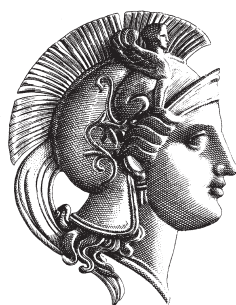


THE WORK AND THE CONTRIBUTION
OF THE RESEARCH CENTRES, OFFICES AND
INSTITUTIONS OF THE ACADEMY OF ATHENS

ACADEMY OF ATHENS

THE WORK AND THE CONTRIBUTION
OF THE RESEARCH CENTRES, OFFICES AND
INSTITUTIONS OF THE ACADEMY OF ATHENS



ATHENS
2022

© Ακαδημία Αθηνών

ISBN: 978-960-404-398-9

CONTENTS

Foreword	9
Section of Sciences	15
Research Center for Astronomy and Applied Mathematics.....	17
Research Center for Atmospheric Physics and Climatology.....	31
Mathematics Research Center.....	59
Office of Theoretical and Applied Mechanics.....	69
Research Office of Experimental Physics	79
Office of Space Research and Technology.....	89
Section of Letters and Fine Arts	101
Research Centre for Modern Greek Dialects.....	103
Hellenic Folklore Research Centre.....	113
Research Centre for Medieval and Modern Hellenism	127
Modern Greek History Research Centre.....	137
Research Centre for the Greek and Latin Literature	147
Research Centre for Scientific Terms and Neologisms.....	157
Research Centre for Antiquity	169
Research Centre for Byzantine and Post-Byzantine Arts	175
Section of Ethical and Political Sciences	199
Research Centre for the History of Greek Law.....	201
Research Centre for Greek Philosophy.....	211
Research Centre for the Greek Society.....	237
Office of International and Constitutional Institutions.....	245
Foundations	247
Biomedical Research Foundation	249
Center for Environmental Effects on Health of the Biomedical Research Foundation.....	273

FOREWORD

Since its foundation in 1926, the Academy of Athens has been fulfilling its mission to cultivate and promote the Sciences, the Letters and Fine Arts, the Ethical and Political Sciences. In parallel, it constitutes a research organisation that supervises several research centres, research offices, and foundations, which conduct research that contributes considerably to the scientific knowledge and artistic creation for the benefit of the academic community and society. This collective volume aims to highlight this multifaceted work of the Academy of Athens and its research structures.

The research centres of the Academy of Athens correspond to the three sections of the institution, each covering an extensive field of scientific enquiry.

1. The Section of Sciences includes Medicine, Physics, Chemistry, Mathematics and Astronomy.

The Research Centers that fall under the domain of the Section of Sciences are the following:

- Research Center for Astronomy and Applied Mathematics
- Research Center for Atmospheric Physics and Climatology
- Mathematics Research Center

The Research Offices that fall under the domain of the Section of the Sciences are the following:

- Research Office of Theoretical and Applied Mechanics
- Research Office for Theoretical Physics
- Research Office of Experimental Physics
- Office of Space Research and Technology
- The Biomedical Research Foundation

2. The Section of Letters and Fine Arts includes Poetry and Prose, History, Literature, Archaeology, Music, Painting, Architecture, and Sculpture.

The Research Centres that fall under the domain of the Section of Letters and Fine Arts are the following:

- Research Centre for Modern Greek Dialects
- Hellenic Folklore Research Centre
- Research Centre for Medieval and Modern Hellenism
- Modern Greek History Research Centre
- Research Centre for Greek and Latin Literature
- Research Centre for Scientific Terms and Neologisms
- Research Centre for Antiquity
- Research Centre for Byzantine and Post-Byzantine Art

Three foundations are operating under the aegis of the Academy of Athens: The Costas and Eleni Ourani Foundation, The Petros Haris Foundation, and The Agni and Michail Sakellariou Foundation. These were established on trust funds bearing the name(s) of the benefactors, who were distinguished men and women of letters. The aim of these foundations is to support university chairs and promote literature, history, and archaeology through publications, awards, and scholarships.

3. The Section of Ethical and Political Sciences includes Theology, Law, Philosophy, Sociology, and Political Sciences.

The Research Centres that fall under the domain of the Section of Ethical and Political Sciences are the following:

- Research Centre for the History of Greek Law
- Research Centre for Greek Philosophy
- Research Centre for the Greek Society
- Research Office of International and Constitutional Institutions

This publication aims to record the work that has been accomplished and is being carried out at the Research Centres, the Offices, and the Biomedical Research Foundation of the Academy of Athens. The relevant report on each research unit is first presented in Greek and then in English. Through this publication, which was compiled by the research staff in the research units of the Academy of Athens, one is able to trace the research interests, the scope of research and the publications in almost every field of enquiry. The reader can thus be better informed on the evolving trends in research, the important findings and conclusions, and the policy proposals in various fields that affect everyday life, specifically energy and climate change. The Academy of Athens is already offering expert advice to the state on critical issues of Greek and international concern.

This collective volume is dedicated to Greece and was compiled this year so that its publication would coincide with the celebration of the 200th anniversary of the Greek Revolution, as a tribute to the struggle of our ancestors. It is also a re-

minder of the research that is being conducted by the Academy of Athens in the context of its mission to improve the scientific and the overall intellectual performance of our country.

I wish to thank cordially all those who contributed to the realisation of this project: the acting directors of the research centres, offices and foundations of the Academy of Athens for compiling the reports on their research units, the researchers for their contribution to the work of our institution, the Secretary General of the Academy of Athens, Professor Christos Zerefos, and my colleagues, the members of the Academy of Athens for the supervision of the research units of our institution. I wish also to thank the editors of this volume, particularly Mr. Sotiris Rizas, acting director of the Modern Greek History Research Centre, and Mrs. Olga Karagiorgou, senior researcher at the Research Centre for Byzantine and Post-Byzantine Art, as well as the printing manager, Mr. Philippos Lenis.

I hope that this volume, which summarises major research achievements of the Academy of Athens and highlights promising possibilities in key research areas, will offer an interesting read.

November 2021

The President of the Academy of Athens

Loucas G. Christophorou

This collective volume, accounting the work and the contribution of the Research Centers and Offices of the Academy of Athens, is the culmination of our researchers' successful performance, as well as the Academy's effective operation as the highest scholarly institute in the country. The deeds in hand are the result of the pervasive spirit of intellectual freedom, but also of the devotion and love for scientific work that characterises the selected research community at the Academy of Athens. The publication of this volume aims to promote the work of our researchers in the spirit of extroversion pursued by the Presiding Board of the Academy.

As mentioned by the Academician Loucas Christophorou in his preface, 15 Research Centers, including the Biomedical Research Foundation of the Academy of Athens, and five Research Offices operated at the Academy of Athens in 2021, employing many permanent researchers, special scientific employees, post-doctoral researchers, lab technicians, PhD students and a significant number of graduates from various University faculties, who are working on their diploma theses. The total number of scientists involved in all these categories exceeds 730. Research conducted at the Academy of Athens covers a wide spectrum of disciplines in Science, Humanities, as well as Letters and the Arts. The amount and success of the research that is being carried out at the Research Centers and Offices of the Academy of Athens is vividly attested by international bibliometric sources: in 2021, approximately 400 papers were published in reputable scientific journals, receiving already a significant number of citations.

During my service for more than ten years in the Research Committee of the Academy of Athens, I am pleased to see an increase in both the number of research projects and the budget of competing research funds, which we have achieved together. Specifically, in 2021 alone, we served 42 research projects, with a total cost of about 668,000 euros; at the same time, the largest research institute of the Academy, namely the Biomedical Research Foundation, carried out almost 100 research projects with a total cost of 4,370,000 euros. Most of the incoming research funds of the Academy originated from competitive programmes.

I would like to add that the present volume constitutes a solid proof that the Academy of Athens fulfills its duty of preserving the ark of moral values and promoting the Sciences, Letters and Arts that were born in this land, where we are

all active today. I wish that we all continue our work united, guided by the freedom of research, the innovation, and the appetite for selfless contribution to Letters and Science, that has always been distinguishing us. The brilliant results in the vocation to research, as presented for the very first time in this collective volume, grant us hope that the efforts made by all of us have begun to bear their rich fruit, promoting thus in the best way the significant work that is being accomplished by the talented scientific human resources active within the premises of the Academy of Athens.

In conclusion, I would like to thank everyone who contributed to the excellent appearance of this edition, and especially the director of the Modern Greek History Research Centre, Mr. Sotirios Rizas, and Mrs. Olga Karagiorgou, researcher at the Research Centre for Byzantine and Post-byzantine Art, with whom the Presiding Board of the Academy of Athens had an impeccable collaboration throughout the preparation of this volume.

I wholeheartedly wish to the members of our community continuous success in all scientific endeavours.

The Secretary General,

Christos Zerefos

SECTION OF SCIENCES

RESEARCH CENTER FOR ASTRONOMY AND APPLIED MATHEMATICS

The Research Center for Astronomy and Applied Mathematics – RCAAM (in Greek: Κέντρον Ερευνών Αστρονομίας και Εφαρμοσμένων Μαθηματικών – KEAEM), established in 1959 as “Office for Research and Calculations”, received its present name in 1966. Its scientific research focuses on the following fields: 1. Dynamical Astronomy, Nonlinear phenomena and Chaos Theory, 2. Galactic Dynamics and Galactic Morphology, 3. Solar and Space Physics, 4. Magnetohydrodynamics and 5. Cosmology. A recently established line of research involves the study of Extremely Low Frequency (ELF) electromagnetic waves in the Schumann (2-50 Hz) region.

The first Supervisor of the Center was the Academician Prof. I. Xanthakis, who served until his passing in 1994. Between 1994-1997, RCAAM was supervised by the Academician Prof. N. Artemiadis. Since 1997, the Center is being supervised by the Academician Prof. G. Contopoulos. The following have served as Directors of the Center: Dr. L. Mavridis (1960-1966), Dr. C. Macris (1971-1979), Dr. C. Poulakos (1981-2001), Dr. N. Voglis (2001-2007), Dr. V. Tritakis (2007, Acting Director), Dr. H.C. Dara (2008), and since 2009 Dr. P.A. Patsis (Acting Director).

RCAAM hosts the “A-EFFORT” solar-flare forecasting service of the European Space Agency (ESA) and has coordinated the “FLARECAST” Consortium of the European Union for the prediction of solar eruptions.

Six tenured researchers serve currently at RCAAM. Dr. S. Basilakos serves also as Director of the Institute for Astronomy, Astrophysics, Space Applications and Remote Sensing of the National Observatory of Athens. Research is conducted through projects supported by the Research Committee of the Academy of Athens, as well as by national and international organisations and institutions. Since 1997, competitive research funding awarded to the Center has amounted to about 280,000 € for research on Magnetohydrodynamics, about 370,000 € for research on Dynamical Astronomy and, since 2010, to more than 1.3 million € for research on Solar and Space Physics.

Research results of the Center are mainly published in high impact, peer-reviewed international journals, as well as in conference proceedings and special volumes. The current publication record of the Center includes **619** research papers

in refereed journals and **263** non-refereed publications with RCAAM as affiliation. Fig. 1 depicts a histogram with the number of publications in 5-years bins. The mean number of refereed papers per year over the last ten years is about **32**. There are more than **12000** third party citations to these 619 papers.

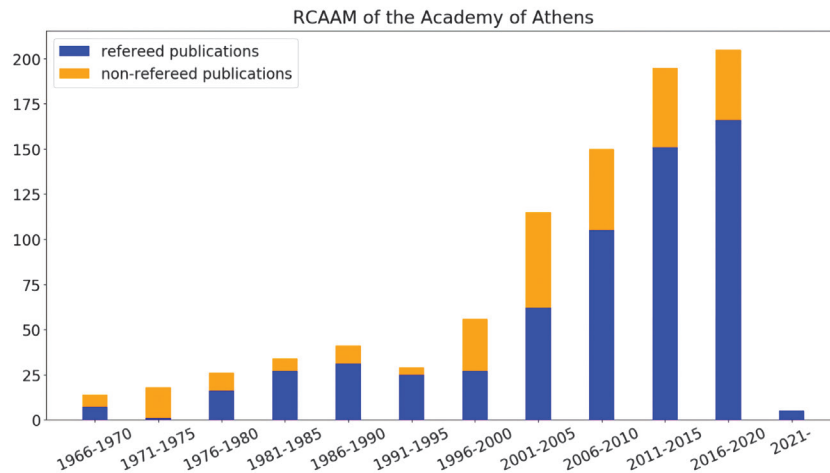


Fig. 1. RCAAM publications since its establishment. In the last 10 years RCAAM has published an average of 32 refereed papers per year (based on NASA/ADS data)

In the last 25 years RCAAM was the exclusive organiser of **4** international conferences and workshops, while its members have served as main organisers and members of the scientific organising committees in more than **94** conferences organised either solely by the Center, or jointly with other institutes. The Proceedings of the following three Conferences, organised by RCAAM, have been published:

- Solar Physics, J.N. Xanthakis (ed.), 1967, John Wiley & Sons
- Galaxies and Chaos, G. Contopoulos and N. Voglis (eds), 2003, LNP (Lecture Notes in Physics), vol. 626, 3, Springer-Verlag
- Chaos in Astronomy, G. Contopoulos and P.A. Patsis (eds), 2009, Astrophysics and Space Science Proceedings, Springer-Verlag

In addition, two books have been published by Prof. G. Contopoulos:

- Order and Chaos in Dynamical Astronomy, 2002, Springer
- Adventures in Order and Chaos: A Scientific Autobiography, Astrophysics and Space Science Library, Vol. 313, 2005, Kluwer.

Finally, RCAAM researchers have served as co-editors of **29** conference proceedings or as guest editors of special volumes.

Since 2016, RCAAM publishes the annual edition “New Advances in Astronomy”. This is a Greek-language summary of recent advances in Astronomy and

Applied Mathematics, associated with research conducted at RCAAM. The Center's Annual Reports since 2009, including detailed publication lists, can be downloaded in PDF format from the Center's website: <http://astro.academyofathens.gr/publications.html>

Since 1997, RCAAM has been organising seminars and research talks on a weekly basis. Besides the RCAAM researchers and students, invited speakers include academicians, professors and distinguished scientists from various universities and research centers in Greece and abroad. A total of **425** talks have been organised at the seminars' room of RCAAM, since 2009 alone.

Since 2000, RCAAM has hosted **19** postdoctoral researchers, working on in-house scientific projects over a period of 2-3 years on average, which are financed by the Research Committee of the Academy of Athens, or other sources. During the same period, a total of 13 PhD students [from the University of Athens (10), the Democritean University of Thrace (1), the National Institute of Astrophysics, Optics and Electronics, Mexico (1), and the University of Florida, USA (1)], have worked under the supervision of RCAAM's researchers and successfully defended their doctoral theses. Currently two more PhD students are hosted at RCAAM, while members of our institute participate, as main supervisors, or as members of supervising committees, in **16** more PhDs (eight at the University of Athens, two at the Georgia State University, USA, two at the University of Ioannina and one in each of the following Universities: Thessaloniki, Volos, the Technical University of Athens and the University of Leuven, Belgium). In parallel, **10** master's students have completed their work and successfully acquired their master's degrees working at RCAAM, under the supervision of the Center's staff. Currently, two master's theses are being supervised by RCAAM researchers. Finally, three undergraduate students (two from the University of Athens and one from the University of Grenoble, France) have completed their diploma theses at RCAAM.

Since 2002, RCAAM researchers have participated in the teaching of six postgraduate disciplines at the University of Athens (corresponding to 30 semesters), as well as the teaching of two undergraduate courses (totally for 7 semesters) at the same University, and one undergraduate course (1 semester) at the Georgia State University, USA. In addition, they have been invited to teach several postgraduate courses in university departments, and offer seminars for students and researchers, organised by universities and scientific associations.

Every year RCAAM researchers accept invitations to give talks in international conferences, as well as to stay for longer terms at various institutes abroad in the framework of joint research projects (details on these activities are given in our Annual Reports). Current collaborations in common research projects involve the following academic and research institutions: University of Helsinki (Finland); European Space Agency (ESA), Paris; Laboratoire d'Astrophysique de Marseille,

University of Aix-Marseille; University of Strasbourg; Institut d'Astrophysique Spatiale, University Paris-Saclay (France); Astronomy Department, University of Munich (LMU); European Southern Observatory (ESO), Munich; Max-Planck Institute for Astrophysics, Munich; Max-Planck Institute for Radioastronomy, Bonn (Germany); National Institute of Astrophysics, Optics and Electronics (INNAOE), Puebla, Mexico; University of Padova (Italy); University of Krakow (Poland); Department of Mathematics, University of Cape Town (South Africa); Space Science Institute (ISSI), Bern, (Switzerland); Georgia State University, NASA/Goddard, NASA/Solar Radiation Analysis Group, NASA/Ames (USA).

Quite indicative among the several distinctions earned by RCAAM members are the election of Prof. Contopoulos as Honorary Doctor of Science of the University of Athens (2009), the inclusion of the paper "Chaos in Bohmian and Quantum Mechanics" by Efthymiopoulos and Contopoulos in the list of selected papers of Journal of Physics A, the Marie Curie Fellowship and Excellent Science Award bestowed upon Dr. Georgoulis (2015), the naming of the minor planet 84015 as "Efthymiopoulos" in honor of the RCAAM researcher Christos Efthymiopoulos (2017), and the honorable mentions by the Gravity Research Foundation to Dr. Basilakos for his research (2013, 2014, 2017 and 2019).

RCAAM researchers have participated in numerous examination committees for PhDs and habilitations, as well as in committees for the nomination and promotion of researchers in universities and research institutes. They are members of several administrative councils and committees of national and international scientific organisations, including the International Astronomical Union (IAU), the European Astronomical Society (EAS), and the Committee of Space Research (COSPAR). They serve as evaluators in research projects, observing programmes' committees, and as reviewers in all the high-impact journals on Astronomy, Astrophysics and Nonlinear Dynamics. RCAAM members participate in the editorial boards of the American Astronomical Society (AAS), and the following international scientific journals: "Celestial Mechanics and Dynamical Astronomy", "High-Energy and Astroparticle Physics" and "The Universe". Dr. Basilakos is currently the President of the Greek National Committee for Astronomy (GNCA).

RCAAM has organised three series of full-year talks for the broad public during the whole year at the Academy of Athens. These were organised in 2009, on the occasion of the "International Year of Astronomy" (11 talks), in 2015, on the occasion of the "International Year of Light" (8 talks) and in 2019, on the occasion of the IAU Centennial (9 talks). Besides these series of talks, RCAAM researchers give many public lectures, they publish popular articles in newspapers and journals, and appear in television and radio programmes in an effort to disseminate the results of their research to the general public.

Future plans: Theoretical and numerical work on Classical and Quantum

nonlinear Dynamical systems in RCAAM will continue, drawing from and extending the recent successes in this field of research. Numerical and observational work on Galactic Dynamics will focus on the comparison of theoretical models with high quality observations of ground- and space-based telescopes. A main scientific endeavor will be the study of the pulsar magnetospheric structure with emphasis on understanding the mechanism of relativistic particle acceleration and emission of high energy radiation in the magnetospheric current sheet. Cutting-edge Solar Physics and Space Weather research at RCAAM will be assisted by the commissioning and future planning of relevant space missions. RCAAM and the National Committee of the Academy of Athens, with Dr. M. Georgoulis as the representative of Greece in COSPAR, will chair the organisation of the 44th COSPAR Scientific Assembly, to be held in Athens in July 2022. In addition, the theoretical and observational research in Cosmology will continue following the high standards that characterise RCAAM's research over the past 15 years.

Details about all RCAAM activities can be found in the Center's website: <http://astro.academyofathens.gr/>

Highlights of RCAAM research

Some indicative research programmes conducted in the Center, whose results have been highly appreciated by the international astronomical community, contributing thus to the Center's worldwide recognition, are as follows:

Quantum Dynamical Systems

RCAAM has played a key role in developing Chaos theory in astronomical systems and in nonlinear dynamical systems, in general. Special emphasis has been given in the last twenty years in the study of quantum dynamical systems in the de Broglie - Bohm interpretation of Quantum Mechanics (Contopoulos, Tzemos 2020, Regul. Chaotic Dyn. 25, 476). The main contribution of the Center is the development of the most general theoretical mechanism for the emergence of chaos in the Bohmian trajectories of two-dimensional (Efthymiopoulos, Kalapotharakos, Contopoulos 2009, Phys. Rev. E 79, 036203) and three-dimensional quantum systems (Tzemos, Efthymiopoulos, Contopoulos 2018, Phys. Rev. E 97, 042201). This is the so called 'Nodal point-X-point mechanism', according to which whenever a Bohmian trajectory comes close to a moving node of the wavefunction Ψ , it gets deflected by its accompanying hyperbolic point, the X-point, as shown in Fig. 2. The cumulative action of many such encounters is the emergence of chaos. Based on this mechanism, the RCAAM researchers study the relationship between chaos, order and the entanglement of complex quantum sys-

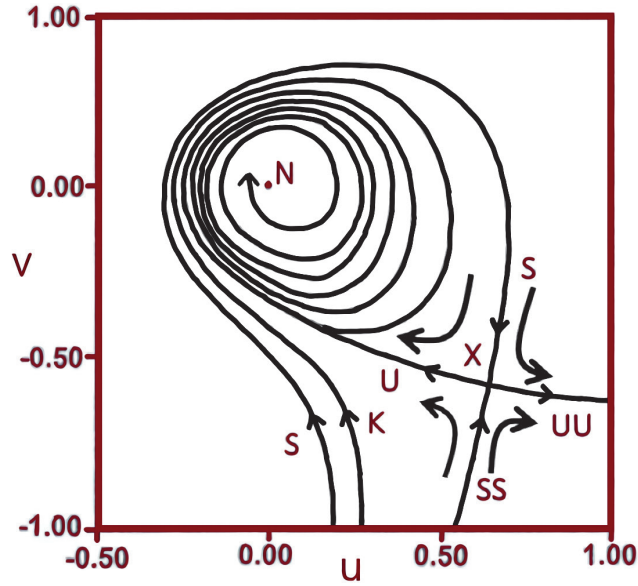


Fig. 2. The typical form of the Bohmian velocity field close to a moving nodal point N . We observe the unstable point X .

tems (Tzemos, Contopoulos 2020, Phys. Rev. E. 102, 042205), which is very important for the theoretical understanding of the origin of Born's rule (probability density $P=|\Psi|^2$) (Efthymiopoulos, Contopoulos, Tzemos 2017, Ann. Fond. Louis De Broglie 42, 133).

Peanut shaped galactic bulges

The central regions of many disk galaxies, including also the Milky Way, have a “peanut” or X-shaped morphology, when viewed edge-on. Puzzled by its presence for many years, researchers initially considered it as a peculiar type of a galactic bulge. Research in RCAAM contributed significantly to the clarification of this structure. In a series of 24 papers, starting in 2002 (Patsis, Skokos, Athanassoula 2002, MNRAS 337, 578), it has been shown that stars, initially on the equatorial plane of the galaxies, feeling the presence of a vertical 2:1 resonance move in such orbits, visit the space away from the galactic plane, as to support the peanut- or X-shaped morphology. In Fig. 3, on the left, we observe a typical galaxy with this morphology (HCG 87a), and on the right, a set of orbits reproducing its central structure (Patsis & Katsanikas 2014, MNRAS 445, 3525). This structure is not a distinct component, but the central, thick part of the galactic bars, as indicated also by N-body simulations. Recent observations with the Aristarchos tel-



Fig. 3. Left: An X-shaped bulge in the central region of a barred galaxy observed edge-on. Right: A set of orbits reproducing the X structure.

escope on mount Helmos gave further support to this theory (Patsis et al. 2021, *Astron. Astrophys.* 647,20).

Chaotic Spirals

A hot topic in modern Galactic Dynamics has been the dynamical mechanism of “chaotic spiral arms” in barred-spiral galaxies. Research in RCAAM played a key role in understanding this phenomenon, starting with the papers by Voglis, Tsoutsis, Efthymiopoulos 2006, *MNRAS*, 373, 280, and Patsis 2006, *MNRAS* 369, L56. The theory of chaotic spiral arms applies to disc galaxies with strong bars, in which the orbits of the stars in the region of corotation are, in principle, chaotic. An important issue, for the understanding of the development of a spiral structure in such systems is the study of the unstable manifolds emanating from the unstable Lagrangian points of equilibrium at the ends of the bar. These manifolds represent chaotic orbits, in spiral arrangement, that extend to large distances away from the bar as shown in Fig. 4 (Efthymiopoulos, Harsoula, Contopoulos, 2020, *A&A* 636, A44). The theory of “chaotic spiral arms” through invariant manifolds can interpret also the material flow “bridges” between the bar and the spirals. Such structures have been modeled on a series of simulations by means of an N-body code developed in our Center, using parallel techniques of adaptive grids. The code studies the manifold theory as well as the secular evolution of galaxies, either isolated, or in an interactive environment with accompanying galaxies. Finally, during the last years, the analytical and numerical theory of manifolds has been developed in the case of multiple pattern speeds of the structures (Efthymiopoulos, Harsoula, Contopoulos, 2020, *A&A* 636, 44).

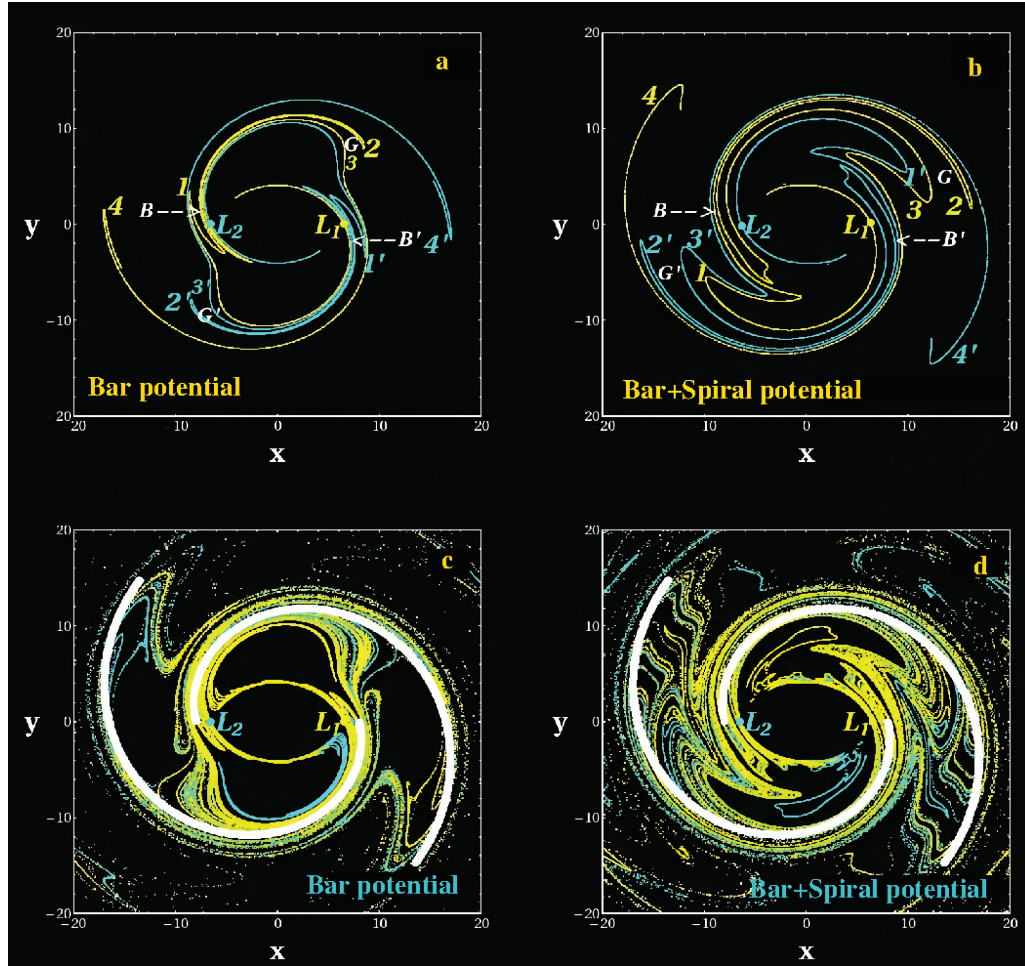


Fig. 4. Spirals supported by chaotic orbits, as predicted by the presence of unstable manifolds, emanating from the unstable Lagrangian points of equilibrium, at the ends of the bar.

Study of solar jets using observations, MHD theory and numerical simulations

Jets are seen very often on the solar surface in many sizes and temperatures. An important contribution of RCAAM, which highlights the constructive combination of observations, MHD theory and simulations, was the study of a jet, observed with the SoHO/SUMER and TRACE space telescopes in 1999. The Observations were very detailed and allowed the measurement of plasma characteristics which were then compared with a MHD numerical simulation of a jet. The observations indicated that photospheric magnetic flux was emerging from the photosphere during the jet. The simulation suggested that the magnetic reconnection be-

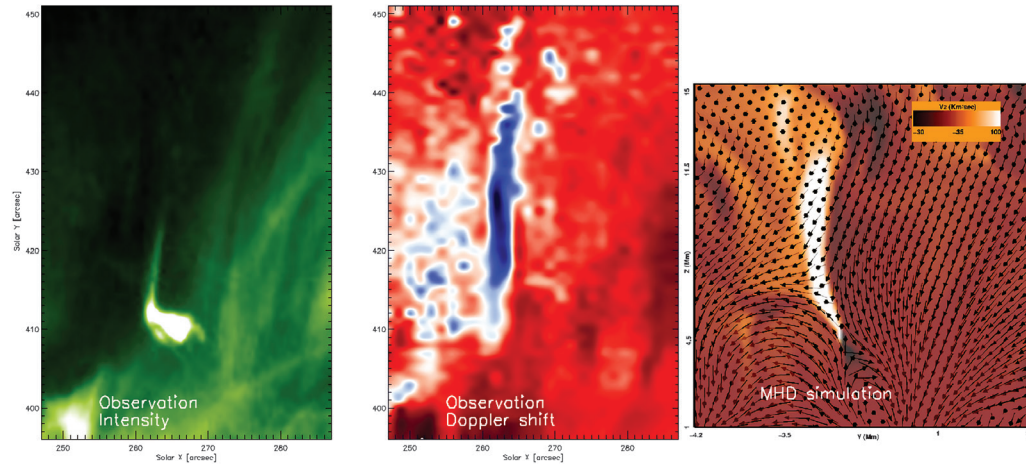


Fig. 5. Three panels showing the observation of a jet in intensity (left) and in a velocity (Doppler) map (center), along with a jet produced with a numerical model (right). In the central panel, upward velocities are indicated in blue. In the right panel, arrows indicate the magnetic field.

tween the emerging flux and the preexisting coronal field created the jet. In Fig. 5, the panels on the left and in the centre show the jet intensity and dopplergram at coronal temperatures. The blue structure indicates ejected material at roughly 100km/s. The right panel shows the simulated velocity of the jet and the simulated magnetic lines of force (Gontikakis, Archontis, Tsinganos, 2009, A&A 506, 45).

Forecasting of the solar end of space weather

Forecasting of the solar end of space weather is an inherently interdisciplinary, worldwide endeavor encompassing fundamental solar physics, advanced statistics and performance verification analysis. A Marie Curie Fellowship of the European Commission awarded to RCAAM in 2010, entitled *Solar Magnetic Eruptions: Understanding and Forecasting*, laid new foundations for both tasks (understanding and forecasting), via a series of about 50 refereed papers starting in 2012 (Georgoulis, Tziotziou & Raouafi, 2012, ApJ, 759, 1; Tziotziou, Georgoulis & Raouafi, 2012, ApJL, 759, L4; Georgoulis, Titov & Mikic, 2012, ApJ, 761, 61; Georgoulis, 2012, Solar Phys., 276, 161). This groundwork ultimately resulted in attracting ESA's A-EFFort project (a-effort.academyofathens.gr), that resulted in RCAAM being named an ESA/SSA/SWE expert group, the national Thales Hellenic Network for Space Weather Research (HNSWR) and the European Union's FLARECAST (www.flarecast.eu, coordinated by RCAAM) and SWATNET ([https://swatnet.eu](http://swatnet.eu)) projects. The culmination of collective and collaborative work at RCAAM over

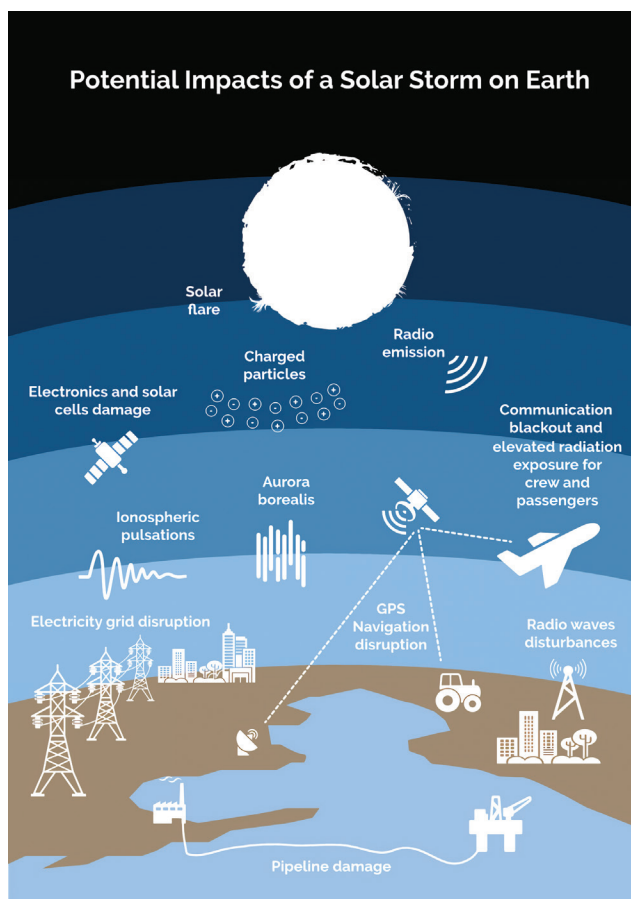


Fig. 6. A graphical summary of extreme solar weather and its repercussions in the terrestrial atmosphere and beyond, until Earth's surface. Image courtesy of the Fachhochschule Nordwestschweiz partner of the FLARECAST Consortium, included in the FLARECAST overview paper by Georgoulis et al. (2021).

a decade included the realisation of an American Geophysical Union monograph by invitation (Georgoulis, 2018, AGU Geophys. Monogr. Series, 235, 371), an invited review in *Philosophical Transactions of the Royal Astronomical Society A* (Georgoulis, Nindos & Zhang, 2019, RSTA, 377, 20180094) and, most importantly, a state-of-the-art overview paper for the FLARECAST project in the *Journal of Space Weather and Space Climate* (Georgoulis et al. [incl. Gontikakis] 2021, JSWSC, in revision). An encompassing picture of this paper, summarising the effect of solar weather in the terrestrial environment, is provided here (Fig. 6). A parallel, but related collaborative work, where RCAAM researchers had a key role, was recently published in *Nature Scientific Data* (Angryk et al. [incl. Georgoulis], 2020, NatSciData, 7, 227).

Study and advancement of the Cosmic Battery

The study and advancement of the Cosmic Battery as the fundamental physical mechanism for the production of astrophysical magnetic fields around black holes, has been elaborated in the framework of RCAAM research projects (see volume “The formation and disruption of black hole jets”, Contopoulos, Kylafis & Gabuzda 2015, Springer Verlag). Our proposal for a Cosmic Battery is that the magnetic field that accelerates and collimates the large scale astrophysical jets observed around black holes (as is the large scale jet in galaxy M87, or the smaller scale jets from X-ray binaries in our own Galaxy) is produced in situ by the radiation of the surrounding accretion disk. The Cosmic Battery predicts that the magnetic field along the axis of the jet is parallel to the direction of the angular velocity vector Ω of the surrounding disk, whereas the magnetic field that surrounds the jet is directed opposite to Ω (Fig. 7). Our theoretical predictions have been confirmed in both the observations of the Faraday RM gradient across the kpc-scale jet (Christodoulou, Gabuzda, Knuettel, Contopoulos et al. 2016, 591 A61, Astronomy & Astrophysics), and the direction of the axial field in the Event Horizon Telescope image of the central black hole M87* (Contopoulos et al. 2022, in preparation).

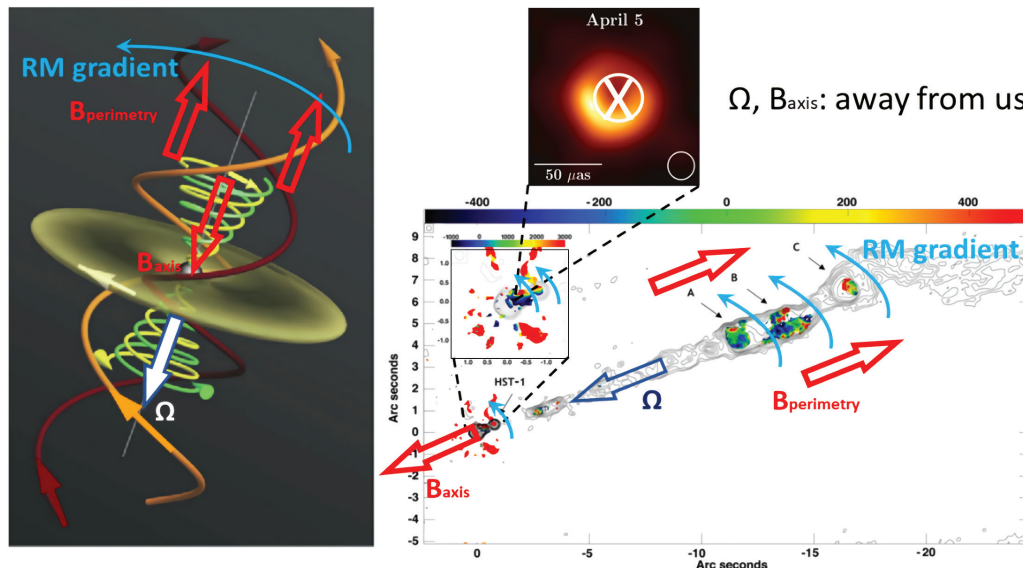


Fig. 7. Predictions of the Cosmic Battery for the magnetic field distribution around astrophysical jets. Red arrows: magnetic field. White arrows: angular velocity of accretion disk. Blue arrows: observed Faraday Rotation Measure gradient.

Cosmology at RCAAM

Cosmology has been one of the key research fields at RCAAM in the last 15 years. Research activities in the fields of Theoretical and Observational Cosmology focus on the study of the Universe as a whole, from its primordial to its late-time era, and in particular on the following topics: 1) Accelerated expansion of the Universe, 2) Dark Energy and Dark Matter, 3) Primordial Universe (Big Bang, Inflation, Reheating, Phase Transitions, Baryogenesis, Nucleosynthesis, etc.), 4) Matter Clustering and Large Scale Structure, 5) Test of General Theory of Relativity at cosmological scales, 6) Modified and Extended Theories of Gravity, 7) Black Holes and Gravitational Waves, 8) Cosmological Simulations and 9) Elaboration of Cosmological Data [from Cosmic Microwave Background Radiation (CMB), Supernovae Type Ia (SNIa), Baryonic Acoustic Oscillations (BAO), Cosmic Chronometers (CC), Growth Index, Large Scale Structure (LSS), etc.]. Research on all the aforementioned topics aims to check cosmological scenarios and theories. Since 2006, the publication record of RCAAM researchers on issues of Cosmology includes 126 papers in refereed journals and 34 in conference proceedings, while the total number of citations is about 4726. The results have been presented in 45 international conferences; RCAAM researchers participated actively in the organisation of 14 of these conferences.

Recording, Analysis and filing of Schumann Resonances

Schumann Resonances (hereafter SR), are electromagnetic waves of Extra Low Frequency (hereafter ELF) in the range of 2-50 Hz. Their scientific interest emanates from their close connection with various geophysical phenomena like atmospheric electricity, ionospheric disturbances, biological effects, and seismic activity. Recording of SR is operated in the observational and recording site on the top of Mount Parnon (1450 m) in South Greece, Laconia territory. As Greece and Eastern Mediterranean are very seismogenic areas, medium size earthquakes occur very often. For this reason, the analysis of preseismic recordings has great priority in this research. In Fig. 8, the top panels show a characteristic preseismic SR signal recorded on Mount Parnon. The event was recorded on August 6, 2020, UT 10.05, two days before a 4.2 R earthquake in the area of Kyllini, and eleven days before a 5.0 R earthquake on the island of Hydra. The left panel presents the observation made by the Polish system of the University of Cracow hosted on Mount Parnon, while the right panel presents the observation by the Greek system. A common property of all preseismic signals is the accumulation of the spectrum power around the 25Hz frequency. Both earthquakes mentioned above occurred within a distance of 300 km from the observation site. This is a distance within the empirical limits of an area, in which preseismic signals can be recorded.

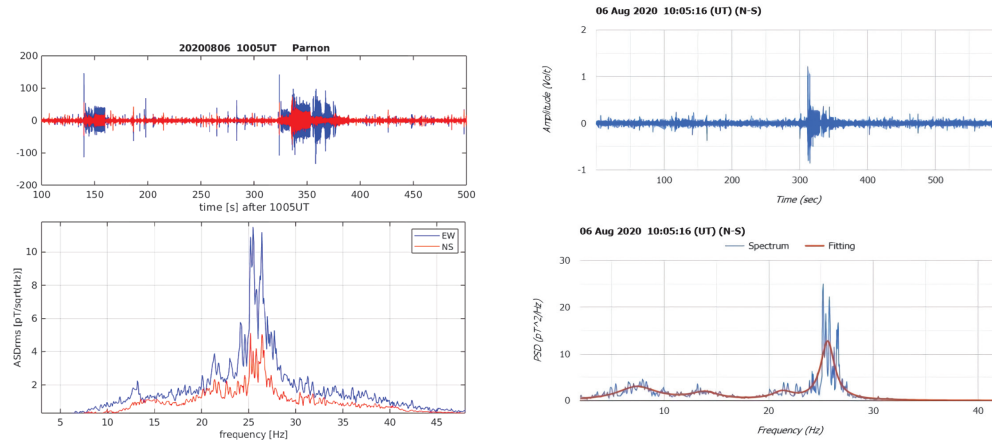


Fig. 8. Schumann Resonances recordings and their corresponding ELF spectra (upper and lower rows, respectively) from the Polish and Greek recording systems (left and right columns, respectively).

RESEARCH CENTER FOR ATMOSPHERIC PHYSICS AND CLIMATOLOGY

1. Introduction

The Research Center for Atmospheric Physics and Climatology - RCAPC (in Greek: Κέντρον Ερεύνης Φυσικής της Ατμοσφαιράς και Κλιματολογίας - ΚΕΦΑΚ) was established by Law in 1977 following a decision of the Plenary Session of the Academy of Athens which ratified a proposal of the Academician Elias G. Mariolopoulos. The Senate of the Academy of Athens appointed Elias G. Mariolopoulos as the first Supervisor of the Center who organised the Center in terms of its installation, equipment and personnel together with the first elected Director of the Center, Professor Christos Zerefos.

The aims of the Center

The aims of the Center, as described in its founding law are:

- The research of climate variations of any time period.
- The systematic study of the observations of the upper layers of the atmosphere.
- The collection and processing of observations related to air pollution.

In recent years the Center deals with the global and regional climate change through analysis of satellite and terrestrial observations as well as simulations with climate models and has established collaborations with many Greek, European and American Research Centers and Universities. The Center specialises in the study of climate variability, in terms of climate trends, extreme events and their impact on infrastructure at various time scales. The Center's researchers have also been working in recent years on air pollution and the interactions between ozone, atmospheric particles, climate and the physical chemistry of the atmosphere. Atmospheric modeling simulations are operated at the Center with various scenarios of future greenhouse gas emissions, in order to facilitate the elaboration of mitigation and adaptation strategies to climate change.

Activities of the Center

The Academy of Athens and the Center coordinated the research of the socio-economic effects of anthropogenic climate change in Greece during the 21st century (Bank of Greece). The Center also had a coordinating role in the preparation of the relevant Greek legislation for the adaptation and mitigation of climate change (Ministry of Environment and Energy). The Academy of Athens is part of the trilateral agreement with Stockholm University and TEMES S.A., established for the operation of NEO (Navarino Environmental Observatory), in Messenia, Peloponnese. The collaboration is dedicated to the study of climate change and its effects on the natural environment and human activities in the Mediterranean. NEO is a dynamic hub of modern environmental and climate research, where scientists from around the world exchange knowledge and ideas, while developing new research tools and methods.

The results of RCAPC researchers have led to more than 230 publications in international peer-reviewed journals with over 15,000 citations. Additional publications of the Center are available in over 30 volumes of books and over 250 conference proceedings. Compiled lists of the Center's publications can be found at the following web pages:

- In the Center's Publications Series (Publications):
(<http://www.academyofathens.gr/el/research/centers/climate/publications>)
- In international scientific journals:
(<http://www.academyofathens.gr/el/research/centers/climate/publications/peer-reviewed>)
- In Conference Proceedings and communications.
(<http://www.academyofathens.gr/el/research/centers/climate/publications/conference-proceedings>)

An indicative list of selected publications in international scientific journals with reviewers includes:

1. Solomos, S., P.T. Nastos, D. Emmanouloudis, A. Koutsouraki, C. Zerefos "Modeling Study on the Downslope Wind of 'Katevatos' in Greece and Implications for the Battle of Arachova in 1826", **Atmosphere**, 12, 993. <https://doi.org/10.3390/atmos12080993>, 2021.
2. Wagner, A., Y. Bennouna, A-M. Blechschmidt, G. Brasseur, S. Chabrillat, Y. Christophe, Q. Errera, H. Eskes, J. Flemming, KM Hansen, A. Inness, J. Kapsomenakis, B. Langerock, A. Richter, N. Sudarchikova, V. Thouret, C. Zerefos "Comprehensive evaluation of the Copernicus Atmosphere Monitoring Service (CAMS) reanalysis against independent observations: Reactive gases", **Elementa: Science of the Anthropocene** 9(1), <https://doi.org/10.1525/elementa.2020.00171>, 2021.

3. Zerefos, C., S. Solomos, D. Melas, J. Kapsomenakis, C. Repapis, “The Role of Weather during the Greek–Persian ‘Naval Battle of Salamis’ in 480 B.C.”, **Atmosphere**, 11, 838; doi:10.3390/atmos11080838, 2020.
4. Zerefos, C., S. Solomos, J. Kapsomenakis, A. Poupkou, L. Dimitriadou, I. Polychroni, P. Kalabokas, C. Philandras, D. Thanos, “Lessons learned and questions raised during and post-COVID-19 anthropopause period in relation to the environment and climate”, **Environment Development and Sustainability**, Springer, DOI: 10.1007/s10668-020-01075-4, 2020.
5. Fountoulakis, I., C.S. Zerefos, A.F. Bais, J. Kapsomenakis, M.E. Koukouli, N. Ohkawara, V. Fioletov, H. De Backer, K. Lakkala, T. Karppinen, A.R. Webb, “Twenty-five years of spectral UV-B measurements over Canada, Europe and Japan: trends and effects from changes in ozone, aerosols, clouds and surface reflectivity”, **Comptes Rendus Geoscience**, 350, 393-402, 2018.
6. Zerefos, C., J. Kapsomenakis, K. Eleftheratos, K. Tourpali, I. Petropavlovskikh, D. Hubert, S. Godin-Beekmann, W. Steinbrecht, S. Frith, V. Sofieva, B. Hassler, “Representativeness of single lidar stations for zonally averaged ozone profiles, their trends and attribution to proxies”, **Atmos. Chem. Phys.**, 18(9), 6427-6440, 2018.
7. Zerefos, C. S., K. Eleftheratos, J. Kapsomenakis, S. Solomos, A. Inness, D. Balis, A. Redondas, H. Eskes, M. Allaart, V. Amiridis, A. Dahlback, V. De Bock, H. Diémoz, R. Engemann, P. Eriksen, V. Fioletov, J. Gröbner, A. Heikkilä, I. Petropavlovskikh, J. Jarosławski, W. Josefsson, T. Karppinen, U. Köhler, C. Meleti, C. Repapis, J. Rimmer, V. Savinykh, V. Shirov, A. M. Siani, A. R. D. Smedley, M. Stanek, and R. Stübi, “Detecting volcanic sulfur dioxide plumes in the Northern Hemisphere using the Brewer spectrophotometer, other networks, and satellite observations”, **Atmos. Chem. Phys.**, 17, 551-574, doi: 10.5194/acp-17-551-2017, 2017.
8. Luterbacher, J., J P Werner, J E Smerdon, L Fernández-Donado, F J González-Rouco, D. Barriopedro, FC Ljungqvist, U. Büntgen, E. Zorita, S. Wagner, J. Esper, D. McCarroll, A. Toreti, D. Frank, J.H. Jungclauss, M. Barriendos, C. Bertolin, O. Bothe, R. Brázdil, D. Camuffo, P. Dobrovolný, M. Gagen, E. García-Bustamante, Q. Ge, J.J. Gómez-Navarro, J. Guiot, Z. Ha, G.C. Hegerl, K. Holmgren, V.V. Klimenko, J. Martín-Chivelet, C. Pfister, N. Roberts, A. Schindler, A. Schurer, O. Solomina, L. von Gunten, E. Wahl, H. Wanner, O. Wetter, E. Xoplaki, N. Yuan, D. Zanchettin, H. Zhang, C. Zerefos, “European summer temperatures since Roman times”, **Environ. Res. Lett.** 11, doi:10.1088/1748-9326/11/2/024001, 2016 *Selected in the “Highlights of 2016” collection by the Editors of the Journal.*
9. Zerefos, C. S., P. Tetsis, A. Kazantzidis, V. Amiridis, S. C. Zerefos, J. Luterbacher, K. Eleftheratos, E. Gerasopoulos, S. Kazadzis, A. Papayannis, “Further evidence

- of important environmental information content in red-to-green ratios as depicted in paintings by great masters”, **Atmos. Chem. Phys.**, 14, 2987-3015, 2014. *Selected as “Research Spotlight” by the Editors of the Journal.*
10. Inness, A., Baier, F., Benedetti, A., Bouarar, I., Chabrillat, S., Clark, H., Clerbaux, C., Coheur, P., Engelen, R. J., Errera, Q., Flemming, J., George, M., Granier, C., Hadji-Lazaro, J., Huijnen, V., Hurtmans, D., Jones, L., Kaiser, J. W., Kapsomenakis, J., Lefever, K., Leitão, J., Razinger, M., Richter, A., Schultz, M. G., Simmons, A. J., Suttie, M., Stein, O., Thépaut, J.-N., Thouret, V., Vrekoussis, M., Zerefos, C., and the MACC team: “The MACC reanalysis: an 8 yr data set of atmospheric composition”, **Atmos. Chem. Phys.**, 13, 4073-4109, doi:10.5194/acp-13-4073-2013, 2013.
 11. Kuglitsch, F.G., A. Toreti, E. Xoplaki, P.M. Della-Marta, C.S. Zerefos, M. Türkeş, J. Luterbacher “Heat wave changes in the eastern Mediterranean since 1960”, **Geophys. Res. Lett.**, 37, L04802, doi: 10.1029/2009GL041841, 2010. *Selected as “Research Spotlight” from the American Geophysical Union (AGU).*
 12. Luterbacher, J., E. Xoplaki, C. Casty, H. Wanner, A. Pauling, M. Kuttel, T. Rütishauser, S. Brönnimann, E. Fischer, D. Fleitmann, F.J. Gonzalez-Rouco, R. Garcia-Herrera, M. Barriendos, F. Rodrigo, J.C. Gonzalez-Hidalgo, M.A. Saz, L. Gimeno, P. Ribera, M. Brunet, H. Paeth, N. Rambu, T. Felis, J. Jacobeit, A. Dunkeloh, E. Zorita, J. Guiot, M. Türkeş, M.J. Alcoforado, R. Trigo, D. Wheeler, S. Tett, M.E. Mann, R. Touchan, D.T. Shindell, S. Silenzi, P. Montagna, D. Camuffo, A. Mariotti, T. Nanni, M. Brunetti, M. Maugeri, C. Zerefos, S. De Zolt, P. Lionello, “Mediterranean Climate Variability Over the Last Centuries: A Review”, Chapter 1, in: *The Mediterranean Climate: an overview of the main characteristics and issues*, (Eds. P. Lionello, P. Malanotte-Rizzoli and R. Boscolo), Elsevier, 27-148, 2006.
 13. Sausen, R., I. Isaksen, V. Grewe, D. Hauglustaine, D.S. Lee, G. Myhre, M. Köhler, G. Pitari, U. Schumann, F. Stordal, C. Zerefos, “Aviation radiative forcing in 2000: An update on IPCC (1999)”, **Meteorol. Z.**, 14, 4, 555-561, 2005.
 14. Stohl, A., P. Bonasoni, P. Cristofanelli, W. Collins, J. Feichter, A. Frank, C. Forster, E. Gerasopoulos, H. Gaggeler, P. James, T. Kentarchos, H. Kromp-Kolb, B. Krüger, C. Land, J. Meloan, A. Papayannis, A. Priller, P. Seibert, M. Sprenger, G. J. Roelofs, H. E. Scheel, C. Schnabel, P. Siegmund, L. Tobler, T. Trickl, H. Wernli, V. Wirth, P. Zanis, C. Zerefos, “Stratosphere-troposphere exchange: A review, and what we have learned from STACCATO”, **J. Geophys. Res.**, 108, D12, 8516, doi: 10.1029/2002JD002490, 2003.
 15. Bais, A.F., C.S. Zerefos, C. Meleti, I.C. Ziomas, K. Tourpali, “Spectral measurements of solar UVB radiation and its relations to total ozone, SO₂, and clouds”, **J. Geophys. Res.**, 98, D3, 5199-5204, 1993.
 16. Stolarski, R., R. Bojkov, L. Bishop, C. Zerefos, J. Staehelin, J. Zawodny, “Measured Trends in Stratospheric Ozone”, **Science**, 256, 342-349, 1992.

As part of its activities, the Center has participated and is participating in more than 50 research projects with international and national funding. The full list of research projects that are being prepared or have been prepared at the Center is provided at the following web page: <http://www.academyofathens.gr/el/research/centers/climate/projects>.

Finally, it should be noted that over the last decade or so, the Center has competitively attracted foreign funding for research projects exceeding €2.5 million. The following list enumerates selected international and national programmes in which the Center participated during the last decade:

International Programmes (indicative list)

1. Programme H2020 “EuroGEOSS Showcases: Applications Powered by Europe-EuroGEOSS”, 2019-2023.
2. Programme LIFE “Boosting the implementation of adaptation policy across Greece: LIFE-IP AdaptInGR”, 2019-2026.
3. Programme ERASMUS+ “Strengthening Education, Research And Innovation For Climate Smart Crops In India-AdaptNET”, 2018-2021.
4. Programme H2020 “Copernicus application facility for environmental effects on health and comfort-CLAIRE”, 2017-2019.
5. Programme H2020 “Copernicus Atmosphere Monitoring Service CAMS-84: Global and regional a posteriori validation, including focus on the Arctic and Mediterranean areas-CAMS84”, 2015-2019.
6. Programme H2020: “Monitoring Atmospheric Composition and Climate III-MACC III”, 2014-2015.
7. Programme EU (FP7): “Monitoring Atmospheric Composition and Climate Interim Implementation- MACC II”, 2011-2014.
8. EU Programme (FP7): “EU Cloud Intercomparison, Process Study & Evaluation Project, EUCLIPSE”, 2010-2014.
9. EU Programme (FP7): “Pollution of air in the extended region of Athens: Space-based Nitrogen Dioxide (NO₂) observations and their comparison with remote and ground-based measurements and modeling simulations” – PARTHENON”, 2010-2013.
10. EU Programme (FP7): “Monitoring Atmospheric Composition and Climate-MACC”, 2009-2011.

National Programmes

11. Hellenic Foundation and Research Innovation Programme, “Mineralogy of Dust Emissions and impacts on Environment and Health”, 2021-2024

12. Academy of Athens Programme, "Climate change at the beginning of the 19th century and its consequences in the struggles for the independence of Greece-1821", 2019-2022
13. ESPA Programme 2014-2020, "Peloponnese Regional Plan for Climate Change Adaptation (PSPKA) (ΠεΣΠΚΑ)", 2018-2021
14. Academy of Athens Programme "Study of climate trends as derived from terrestrial and satellite observations and as calculated from numerical models", 2014-2016
15. Academy of Athens Programme, "Proposal for the digitization of the meteorological and related archives of Aeginitis and Mariolopoulos kept at the Research Center for Atmospheric Physics and Climatology of the Academy of Athens", 2014-2015
16. COOPERATION-ACTION I Programme, "Impacts of Climate Change on the Tourism Development of Sensitive Areas in Greece. Pilot Application: Messinia - Areas of Integrated Tourism Development - XENIOS", 2010-2013
17. Programme of the Bank of Greece, "Climate Change Impacts Study Committee", 2009-2011.
18. KAPODISTRIAS Programme, "Natural changes of the Thyssans on a global scale", 2009-2011
19. Programme of the Academy of Athens, "Study of the seasonal variation of the vertical distribution of tropospheric ozone in the Eastern Mediterranean (Greece, Turkey, Egypt, Israel) based on the airborne measurements of the European programmes MOZAIC and IAGOS", 2011-2013,
20. Programme of the Academy of Athens, "Study of the vertical distribution of tropospheric ozone in the Eastern Mediterranean and comparison with Central Europe based on the airborne measurements of the European MOZAIC Programme", 2008-2011

Personnel of the Center (1977-2021)

Supervising academicians:

Elias Mariolopoulos, 1977-1991
 Angelos Galanopoulos, 1991-2001
 Panos Ligomenidis, 2001-2007
 Christos Zerefos, since 2007

Researchers:

Christos Zerefos (Director: 1977-1979), Christos Repapis (Director: 1980-2007), Stavroula Kotini- Zambaka (1982-1995), Konstantinos Filandras (since 1985, Act-

ing Director: 2013-2014), Pavlos Kalabokas (since 1996, Acting Director: 2010-2013 and since 2014), Prodromos Zanis (2003-2007), George Tselioudis (Director: 2007-2010), Anastasia Romanou (2007-2009), Ioannis Kapsomenakis (since 2020), Stavros Solomos (since 2020), Anastasia Poupkou (since 2020)

Honorary Professors who carried out research at the Center:

Homer Mantis, Honorary Professor of Univ. Minnesota, USA, Corresponding Member of the Academy of Athens, 1980-2002, Dionysios Metaxas, Honorary Professor Univ. Ioannina, 1996-2011, J. Luterbacher, Professor University of Giessen-Germany, I. Isaksen, Professor University of Oslo, Rumen D. Bojkov, World Meteorological Organization (WMO)

Administrative Personnel:

Seta Gazerian (since 2009), Marina Soilemezidou (2009-2011)

Research Associates in the framework of research programmes:

Konstantinos Douvis, Michalis Vrekousis, Ioannis Liakos, Dimitra Konsta, Lida Demitriadou, Ilianna Polychroni, Theodora Stavraka, Athina Progiou, Panagiotis Nastos, Theodora Antonakaki, Dimitrios Voloudakis, Fanourios Sakellarakis, Anastasia Christopoulou, Margarita Arianoutsou Faragitaki, Georgios Kalpadakis, Elena Xoplaki, Konstantinos Eleftheratos.

Equipment and Infrastructure

The Center has a modern supercomputer center which consists of a Power-Edge R640 server array with > 160 cores Intel Xeon Gold 6230, 8 × 32GB RDIMM and 16TB of storage, for the execution of complex numerical models in parallel computing environment. The following specialised atmospheric models are installed and used on a daily basis at the Center's computer lab:

- WRF-ARW for the simulation and operational forecast of meteorological conditions and the support of the application <https://unesco-weather.gr/> for the provision of climatic, seasonal and daily forecasts in areas of world cultural heritage.
- WRF-CHEM, NMM, RAMS and CAMx for the simulation and operational forecasting of air quality as well as for the study of the interactions of gaseous and particulate pollutants with physicochemical processes in the atmosphere.

- Lagrangian models (HYSPLIT, FLEXPART, HYPACT) for calculating the dispersion as well as the backtrajectories followed by the gas masses in the atmosphere.
- Specialised statistical packages and applications (in-house developments) in R-project, python, bash, NCL, IDL environment for the analysis of climate parameters and the evaluation of climate models (eg CAMS, MACC)

2. The main achievements of the Center until 2020

Published papers in international scientific journals

The published works of the Center are grouped into the following research topics:

A. Studies on the observations of the upper atmosphere and on stratospheric ozone

The study of the upper atmosphere is carried out in relation to the study of stratospheric temperature fluctuations in the northern hemisphere, the stratospheric-tropospheric connection associated with the cloud cover in the tropics, the effect of proton solar flash on atmospheric temperature, the thermal situation of the polar stratosphere, the southern oscillation in the stratosphere and the seasonal variation of the temperature of the upper stratosphere and the lower mesosphere.

Research on the stratospheric ozone focused on the following main issues: the summer total ozone peak in Europe and the possible effect of southern oscillation, the representativeness of total ozone trends from satellite and terrestrial measurements, stratospheric ozone in Europe, horizontal and vertical ozone distribution anomalies, study of stratospheric intrusion in Europe and the Eastern Mediterranean. Studies have also been published on the effects of stratospheric ozone depletion on climate change, on the recovery of stratospheric ozone trends, and on the effect of the 11-year solar cycle on stratospheric ozone and surface erythemal radiation. Other relevant research issues concerned the characteristics of ozone depletion in the northern and southern hemispheres, the evaluation of total ozone measurements in Greece, the exceptional ozone depletion in the Arctic in 2011, the effect of a stratospheric cooling over the Northern Hemisphere, the representativeness of the ozone measuring stations, the possible effects of greenhouse gases on ozone profiles and ultraviolet radiation at ground level, the use of QBO, ENSO and NAO atmospheric disturbances in the evaluation of ozone satellite measurements.

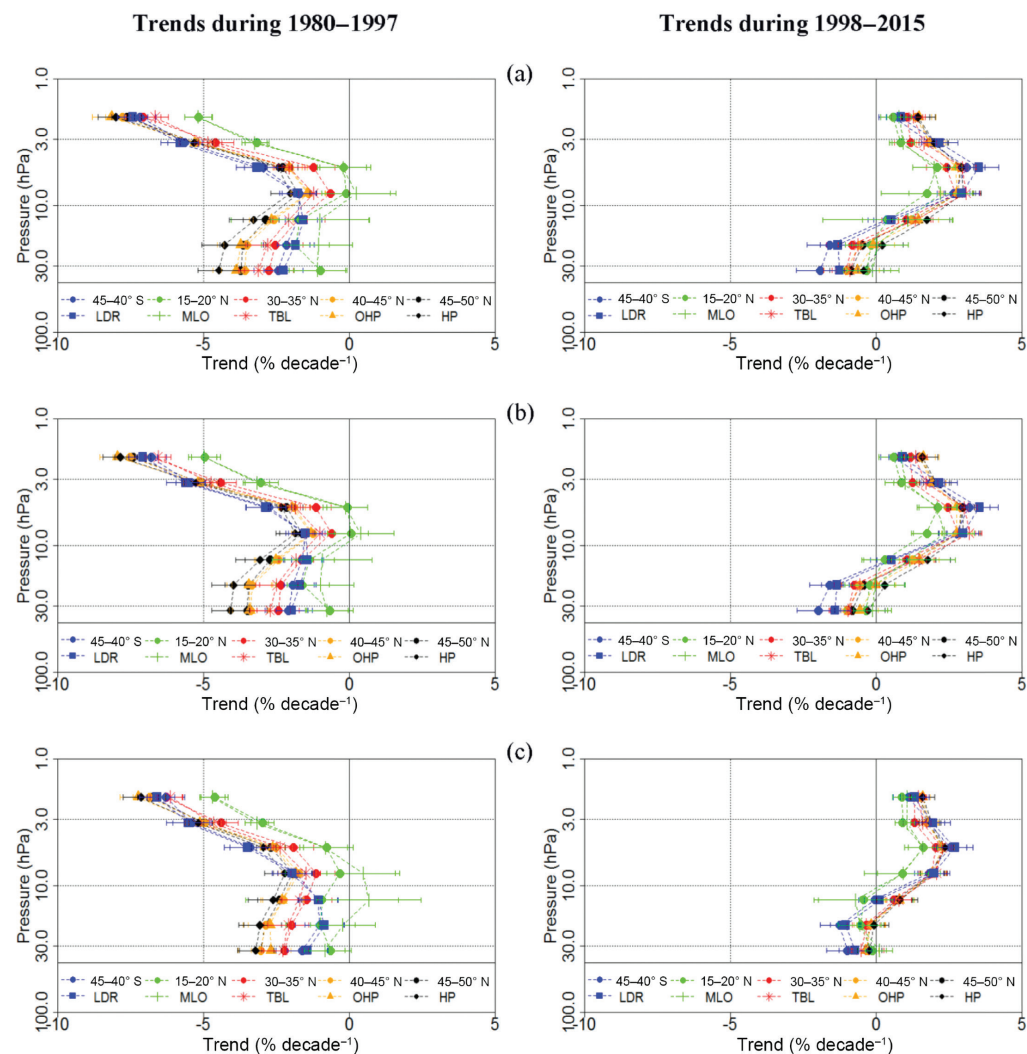


Fig. 1. Trends in the vertical distribution of ozone for the pre-1998 and post-1998 period, based on SBUV station overpass and zonal mean data. First sign of the reverse of ozone depletion after the implementation of the Montreal Protocol. (Zerefos, C., J. Kapsomenakis, K. Eleftheratos, K. Tourpali, I. Petropavlovskikh, D. Hubert, S. Godin-Beekmann, W. Steinbrecht, S. Frith, V. Sofieva, B. Hassler, “Representativeness of single lidar stations for zonally averaged ozone profiles, their trends and attribution to proxies”, *Atmos. Chem. Phys.*, 18 (9), 6427-6440, 2018)

B. Climate variations - Climate change

Research was initially carried out on historical texts including relevant references such as the climate change in Mycenaean Greece recorded by Aristotle, the nine-year oscillation of the water level in Lake Kopais reported by Theophrastus and Pliny, as well as the frequency of occurrence of extremely cold winters according to monastic and historical records from Greece during the period 1200-1900 AD.

The climatic situation in Greece was studied extensively in the following studies: definition of transitional zones between humid continental and Mediterranean climate, distribution of continental indicators, application of statistical analyses of temperature and precipitation, variability and trends of air temperature, statistical evaluation of changes in extreme climatic conditions, air temperature trends associated with changes in atmospheric circulation. Also, the variability and the trends of the maximum and minimum air temperature in Greece, the climatic evolution of the Etesian winds in the Aegean Sea and the spatial and temporal variability of the drought index were studied from ground and satellite observations. A study of regional climate simulations was also conducted.

Particular emphasis was given to the study of rainfall in Greece with special studies on rainfall time fluctuations, spatial distributions of hail days, delimitation of regional distributions of storm days and hail, orographic precipitation, variability of the distribution of rainfall, extreme daily rainfall in Athens, cyclicity of the intra-annual variability of precipitation in Greece, relationship between orography and extreme dry periods, study of rain intensity in Athens and Thessaloniki, changes in extreme daily rainfall per decade, spatial and temporal variability of successive dry and wet days, climate change and rainfall.

The climatic situation of Athens, regarding the possible effect of urbanization on climatic fluctuations of air temperature and the climate variability, was also studied. Analysis of absolute humidity during the continental and sea breeze was also performed. The correlation of sudden overheating in the National Observatory of Athens and climate change was studied resulting to corrections in the recent air temperature station record, as well as the time variations of atmospheric oscillations in Athens. Finally, the trends of the urban thermal island in Athens and its response to heat waves were studied.

Several climate studies were also carried out in the Mediterranean region on topics such as the contribution to climatology of the sensible heat flow, air temperature trends of the last 100 years, climatology of the upper air temperature, rainfall and temperature in Cyprus as a result of global climate change. Research was also carried out on climate and extreme weather conditions during the 21st century in Greece and in Cyprus, changing energy requirements in the Mediterranean, observed changes in the heat waves in the Eastern Mediterranean and long-term

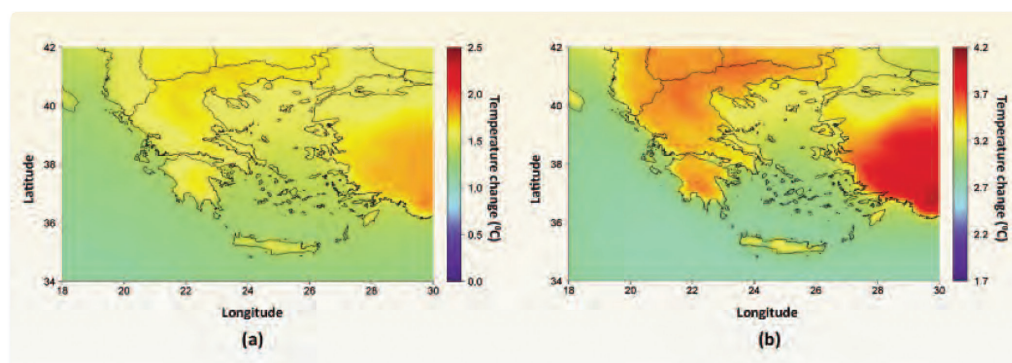


Fig. 2. Changes in mean air temperature between (a) 2021-2050 and (b) 2071-2100, compared to 1961-1990. The results are based on 12 selected RCMs simulations from the EU ENSEMBLES project under A1B emission scenario. (*The environmental, economic and social impacts of climate change in Greece, BoG, 2011*)

rainfall trends in the region. In addition, the variability of evaporation and rainfall in the Mediterranean and the Black Sea from satellite data, the extreme rainfall based on satellite and high-resolution grid data, the dynamics of atmospheric circulation and its influence on European climate during the last 500 years, as well as European summer temperatures since Roman times, were also studied.

Global climate studies including the tropics and the oceans have also been published using climate models. During this research the following topics were studied: spatial and temporal distribution of air temperature in the northern hemisphere, climate change and the US economy, projected climate change in Uruguay and adjacent areas, temporal variability scales of the tropical atmosphere and the effects on atmospheric water vapor, changes in cloudiness along the trajectory of extraterrestrial storms, main characteristics of clouds in the Southern Oceans and their effects on the energy balance, dynamic sub-scaling in simulations of precipitation changes, tropical ocean cloud processes, evaluation of cloud description in general circulation models, global weather conditions and their properties from retrieval of cloud satellite data.

Finally, there have been studies on the effects of climate change on various activities in Greece such as, climate and olive growing relations, the impact of rising air temperatures on buildings, linking the effects of climate change to emergency adaptation strategies for transport networks, the impact of climate change forecasts on forest fire behaviour, forecasting of climate impacts for cotton yields, evaluation of grid precipitation estimates, effects of climate change on the hydrology of Natura 2000 sites, comparative assessment of the impacts of climate change on cotton and maize.

C. Atmospheric pollution - Tropospheric ozone - Atmospheric particles

Initially, the first ever measurements of air pollutants in Athens, processed together with meteorological observations were published. A study was also conducted to compare photochemical air pollution in Athens with the corresponding one in Los Angeles. Then an analysis was performed of the evolution of the recording of continuous measurements of primary and photochemical pollutants in Athens. Emphasis was also put on the study of the characteristics and the climatology of rural surface ozone in the area, as well as on the population exposure to atmospheric ozone in Athens compared to other European capitals. The characteristic changes of the atmospheric concentrations of PM₁₀ particles in Athens and Thessaloniki were also studied in comparison with the other gaseous pollutants. Atmospheric measurements of primary and secondary air pollutants in the Athens basin were also analysed with modern measurement techniques and the effects of the intense fires of Attica on air quality in Athens were studied. Atmospheric concentrations of saturated and aromatic hydrocarbons and nitrogen oxides around an oil refinery were also studied in comparison with the corresponding measurements in Athens. The Center participated in international airborne and ground field measurement campaigns in Greece, as well as in a European Project for the study of health risks related to environmental pollution.

In recent years the Center has participated in many studies concerning air pollution on a regional and global scale using satellite measurements, as well as simulations of atmospheric models, with the following topics: comparison of satellite nitrogen dioxide columns with a set of global and European regional air quality models, inventory of anthropogenic PM₁₀ particulate emissions in Greece, air pollution simulations during the European heat wave of 2003, a model for biogenic volatile organic compounds emissions in Europe. The influence of large cities in the Eastern Mediterranean to the regional air pollution as well as the discomfort index and air quality index, simulated air quality and pollution balance calculations in Europe, the effects of the economic crisis in Greece on the levels of air pollutants based on satellite observations and simulation studies, the effects of Greek forest fires on the levels of gaseous pollutants in the Eastern Mediterranean and the detection of sulphur dioxide plumes in the Northern hemisphere, were also examined.

During the past two decades, the Center has been intensively researching the role of tropospheric ozone and atmospheric particles in air pollution as well as in global and regional climate, with emphasis on the Mediterranean. This research has led to a number of publications on related topics such as the modifications in tropospheric ozone induced by changes in stratospheric ozone, seasonal variability of ozone production yields in the free troposphere of central Europe, vertical measurements of tropospheric ozone in the Eastern Mediterranean and com-

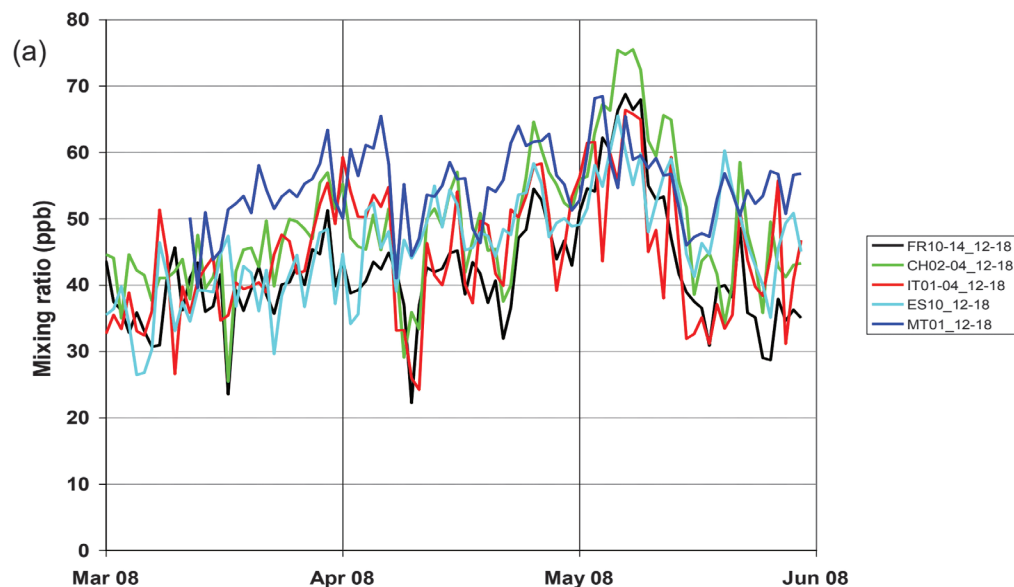


Fig. 3. Case study for daily ozone depletion in the afternoon at EMEP stations surrounding the western Mediterranean basin for Spring 2008 (Kalabokas, P., Hjorth, J., Foret, G., Dufour, G., Eremenko, M., Siour, G., Cuesta, J., and Beekmann, M.: An investigation on the origin of regional spring-time ozone episodes in the western Mediterranean, *Atmos. Chem. Phys.*, 17, 3905-3928, <https://doi.org/10.5194/acp-17-3905-2017>, 2017).

parison with Central Europe, investigation of meteorological and photochemical factors affecting the levels of rural surface ozone in the Central and Eastern Mediterranean, atmospheric conditions associated with high and low vertical ozone measurements in the lower troposphere of the Eastern Mediterranean, summer variability of tropospheric ozone in the Mediterranean basin by satellite measurements, temporal and spatial variability of ozone in Cyprus, origin of the spring regional ozone episodes in the Western Mediterranean, effect of tropospheric subsidence on surface ozone in Northern Italy.

The following studies on tropospheric ozone were also performed using atmospheric models: simulation of summer ground level ozone concentrations in Greece, three-dimensional evaluation of ozone simulations in regional transport-chemistry models, mapping of seasonality and trends of surface ozone across Europe using statistical techniques, ozone and ultraviolet radiation spectral changes at mid- and high-latitudes, atmospheric ozone and methane in a changing climate, surface ozone assessment in Europe by MACC analysis, data assimilation of satellite ozone, carbon monoxide and nitrogen dioxide, assessment of the potential of the MACC operational forecasting system in active tropospheric gases, the

distribution and trends of tropospheric ozone related to climate and the global evaluation of atmospheric chemistry models, the link between Etesian winds, tropopause folds and tropospheric ozone over the Eastern Mediterranean.

Indicative titles of published papers related to the analysis of atmospheric particle measurements include: photometric measurements of optical properties of aerosols, passive and active remote sensing measurements to validate a regional dust model, dust attenuation over the Eastern Mediterranean using models and photometric data, satellite study of smoke injection from agricultural combustion in Eastern Europe, optical properties of aerosols in Thessaloniki, measurements of optical depth of aerosols over the Eastern Mediterranean and especially in the urban environment of Athens, particulate pollution from the deposition practices of materials in a cement industry, validation of the MACC and CAMS global analysis and forecasting system, optical aerosol depth with a Brewer spectrophotometer in Athens.

D. Other Meteorological phenomena

The first published studies concerned the possible correlation between solar activity and weather, as well as studies on the boundary layer of the atmosphere over the Aegean.

An important part of the Center's research activities concerned the study of solar radiation, especially ultraviolet, with the following topics: the study of the changes of ultraviolet radiation during urban air pollution episodes, climatology of solar ultraviolet radiation over Athens, factors affecting solar UV radiation in Thessaloniki, solar attenuation and brightness over Thessaloniki and Beijing, comparison of satellite UV radiation measurements with terrestrial measurements at European stations, spectral measurements of UV radiation in Canada, Europe and Japan, solar UV radiation in a changing climate and simulations of clear sky UV radiation in the 21st century.

The study of cirrus clouds and their possible effect on climate and solar radiation was another research topic that was treated at the Center, resulting to publications on the demonstration of the effect of air traffic on the formation of cirrus clouds, a study on natural and anthropogenic global fluctuations of cirrus cloud cover, a search for anthropogenic cirrus clouds over SE Asia, the temporal variability of cirrus clouds in the tropics based on satellite data, the effects of cirrus cloud cover on solar radiation in different spectral zones.

The Center coordinated and/or participated in several studies prompted by the total solar eclipse of March 2006 in Greece, such as the effect of total eclipse on meteorological variables in Greece, the reduction of total ultraviolet and visible radiation in Greece during the total eclipse, the effects on surface atmospheric

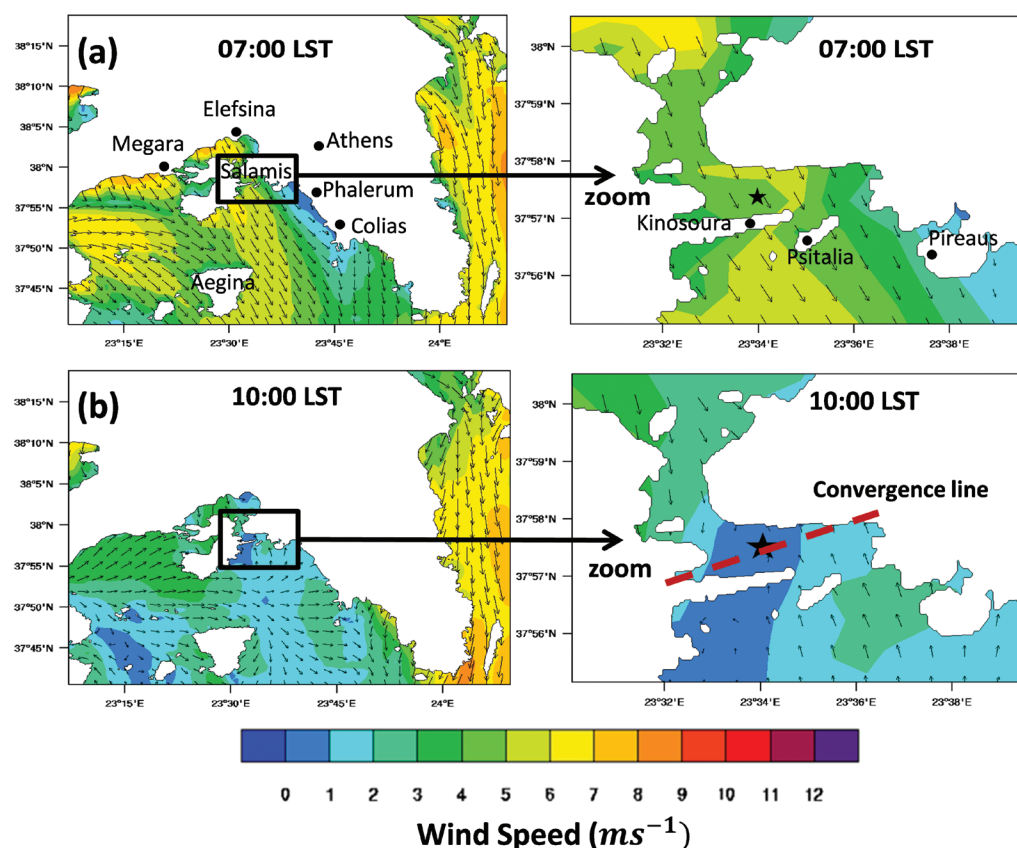


Fig. 4. Example of a study on the effect of the local climatic conditions in the Saronic Gulf on the outcome of the Battle of Salamis between the Greeks and the Persians in 480 BC. Wind speed and direction (m s^{-1}) (a) 07:00 LST, (b) 10:00 LST, as shown by the 10-year mean value of the WRF atmospheric model simulations at a spatial resolution of $1 \times 1 \text{ km}$, using climatic input data from the ERA5 database (Zerefos, C.; Solomos, S.; Melas, D.; Kapsomenakis, J.; Repapis, C. *The Role of Weather during the Greek-Persian "Naval Battle of Salamis" in 480 BC Atmosphere* 2020, 11, 838. <https://doi.org/10.3390/atmos11080838>)

photo-oxidant pollutants in Greece during the solar eclipse, observations of lidar laser aerosols and model calculations of the evolution of the atmospheric boundary layer over Greece during the total eclipse, indications of gravity waves in the atmosphere during total solar eclipse, observations of the parameters of the surface boundary layer during total eclipse.

Other research topics at the Center in this thematic area included the study of the Etesian winds in the Aegean, techniques for calibration of temperature and humidity satellite measurements in the atmosphere, the spectral effect of depend-

ence of reflectance on ultraviolet radiation and explanation of the upper tropospheric humidity.

There have also been publications of wider scientific or cultural interest, such as on the role of weather during the naval battle of Salamis in 480 BC, the environmental information of volcanic aerosols in red-green proportions as depicted in paintings by great masters, lessons and questions asked during and after the COVID-19 pandemic in relation to the environment, air pollution and climate.

Organisation of conferences

Ever since its foundation the Center has organised important conferences and workshops on topics related to its research interests. Some indicative examples are listed below.

- Symposium “Ozone Depletion: from its discovery to Envisat and Aura”, on the occasion of the 20th anniversary of the signing of the Montreal Protocol, co-organised by the Academy of Athens, the National Observatory of Athens, the United Nations Environment Programme, the Global Meteorological NASA and the International Ozone Commission, Athens, September 23-26, 2007
- International Conference “Adaptation Strategies to Global Environmental



Photo 1. Symposium “Ozone Depletion: from its discovery to Envisat and Aura”, Athens, 23-26 September 2007.

Change in the Mediterranean City and the Role of Global Earth Observations”. The Conference was convened by the Greek Presidency of the European Council for 2014, under the auspices of the General Secretariat for Research and Technology and was co-organised by the EU, Eurisy, the Mediterranean Consortium for Climate Change (MC-4), Eurisy, Mariolopoulos-Kanaginis Foundation for the Environmental Sciences, Research Center for Atmospheric Physics and Climatology of the Academy of Athens and the Justus-Liebig Giessen University, Germany (June 2014).



Photo 2. Symposium “Adaptation Strategies to Global Environmental Change in the Mediterranean City and the Role of Global Earth Observations”, Athens, 10-11 June 2014.



Photos 3a-b. Conference under the Honorary Presidency of His All Holiness the Ecumenical Patriarch Mr. Bartholomew on “The Impact of Climate Change in the Mediterranean”, 8 November 2008.



Photos 4a-b. The lecture of C. Zerefos and P. Tetsis on “The color of the weather and the climate”. The Megaron Plus series of public lectures, Athens, 14 November 2013.



Photo 5. The Copernicus Atmosphere Monitoring Service (CAMS), 1st General Assembly, Athens, 14-16 June 2016.

Memoranda of Understanding (MoU)

- The Academy of Athens through the Research Center for Atmospheric Physics and Climatology signed a Memorandum of Understanding with the Open Hellenic University to support and develop joint initiatives, scientific, research and other actions aimed at protecting the country's cultural and natural heritage from the effects of climate change.
- The Academy of Athens through the Research Center for Atmospheric Physics and Climatology signed a Memorandum of Understanding with the public benefit non-profit company "Together We Can" in order to join forces and cooperate in disseminating the results of the LIFE-IP programme for the adaptation of Greece to the anthropogenic climate change in order to raise the awareness of the country's citizens and to achieve their active participation in climate change issues.
- The Academy of Athens through the Research Center for Atmospheric Physics and Climatology signed a Memorandum of Understanding with the National Technical University of Athens for (a) the evaluation of technological solutions that can be implemented in Greece to reduce greenhouse gas emissions, (b) the creation of a roadmap to reduce greenhouse gas emissions aim-



Photos 6a-b. The former President of the Hellenic Republic, Mr. Prokopios Pavlopoulos, with Princess Victoria of Sweden and the former Ambassador of Sweden in Greece, Mr. Charlotte Sammelin, at the Academy of Athens, in the framework of the seminar of the Navarino Environmental Observatory (NEO), entitled “Challenges and Opportunities for a New Economy in the Context of Climate Change: Promoting Innovation for Sustainable Development” (May 2, 2019).

ing to zero CO₂ emissions in 2050 or earlier and, (c) the creation of a Center of Excellence to support the country's transition to the post-lignite era in cooperation with the University of Western Macedonia

3. The main achievements of the Center in 2021

Research projects

In the framework of the European project LIFE-IP AdaptInGR, RCAPC contributes to the optimal implementation of the climate change adaptation strategy at national and regional level. An integrated framework for monitoring and evaluating climate change adaptation using indicators, as well as updating the scientific study on the environmental, economic and social impacts of climate change in Greece is already in progress. The Center has also undertaken the scientific support of the Coordinating Working Group of the international initiative of Greece for the protection of cultural heritage and natural monuments from the effects of climate change. UNESCO and the World Meteorological Organisation are participating in the initiative. The main pillars of the initiative are the Center, the non-governmental organisations ICOMOS and Europa Nostra as well as the Hellenic Geo-Observation Office. This initiative is in the first phase of implementation, which includes the initial recording of the monuments of the countries supporting the initiative, which are at risk from climate change, together with the identification of the main related environmental problems.

Since April 2021, the Center is implementing the research project “Metal content in dust emissions and effects on the environment and health” (Hellenic Foundation of Research and Innovation) with the object of studying the physico-chemical properties of suspended particles of desert dust.

Scientific Publications

A study is being carried out at the Center to highlight the required synergy of the Brewer and Lidar instruments for the integrated monitoring of the composition of the atmosphere, especially following volcanoes eruption. The study includes the combined use of measurements from networks (WOUDC, EARLINET) and the application of trajectory and dispersion models (HYSPLIT, FLEXPART).

Current research undertaken by the Center is focused on the reduction of air emissions from maritime transport, the ozone changes and UV radiation using terrestrial and satellite observations as well as simulation results from chemistry-climate models, the climate change in the region of Crete, the fluctuations of spring and summer tropospheric ozone in Greece and the Eastern Mediterranean, the gravity waves on Mount Parnassos and the role played by the descending wind

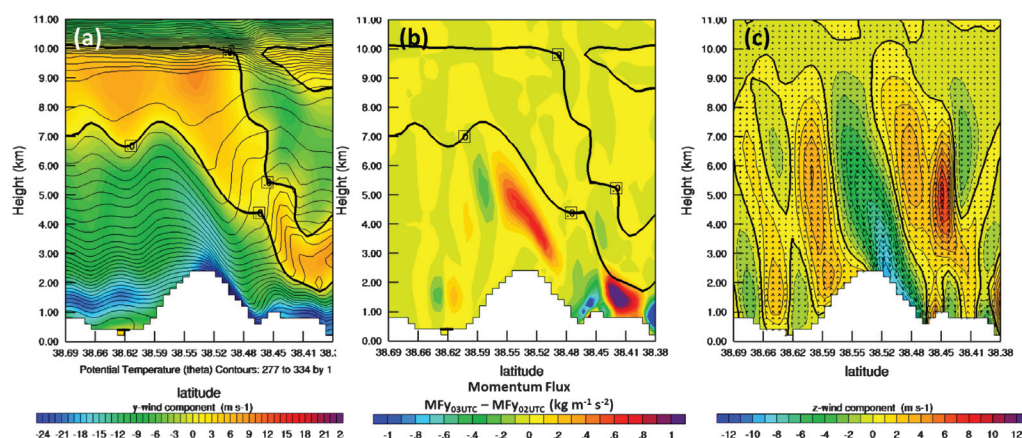


Fig. 5. Case study for the creation of gravity waves in the area of Arachova on Mount Parnassos. a) Potential temperature and meridional component of wind speed b) Change in the vertical flow of momentum ($\text{kg m}^{-1}\text{s}^{-2}$) and reflection of the gravitational wave at the critical wind level (critical level) c) Vertical component of the wind (w) (m s^{-1}) and generation of strong downstream currents (Solomos, S.; Nastos, P.T.; Emmanouloudis, D.; Koutsouraki, A.; Zerefos, C., *A Modeling Study on the Downslope Wind of “Katevatos” in Greece and Implications for the Battle of Arachova in 1826. Atmosphere* 2021, 12, 93. <https://doi.org/10.3390/atmos12080993>)

in the battle of Arachova in 1826, the greenhouse gases CO_2 and CH_4 in urban environment, the role of dust particles in the formation of ice crystals and their impact on flight safety, the optical properties of desert dust particles during the COVID-19 period in Athens and during the PreTECT experiment in Crete, the effect of sea waves on salt particle emissions, the effect of ozone and aerosols on erythematos radiation, atmospheric transport of particles and gases of volcanic origin in the Mediterranean and Etna-Antikythera interconnection.

Within the framework of the afore-mentioned research, relevant studies have been (or are about to be) completed. These will be presented in national and international Conferences and will then be submitted for publication in international scientific journals, or in conference proceedings. A full list of these activities will be published in the annual proceedings of the Academy of Athens by the end of the year. Furthermore, the Center organises lectures and publishes articles for the general public. Finally, the Center’s researchers participate in the consultation and final examination of doctoral dissertations on relevant scientific fields.

Participation in research networks and committees

The Center, taking into account the vulnerability of the forest ecosystems in Greece and the most serious forest fires in recent years, has set up a special Committee of Experts called the “Research Committee on the Sustainability of Greek

Forest Ecosystems”. The purpose of the Committee is to investigate the resilience of the country’s forest ecosystems to specific meteorological-climatic conditions that threaten them. The Committee also examines the intertemporal impact of climate change on the country’s forest ecosystems.

The Research Center for Atmospheric Physics and Climatology participates in the creation of the network of Local Authorities for climate change and the mitigation of its effects under the name CLIMATTICA, at the initiative of the Attica Prefecture.

4. The main goals of the Center in the future

A. Atmospheric integrated processes, source-receptor apportionments and relationships between climate and air quality

The purpose of this research will be to better understand the complex processes in the atmosphere for the determination of its chemical composition with the help of up-to-date atmospheric models equipped with special tools for analysing atmospheric processes, such as the separation of pollutant sources and the determination of geographical areas with significant sources of pollution. Emphasis will be given on the Mediterranean region, where high levels of photochemical pollutants and particulate matter are encountered. Furthermore, it will be examined how important climatic factors (e.g. volcanic eruptions, natural emissions, Etesian winds) influence atmospheric composition and affect the future climate. For this purpose, connected computer models (online models) are used to better capture the interactions and feedback of the parts of the Earth system.

B. Role of atmospheric aerosols in meteorological and climatic processes - Adaptation to climate change

The Center participates in cutting-edge research projects which are essential for a deeper understanding of the role of aerosols in the physical and chemical processes of the atmosphere, further improvement of atmospheric modeling and observation capabilities. Climatic analyses as well as theoretical modeling studies are carried out in the Center in combination with remote sensing observations (e.g., satellite, radar, lidar), but also with in-situ measurements of atmospheric composition and meteorological parameters. This research direction is particularly important in order to minimize uncertainties about future climate forecasts and strengthen mitigation efforts to climate change. However, the inevitable change in climate conditions, especially in sensitive areas like the Mediterranean, also highlights the need for adaptation strategies to climate change. In

this regard, the Center provides the institutions responsible for climate policy-making with all the necessary scientific information, at regional and local level, in order to assist in the definition of actions and adaptation policies in various sectors (e.g., health, agriculture, education, cultural heritage, tourism, transport, etc.). Also, the Center develops advanced services and tools to improve resilience in severe weather. To this end, synergistic systems are being developed, including network of stations, radars and numerical models, to provide the information needed for detailed nowcasting and medium-scale forecasting of onshore and offshore meteorological conditions.

C. Oscillations of climatic parameters - Extreme climatic phenomena

One of the main activities of the Center is its ongoing collaboration with the Laboratory of Climatology of the University of Athens on a research project that studies extreme climatic phenomena, as well as the variations of climatic parameters in various regions of Greece and the Eastern Mediterranean based on surface measurements, atmospheric remote sensing data (satellite and terrestrial), and measurements of the upper atmosphere.

D. Tropospheric ozone in the Mediterranean - Air pollution in Athens

The examination of the role of tropospheric ozone in the physicochemical processes of the atmosphere will contribute to a further understanding of the physical and chemical atmospheric processes that are responsible for the very high concentrations of ozone in the atmosphere of the area, especially in the Eastern Mediterranean, one of the spots with the highest summer tropospheric ozone concentrations around the globe. The study will focus primarily on assessing the influence of tropospheric ozone on the high ozone concentrations in the boundary layer and ground surface that are frequently recorded in the area, which, in combination to local and peripheral photochemical ozone production, lead to high ozone levels, especially during spring and summer. Special emphasis will be given to the study of the vertical distribution of ozone using available data from major international programmes (IAGOS, WOUDC, COPERNICUS). A detailed examination of the climatic characteristics of the tropospheric effect of ozone on surface ozone concentrations in the urban area of Athens will also take place, as within the next 10 years significant reductions in primary pollutant emissions are expected due to the foreseen measures for adaptation and mitigation of climate change.

E. Effects of meteorology and air quality on human health and potential effects due to climate change

The relevant studies include assessment of biometeorological indicators from a combination of meteorological parameters, levels of air pollutants and air quality indicators and statistical analysis of meteorological and air pollution data, with data on hospital admissions and mortality. The studies can be based on the analysis of data observations from the application of atmospheric models with emphasis on extreme values (e.g., heat waves, severe pollution episodes, etc.) and on geographical locations representing different biometeorological environments (e.g., large urban centers, industrial areas, areas under the influence of important natural resources).

F. Climate Change and Cultural Heritage

The Center has undertaken the scientific support of the Coordinating Working Group of the international initiative of Greece for the protection of cultural heritage and natural monuments from the effects of climate change. UNESCO and the World Meteorological Organization are participating in the initiative. The main pillars of the initiative are the Center, the non-governmental organizations ICOMOS and Europa Nostra as well as the Hellenic Geo-Observation Office. These studies include the identification of the necessary atmospheric variables and indicators to monitor the vulnerability and risk of natural and cultural heritage sites. The values of the variables and indicators are calculated for each monument based on available measurements and model simulations for the present and future climate. As part of this research activity, a special cooperation protocol was recently signed between the Hellenic Open University and the Academy of Athens through the Center with the aim of launching a new 2-year Postgraduate Programme entitled “Protection of cultural and natural heritage sites from the effects of climate change” for the period 2021-2027.

G. Contribution to the adaptation of Greece to the effects of climate change within the European project: “LIFE-IP AdaptInGR - Boosting the implementation of adaptation policy across Greece”

The project aims to strengthen the implementation of the National Strategy and the 13 Regional Plans for Adaptation to Climate Change, during the current climate change adaptation cycle (2016-2025) and to prepare for the transition to the next cycle of adaptation policy, with appropriate actions at national, regional and local level.

Within the framework of this project, the Center, in collaboration with the National Observatory of Athens, has recently completed a study in high spatial resolution specifically for Greece on the expected changes of the main climatic parameters in the 21st century for different scenarios of greenhouse gas emissions, and the parameters related to extreme weather phenomena such as heat waves, floods, droughts, etc. In the coming years, until 2027, within the framework of this project, the Academy of Athens will coordinate the updating of the Bank of Greece Report on the Environmental, Social and Economic Impact of Climate in Greece, within the context of the National Strategy and Regional Plans for Adaptation to Climate Change, preparing the next cycle of implementation of the adaptation policies, after 2026. In parallel, the Center coordinates the activities of the scientific committee of the project.

MATHEMATICS RESEARCH CENTER

The foundation of the Mathematics Research Center – MaRC (in Greek: Κέντρον Ερευνών Θεωρητικών και Εφαρμοσμένων Μαθηματικών – ΚΕΘΕΜ) was decided unanimously at the plenary session of the Academy of Athens during session no. 2510. It is an upgrade of the Research Office of Pure Mathematics (ROPM), which was founded in 1992 by the late Academician Nikolaos K. Artemiadis. MaRC was established on March 7, 2008, following the initiative of the Academician Athanasios Fokas (Presidential Decree 23/2008; Government Gazette 42 A' / 07.03.08). In September 2009, Dr. George Kastis was appointed Assistant Research Professor and Acting Director of the Center. In 2020, two new Assistant Research Professors were appointed, Dr. Konstantinos Kalimeris and Dr. Nikolaos Dikaïos. The first Supervisor of MaRC was the late Academician Nikolaos Artemiadis. Since 2010, Supervisor of the Center is the Academician Athanasios Fokas.

The main aim of MaRC is the promotion of cutting-edge research in theoretical and applied mathematics. The researchers of MaRC have produced and continue to develop novel rigorous theoretical results, which in turn impact on a variety of practical problems which originate in the real world. These include the areas of biomedicine, with emphasis on medical imaging, fluid dynamics, and recently the pandemic. The research activities of the Center can be summarized as follows:

- Applications of complex analysis
- Analysis and solution of partial differential equations
- Pure and applied asymptotic analysis
- Mathematical analysis of fluid dynamics
- Theoretical aspects of the general theory of relativity and of particle physics
- Rigorous analysis and development of efficient algorithms for the solution of a variety of inverse problems
- Reconstruction algorithms for Magnetoencephalography (MEG) and Electroencephalography (EEG)
- Medical imaging, including Positron Emission Tomography (PET), Single Photon Emission Computed Tomography (SPECT), and Magnetic Resonance Imaging (MRI)

- Computer-aided diagnosis (CAD) of cancer based on multi-modality imaging
- Machine learning in biomedicine
- Cancer informatics analysis of molecular genetics and medical imaging, with emphasis in radiogenomics
- Small-animal multi-modality imaging for drug discovery
- Nanoparticle brachytherapy and image guided radiotherapy of cancer
- Mathematical modelling of the dynamics of infectious diseases using analytic algorithms and machine learning.

Publications

Since its creation, the members of MaRC have published 120 articles in international peer-reviewed journals, 3 books, 4 book chapters, 17 articles in full conference proceedings, and 20 abstracts in international and national conferences.

Areas of Achievement

In MaRC, the main areas of focus have been complex analysis, asymptotic analysis, inverse problems, and machine learning. The centre's research has significant contributions in several areas of theoretical mathematics, including the analysis of partial differential equations and the study of the Riemann zeta function. It also had a significant impact in the mathematical formulation and solution of practical problems in several areas, and particularly in medical imaging and physics, where its developments have had impacted cancer diagnosis and brain activity diagnostics. The major achievements to date are summarized below.

The unified transform method

The so-called inverse scattering transform, which was introduced in 1967, is considered as a major breakthrough in mathematical physics. It provides a non-linear version of the classical Fourier transform and is used for the study of the initial-value problem of integrable, nonlinear, evolution partial differential equations (PDEs). After the solution of the latter problem, the most important open problem associated with the analysis of nonlinear integrable equations became the solution of initial-boundary value problems. The solution of this problem was made possible by the introduction of the so-called “unified transform” by Fokas (also known as the “Fokas method”) [1]. Over the last two decades, several hundred researchers have applied the unified transform to innumerable and substantially different circumstances, in a variety of areas, including theoretical, applied, and computational areas, displaying a spectacular universality. The contri-

bution of MaRC to this development is indispensable and includes: the analysis of boundary value problems for integrable nonlinear PDEs, the introduction of a new method for studying the well-posedness of arbitrary nonlinear evolution PDEs, a novel formulation of the classical problem of water waves, a new methodology for studying controllability of linear PDEs, and the derivation of explicit analytical solutions for a plethora of other problems. In a highly unexpected development, members of the Center have obtained novel results for ‘classical’ problems: the unified transform has led to the emergence of a novel and powerful approach for studying boundary value problems for linear PDEs. An important advantage of the Fokas method for evolution PDEs is that it can be easily used for the numerical computation of the solution. Furthermore, for elliptic PDEs it has led to a new and now established numerical technique. This summary justifies the statement of one of the greatest mathematicians of the last century, Israel Gelfand, that “this is the most important development in the exact analysis of PDEs since the works of the classics of the eighteenth century”. Indeed, scientists, in addition to the classical Fourier and Laplace transform, now also have at their disposal the Fokas transform.

Asymptotic analysis of the Riemann zeta function

One of the most important open problems in the history of Mathematics is related to the asymptotic behaviour of the Riemann zeta function $\zeta(s)$, $s=\sigma+it$, when t tends to infinity. It is well known that the leading asymptotics of $\zeta(s)$ is expressed in terms of two transcendental sums, whose ranges of summation are explicitly related to the variable t . Siegel, in his classic paper, presented the asymptotics of $\zeta(s)$ to all orders in the important particular case, where the aforementioned range of summations are equal. Fokas and Lenells [2] were able to present analogous results for $\zeta(s)$ (and for a novel two parameter generalization of $\zeta(s)$) for any range of summations, to all orders. Furthermore, Fokas formulated a singular integral equation for $|\zeta(s)|^2$ which provides a powerful and unexpected approach to the famous Lindelöf hypothesis. In particular, this approach has led to the proof of the analogue of the Lindelöf hypothesis for a sum which is similar to the sum characterizing the asymptotics of $|\zeta(s)|^2$ but it has different range of summations [3]. More importantly, Fokas and Kalimeris [4] have achieved the formal reduction of the Hardy-Littlewood exponent from $1/6$ to $1/12$.

Image Reconstruction in Nuclear Medicine (PET and SPECT)

Single photon emission computed tomography (SPECT) and positron emission tomography (PET) are types of nuclear imaging that provide metabolic and

functional information, unlike conventional structural imaging such as CT or MRI. They are especially used in aspects of cardiology, neurology, psychiatry, and oncology. However, limited spatial resolution and radiation dosage limit the wider application of PET and SPECT. Members of the Center have devised fundamental new methods for image reconstruction via PET and SPECT that have resulted in improved contrast and biased over commercial algorithms, such as Filtered Back Projection (FBP) and Ordered-Subsets Expectation Maximization (OSEM). These breakthroughs were built upon foundational discoveries made by Fokas with Gelfand in 1994 that introduced a new method for inverting transforms – a core mathematical technique that underpins medical imaging and reconstruction methodology. This finally led to the analytical inversion of the attenuated Radon transform, which is of crucial importance in SPECT. Subsequently, a novel numerical implementation of the inverse attenuated Radon transform was introduced, based on “custom made” splines. Analogous inversion using splines was presented for the Radon transform, which is crucial for reconstruction images from PET and CT. This algorithm was named spline reconstruction technique (SRT) and its usefulness was established in Kastis *et al* [5,6]; where rigorous studies show that in the case of PET, the images of SRT are superior to those obtained via the commercially available algorithms of FBP and OSEM. Similarly, advantages of the aSRT have now been demonstrated for SPECT [7]. The above developments have led to the initiation of several preclinical and clinical studies. In particular, for PET, the less the radioactive uptake, the greater the advantage of SRT (with respect to bias and contrast). This makes SRT ideal for myocardial infarction studies. This hypothesis is currently in the process of being evaluated.

Electroencephalography and Magnetoencephalography

Brain, neuronal currents generate electrical and magnetic fields that can be recorded by electroencephalography (EEG) and magnetoencephalography (MEG) imaging techniques, respectively. However, these techniques suffer from non-uniqueness, resulting in an inability to truly exploit the potential of EEG and/or MEG for spatially precise and dynamic localisation measurement of brain processes and function. Although it was known to Helmholtz since 1853 that it is not possible to reconstruct uniquely the current in a homogeneous conductor from the knowledge of the magnetic field outside the conductor, the important question of which part of the current can be reconstructed via MEG and EEG remained open for a very long time. In an unexpected breakthrough, Fokas, after extending some earlier joint results with Gelfand and others, presented the complete answer to the above question for both EEG and MEG for arbitrary geometry. Furthermore, he provided an algorithm for determining the “visible” compo-

nent of the current. In certain physiologically important circumstances, the current is localised on the cortical surface and furthermore it is normal to this surface; it is shown that in this case the current can be computed uniquely; moreover, an algorithm has been presented for the efficient determination of this current. As it is well known, at the moment there is lot of excitement in the area of Artificial Intelligence about deep learning; Fokas' group has pioneered the use of this technique in EEG. The above results have opened a new chapter in the use of EEG. Indeed, this widely available and low cost technology can analyse the workings of the brain in healthy and disease states (such as epilepsy and coma) at higher spatial resolution than before and lower neuronal activity thresholds. The recently published book of Dassios and Fokas summarizes the above results [8].

Magnetic resonance imaging

Quantitative magnetic resonance imaging (MRI) estimates magnetic parameters related to tissue, such as T1, T2 relaxation times and proton density. The quantification of T1, T2 relaxation times and proton density has important clinical applications especially in oncology, where they are being used to detect and characterize tumours. MR fingerprinting (MRF) is a new concept that uses pseudo-random, incoherent measurements to create a unique fingerprint for each tissue type to quantify magnet parameters. The centre's research has significantly enhanced MRF performance and improved the quantification of T1, T2. This was achieved by investigating (i) the most suitable acquisition methods, and (ii) using novel analytical transformations. The proposed novel analytical transformations of MR fingerprinting data aim to replace existing non-uniform Fourier Transform methods and Filtered Back Projection, leading to a better quantification of T1, T2 tissue properties [9].

Metabolic fingerprinting

Metabolic fingerprints are valuable biomarkers for diseases that are associated with metabolic disorders. ^1H magnetic resonance spectroscopy (MRS) is a unique non-invasive diagnostic tool that can depict the metabolic fingerprint based solely on the proton signal of different molecules present in the tissue. However, its performance is severely hindered by low SNR, field inhomogeneities and overlapping spectra of metabolites, which affect the quantification of metabolites. Consequently, MRS is rarely included in routine clinical protocols and has not been proven in multi-institutional trials. Nikos Dikaïos has proposed an alternative approach, where instead of quantifying metabolites' concentration, deep learning (DL) is used to model the complex nonlinear relationship between dis-

eases and their spectroscopic metabolic fingerprint (pattern). DL requires large training datasets, acquired (ideally) with the same protocol/scanner, which are very rarely available. To overcome this limitation, members of the Center have proposed a novel method that can quantum-mechanically synthesise MRS data for any scanner/acquisition protocol. The proposed methodology has successfully been applied to the challenging clinical problem of differentiating metastasis from glioblastoma brain tumours on data acquired across multiple institutions. The DL algorithms were trained on the augmented synthetic spectra and tested on two independent datasets acquired by different scanners, showing an accuracy of almost 100% [10].

Proton Beam Therapy

One in two people will develop cancer, and radiotherapy accounts for >40% of curative treatments, owing its effectiveness in the ability to accurately target tumours. Proton Beam Therapy (PBT) is rapidly gaining momentum worldwide compared to x-ray/electron beams with an increasing number of operating sites. Protons have similar relative biological effectiveness (RBE) to photons, but a far better depth-dose distribution profile which allows better conformation of dose distribution, compared to x-rays or electrons, thereby reducing the integral dose to the body and avoiding dosing normal tissue structures near the tumour. This is crucial when treating growing children, to avoid side effects such as developmental delays, hormone deficiencies, effects on bone and muscle tissue, and hearing loss or damage to salivary glands. PBT can deliver treatments in sub-mm accuracy, but because of imaging limitations it currently cannot achieve more than 7 mm accuracy. To maximise the potential of PBT it is crucial to accurately know the dose distribution and be able to shape and control it, making imaging the main challenge for accurate treatment planning. Based on the reconstructed proton Computed Tomography (pCT) images, proton stopping power maps are calculated, which provide information about the dose distribution. Due to the proton Bragg peak characteristic, a miscalculation in the proton stopping power map (distance from the 90% to the 10% dose level is only a few mm) can result in the proton beam missing its target and damaging healthy tissue, while the tumour receives much lower dose. Reconstructed pCT images become blurred by Multiple Coulomb Scattering, which results in a resolution of around 3-5 mm. Members of the Center have developed machine learning algorithms that can successfully track protons, while simultaneously estimating proton stopping power maps needed for radiotherapy planning [11].

General Theory of relativity

Blanchet, a leading world expert in the calculations for the 2-body problem in general relativity, and Fokas [12] solved the two-body problem in general relativity in the so-called post-Minkowskian approximation, where the dimensionless parameter $r_s = 2Gm/c^2r$ tends to zero, with G denoting the gravitational constant, c the speed of light, and r is a typical length. The paper presenting this unexpected result was chosen in the prestigious category of “editor’s suggestion”. The post-Minkowskian approximation is valid for the motion of quarks, and in this case, their speed tends to c . Thus, computing this limit (known as the ultra-relativistic limit), could be important for the analysis of mesons, as first suggested by the iconoclastic ideas of the Academician Costas Vayenas. Fokas [13] has performed this computation and has shown that, remarkably, the resulting gravitational force between the two particles has features associated with the strong force, namely, confinement and asymptotic freedom.

Mathematical Modelling of Infectious Diseases

In 2020, due to the COVID-19 pandemic, MaRC developed an intense activity on developing mathematical algorithms and using machine learning in order to model the dynamics of the COVID-19 disease. More specifically, members of the Center have introduced a new forecasting model that can provide highly accurate long-term predictions both for the number of deaths [14] caused by COVID-19 and the number of reported infected cases [15]. This success was based on replacing the usual logistic formula used in epidemiology by more general formulae. Interestingly, these formulae are, in a sense, optimal, since elaborate “deep learning” algorithms could not improve the predictions obtained by them.

Gamma-ray Imaging

In 2014, a laboratory was created for gamma-ray imaging of small animals, in collaboration with the Center for Gamma-Ray Imaging (CGRI) of the University of Arizona and the Radiopharmaceuticals Laboratory of the Institute of Nuclear and Radiological Sciences, Technology, Energy and Safety, of the NCSR “Democritus”. This collaboration allows us to test our reconstruction algorithms in a real preclinical environment as well as to perform imaging protocols for drug discovery. By employing this small Anger camera members of the Center were able to conduct research in the following topics: a) Measuring lung epithelial permeability in rats that underwent inspiratory resistive breathing using ^{99m}Tc -diethylenetriaminepentaacetic acid (^{99m}Tc -DTPA) scintigraphy of the respiratory

system [16]; b) Measuring the dose- and time-dependent effects of lipopolysaccharide on technetium-99-m-labeled diethylene-triamine penta-acetic acid clearance [17]; c) Measuring tracer accumulation of a superparamagnetic iron oxide nanoparticle for targeted dual-modality SPECT/MR imaging of angiogenesis [18]; d) Investigating the feasibility of using radiolabelled methotrexate as a new diagnostic agent of inflammatory target sites [19].

Future Aims and Goals

One of the aims of MaRC is to define the next stage of the unified transform, both in terms of theoretical developments, as well as its impact on applications. Furthermore, we expect to complete the rigorous proof of the formal asymptotic results pertinent to the Riemann zeta function, derived earlier by members of the Center. The successful outcome of this project will attract the interest of the entire international mathematical community. In addition, Fokas and the leading theoretical physicist Neil Turok have begun a long-term collaboration which, motivated by the far-reaching ideas of the Academician C. Vayenas, aims to investigate the unexpected relationship of general relativity (involving particles of small masses moving at very high speeds) and particle physics. This work could have major implications in modern physics. MaRC is working into mathematical models to correlate imaging textural features to molecular markers of diseases aiming to eventually achieve personalised therapy. Finally, MaRC is looking into explainable artificial intelligence, aiming to develop mathematical methods that can explain and interpret machine learning models.

References

1. Fokas A.S. (1997). *Proceedings of the Royal Society of London A*, 453(1962), pp. 1411-1443.
2. Fokas A.S. & Lenells J. (in press). *Memoirs of the AMS*.
3. Fokas A.S. (2019). *Transactions of Mathematics and Its Applications*, 3(1), tnz006.
4. Kalimeris K. & Fokas A.S. (2019). *Mathematics*, 7(7), 650.
5. Kastis G.A., et al. (2014). *Medical Physics*, 41(4), 042501.
6. Kastis G.A., et al. (2015). *Medical Physics*, 42(10), pp. 5970-5982.
7. Protonotarios N.E., et al. (2018). *Journal of the Royal Society Interface*, 15(148), 20180509.
8. Dassios G. & Fokas A.S. (2020). *Electroencephalography and magnetoencephalography*. De Gruyter.
9. Dikaïos N., et al. (2021). *Magnetic Resonance Imaging*, 80, pp. 81-89.
10. Dikaïos N. (2021). *NMR in Biomedicine*, 34(4), e4479.

11. Lazos D., et al. (2021). *Physics in Medicine & Biology*, 66(10), 105013.
12. Blanchet L. & Fokas A.S. (2018). *Physical Review D*, 98(8), 084005.
13. Fokas A.S. (2019). *The European Physical Journal C*, 79(3), 271.
14. Fokas A.S., et al. (2021). *Proceedings of the Royal Society A*, 477(2249), 20200745.
15. Fokas A.S., et al. (2020). *Journal of the Royal Society Interface*, 17(169), 20200494.
16. Toumpanakis D., et al. (2010). *American Journal of Respiratory and Critical Medicine*, 182(9), pp. 1129-1136.
17. Kastis G.A., et al. (2013). *Experimental Biology and Medicine*, 238(2), pp. 209-222.
18. Tsoukalas C., et al. (2018). *Frontiers in Chemistry*, 6, 224.
19. Papachristou M., et al. (2018). *Molecular Medicine Reports*, 17(2), pp. 2442-2448.

RESEARCH OFFICE OF THEORETICAL & APPLIED MECHANICS

Foundation - Scope

The Research Office of Theoretical & Applied Mechanics was founded in 1978 on the initiative of the former President and General Secretary of the Academy of Athens, Professor of Mechanics at the National Technical University of Athens (NTUA), Periklis S. Theocharis. According to the regulations of the Founding Charter of the Academy, Prof. P.S. Theocharis was the Supervisor (or Chairman) of the Supervising Committee of the Office (maximum 5 members), which also had two deputy members. Prof. Theocharis was succeeded by his close associate and Professor at NTUA, Anthony N. Kounadis, when the latter was elected full member of the Academy of Athens in 1999. The following year, after his election as Member of the Board of Directors of the Institute for Biological Research of the Academy of Athens, Prof. Kounadis was granted an office in the premises of the Institute, which serves also as the basis of the Research Office. In 1984, Prof. Kounadis succeeded Prof. Theocharis in the Presidency of the Hellenic Society of Theoretical & Applied Engineering (HSTAM). Since then, HSTAM has a close cooperation with the Administrative Committee of the Research Office and its members. This cooperation continues successfully until today and concerns mainly the organisation of national/international Conferences or international Symposia on current developments in the fields of Mechanics and Engineering, which are held at regular intervals (usually every three years).

The first collaborative event between the Supervising Committee of the Office and HSTAM took place in the Ceremonial Hall of the Academy of Athens at the Opening ceremony of the 3rd National Conference on Mechanics of HSTAM (June 25-27, 1992) (Fig. 1).

In 1994, the First Greek-Serbian Symposium on Mechanics took place in Athens (CARAVEL Hotel) with the participation mainly of Members of the Serbian Academy of Sciences and Arts (SANU). In response to this, two years later, the second relevant event took place at the SANU Building (Belgrade 1996), where it was decided that the Greek-Serbian Symposium would be organised on a regular basis. Subsequently, the above cooperation expanded with the partic-



Fig. 1. The former Minister of Industry, Energy, Technology, and Trade, Mr. Andreas Andrianopoulos (on the podium), greets the participants at the Opening ceremony of the 3rd National Conference on Mechanics of HSTAM (Academy of Athens, June 25-27, 1992). Below, Members of the Conference Presidium (from left to right): Prof. A. N. Kounadis (Professor at the NTUA), Prof. P. S.Theocharis (Professor at the NTUA and, at that point, General Secretary of the Academy of Athens), Prof. D. Beskos (Professor at the Polytechnic School of the University of Patras) and Prof. J. T. Katsikadelis (Professor at the NTUA).

ipation of other countries, leading to the International Greek-Serbian and later Greek-German-Serbian-Polish Symposium, which takes place every three years and is chaired by A. N. Kounadis (Member of the Academy of Athens), Nikola Hajdin (President of SANU), Oskar Mahrenholtz (Professor at the University of Hamburg) and Roman Bogatz (Director of the Research Center of the Polish Academy).

The 6th German-Greek-Polish Symposium was held in Alexandroupolis in 2007, in collaboration with the Office of the Academy of Athens and HSTAM, and was funded by the P.S Theocaris Foundation.

On October 30, 2008, a Cooperation Protocol was signed between the Academy of Athens and SANU. It should be noted that the Serbian Professors Maksimović Ljudomir and Subotić Gojko were elected corresponding Members of the Academy of Athens in 2001 and 2006, respectively, while Prof. Nikola Haj-



Fig. 2. The official reception of Prof. A. N. Kounadis as a full member of SANU on May 15, 1998. In the foreground (from right to left): Mr. Karolos Papoulias (Member of the Greek Parliament, former Minister for Foreign Affairs and later President of the Greek Republic), Prof. Nikola Hajdin (Vice President of SANU), Prof. A. N. Kounadis, Mr. P. Vlassopoulos (the Greek Ambassador at Belgrade), and two other members of SANU.

din was elected a foreign member (2005). Prof. A. N. Kounadis was elected as a full member of SANU in 1997 and his official reception took place on 15/5/1998 at the SANU Building in Belgrade (Fig. 2). Two more members of the Academy of Athens, Prof. Panayotis L. Vocotopoulos and the late Angeliki Laiou, were thereafter elected as full members of SANU.

Since 2000, the Supervising Committee of the Office has operated as a five-member body (with the participation of non-academician, university professors). Apart from the positions of the President and the Secretary, occupied since the foundation of the Office by the Academician A. N. Kounadis and Prof. John T. Katsikadelis (Professor at the NTUA), respectively, all the other honorary positions in the Supervising Committee have been occupied for shorter tenures by various colleagues, who are thus able to contribute to the research work carried out by the Office.

Research work - publications

Despite the lack of funding, which is necessary to carry out basic research, the President of the Office and its members have been performing significant research work, as demonstrated by their annual publication record, whether monographs or articles in reputable international journals, conference proceedings, and honorary volumes. These are announced in the annual report of the Research Centers and Offices of the Academy of Athens during its established ceremonial session at the end of each calendar year.

At the request of Dr. D. Cotsovos, the Research Committee of the Academy of Athens approved in November 2008 the funding of a research project related to the earthquake protection of the statues of Athena and Apollo that decorate the front of the neoclassical building of the Academy of Athens (Fig. 3). The aim of this research project was to investigate how to protect these two statues, an issue that had preoccupied for long both the Academy of Athens and the Technical Council under the Presidency of the Academician A. N. Kounadis. This research resulted in four publications by Dr. D. Cotsovos (currently Professor at the University of Edinburgh), co-authored by the Academician A. N. Kounadis (in his role as the Supervisor of the Research Project), Prof. G. Papadopoulos, and others, see, e.g., the publication “Overturning instability of a two - rigid block system under ground excitation”, *ZAMM*, vol. 92.7 (2012), 536-557. The first part of this Research Project was announced by the Academician A. N. Kounadis during his communication in the Plenary Session of the Academy of Athens on December 6, 2012, entitled: “Rocking of a cantilever consisting of rigid elements (rigid blocks, spondyles) freely supported on each other and subjected to ground excitation” (Proceedings of the Academy of Athens, vol. 87, A', 2012).

Subsequently, the Academician A. N. Kounadis continued this research by extending it to multi-spondyle columns on which heavy bodies (such as the statues of Athena and Apollo) are supported through high friction, taking into account a small slip between the spondyles. Several important studies based on the afore-mentioned research were published in reputable international journals. The last one was evaluated as one of the eight most influential studies published in 2019 in the journal “Soil Dynamics and Earthquake Engineering”. Directly relevant to this research was Prof. A. N. Kounadis' lecture at the Plenary Session of the Academy of Athens, entitled “Rocking due to earthquake of multi-spondyle columns bearing heavy bodies: A heuristic stable structural system of ancient technology”, which was delivered on the occasion of his ceremonial nomination as President of the Academy of Athens on January 16, 2018 (Fig. 4) (Proceedings of the Academy of Athens, vol. 93, A', 2018).

It is worth noting that this long term research on the protection of the statues

of Athena and Apollo led to the significant conclusion that, on account of the historical and seismological data of the area, they are not at risk due to earthquakes. Therefore, there is no reason to take them down and replace them with copies. However, the marble surfaces of the statues should be protected against atmospheric pollution with a specific layer of protective material every five to ten years.



Fig. 3. The facade of the Building of the Academy of Athens with the statues of Athena (left) and Apollo (right) at the top of the respective multi-spondyle columns.

Publications related to the activities of the Office

a. Publications of A. N. Kounadis

1. **Cotsovos D. M., Cotsovos G. M., Cotsovos M. D. and Kounadis A. N.** “Seismic Behaviour of RC Walls: An Attempt to Reduce Reinforcement Congestion”, *Mag. of Concrete Research*, vol. 63 (4), 235-246, 2011.
2. **Kounadis A. N.** “Rocking Instability Under Ground Motion of Large Statues Freely Standing Atop Elastically Supported Cantilevers”, *Archives of Applied Mechanics*, vol. 84, 933-951, 2014.
3. **Kounadis A. N.** “Rocking Instability of Free-Standing Statues Atop Slender Viscoelastic Columns Under Ground Motion”, *Soil Dyn. and Earth. Eng.*, vol. 63, 83-91, 2014. 4

4. **Kounadis A. N.** “On the Rocking Complex Response of Ancient Multi-Spondyle Columns: A genius and challenging structural system requiring reliable solution”, *Journal of Meccanica*, vol. 50, 261-292, 2015.
5. **Kounadis A. N., Papadopoulos G. J.** “On the Rocking Instability of a Three-Rigid Block System”, *Archive of Applied Mechanics*, vol. 86, 957-977, 2016
6. **Kounadis A. N.** “The Effect of Sliding on the Rocking Instability of Multi-Rigid Block Assemblies under Ground Motion”, *Soil Dyn. & Earth. Eng.*, vol. 104, 1-14, 2018.
7. **Kounadis A. N.** “The Effect of Sliding on the Rocking Instability of Multi-Rigid Block Assemblies under Ground Motion”, *Soil Dyn. & Earth. Eng.*, vol. 104, 1-14, 2018.
8. **Kounadis A. N.** Author’s reply to discussers on “The effect of sliding on the rocking instability of multi-rigid block assemblies under ground motion”, *Soil Dyn.& Earth. Eng.*, vol.104, 369-371, 2018.
9. **Kounadis A. N.** “Seismic instability of free-standing statues atop multi-spondyle columns: A heuristic very stable system of ancient technology”, *Soil Dyn.& Earth. Eng.*, vol. 119 (1), 256-264, 2019.



Fig. 4. The Academician A. N. Kounadis delivers his lecture entitled “Rocking Due to Earthquake of Multi-Spondyle Columns Bearing Heavy Bodies: A Heuristic Stable Structural System of Ancient Technology” during his ceremonial nomination as President of the Academy of Athens at the Plenary Session on January 16, 2018.

The other members of the Supervising Committee of the Office have also carried out important research work related to the activities of the Office. The resulting publications have been reported to the Academy by the academicians members of the Office in their own annual reports. Thus, the following list enumerates publications of the non-academician members of the Supervising Committee of the Office, which fall within its research aims, such as certain publications by Prof. J. T. Katsikadelis (Secretary of the Supervising Committee of the Office).

b. Publications of J. T. Katsikadelis

1. **Fama, G. S. A., Rashed, Y. F. and Katsikadelis, J. T.** “The analog equation integral formulation for plane piezoelectric media”, *Engineering Analysis with Boundary Elements*, v. 51, 199-212, 2015.
2. **Chinnaboon, B., Chucheepsakul, S. and Katsikadelis, J. T.** “A BEM-based Domain Meshless Method for the Analysis of Mindlin Plates with General Boundary Conditions”, *Computer Methods in Applied Mechanics and Engineering*, vol. 200 (13-16), 1379-1388, 2010,
3. **Babouskos N. and Katsikadelis J. T.** “Nonlinear Vibrations of Viscoelastic Plates of Fractional Derivative Type. An AEM Solution”, *Open Mechanics Journal*, vol. 3, 25-44, 2009.
4. **Katsikadelis J. T.** “Numerical Solution of Multi-term Fractional Differential Equations”, *ZAMM: Zeitschrift für Angewandte Mathematik und Mechanik*, vol. 89 (7), 593-608, 2009.
5. **Katsikadelis J. T.** “The 2D Elastostatic Problem in Inhomogeneous Anisotropic Bodies by the Meshless Analog Equation Method (MAEM)”. *Engineering Analysis with Boundary Elements*, vol. 32 (12), 997-1005, 2008.

Other activities of the Office

The Supervisor of the Office upon his election as Full Member of the Academy of Athens and in his capacity as a founding member and Honorary President of the Hellenic Linguistic Heritage Society (HLHAS) has been involved in activities related to the protection, promotion, and dissemination of the Greek language. Since 2001, the Office together with the Academy of Athens has organised several, well-received events regarding Greek language and education at the Main Building of the Academy of Athens in the presence of the political, ecclesiastical, judicial, and military leadership of the country. In this context, the Academician A. N. Kounadis has given many lectures on the Greek language within Greece and abroad upon invitation (Fig. 5). He is the author of the well-known Declaration of 40 Academics in 2000 against the “Latinisation” of the Greek Alphabet, an initiative that received wide publicity in the daily and periodical press of Greece for a long time.



Fig. 5. Prof. A. N. Kounadis on the podium of the new Library of Alexandria during its inauguration ceremony (October 2008) under the auspices of the President of Egypt, Mr. Hosni Mubarak, and the President of the Hellenic Republic, Mr. Karolos Papoulias. Prof. Kounadis delivered the keynote lecture at this event entitled “The Ecumenicity of the Greek Language.”

Honorary distinctions and awards to A. N. Kounadis

Honorary Distinctions: Member of the Academia Europaea (1992), the Serbian Academy of Sciences and Arts (1997), the European Academy of Sciences (Liege 2010), the Russian Academy of Engineering (RAACS 2000), etc. Honorary Doctor of the Democritus University of Thrace (DUTH), and foreign universities (Nis 2006, and Novi Sad 2013). Honorary Professor of DUTH (2017), President of the Empirikion Foundation (2017-), President of European / International Conferences on Dynamics, Steel Structures and Mechanics.

Awards: Blaise Pascal Medal in Engineering of the European Academy of Sciences (2010) (Fig. 6), Honorary volume of the international journal *J. Archives of Appl. Mechanics* (2012) and *NTUA* (2005), Lifetime Achievement Award (ICES2012), Distinguished Lecturer (Caltech 2014), Grand Master Teacher of the Patriarchate of Alexandria and All Africa (2012), Golden Cross of the Holy Metropolises (Thessaloniki, Chios - Oinousses and Paronaxia 2018), Golden Cross of the Order of the Phoenix, Senior Brigadier General of King George I, and Senior Brigadier of the Order of Honor (2014), Honorary President and Honorary Member of Philological and Cultural Societies (Hellenic Linguistic Heritage Society, Estia of New Smyrni, National Society of Greek Writers, Philological Society of Parnassos, Society of Greek Philologists, Society of Cycladic Studies, etc.).



Fig. 6. Mrs. Helene De Rode, President of the European Academy of Sciences, delivers to the Academician A. N. Kounadis the Blaise Pascal Medal in Engineering for the year 2010 (Academy of Athens, November 5, 2011).

Future goals - perspectives

The activity of the Office during the year 2020 was essentially suspended due to the pandemia (COVID-19). However, the President and the Members of the Supervising Committee of the Office hope to resume work and continue research in the framework of the goals and perspectives of the Office with the cooperation and assistance of new members such as the distinguished colleague, Prof. Emmanuel E. Gdoutos (Professor of Theoretical and Experimental Engineering).

RESEARCH OFFICE OF EXPERIMENTAL PHYSICS

The Research Office of Experimental Physics of the Academy of Athens, supervised by the Academician Prof. Loucas G. Christophorou, was established in 2003 for the following purposes:

1. The study of the basic reactions of low energy electrons with molecules of mostly environmental and biological interest and the application of the results of basic research on the interactions of matter and energy (mainly low-energy electrons, ions and photons with atoms and molecules) in the science and technology of materials, plasma and energy. In these areas, the Office plays an important advisory and coordinating role internationally.
2. The promotion of science and energy technology in Greece. For this purpose, it collaborates with organisations within Greece and abroad, participates in international programmes, conferences and organisations, cooperates closely with Greek Universities and Research Centers, and has, independently or jointly, organised Conferences to investigate and discuss the energy needs and energy planning in Greece.
3. The in-depth study of issues concerning the relationship between science and scientific technology and society, mainly the effects of science and scientific technology on human values. In this area, the Office has developed an intense extroverted activity by participating in and/or organising international organisations and Symposia, in collaboration with foreign Academies.

THE OFFICE'S MAIN ACHIEVEMENTS FROM ITS ESTABLISHMENT UNTIL 2020

Research Programmes

2004-2020: “Supervision of Publications and Preparation of the Conclusions and Events of the Energy Committee of the Academy of Athens” (see Publications).

2010-2011: “Energy: Production, Transport, Transformations and Uses”, “Energy Sources and Needs of Greece”.

2005-2008: The postgraduate students Aristotelis Zaras and Dimitris Chatzian-

toniou (as well as Professor Panagiotis Papagiannakopoulos of the University of Crete and the researcher Athanasios Asthenopoulos from NCSR “Demokritos”) worked for the establishment and the assembling of the necessary equipment of the Laboratory of Bioelectronics and Environmental Physics, using instruments funded by the Academy, or donated by the National Laboratory of NIST (National Institute of Standards and Technology) of the USA. The experimental devices were used to conduct experiments for quantitative measurements and studies on the reactions of low-energy electrons with molecules of environmental and energy interest mainly in the quantitative measurement of the probabilities of decomposition of polyatomic molecules of environmental and energy interest in collisions with low-energy electrons. These measurements were made at different temperatures, in order to determine the quantitative effect of the molecules’ internal energy in the possibility of their decomposition with production of negatively charged fragments.

2004-2020: In 2004, the Research Office of Experimental Physics of the Academy of Athens recommended the establishment of the Energy Committee of the Academy of Athens, in order to play an advisory role in the energy issues of Greece. The Plenary Session of the Academy of Athens approved the proposal unanimously in 2005. In the period 2005-2020, the Energy Committee provided valid knowledge and information to the Greek citizen, as well as an independent and scientifically substantiated opinion to the Government, for the energy needs, choices and prospects of Greece. The Committee achieves its goal through studies on energy issues under consideration by Greek and foreign experts, workshops, working groups, lectures, press releases, articles published in international journals and Conference Proceedings, and also by publishing books, which are then distributed widely and free of charge.

In summary, the Office’s and the Energy Committee’s achievements over the last 16 years are:

- The study of a significant part of the spectrum of Greek energy needs.
- The participation of hundreds of scientists to achieve the goals of the Energy Committee.
- The presence and participation of thousands of Greeks in the audience of the Office’s and the Energy Committee’s events.
- The valid and thorough information of the Government in various ways, such as through the Conference Books published by the Academy, on the critical Greek energy issues.

The Workshops and Working Groups focused on important energy areas, analysing specific topics, as the ones mentioned below:

1. *Energy Saving* in buildings, transport, industry, etc., discussing the important role of new materials for energy saving, which is considered as the most important energy resource in Greece.
2. *Energy and Environment*, discussing the impact of energy production, transmission and use on the environment and the climate change, and proposing counter measures.
3. *Nuclear Energy and Energy Needs of Greece*, discussing the study of scientific knowledge and data on nuclear energy and their evaluation in relation to the energy needs of Greece.
4. *Materials for Energy Applications*, demonstrating the crucial role of materials in the transformation of primary energy into electricity and heat, as well as in the storage, transport and use of energy.
5. *Production of Electric Supply in Greece: Fossil Fuels, Renewable Energy Sources and Energy Supply Perspective*, discussing thoroughly fossil fuels, various renewable energy sources, and their prospects in the future energy supply.
6. *Greek Hydrocarbons (HC): From Exploration to Exploitation*, offering an in-depth discussion on the existing amount of research, the available studies, the applied technology and the planning for locating and exploiting HC in Greece, as well as the estimated size and potential of these energy resources. It is considered that various parts of Greece fulfill the necessary conditions for the existence of remarkable HC deposits, which should be further explored.
7. *Renewable Energy Sources: Conditions for Massive Penetration in Production of Electric Supply*, discussing at length the available research, studies, technologies and possibilities relating to the mass penetration of Renewable Energy in the electric supply generation in Greece, as well as all the necessary prerequisites to achieve this goal, such as infrastructure, interconnections with the European system, and an overall long-term energy planning.
8. *Waste Management and Energy Exploitation in Greece*, discussing programmes, experiences, opportunities, prospects and priorities for the efficient waste management and energy exploitation in Greece, as well as ways of waste processing to recover useful materials and energy.
9. *Energy and Developmental Planning in Greece*, discussing a development plan for the country based on its energy needs and its energy capabilities as a growth lever; such a goal requires the establishment of a National Council for Energy Policy and a developmental planning of the energy sector.
10. *Energy and Transport in Greece: Conditions and Measures for Clean and Sustainable Energy*, discussing practical data and suggestions on the size and types

of energy used in transport in Greece, with emphasis on road, sea and rail transport. Energy consumption in transport in Greece is too high and electromobility is at a fetal level.

11. *Energy Prospects of Greece in 2030 with Horizon of 2050*. This Working Group formulated proposals to the Government for the energy prospects of Greece and the long-term developmental planning of the country, based on its energy potential and the type of its domestic energy sources, with a horizon of 2050.
12. *Research in the Energy Sector in Greece*, discussing research achievements and research perspectives in the Energy sector. Many projects are funded by the European Union, but infrastructure and support for basic, applied and industrial research is required from the Government. Energy research in Greece is mainly active in solar and wind energy, hydrogen, fuel cells, energy saving and materials with energy applications.
13. *Energy and Water in Greece*, discussing in-depth the energy aspects of water in Greece and the dynamic relationship between water, agriculture and energy. The main sectors, which are responsible for the high water consumption in Greece, are agriculture and energy.

International Collaborations

In addition to participating in scientific conferences, the Office has collaborated with many institutions within Greece and abroad and with Academies of Sciences in many countries. The Academician Loucas G. Christophorou represented the Academy of Athens in meetings of the Academies of ICSU (International Council for Science), ALLEA (All European Academies), IAP (InterAcademy Panel), EASAC (European Academies Science Advisory Council) and ISC (International Science Council).

Organisation of Conferences and Meetings

- Working Group Event on “Hydrocarbon Exploration in the Eastern Mediterranean: Prospects and Challenges”, organised by the Research Office of Experimental Physics, the Energy Committee, and the University of Ioannina, in collaboration with the Group of Political and Social Concerns of Ioannina, Academy of Athens, June 11, 2018.
- European Science Day: Science Education and Responsibilities of Scientists, Rome, organised with A. Boriani and M-L Channin, September 26, 2011.
- Workshop on “Solar Energy-Concentrating Solar Power”, Academy of Athens, organised with John Holmes, December 9, 2011.

- EASAC Meeting, Academy of Athens, December 8, 2011.
- Second International Symposium of the Academy of Athens for Universal Values on “Science, Technology and Human Values”, Athens, May 2-4, 2007.
- First International Symposium of the Academy of Athens for Universal Values on “Universal Values”, Athens, May 26-28, 2004.
- Tenth International Symposium on *Gaseous Dielectrics*, Athens, March 29 April 2, 2004.

Selected Publications

- L. G. Christophorou (Ed.), Proceedings of the Workshop “Energy and Water in Greece”, ISBN: 978-960-404-369-9, Academy of Athens, 2020.
- L. G. Christophorou, Energy and Modern Civilization: The Emerging Global Landscape and its Challenges – The Activities of the Academy of Athens, The Capital of Knowledge, Society for the Propagation of Useful Books, ISBN: 978-960-8351-83-7, pp.185-192, 2020.
- L. G. Christophorou (Ed.), Proceedings of the Workshop “Research in the Energy Sector in Greece”, ISBN: 978-960-404-357-6, Academy of Athens, 2019.
- L. G. Christophorou (Ed.), Proceedings of the Workshop “Energy Prospects of Greece in 2030 with Horizon of 2050”, ISBN: 978-960-404-335-4, Academy of Athens, 2018.
- L. G. Christophorou, Emerging Dynamics: Science, Energy, Society and Values, Springer, <https://doi.org/10.1007/978-3-319-90713-0>, 2018.
- L. G. Christophorou (Ed.), Proceedings of the Workshop “Energy and Transport in Greece: Conditions and Measures for Clean and Sustainable Energy”, ISBN: 978-960-404-319-4, Academy of Athens, 2017.
- L. G. Christophorou (Ed.), Proceedings of the Workshop “Energy and Developmental Planning in Greece”, ISBN: 978-960-404-307-1, Academy of Athens, 2016.
- L. C. Pitchford, L. L. Alves, K. Bartschat, S. F. Biagi, M. -C. Bordage, I. Bray, C. E. Brion, M. J. Brunger, L. Campbell, A. Chachereau, B. Chaudhury, L. G. Christophorou, E. Carbone, N. A. Dyatko, C. M. Franck, D. V. Fursa, R. K. Gangwar, V. Guerra, P. Haefliger, G. J. M. Hagelaar, A. Hoesl, Y. Itikawa, I. V. Kochetov, R. P. McEachran, W. L. Morgan, A. P. Napartovich, V. Puech, M. Rabie, L. Sharma, R. Srivastava, A. D. Stauffer, J. Tennyson, J. de Urquijo, J. van Dijk, L. A. Viehland, M. C. Zammit, O. Zatsarinny, S. Pancheshnyi, LXCat: an Open-Access, Web-Based Platform for Data Needed for Modeling Low Temperature Plasmas, *Plasma Process. Polym.*, 14: 1600098. <https://doi.org/10.1002/ppap.201600098>, 2016.
- L. G. Christophorou (Ed.), Proceedings of the Workshop “Waste Manage-

- ment and Energy Exploitation in Greece”, ISBN: 978-960-404-292-0, Academy of Athens, 2015.
- L. G. Christophorou (Ed.), Proceedings of the Workshop “Renewable Energy Sources: Conditions for Mass Penetration in Production of Electric Supply”, ISBN: 978-960-404-281-4, Academy of Athens, 2014.
 - L. G. Christophorou, Energy, Environment and Modern Civilization, In: Proceedings of the International Conference “Transition to a new Society”, 20-22 March 2014, Podgorica, Montenegro, pp. 257-269, 2014.
 - L. G. Christophorou, Energy, Environment and Civilization, International Journal of Environmental Sciences (IJES), 1, No 1, 2013.
 - L. G. Christophorou (Ed.), Proceedings of the Workshop “Greek Hydrocarbons (HC): From Exploration to Exploitation”, ISBN: 978-960-404-250-0, Academy of Athens, 2012.
 - L. G. Christophorou, Scientists and society: needs and responsibilities, Rendicoti Lincei – Scienze Fisiche e Naturali, 23 (Suppl. 1), pp. 23-27, under the heading “Today’s Topics in Sciences”, doi: 10.1007/s12210-012-0188-y, 2012.
 - L. G. Christophorou (Ed.), Proceedings of the Workshop “Production of Electric Supply in Greece: Fossil Fuels, Renewable Energy Sources and Energy Supply Perspective”, ISBN: 978-960-404-199-2, Academy of Athens, 2011.
 - L. G. Christophorou, Energy and Civilization, ISBN: 978-960-404-216-6, Academy of Athens, 2011.
 - L. G. Christophorou (Ed.), Proceedings of the Workshop “Materials for Energy Applications”, ISBN: 978-960-404-165-7, Academy of Athens, 2010.
 - L. G. Christophorou (Ed.), Proceedings of the Workshop “Nuclear Energy and Energy Needs of Greece”, ISBN: 978-960-404-140-4, Academy of Athens, 2009.
 - L. G. Christophorou, The universality of science: limits and needs, In: Revista de Filosofie, Sociologie și Științe Politice. nr. 3(151), pp. 7-14. ISSN 1957-2294, 2009.
 - L. G. Christophorou (Ed.), Proceedings of the Workshop “Energy and Environment”, ISBN: 978-960-404-126-8, Academy of Athens, 2008.
 - L. G. Christophorou, A. Zaras, P. Papagiannakopoulos, Environmental Applications of Electron-Molecule Interactions, International Journal of Mass Spectrometry, 277, 1-3, pp. 26-30, 2008.
 - L. G. Christophorou, Viable Energy, Proceedings of the Academy of Athens, 2008.
 - L. G. Christophorou, Gaseous Dielectrics in Power Transmission and Distribution, In: Deregulated Electricity Market Issues in South-Eastern Europe, Dogus University Publications, Publication Number, 2, pp.13-19, ISBN 978-9944-5789-1-2, 2007.
 - L. G. Christophorou, The Inductive Method of Physics (From Molecules to Man?), Proceedings of the Academy of Athens, 82, A’, 2007.

- L. G. Christophorou, Scientific questions without scientific answers, *Ευθύνη*, 426, 281-283, 2007.
- L. G. Christophorou and C. Drakatos (Eds.), *Science, Technology and Human Values*, ISBN: 978-960-404-117-6, Academy of Athens, 2007.
- L. G. Christophorou (Ed.), *Proceedings of the Workshop “Energy Saving”*, Academy of Athens, 2006.
- L. G. Christophorou, Gaseous Functional Materials for Advanced Technologies Based on Knowledge on Electron-Atom/Molecule Interactions, *Rev. Adv. Mater. Sci.* 12, 1-12, 2006.
- L. G. Christophorou and D. Hadjiantoniou, Electron Attachment and Molecular Toxicity, *Chem. Phys. Lett.* 419, Issue 4, 405-410, 2006.
- L. G. Christophorou, The Universality of Science, *Ευθύνη*, 413, 241-246, 2006.
- L. G. Christophorou, Science and Values, *Proceedings of the Academy of Athens*, 80, A', 2005.
- L. G. Christophorou and G. Contopoulos (Eds.), *Universal Values*, ISBN: 960-404-061-8, Academy of Athens, 2004.
- L. G. Christophorou and J. K. Olthoff, *Fundamental Electron Interactions with Plasma Processing Gases*, Springer, ISBN 978-1-4613-4741-5, doi: 10.1007/978-1-4419-8971-0_1, 2004.
- Christophorou L.G., Olthoff J. K., Assessed Total and Partial Ionization Cross Sections for CF₄, C₂F₆, C₃F₈, CHF₃, CF₃I, c-C₄F₈, C₁₂, CC₁₂F₂, BCl₃, SF₆, and Fragments of CF₄ and SF₆. In: Christophorou L.G., Olthoff J.K., Vassiliou P. (Eds.) *Gaseous Dielectrics X*. Springer, Boston, MA. https://doi.org/10.1007/978-1-4419-8979-6_24, 2004.
- L. G. Christophorou, Energy, *Proceedings of the Academy of Athens*, 79, A', 2004.
- L. G. Christophorou, Free Electrons: Fundamental Interactions, Applications, and Data Needs, *Nucleonika* 48(2), 67-74, 2003.

Selected Lectures

- L. G. Christophorou, The Energy Committee of the Academy of Athens: Its Purpose and Work, Academy of Athens, November 26, 2019.
- L. G. Christophorou, Light, Body of Professors Emeriti of the National and Kapodistrian University of Athens, October 5, 2016.
- L. G. Christophorou, Greek Energy Resources, Academy of Athens, November 13, 2012.
- L. G. Christophorou, Scientists and Society: Needs and Responsibilities, Invited lecture at the European Science Day, September 26, 2011, Rome, Italy, in connection with the 30th General Assembly of the International Council for Science (ICSU).

- L. G. Christophorou, At the Limits of Science: Scientific Questions without Scientific Answers, 10th Greek Cypriot Surgical Conference, Nicosia, November 18, 2011; also at the event in honor of Professor Panagiotis Karagianakos, Biomedical Research Foundation of the Academy of Athens, December 12, 2011.
- L. G. Christophorou, The Universality of Science: Limits and Needs, Invited lecture at the International Council for Science (ICSU) European members annual meeting, Podgorica, Montenegro, 29-30 September 2009.
- L. G. Christophorou, Nuclear Energy and Energy Needs of Greece, Working Group, Academy of Athens, November 14, 2008.
- L. G. Christophorou, Viable Energy, Academy of Athens, April 15, 2008.
- L. G. Christophorou, Energy and Environment, Workshop of the Academy of Athens and National Technical University of Athens, Athens, April 4, 2008.
- L. G. Christophorou, Keynote Lecture Energy and Environment, National Technical University of Athens, March 11, 2008.
- L. G. Christophorou, Energy and Environment, Conference of the Union of Greek Physicists, Athens, January 26, 2008.
- L. G. Christophorou, Energy: Modern sources and uses, Conference of the Union of Greek Physicists, Olympia, November 2-3, 2007.
- L. G. Christophorou, Plenary lecture, Use of Sulfur Hexafluoride by the Electric Power Industry, University of Cyprus / Electricity Authority of Cyprus, December 18, 2007.
- L. G. Christophorou, “From molecules to man?”, Christian Scientists Association, Athens, November 25, 2007.
- L. G. Christophorou, Keynote lecture, Gaseous Dielectrics for Power transmission and Distribution, DEMSEE 2007 Meeting, Istanbul, Turkey, September 18-20, 2007.
- L. G. Christophorou, Energy saving, Workshop of the Academy of Athens/ National Technical University of Athens, Athens, November 3, 2007.
- L. G. Christophorou, The influence of science on traditional values, Metropolitan Hospital, Piraeus, June 21, 2007.
- L. G. Christophorou, The Inductive Method of Physics (From Molecules to Man?), Academy of Athens, February 13, 2007.
- L. G. Christophorou, Modern science and man, Papastavrou Papagathangelou Foundation, Nicosia, Cyprus, November 20, 2007.
- L. G. Christophorou, Plenary lecture, Significance of Electron-Molecule Interactions in the Development of Materials for New Technologies, Low-Energy Electron-Molecule Interactions and Electron Scanning Microscopy, Malta, September 16-21, 2006.
- L. G. Christophorou, The Ecumenism of Science, 1st Panhellenic Conference

& International Symposium of the Hellenic College of Surgeons, Athens, March 9, 2006.

- L. G. Christophorou, Universal values, Christian Association of Scientists and Educational Officers, Athens, October 3, 2005.
- L. G. Christophorou, Keynote lecture, Gaseous Functional Materials for Advanced Technologies Based on Knowledge on Electron-Atom/Molecule Interactions, 2nd Workshop on Functional Materials, September 26, 2005, University of Athens, Greece.
- L. G. Christophorou, Science and Values, Academy of Athens, April 19, 2005.
- L. G. Christophorou, Energy, Greek Open University, May 18, 2004.
- L. G. Christophorou, Energy, Academy of Athens, January 20, 2004.
- L. G. Christophorou, Electron Interactions with Plasma Processing Gases, Plasma Physics Symposium, University of Birmingham, UK, September 2003.
- L. G. Christophorou, Light, Christian Association of Scientists and Educational Officers, June 1, 2003.
- L. G. Christophorou, Toward the physics of life sciences: Bioelectronics, National Research Foundation, Athens 30 May 2003.

MAIN ACHIEVEMENTS OF THE OFFICE IN 2021

Research Programmes

2021: “Decarbonization of Greece”, “Renewable Energy Sources (RES) and the need to store electric energy from RES”, “Energy Autonomy of Greece in the Framework of the European Energy Policy”.

Conferences and Meetings

Conference on “Energy Autonomy of Greece in the Framework of the European Energy Policy”, organised at the Academy of Athens, October 1, 2021, see <http://www.academyofathens.gr/el/conferences/energy2021>.

FUTURE AIMS OF THE OFFICE

With the increasing challenges of climate change, rapid population growth and depletion of energy resources, the search for new technologies for the production, distribution and optimal use of energy is becoming critical. In this context, the Research Office of Experimental Physics of the Academy of Athens seeks

to highlight, through research, energy options appropriate to the needs of the society.

Through its work, the Office aims at:

- Predicting future opportunities, both short- and long-term, concerning the development of energy production, distribution and use, as well as technologies on energy storage.
- Mobilizing and coordinating government agencies to increase awareness of the value of research in the Energy sector.
- Developing strong links with the global scientific community.

OFFICE OF SPACE RESEARCH AND TECHNOLOGY

The Office of Space Research and Technology - OSRT (in Greek: Γραφείο Διαστημικής Ερεύνης και Τεχνολογίας - ΓΔΕΤ) was established in February 2006, following the election of Professor Stamatios M. Krimigis to the chair of “*Space Sciences - Theory and Applications*” of the Academy of Athens in January 2005. Since its establishment, OSRT has been operating in direct response to the aims and scopes of the Academy of Athens (AoA), providing research and public outreach in the fields of “*Space and Magnetospheric Physics, Planetary Physics, and Plasma Physics, with emphasis in the analysis of data provided by ongoing space missions*”. From its early stages, OSRT became a major player in leading international Space Science & Technology collaborations and continues to be at the forefront of recent developments at an international level, with many substantial contributions in cutting-edge scientific and technological endeavors.

1. Contributions of OSRT from 2006 to mid-2021

The achievements of OSRT are summarized in (but are not limited to) Table 1. The OSRT has undertaken a substantial role in several major International Space and Plasma Physics/Science collaborations, pushing the envelope across the field of Space Science Research and Technology, in a diverse range of research activities, such as NASA’s and/or ESA’s Voyager 1, Voyager 2, Cassini-Huygens, MESSENGER, Parker Solar Probe and New Horizons missions, the establishment of the newly formed SHIELD-DRIVE Science Center (Boston, USA) and the Study Team for the innovative Interstellar Probe space mission (Johns Hopkins/APL). The OSRT has organised and/or co-organised several international conferences, workshops and/or sessions in leading organisations around the globe (e.g., MOP-2013, AGU-2017 and beyond, the upcoming COSPAR Athens-2022, etc.), while its members have received multiple awards from major international institutions for their exceptional contributions in science and technology.

Table 1. Peer-reviewed publications with an OSRT first author or co-author from 2006 to mid-2021.

	Sun & inner Heliosphere	Mercury	Venus	Mars	Jupiter	Saturn	Pluto	Outer Heliosphere	Other ¹	Total ²
Papers	14	28	2	4	3	158	7	48	13	277
Nature & Science	1	8	–	–	1	4 & 6	4	3 & 5	1 & 1	34

¹Includes peer-reviewed articles of general interest, contribution articles about new mission planning and the Kuiper object publication. ²The table does not include other peer-reviewed publications, such as the publication of one book about Saturn (Ed. S. M. Krimigis), four book chapters and 10 white papers (not peer-reviewed).

1.1 The Physics of Planetary Magnetospheres and Interplanetary Space

The OSRT has been a key partner in several missions, addressing longstanding science questions that date back to 1957-58, the beginning of space age, humanity's first steps towards exploring what lies beyond Earth's atmosphere.

1.1.1 From the Sun, to Mercury, to Pluto and a Kuiper Belt object

Launched in 2018, NASA's Parker Solar Probe (PSP) mission uses Venus' gravity during seven flybys over a time period of seven years to gradually bring the spacecraft to fly through the Sun's atmosphere, as close as $\sim 6.1 \times 10^6$ km to our star's surface. The OSRT contributed to the first results from PSP's plunge through the inner heliosphere of the Sun to its perihelia, about 24×10^6 km from the Sun, showing direct observations of the energetic particle radiation environment in the region just above the corona of the Sun and exploring the physics of particle acceleration and transport [McComas *et al.* 2019].

Launched in 2004, the MErcury Surface, Space ENvironment, GEochemistry, and Ranging (MESSENGER) spacecraft, that orbited Mercury for more than four years, became the first spacecraft to orbit the planet (Fig. 1a), revealing its surface composition [Solomon *et al.* 2008] indicative of its geological history, discovering details about its internal magnetic field [Slavin *et al.* 2008] and magnetosphere/plasmasphere composition [Zubruken *et al.* 2008; 2011] and dynamics [Slavin *et al.* 2009; 2010; Ho *et al.* 2011] and verifying that its polar deposits are dominantly water-ice.

Launched in 2006, the New Horizons (NH) spacecraft flew by Jupiter's magnetosphere, revealing signatures of plasma streaming away from the planet and injection sites in the near-tail region [McNutt *et al.* 2007]. Almost a decade later, on July 14, 2015, NH became the first spacecraft to explore Pluto up close (Fig. 1c),

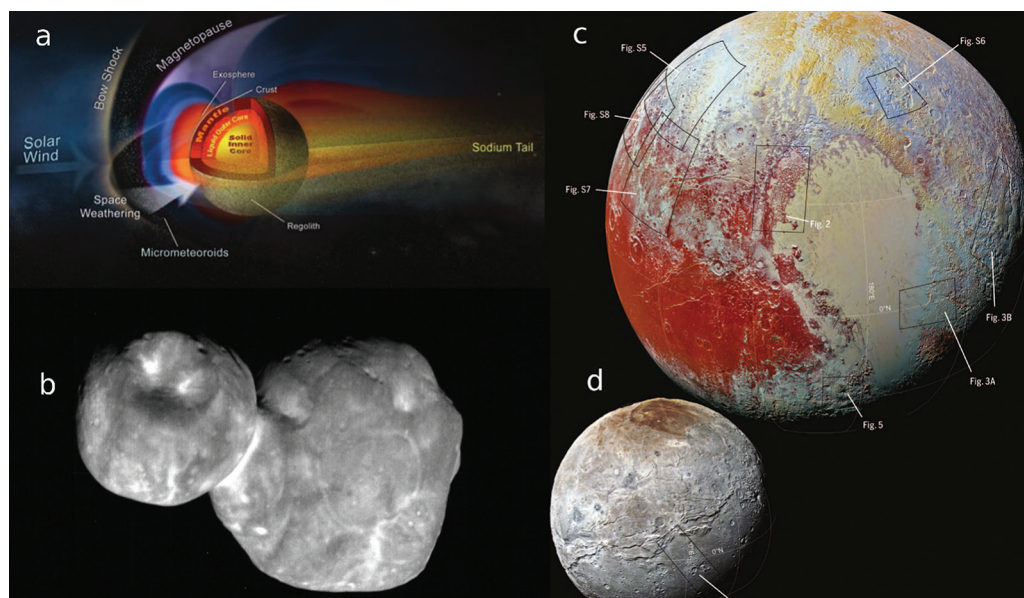


Fig. 1. (a) Schematic depiction of Mercury's interior, surface, atmosphere, and magnetosphere from MESSENGER [Solomon *et al.* 2008]. (b) Image of MU₆₉ from New Horizons LORRI observations taken 1 January 2019 [Stern *et al.* 2019]. (c) The astonishing variety of landscapes of Pluto's surface together with its (d) largest moon Charon, from New Horizons [Moore *et al.* 2016].

flying by the dwarf planet and its moons [Stern *et al.* 2015], showing its diverse surface landforms, providing evidence for a water-ice crust, an extended atmosphere and a surprisingly small interaction region between the planet's magnetosphere and the solar wind [Bagenal *et al.* 2016; Moore *et al.* 2016; Gladstone *et al.* 2016].

New Horizons examined also the complex geology of Pluto's moon Charon [Moore *et al.* 2016; Fig. 1d], which (although currently inactive) showed evidence for past cryovolcanic activity (about 4 billion years ago), whereas the impact crater populations on both Pluto and Charon are not consistent with the steepest impactor size-frequency distributions proposed for the Kuiper Belt. Soon after the Pluto fly-by, NH shifted course to encounter a 30 km wide object (MU₆₉; Fig. 1b) that is part of the Kuiper Belt and showed initial results from its geology and composition, while the analysis showed no evidence for satellites, rings or other dust structures, a gas coma, or solar wind interactions around the object [Stern *et al.*, 2019].

1.1.2 The Cassini Mission to Saturn

Launched in 1997, the Cassini-Huygens mission to Saturn is considered a major technological advance, humanity's most distant planetary orbiter and probe to date, that provided the first in depth, close up study of Saturn, its magnificent rings and unique moons, revolutionizing our understanding of the Kronian system [Paranicas *et al.* 2020]. The OSRT, via its Supervisor, S.M. Krimigis (Principal Investigator-P.I. of Magnetospheric Imaging Instrument, MIMI on Cassini), was instrumental in leading the Cassini-Huygens mission from its inception, up to the mission end (15th September 2017).

The MIMI instrument provided the first measurements of Saturn's magnetospheric energetic ion composition, whereas via the MIMI/Ion and Neutral Camera (INCA), a remote sensing system measuring Energetic Neutral Atoms (ENA), identified a "day-night" asymmetry within the magnetosphere, that varied with an ~ 11 hour periodicity. Those important results, published in Krimigis *et al.* [2005], showed also the existence of a radiation belt residing inward of Saturn's D-ring, that was thought to form via the re-ionization of ENAs originating from the planet's middle magnetosphere (Fig. 2a), that eventually become temporarily trapped by the planet's magnetic field.

The existence of stable radiation belts near the planet and inward of Saturn's ring system was previously entirely unknown and several years later, before Cassini's final plunge into Saturn, an inner radiation belt was detected by MIMI in

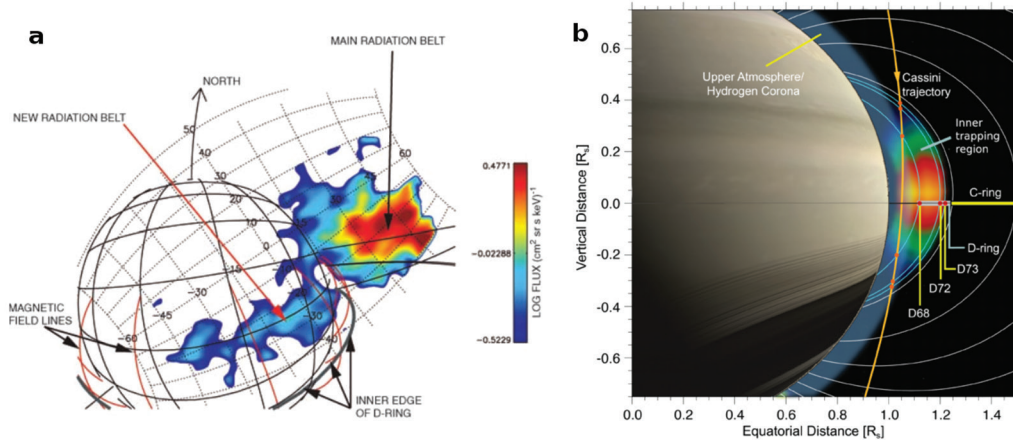


Fig. 2. (a) A variable radiation belt inward of Saturn's D-Ring and the main radiation belt as shown in images of 20-50 keV ENAs from MIMI/INCA [Krimigis *et al.* 2005]. (b) A schematic, color-coded illustration of the inner trapping region at Saturn, together with a typical Cassini proximal orbit, probing the effects of the D-Ring's dust environment on charged particles that bounce along the planetary magnetic field lines [Roussos *et al.* 2018].

the gap between the D-ring and Saturn's upper atmosphere [Roussos *et al.* 2018; Fig. 2b]. As Saturn's main rings inhibit the inward motion of trapped charged particles that form the radiation belts outside the Kronian main ring system, this inward radiation belt, which forms via the Cosmic Ray Albedo Neutron Decay (CRAND) mechanism, is decoupled from the rest of the magnetosphere, being one of the most isolated regions within a planetary magnetosphere found to date.

The OSRT explored for the first time the nature of the electrical current system that encircles Saturn, together with the day-night pressure asymmetry and tilt of the planet's plasma sheet [Krimigis *et al.* 2007; Fig. 3; Sergis *et al.* 2007]. These studies showed the variability of the planet's ring current, presenting strong longitudinal asymmetries that essentially corotate with the planet, revealing the complexity of the Kronian magnetosphere dynamics, pointing to the mechanisms that power up a variety of complex phenomena which pertain to the interplay between internal plasma sources and external (solar wind) contributions that are also interwoven with the planetary rotational properties [e.g. Arridge *et al.* 2016; Allen *et al.*, 2018; Dialynas, 2018].

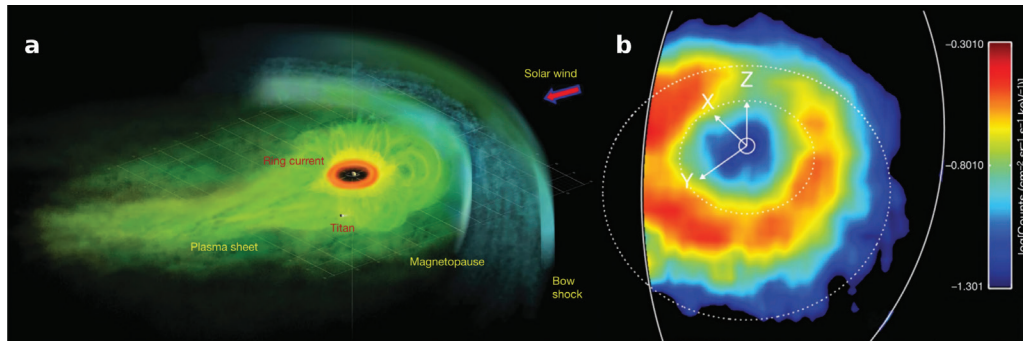


Fig. 3. A conceptual view of Saturn's (a) plasma sheet and embedded (b) ring current, based on the measurements collected from the Magnetospheric Imaging Instrument on the Cassini spacecraft (adopted from Krimigis *et al.* [2007]).

Following the discovery of Enceladus' massive water vapor and water ice plumes spewing into space, leading to the discovery of a subsurface ocean, OSRT explored the conditions through which the cryovolcanic activity at Enceladus could lead to electrodynamic coupling between the moon and Saturn. Prior *et al.* [2011] reported on the detection of magnetic-field-aligned ion and electron beams with sufficient power to stimulate detectable aurora, associated with the moon's footprint, the variability of which was attributed to the variable plume activity.

1.2 The Physics of the Heliosphere

Launched more than 44 years ago, the Voyager missions (Voyager 1; V1, Voyager 2; V2) flew past the gas giant planets in the late 1970s and 1980s and continued their journey through interplanetary space, reaching new and unexplored realms where no mission has ever gone before and no mission is expected to be there for –at least– the next two decades, aiming to answer questions on what lies *ahead*, in this vast and unexplored part of the Local Interstellar Cloud that hosts our Sun and the Solar System. Through the Supervisor of OSRT (S. M. Krimigis), leading the Low Energy Charged Particle (LECP) experiments on both V1 & V2, and the MIMI experiment on Cassini, AoA became one of the few institutions around the globe that reported on the most important discoveries throughout the history of the field of Heliospheric/Space Physics, opening paths for new and exciting discoveries in the years to come.

1.2.1 In-situ particle and field measurements from Voyager 1 & 2

The crossing of the Termination Shock (TS) from V1 spacecraft [Decker *et al.* 2005] at a distance of ~ 94 AU ($1 \text{ AU} \sim 150 \times 10^6 \text{ km}$), was among the first of the many startling discoveries related to the physics of the boundaries of our solar bubble (Fig. 4a). The TS is the inner boundary of the heliosphere and acts as the dynamical surface where the free expansion of the supersonic solar wind (SW) terminates at the shock and becomes the heated non-thermal plasma region called the heliosheath (HS). This crossing led to the discovery of the reservoir of ions and electrons that constitute the HS, the region between the TS and the outer boundary of our heliosphere, called heliopause (HP). Within the year 2007, the V2 spacecraft also entered the HS [Decker *et al.* 2008; Fig. 4b], after crossing the TS at a distance of ~ 84 AU.

After a 6-year time period of continuous particle and fields measurements from V1 throughout the HS, travelling over ~ 22 AU past the TS, Krimigis *et al.* [2011] provided a method to deduce the bulk velocity of the plasma in the radial-transverse plane and reported that the radial component of the velocity had been decreasing almost linearly for three years, from $\sim 70 \text{ km/s}$ to $\sim 0 \text{ km/s}$, where it subsequently remained stable for eight months, indicating that the spacecraft had entered a finite transition layer of zero-radial-velocity plasma flow. An accurate prediction concerning the possible location for the HP was also provided from the synergy between in-situ ions from LECP in overlapping energies with MIMI/INCA ENA spectra.

The Supervisor of the OSRT proposed to NASA's Voyager project a daring plan that involved temporary re-orientations of the V1 spacecraft toward re-



Fig. 4. (a) The cover of Science journal, issue 5743 (2005) featuring the crossing of Voyager 1 from the TS; (b) The cover of Nature journal, issue 7200 (2008) featuring the crossing of Voyager 2 from the TS; (c) The Cover of Nature Astronomy, issue 3 (2019), featuring the crossing of Voyager 2 from the HP (Krimigis *et al.* [2019]; after 41 years of travel, Voyager 2 exited the heliosphere on 5 November 2018 at a distance of 119 AU).

aligning the LECF on V1, so that it could measure meridional flow. Decker *et al.* [2012] showed a very unexpected result, that elaborates on the enigmatic nature of the region just before the interface between our solar bubble and the galaxy: a nearly zero meridional flow velocity for several AU within the heliosheath transition region.

A subsequent publication [Krimigis *et al.* 2013] provided the first measurements of energetic charged particles on V1 from the interface region between the HS, that is dominated by heated solar plasma, and the LISM, which mainly contains cold non-solar plasma and the galactic magnetic field. After nearly 36 years in space, at a distance of ~ 122 AU from the Sun, V1 became the first man-made object in human history that left our solar bubble and entered IS space. The long-anticipated encounter by V2 of the region between the heliosphere and the LISM occurred some six years later, toward the end of 2018 [Krimigis *et al.* 2019; Fig. 4c].

Over the past decade, the V1 and V2 crossings of the HP allowed researchers to study the tenuous material that fills the vast space between the stars [Gurnett *et al.* 2021; Dialynas *et al.* 2021], showing that IS space is not the “calm sea” of rarefied plasma and fields that scientists have conceptualized for more than five decades. Surprisingly, the magnetic field upstream at the HP was about 2-3 times higher than what was expected prior to the spacecraft crossings, and the Galactic Cosmic Rays (GCRs) deviated from the theoretically expected isotropy. The interstellar (IS) flow is not the primary driver of the interaction of the heliosphere with the LISM, but it is the pressure of the IS magnetic field that mainly config-

ures the HS [Krimigis *et al.* 2009; Dialynas *et al.* 2017]. Both crossings were associated with a virtual depletion of particles of solar origin at all levels, an abrupt increase of GCR, magnetic field and plasma density upstream of the HP, while the temperature was found a factor of ~ 2 higher than expected.

Apart from the similarities between the V1 and V2 crossings, some substantial differences were also identified, such as the discovery of the flow stagnation region that was observed before the boundary from V1, which was attributed to flux tube interchange instability at the HP [Krimigis *et al.* 2013]. Unlike V1, which found two IS flux tubes that had invaded the HS with strong anticorrelations in GCRs, V2 found no similar precursors to the HP [Krimigis *et al.* 2019].

1.2.2 Remotely sensed ENA measurements from Cassini

The OSRT enabled an intense research activity that aimed to examine the dynamics of the heliosphere interactions with the LISM on a global scale, by studying the fundamental properties of the global HS through a combination of ENA measurements from MIMI/INCA on Cassini and in-situ measurements from the Voyagers, addressing long-standing, 50-year old science questions. Although imaging of the heliosphere was not within the Cassini mission initial scope, MIMI/INCA has not only surpassed the initial mission planning, but surprised the heliospheric community, being the first flown instrument to image the global heliosphere in >5.2 keV ENAs and exploring an entirely uncharted territory that was previously considered inaccessible.

The INCA/ENA images published in Krimigis *et al.* [2009] placed the local Voyager measurements in a global context and revolutionized our notions about the formation and interactions of the global heliosphere, providing insights on the plasma processes at ~ 100 AU, revealing two unexpected heliospheric features: a) The “Belt”, a broad band of ENA emission that wraps around the sky sphere and corresponds to a “reservoir” of particles that exist within the heliosheath, and b) the “Basins” where the ENA minima occur (Fig. 5). This publication suggested an important modification to the historic Parker, [1961] model for the global heliosphere, by replacing the shock-heated thermal plasma pressure at the TS with the ENA-inferred nonthermal proton pressure that fills the heliosheath from the TS to the HP, thus moving the interaction with the ISMF from the TS to the HP.

After about 11 years of continuous imaging the heliosphere with Cassini/INCA, Dialynas *et al.* [2017] provided hard evidence that the >5.2 keV ENAs are the manifestation of the hot plasma ions sampled by the Voyager spacecraft locally, and illuminate the region of enhanced particle pressure between the TS and the HP. The global heliosphere forms a time-dependent obstacle to the inward interstellar flow, reflecting a solar cycle “breathing mode” that responds promptly, within

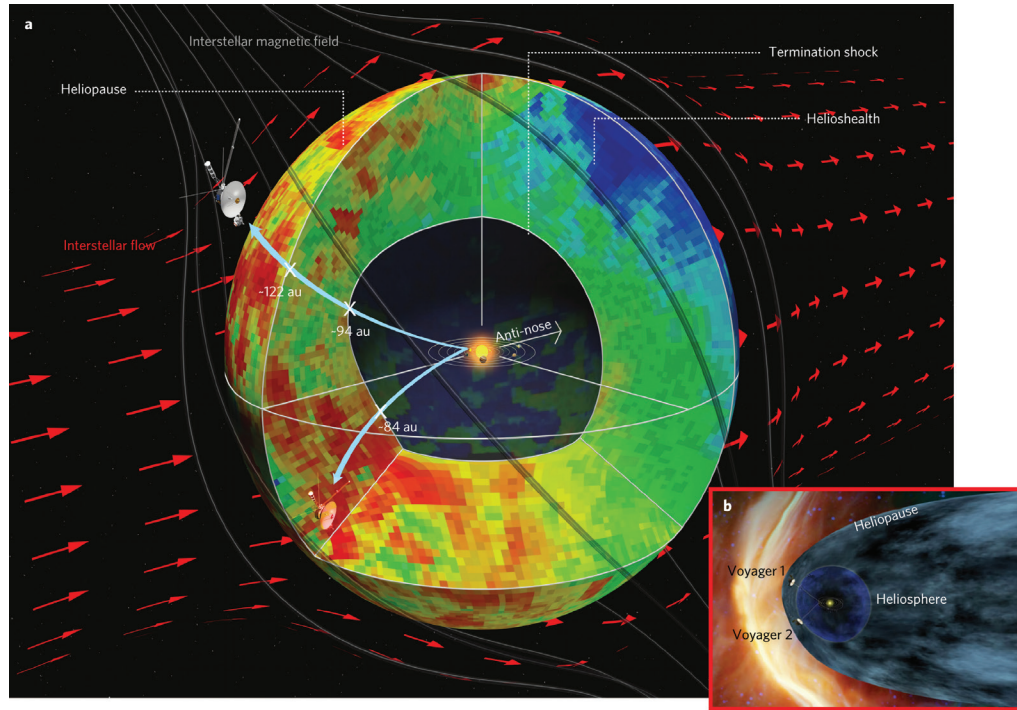


Fig. 5. (a) The gross shape and basic properties of the global heliosphere in three dimensions based on both remote ENA and in-situ ion measurements from Cassini/INCA and LECP/V1 and V2, respectively. (b) A magnetosphere/comet-type configuration including an elongated heliotail (from *Dialynas et al. [2017]*).

about 2-3 years, to outward propagating solar wind changes in both the nose and tail directions. These results, together with the V1 measurement of a ISMF > 0.5 nT and the enhanced ratio between particle pressure and magnetic pressure in the HS, suggested that the solar wind plasma is confined between the TS and the HP globally and interacts directly with the strong ISMF forming a roughly symmetric, diamagnetic bubble-like heliosphere, with few substantial tail-like features (Fig. 5a).

2. The future goals of OSRT

The path-breaking nature of all results described above provided key arguments in many international meetings, where the OSRT is currently a major participant, proving the forward nature of OSRT's activities towards establishing the necessary conditions for the wealth and further growth of Space Sciences in Greece.

The innovative Interstellar Probe (ISP) mission concept argues for the necessity of synergistic use of in-situ particle and fields measurements together with

remotely sensed ENAs (Fig. 6). ISP, assigned to JHU/APL by NASA (<http://interstellarprobe.jhuapl.edu/>), is a pragmatic mission concept that is technologically feasible and expected to be implemented around 2030. It is characterized as the boldest move in space exploration since humans landed on the moon, that will travel far beyond the Sun's sphere of influence, as far as 1000 AU within an estimated time-frame of about 50 years. An ISP mission will provide the most viable method to answer a wide range of fundamental questions from many different disciplines. The OSRT is currently a key partner that aims to continue sharing knowledge, expertise and human resources for this important mission planning that promises endless possibilities for enabling future science endeavors and technological achievements.

The Academy's OSRT, together with other institutions around the globe, initiated a proposal for the establishment of a DRIVE Science Center that was selected for Phase-A by NASA (Boston/USA-SHIELD; <http://sites.bu.edu/shield-drive/>), aiming to employ all available measurements from space missions and current models for the heliosphere to construct a predictive model to understand the immense shield protecting the solar system from the harsh galactic radiation,

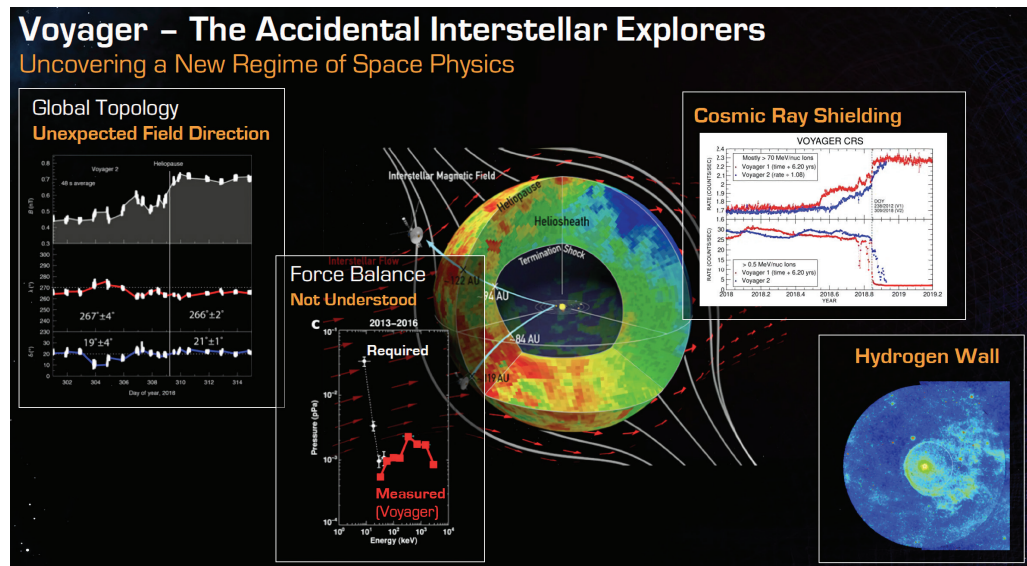


Fig. 6. Part of the science arguments for the innovative ISP mission are based on the science research provided by the OSRT. As the expanding, magnetized solar wind meets the plasma, gas and dust flows of the LISM, a complex and vast interface is created that separates the solar environment from the unperturbed interstellar environment that our solar bubble plows through. This region is the culmination of remarkable physical processes [Dialynas *et al.* 2019] that dictate the entire shape [Dialynas *et al.* 2017], extent and dynamics of our heliosphere (adopted from <http://interstellarprobe.jhuapl.edu/Science/>).

which affects both life on Earth and human space exploration. The heliosphere is a window into processes occurring in all other, distant, astrospheres and SHIELD brings together expertise across the fields of Space Science and Astrophysics to understand the processes that enable predictions about the astrospheric conditions that are necessary to create habitable planets. OSRT is a key partner to this important, new endeavor that provides a one-off opportunity to enable and continue such a fundamentally important and novel line of research with large discovery potential. OSRT will contribute key data to this effort through the continuing analyses of the LECP measurements from the Voyager missions in the next few years.

3. References

- Allen, R. C. et al. *JGR: Space Physics*, 123, 4712-4727 (2018).
Arridge, C. S. et al. *Nature Physics*, 12, 3, (2016).
Bagenal, F. et al. *Science*, 351, 6279 (2016).
Decker, R. B. et al. *Science*, 309, 2020 (2005).
Decker, R. B. et al. *Nature*, 454 (2008).
Decker, R. B. et al. *Nature*, 489 (2012).
Dialynas, K., et al. *Nature Astronomy*, 1, 0115 (2017).
Dialynas, K. et al. *JGR: Space Physics*, 123, 9 (2018).
Dialynas, K., et al. *GRL*, 46, 7911 (2019).
Dialynas, K., et al. *ApJ*, 917, 1 (2021).
Gladstone, G. R. et al. *Science*, 351, 6279 (2016).
Gurnett, D. A. et al. *AJ*, 161, 11 (2021).
Ho, G. C. et al. *Science*, 333, 6051 (2011).
Krimigis, S. M. et al. *Science*, 307, 5713, (2005).
Krimigis, S. M. et al. *Nature*, 450 (2007).
Krimigis, S. M. et al. *Science*, 326, 971 (2009).
Krimigis, S. M. et al. *Nature*, 474 (2011).
Krimigis S. M. et al. *Science*, 341, 144 (2013).
Krimigis S. M. et al. *Nature Astronomy*, 3, 997 (2019).
McComas, D. J. et al. *Nature*, 576, p. 223-227 (2019).
McNutt, R. L. et al. *Science*, 318, 5848, (2007).
Moore, J. M. et al. *Science*, 351, 6279 (2016).
Paranicas, C., et al. Cassini Final Mission Report 2019: Volume 1, *JPL/Caltech* (2019).
Parker, E., *ApJ*, 134, 20 (1961).
Pryor, W. R. et al. *Nature*, 472, 7343, (2011).
Roussos, E. et al. *Science*, 362, 6410 (2018).
Sergis, N. et al., *GRL*, 34, L09102, (2007).

- Slavin, J. A. et al. *Science*, 321, 5885 (2008).
Slavin, J. A. et al. *Science*, 324, 5927, (2009).
Slavin, J. A. et al. *Science*, 329, 5992, (2010).
Solomon, S. C. et al. *Science*, 321, 5885 (2008).
Stern, S. A. et al. *Science*, 350, 6258 (2015).
Stern, S. A. et al. *Science*, 364, 6441 (2019).
Zurbuchen, T. H. et al. *Science*, 321, 5885 (2008).
Zurbuchen, T. H. et al. *Science*, 333, 6051, (2011).

SECTION OF LETTERS AND FINE ARTS

RESEARCH CENTRE FOR MODERN GREEK DIALECTS – HISTORICAL DICTIONARY

1. Short history and aims

The Research Centre for Modern Greek Dialects-Historical Dictionary – KENDI-ILNE (in Greek: Κέντρον Ερεύνης των Νεοελληνικών Διαλέκτων και Ιδιωμάτων-Ιστορικό Λεξικό της Νέας Ελληνικής – ΚΕΝΔΙ-ΙΛΝΕ) is the oldest research institute of Greece. It possesses the largest dialectology archive in Greece, as well as one of the most specialised libraries for the study of the Greek language. Its aim is to conduct research on the history of the Greek language, in all its geographical variation, within and beyond the borders the modern Greek State, to salvage, preserve and promote the huge cultural treasure of the Greek language, and to document the unbroken continuity of Hellenism through the evidence of language.

The Centre was founded in 1908, by Royal Decree, with the initial aim to compile and publish a “Comprehensive Dictionary of the Greek Language, from its first emergence until the present day”. To fulfill this task, the Ministry of Education founded in 1914 a national Language Archive, which came under the jurisdiction of the Academy of Athens in 1927, when the Academy was founded, as the responsibility for the study and preservation of the Greek language is included in Article 1 of its Foundation Charter.

The initial appellation of the centre as “Centre for the Compilation of the Historical Dictionary” was modified in 2003 into “Research Centre for Modern Greek Dialects – Historical Dictionary”, so that it would reflect more adequately the full range of the Centre’s research activities. These are not limited to the publication of the *Historical Dictionary*, but include a variety of research and editorial projects revolving around the Greek language and its various dialects.

2. Main achievements of the Centre since its foundation

2.1 Main Activities of KENDI-ILNE

2.1.1 The Historical Dictionary of Modern Greek

The main publishing activity of the Centre is the regular publication of the volumes of the *Historical Dictionary of Modern Greek*, both of the Standard lan-

guage and the dialects (Ιστορικόν Λεξικόν τῆς Νέας Ἑλληνικῆς, τῆς τε κοινῶς ὁμιλουμένης καὶ τῶν ιδιωμάτων – ΙΛΝΕ).

ILNE has a long history, which goes hand in hand with the history of modern Greece. It is the product of the late 19th-century intellectual currents which sought a foundation for the establishment of national identity in basic cultural values, such as language, literature and tradition. The Dictionary's founder is Georgios Hatzidakis (1848-1941), the "father" of modern linguistics in Greece, and many eminent Greek scholars, such as Nikolaos Andriotis, Manolis Triantafyllidis, Phaedon Koukoules and Ioannis Kakridis worked for years as lexicographers of ILNE. In fact, research conducted for the publication of ILNE led to the genesis of scientific lexicography in Greece. Models for ILNE were the great "national" dictionary of Germany, the renowned multi-volume *Deutsches Wörterbuch* by the Brothers Grimm, and the equally long-scale national lexicographic project of the United Kingdom, the well-known *Oxford English Dictionary*, published by the University of Oxford.

ILNE examines the history of the Modern Greek vocabulary from 1800 onwards, taking each lexical item back to its first appearance. But, in contrast to

δελφίνι τό, δελφίνιν [delfini] Κύπρ. Πόντ. (Κερσ. Τρίπ.) δελφίνι [delfini] κοιν. καὶ Τσακων. δελφίν' [delfin] Πόντ. (Ὁφ. Τραπ.) διλφίν' [delfin] πολ-
λαχ. βορ. ιδιωμ. διλφίν' [delfin] Ἀλόνν. Θεσσ. Σα-
μοθρ. Σκόπ. κ.ά. ἀδιλφίν' [adilfin] Σαμοθρ. δερφίνιν
[derfinin] Κύπρ. Κῶς Ρόδ. δερφίνι [derfini] Ἀστυπ.
Εὐβ. (Αὐλωνάρ.) Θήρ. Κάλυμν. Κέρκ. Κύθν. Λειψ.
Μερίστ. Μύκ. Παξ. Πάτμ. Σέριφ. Σύμ. Σύρ. —
Λεξ. Σμῖτ Βυζ.¹ Πρω. Δημητρ. Σταμ. Βλαστ. — Ψυχάρ.
Ἰσκ. πλάτ., σ. 113 δερφίν' [derfin] Πάρ. (Λεῦκ.) διρ-
φίν' [delfin] Αἰτωλοακαρν. (Σπάρτον) Ἐβρ. (Σουφλ.)
Θεσσαλον. (Σταυρός) ντελφίνι [delfini] Αἰτωλοακαρν.
(Ἀστακ.) Ἀρκ. (Λάστ.) Ἀχαΐας (Καλάβρ.) Λακων.
(Γεράκ. Μάν.) Πρεβ. (Πάργ.) Τσακων. (Πέρα Μέ-
λαν.) — Λεξ. Πρω. ντελφίν' [delfin] Εὐβ. (Ἀγία Ἄνν.)
ντελφίν' [delfin] Πιερ. Σάμ. ντερφίνι [derfini] Ζάκ.
Μεσσην. (Μάν.) ζελφίν' [zelfin] Πόντ. (Κούωρ.) δολ-
φίν' [delfin] Πάρ. (Λεῦκ.) γορφίνιν [gorfinin] Κάρπ.

Νεότ. οὐσ. δελφίνι (πβ. Λεξ. Κωνστ. λ. δελφίν),
ὑποχωρητ. σχηματισμὸς ἀπὸ τὸ μεσν. οὐσ. δέλφινας,
τὸ ὅπ. ἐπαναναλύθηκε ὡς μεγεθ., κατὰ τὸ ἀναλογ.
σχῆμα κόφινας — κοφίνι. Πβ. καὶ ἐρυθρίνος
> λυθρίνος > λύθρινας → λυθρίνι (γὰρ τὴν
ἀναλογ. αὐτὴ διαδικασία βλ. Μηνᾶς 2003²: 164-173).
Γιὰ τὸν τύπ. γιορφίνι βλ. δέλφινας, ὅπου καὶ
τύπ. γιόρφινας. Γιὰ τὸν τύπ. ζελφίν' μετὰ τὴν σπά-
νια στήν Ποντιακὴ τροπὴ [ð] > [z] πβ. τὰ δελφίνος
> ζελφίνος Κούωρ., διδυμάρικο > ζυμάρι-
κο Ἰνέπ. καὶ τὴν ἀντίστροφη, μεμονωμένη περίπτωση
ξέστᾱ, ξεστὸς > δέστᾱ, δεστὸς Χαλδ. (Οἰκο-
νομίδης 1958: 100).

Δελφίνι τὸ κοινὸ (Delphinus delphis), ὑδρόβιο θη-
λαστικὸ τῆς οἰκογενείας τῶν Δελφινιδῶν (Delphinidae)
τῆς τάξεως τῶν Κητωδῶν (Cetacea) κοιν. καὶ Πόντ.
Τσακων.: Εἶδα κάτι δελφίνα νὰ ἀκολουθοῦν τὸ πλοῖο
μας κοιν. Μᾶς μπλέχτηκε ἓνα δελφίνι, θεριὸ ὀλάκερο,
μέσ' στήν τράτα καὶ μᾶς ἔκαμε τὰ δίχτυα συμπαράλια
Κέρκ. Τοῦ διλφίν' ὅταν νοιώθ' τοῦ γιρό, π'δαίει στ' θά-
λασσα Αἰτωλοακαρν. (Μπούκκ.) Τῶνηρῶν δους (ἐνν.
τοὺς κεφάλους) οὐλ-λα τὰ μεάλα ψάρκα, οἱ τῶνηροί,
οἱ ὅ-σὺλ-λοι, τὰ δερφίνια (ὅ-σὺλ-λοι = σκυλόψαρα)
Κύπρ. Ἠπέρας' ἓνα κοπάδ' δολ'φιν' δ'πλ' ἀπ' τὸ κα-
ράβ' Πάρ. (Λεῦκ.) Τὰ ντελφίνια ἦγιν ἀσπηδοῦντα τάς'
τὰ θάσσα (τὰ δελφίνια πηδοῦσαν μέσα στήν θάλασσα)
Τσακων. (Πέρα Μέλαν.) || Φρ. Κολυμπάει σὰν δελφί-
νι (ἐπὶ δεινῶν κολυμβητῶν) κοιν. Ἐν' δερφίνιν τοῦτος
(συνών. μετὰ τὴν προηγ.) Κύπρ. || Γνωμ. Σὰ χορεύγουν
τὰ δερφίνια, προσκαλοῦσιν τὴ φουρτούνα Μερίστ. Τὸ
γνωμ. καὶ σὲ παραλλ. κ.ά. Ὅπου ἔσει δερφίνια, δὲν
ἔσει ὅ-σὺλ-λόψαρα Κύπρ. || Ἄσμ.

Τὰ δελφίνια νὰ τοὺς τρῶνε καὶ τοῦ δυῶνε τὰ μυαλά
Μεσσην. (Φλέσ.) — Πούμ.

Μὲς στὸ αὐλάκι ποὺ τὸ πέρασμά σου ἀφήνει

Σὰν δελφίνι πρωτόπειρο ν' ἀκολουθεῖ

Καὶ νὰ παίζει μετ' ἄσπρο καὶ τὸ κυανὸ ἢ ψυχρή μου!

Ἐλύτ. Μονόγρ. VI, στ. 10-12

οἱ ἄνθρωποι πᾶν μπροστὰ ἀπ' τὸν ἴσκιο τοὺς σὰν
τὰ δελφίνια

μπρὸς ἀπ' τὰ σκιαθίτικα καϊκία

Ρίτσ. Ρωμμοσ., III στ. 4-5

Fig. 1. The entry δελφίνι (dolphin) in ILNE

other major international lexicographical projects, such as the ones mentioned above, the Greek Historical Dictionary is at the same time a dictionary of Standard Modern Greek and a comparative dictionary of the Modern Greek dialects (the only one of its kind in Greece and abroad). For each word, it records not only its current meaning and its etymology, but also when it first appears, when each change in its form and meaning is first attested, and what variations in form and meaning it presents throughout the Greek-speaking world, in all local dialectal varieties (e.g., in Pontus, Cappadocia, South Italy, Cyprus, Crete, Macedonia, Thrace, the Aegean Islands, etc.). The documentation relies on full bibliographic data, as well as a multiplicity of examples drawn from original dialectal speech or Modern Greek literature, the daily press, the available textual corpora for Modern Greek, as well as targeted web searches (Web-as-corpus). Finally, the documentation of ILNE also includes the enormous folklore treasure of the modern Greek dialects (fairy tales, demotic songs, proverbs, etc.), which constitute invaluable indications of diachronic continuity and cultural wealth.

In more detail, the aims of ILNE are the following:

- To highlight the long history of the Greek language and provide evidence of its uninterrupted continuity until today, with the fullest possible textual and bibliographic documentation
- To record and preserve the linguistic treasure of the Modern Greek dialects, which constitute the most direct links to the past and provide evidence of the diachronic presence of Greek speakers within and outside the current boundaries of Modern Greece.
- To preserve and enrich the largest dialectal archive in Greece, which possesses rare and original oral material from the middle of the 19th century until today.
- To offer a high-level standardized description of Modern Greek, adhering to the principles and methodology of the most recent advances in linguistics and lexicography
- To promote the knowledge of the Ancient, Byzantine and Modern Greek literature through extensive textual quotations

The first volume of ILNE was published in 1933, and the Dictionary continued to be published regularly, about one volume every 5 years, even during the difficult times of the 2nd World War and the German Occupation. After a break of some years, ILNE has now started appearing again following a major revision and update of its corpus and methodology, necessitated by recent progress in historical and dialectal lexicography as described in its new Manual of Regulations (published in 2012). The latest volume of ILNE, no. 6 (*δε-διάλεκτος*), was published in early 2017, while volume no. 7 (in press) is expected in early 2021.

Thanks to the major project “Promoting the work of the Research Centres of the Academy of Athens”, funded by the Operational Programme *Digital Con-*

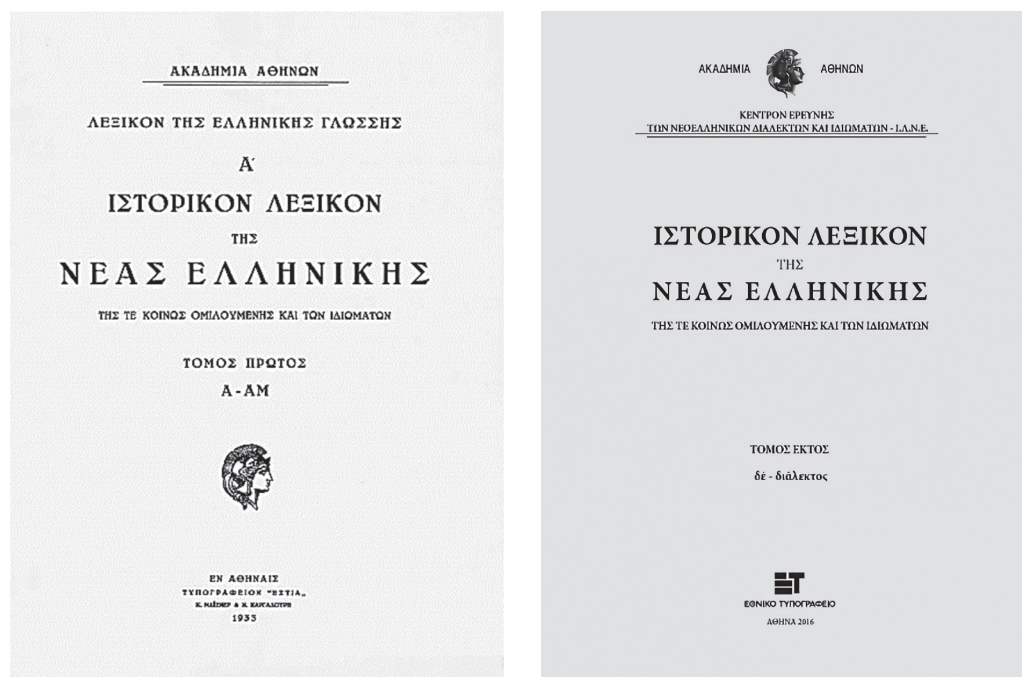


Fig. 2. ILNE vols. 1 and 6

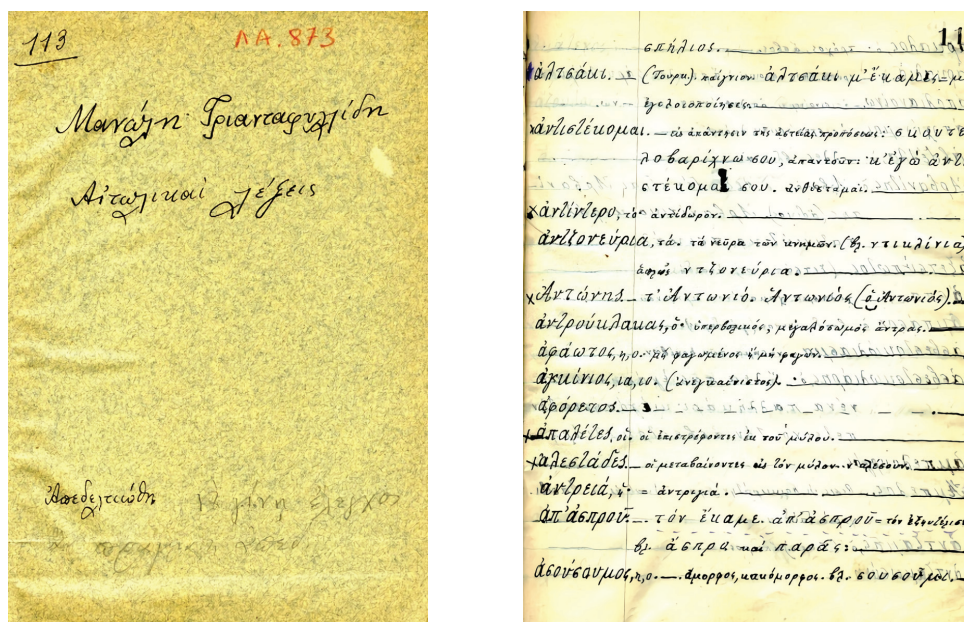
vergence under the NSRF 2007-2013, the first 5 volumes of ILNE are now freely available online at the Digital Repository of the Academy of Athens (<http://repository.academyofathens.gr/kendi/index.php/gr>)

More information on ILNE can be found in the following publications:

- Katsouda, G. "The new volume of the Historical Dictionary of Modern Greek of the Academy of Athens: synchronic perspectives". *Studies in Greek Linguistics* 36 (2016), 151-160.
- Manolessou, I. "The new volume of the Historical Dictionary of Modern Greek of the Academy of Athens: diachronic perspectives". *Studies in Greek Linguistics* 36 (2016), 239-349.
- Manolessou, I. "The Historical Dictionary of Modern Greek as a historical dictionary". *Lexikographikon Deltion* 26 (2012), 9-76.

2.1.2 The Archive of Manuscript Collections

The compilation of ILNE would have been impossible without the use of a comprehensive dialectal corpus of data stored in a rich linguistic archive, which preserves authentic dialectal sources from all areas where the Greek language is spoken. This archive has gradually emerged from the annual fieldwork missions of the



researchers of the Centre, starting from the earliest days of the Centre's existence (1908). At the same time, the Academy of Athens made additional provisions for the enrichment of the Archive, through annual open competitions for the best collections of dialectal linguistic material, awarded with a prize offered by the Linguistic Society of Greece. A major addition to the archive were the rare and now invaluable written recordings of linguistic material collected by the Hellenic Philological Society of Constantinople in the late 19th c., which were donated to the Academy of Athens for preservation. The linguistic Archive of the Centre now holds about 1600 manuscripts of oral dialectal material, comprising ca. 340.000 pages of linguistic data. These data were collected by ca. 600 researchers and local scholars from 1330 data collection points throughout Greece and other Greek-speaking areas (Asia Minor, South Italy, Cyprus, Corsica). The manuscripts archive of KENDI-ILNE is thus the richest depository of the Greek dialects in Greece and abroad, now doubly important due to the rapid rate of dialect retreat and obsolescence observed everywhere, due to the influence of the Standard language.

2.1.3 The Card-slip Archive of KENDI-ILNE

The manuscripts archive of ILNE, described above, has been excerpted for the purposes of the compilation of the *Historical Dictionary*. As a result of this massive

excerption process, together with the addition of new material from published linguistic sources, such as dictionaries, glossaries, and linguistic studies, the Centre has gradually created a large lexicographic archive of ca. four million (4.000.000) card slips, organised by alphabetical letter, which is kept on the ground floor of the Centre. This lexicographic archive that covers almost the totality of the vocabulary of Standard Modern Greek and all its dialectal varieties (ca. 300.000 words or lexical entries), is being constantly enriched. The Academy of Athens is now implementing a new digitization project to scan the card-slip archive and organise the material in a digital database.

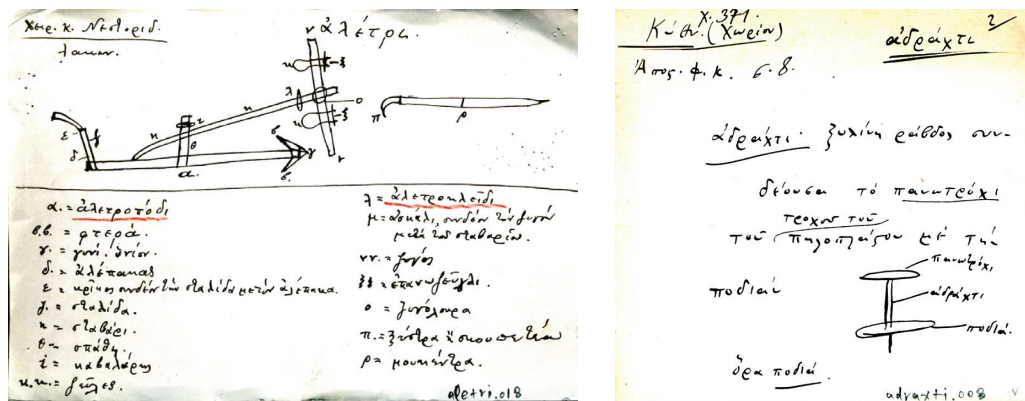


Fig. 4. Samples of the card-slip archive of ILNE

2.1.4 The Audio Archive of KENDI-ILNE

Apart from written dialectal collections, the fieldwork missions of the Centre's researchers have also produced a sizeable audio archive of linguistic material from various Greek dialects derived from live audio recordings of native dialect speakers, as well as other secondary sources. This, almost 200 hours long, audio material, recorded in various forms (older magnetic reel tapes, audio cassettes and digital audio files) is currently being digitized.

2.1.5 The Archive of Placenames

KENDI-ILNE includes a special Archive for Placenames and Proper names, created in 1984 during the indexing of the Centre's manuscript archive for onomastic material. This largely unknown and unpublished material is gradually being integrated in a database, which now contains ca. 200.000 entries and constitutes the largest toponymic corpus in Greece.

2.1.6 *The Research Library of KENDI-ILNE*

The research library of the Centre constitutes a sub-section of the Central Library of the Academy of Athens. It specialises in Greek and international bibliography on linguistics with emphasis on dialectology, historical linguistics, lexicography and the synchronic and diachronic description of the Greek language. It also includes several local press editions, useful as primary sources of dialectal material.

2.1.7 *Annual fieldworks of KENDI- ILNE*

The Research Centre for the Modern Greek Dialects organises annually in situ fieldwork, thanks to which the Centre's researchers collect dialect material from every Greek dialect-speaking area through live audio recordings. These are later transcribed, excerpted and integrated in the Centre's lexicographic archive.

2.2 *Publications of KENDI-ILNE (from its foundation until today)*

The Centre specialises in publications in the following domains:

- a. The long-term publication of the *Historical Dictionary of Modern Greek*
 - b. Dialectology, through the publication of dictionaries and grammatical descriptions for various dialectal varieties of Greek
 - c. Periodical editions, through the Centre's journal, *Lexikographikon Deltion*, and Conference Proceedings (*Neoelliniki Dialektologia*)
 - d. Education, through the production of manuals and tools for teaching elements of the Modern Greek dialects in secondary education
 - e. More generally, Greek linguistics, through the publication of various studies concerning the history and analysis of the Greek language and its dialects.
- More specifically, the publications of KENDI-ILNE are the following:

I. Historical Dictionary of Modern Greek, both of the Standard Language and the dialects

- Volume 1 (α-αμωρωζοσύνη) (1933)
- Volume 2 (άν-απώρυγα) (1939)
- Volume 3 (άρα-βλέπω) (1942)
- Volume 4 Fascicle A (βλεφαρίδα-γάργαρας) (1953), Fascicle B (γαρδαλώνω - γεροδάσκαλος) (1980)
- Volume 5 Fascicle A (γεροδέματος - γλωσσωτός) (1984) Fascicle B (γναθάδα - δαχτυλωτός) (1989)

- Volume 6 (δε – διάλεκτος) (2016)
- *Manual of Regulations of the Historical Dictionary of Modern Greek* [*Lexikographikon Deltion*, Supplement 6]. Athens 2012

II. -*Lexikographikon Deltion* (Lexicographical Bulletin)

- Volumes: 1 (1939), 2 (1940), 3 (1941), 4 (1942-1948), 5 (1950), 6 (1953-1954), 7 (1955), 8 (1958), 9 (1963), 10 (1964-1965), 11 (1966-1969), 12 (1972), 13 (1978), 14 (1982), 15 (1985), 16 (1986), 17 (1991), 18 (1992-93), 19 (1994-95), 20 (1996), 21 (1997), 22 (1998), 23 (2001), 24 (2003), 25 (2005), 26 (2012)

III. *Grammatical, lexicographical and descriptive studies on Modern Greek dialects*

- Oeconomides D. H., *Grammar of the Greek dialect of Pontos* (*Lexikographikon Deltion*, Supplement 1). Athens, 1958.
- Hatzidakis G. N., *Einleitung in die neugriechische Grammatik*. Reprint of the 1st edition, Leipsig 1892 (*Lexikographikon Deltion*, Supplement 3). Athens 1975.
- Hatzidakis G. N., *Lingusitic Researches*, Volume 2, *Lingustic Studies* 1884-1936, (*Lexikographikon Deltion*, Supplement 2). Athens 1977.
- Hatzidakis G. N., *Lingusitic Researches*, Volume 1 (Reprint of the edition in 1934) (*Lexikographikon Deltion*, Supplement 4). Athens 1980.
- Karanastasis A., *Historical Dictionary of the Greek dialects of the South Italy*, Volume 1 (α) (1984), Volume 2 (β-ι) (1986), Volume 3 (κ-λ-μ) (1988), Volume 4 (ν-σ[σ-σενία]) (1991), Volume 5 σ(σ-σένο[ς] -ω) (1992). Athens
- Karanastasis A., *The Grammar of the Greek dialects of the South Italy*, Athens 1997.
- Vagiakakos D. B., *Georgios N. Hatzidakis (1848-1941) – Life and works* (*Lexikographikon Deltion*, 2α, Supplement). Athens 1977.
- Kafkalas M., *On the euphony of the Cretan dialect* (ed. E. Giakoumaki). *Lexikographikon Deltion*, Supplement 5.
- Pangalos G., *On the dialect of Crete*, 2nd edition Volume 2 (Α-Γ) (1994) Volume 3 (Δ-Λ) (1997) Volume 4 (Μ-Ρ) (1999) Volume 5 (Σ-Ω) (2002)
- Kostakis Th. P., *Misti in Cappadocia*, 1977 (Κωστάκης, Θ.Π. 1977: *Tò Misti tēs Kapπαδοκίας*. Ἀθήναι: Ἀκαδημία Ἀθηνῶν)
- Kostakis Th. P., *Dictionary of the Tsakonian dialect*. Athens, 1986-1987. *Λεξικό της τσακωνικής διαλέκτου*. Ἀθήνα: Ἀκαδημία Ἀθηνῶν.
- Minas K., *The language of the published medieval Greek documents of South Italy [Magna Grecia] and Sicily*, Athens 2003 [Ἡ γλώσσα τῶν δημοσιευμένων Μεσαιωνικῶν ἐλληνικῶν ἐγγράφων τῆς Κάτω Ἰταλίας καὶ τῆς Σικελίας]

IV. Conference Proceedings

Neoelliniki Dialektologia (Modern Greek Dialectology):

- Volume 2: *Proceedings of the second conference in Modern Greek Dialectology (Rhodes 1995)*. Athens 1998
- Volume 3: *Proceedings of the third international conference in Modern Greek Dialectology (Kalymnos 1998)*. (ed. S. Katsouleas). Athens 2000
- Volume 4: *Proceedings of the fourth international conference in Modern Greek Dialectology (Athens 2001)*. Athens 2003
- Volume 5: *Proceedings of the fifth international conference in Modern Greek Dialectology (Athens 2006)*. Athens 2008
- Proceedings of Symposium, *Onomastic Studies on Euboia*, ONOMATA Volumes 17-18, Athens 2005
- Proceedings of the IV Conference in Onomastics, *Onomastic Studies on the Cyclades (Tinos 2005)*. ONOMATA Volume 19, Athens, 2007

V. Educational publications

Modern Greek dialectal varieties and their study in the Research Centre for Modern Greek Dialects of the Academy of Athens, Athens 2007. The book also includes an English and a French translation and is accompanied by a CD-Rom with dialect multimedia applications). It has been approved as a coursebook by the Greek Ministry of Education and Religious Affairs for use in the Greek Secondary Education.

2.3 Research projects

The Centre has implemented a series of internal or state-funded projects for the advancement of its research (excerption, scanning, organisation of the material, digitization, creation of specialised tools, investigation of specific dialectal varieties). Some indicative activities are listed below:

1. Creation of the font **Athens Academy Greek Fonts** (an original custom-made set of Unicode symbols of the International Phonetic Alphabet and special symbols for the transcription of modern Greek dialectal phonetic realisations)
2. **Hellenikos Logos I - IV** (Academy of Athens).
3. **Ametos** (in collaboration with the Institute for Language and Speech Processing [ILSP]).

4. **Monuments of Modern Greek Speech** of the operational programme “Information Society (2000-2006 III Community framework programme)
5. “Promoting the work of the Research Centres of the Athens Academy”, funded by the Operational Programme *Digital Convergence* under the NSRF 2007-2013.

At the same time, the Centre’s researchers participate in partnerships for the implementation of a number of state-funded international research projects through consecutive funding frameworks (Pythagoras, Thales, Aristeia I & II, HFRI).

3. Main achievements of KENDI-ILNE in 2021

- Publication of volume 7 of the *Historical Dictionary* (διάλεκτος-δόγης).
- Presentation of the Centre’s research in online conferences and seminars

4. Main aims of KENDI-ILNE for the future

- Stabilisation and acceleration of the production rhythm of the volumes of the *Historical Dictionary*
- Completion of the digitization of the Archives (manuscripts, card-slips, audio recordings)
- Contribution to the preservation of the Modern Greek dialects through the continuation of fieldwork for the collection and recording of dialectal material from locations within Greece and abroad.
- Participation in major research projects for the study of the Modern Greek dialects.

HELLENIC FOLKLORE RESEARCH CENTRE

Foundation and aims

The Hellenic Folklore Research Centre – HFRC (in Greek: Κέντρον Ερεύνης της Ελληνικής Λαογραφίας – ΚΕΕΛ), known until 1966 as *The Folklore Archive*, was established in 1918, originally as an independent institution. Its aim was “to collect, preserve and publish the memorials and records of the life and language of the Greek people”. The *Folklore Archive* was founded on the initiative of Nicolaos Politis, Professor of Greek Archaeology and Mythology at the University of Athens, and “father” of the discipline of Folklore in Greece (Fig. 1). Stilpon Kyri-



Fig. 1. The founder of the *Folklore Archive*, Nicolaos G. Politis, as rector of the University of Athens (1907).

akidis was the first Director of the *Archive*. In 1926 the then *Folklore Archive* was placed under the aegis of the Academy of Athens.

According to its *Regulations* the aim of the Hellenic Folklore Research Centre is, firstly, *to collect folklore material of every kind and to publish it*. In particular, its aims are the same as those pursued by similar scholarly institutions in other countries, as formulated in the decree of the Folklore Conference held in Lund in 1935 (see *Zeitschrift für Volkskunde*, Bd/6, p. 314). These aims are:

- To collect all published texts on folk culture, to extract any relevant information and to compile bibliographies.
- To enrich unpublished material drawn from oral tradition through fieldwork conducted by its research staff, through the institution of competitions, through the circulation of questionnaires to institutions or individuals, etc.
- To preserve in their original form or in copy the texts of the Folklore Collections of the Centre.
- To classify into separate archives the folklore material so extracted, so that it is accessible to researchers by subject.
- To publish its own scientific journal, the *Annual* (in Greek: *Επετηρίς του Κέντρου Ερεύνης της Ελληνικής Λαογραφίας της Ακαδημίας Αθηνών*), which includes studies written by researchers working at the Centre. The Centre also publishes independent scholarly publications in the form of books, maps, records, DVDs, digital applications, etc.

Main accomplishments up to 2020

The HFRC Archive has a rich collection of holdings, put together since the late 19th century. It contains a great deal of folklore material in written form, both published and unpublished. It also holds musical recordings, photographs, film and video material, pertaining to every aspect of folk culture regarding the material and spiritual life of the Greek people. This diverse material derives from fieldwork carried out by the Centre's research staff (Figs. 2-4), its external associates, and members of the public, both amateurs and professionals, with a personal interest in Greek folklore. Worth noting is also the folklore material that becomes available through the annual competitions involving its collection. Despite the limited human and technical resources, the Centre has been able to record in detail numerous aspects of the regional Greek folk culture through interviews, recordings, photographs, films, manual recordings, and participant observation. Thus, throughout its lifetime the Centre has been able to assemble and archive valuable scientific data of great national interest. The Centre's Archive currently contains some 40,000 specialist volumes and articles on folklore, 8,000 manuscripts covering some 500,000 pages, 25,000 hours of audio recordings on 1,700 reel-to-



Fig. 2. Fieldwork: Collection of folklore data by Demetrios Petropoulos in Kalamitsi Alexandrou, Municipality of Apokoronou, dep. of Chania, Crete, 1953.



Fig. 3. Fieldwork: Georgios Aikaterinidis filming the feast of Saint Charalampos in Agia Paraskevi, Lesvos island, 1969.

reel tapes and large numbers of cassettes, cinematographic recordings, 13,000 LPs and about 1,300 museum-style artefacts, including approximately 100 musical instruments and other specialised collections (e.g. ex-votos).

Almost a century since Nicolaos Politis, the founder of the discipline of Greek folklore, embarked on the recording of the folk life and culture of Greece, a body of valuable manuscripts dated from the early 19th century has been gradually building up in the Centre's **Manuscript Archive**, which today holds 8,000, mostly unpublished, manuscripts with valuable information on a range of folklore material (Fig. 5).

The Centre's **Music Section**, which was created as part of the Folklore Archive, incorporated in 1927 the National Music Collection. The National Music Collection was founded in 1914 (Law 432), "*to preserve and collect the songs, dances and musical instruments of the Greek people.*" In 1939 the Archive acquired its first recording equipment. Despite the efforts of Georgios Megas, then Director of the Centre, to employ this equipment "for the recording of folk music", this was impossible due to the contemporary stormy political events. It was only in the early 1950s, when a researcher of music was first appointed in the Folklore Archive, that this recording equipment was finally put in operation; thus, the first recordings in the Centre's Archive date from 1952. Today the Archive contains about 30,000 reels and cassettes, mainly of musical material. In the framework of a special project, the entire recorded material is copied in digital format in the specially equipped "Menelaos Pallantios' studio" of the Centre.

The **National Record Collection** was established in HFRC in 1966 (Law 4545). Today the collection possesses about 13,000 records and CDs in duplicate of folk and popular music, and is continuously acquiring new material provided by music companies and individuals.

The **Museum Collection of Folklore Objects** was established in 1939 and today it holds about 1,200 exhibits, such as agricultural tools, utensils, clothes, ceramic objects and musical instruments. The more recent exhibits include the *panarmonium* once belonging to the renowned Constantinopolitan music teacher Constantinos Psachos (1869-1949), as well as objects of folkloric interest belonging to the Hellenic Folklore Society (some of them are displayed in the Centre for Folk Art and Tradition of the Municipality of Athens, housed in the former residence of Angeliki Chatzimichali), musical instruments and ritual masks from the collection of Nikos Papageorgiou and some ex-votos objects.

In 1962, the then Director, Georgios Spyridakis, founded the **Cinematographic Section for Folk Culture Topics**. This was subsequently enriched by the member of the research staff, Georgios Aikaterinidis. The Archive has 82 films of folklore subjects in 16 mm films, about 8,500 metres long. Since the 1980s, the researchers of the Centre have been using video cameras, and more recently digital



Fig. 4. Fieldwork: Aikaterini Polymerou-Kamilaki and her informants in Trikeri, department of Magnesia, 1979.



Fig. 5. A fieldwork manuscript by Dimitrios Loukatos (reg. n. 2344, Mathraki, Ionian Islands, 1960).

cameras, during fieldwork. In an effort to reorganise and update its archives, HFRC has embarked on converting its cinematographic material to digital format (starting with the 16 mm films in the collection), thus making it more easily accessible to anyone interested. The Greek public television has often used in its programmes cinematographic material kept in the Centre.

The Centre has a rich **Photographic Collection** of over 30,000 photographic prints and numerous negatives. These photographs constitute part of the manuscripts produced the Centre's research staff during their fieldwork. The Photographic Archive is gradually acquiring more holdings, thanks to more fieldtrips undertaken by its researchers and important donations, such as the donation of 1,600 photographs by Helen Fay Stamatis, and the collection of Dimitrios Kalousios. The electronic classification of these photographs in special electronic formats, is but one of the special projects that are currently being carried out in the Archive to improve its accessibility.

The **Folklore Library** of the Hellenic Folklore Research Centre was founded in the very early years of the Folklore Archive. It was further organised after World War II and acquisitions were generally dictated by the research interests and the needs of the research staff of the Centre (Figs. 6-7). The library is a specialised scholarly, non-lending library, and is used chiefly by the Research Staff Members of the Centre. It is, however, also used by scholars, postgraduate students and other researchers who may wish to consult it. It contains about 40,000 titles, among which are rare folklore and other publications of the 19th and the early 20th centuries. The library is being systematically enriched and kept up to date through purchases and donations of books, journals, offprints and other Greek or foreign publications. Today, access to the printed material of the library is also possible through an online catalogue.

Publications by the Centre include studies published from 1920 up to the present day and questionnaires for the collection of folklore material that are widely employed by those collecting it. The Centre publishes its *Annual* (*Epetiris tou Kentrou Erevnis tis Ellinikis Laografias tis Akadimias Athinon*), founded in 1939 (36 vols. published, so far), and the series "Publications", "Sources of folk culture", "Educational programmes" and various other editions. All the publications are accessible online via the following link: <http://www.kentrolaografias.gr/en/content/publications>.

The Hellenic Folklore Research Centre is a repository of folk culture and expresses the national consciousness and cultural identity of Hellenism. Besides promoting and facilitating research, it functions as a platform for the debate of theoretical and methodological issues, thereby reflecting a manifold social reality and, in particular, the academic identity of Greek folklore studies.

In the 1960's and 1970's the Centre endorsed the international initiative for



Fig. 6. Book storage building.



Fig. 7. The library's reading room.

creating a *European Ethnological Atlas* centered around a particular range of subjects dealing with ritual fires of the yearly cycle, the wooden plough, the yoke and the iron plough. The *Atlas* offers a clear picture in map form of the geographical distribution of a particular phenomenon. It employs symbols and notes referring to the matters recorded. The *Atlas of Greek Folklore* is a complete and comprehensive academic work published in 1975 and produced in digital, user-friendly form in 2008, aiming to reach a general readership and attract younger users familiar with digital technology.

Digitization works started in the late 1990s in the framework of mainly European programmes and continue till the present day (Fig. 8). A massive digitization of the manuscripts and sound material of the Archive took place in 2006-2008 (*Information Society* programme) following European patterns concerning the forms of the digital material (manuscripts, printed editions, sound and photos). European programs and national funding have allowed the digitization of different types of material followed by the development of digital databases and specialised digital repositories permitting the dissemination of research results to a wider audience.

In 2002, the physical surroundings of the Centre were considerably upgraded, when this was relocated in an elegant Neoclassical building in the centre of Athens (3 Ipitou str.), a donation of the Foundation Lilian Voudouri.



Fig. 8. Scanning books and manuscripts (2007).

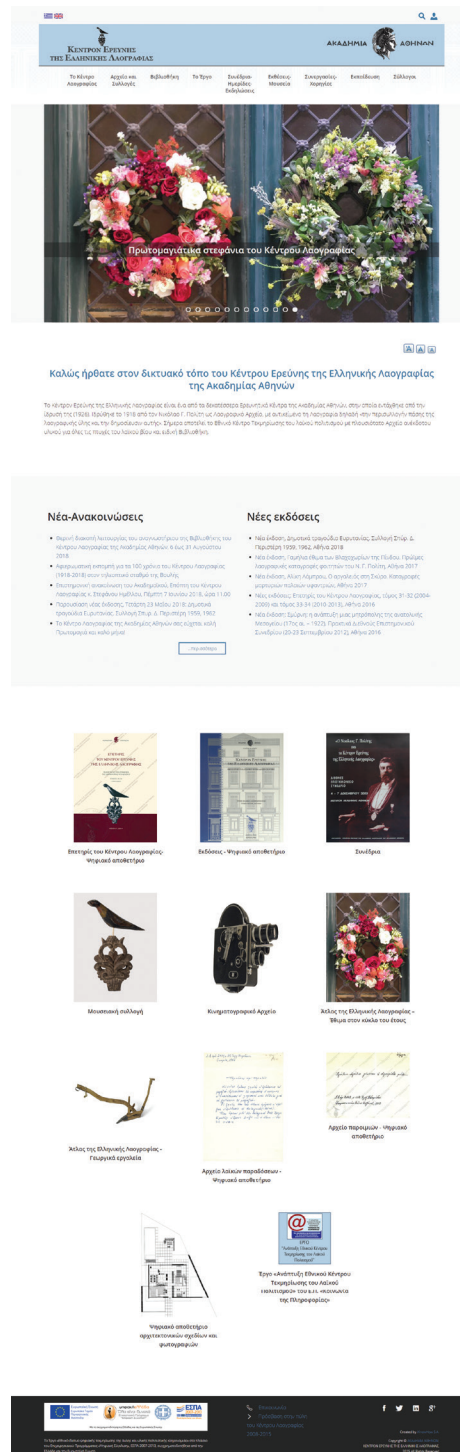


Fig. 9. Screenshot of the web portal, kentrolaografias.gr.



Fig. 10. The HFRC's building in Plaka, central Athens.

Another outcome of the existence of this digital infrastructure is a closer relation between the Centre and various regional cultural associations, which for more than a century have rendered extremely valuable service (mainly in the context of urban centres), in the collection, study and preservation of folklore material of traditional Greek culture. The database that the Centre has created and the easier communication via this portal certainly facilitates the work of these regional cultural associations. An indicative example is offered by “The Educational Brotherhood of Tziourtzia” at Athamania (Prefecture of Trikala, Thessaly), which possesses an extremely important archive of 2,600 pages with entries of folklore interest, which was created in 1893 and is still functioning today (in fact, it has been digitized). The Centre’s database contains the archival material of about 6,000 regional cultural associations, 1,000 of which are still active and have provided the Centre with detailed information on their history and activities.

HFRC organised the exhibition *In Praise of the Olive (Elaias Enkomion)*, held in the premises of the Academy of Athens during the Olympic Games of 2004 (Fig. 12). This exhibition also appeared in many cities and towns of Greece, as well as New York, in the United Nations Building (September-October 2007), when Greece assumed the presidency of the United Nations Security Council. As part of its research activities, HFRC developed a museum policy, by offering its experience and scientific background in the design and creation of specialised local museums in the countryside. HFRC designed, implemented and supervised the following museums and/or exhibitions: Bread Museum, Amfikleia, Fthiotis (2003); Museum of the Acritans, Paleochora, Chania Crete (2006); Permanent Exhibition of Mementos from the fifty-year period (1962-2012) of the International Folklore Festival of Lefkas “The Gifts of the Festival” (2012); Folklore Museum in Kavalo, Lefkada Island (2011-2017); Folklore Museum of Arachova, Boeotia (in progress). The Centre has also promoted collaboration with the *Museum of European and Mediterranean Civilisations* in Marseilles. It organised many international conferences, such as the 15th International Congress of Folk Narrative Research, held in Athens in June 2009, and the conference on the occasion of its centenary “*Du terrain à l’archive: les archives de folklore et d’ethnologie en tant que pôles de recherche, d’éducation et de culture*” *Centenaire du Centre de Recherches du Folklore Hellénique de l’Académie d’Athènes (1918-2018) 14-16 septembre 2018*.

In recent years (2014-2015), in the framework of large European programmes, such as the “National Network for the Documentation of Tangible and Intangible Heritage, Operational Programme ‘Digital Convergence’” and “Promoting the work of the Research Centres of the Athens Academy, Operational Programme ‘Digital Convergence’”, the Centre created digital repositories for proverbs, popular legends, selected manuscripts and videos, certain publications and all the volumes of the *Annual*. These digital repositories are also accessed via the Greek Digital Accumulator of Cultural Heritage (searchculture.gr).

Main accomplishments in 2021

Despite difficulties caused by the COVID-19 pandemic, HFRC managed to bring to a successful conclusion the projects “Digitization of analog sound folklore material” and “Digitization of manuscript and printed folklore material” (1919-1920), financed by the Research Committee of the Academy of Athens. Through these projects, a considerable number of sources became more accessible, facilitating thus their study and future publication; these projects offered young graduate students the opportunity to work in the Centre and interact with the Centre’s research staff. Furthermore, a double volume of the *Annual* (vols. 35-36), covering the years 2014-2019, was published. A series of digital lectures on “Folk-



Fig. 11. Folk musicians and dancers with the then HRFC Director, and later Academician, Prof. Stephanos Imellos, and the musicologists, S. Peristeris and S. Chianis (centre) at the Smithsonian Folklife Festival in 1976 in the occasion of the United States' Bicentennial celebrations.



Fig. 12. "In Praise of the Olive", an HFRC's exhibition at the Building of the Academy of Athens in 2004.

lore Archives and Fieldwork” was successfully organised. On June, 3-4, 2021, the Centre organised a digital Congress on “Sustainable economy in a historical perspective” in collaboration with The Piraeus Bank Cultural Foundation, the University of Athens, the National Research Foundation and other partners. Furthermore, certain collaborations have been initiated between HFRC and other state institutions, such as the Municipality of Heraklion (Crete) and the Foundation for Research and Technology, on a project concerning the historical and ethnographic research in Heraklion, as well as the Municipality of Kythira, on a project that aims to create an Immigration Museum on the island. Finally, during 2021, three new researchers, specialising on folk narrative research, were appointed to the Centre.

Future aims

Today, one hundred and three years after its foundation, and despite the difficulties affecting all aspects of the country’s life since the beginning of the crisis in 2010 and the recent pandemic of COVID-19, the Hellenic Folklore Research Centre maintains a regular programme of fieldwork, publishes its *Annual* and other important series, supports and manages thematic folklore museums throughout the country, welcomes university students for practical experience, grants access to Greek and foreign researchers to its specialised libraries, its rich archives and collections, and organises regularly seminars and international conferences. HFRC has digitized most of its archival material, aiming to create the necessary infrastructure that will facilitate research in the future. HFRC constitutes, therefore, a documentation Centre of national importance for the traditional and contemporary Greek culture.

HFRC is better placed than ever to promote its permanent and fundamental aims and to respond to contemporary needs that arise as a result of changes in academic thinking over time. Such changes include contemporary academic trends that favour rapprochement and communication among the academic disciplines of folklore, ethnology and social anthropology.

Co-operation with institutions worldwide was always a primary concern for the HFRC directors and researchers. In difficult times it is important to establish a mutual understanding concerning the approaches and the perceptions of others, in order to examine new and old issues. Invisible fields appear before our eyes and latent topics take a new dynamic. In order to achieve this, the principle of interdisciplinarity is of great importance.

Equipped with a wealth of experience, HFRC straddles the threshold of the 2nd century of its institutional life with optimism.

Contact

Hellenic Folklore Research Centre
3 Ipitou St.
GR 105 57 Athens
Front Desk tel.: +30 210 3664751, -752
E-mail: keel@academyofathens.gr

Web page and digital repositories

<http://www.kentrolaografias.gr>

Digital repository of the Annual of HFRC and publications:

<http://editions.academyofathens.gr/epetirides/xmlui/handle/20.500.11855/2?locale-attribute=en>

Digital repository of proverbs and oral traditions:

<http://repository.kentrolaografias.gr/xmlui/>

Digital repository of videos:

<http://repository.academyofathens.gr/gr/video2>

Digital repository of museum artifacts (3D):

<http://repository.academyofathens.gr/keel/index.php/gr/objects3d>

RESEARCH CENTRE FOR MEDIEVAL AND MODERN HELLENISM

During its 91 years of operation the Research Centre for Medieval and Modern Hellenism (in Greek: Κέντρον Ερεύνης του Μεσαιωνικού και Νέου Ελληνισμού - KEMNE) has contributed significantly to the study of the history of Medieval and Modern Greece. KEMNE carries out historical and philological research of the period 1204-1821, that is of Late Byzantium (1204-1453), the Venetian occupation (13th-18th centuries) and the Ottoman occupation (1453-1821).

A. FOUNDATION AND PURPOSE OF KEMNE

The Research Centre for Medieval and Modern Hellenism, established in 1966, is the successor of the Medieval Archive, which was founded in 1930. Over all these years research work conducted in the Centre was based on numerous research missions in various regions of Greece and abroad, the collection and systematic processing of documentary and manuscript evidence. The critical re-approach of the existing sources has gradually increased the Centre's publishing production of important monographs, articles, and collective volumes. A significant number of renowned researchers in philology and history have served in the Medieval Archive and (after 1966) in its successor Research Centre, ensuring through their original work and scholarly dedication the uninterrupted and important scientific contribution of KEMNE. Today, the personnel of KEMNE includes the following researchers: Chariton Karanasios, Kostas Lambrinos, Despina Vlami, Anastasia Kontogiannopoulou and (since September 2021) Ikaros Mantouvalos. The supervisor of KEMNE is the member of the Academy of Athens Chryssa Maltezou.

B. MAIN RESEARCH ACTIVITIES UP TO 2010

A programme of source indexing for the period 1453-1821 provided the Centre's archives with rich historical and linguistic material, amounting to hundreds of thousands of records, which have been digitized and uploaded in the Digital Repository of the Academy of Athens. This material includes names of

people and places, as well as selected keywords and terms of the period under investigation.

Since the 1950s, the Centre has been organising special research missions in libraries and archives in Greece and abroad, in order to locate and photograph archival material and old publications, as well as manuscripts. These research missions have intensified over the last 20 years and have included archives and collections in places such as Mount Athos, Istanbul, Bucharest, Iasi, St. Petersburg, Venice, Heraklion, and London.

Since the 1950s, the Centre's collections have been enriched with original archival material, manuscripts, as well as parts of the private archival collections donated by important personalities. The following donations to the Academy of Athens are today kept at KEMNE: a) The Land Registry of Nafplio and its surrounding area during the second Venetian occupation in the Peloponnese (*Catastico Particolare*), b) various documents relating to the Cretan family of Chortatsi from Smyrna (17th-19th c.), c) the archive of Konstantinos Oikonomos of Oikonomon (1780-1857), d) the collection of Anastasios K. P. Stamoulis (1843-1943) relating to Thrace.

KEMNE possesses also 28, mainly post-Byzantine, literary and liturgical manuscripts. Among the most treasured holdings of KEMNE is the only surviving copy of the *Thourios* of Rigas Velesinlis, the pioneer of the Hellenic Revolution against the Turks (Corfu 1978, 2nd ed.)

KEMNE's researchers collaborate with colleagues from other Research Institutes and University Departments in Greece and abroad, and participate actively in the contemporary historical and interdisciplinary dialogue by presenting papers in various Greek and international conferences, symposia, workshops and other related scientific meetings.

1. Older research projects

KEMNE hosted in the past the following research projects, which produced a number of important publications:

MANUSCRIPT CATALOGUES

Τα χειρόγραφα των Μετεώρων. Κατάλογος περιγραφικός των χειρογράφων κωδίκων των αποκειμένων εις τας Μονάς των Μετεώρων.

vol. A': [*Τα χειρόγραφα της Μονής Μεταμορφώσεως*], εκ των καταλοίπων Ν. Α. Βέη. Introduction and additions by L. Vranousis, Athens 1967. Second edition, introduction-additions by L. Vranousis, D. Z. Sofianos, Athens 1998.

vol. B': *Τα χειρόγραφα της Μονής Βαρλαάμ*, εκ των καταλοίπων Ν. Α. Βέη, Introduction and additions by D. Z. Sofianos, Athens 1984.

- vol. Γ': *Τα χειρόγραφα της Μονής Αγίου Στεφάνου*, ed. D. Z. Sofianos, Athens 1986.
- vol. Δ' 1: *Τα χειρόγραφα της Μονής Αγίας Τριάδος*, ed. D. Z. Sofianos, Part A' [cod. 1-62], Athens 1993.
- vol. Δ' 2: *Τα χειρόγραφα της Μονής Αγίας Τριάδος*, ed. D. Z. Sofianos, Part B' [cod. 63-124], Athens 1993.
- D. Z. Sofianos – L. Deriziotis, *Η Ιερά Μονή της Υπαπαντής των Μετεώρων. Δεύτερο μισό του 14ου αιώνα. Προσκυνητάριο – Ιστορία και Τέχνη*, Athens 2011.
- D. Z. Sofianos – G. Galavaris, *Τα εικονογραφημένα χειρόγραφα των μονών των Μετεώρων*, vol. A': *Introduction-Descriptions, Black and white plates A'-ΠΑ'*, introduction by P. L. Vocotopoulos, Athens 2007.
- D. Z. Sofianos – G. Galavaris, *Τα εικονογραφημένα χειρόγραφα των μονών των Μετεώρων*, vol. B': *Coloured plates*, nos. 1-460, Athens 2007.
- Sofia N. Laiou, *Τα οθωμανικά έγγραφα της μονής Βαρλαάμ Μετεώρων, 16ος-19ος αι.*, Athens 2011.
- D. Z. Sofianos – F. A. Demetrakopoulos, *Τα χειρόγραφα της Μονής Δουσίκου – Αγίου Βησσαρίωνος. Κατάλογος περιγραφικός*, Athens 2004.
- Evang. A. Skouvaras, *Ολυμπιώτισσα. Περιγραφή και ιστορία της Μονής. Η Βιβλιοθήκη και τα χειρόγραφα. Κατάλογος των χειρογράφων. Αναγραφαί και χρονικά σημειώματα. Ακολουθία Παναγίας της Ολυμπιωτίσσης. Έγγραφα εκ του Αρχείου της Μονής, 1336-1900*, Athens 1967.

REPRINTING OF THE NEWSPAPER OF MAKRIDES POULIOU

- vol. 1: *Εφημερίς του έτους 1791*.
- vol. 2: *Εφημερίς του έτους 1792*.
- vol. 3: *Εφημερίς του έτους 1793*.
- vol. 4: *Εφημερίς του έτους 1794*.
- vol. 5: *Προλεγόμενα Λ. Βρανούση στην Εφημερίδα του έτους 1797*.
- vol. 6: *Εφημερίς του έτους 1797*.
- vol. 7: *Ευρετήρια. Κύρια ονόματα και Γλωσσάριο*, Athens 2000.

THE CORRESPONDENCE OF KONSTANTINOS OIKONOMOS

- Κωνσταντίνος Οικονόμος ο εξ Οικονόμων, *Αλληλογραφία*.
- vol. A': *1802-1817*, ed. K. Lappas – R. Stamouli, Athens 1989.
- vol. B': *1818-1822*, ed. K. Lappas – R. Stamouli, Athens 2002.
- vol. Γ': in press.

THE MONASTERIES OF CRETE

D. Tsoungarakis – Eleni Angelomati-Tsoungaraki, *Σύνταγμα (Corpus) χαραγμάτων εκκλησιών και μονών της Κρήτης*, Athens 2015.

ARCHIVES OF PREVEZA

- «Το σωζόμενο Βιβλίο Ψηφοφοριών της Κοινότητας της Πρέβεζας (1795-1797)», *Μεσαιωνικά και Νέα Ελληνικά* 12 (2016), 389-461.
- «Ειδήσεις για την παιδεία στην Πρέβεζα (δεύτερο μισό 18ου-αρχές 19ου αιώνα)», *Proceedings of the Second International Symposium on the History of Preveza* (16-20 September 2016), Preveza 2010, 307-314.
- «Συμβολή στην προσωπογραφία του Ιονίου. Η οικογένεια Αλεάνδρη και ο ανταποκριτής του Ρήγα Λαυρέντιος (18ος-19ος αι.)», *Μεσαιωνικά και Νέα Ελληνικά* 7 (2004), 227-292.
- «Πολιτικές κινητοποιήσεις των Πρεβεζάνων μετά τον “χαλασμό” (1798-1801)», *Μεσαιωνικά και Νέα Ελληνικά* 6 (2000), 305-398.
- «Η συνθήκη της Πρέβεζας (25 Δεκ. 1800) και η απήχυσή της στα 1828», *Μεσαιωνικά και Νέα Ελληνικά* 5 (1996), 403-454.
- «Οι οικογένειες της Κοινότητας της Πρέβεζας (1741)», *Μεσαιωνικά και Νέα Ελληνικά* 1 (1984), 403-416, Pls. I-IV, NB'-ΝΣΤ'.

2. KEMNE publications

Journals

α) *Επετηρίς του Μεσαιωνικού Αρχείου*

A total of 15 volumes were published: 1 (1939), 2 (1940), 3 (1950), 4 (1952), 5 (1955), 6 (1956), 7 (1957), 8-9 (1958-59), 10 (1960 [1997]), 11 (1961 [1997]), 12 (1962), 14 (1964), 15-16 (1965-66 [1997]), 17-18 (1967-68 [1997]), 19-20 (1969-70 [1997]).

β) *Μεσαιωνικά και Νέα Ελληνικά*: 1 (1984), 2 (1986), 3 (1990), 4 (1992), 6 (2000), 7 (2004), 8 (2006), 9 (2008), 10 (2012), 11 (2014), 12 (2016), 13 (2019), 14 (2021).

Monographs

Cryssa Maltezos, *Το βενετικό αρχείο της Μονής Αγίας Λαύρας Καλαβρύτων. Σκρετούρες παλιές (1688-1715)*, Athens 2020.

- Kostas E. Lambrinos (ed.), *Koινωνίες της υπαίθρου στην ελληνοβενετική Ανατολή (13ος-18ος αι.)*, Athens 2018.
- Anastasia Kontogiannopoulou (ed.), *Πόλεις και εξουσία στο Βυζάντιο κατά την εποχή των Παλαιολόγων (1261-1453)*, Athens 2018.
- Chariton Karanasios (ed.), *Ευγένιος Βούλγαρης, Ο homo universalis του Νέου Ελληνισμού. 300 χρόνια από τη γέννηση του Ευγενίου Βούλγαρη (1716-2016)*, Athens: KEMNE – Holy Great Monastery of Vatopedi, 2018.
- Despina Vlami, *Επιχειρηματικότητα και προστασία στο εμπόριο της Ανατολής, 1798-1825. Η βρετανική Levant Company και ένας ελληνικός 'δούρειος ίππος'*, Athens 2017.
- Kostas E. Lambrinos, *Οι cittadini στη βενετική Κρήτη. Κοινωνικο-πολιτική και γραφειοκρατική εξέλιξη (15ος-17ος αι.)*, Athens 2015.
- Anastasia Kontogiannopoulou, *Τοπικά συμβούλια στις βυζαντινές πόλεις. Παράδοση και εξέλιξη (13ος-15ος αι.)*, Athens 2015.
- Φαναριώτικα και αστικά στιχουργήματα στην εποχή του νεοελληνικού Διαφωτισμού, eds. I. Chatzipanagioti-Sangmeister, C. Karanasios, M. Kappler, C. Chotzakoglou, Athens: KEMNE, University of Cyprus, Society of Cypriot Studies, 2013.
- Αναστάσιος Γόρδιος, *Αλληλογραφία (1675-1728)*, ed. C. Karanasios, I. Kollia, Introduction and commentary by C. Karanasios, vols. A'-B', Athens 2011.
- Michiel Gradenigo, *νοτάριος στη δουκική γραμματεία του Χάνδακα. Libro 1593-1617*, ed. K. E. Lambrinos, Athens 2010.
- Eytychia D. Liata, *Το Ναύπλιο και η ενδοχώρα του από τον 17ο στον 18ο αιώνα. Οικιστικά μεγέθη και κατανομή της γης*, Athens 2002.
- Μανουήλ Χρυσολωράς, *Λόγος προς τον αυτοκράτορα Μανουήλ Β' Παλαιολόγο*, ed. C. G. Patrinelis, D. Z. Sofianos, Athens 2001.
- Ανέκδοτα στιχουργήματα του θρησκευτικού θεάτρου του ΙΖ' αιώνα, έργα των Ορθοδόξων Χίων κληρικών Μιχ. Βεστάρχη, Γρηγ. Κονταράτου, Γαβρ. Προσοψά*, Critical edition, introduction, commentary, indices by M. I. Manousakas, V. Pouchner, Athens 2000.
- Eleni Angelomati-Tsountarakis, *Τα ταξίδια του λόρδου Guilford στην Ανατολική Μεσόγειο*, Athens 2000.
- François Scouphos, *Ο Γραμματοφόρος (Le Courier). Édition critique du recueil de ses lettres avec Introduction, Commentaire et Répertoires par Manoussos Manousakas et avec la collaboration de Michel Lassithiotakis*, Athens 1998.
- Λεονάρδος Ντελλαπόρτας, *Ποιήματα (1403/1411)*, Critical edition, introduction, commentary, indices by M. I. Manousakas, Athens 1995.
- Γεώργιος Χούμνος, *Η Κοσμογέννησις. Ανέκδοτον στιχούργημα του ΙΕ' αιώνα. Έμμετρος παράφρασις της Γενέσεως και Εξόδου της Παλαιάς Διαθήκης*, ed. G. A. Megas, Athens 1975.

- Αρχαίον Ψαρών 1821-1827*, vol. A': 1821-1824, ed. V. V. Sfyroeras, Athens 1974.
- Anastasios K. Orlandos in collaboration with L. Vranousis, *Τα χαράγματα του Παρθενώνος, ήτοι επιγραφαί χαραχθείσαι επί των κιόνων του Παρθενώνος κατά τους παλαιοχριστιανικούς και βυζαντινούς χρόνους*, Athens 1973.
- Αθανάσιος Ξοδύλος, *Η Εταιρεία των Φιλικών και τα πρώτα συμβάντα του 1821. Ανέκδοτα απομνημονεύματα, προκηρύξεις, γράμματα κ.ά. κείμενα*, ed. L. I. Branousis, N. Kamarianos, Athens 1964.
- Νικήτας Νηφάκης (1748-1818 περ.), *Μανιάτικα ιστορικά στιχουργήματα εκδιδόμενα εκ χειρογράφων κωδίκων*, introduction - commentary by S. B. Kougeas, Athens 1964.

C. RESEARCH ACTIVITIES IN 2021

In the context of the celebration of the 200th anniversary of the Greek Revolution of 1821, KEMNE dedicated the 14th volume of its journal *Μεσαιωνικά και Νέα Ελληνικά* (2021) to this historic event that redefined the history and evolution of Modern Greece.

Also, KEMNE reprinted 3000 copies of the second edition of the *Thourios* of Rigas by Christoforos Perraivos (Corfu 1798), in remembrance of the first edition of this important work (Vienna 1797).

Chariton Karanasios published the following studies:

- «Το ανέκδοτο έργο του Καισαρίου Δαπόντε *Χριστιανών θυσία*», *Δώρα Σεμνά. Studies in honour of Prof. Martha Karpozilou*, eds. I. Polemis, A. Mprouzou, A. Vogiatzoglou, D. S. Georgakopoulos, Thessaloniki 2021, 133-150.
- «Η πρόσληψη της Νέας Ιατρικής του John Brown στην προεπαναστατική Ελλάδα», *Παρελθόντος κατοπτρισμοί. Studies in honour of Prof. G. P. Papa-georgiou*, Athens 2021, 313-336
- «The professional patriarchal-principal copyist Michael Byzantios (ca. 1700)», *Travaux et Mémoires 24/1: Le livre manuscrit grec: écritures, matériaux, histoire. Actes du IXe Colloque international de Paléographie grecque Paris, 10-15 septembre 2018*, eds. Marie Cronier - Brigitte Mondrain, Paris 2020, 557-574.

Kostas Lambrinos submitted for publication the following studies:

- «Dal ceto rurale alla classe nobiliare: ambizioni e aspettative della famiglia cretese Varucha Makrimalli (sec. XVII)», in: *In memory of Prof. Konstantinos Ntokos*.
- «Διεργασίες στον κοινωνικό ιστό του Χάνδακα κατά την εποχή του Κρητικού Πολέμου», *Proceedings of the International Symposium: Cretan War (1645-1669). Unknown Aspects, (Herakleion 1-3 Νοεμβρίου 2019)*.

- «Συλλογική έκφραση και βενετική πολιτική στην Κορώνη: προσεγγίζοντας τον θεσμό των *vetrani*-γερόντων στα χωριά της περιοχής (14ος αι.)», *Proceedings of the International Scientific Symposium: Franks and Venetians in Messina. Exploring the Western past of the Peloponnese (Kalamata, 7-9 June 2019)*.

Despina Vlami submitted for publication the following studies:

- «Πόλεμος και Επιχειρήσεις: οι αδελφοί Μπουντούρη και η οικονομία της Επανάστασης στην Ύδρα κατά τον 19ο αιώνα», *Μεσαιωνικά και Νέα Ελληνικά* 14 (2021).

Anastasia Kontogiannopoulou submitted for publication the following studies:

- «Όψεις της κοινωνικής οργάνωσης και των λειτουργιών του βυζαντινού δήμου: η μαρτυρία των αφηγηματικών πηγών (13ος-15ος αι.)», *Proceedings of the Scientific Meeting entitled «Social profiles and social groups: perceptions of social status in Byzantium»* (National Research Foundation, Institute of Historical Research, 19 December 2014).
- «Πόλεις και πολιτική αντιπαράθεση στο Βυζάντιο τον 14ο αιώνα», *Proceedings of the International Scientific Symposium in honour of Professor Emeritus Georgios Velenis*, Thessaloniki 4-7/10/2017.
- «Autonomy, Apostasy and the Administration of Macedonia and Thrace in the Palaiologan Period (mid-14th to mid-15th c.)», *Travaux et Mémoires* (2021).

Ikaros Mantouvalos published or submitted for publication the following studies:

- «Ο θάνατος στα χρόνια της Επανάστασης μέσα από τις αφηγήσεις του Anton Prokesch», *Μεσαιωνικά και Νέα Ελληνικά* 14 (2021).
- «Οι Έλληνες του εξωτερικού στον αστερισμό του μεγαλοϊδεατισμού (β' μισό του 19ου αι.): Ο Παύλος Χαρίσης, «η Χάρης» και η έννοια του ελληνισμού στη σκέψη του» in: Anastasia Papadia-Lala et al. (eds), *Ο Νέος Ελληνισμός. Οι κόσμοι του και ο κόσμος*, Αθήνα 2021, 315-331.

Further, he participated as speaker in the following international Congresses about the Greek Revolution:

- A. «Το παρόν και το παρελθόν μέσα από τα μάτια του Anton Prokesch (von Osten). Ένας αξιωματικός του ναυτικού στα χρόνια της Επανάστασης». Paper delivered at the international Congress «Εθνικά κινήματα και Φιλελληνισμός» (5.2.2021).
- B. «Οδεύοντας προς το 1821. Οι κόσμοι των παροίκων στα ευρωπαϊκά περιβάλλοντα και τα εμπορικά τους δίκτυα στον χώρο των Βαλκανίων και της Ανατολικής Μεσογείου (18ος αι.-αρχές 19ου αι.)». Paper delivered at the international Congress «Η γνωστή-άγνωστη Επανάσταση. Μια παράδοση ανταρσίας» (10.12.2021)

D. CURRENT RESEARCH PROJECTS

The researchers of KEMNE continue their research activity on the joint Research Programme “Social and intellectual mobility of Modern Hellenism. Itineraries of people, ideas, goods (1204-1821)” presenting significant studies that emerge within the framework of the following individual research projects:

1. CITIES IN BYZANTIUM: ECONOMY-ADMINISTRATION-SOCIETY (13TH-15TH CENTURIES)

Researcher in charge: Anastasia Kontogiannopoulou

Indicative recent publications:

Anastasia Kontogiannopoulou (ed.), *Πόλεις και εξουσία στο Βυζάντιο κατά την εποχή των Παλαιολόγων (1261-1453)*, Athens: KEMNE, 2018.

- *Τοπικά συμβούλια στις βυζαντινές πόλεις. Παράδοση και εξέλιξη (13ος-15ος αι.)*, Athens: KEMNE, 2015.
- «Οι δέσποινες των Παλαιολόγων και η αυλή της Θεσσαλονίκης», *Μεσαιωνικά και Νέα Ελληνικά* 13 (2019), 45-67.
- «Η περιφερειακή διοίκηση του Βυζαντίου κατά τον 13ο και 14ο αιώνα: Η περίπτωση της Δυτικής Μακεδονίας», *Proceedings of the Third Symposium of Local History: Kozani and its wider area from Byzantine to Modern times, Kozani 7-9 December 2018*, Kozani 2019, 51-62.
- «Μεταξύ Κωνσταντινούπολης και Θεσσαλονίκης: Διοικητική και κοινωνική οργάνωση στις Σέρρες (1261-1383)», *Πόλεις και εξουσία στο Βυζάντιο κατά την εποχή των Παλαιολόγων (1261-1453)*, ed. Anastasia Kontogiannopoulou, Athens: KEMNE, 2018, 121-160.

2. SOCIETY IN GREEK AREAS UNDER VENETIAN RULE WITH EMPHASIS ON CRETE

Researcher in charge: Kostas Lambrinos

Indicative recent publications:

Kostas E. Lambrinos (ed.), *Κοινωνίες της υπαίθρου στην ελληνοβενετική Ανατολή (13ος-18ος αι.)*, Athens: KEMNE, 2018.

- *Οι cittadini στη βενετική Κρήτη. Κοινωνικο-πολιτική και γραφειοκρατική εξέλιξη (15ος-17ος αι.)*, Athens: KEMNE, 2015.

Michiel Gradenigo, *νοτάριος στη δουκική γραμματεία του Χάνδακα, Libro 1593-1617*, Introduction, ed. Kostas E. Lambrinos, Athens: KEMNE, 2010.

Kostas E. Lambrinos, "Social preeminence, power and prestige: nobles versus nobles in Venetian Crete (16th-17th cent.)," *Μεσαιωνικά και Νέα Ελληνικά* 13 (2019), 159-178.

- "Ricchezza e potere nell'isola di Tinos: la famiglia Scutari nel XVI secolo", *Μεσαιωνικά και Νέα Ελληνικά* 12 (2016), 161-184.

3. DIPLOMACY AND TRADE IN THE EASTERN MEDITERRANEAN, 17TH – 19TH CENTURIES

Researcher in charge: Despina Vlami

Indicative recent publications:

Despina Vlami, *Επιχειρηματικότητα και προστασία στο εμπόριο της Ανατολής, 1798-1825. Η βρετανική Levant Company και ένας ελληνικός 'δούρειος ίππος'*, Athens: KEMNE, 2017.

- *Trading with the Ottomans: The Levant Company in the Middle East*, London: Tauris, 2014.
- "Building Trust Relations in Business. The De Vogel-Cardamici association in Amsterdam and Izmir and an eighteenth-century Dutch Masterclass on trading", *Rives méditerranéennes* 59 (2019), 47-70.
- «Δεσμοί αγάπης και πνευματικές συγγένειες. Η οικογένεια Παναγιώτη Πάλλη στο Λιβόρνο (αρχές 19ου αι.)», *Μεσαιωνικά και Νέα Ελληνικά* 13 (2019), 245-275.
- "Levant Company", Entry in the *Encyclopaedia of Islam*, 3rd edition, fascicle 2018-6 (ed. Kate Fleet), Leiden: Brill Publishers, October 2018.

4. EDUCATION AND IDEOLOGY OF MODERN HELLENISM

Researcher in charge: Chariton Karanasios

Indicative recent publications:

Chariton Karanasios (ed.) *Ευγένιος Βούλαρης, Ο homo universalis του Νέου Ελληνισμού, 300 χρόνια από τη γέννησή του (1716-2016)*, Athens: KEMNE – Holy Great Monastery of Vatopedi, 2018.

Chariton Karanasios et al. (eds.) *Φαναριώτικα και αστικά στιχουργήματα στην εποχή του νεοελληνικού Διαφωτισμού*, Athens: KEMNE, University of Cyprus, Society of Cypriot Studies, 2013.

Αναστάσιος Γόρδιος, Αλληλογραφία (1675-1728), eds. Chariton Karanasios, Ioanna Kolia, Introduction and commentary by Chariton Karanasios, vols. A'-B', Athens: KEMNE, 2011.

- Chariton Karanasios, “Griechische Handschriften rumänischer Sammlungen: Die Handschriften des Orthodoxen Patriarchats von Rumänien”, in: Chr. Brockmann, D. Deckers, D. Harlfinger, St. Valente, (eds.), *Griechisch-byzantinische Handschriftenforschung. Traditionen, Entwicklungen, neue Wege*, Berlin – Boston 2020, 71-80, (pls.) 727-729.
- “L’édition de textes philosophiques et philologiques post-byzantins”, *Texte et contexte. Méthodes et outils de l’édition critique de quelques manuscrits arabes, grecs, italiens et latins*, eds. Irini Tsamadou-Jacobberger, Isabella Stamatiadou, Strasbourg: Presses universitaires de Strasbourg, 2019, 13-26.

THE MODERN GREEK HISTORY RESEARCH CENTRE

The idea to establish a research centre for modern Greek history originated from Constantinos Amantos (1874-1960), a Byzantinist and a member of the Academy of Athens, who was convinced that modern Greek history was underdeveloped due mainly to the lack of archival documentation. Thus, in 1944 he suggested to the Academy of Athens the establishment of a Historical Archive of Modern Hellenism (in Greek: Ιστορικό Αρχείο Νεωτέρου Ελληνισμού – IANE). His recommendation was accepted by the Academy of Athens in June 1944, and was approved by the Ministry of Education in July 1945. However, IANE was established no sooner than September 1957 due to financial difficulties. IANE's mandate reflected the specialisation and the interests of Constantinos Amantos: IANE was authorized to study the history of modern Hellenism and the relations with its Balkan neighbours from the thirteenth century onwards. Nonetheless, it was realised that this timespan went far beyond the scope of modern Greek history, which corresponded to IANE's mission. Therefore, IANE's mandate was accordingly limited to the period following the outbreak of the Greek Revolution of 1821. IANE's first director, Georgios Kollias, served during a period (1958-1962) when the Archive lacked human and material resources. IANE was transformed during the term of its second director, Georgios Prevelakis (1962-1980): in 1966 the Centre was renamed to Modern Greek History Research Centre (in Greek: Κέντρον Ερεύνης της Ιστορίας του Νεωτέρου Ελληνισμού – KEINE), while between 1970 and 1975 tenured research staff was appointed, and programmes for the acquisition and publication of archival sources were developed.

The history of KEINE's first tricennial was recorded by Prevelakis himself in his succinct publication: "The Research Center for the Study of Modern Greek History of the Academy of Athens", *Modern Greek Studies Yearbook*, University of Minnesota, Volume 2, 1986, pp. 221-269.

Archival Collections

KEINE acquired voluminous material related to Greece, covering the nineteenth and twentieth centuries from the British, French, Austrian and US State archives.

- British Archival Collections
 - Colonial Office Records
 - Foreign Office Records, Political and Consular Correspondence
 - War Office Records, World War II
 - Records of the Special Operations Executive, World War II
- French Archives
 - Records of the Foreign Ministry, Political and Consular Correspondence
- United States of America Archives
 - State Department Records, Political and Consular Archives
- Archives of Austria and, after 1867, Austro-Hungary
 - Records of the Foreign Ministry, Political Correspondence
- Wartime Archives of the Axis Powers
 - German Seized Records, National Archives and Records Administration
 - Italian Seized Records, National Archives and Records Administration

The following archival collections are also deposited in KEINE:

- Archive of the Greek Community of Alexandria
- Dionysios Solomos Papers
- Nicolaos Mantzaros Chalikiopoulos Collection
- Elias Zervos Iakovatos Archive
- Aristomenis Provelengios Archive
- Panayis Skouzes' Memoir
- "Nikitaras's Life" by Georgios Tertsetis
- Letters of Theophil Hansen to Ernst Ziller
- Rizos Rangavis Family Archive
- Ioannis Kolettis Archive
- Nikolaos Hatziskos Archive
- Records of the Greek Literary Club of Constantinople

Publications of Sources

On the assumption, that was prevailing till the end of the twentieth century that the Greek State was deprived of well-organised and adequately funded archival depositories, KEINE undertook an extensive programme of publication of archival documentation that contributed considerably to the development of modern Greek historiography:

The Cretan Revolution 1866-1869. Greek Consular Reports from Crete, edited by Eleftherios Prevelakis and Vassiliki Plagianakou Bekiari, part I, April 1866-July 1867, Athens 1967, part II, August 1867-December 1868, Athens 1970
Abstracts of documents from the British Foreign Office, vol. I, files 1-34, docu-

- ments of the years 1827-1832, edited by Eleftherios Prevelakis and Philippos Glitsis
- Abstracts of documents from the British Foreign Office, vol. II, files 35-56, documents of the years 1833-1835, edited by Philippos Glitsis, Christos Loukos, Helen Belia
- Abstracts of documents from the British Foreign Office, vol. III, files 57-74, documents of the years 1836-1837, edited by Philippos Glitsis, Christos Loukos, Helen Belia
- Abstracts of documents from the British Foreign Office, vol. IV, files 75-94, documents of the years 1838-1839, edited by Philippos Glitsis, Christos Loukos, Helen Belia
- Abstracts of documents from the British Foreign Office, vol. V, files 95-117, documents of the years 1840-1841, edited by Philippos Glitsis, Evi Karouzou, Christos Loukos
- Chronology of events during World War II from the documents of the British Foreign Office
- Vol. I, 1940-1943, edited by Maria Spiliotopoulou and Prokopis Papastratis, Athens 2002
 - Vol. II, 1944, edited by Maria Spiliotopoulou, Athens 2004
- Chronology of events during World War II from the documents of US agencies, edited by Sotiris Rizas, Athens 2004
- Epirus, Ali Pasha and the Greek Revolution-Consular Reports of William Meyer, edited by Eleftherios Prevelakis and Kallia Kalliataki Mertikopoulou, vol. I, 1819-1821, Athens 1996
- Epirus, Ali Pasha and the Greek Revolution-Consular Reports of William Meyer, edited by Kallia Kalliataki Mertikopoulou, vol. II, 1822, Athens 1996
- Archive of Ioannis Kolettis, vol. I, edited by Vassiliki Plagianakou Bekiari and Aristidis Stergellis, Athens 1996
- Archive of Ioannis Kolettis, vol. II, Abstracts, edited by Aristidis Stergellis, Athens 2002
- Alexandros Rizos Rangavis Codex no 35, from the Archive of the Rangavis Family, edited by Eleftherios Soulogiannis and Ifigeneia Botouropoulou, Athens 1997
- Correspondence between the Foreign Office and the British Embassy and Consulates in the Ottoman Empire, 78/97-221. A Descriptive List, vol. II, edited by Eleftherios Prevelakis and Helen Gardikas Katsiadakis, Athens 2003
- Correspondence between the Foreign Office and the British Embassy and Consulates in the Ottoman Empire, 78/97-221. A Descriptive List, vol. II, edited by Eleftherios Prevelakis and Helen Gardikas Katsiadakis, Athens 2005

In recent years, as various state and private research institutes developed well-organised archival depositories, KEINE has decided to shift the emphasis of its activities from the publication of sources in extenso to the realisation of new research projects based on digital technologies, as well as the publication of monographs:

Catherine Bregianni, *Modern Greek currency. State and Ideology from the Revolution to Interwar*, Athens 2011

The book discusses the issuing of coins and banknotes and the ideological, political, economic and cultural symbolism of their decorative motifs.

Sotiris Rizas, *The Office of Strategic Services in Occupied Greece 1943-1944*, Athens 2012

The book examines the interplay between the operational and political aspects of OSS activity in occupied Greece in the context of the growing involvement of the US in the Balkans and the Mediterranean in 1943-44.

Eleftherios Prevelakis, *The Revolution for a "Metapolitefsis" in Crete (1895-1896)*, Athens 2014

This is the edition of Eleftherios Prevelakis' manuscript, which deals with the developments of the Revolution of 1895 that sought to alter the constitutional regime of Crete.

Evi Karouzou, *Les Jardins de la Méditerranée. Agriculture et société dans la Grèce du sud 1860-1910* (in French), Athens 2014

The book deals with the cultivation of vegetables on the plain of Argolis and examines its economic potential and contribution to the growth of agriculture and its impact on the demography of the region.

Catherine Bregianni, *Ionian State 1814-1864, Institutions and Social Structure*, Athens 2017

The book examines the institutional setup of the Ionian protectorate from the vantage point of the British imperial structures. It furthermore explores continuities and discontinuities from the Venetian era and the impact of the institutions in the formulation of local societal identities

Evi Karouzou, *National Land, National Loans, and National Sovereignty, 1833-1843*, Athens 2018

The book deals with British policy towards the question of redistribution of national lands in relation to the servicing of the Greek national debt during the period of royal absolutism under king Othon.

Fotini Asimakopoulou, *Athos and Pan Slavism*, Athens 2021

The book examines the involvement of Alexandros Lykourgos, Archbishop of Syros, in the management of a crisis in the Saint Paul monastery of Athos in the early 1870s.

Since 1998, KEINE has been publishing an academic journal, the “Bulletin of the Modern Greek History Research Centre”, whose aim is to present studies by the members of the Academy and its research staff, which are directly or indirectly related to the Centre’s research projects, as described below.

Vol. I (in memory of Eleftherios Prevelakis) 1998

The volume contains studies on borrowing and taxation in the villages of Karytaina during the last four years before the outbreak of the Revolution of 1821 (Katerina Gardikas), the plans to organise courts and civil procedure in 1830 (Melenaios Tourtoglou), the relations between the Oecumenical Patriarchate and the Greek Literary Club of Constantinople (Aristidis Stergellis), the Zarifeia Institutes of Philippoupolis (Helen Belia), Constantinos Amantos’ views on the modernization of the countryside (Elizabeth Kontogiorgi), the famine in Syros and the consequent deaths during the Italian occupation in World War II (Christos Loukos), the formulation of British policy towards Cyprus during World War II (Sotiris Rizas), the Greek Republican League of Egypt in 1945-46 (Efthymios Soulogiannis), the war diaries of Georgios Spiliotopoulos and Mitsos Karatzas during 1947-48 (Maria Spiliotopoulou), diasporas as geographical systems in an increasingly integrated world (Eleftherios Prevelakis). There also appeared a sketch of the Programme of the Ionian Prosopography (Helen Gardikas Katsiadakis), a list of periodical publications held in the KEINE library (Petros Matsis) and various leaflets from the years 1858-1880 (Dimitrios Sofianos).

Vol. II, 2000

This volume contains studies on Ioannis Kapodistrias’ idea of stability in Europe after the Congress of Vienna (Constantinos Svolopoulos), the circular letters of the Patriarch of Constantinople, Evgenios the Second, on the revolution of 1821 (Dimitrios Sofianos), the Convention of Alexandria of 1828 and its relation to the perceptions of slavery in Britain and France (Helen Gardikas Katsiadakis), Ioannis Kolettis conception of the Great Idea (Aristidis Stergellis), schools in rural Crete of the late nineteenth century (Kalliopi Kalliataki Mertikopoulou), notes from the archive of Dimitrios Vikelas (Alkis Angelou), the educational activities of Georgios Drosinis (Helen Belia), the Greek presence in Egypt in the context of this country’s quest for independence during the first tricennial of the twentieth century (Efthymios Soulogiannis), the issue of communal pastureland in the northern provinces of Greece from 1923 through 1932 (Elizabeth Kontogiorgi), US aid to Greece and the Greek government’s efforts to secure additional aid in Western Europe in the early 1960s (Sotiris Rizas), the organisation “United National Resistance” (Maria

Spiliotopoulou), the attitude of Turkish historiography towards Turkey's Ottoman past (Penelopi Stathi), holdings from the Archive of Dimitrios Hatziskos (Ifigeneia Botoropoulou) and Georgios Mylonas' library (Petros Matsis).

Vol. III

There appeared studies on the correspondence of the Archbishop of Syros, Alexandros Lykoyrgos, with Dimitrios Vernardakis (Michail Sakellariou), and the civil law expert Vassilios Oikonomidis (Apostolos Georgiadis), the activities of the Greek resistance during the invasion of the Axis and the Greek government's proposal to the British for the annexation of Cyprus by Greece (Constantinos Svolopoulos), the career of the jurist Nikolaos Gerakaris in the newly-founded Greece State (Ilias Arnaoutoglou), a letter of Antonios Manoussos of 1856 to Iakovos Polyas concerning language and the transcription of works of Ioannis Vilaras (Helen Belia), representations of economic space in Greek literature (Catherine Bregianni), the inaugural lecture of Hubert Pernot that initiated the teaching of courses of Modern Greek Literature at the University of Paris in 1912 (V. Karkagiani Karabelia), Alexis Kyrrou's influence in the formulation of Greek policy towards Cyprus in 1953-54 (Evanthis Hatzivassiliou), the formulation of Greek government's policy and its decision to apply for an Association agreement with the European Economic Community in 1957-59 (Marietta Minotou), the policy of the National Radical Union party during 1964-67 (Sotiris Rizas), and a list of the newly acquired books by the KEINE library (Petros Matsis).

In 2008 the journal was renamed to "Modern Greek History" and was divided in two parts: the first part publishes studies authored by its research staff, which are directly or indirectly related to KEINE's research projects, while its second part presents contributions of guest colleagues on a specific theme, as defined by the Centre.

Vol. I, 2008

This volume's special subject is Greece and World War II (introduction Sotiris Rizas) and contains studies on the impact of the German Balkan campaign at the time of the operation Barbarossa against the Soviet Union (Constantinos Svolopoulos), the divergent visions of the Greek government in exile and the resistance in occupied Greece (John Iatrides), the debates in the House of Commons on the problem of Greek relief (Georgios Kazamias), the imposition by the Turkish government of the varlik tax on the Greek properties in Constantinople (Sevasti Christidou), and the effort of the German Occupation authorities to spread the German language in occupied Greece (Phoedra Koutsoukou).

There also appeared studies of the researches of KEINE dealing with the influence exerted by the Archbishop of Syros, Alexandros Lykoyrgos, in the dialogue between the Anglican and the Orthodox Church during the 1870s (Elizabeth Kontogiorgi), the Greek civil engineers of the nineteenth and early twentieth centuries (Fotini Asimakopoulou and Kostas Hatzis), the relation between growth and redistribution in Greece's economic policy making in the mid-1960s (Sotiris Rizas), and the perception of space in literary representations (Catherine Bregianni).

Vol. II, 2010

The special section of this volume is devoted to European Philhellenism during the Greek Revolution (introduction and edition Helen Gardikas Katsiadakis) and contains studies on the relationship between Europe and the Nation and specifically Byron's oecumenical perception of Greekness (Margarita Milioris), French philhellenism during the Greek revolution (Constantine Svolopoulos), a visual representation of the Greek Revolution, and the French intellectual Du-trone (Fotini Asimakopoulou and Kostas Hatzis).

Furthermore, the researchers of the Centre published studies concerning the policy on crime during the reign of Otto of Greece (Evi Karouzou), economic ideologies during the interwar era (Catherine Bregianni), Greek-German relations during the last term of Eleftherios Venizelos (Dimitrios Apostolopoulos), the itinerary of the British Liaison Officer, Patrick Leigh Fermor, on Crete during the German occupation, (Maria Spiliotopoulou). There also appeared a historical evaluation of the Committee of the Six Colonels, a group of Greek Army officers established in Athens during the Axis (Epaminondas Spiliotopoulos) and a review article on Greek-American relations and anti-Americanism in post-Civil War Greece (Sotiris Rizas).

Vol. III

The special section of this volume is devoted to the Greek road network (introduction and edition by Catherine Bregianni) and contained contributions on technical terminology in nineteenth century military journals (Fotini Asimakopoulou), the public works policy during the nineteenth century (Antonis Antoniou), the steam rail in the railway line of Athens-Piraeus and the electrical railway line of Kifissia-Piraeus (Dimitris Apostolopoulos) and the relationship between transportation and the growth of tourism (Helen Dritsa).

The researchers of the Centre published studies on the strategies of survival during the Greek Revolution of 1821 in the Cycladic islands (Maria Spiliotopoulou),

archival information regarding Odysseus Androutsos (Aristidis Stergelis), the contradiction between modernization and protectionism in the Interwar greek farming policy (Catherine Bregianni), the refugee settlement and the issue of church lands during the Interwar period (Elizabeth Kontogiorgi) and Greece's accession to the European Community in the context of the Community's enlargement to Southern Europe (Sotiris Rizas). A study on the legal sytem during the August 4th, 1936 Dictatorship was also published (Apostolos Georgiadis).

Vol. IV

The special section, devoted to breakthroughs in farming in Greece from 1830 through 1960 (introduction and edition by Karouzou), contains contributions on the customary law (Eleftheria Zei), the distribution of National Lands in 1871 (Alexis Frangiadis), the rise of the productivity in Greek farming within a Southern European context from 1860 through 1980 (Socratis Petmezas), agricultural reforms, continuities and discontinuities in Greek agricultural space (Catherine Bregianni), the interrelationship between agriculture and industry in the discourse of intellectuals (Dimitris Panagiotopoulos), cultivations in the Po Valley (Franco Cazzola) and Spanish agriculture in the twentieth century (Manuel Gonzalez de Molina, David Soti Fernandez, Juan Infante Amate, Gloria Guzman Casado).

The researchers of the Centre published papers on the battle of Crete, from the perspective of the German Seized Records (Dimitris Apostolopoulos), Allied missions in the Cycladic islands of Naxos, Paros and Heracleia (Maria Spiliotopoulou) and the stance of liberal and conservative parties during the December 1944 Events (Sotiris Rizas).

Vol. V

The special section of the volume deals with the twenty year period from Greece's default in 1893 to the Balkan wars of 1912-13 (introduction and edition by Sotiris Rizas), and contains studies on the historical background (Thanos Veremis), the content of "reform" in the discourse of intellectuals and politicians (Spyridon Ploumidis), the crisis of legitimacy, emancipation and violence in Greek public discourse (Niki Maroniti), the default and the International Financial Control (Andreas Kakridis), Greece and the international system (Manolis Koumas and Dionysis Chourchoulis), the League of Greek Officers, formed by a group of officers who had participated in the Greek armed groups that were active in Macedonia in the early twentieth century (Basil Gounaris), and the so-called reformist parliamentary group of the Japanese (Leonidas Kallivretakis).

The researchers of the Centre contributed papers on the Interwar economic crisis and Greece (Catherine Bregianni), the Metaxas dictatorship from a National Socialist perspective (Dimitris Apostolopoulos), and the French policy towards the Cyprus crisis of 1963-64 (Sotiris Rizas). There also appears a review of the book by Pedro Alvarez and Dimitris Philippis (published in Spanish) on the Interwar Greek Republic (Evi Karouzou).

KEINE organised the following conferences:

- The unification of the Ionian islands with Greece 1864-2004. The two volume Proceedings were published in 2005-2006 (eds. Helen Gardikas Katsiadakis and Helen Belia)
- Agricultural Cooperatives in South and Central Europe, 19th-20th century. A comparative approach. The Proceedings were published in 2013 (eds. Helen Gardikas Katsiadakis and Catherine Bregianni)
- One Hundred Years after the End of World War I, jointly with the League of National Defence Staff Officers on November 9, 2018. The Proceedings were published in 2020 (eds. Spyridon Beleggratis and Sotiris Rizas)
- The 1929 Crisis and Greece. Economic, political and institutional aspects, jointly with the Centre of Culture, Research and Documentation of the Bank of Greece, 31 October 2019

Other projects that are being implemented in the Centre:

- Ionian Prosopography
Principal investigator: Helen Gardikas Katsiadakis
- Apollonis. National Digital Infrastructure for Digital Humanities.
Principal investigator:
2013-2016 Helen Gardikas Katsiadakis
2017-2020 Maria Spiliotopoulou
- Transmoney. Inter-state monetary and economic alternatives in Interwar Politics. The Greek crisis of 1930 in a European network.
Principal investigator: Catherine Bregianni

RESEARCH CENTRE FOR GREEK AND LATIN LITERATURE

The Research Centre for Greek and Latin Literature – KEELG (in Greek: Κέντρον Ερεύνης της Ελληνικής και Λατινικής Γραμματείας – ΚΕΕΛΓ) was founded in 1955 (law 3197/1955, Government Gazette 98 A), and operated for the first time in May 1958 under the designation *Archive of editions of Greek authors who date from ancient times till the fall of Constantinople*. As evident by its first official name and the relevant statement in its Constitution, the Centre's objective in these first steps was to publish commentaries of ancient and Byzantine Greek authors (including an introduction, the text, its translation, the commentary itself, and indices) by applying up to date research tools and methods, and with the aim of introducing the authors to the Greeks and inspiring love for the ancient and Byzantine world. Later on, in 1966, the Centre's name changed to *Centre for publishing Greek authors who date from ancient times till the fall of Constantinople*. The Centre's current official title dates from 2003.

It should be noted that when the Research Centre was first established back in 1958, it continued to fulfil the principal goal of the book series *Greek Library* (*Hellenike Bibliothke*), published by the Academy of Athens at the request of the Academicians Simos Menardos (1871-1933), Demetrios Aiginitis (1862-1934), and Ioannis Kalitsounakis (1878-1966). Ioannis Sykoutris, editor of the series, published a commentary on Plato's *Symposium* (1934), while his commentary on Aristotle's *Poetics* (with a translation written by Simos Menardos) was published posthumously in 1937. Emmanuel David also published two commentaries in the same series, one on Plutarch's *Symposium of the Seven Sages* (1936) and one on Theophrastus' *Characters* (1940).

The following summary of the history of KEELG shows that its principal objective, that is, the publication of editions of ancient authors, has certainly been achieved, as attested by the rich publication record of the Centre. More specifically, KEELG's publication history can be divided into the following chronological periods:

- a. 1958-1981
- b. 1982-1996
- c. 1997-up until today

As it will become obvious, during the first period of its operation, the foundations

were set for KEELG's growing presence in the field of publications, which are currently reaching their peak.

a. During 1958-1981 KEELG's research staff and its associates worked fervently with the exclusive aim of publishing critical editions of ancient Greek authors. In 1961, the Academician Ioannis Stamatakis, member of the Supervising Committee of the Centre, embarked on his edition of the sixth and seventh book of Thucydides' *Histories*; the physician Konstantinos Metropoulos on his edition of ten medical works from the *Corpus Hippocraticum*; Nikon Kasimakos on his edition of Demosthenes' *On the Crown*; Konstantinos Georgoulis on his edition of Aristotle's *Physics*, and Charalambos Floratos, the Director of KEELG at the time, on his edition of Plato's *Laws*. The completion of other critical editions were also assigned to other scholars: Isocrates' *Panegyric* to Theseus Tzanetatos, Apollonius of Rhodē's *Argonautica* to Spyridon Philippas, Theocritus' *Idylls* to Stamatios Polemis, Poseidonius' philosophical fragments to Georgia Tatsiramou, and the *Hymns* of Saint Symeon the New Theologian to Demetrios Stathopoulos. In addition, in 1962 Friedrich Walter Lenz offered to work on an edition of the five orations of the Byzantine rhetorician and grammarian Thomas Magister, while Ioannis Kakridis undertook the task of writing an edition of Pseudo-Xenophon's *Constitution of the Athenians* and Theseus Tzanetatos of Isocrates' *Evagoras* (which took precedence over his edition of the *Panegyric*). A four-volume critical edition, consisting of c. 3.000 handwritten pages, entitled Pindar's *Epinicia* and written by P. G. Papakonstantinou (the former teacher of "the Great School of the Nation"), was also submitted for publication. In 1964, Minos Kokolakis, Linos Benakis, and Christina Dedousi also engaged in the preparation of editions for Plutarch's *Peri Euthumias*, Aristotle's fragments, and Aristotle's *Nicomachean Ethics*, respectively. In 1965 Evangelos Roussos, one of the collaborators of the *Historical Lexicon* seconded to KEELG, worked on the edition of Heracleitus' fragments, and Charalambos Floratos embarked on working on the edition of Callimachus' *Hymns*.

In 1966, while many other editions of ancient authors continued to be assigned to research associates of KEELG, its Supervising Committee decided in favour of the translation in Modern Greek of important scholarly books that would help in the preparation of the critical editions. Four books exploring the history of classical philology and its research methods and tools were published between 1972 and 1980 in a special book series entitled *Reference Works*. In the same spirit, between 1975 and 1977 the Centre organised three seminars on issues of textual criticism, interpretation, and translation of texts whose critical editions were under preparation at KEELG. These seminars aimed at the production of a book with guidelines on the preparation of the critical editions. Lastly, the series *Miscellaneous Publications* of the Academy of Athens featured in 1978 Panagiotis L. Pat-

tichis' edition of Euripides' *Helen* (the three typewritten volumes had been submitted for publication in 1968 and were approved by the Supervising Committee in 1972), and in 1980 Georgia Xanthaki-Karamanou's book entitled *Studies in the Fourth-Century Tragedy*.

In sum, despite the low number of publications between 1958-1981, it is during those years that the Centre laid the foundations for its subsequent development and the establishment of its 'physiognomy' as a research centre by pursuing intensively its orientation and objectives. In terms of infrastructure, a Library and a Film Archive of ancient manuscripts were also established during this first period of KEELG's operation, both of which have been continuously expanding (the Library currently holds more than 25.000 volumes). Last but not least, during 1958-1981, KEELG recruited its own staff, proceeded to the purchase of necessary equipment, and gradually began to obtain the organisational structure that would facilitate the production of the publications of the next period.

b. During 1982-1996, KEELG took a dynamic role in the field of academic publications, issuing several editions of ancient texts, as well as scholarly books. The idea of publishing exclusively critical editions of ancient authors, which had prevailed during the Research Centre's first period of operation, was abandoned. In the Centre's official report for 1982, it is stated that under the jurisdiction of Konstantinos Trypanis (at the time Head of the Supervising Committee) all necessary steps were taken so that the Research Centre launches a series of editions of ancient authors with introduction, translation, and commentary. That year, the edition of Ephraim of Ainos' *Historia Chronike* was in press, while Demosthenes' *Olynthiacs* and Plato's two dialogues, *Euthyphro* and *Euthydemus*, were ready to go to print. Moreover, as recorded in the official report for 1982, the Academy signed contracts for the preparation of the editions of twenty four more ancient texts.

Worth noting is that two book series were launched during this period of KEELG's operation: a) the *Library of Greek Authors*, featuring the publication of nine commentaries on ancient authors (the series was completed in 1997); and b) the *A. Manousis Library* in which fifteen volumes have so far been published, with the first four during the period 1991-1995 (the series is still in commission). Moreover, between 1990 and 2011, three critical editions belonging to the *Series Atheniensis* were published as part of the *Corpus Fontium Historiae Byzantinae*. These were the critical editions of the following Byzantine texts: Ephraim of Ainos' *Historia Chronike*, mentioned above (vol. 27), Constantine Manasses' *Synopsis Chronike* (vol. 36 / I, II), and Michael Attaleiates' *History* (vol. 50).

c. KEELG's third period of operation (1997-up until today) has been the most productive in several domains:

1. Publications

To begin with, in the Series *A. Manousis Library* mentioned above, eleven out of the fifteen volumes (mainly commentaries) that have so far been published, appeared during the period 1995-2019. Two new series were also introduced: the *Ponemata. Contributions to the Study of the Greek and Latin Literature*, and the *Greek Library (Hellenike Bibliotheke)*, the second one aiming to revive the idea of a book series exclusively focused on critical editions of ancient authors. Between 1997 and 2020, in the Series *Ponemata*, nine books were published on various facets of ancient Greek literature and its reception, while in the Series *Greek Library* between 2002 and 2011 four critical editions of ancient authors were published.

Several editions of ancient authors were also published in two other series which are produced under the auspices of the International Union of Academies (IUA), that is, the *Corpus Philosophorum Medii Aevi. Philosophi Byzantini* and the *Corpus Philosophorum Medii Aevi. Commentaria in Aristotelem Byzantina*. Significant has been the publication, between 2002 and 2016, in the Series *Corpus Philosophorum Medii Aevi. Commentaria in Aristotelem Byzantina* of the *editio princeps* of five books of George Pachymeris' *Philosophia* – an attempt by the Byzantine scholar to epitomise the *corpus aristotelicum* in twelve books.

Moreover, between 2008 and 2017, Heinz G. Ingenkamp and Panagiotis D. Vernardakis published a new six-volume critical edition of Plutarch's *Moralia (Ethics)*, based on the *editio princeps* of Gregory Vernardakis (Leipzig 1888-96).

Lastly, in 2018-19 KEELG published two books on ancient drama and in 2020 the Proceedings of the second international colloquium of the European Society for the History of Oncology, which took place at the Academy of Athens in 2019. The collective volume had the title *Palaeo-Oncology. Historical Review of Cancer from Antiquity to the 21st Century*.

An important achievement of KEELG which should be highlighted is the six-volume edition of Plotinus' *Enneads* (including the ancient text, its translation, and commentary) in the Series *A. Manousis Library* (1994-2018) by KEELG's research associate Pavlos Kalligas. Professor Kalligas had already published a commentary on Porphyrys' *On Plotinus' Life and the Order of his Books* back in 1991, while in 2019 he published a supplementary volume that included the *Epilegomena* to Plotinus' work (the textual transmission of the *Enneads* and a concise introduction to Plotinus' philosophical principles), a general bibliography concerning all *Enneads*, and an index with all ancient texts to which he referred in his six-volume edition.

Up until today, individual volumes of the edition have been reprinted several times, while Princeton University Press proposed to undertake the translation in English of the entire commentary of Kalligas. The Academy of Athens granted the relevant permission, and the first volume of this project –including the transla-

tion into English by Elizabeth Key Fowden and Nicolas Pilavachi of the first three volumes of the commentary (excluding Kalligas' translation of the *Enneads*)– was published in 2014. The translation of the rest of the volumes is under way. In addition, the reprint of Kalligas' commentaries on Porphyrys' *On Plotinus' Life and the Order of his Books* and *Plotinus' Fifth Ennead* has been scheduled to appear in 2021.

2. International Collaborations

In recent years, KEELG has achieved two ground-breaking international collaborations. Since October 2019 it acts as the seventh Editorial Office worldwide of *L'Année Philologique*. Our team, housed at KEELG, collects, edits and registers entries for studies published in Greece related to ancient Greek and Roman civilisations (monographs, academic journals, collective volumes, and conference proceedings). The team consists of scholars in Classics and Archaeology and experts in the field of bibliographic indexing. The whole programme has been financially supported by the Research Committee of the Academy of Athens.

In addition, in 2019, a collaboration between KEELG and the German Publishing House Walter De Gruyter was inaugurated. Its aim was the publication of the studies presented in the conferences, seminars and scientific workshops organised by the Centre, as well as of the monographs prepared by the Centre's staff and research associates, in a series entitled *Athenian Dialogues*. To date, two volumes have been published in this series.

3. Conferences/Colloquia and Seminars

a. Conferences-Workshops: During the last few years KEELG has organised successfully a number of conferences and colloquia, which took place in the Eastern Conference Hall of the Academy of Athens:

- On June 18, 2018, the international colloquium *Meanings and Aspects of Silence in Ancient Greek Literature* was organised by Efi Papadodima, with the participation of many distinguished scholars from abroad.
- On December 4, 2019, KEELG in collaboration with the «Centre for the Greek Language» organised the colloquium *Teaching Classical Literature in the Greek Education System. Seeking for a Prototype for the 21st century School*. Fifteen speakers from all sectors of the Greek educational system participated, expressing their thoughts and anguish for the future of Classical Studies in our country. The former President of the Hellenic Republic, Prokopios Pavlopoulos, introduced the colloquium. The event was attended by Delegates and other officials of the Academy of Athens, the political leadership of the Ministry of Education. Most importantly, the colloquium had a great impact

on reinstating the Latin language and literature as one of the available courses in the Greek High School (Lyceum) and as an examination subject in the Panhellenic university entrance exams.

- On January 17-18, 2020, an international two-day workshop entitled *Translation and Classical Reception Studies: Mapping the Terrain* was held. The workshop was organised by Richard Armstrong (University of Houston) and Alexandra Lianeri (Aristotle University of Thessaloniki) in collaboration with KEELG. Several experts in the field participated both from Greece and abroad.

In 2016, KEELG established an annual research seminar, featuring one lecture each month, and aiming to offer new perspectives on various issues related to ancient Greek and Latin literature. In 2021, it also inaugurated two more annual events: a seminar entitled LOGO-DEMY, an outreach activity that aims to strengthen the bonds between the Academy and the general public, and a series of annual colloquia that will explore in an interdisciplinary manner issues pertaining to the field of Classics. Both seminars and the series of colloquia aim to make KEELG more 'extrovert', strengthening its bonds with the rest of the academic community and securing a platform for a regular and productive dialogue both with the specialists, as well as those who are simply interested in the field of Classics and the ancient world. Regarding the two seminars, this aim has already been achieved as both of them have been attended by a considerable number of students and scholars in Classics, as well as teachers and the general public. We had similar results in October 2021, when the first annual interdisciplinary conference took place. A synopsis of the seminars and the conference follows:

b. The Annual Seminar since 2016: The seminar is organised by Efi Papadodima. Each year it explores a different topic pertaining to the field of ancient Greek and Latin literature, it takes place on a monthly basis, and the lectures are delivered by a dynamic mixture of stellar scholars from Greece and abroad. Each lecture is followed by discussion. The seminars have already gained a prominent place in the world of academic scholarship, attracting great interest from students and scholars, while, as mentioned above, producing in parallel collective volumes that make a substantial contribution to academic scholarship in our field.

The Annual Seminar for the year 2016-2017 was entitled *Ancient Drama and Popular Ethics* and it examined inter alia the ways in which ancient Greek tragedy and comedy explored and presented issues of 'everyday' moral behaviour, attitudes, and predispositions. Speakers (in alphabetical order): Lucia Athanassaki, Angus Bowie, Douglas Cairns, Patrick Finglass, Jon Hesck, Ioanna Karamanou, Ioannis Konstantakos, Vayos Liapis, Andreas Markantonatos, Ioannis Perysinakis, Ruth Scodel, Ineke Sluiter, and Mary Yossi.

The theme of the second seminar (2017-2018) was defined as *New Approaches to the Ancient Epic*. The seminar explored a wide range of issues concerning poetics, intertextuality, and the reception of the archaic, Hellenistic and imperial epics. Speakers: Egbert Bakker, Anton Bierl, Margalit Finkelberg, Gregory Hutchinson, Filippomaria Pontani, Orestis Karavas, Evangelos Karakasis, Katerina Karvouni, Michael Paschalis, Filippomaria Pontani and Christos Tsagalis.

In 2018-2019 the seminar, entitled *Ancient Greek Literature and the Foreign*, discussed the relationship and interaction between ancient Greek literature and the literatures of other ancient cultures, as well as issues connected to the depiction and representation of foreigners in ancient Greek literature. Speakers: Luigi Battezzato, Paul Cartledge, Simon Hornblower, David Konstan, Mary Lefkowitz, Irad Malkin, Efi Papadodima, Michael Paschalis, Richard Seaford, Rosalind Thomas, Phiroze Vasunia, and Kostas Vlassopoulos.

The topic of discussion for 2019-2020 (hence the seminar's title) was *Freedom and Unfreedom in the Ancient Greek World*. Due to the outburst of the COVID-19 pandemic, only the first five of the scheduled lectures took place, specifically those delivered by David Carter, Nick Fisher, Stephen Hodkinson, Katerina Synodinou, and Gonda van Steen.

For 2020-2021 the issue under investigation was *(Self-)Praise and (Self-)Blame in Ancient Literature*. The lectures were delivered online by Timothy Duff, Stephen Harrison, Ioannis Konstantakos, Sheila Murnaghan, Gregory Nagy, Kathryn Tempest, Frances Tichener, Kostas Valakas, Tim Whitmarsh, and Mary Yossi.

For 2021-2022, the sixth seminar has been scheduled and will explore two interrelated topics:

1. *Freedom and Unfreedom in Ancient Literature and Culture* (returning to the topic of the fourth seminar that was disrupted due to the pandemic)
Speakers: Ilias Arnaoutoglou, Ryan Balot, Mirko Canevaro, Edward Harris, Robin Osborne, and Michael Paschalis.
2. *Cosmopolitanism, Race, and Ethnicity in the Ancient World and Beyond*.
Speakers: Rebecca Kennedy, Anthony Long, Pantelis Michelakis, Helen Morales, Jackie Murray, Dimitri Nakassis, Patrice Rankine, and Nancy Worman.

c. The LOGO-DEMY Seminar: The seminar's title constitutes a playful combination of the words 'logos' and '(Aca)demy'. It is organised by Alexandra Rozokoki and Andreas Serafeim who, together with Maria Kanellou and Nikolaos Manoussakis, are also responsible for the coordination of the discussion that follows each lecture. This seminar aims, inter alia, to act as a platform for a constructive discourse between KEELG, the academic community, and the general public discussing issues that concern not only ancient Greek literature and civilisation, but

also modern society in the light of ancient and modern texts. In 2021, the following topics were discussed (online due to the pandemic):

1. 13 January: *Does the Past have a Future? Classical Philology (in Education) Today*. Speakers: Theodore Papanghelis, Evina Sistakou.
2. 17 February: *Epidemics in Greece from Antiquity till Modern Times*. Speakers: Marianna Karamanou, George Kazantzidis.
3. 10 March: *Learning about 1821: History, Literature, and the Greek Revolution*. Speakers: Afroditi Athanasopoulou, Petros Papapolyviou.
4. 7 April: «Κρήμα ἐς αἰεί»: *Lessons in History, Military Tactics and International Relationships from Thucydides*. Speaker: Vasileios Liotsakis.
5. 12 May: *The Years of the Cypriot Dispute: Milestones and Current Challenges in Foreign Affairs*. Speaker: Nikos Christodoulides, presented to the audience by the President of the Academy of Athens, Loukas Christoforou.
6. 9 June: *Classical Antiquity and Modern Greek Literature: Helen in Greek Literature*. Speaker: Alexandra Rozokoki.
7. 1 July: «Αριστοφάνης ο διαχρονικός»: *The Techniques and Limits of Modern Satire*. Speaker: Andreas Markantonatos.

d. Annual International Colloquia: This new initiative aims to strengthen the bonds between KEELG and the rest of the academic community both in Greece and abroad, and in parallel contribute to the advancement of academic scholarship by approaching a variety of topics from an interdisciplinary perspective. It carries the title *Interdisciplinary Perspectives in Classics*. The organising committee consists of Antonios Rengakos, Athanasios Stefanis, Andreas Serafeim, and Sophia Papaioannou. The first of the colloquia (October 6, 2021), entitled *Making the Body Speak: Non-verbal Communication and Cultural Performance in Ancient Literature*, explored the use of the human body and the physical (conscious or unconscious) bodily reactions as represented in both Greek and Latin texts and archaeological findings. A distinguished array of scholars delivered papers on the topic: Lucia Athanassaki, Armand D'Angour, Bartłomiej Bednarek, Anthony Corbeill, Glenys Davies, Michael Gagarin, Christos Kremmydas, Ioannis Konstantakos, Donald Lateiner, Lloyd Llewellyn-Jones, Victoria Pagán, Mali Skotheim, and Christos Tsagalis. As already mentioned, the conference proceedings will be published by De Gruyter, in the *Athenian Dialogues* book series.

4. The Library – Student/Postdoctoral Internships

In recent years, crucial steps have been taken towards the radical reorganisation of the Research Centre's Library: a new and functional classification system of its collections was put into practice, which adopts the system used by the Uni-

versity of Hamburg. The Library also acquired modern equipment. With the help of generous financial grants and donations, the Library's collections have significantly been enhanced. The Library currently encompasses more than 25.000 volumes (including editions of ancient texts, commentaries, monographs and collective volumes, specialised dictionaries and other reference books), as well as a collection of the most important academic journals in the field of Classics.

Moreover, since 2015, KEELG receives annually undergraduate students of Classics, who carry out a two-month internship and are thus initiated into the world of academic scholarship and research. Up until October 2019, seventeen undergraduate students from the Universities of Athens and Ioannina held internship positions at KEELG, as part of the Centralised Internship Support System for Greek Higher Education Students (ATLAS). Unfortunately, no more students have been accepted since 2020, due to the pandemic. Since 2018 the Centre also accepts applications for postdoctoral research to be conducted at KEELG's facilities. More specifically, during 2018-2019, Nikolaos Manousakis, at the time a postdoctoral researcher at the University of Athens, conducted as unpaid research fellow, and in collaboration with the Drama School of the National Theatre of Greece, a research programme whose objective was the analysis of the fragments from Aeschylus' *Myrmidons*, *Nereids*, and *Phrygians*. In 2019, KEELG accepted to act as the host institution for the postdoctoral research of Stefanie Roussou. The project bears the title *Theognostus Canones: A bridge between the Ancient and Byzantine Worlds*, and was subsequently funded by the Hellenic Foundation for Research and Innovation.

For the years to come, KEELG's principal objective is to increase its attendance in the fields of academic publishing and international collaborations. In this way, KEELG will not only continue but, furthermore, strengthen the objective that was set when it was founded back in 1955. KEELG publishes and will continue to publish critical editions and commentaries on both ancient Greek and Latin authors, as well as other studies that make a substantial contribution to the field of ancient Greek and Latin literature. In addition, the international collaborations, seminars and international conferences organised by the Research Centre have contributed and will continue to contribute to the advancement of research in the field of Classics and the promotion of Classical Studies both within Greece and abroad. Last but not least, all KEELG's outreach activities (such as the conference on the future of classical studies and the LOGO-DEMY) play a key role in cultivating in the Greeks a deeper appreciation of their Greco-Roman heritage and the significance of ancient Greek and Latin studies.

These ever-increasing demands and goals illustrate the need for a substantial increase in the number of KEELG's permanent staff and its research associates, so

that the Centre continues to successfully address all future challenges and pursue its commitment for excellence, thus representing deservedly the Academy of Athens in the international domain of Classical Studies.

Webpage:

<http://www.academyofathens.gr/en/research/centers/greeklatin>

RESEARCH CENTRE FOR SCIENTIFIC TERMS AND NEOLOGISMS

Foundation and mission

The Research Centre for Scientific Terms and Neologisms (in Greek: Κέντρον Ερεύνης Επιστημονικών Όρων και Νεολογισμών – KEEON) is appointed by the Greek State to officially consult on language policy matters, and track linguistic innovation in online journalistic and scientific discourse. The Centre was established in 1966 and began activities in 1973 with the following objectives:

- The study of neology; more specifically, the collection, documentation, and linguistic inspection of neologisms of Standard Greek.
- The identification and proposals for normalization in Standard Greek of infelicitous Greek new formations.
- The recording of incoming coinages or loanwords for which the Academy of Athens proposes Greek equivalents, when necessary, and only if these foreign words are not already institutionalized in usage.
- A general concern on language awareness and language education, developing recommendations on proper language usage. These observations are addressed towards both the scientific community and the wider society.
- The rendering in Greek of cutting-edge scientific terminology in line with the recent achievements in theoretical and applied sciences.

The founding principles and the Centre's mission are realised through:

- The compilation of an *Archive of Neologisms* of Standard Greek for the monitoring of Modern Greek neology by (a) systematic data collection from selected sources of the Greek Press, and (b) linguistic description and inspection of new word formations with suggestions of equivalent variants, if necessary.
- The compilation of an *Archive of Scientific Terms* and the development of terminological resources in Greek for new scientific terms, in close collaboration with the scientific community.
- The publication of the Centre's research outcomes (recommendations on the form and function of new formations entering the Greek language, overall

surveys on written/spoken language and general proposals on language use, even theoretical issues stemming from the Centre's research orientation) in the Centre's Yearbook, the *Bulletin of Scientific Terminology and Neologisms*.

Supervising Committee (Academy members):

President: Antonios Rengakos

Supervisor: Theodore Papanghelis

Members: Emmanouel Roucounas, Michalis Tiverios, Vasilis Rapanos

Alternate Members: Constantinos Vayenas

Acting Director: Anastasia Christofidou

Researcher Emeritus: Titos Jochalas (Former Director)

Greek Neology at the Research Centre for Scientific Terms and Neologisms

I bow to you, language, many are your miracles.

Kiki Dimoula (1931-2020)

A neologism is defined as any new lexical unit which – through the socio-pragmatic process of institutionalization – becomes a member of the active vocabulary of the speaking community. Neologisms are divided into two main types: indigenous neologisms, e.g., λαθρεπιβίβαση *lathrepivivasi* 'travelling without a ticket' and loan words. Loan words can be either foreign neologisms (simple loanwords in a foreign language, inflectionally adapted/unadapted) or loan translations, e.g., γκάλοπ *galop* 'opinion poll' and κυβερνοασφάλεια *kyvernoasfalia* 'cybersecurity', respectively.

The variety of criteria (quantitative and qualitative) used to select the neologisms that are included in the Centre's *Archive of Neologisms* (and for final publication at the *Bulletin*) are presented in detail in the Introductory Sections of the *Bulletins* (see *Bibliographical references*). Some indicative criteria include the presence of the new words in selected Greek reference dictionaries, specific thresholds of occurrence at the Centre's corpus resources and/or the web (*Web for/as Corpus* methodology, see below).

The two research strands of the Centre (Neologisms and Scientific Terminology) are utterly intertwined, since many scientific terms are subsequently popularized in the Press (for instance, the medical term: *generics* referring to drugs, rendered in Greek as ομοιότυπα [φάρμακα]).

Main contribution of the Centre: *The systematic recording of new terms and the timely interventions with recommendations on their proper usage utterly cultivate language, both directly (for instance, in a counselling way for philologists, journal-*

ists, translators, etc.) and indirectly, that is, with the potential to enrich the major current reference dictionaries of Modern Greek, such as the 'Practical Dictionary of the Modern Greek Language of the Academy of Athens'

RESEARCH & DEVELOPMENT ACTIVITIES

I. NEOΔHMIA

NEOΔHMIA is the name of an ongoing research programme conducted at the Centre from 2008 onwards, and at the same time, an integrated information system and research environment constantly developed to accomplish the tasks of:

- (semi)automated detection
- linguistic analysis
- monitoring of neologisms (indigenous or not).

By default, priority is given to neologisms which are not included in selected Greek dictionaries, and in a second phase, all new formations are considered, irrespective of their presence in Modern Greek dictionaries.

The Neologism extraction component of NEOΔHMIA is the first of its kind concerning Greek (see *Bibliographical resources*): a dedicated tool performs semi-automated detection of 'new words' (candidate neologisms) through computational techniques. Lists of candidate neologisms are produced for manual evaluation employing various criteria.

The Neologism classification component of NEOΔHMIA makes use of a relational database approach: morphological (mainly word-formation information), lexical and textual information (genre, text type, topic, text structure, etc.) is recorded at the Centre's database of neologisms (see Fig. 1).

The web interface allows:

- user queries according to multiple criteria (morphological, syntactic, textual, etc.)
- alphabetical or reverse alphabetical browsing of entries (to observe the productivity of suffixes, just like in Reverse Dictionaries or Indexes)
- data visualization with graphs to summarize tendencies.

The Neologism Monitoring component (see also section II below) measures the web impact (webometric analysis) of new formations via linguistically relevant search engine queries (Google or Bing-based). Linguistic research, nowadays, views the web as a huge corpus of texts (*Web as Corpus* methodology). To this end, the Centre has developed a methodological framework to repurpose and critically use search engines at the service of neology.

φτωχοποίηση

Τόμος 11

Κατηγορία: Ελληνικός νεολογισμός > Αθροιστικός > Θεματική κατηγορία: Γενικό λεξιλόγιο >

Απόδοση:

Σχόλιο:

Δεδομένα - Πηγή:

Εμφανίζεται: Η Καθημερινή 14/11/2013 Τίτλος: Όχι Πρόλευση (url αρχείο): <http://www.kathimerini.gr/838612/article/epixairitita/eliada/en-fothasmi-eikagories-stin-kanakoub-onis-kakitis>

Κριτικό είδος: Επιμετρικό άρθρο Θεματική ενότητα: Κοινωνία

Κείμενο: Οι συνέπειες της ανεπάρκειας αυτής είναι πολύ σοβαρές: από τη φτωχοποίηση με πολιτικών νεοκαταρτών και τα εμπόδια που πρέπει να ξεπεράσει μια γενναία «διεξοδα στον άμεσο τομέα» για να συνδεθεί με τη μεριά της με την εργασία έως την απώλεια (στην ελπίδα) της επανοστάσης από τη φτώχεια που δεν βλέπουν πως θα μπορούσαν να παρέχουν για τα παιδιά τους στον δημοκρατικό να τα εφοδιάσουν για τους ίδιους.

Εμφανίζεται: Η Αυγή 27/02/2003 Τίτλος: Όχι Πρόλευση (url αρχείο): <http://www.anggi.gr/article/10840/72477/m-charakteristika-diastrophika-apote-mechri-stigmas-don-othetai-thema-demokratia-ty>

Κριτικό είδος: Επιμετρικό άρθρο Θεματική ενότητα: Κοινωνία

Κείμενο: Η κυβέρνηση επιδεικνύει τώρα «επιστροφή», έχοντας αποδεχτεί την «ελευθερία» στη σύσταση των τροφίμων ως προς την πρόλευση των πρώτων υλών σε ελεγχόμενη, σύμφωνα με την κοινοτική νομοθεσία, που εφίπεται τα συμφέροντα πολιτικών και βιομηχανικών τροφίμων, σε βάρος των καταναλωτών, που η «φτωχοποίηση» των τελευταίων στην τοξική καθατή είναι μία στις «τροφοφόρες» τους και σωτηρίας επί μακρόν, θεωρώντας ότι το θέμα δεν αφορά την εύρυθμη αγορά.

Εμφανίζεται: Ελευθεροτυπία 02/05/2009 Τίτλος: Όχι Πρόλευση (url αρχείο): <http://www.eset.gr/NewsArticleId=10164>

Κριτικό είδος: Άρθρο γνώσης Θεματική ενότητα: Κοινωνία

Κείμενο: Κοινωνία, οι σχέσεις ανάμεσα των διαπιστώνται θα συνεχιστούν, αλλά με νέα εμβόλια: Τη φτωχοποίηση των αστικών στρωμάτων και τις νέες ευρωπαϊκές εργασιακές δεσμεύσεις από την έπαυλη, λόγω επιτάξεως που απαιτούνται εισοδήματος.

Εμφανίζεται: Έθνος 14/12/2007 Τίτλος: Όχι Πρόλευση (url αρχείο): <http://www.ethnos.gr/article.asp?catid=22788&subid=2&pubid=19871>

Κριτικό είδος: Άρθρο γνώσης Θεματική ενότητα: Πολιτική

Κείμενο: Όχι μόνο δεν πήρε το μέγεθος, θα πήρε το μέγεθος, όταν καταβεί το νομοσχέδιο ότι μόνο για τη συντομία «φτωχοποίηση» των Τραπεζών, αλλά και για τα περίφημα «έν» που προβάλλονται που είναι προαπαιτούμενα ως προαπαιτούμενα καπνός. Η φτώχεια, όμως, αυτή τη φορά δεν και το σώμα της πατρίδας, αλλά φθίνει τον καθέναν ξεχωριστά.

Εμφανιστές τύπων:			
Τύπος:	Αριθμός:	Εμφανιστές:	Ημέρ./νέο:
φτωχοποίηση	Ενικός	900	02/11/2011
φτωχοποιητής	Πληθυντικός	103	02/11/2011

Γραμματική ανάλυση:

Μέρος του λόγου: Ουσιαστικό > Είδος θανόντων: Τμήμα θανόντων > Γλώσσα προέλευσης: Γαλλικά >

Μορφολογική ανάλυση: Παραθετική σύνταξη >

Σχόλιο: Γλώσσα προέλευσης: σύμφωνα με το Χρηστικό Λεξικό της Ακαδημίας Αθηνών

Συντακτική ανάλυση: Ουσιαστικό > Συντακτική λειτουργία:

Fig. 1. The neologism φτωχοποίηση *ftochopiisi* ‘impoverization’ as recorded in NEOΔΗΜΙΑ’s database.

II. Monitor Corpus of Neologisms

With the aim to analyse lexical innovation not only microscopically, in terms of word formation and morphological processes, but also macroscopically, at the level of texts, and in line with the dynamic, quantitative orientation of related research projects worldwide, the Centre has adopted a corpus-linguistic approach and developed the first Greek *Monitor Corpus of Neologisms* (MCN). MCN is a specifically designed corpus of online newspaper discourse (*Web for Corpus methodology*). A custom-made crawler (Neologism text retrieval component) is browsing the online versions of selected Greek newspapers with the largest circulation. The crawling software and post-processing tools were offered at the Centre by Iraklis Varlamis, Associate Professor of Informatics at Harokopio University of Athens, and are constantly updated to meet the demands of linguistic analysis via the Computer Science undergraduates’ internships scheme and a dedicated research programme managed by the Academy of Athens Research Committee. The *Monitor Corpus of Neologisms*, a unique type of resource in Greece in terms of its specifications, compiled according to international standards (*Text Encoding Initiative*), includes nowadays more than 400 million words of journal-

istic discourse. An expandable document model has been defined as a custom-made TEI schema (research and implementation: Vassiliki Afentoulidou) comprising different annotation layers for the representation of basic metadata, document structure and text profiling (genre and topic classification). This document model is used internally at the Centre to support:

- the neologism retrieval process
- the textual documentation of new forms
- the monitoring of neologisms, quantitatively and qualitatively, across texts (with the help of textlinguistic taxonomies) and time.

III. Machine Learning and text classification

From 2017 onwards, topic-related parameters of neologism use are explored with the aid of artificial intelligence. A system of automatic thematic classification of newspaper articles is being developed using supervised **machine learning** techniques to facilitate contextual analyses of neologisms on a larger scale. A first model of such a system is now running and the aim is to complement it with genre and text type classification predictions (see Christofidou, 2018).

IV. System architecture and current research pipeline

Thanks to the flexibility of the computational and corpus-linguistic methodology, neology is approached holistically (both top-down and bottom-up strategies). The approach is well suited to illustrate the dynamics of new word formation and adaptation, in such a way that overall tendencies can be observed from the data, and qualitative and quantitative inferences can be made. Notably,

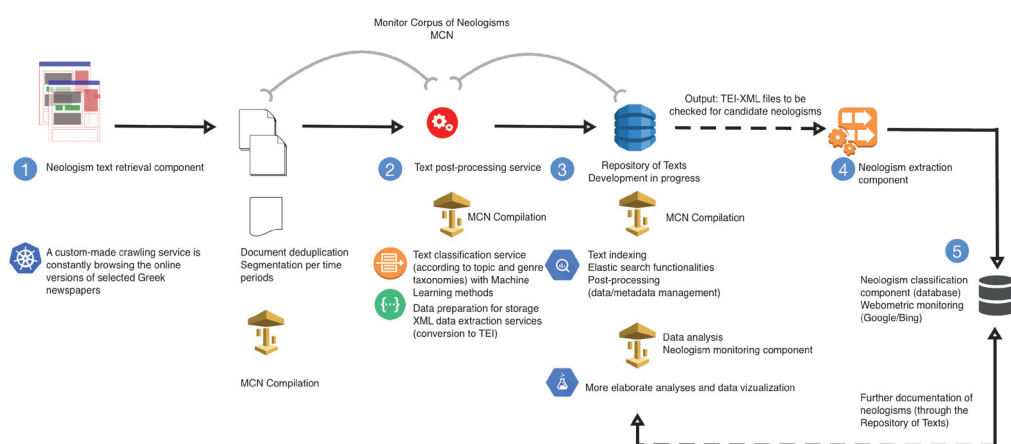


Fig. 2. NEOΔHMI's pipeline of research (emphasis on the Monitor Corpus of Neologisms).

NEOΔHMIA's pipeline of research can be used as an 'objective lens' to linguistic behaviour, supporting, on the evidence of numerous real-world examples, the Centre's recommendations concerning proper language usage.

Main contribution of the Centre: 1) *creation of a Digital Archive of Neologisms and Terminology with systems of detection, recording, multilayered classification (morphological, textual, etc.) of novel words* 2) *compilation of a Monitor Corpus of Neologisms* 3) *combination of research on linguistic theory with empirical evidence from data analysis – published work*

SCIENTIFIC TERMINOLOGY

The human language differs from the language of animals (for instance of bees), in that it is not only used to transfer information but also to formulate arguments which allow the development of science.

Costas Krimbas (1932-2021)

The Centre is developing terminological resources and proposes Greek equivalent terms to incoming scientific vocabulary, selected from cutting-edge scientific domains where new concepts constantly emerge and enter the Greek language. To this aim, the researchers are working closely with Greek experts from various fields, since scientific terminology should be first accepted by the Greek scientific community in order to be effectively established in Modern Greek.

Since 1984, the Centre has collaborated with terminological bodies and international organisations, for instance, the *Bureau de Terminologie de la Commission des Communautés Européennes* in Luxembourg, the French Ministerial Committees for Terminology, the *Organisation Internationale d'Unification des Néologismes Terminologiques* (OIUNT) in Warsaw, and numerous Greek Scientific Societies (*Hellenic Astronautical Society, Hellenic Medical Society, Hellenic Chemists' Society*, etc., see *Bibliographical resources* for further information).

The establishment of scientific vocabulary in Greek, as well as the initial choice of domains of interest is finally validated by the members of the Academy participating in the Supervising Committee of the Centre.

The vocabularies are always published at the Centre's *Bulletin* and include the Greek renderings of the new terms, as well as the original sources (mostly of English or French origin), organised per subject area, scientific domain and (source/target) language. From Volume 2 onwards, definitions of the terms are added. When required, external links to terminological databases, specialized studies and other resources are provided.

- Volume 1 (1986 & 1988 2nd edition): Terminology of Astronautics, Linguistics, Medical sciences, Soil sciences, Chemical sciences.
- Volume 2 (1988): Terminology of Videography, Robotics, Microphotography.
- Volume 3-4 (1990): Terminology of Economics.
- Volume 5 (1994): Terminology of Aerospace Remote Sensing, Economics.
- Volume 6 (1997): Terminology of Gerontology, (Sea) Transports, Nuclear sciences.
- Volume 7 (2000): Terminology of Chemical sciences.
- Volume 8 (2004): Terminology of Olympic Sports.
- Volume 9-10 (2009): Terminology of Energy Technology (A-L)
- Volume 11 (2012): Terminology of Energy Technology (A-Z)
- Volume 13 (2015): Terminology of Computational Linguistics.

The Centre has recently undertaken two initiatives:

- a. (from 2019 onwards) integration of ontology-building techniques to organise and semantically connect forthcoming, as well as already compiled terminological resources,
- b. migration of existing data to a thesaurus management system to host and utterly display these terminological resources to the public.

The research project was undertaken in collaboration with the Athens University of Economics and Business (Dept. of Informatics, Professor Panos Constantinopoulos, Computer Science undergraduates' internships scheme). The first application of the new system concerns the development of an ontology of Energy Terminology, in collaboration with the *Research Centre for Atmospheric Physics and Climatology* of the Academy of Athens (project completion planned for the end of 2022).

Main contribution of the Centre: *The rendering of Scientific Terminology in Greek, development of terminological resources using ontologies and dissemination to the public*

BULLETIN OF SCIENTIFIC TERMINOLOGY AND NEOLOGISMS

As to the enforcement of the new terms there are no legal sanctions. The authority, however, of the Establishment will sanction and impose them. In that way, the Academy should classify the new terms and neologisms and ... should publish a periodical that includes the words, which [the Academy] approves of.

Konstantinos Tsatsos, Excerpt from the Supervising Committee Minutes, 1973

The *Bulletin of Scientific Terminology and Neologisms* is being published since 1984. Lately, special issues of the *Bulletin* on specific topics of linguistic theory and analysis have also been prepared with the participation of distinguished academics from Greece and abroad, such as:

- *Creation and Formation in Language* (2013)
- *Aspects of Corpus Linguistics: Principles, implementations, challenges* (2017)
- *Multiword expressions: Drawing on data from Modern Greek and other languages* (2020). The special issue is complemented with the bibliographic database compiled with the use of reference management software and publicly available to both the research community and the public, see *Centre's website* > *Multiword Expressions in Modern Greek: A bibliography in progress*.

Moreover, most of the data published in printed form (neologisms and scientific terminology) has been digitized and migrated to an archival format for display at the Centre's Portal in the Digital Repository of the Academy of Athens (see *Bibliographical resources*). Details on the hosted material, as well as general information on the Centre's research strands is presented at the Centre's Collections at the *Digital Academy* (see *Bibliographical resources*).

Contribution of the Centre: *Regular dissemination of the outcomes of research to the academic community and the public, promotion of the fields of study relevant to the Centre's mission through the publication of volumes dedicated to linguistic topics of special interest*

Connection with other academic institutions in Greece

- Researchers of the Centre give linguistic courses at undergraduate and post-graduate level at the University of Athens (NKUA).
- The Centre offers internship opportunities to students of Philology, Linguistics and Computer Science at Greek universities (it was the first Centre of the Academy of Athens to activate the ATAAΣ Centralized Internship Support system for Greek Higher Education Students scheme).

Contribution of the Centre: *The Centre responds to the challenge of the connection between research and education*

2021: THE DATA REVOLUTION AND FUTURE RESEARCH

Outline of research activities

During the almost fifty years of operation, the Centre's work methodology is constantly evolving to adapt, on the one hand, to the changing face of the discipline of Linguistics itself (both theoretically and empirically), and on the other

hand, to Greek society's orientation towards the implementation of Digital Transformation policies and Open Science methodologies. Research, nowadays, is more committed than ever to the integration of computational techniques in data analysis, the development of research tools, and, at the intersection of technology and society, to the implementation of science engagement strategies, for instance by the frictionless dissemination of large datasets to both the scientific community and the public. The Centre has embraced both directions.

More specifically, the summer of 2021 marks the completion of the research programme "Updating NEOΔHMIA", managed by the Academy of Athens Research Committee:

- enhanced text retrieval methods have made the system more compatible with big data processing demands,
- new automated features have been added to the text retrieval component to aid the processes of tracking and monitoring neologisms,
- a first implementation of a system of topic classification via machine learning techniques took place,
- the *Monitor Corpus of Neologisms* is now enriched with tools for basic grammatical analysis (POS tagging and lemmatization).

At the same time, new word formations entering the Greek language during the pandemic are still being recorded at the Centre.

Thanks to the afore-mentioned activities, the Centre can now proceed to the design of a new type of specialised dictionary, an *Electronic Dictionary of Neologisms*, as a direct derivative from its *Digital Archive of Neologisms and Terminology*. The *Electronic Dictionary of Neologisms* will document and dynamically monitor the new terms and present them to the public.

NEOΔHMIA (which is constantly updated) will thus serve as an informationally-rich source to track, record, and monitor lexical diffusion, since it can provide a representative picture of the novel words' unique trajectories, or rather 'success stories' in journalistic prose (see Afentoulidou & Christofidou, 2021). Some emerging words are entirely ephemeral, some others reign supreme. The challenge in this revolutionary era is to engage with the scientific community and the public in a discourse of language awareness, offering data, methods, and tools.

Contribution of the Centre: *The Centre aims to build a sustainable infrastructure for the compilation of a dynamic, Electronic Dictionary of Neologisms*

BIBLIOGRAPHICAL RESOURCES

Web resources

For further information concerning the *Research Centre of Scientific Terms and Neologisms*, the personnel, the research projects, and further publications, please consult the Centre's website (<http://www.academyofathens.gr/en/research/centers/scitermneo>)

The Centre's Portal at the *Digital Academy* and the Centre's Collections at the Digital Repository of the Academy of Athens (<http://repository.academyofathens.gr/keeon/index.php/en>)

Information about the Centre's research strands and resources (published at the Centre's Portal at the *Digital Academy*, in Greek)

- *Terminology of Olympic Sports (in Greek, French, and English)*
- *Olympic Games, Athens 2004: A tribute of the Academy of Athens*
- *Scientific Terminology*
- *The contribution of the Academy of Athens to the rendering in Greek of cutting-edge scientific terminology from 1986 till today*
- *Greek neologisms and incoming novel loanwords*
- *Neology as a linguistic phenomenon: The contribution of the Academy of Athens to the monitoring of the evolution of Greek*
- *The Research Centre for Scientific Terms and Neologisms and the study of neology: objectives, methodology, organisation of research*
- *Project NEOΔΗΜΙΑ: Semi-automated identification and classification of Neologisms and Terminology in the Research Centre for Scientific Terms and Neologisms*

Research Methodology

Introductory chapters in the *Bulletin of Scientific Terminology and Neologisms*, vols. 9-10, 11, 13

Project NEOΔΗΜΙΑ and Monitor Corpus of Neologisms

References in Greek

Afentoulidou, V. & Christofidou, A. (2017) [2018]. Σώμα Εποπτείας Νεολογισμών της Νέας Ελληνικής: Σχεδιασμός και κειμενική ταξινόμηση [A monitor corpus of Modern Greek neologisms. Design criteria and genre considerations]. Στο Α. Χριστοφίδου (Επιμ.), *Όψεις της Σωματοκειμενικής Γλωσσολογίας: Αρχές, εφαρμογές, προκλήσεις, Δελτίο Επιστημονικής Ορολογίας και Νεολο-*

- γισμών [*Bulletin of Scientific Terminology and Neologisms*], 14, 129-180. Αθήνα: Ακαδημία Αθηνών.
- Christofidou, A. (2017). Νεολογία και Ορολογία στην Ακαδημία Αθηνών. *Ελληνική Γλώσσα και Ορολογία* [Neology and Terminology at the Academy of Athens]. *Πρακτικά 11ου Συνεδρίου Ελληνικής Εταιρείας Ορολογίας*. Αθήνα: ΤΕΕ.
- Christofidou, A. (2018). Κειμενικά είδη και τρόποι λόγου: μια συνολική κειμενογλωσσολογική πρόταση [Genres and discourse modes: an integrated text-linguistic proposal]. Στο Κ. Ντίνας (επιμ.), *Figura in praesentia* (σσ. 604-624). Αθήνα: Πατάκης.
- Christofidou, A. & Afentoulidou, V. (2021). Στα όρια της ελληνικής λέξης: *κόκκινα δάνεια πρώτης κατοικίας* [At the limits of the Greek word: *Kokina dania protis katikias*]. In Th. Markopoulos et al. (Eds) *Proceedings of ICGL 14*, 5-8 September 2019. University of Patras, pp. 1510-1525, <https://pasithee.library.upatras.gr/icgl/issue/view/387>
- Christofidou, A. & Afentoulidou, V. (2016). Νεολογία και κειμενικό είδος. Μια σωματοκειμενική προσέγγιση [Neology and genre. A corpus-linguistic approach]. *Εισήγηση στην Ημερίδα «Ο Δημιουργικός Λόγος στην Εκπαίδευση»*, 27-28 Ιουνίου, Μαράσλειο Διδασκαλείο. ΕΚΠΑ, Εργαστήριο Εφαρμοσμένης Γλωσσολογίας & Μελέτης της Λογοτεχνίας και της Ρητορικής & Ελληνική Ένωση για την Προώθηση της Ρητορικής στην Εκπαίδευση. Υπό την αιγίδα του ΥΠΠΕΘ.
- Christofidou, A., Karasimos, A. & Afentoulidou, V. (2014). Έλεγχος, παρακολούθηση και ταξινόμηση νεολογισμών με το ηλεκτρονικό πρόγραμμα *Νεοδημία*: Η προσέγγιση των νέων δανείων [Monitoring and classification of neologisms using the electronic programme *Neodhmiá*: An approach to novel loanwords]. Στο G. Kotzoglou, K. Nikolou, E. Karantzola, K. Frantzi, I. Galantomos, M. Georgalidou, V. Kourti-Kazoullis, Ch. Papadopoulou, E. Vlachou (Επιμ.), *Selected Papers of the 11th International Conference on Greek Linguistics* (σσ. 1850-1868). Rhodes: University of the Aegean.
- Christofidou, A., Afentoulidou, V., Karasimos, A. & Dimitropoulou, I. (2013). Ηλεκτρονικό Πρόγραμμα Νεολογισμών και Ορολογίας *Νεοδημία*: Προκλήσεις και δικτυο-λύσεις [*Neodhmiá*, an electronic programme for neologisms and terminology: Challenges and web-solutions]. Στο Α. Χριστοφίδου (Επιμ.), *Δημιουργία και Μορφή στη γλώσσα, Δελτίο Επιστημονικής Ορολογίας και Νεολογισμών* [*Bulletin of Scientific Terminology and Neologisms*], 12, 193-243. Αθήνα: Ακαδημία Αθηνών.
- Έρευνα & Τεχνολογία* [Research & Technology]. (2012). Το Κέντρο που «ανακαλύπτει» τις λέξεις [A Centre's discovery of new words]. Τεύχος Ιουλίου, ΓΓΕΤ.
- Έρευνα & Τεχνολογία* [Research & Technology]. (2012). Πρόγραμμα ηλεκτρονι-

κής εύρεσης και ταξινόμησης νεολογισμών και ορολογίας. Μια πρωτοποριακή ελληνική εφαρμογή στο Κέντρο Ερεύνης Επιστημονικών Όρων και Νεολογισμών της Ακαδημίας Αθηνών [Computer-aided tracking and classification of neologisms and terminology. An innovative project at the Centre for Scientific Terms and Neologisms]. Τεύχος Οκτωβρίου, ΓΤΕΤ.

References in English

- Afentoulidou, V. & Christofidou, A. (2021). It's a long way to a dictionary: Between creation and dictionarization. In Z. Gavriilidou, L. Mitits, S. Kiosses (Eds), *Lexicography for inclusion*. EURALEX XIX Congress of the European Association Proceedings Book Volume 2., 7-9 September 2021, virtual. Democritus University of Thrace, pp. 597-606 https://euralex2020.gr/wp-content/uploads/2021/09/Pages-from-EURALEX2021_ProceedingsBook-Vol2-p597-606.pdf
- Christofidou, A., Afentoulidou, V., Karasimos, A. & Vassiliadou, R. (2020). Compoundhood: defining, extracting and monitoring multiword A+N compounds in a database of Greek neologisms. Στο Σ. Μαρκαντωνάτου & Α. Χριστοφίδου (Επιμ.), *Πολυλεκτικές εκφράσεις: μελέτες με δεδομένα από την Ελληνική και άλλες γλώσσες, Δελτίο Επιστημονικής Ορολογίας και Νεολογισμών [Bulletin of Scientific Terminology and Neologisms]*, 15, 133-192. Αθήνα: Ακαδημία Αθηνών.

RESEARCH CENTRE FOR ANTIQUITY

1. Foundation, Aims, Research projects

The Research Centre for Antiquity (in Greek: Κέντρον Ερεύνης της Αρχαιότητος – KEA) was created in 1977 on the initiative of the Academician George E. Mylonas. The aim of the Centre is to promote research in the History, Art and Civilization of Greek and Roman antiquity from the Prehistoric Period to Late Antiquity.

The Centre began operating in 1980 when its first research assistant was appointed. Another four research assistants, all of them doctorate holders, as well as the first Director, were appointed in 1985. In the early 1990s, the research staff already in post were appointed at the appropriate academic grades and preparations were made for new appointments: two in 1995, two in 2009 and two more in 2019. Today six researchers are in post at KEA: two at grade A, two at grade B and two more at grade C (since September 2021).

Research work conducted in the Centre covers a wide chronological range from the Prehistoric to the Late Roman period, while the international programmes, carried out under the auspices of the Academy of Athens, are successfully supported.

The disciplines (sculpture, vase painting and ancient Greek history/historical topography) are appropriate to the thematic of the international programmes which are supervised by the Centre with the oversight of relevant Academic Committees. These international programmes are as follows:

- Corpus Vasorum Antiquorum (CVA) – ancient Greek vase painting: catalogues of museums and private collections in Greece.
- Tabula Imperii Romani (TIR) – the preparation of a map of the Roman empire consisting of 56 sheets on a 1:1.000.000 scale. The sheets are accompanied by an index with geographical, historical, and archaeological data, and bibliographic information on each one of the sites represented on the sheets.
- Sylloge Nummorum Graecorum (SNG) – Greek coins: catalogues of museums and private collections in Greece.
- Corpus Signorum Imperii Romani (CSIR) – Sculpture of the Roman Period: catalogues of museums and private collections in Greece.

Those projects are conducted under the aegis of the Union Académique Internationale and the Association Internationale d'Archéologie Classique. Researchers of the Centre often participate also as authors in these scholarly undertakings.

In addition, research conducted by the Centre covers a wide range of periods of antiquity. It includes excavation, the study of the finds, collaboration with the Archaeological Service of the Hellenic Ministry of Culture and Sports, as well as with foreign museums and institutions. It incorporates research on ancient Greek sculpture, pottery and comparative studies on iconography and religion.

a. Prehistory

Different Prehistoric periods, such as the Neolithic and the Creto-Mycenaean, are being treated at the Centre with research projects focusing on specific topics, such as the Neolithic figurines, whether in terms of iconography or ritual practice. A major excavation project has been conducted for more than twenty years by the Emeritus researcher Christos Boulotis at Koukonissi on Lemnos (Research Committee no. 200/497), a site first identified and systematically explored by him. Apart from his lectures and contributions to International Conferences and journals, the importance of this excavation is also highlighted by a showcase

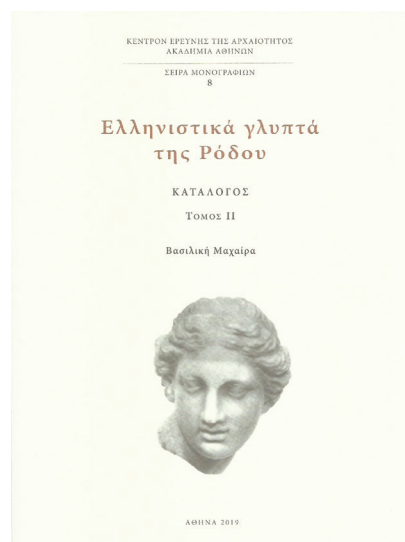


in the Museum of Myrina on Lemnos, specifically dedicated to an indicative selection of the excavated finds. The conduct of the research under the auspices of the Academy of Athens is explicitly acknowledged.

Other research in the Prehistoric period relates to the publication of excavated material from the Bronze Age sites of Attica, such as Arafinides Ales, Rhamnous, Brauron and the Acropolis of Athens by Konstantinos Kalogeropoulos.

b. Historical times-Classical period

In the Historical period research relates in particular to sculpture in the Hellenistic and Roman period in Greece, as well as vase painting and pottery in the Classical period.



A. Sculpture. This concerns the study and publication of Ancient Greek and Roman sculpture, especially the excavated material of Hellenistic sculptures from Rhodes, but also from the sanctuary of Asklepios at Lissos (Chania Prefecture). Apart from the lectures, articles and communications at International Conferences, Vasiliki Machaira, the project's director, has authored a two-volume Catalogue Raisonné of the Hellenistic Sculptures of Rhodes published by the Academy of Athens, see <http://www.academyofathens.gr/el/research/centers/antiquity/publications>, no. 7-8.

As an expert on Hellenistic Sculpture, Vasiliki Machaira has already been appointed member of the International Academic Commission for the conservation of the Nike of Samothrace in the Louvre [2013-2014]. Collaboration with the Austrian Academy of Sciences (Archaeological Institute) is already underway for the study of the sculptures from the Artemision at Ephesus [2018-]. Research into sculpture in the Hellenistic period in the Aegean continues in collaboration with the Ephorates of Antiquity of the Dodecanese and Chania.

The research programme on Greco-Roman sculpture began in 1996 and includes oversight of the international programme Corpus Signorum Imperii Romani (CSIR).

B. Pottery and vase painting. This concerns the study and publication of ancient Greek pottery, principally excavated by Victoria Sabetai. This programme with

the broad title 'Figured vases from Boeotian tomb groups, from Akrapheia in Boeotia' has already resulted in international collaboration in academic projects, the organisation and participation in conferences, as well as articles in international journals. An international academic programme is underway in collaboration with the museums of Berlin and the Pushkin Museum of Moscow in relation to the 'Kriegsbedingt verlagerte Vasen der Antikensammlung in Staatlichen Historischen Museum Moskau' [2018-2022], for which Victoria Sabetai has been invited as a specialist in Boeotian pottery.

Victoria Sabetai is preparing a monograph on Classical Attic vase painting, particularly in relation to the Washing Painter and the wedding and genre iconography [2007-].

The oversight of the international programme *Corpus Vasorum Antiquorum* (CVA) has been the responsibility of the Classical vase painting project since 1985.

c. Greco-Roman period

Ancient Greek history, historical topography. In addition to the supervision and participation in the international programme of *Tabula Imperii Romani* (TIR), Georgios Zachos participates in interdisciplinary programmes concerning historical topography in collaboration with the Ephorate of Antiquities of Phthiotis and the German Archaeological Institute. In addition to his participation in conferences and colloquia, he has authored two volumes of the TIR [2018, 2021].

The project 'Ancient Testimonia from the cities of Phokis' is underway.

The international programme TIR, which started in 2010, is also part of the programme of ancient Greek history.

2. Achievements-publications

<http://www.academyofathens.gr/en/research/centers/antiquity/publications>

Monographs

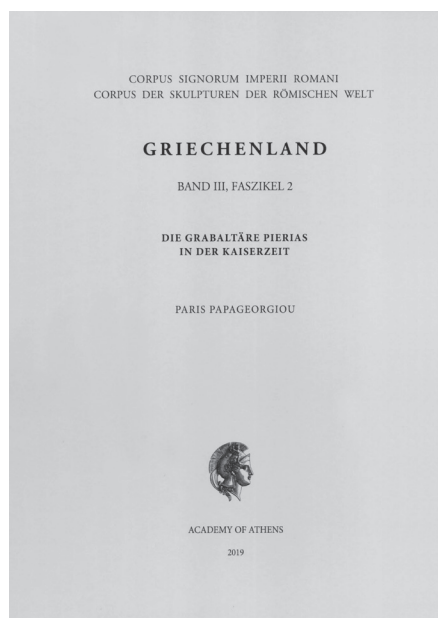
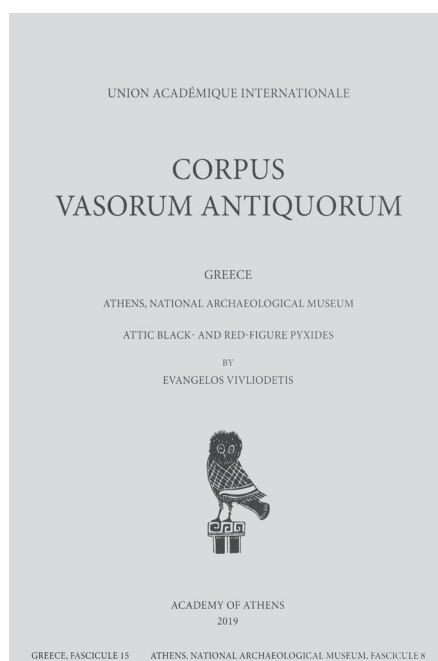
One of the main achievements of the Research Centre for Antiquity is the publication of scientific research on Ancient Greek and Roman History and Archaeology with international impact. The Series of monographs of the Centre, which was launched in the late 1980s, includes eight volumes, so far: the first one appeared in 1989, while the most recent in 2019.

International Archaeological Projects

- *Corpus Signorum Imperii Romani*. The project aims at the publication of all sculpture of the Roman world kept in museums and private collections. Five volumes have appeared since 1996; one more is in publication.
- *Corpus Vasorum Antiquorum*. The aim of the project is to publish ancient Greek pottery kept in museums and private collections. Thirteen volumes have appeared since 1985; one more is in publication.

Maria Pipili, the former Director of the Research Centre for Antiquity, who served as academic supervisor of the project until her retirement in 2012, has authored one volume (1993) and co-edited another one (1986); Victoria Sabetai, the current academic supervisor of the project, has also contributed two volumes (2001, 2006).

- *Sylloge Nummorum Graecorum*. The purpose of this project is to publish ancient Greek coins in Museums or Private Collections. Five volumes have appeared since 2004.
- *Tabula Imperii Romani*. This project aims at the preparation of a map of the Roman empire consisting of 56 sheets on a 1:1.000.000 scale. The sheets are accompanied by an index with geographical, historical, and archaeological data, and bibliographic information on each one of the sites represented on the sheets. The first fascicule appeared in 1993; six more have appeared since 2010.



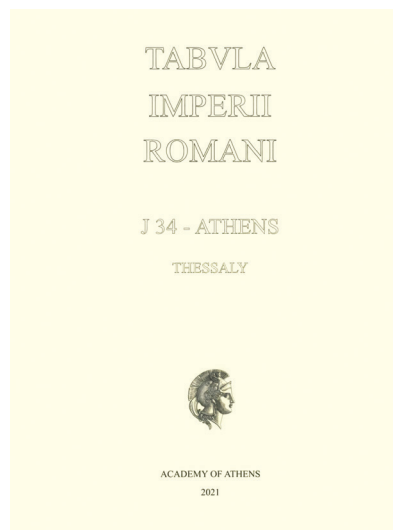
3. Achievements in 2021

Publication of TIR, sheet J34 - Athens: Thessaly, by Georgios Zachos

4. Future aims

The following reports on research projects are in preparation for publication in the near future by the researchers of the Centre:

- Konstantinos Kalogeropoulos, *The Acropolis of Brauron in the Bronze Age*
- Victoria Sabetai, *Wedding and Genre iconography in the Classical period. The case of the Washing Painter*
- Vasiliki Machaira, *The Temple of Asclepios at Lissos – Sculptures and bases*
- Georgios Zachos, *Archaeological investigation in East Phokis (Elateia, Tithorea, Exarchos) in the 19th and early 20th c.: Archival and Archaeological evidence*



Christos Boulotis, Research Director Emeritus, is also preparing a monograph entitled, *Koukonissi at Lemnos. Excavation Research*.

- The research proposal of Victoria Sabetai (Research Director) entitled “*Women, Children and the Family Beyond Athens. The Oikos’ Evolving Lives in the Art of Mainland Greece*” has been approved for funding by the Hellenic Foundation for Research and Innovation-HFRI [A.Π. 39886/11.10.2021 (ΑΔΑ: 6ΜΟΑ46Μ77Τ-18Β)].

Also, the following two volumes are in publication for the International Academic projects.

- CSIR III, 3. - Iphigeneia Leventi, *Grave stelae from Thessaly*
- CVA 16, NAM 9. - Christina Avronidaki, *Athens, National Archaeological Museum - Boeotian Red-figure vases*

THE RESEARCH CENTRE FOR BYZANTINE AND POST-BYZANTINE ART

Foundation - Purpose

The Research Centre for Byzantine and Post-Byzantine Art (in Greek: Κέντρον Ερεύνης της Βυζαντινής και Μεταβυζαντινής Τέχνης – ΚΕΒΜΤ), the successor of the Research Office for the Compilation of the Corpus of the Byzantine Monuments of Greece, was founded in 1994 on the initiative of Manolis Chatzidakis (1909-1998), a Byzantinist and Member of the Academy of Athens. The aim of the Centre is “the research of the history of Byzantine and Post-Byzantine art with emphasis on the architectural and painted monuments and all other works of art of that period”¹. The Research Office of Modern Greek Art, founded in 1993 on the initiative of Chrysanthos Christou (1922-2016), a Modern art historian and Member of the Academy of Athens, ceased to exist in 2016 and its library and archives were transferred to the Centre.

Supervising Committee (2021-2022)

Panayotis L. Vocotopoulos (President), Vasileios Petrakos, Michael Tiverios, Chryssa Maltezou, Theodoros Papangelis.

Supervisor: Chryssa Maltezou

Researchers: Ioanna Bitha (senior researcher-acting director), Ioannis Vitaliotis (senior researcher), Olga Karagiorgou (senior researcher) and Ioannis Galeridis (research director).

Former researchers: Stamatia T. Kalantzopoulou (1983-2013), Ioanna Christoforaki (2004-2018).

1. <http://www.academyofathens.gr/el/research/Centres/byzantine>
<https://academyofathens.academia.edu/ResearchCentreforByzantineandPostByzantineArtKEVMTAcademyofAthens>

Brief overview

The research projects carried out in the Centre relate to the study of Byzantine and Post-Byzantine art and aim to create complete archives, databases or open access websites, which are being presented in independent publications by the Centre, or in collective, Greek or international, publications. Through its projects and publications, the Centre offers important research tools to scholars interested in the study of Byzantine and Post-Byzantine art, especially in the fields of wall-painting and architecture. The Centre leads the International Programme for the Compilation of the “Corpus of the Byzantine Wall-Paintings” (*Corpus de la peinture monumentale byzantine*) and is responsible for its representation at the International Union of Academies (Union académique internationale). It has also contributed to bringing to the attention of the international community of Byzantinists the Greek bibliographic production in the fields of Byzantine and Post-Byzantine archaeology and art.

At the same time, the Centre hosts research projects on the study of Byzantine history, art and culture concerning areas of the Byzantine Empire that lay beyond the borders of the modern Greek State, exercising thus a kind of cultural diplomacy. This activity is exemplified by the following research projects: “Monuments of Christian Worship in Albania”, “TAKTIKON: Prosopography and administrative structure of the Byzantine themata on the evidence of seals and other sources”, “Archaeological evidence on Byzantine wine-producing installations in Asia Minor: the case of Amorion (7th-9th c. A.D.)”.

In the same framework of extroversion, the Centre supports the participation of its researchers in international projects. An indicative case is the engagement of Olga Karagiorgou, with expertise in the archaeology of Late Antique Thessaly, in the programmes of (a) the Freie Universität zu Berlin, entitled *Authorization of early Christian knowledge claims in Asia Minor and Greece*, Exzellenzcluster 264-TOPOI Project (B-5-3), Director: Prof. Cilliers Breytenbach (<https://topoi.org/project/b-5-3/>) in June-August 2018, and (b) the University of Mainz, entitled *Procopius and the Language of Buildings / Prokop und die Sprache der Bauten*, Director: Prof. Gunnar Brands (<https://gepris.dfg.de/gepris/projekt/400139393>) in 2020-2022.

The Centre keeps archives of photographs, architectural designs, and drawings of the monuments that fall within its research field, which are being constantly enriched and in certain cases digitized. The Centre’s Photographic Archive also includes the photographic collection of Angeliki Mitsani on the monuments of the Cyclades, and the photos of the illuminated manuscripts of the National Library of Greece, which were used in the relevant publication of the Academy of Athens by Anna Marava-Chatzinikolaou and Christina Paschou. The Centre

has also received the Photographic Archive and the full set of drawings of the late Academician, Pavlos M. Mylonas, which concern the wall-paintings of monuments on Mount Athos and elsewhere.

Several of the Centre's archives were digitized in 2016 during the Operational Programme "Promotion of the work of the Research Centres of the Academy of Athens on the World Wide Web" (NSRF 2007-2013).

The Centre has a library specialising in publications on Byzantine and Post-Byzantine art, which has been enriched by the posthumous donations of Manolis Chatzidakis, Georgios Galavaris, Angeliki Laiou and Stamatia Kalantzopoulou.

In brief, the Centre hosts five research projects [The Corpus of the Byzantine Wall-Paintings of Greece; Monuments of Christian Worship in Albania; Recording and publication of the collection of icons of the Holy Patriarchal and Stavropegic Monastery of Chrysopigi in Chania, Crete; *TAKTIKON*: Prosopography and administrative structure of the Byzantine themata on the evidence of seals and other sources; Archaeological evidence on Byzantine wine-producing installations in Asia Minor: the case of Amorion (7th-9th c. A.D.)], two infrastructure activities (The Greek Bibliography of Byzantine and Post-Byzantine Art; The Pavlos M. Mylonas Archive of Mount Athos), and various scientific (lectures, conferences) and publishing activities.

RESEARCH ACTIVITIES UNTIL 2020

Corpus of the Byzantine Wall-Paintings of Greece

Project Director: Manolis Chatzidakis (1982-1998), Panayotis L.

Vocotopoulos (2000-) with the collaboration of Ioanna Bitha (1982-)

The aim of this project is on the one hand to compile a detailed record with description, drawings, photographs and bibliography for each monument in Greece, and on the other hand to publish these monuments grouped by regions in independent volumes in the series "Corpus of the Byzantine Wall-Paintings of Greece". This project is being carried out with the approval of the Central Archaeological Council (CAC) and in collaboration with the Greek Archaeological Service. Thus, the ensuing records become valuable tools at the disposal of researchers and scholars who study, or manage the conservation, restoration, and promotion of these monuments.

The "Corpus of the Byzantine Wall-Paintings of Greece" has two parts:

(a) the "*General* Corpus of the Byzantine Wall-Paintings of Greece" comprises the individual records of ca. 2500 Byzantine churches that preserve their mural decoration, even if in fragmentary condition. These records include informa-

tion collected from the relevant bibliography relating to the architectural form of the monument, the various phases of its wall-painting, the iconographic themes, the inscriptions, the chronology, and the bibliographic documentation (Stamatia Kalantzopoulou). The content of the “General Corpus” has been digitized in a specifically designed pilot database.

(b) the individual volumes of the “Corpus of the Byzantine Wall-Paintings of Greece” by region, whose content is far more analytical and secure, as it has been checked during fieldwork that allowed the meticulous study of the painted monuments under consideration and their careful and accurate recording with architectural plans, drawings and high-quality professional photos; in the course of the fieldwork in a specific area, it is not unusual to also discover previously unknown monuments. The main purpose of this project is to create complete records with all the aforementioned information for each monument, all at the disposal of researchers, which are later used in the publication of the recorded monuments in geographical groups, in the homonymous publication series of the Centre. The, so far, published “Corpus of the Byzantine Wall-Paintings of Greece” concern painted monuments on the island of Kythira (in Greek and English)², in Eastern Macedonia and Western Thrace³, and on the Ionian Islands⁴. The respective volumes on the painted monuments on the Dodecanese (Symi, Tilos, Chalki, Rhodes), Epirus and Crete (provinces of Apokoronas and Kydonia, Chania) are in preparation. The study of all this material has also led to the presentation of work-in-progress reports in several conferences and in the publication of articles in scientific journals⁵.

The aforementioned project forms part of a wider, international programme entitled “Corpus de la peinture monumentale byzantine / Corpus of the Byzantine Wall-Paintings”, initiated by Manolis Chatzidakis when he was Chairman of the Committee for Byzantine Art at the International Association of Byzantine Studies. This programme aims to compile *corpora* of Byzantine wall-paintings in monuments situated in regions within the official borders of the Byzantine Empire, as well as in other areas that were heavily influenced by the radiance of Byzantium. Today, this programme is under the auspices of the International Union

2. Μανόλης Χατζηδάκης, Ιωάννα Μπίθα, *Ευρετήριο Βυζαντινών Τοιχογραφιών Ελλάδος. Κύθηρα*, Αθήνα 1997. Manolis Chatzidakis, Ioanna Bitha, *Corpus of the Byzantine Wall-Paintings of Greece. The island of Kythera*, Athens 2003 (improved version in English).

3. Evangelia Papatheofanous-Tsouri, *Corpus of the Byzantine Wall-Paintings of Greece. Eastern Macedonia, Western Thrace*, Athens 2016.

4. Παναγιώτης Λ. Βοκοτόπουλος, Πολυξένη Δημητρακοπούλου, Διαμάντω Ρηγάκου, Δημήτριος Δ. Τριανταφύλλοπουλος, Ιωάννης Π. Χουλιάρης, *Ευρετήριο Βυζαντινών Τοιχογραφιών Ελλάδος. Ίονια Νησιά*, Αθήνα 2018.

5. <http://www.academyofathens.gr/el/researchers/bitha>

<https://academyofathens.academia.edu/IoannaBITHA>



Fig. 1. Published volumes of the “Corpus of the Byzantine Wall-Paintings of Greece”.

of Academies (Union académique internationale, Project no. 40a), where it is being represented by the Academy of Athens and the Centre. The published volumes, so far, present the wall-paintings of Sweden⁶ and Umbria in Italy⁷; another volume on the wall-paintings of Calabria is in print⁸, and three more on the wall-paintings of other areas in Italy are in preparation⁹.

Monuments of Christian Worship in Albania Researcher in charge: Ioannis Vitaliotis

The aim of this research project is to study and publish portable and monumental works of Christian art, with emphasis on those that bear painted decoration (wall-paintings, icons, manuscripts), which date back to the Byzantine and Post-Byzantine period, and are preserved within the present-day Albania. For the purposes of this project, fieldwork is carried out in collaboration with several Albanian researchers (archaeologists and art historians) and state institutions: the Archaeological Institute of Tirana/Instituti Arkeologjik (until 2008 under the auspices of the Albanian Academy of Sciences, but since 2008 member of the Academy of Albanian Studies/Akademia e Studimeve Albanologjike), the National Institute of Cultural Heritage (Instituti Kombëtar i Trashgimisë Kulturore), the National Historical Museum of Tirana (Muze Historik Kombëtar) and the Museum “Onufri” (Muze “Onufri”) in Berati.

6. Elisabeth Piltz, *Corpus de la peinture monumentale byzantine. La Suède. La région de Gotland*, Uppsala 1988. Elisabeth Piltz, *Corpus de la peinture monumentale byzantine. La Suède. Torpa*, Uppsala 2009.

7. Mara Bonfioli (ed.), *Corpus della pittura monumentale bizantina in Italia. I. Umbria*, Roma 2012.

8. Lorenzo Riccardi, *Corpus della pittura monumentale bizantina in Italia. II. Calabria*.

9. For the areas of Abruzzo, Emilia-Romagna, and Basilicata.

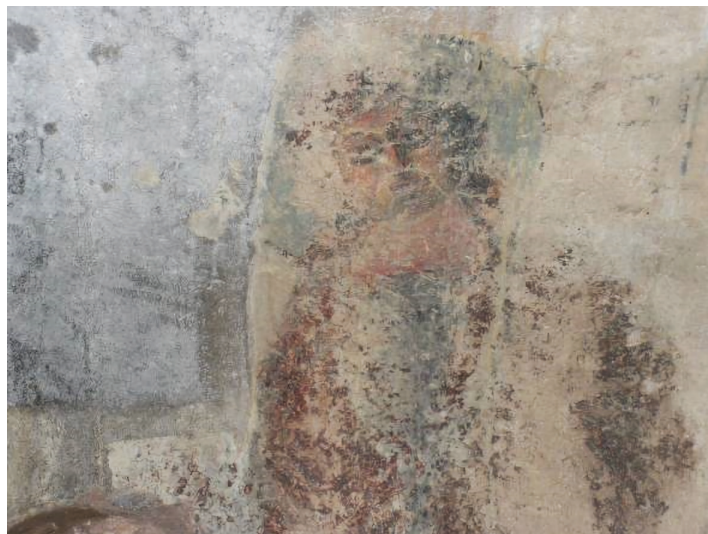


Fig. 2. Monuments of Christian Worship in Albania. Excavation of the Institute of Archaeology of Tirana – Academy of Albanian Studies. Agioi Saranta, Basilica of Agioi Tessarakonta, crypt. Christ Emmanuel, 6th century (photo: Ioannis Vitaliotis).

Between 2003 and 2008, Ioannis Vitaliotis participated in the archaeological works of the then Archaeological Institute of Tirana in the area of Saranda, which included excavation in the Byzantine basilica of Agios Ioannis in Foiniki, the Byzantine basilica of Episkopi in Nivitsa, and the Early Christian basilica of Agioi Tessarakonta, whose frescoes he studied and published (Fig. 2). Since 2008, Ioannis Vitaliotis has expanded his research all over Albania. More specifically, he has recorded a significant number of monuments (ca. 50), several ensembles and fragments of wall-paintings, as well as portable icons, and has compiled a valuable photographic record which is being constantly updated (Fig. 3).



Fig. 3. Monuments of Christian Worship in Albania. Berati, church of St. Nikolaos Saints in roundels and Christological scenes, unsigned work of Onoufrios of Cyprus, 1591 (photo: Ioannis Vitaliotis).

This research has already illuminated many aspects of Early Christian, Byzantine and Post-Byzantine painting in a geographical area that remains insufficiently known. Further elaboration of this material resulted in several communications at national and international scientific meetings, some of them by invitation, as for example, the conferences at the École des Hautes Études, Paris, at the Department of History of the University of Tirana, the National Institute of Cultural Heritage of the Albanian Ministry of Culture, and the Academy of Sciences of Albania. More than twenty relevant publications, some of them co-authored with Albanian colleagues, have appeared in scientific journals, proceedings of conferences, and exhibition catalogues¹⁰.

The recording and publication of the collection of icons of the Holy Patriarchal and Stavropegic Monastery of Chrysopigi in Chania, Crete
Researcher in charge: Ioannis Vitaliotis

Work on this research project, which was launched officially in 2020, had already been carried out since 2019, see I. Vitaliotis, “Reproducing engravings on a single icon: The case of the Theotokos Megaspelaiotissa”, in: *Patterns – Models – Drawings. Art Readings 2019*, eds. T. Bacheva, E. Mutavof, Institute of Art Studies, BAS, Sofia 2020, 153-174) (Fig. 4). The project is expected to be completed in 2023.

This research aims to record systematically and then publish in a scientific catalogue the collection of the ca. 60 icons, mainly of the Post-Byzantine and modern period, which are kept in the sacristy, the catholicon, and the chapels of the Holy Patriarchal and Stavropegic Monastery of Chrysopigi in Chania. Only five of these icons have been published. The icons date between the 15th and the early 20th centuries, but most of them belong to the period between the 17th and the 19th centuries. The collection includes signed works of well-known icon painters (Emmanuel Skordilis, Nikephoros Karpenisiotis, Emmanuel Tripalitakis, etc.), or icons that can be attributed to specific Cretan workshops (Theophanes of Crete, Emmanuel Skordilis). The catalogue will also include artefacts of the same period with figural decoration, such as bema doors, wood-carved bread disks, etc.

The number of icons and other artefacts exceeds 60, including the small icons of the Twelve Feasts. The publication will include a complete list of all the artefacts and extensive entries on ca. 35-40 icons, selected on the basis of their archaeological and historical value.

10. <http://www.academyofathens.gr/el/researchers/vitaliotis>
<https://academyofathens.academia.edu/IOANNISVITALIOTIS>



Fig. 4. Holy Patriarchal and Stavropegic Monastery of Chrysopigi, Chania. Panagia Megaspilaitissa with scenes from the synaxarium of the icon, work of Nikephoros Karpenisiotis, hieromonachos, 1806 (photo: Ioannis Vitaliotis).

TAKTIKON: Prosopography and administrative structure of the Byzantine themes on the evidence of seals and other sources

Project director: Olga Karagiorgou

The main idea and the methodological principles of the *TAKTIKON* research project sprang from Olga Karagiorgou's research on "*The sigillographic corpus* of the officials of the theme of Hellas". After receiving significant funding by the ARISTEIA II Operational Programme (NSRF 2007-2013), the project extended to the three largest themes of Byzantine Asia Minor (Opsikion, the Anatolikai, the Kibyrraiotai).

The aim of the *TAKTIKON* is to create complete and reliable catalogues (in chronological order) of all the state officials active in the Byzantine themes, based on the evidence provided by sigillographic and non-sigillographic sources. All this information is presented in a constantly updated online database hosted at the Academy of Athens (<https://taktikon.academyofathens.gr>), which includes specifically designed Records presenting the career of each thematic official (Prosopography Records, see Fig. 6) and a detailed description of each thematic lead seal (Molybdoboullon Records, see Fig. 7). This database aspires thus to provide researchers, scholars, and university teachers with up-to-date information on the political, military, institutional and social history of Byzantium, as well as on Byzantine epigraphy and iconography, as attested on molybdoboulla



Fig. 5. The logo of the research project *TAKTIKON*.



About the TAKTIKON | Search the TAKTIKON | References | News | Contact us

PN_557Leon Skleros 1060-1080

THEMATIC CAREER

Career Stage I [1060-1070]

vestarches and krites of the Anatolikoi

Sigillographic Sources

BL_557.1: [ANAT_191](#)

BL_557.2: [ANAT_123](#)

Non Sigillographic Sources

n/a

Career Stage II [1060-1070]

vestarches and krites of Opsikion

Sigillographic Sources

BL_557.3: [OPS_161](#)

Non Sigillographic Sources

n/a

Career Stage III [1060-1080]

magistros and praitor of Opsikion

Sigillographic Sources

BL_557.4: [OPS_99](#)

BL_557.5: [OPS_176](#)

Non Sigillographic Sources

n/a

PN Comments

Leon Skleros served as krites of the Anatolikoi and was subsequently appointed at Opsikion, where he received his promotion to magistros. We know that later on, he had two more career stages as praitor of the Boukellarioi, and as krites of the Aigaion Pelagos (to be completed in this Prosopography Card in due course).

PN References

PBW (2016), Leon 20197

Cheynet, Sklèros (2008), nos. 4-5

Leveniotis, Doukaton (2005-2006), no. 48 (p. 94)

Asia Minor (1998), p. 363 (no. 11) and p. 401 (no. 2)

Seibt, *Skleroi* (1976), no. 20

Fig. 6. The online database of the *TAKTIKON*. The Prosopography Card of Leon Skleros (1060-1080).



About the **TAKTIKON** | Search the **TAKTIKON** | References | News | Contact us

KIB_103 Theophilos, imperial spatharios and tourmarches of the Kibyrraiotai

DATE: 750-800

FINDSPOT: n/a

PRESENT LOCATION: Russia: Saint-Petersburg, Hermitage M-7009 (ex N. Likhachev coll.)

ACQUISITION MODE: n/a

METRIC DATA

D(t)	D(f) obv	D(f) rev	Th	W
24,5	n/a	n/a	n/a	8.33

ORIENTATION OF DIES: n/a

BLANK/DIE RELATION: n/a

STATE OF PRESERVATION: chipped; the channel is fake (most probably this is the copy of a lost original)

Obverse Image



© The State Hermitage Museum

Obverse Description

Cruciform invocative monogram (Laurent type V) with inscription in the quarters

(Athena Ruby)

ΤΩ – CΩ
ΔΘ – ΛΩ

(minuscule Greek)

(Θεοτόκε βοήθει) τῷ σῷ δούλῳ

Reverse Image



© The State Hermitage Museum

Reverse Description

Inscription in five lines

(Athena Ruby)

. ΘΕΟ
ΙΛΒCΠΑ
ΘΚΤΩΡΜΑ
ΤΩΝΚΙΒΥΡ
ΕΩΤΩ

(minuscule Greek)

[+] Θεο
φίλ(ω) β(ασιλικῶ) πα-
θ(αρίω) κ(αί) τουρμά(ρχη)
τῶν Κιβυρ-
εωτῶ(ν)

CRITICAL EDITION

Θεοτόκε βοήθει τῷ σῷ δούλῳ Θεοφίλῳ, βασιλικῷ σπαθαρίῳ καὶ τουρμάρχει τῶν Κιβυρραιωτῶν

TRANSLATION

Theotokos aid your servant Theophilos, imperial spatharios and tourmarches of the Kibyrraiotai

PUBLISHING HISTORY

Stepanova, Kibyrraiotai (2021), no. 12

Schlumberger, Sigillographie (1884), p. 261 (no. 1) [8th c.]

PARALLEL(S): n/a

SIMILAR(S): n/a

COMMENTS: This specimen has been stamped on a very thin blank. Furthermore, it has a fake channel and its colour is rather unusual for a lead seal. N. Likhachev was probably right to record it as a copy; nevertheless, it must reflect its original prototype.

Fig. 7. The online database of the **TAKTIKON**. The Record Card for the Molybdoboullon (KIB_103) of Theophilos, imperial spatharios and tourmarches of the Anatolikai (second half of the 8th century), kept at the State Hermitage Museum.

(lead seals). The *TAKTIKON* primarily serves Byzantine prosopography. Contrary, however, to other prosopographic research projects, which offer a “horizontal view” of the Byzantine society by creating alphabetical lists of individuals (according to their baptismal name) from all walks of life, the prosopographic catalogues of the *TAKTIKON* offer a “vertical view” (through the centuries) of a particular social group (the Byzantine state officials), focusing thus on individuals who, by definition (due to their position), succeeded each other. These lists are thus transformed into a valuable research tool, not only in the difficult task of dating the molybdeboulla more accurately, but also in the thorny issue of the creation, evolution, and structure of Byzantine themes.

Research on the four themes of Hellas, Opsikion, the Anatolikoi and the Kibyrraiotai that was completed at the end of 2020 with the valuable co-operation of the two main researchers of the *TAKTIKON* (Pantelis Charalampakis and Christos Malatras) has gathered a total of 1110 molybdeboulla, so far. These have been detected in 64 state, and in more than 15 private (known and unknown) collections in 17 different countries (several of these collections were visited by the *TAKTIKON* research team), but also in (printed and online) catalogues of at least 40 auction houses. References to thematic officials and institutions both in this material and in other non-sigillographic sources have doubled the number of the (so far) known individuals active in the themes under examination, and have provided important new data regarding the emergence, development, and administrative structure of the themes.

During the ARISTEIA II Programme, an International Workshop relevant to this research project was held at the Academy of Athens with the participation of 16 speakers from seven countries. The communications delivered at this International Workshop, as well as the results of the project up to the end of 2020, are presented in the volume *TAKTIKON: Studies on the prosopography and administration of the Byzantine themata*, eds. Olga Karagiorgou, Pantelis Charalampakis, Christos Malatras (900 pages, in press). This publication is generously supported by the “Janet Zakos Foundation for the Study of Byzantium” (Geneva), the John S. Latsis Public Benefit Foundation and the insurance companies Capuano Insurance Brokers S.A., Eurolife FFH, and Generali Hellas. The results of the project have been presented in at least 15 national and international conferences, and more than twenty relevant papers have been published in scientific journals, conference proceedings, honorary volumes, and exhibition catalogues¹¹. In July 2021 the project received financial

11. <http://www.academyofathens.gr/el/researchers/karagiorgou>;
<https://academyofathens.academia.edu/OlgaKaragiorgou>. See also
<https://www.onassis.org/initiatives/onassis-communities/onassis-scholars-association/success-stories/olga-karagiorgou>;
<https://www.facebook.com/staatlichemuenzsammlung/posts/193948376086116>.

support from the Research Committee of the Academy of Athens towards the necessary technical update of its online database, so that it can accommodate more information, as research continues in other themes of the Byzantine State.

Archaeological evidence on Byzantine wine-producing facilities in Asia Minor: the case of Amorion (7th-9th c. A.D.)

Academic advisor: Olga Karagiorgou

This research project received funding under the Operational Programme “Human Resources Development, Education and Lifelong Learning” of the Ministry of Development and Investments (NSRF 2014-2020). The research team consists of four members (Main Researchers: Nikos Tsivikis, Athanasios Sotiriou and Academic Advisors: Olga Karagiorgou, Ilias Anagnostakis). The first three of them have a direct relationship to Amorion due their participation over the last twenty years in the archaeological investigation conducted in the city¹². The results of the systematic excavations carried out in Amorion since 1988 have contributed in a unique way to our understanding of the life in the Early- and Middle Byzantine cities, especially during the so-called “dark centuries” of Byzantium (7th-9th c.), since it is precisely then that Amorion flourished as the capital of the theme of the Anatolikoi and centre of the provincial military administration. The city’s prosperity in the 9th century is directly connected to the ascension to the imperial throne of the Amorion dynasty: Michael II (820-829), Theophilos (829-842) and Michael III (842-867). The excavations at Amorion have brought to light to date ten wine installations in different parts of the walled Lower city (Fig. 8). All these facilities are placed in the 8th and early 9th centuries, as they have been found within the layer of destruction caused during the sack of the city by the Abbasid caliph of Baghdad and Samara Al-Motasim in 838 A.D.

The aim of this research project is the systematic archaeological and historical study of the wine-producing installations (mechanical wine presses, treading floors) and the archaeological remains of the ceramic (amphorae, jugs) and non-ceramic (sheepskins, barrels) vessels for the storage and transport of wine that have been found in Amorion, in connection to the possibilities of viticulture in the surrounding rural landscape during the Byzantine era and the contemporary literary (historical and hagiographical) evidence on making and trading wine. On the basis of the excavated material evidence, the project tries to assess (a) the volume of local wine production at Amorion and its possible association with the intense military pres-

12. On the activity of Olga Karagiorgou at Amorion, see her relevant publications under <http://www.academyofathens.gr/el/researchers/karagiorgou>; <https://academyofathens.academia.edu/OlgaKaragiorgou>



Fig. 8. Amorion in Phrygia. Aerial photo of Basilica A, 5th century with later phases (in the red frame, the location of the wine press northwest of the baptistery).

ence in the city, due to the stationing of the thematic administration there in the 7th century, (b) the hyperlocal dimension of wine production, and (c) the distribution of wine in the context of the turbulent 7th and 8th centuries, when large parts of the Byzantine State in East and West are lost and large-scale exchange networks are collapsing. Some of the results of this project were presented in a public lecture in December 2020 (see <https://www.youtube.com/watch?v=TWr3NsTdVjw&t=19s>), as well as during a communication at an international conference in April 2021 (see https://www.academia.edu/45643522/15_04_2021_On_the_vine_road_between_Bithynia_and_the_East_Production_and_Consumption_of_the_Amorian_wine_in_the_Middle_Byzantine_period_Colloquia_Ceranea_III_University_of_Lodz_). The final study by the four-member research team is expected to be completed and submitted for publication at the end of 2021.

INFRASTRUCTURE WORK

Bibliography of Byzantine and Post-Byzantine archaeology and art. The Greek contribution

Researchers in charge: Ioanna Bitha (1991-2005, 2011-),
Olga Karagiorgou (2006-2010)

The *Bibliography of Byzantine and Post-Byzantine Art* brings together and presents the bibliographic contribution of Greek scholars in the fields of Byzantine and Post-Byzantine archaeology and art (4th to 19th centuries). The presentation of the bibliographic production of the Greek Byzantinologists was an initiative of Manolis Chatzidakis, and when it was launched it included publications

between 1945 and 1966. From 1991 onwards, this infrastructure work has been undertaken by the Centre (Researcher in charge: Ioanna Bitha), initially in collaboration with the Greek Committee for Byzantine Studies, and since 1996 exclusively. The bibliographic references are collected by indexing and in collaboration with the authors, and then they are registered in a specifically designed database. All this material is then processed and presented in a volume in alphabetical order (according to the authors' last name), accompanied by detailed indices of content and illustrations (using pertinent key words). The four volumes of the Greek bibliography that have been published, so far, cover the period up to 2010: the first three volumes for the period 1975-2005 were compiled by Ioanna Bitha, assisted by external collaborators; the fourth volume, for the period 2006-2010, was compiled by Olga Karagiorgou¹³ (Fig. 9). After 2010, a specifically designed database was developed that allows each author to submit online his/her own publications accompanied by the necessary keywords for the thematic index, so that all this material can be easily accessible on the internet.

The main goal in the future is the successful operation of the online database, in order to offer to the scholarly community a useful research tool on the bibliographic production of Greek Byzantinists at national and international level.

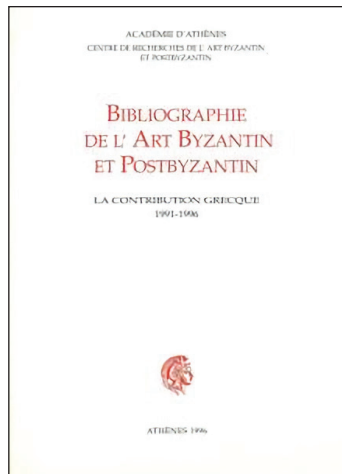


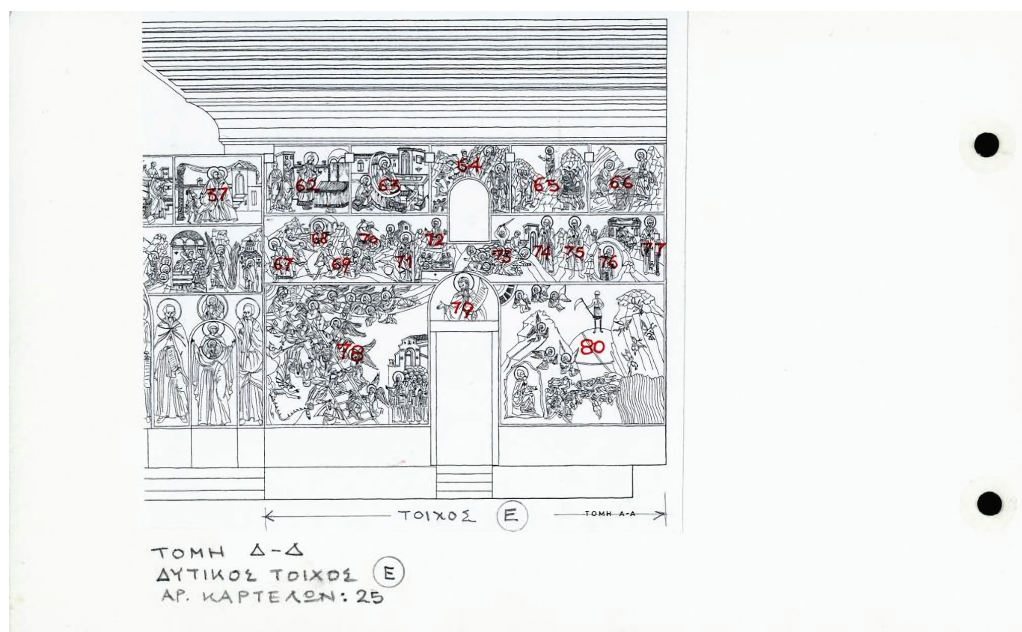
Fig. 9. The first volume of the series “Bibliography of Byzantine and Post-Byzantine Art”.

13. See <http://www.academyofathens.gr/el/research/Centres/byzantine/publications> [Publications B.1-4].

Archive of Mount Athos of Pavlos M. Mylonas

Researcher in charge: Ioanna Bitha

The Archive of Mount Athos by the late Academician Pavlos M. Mylonas (1915-2005) includes a complete set of architectural plans and drawings of most of the wall-paintings of the monasteries of Mount Athos (Fig. 10), with emphasis on the mural decoration of the refectories, as well as the accompanying photographs. This Archive was created in the years 1969-1972 during fieldwork conducted by Pavlos Mylonas, Professor of Building Orders at the Athens School of Fine Arts, and groups of young collaborators, many of whom are now established scholars and artists. In 2005, the drawings of the wall-paintings and the photos of the Archive of Mount Athos by Pavlos Mylonas were donated to the Centre, while



West wall (E) (62-80)

Scenes from the Life of St. John the Forerunner (62-66, 133-137)

MENOLOGION for SEPTEMBER (38-48, 67-77, 91-110)

67. *On the Heavenly Ladder* (T. – F. 305: John Klimax)

68. *St. Ioannes of the Ladder* (T. – F. 306: John Klimax)

69. *Το δι' εμού δρέπανον πάντας ανθρώπους και γίγας διχάσει θάνατος και τάφος γαρ κατασταθήτω μου η εξουσία εκ των αδυνάτων φείξασθαι τούτου του ποτηρίου* (T. – F. 307: Allegory of Death)

Fig. 10. Sample drawing from the Archive of Mount Athos by Pavlos M. Mylonas. Refectory of the monastery of Docheiariou.

the architectural plans were donated to the Modern Greek Architecture Archives (M.G.A.A.) of the Benaki Museum.

The set of drawings (ca. 600) kept in the Centre represent the entire spectrum of work that is necessary for the recording of the monumental treasures of Mount Athos, as it includes both sketches and preliminary drawings of the wall-paintings, as well as complete drawings ready for publication, accompanied with detailed descriptions of the numbered scenes. The Archive of Drawings has been linked to the Photographic Archive (ca. 10.000 records, including negative and positive films and prints of various dimensions) and to the corresponding catalogue of the numbered scenes. The Pavlos Mylonas' Photographic Archive comprises also photos of artefacts (sculptural decoration, icons, iconostasis, manuscripts) from Mount Athos and other regions of the Byzantine Empire. The recording, the checking, and the commentary of the afore-mentioned material, as well as its digitization, was carried out under the responsibility of Ioanna Bitha with the valuable cooperation of Alexandra Karageorgou, Assistant Designer of Pavlos Mylonas (working mainly on a voluntary basis), and Eugenia Koureta, Librarian. The material from the Pavlos Mylonas' Archive concerning the refectories of Mount Athos was presented at the 23rd International Congress of Byzantine Studies (Belgrade 2016).

ORGANISATION AND PUBLICATION OF MANOLIS CHATZIDAKIS MEMORIAL LECTURES

Researcher in charge: Ioanna Bitha assisted by the Centre's researchers

Another activity of the Centre is the organisation of the annual lecture in memory of its founder, Manolis Chatzidakis. The Supervising Committee of the Centre invites a distinguished Byzantinist to give a lecture on a subject related to the Centre's research interests. The lecture is later published independently in the series "Manolis Chatzidakis Memorial Lectures". So far, a total of 22 lectures have been held¹⁴; nine of them have been published¹⁵ (Fig. 11).

14. See <https://academyofathens.academia.edu/ResearchCentreforByzantineandPostByzantineArt/KEVMTAcademyofAthens> (Catalogue of Lectures "Manolis Chatzidakis Memorial Lectures").

15. See <http://www.academyofathens.gr/el/research/Centres/byzantine/publications> (Publications C.1-9).

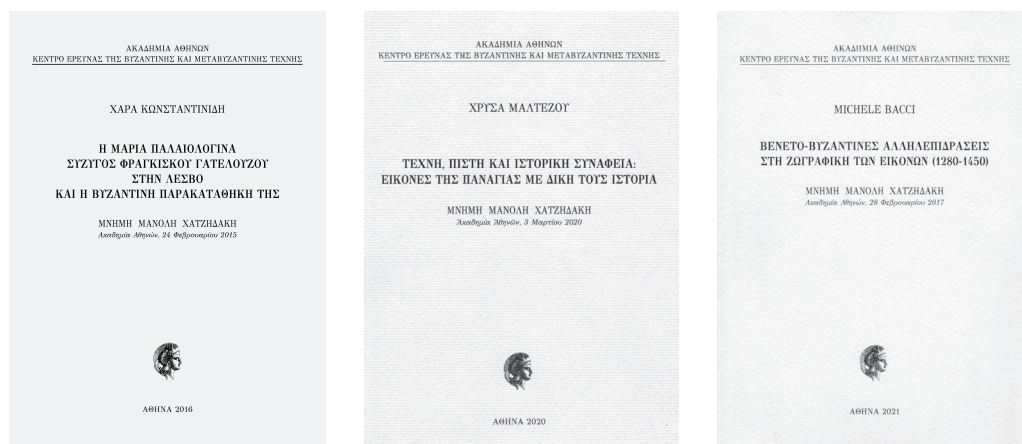


Fig. 11. The most recent volumes of the series “Manolis Chatzidakis Memorial Lectures”.

ORGANISATION OF CONFERENCES

The Centre has organised three international conferences and/or workshops, so far:

Troisième réunion de travail d'experts: Le Corpus de la peinture monumentale byzantine. Bilan et Perspectives, Academy of Athens, 6-9 November 2003 (organised by Panayotis L. Vocotopoulos with the collaboration of Ioanna Bitha).

The main purpose of this Third Experts' Workshop was to overview the progress of the Corpus of the Byzantine Wall-Paintings, redefine the objectives of this international programme, and plan future actions for widening the participation of all concerned national Academies. The two previous Experts' Workshops (in 1982 and 1983) had set the specifications and the publication guidelines of the Corpus. The Third Workshop was attended by 24 Byzantinologists and representatives of national Academies: twelve from Greece, four from Italy, two from Bulgaria and one from Serbia, Montenegro, Sweden, Georgia, Armenia, and Israel, respectively. The Workshop was also followed by members of the Committee for Byzantine Art of the International Association of Byzantine Studies, curators of Byzantine Antiquities of the Hellenic Ministry of Culture, and the Deputy Secretary General of the International Association of Academies.

International Workshop in the framework of the Operational Programme ARISTEIA II entitled: *The prosopography of the thematic administration: old and new evidence on the Opsikion, the Anatolikoi and the Kibyrraiotai*, Academy of Athens, 19 June 2015 (organised by Olga Karagiorgou).

The aim of this Workshop was to present the results of the ARISTEIA II Re-

search Project, that is new evidence on the prosopography and administrative structure of the three Asia Minor themes (Opsikion, the Anatolikoi and the Kibyrraiotai), as well as the newly created digital database *TAKTIKON*, hosted at the Academy of Athens (<https://taktikon.academyofathens.gr>). The workshop was attended by 16 speakers from Greece, Bulgaria, France, U.S.A., Ukraine, Russia and Turkey.

International Conference entitled *Mendicant Orders in the Eastern Mediterranean: Art, Architecture and Material Culture (13th-16th c.)*, Nafplio, 19-23 April 2017 (organised by Ioanna Christoforaki).

The main purpose of this conference was to explore the material remains of the Mendicant Orders in the eastern Mediterranean from the 13th to the 16th centuries. This scientific meeting, the first ever to explore this topic, brought together several experts on this subject from all over the world (20 Greek and 37 foreign participants). The Conference was held under the auspices of the Academy of Athens and received the financial support of the Fritz Thyssen and the Ioannou F. Costopoulos Foundations.

PUBLISHING SERIES OF KEBMT

- A. "Corpus of the Byzantine Wall-Paintings of Greece".
This series is dedicated to the publication of the archive of the Byzantine Wall-Paintings of Greece according to geographical regions.
- B. "Bibliography of Byzantine and Post-Byzantine archaeology and art. The Greek contribution".
This series publishes the bibliographic production of Greek Byzantinologists in the fields of Byzantine and Post-Byzantine archaeology and art, in alphabetical order (according to the authors' last name), accompanied by the necessary indices.
- C. "Manolis Chatzidakis Memorial Lectures".
This series publishes the papers of the invited speakers at the annual lecture in the memory of Manolis Chatzidakis.
- D. "Miscellaneous Publications - *Εκφράσεις* of Archaeology and Art".
This series publishes works related to the research interests of the Centre, after the Supervising Committee of the Centre has approved the relevant request from the interested parties. The series was inaugurated in 2007, under the direction of the Academician Panayotis L. Vocotopoulos, with the publication of the Proceedings of the International Conference entitled *The Fourth Crusade and its impact* (Academy of Athens, 9-12 March 2004), which was organised by

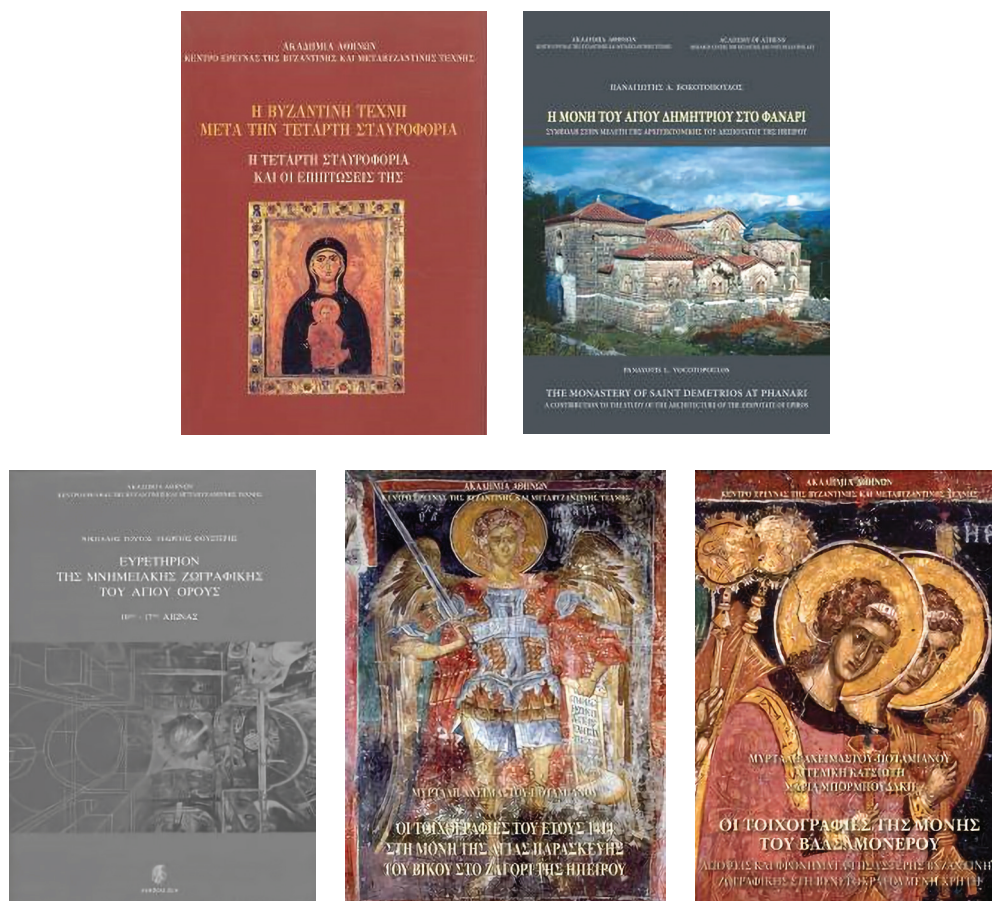


Fig. 12. The published volumes of the series “Miscellaneous Publications - Εκφράσεις of Archaeology and Art”.

the late Academician Angeliki Laiou (†2008). Since then, a total of five publications have appeared in this series¹⁶ (Fig. 12).

Main research activities in 2021 (in preparation)

Publications

- Maria Vasilaki, *Cretan icons and Cretan painters in Sinai, Manolis Chatzidakis Memorial Lecture*, Academy of Athens, 26 March 2019.
- Panayotis L. Vocotopoulos, *Icons and iconography. Fifty studies*.

16. See <http://www.academyofathens.gr/el/research/Centres/byzantine/publications> (Publications D.1-5).

- Ioanna Bitha, *Corpus of the Byzantine Wall-Paintings of the island of Symi, Dodecanese*.
- Olga Karagiorgou, Christos Malatras, Pantelis Charalampakis (eds.), *TAKTIKON: Studies on the prosopography and administration of the Byzantine themata*. The volume presents the Proceedings of an International Workshop held during the Operational Programme ARISTEIA II, as well as the overall results of the Research Project *TAKTIKON* by the end of 2020.

Research work in progress

- Publication of the *Corpus of the Byzantine Wall-Paintings of the islands of Tilos and Chalki, Dodecanese*.
- Publication of the *Corpus of the Byzantine Wall-Paintings of Epirus*.
- Publication of the Scientific Catalogue of the Collection of the Holy Patriarchal and Stavropegic Monastery of Chrysopigi, Chania, Crete.
- Publication of the results of the research project “Archaeological evidence on Byzantine wine-producing installations in Asia Minor: the case of Amorion (7th-9th c. A.D.)”.
- Detailed archaeological commentary on the Justinianic fortifications in Thessaly for the research project of the University of Mainz: “Procopius and the Language of Buildings / Prokop und die Sprache der Bauten”.
- Upgrading and updating of the *TAKTIKON* website, hosted at the Academy of Athens (<https://taktikon.academyofathens.gr>) with at least 500 new Prosopography Records and 700 new Molybdoboullon Records, presenting new material for the already studied themes of Hellas, Opsikion, the Anatolikoi and the Kibyrraiotai, as well as for five more themes of the Byzantine Empire.
- Presentation of the website *TAKTIKON* at the 24th International Congress of Byzantine Studies (Venice-Padua, August 2022) during a communication by Olga Karagiorgou, entitled “Ink versus Lead: hetero- and self-portrayal of thematic officials on the evidence of *TAKTIKON*”.
- Checking the digitized records of the Centre’s Archives prior to uploading them in the digital repository of the Academy of Athens.
- Organisation of a scientific workshop on monastic refectories, dedicated to the memory of Pavlos M. Mylonas, where the relevant Archive and Digital Repository of the Centre will be presented.

RESEARCH OFFICE OF MODERN GREEK ART

The research projects and the publications of the Research Office of Modern Greek Art have contributed significantly to the recording and the study of the artistic heritage of modern Greece and its integration within the framework of the European artistic currents. The publications of the Office during its operation between 1993 and 2016 include eleven monographs by Chrysanthos Christou, and one by Chrysanthos Christou and Ioannis Galeridis (Fig. 13). In 2016, the Office was incorporated in the Research Centre for Byzantine and Post-Byzantine Art. Since then, the following research projects are being realised by the Centre:

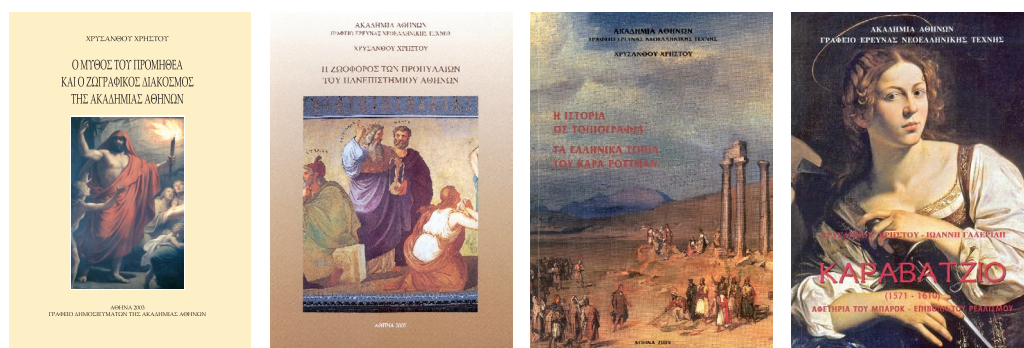


Fig. 13. Publications of the Research Office of Modern Greek Art.

Corpus of Sculptures in Public Spaces in Greece (19th-21st centuries) Researcher in charge: Ioannis Galeridis

This project aims to form a complete record with scientific commentary and photographic documentation of works of sculpture, set in public spaces in Greece. The publication of the sculptures is organised according to their geographical location, an approach that better supports their interpretation and the understanding of their appeal to the public. This project promotes the artistic production of modern Greek sculptors, it raises the awareness of the public to issues of modern cultural heritage and its protection, both at a local and national level, and contributes to the study of modern Greek art history and the history of modern Greece in all its aspects (social, political, economic, cultural and religious), since many of these sculptures portray famous personalities of the Greek public life (Fig. 14).

The necessary fieldwork for the purposes of this project has already covered several cities and regions of Greece: Livadia, Chalkida, Corinth, Nafplio, Tripoli,

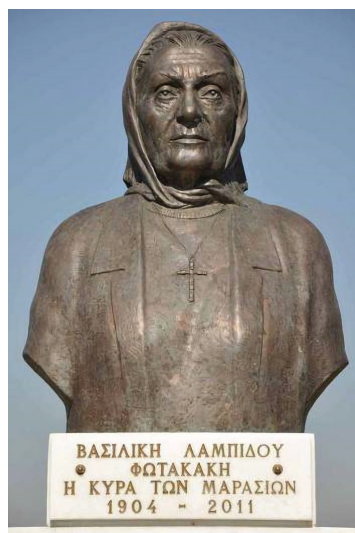


Fig. 14. Ioannis Bardis (1947-), Vasiliki Lampidou-Fotakaki – “The Lady of Marasia”, 2012, brass, 75 × 58 × 36 cm, Marasia Evros (photo: Ioannis Galeridis).

Sparta, Pyrgos, Kavala, Drama, Serres, Polygyros, Kilkis, Veria, Edessa, Kozani, Florina, Kastoria, Ioannina, Arta, Igoumenitsa, Preveza, Attica, the Cyclades and the Dodecanese, the islands of Thassos, Lesbos, Chios and Samos, and the prefectures of Evros, Rodopi and Xanthi. The Archive of public sculptures of the 19th-21st centuries includes at present about 2200 records.

Inventory of Inscriptions of the City of Athens (19th-21st centuries)

Researcher in charge: Ioannis Galeridis

This project, which was launched in 2018, aims at the collection of inscriptions (commemorative, honorary) dating from the foundation of the Modern Greek State (1828) until today. Apart from inscriptions on slabs and signboards, this Inventory takes also into account non-inscribed monuments and works of art (sculptures, frescoes) whose inscriptions commemorate an event or an individual closely linked to the history of Athens, or Greece, in general. This Inventory, the first one to collect the epigraphic material of Athens in modern times, is in fact a primary historical source and, therefore, a valuable research tool for the study of various aspects of human activity during the last three centuries in the capital of the Greek State.

The Inventory already includes 700 records, resulting from fieldwork in several open areas of the historical Centre of Athens and various emblematic buildings (public and private): the Academy of Athens (Fig. 15), the National and Kapodistrian University of Athens, the National Library (Vallianeion Melathron),



Fig. 15. Academy of Athens, north side of the interior of the Ceremonial Hall, engraved epigram of Philippos Ioannou, 1886 (photo: Ioannis Galeridis).

the Hellenic Parliament with *The Monument of the Battle of Pindos* and the wall-painting ensembles in the Trophy Hall and the Aides de Champ Room, the Archaeological Society at Athens, the Athens Public Eye-Hospital (*Ophthalmiatreio Athinon*), the Iliou Melathron, the National Historical Museum (Old Parliament), the Zappeion, the Dekozi-Vouros Mansion, the Arsakeio, the Marasleios Pedagogical Academy, the National Observatory of Athens, the Kleanthous-Schaubert Mansion (Old University) and the Gennadius Library. Detailed descriptions and photos of the relevant inscriptions per monument are kept in a specifically designed electronic database.

The main objective of this project is the completion of the recording of the relevant inscriptions, their detailed study and finally the publication of the epigraphic inventory for the city of Athens (19th-21st centuries).

SECTION OF ETHICAL AND POLITICAL SCIENCES

RESEARCH CENTRE FOR THE HISTORY OF GREEK LAW

I. Foundation and aims

The Research Centre for the History of Greek Law (in Greek: Κέντρον Ερεύνης της Ιστορίας του Ελληνικού Δικαίου – ΚΕΙΕΔ) was established in 1929, on the initiative of D. Pappoulas, member of the Academy of Athens and Professor of Civil Law at the School of Law, University of Athens, in order to investigate “the unique phenomenon of the unremitting history of Greek law”. Since 1948 the Centre has been publishing an annual journal initially under the title *Annual of the Archive for the History of Greek Law*, and since vols. 10-11 (1963-1964) known as *Annual of the Research Centre for the History of Greek Law - EHHD* (in Greek: *Επετηρίς του Κέντρου Ερεύνης της Ιστορίας του Ελληνικού Δικαίου - ΕΚΕΙΕΔ*). The journal, counting so far 50 volumes, publishes critical editions of Byzantine, post-Byzantine, and Neo-hellenic legal sources, and essays on Greek legal history, from the Greco-Roman antiquity to the nineteenth century. Since 1998, a series of monographs and editions of sources published as Supplements was inaugurated; so far 16 volumes have been printed (for more details, see <https://sites.google.com/view/postbyzlaw/home>).

With the purpose of serving the aims of the Centre’s activity, as described in article 115 of the Academy’s bylaws, the Centre runs a well-equipped library, with c. 14,000 printed items (books, periodicals, and offprints) and archival material in photographs (coming mainly from the General State Archives, and regional archives, such as Kerkyra, Rhodes, Sparta, Hydra, etc.). The collection of archival material is the result partly of scientific expeditions of the staff, and partly of private donations (for more details, see <http://repository.academyofathens.gr/keied/index.php/gr/content/38>); it includes law courts decisions, codices of notaries, loose private documents recording legal transactions, and judicial and administrative documentation from the 15th to 19th century. A large part of the archival material, edited and commented upon by researchers of the Centre, has been published in *EHHD* or other internationally renowned journals.

II. Activities of the Research Centre for the History of Greek Law from its foundation to 2020

II.1 *Critical editions of legal sources*

The Research Centre for the History of Greek Law, faithful to the mission outlined in its statute, attributes special importance in collecting, editing, and commenting the so far unpublished legal sources of the post-Byzantine period. Since 1948, it has published a plethora of post-Byzantine legal documents, dated in the periods of the Latin (Frankish and Venetian) and Ottoman domination, as well as of the revolutionary, Capodistrian and Neo-hellenic period. As it has been repeatedly underlined, these documents reveal the self-sufficiency and the particularity of post-Byzantine law, in the area both of public and private law. They also highlight the system of dispensing justice in action and its historical roots, during the last stage of its historical evolution, which remains largely underexplored till today, due to the dispersion and inaccessibility of the primary sources. The publications of the Centre include:

A. Editions of post-Byzantine nomo-canonical texts and legal compilations.

These texts witness the diffusion and implementation of Byzantine law in the Orthodox populations of the Ottoman empire, from the early 18th century to the outbreak of the Greek revolution (1821).

B. Editions of notarial codices and loose legal documents from the Cyclades (Naxos, Paros, Siphnos, Syros, Tenos), Skyros, Chios, Crete, the Ionian islands (Kerkyra, Zakynthos, Kephallonia), Athens, and Peloponnese (Demetsana, West Mani).

C. Edition and commentary of judicial decisions issued by ‘community’ law courts (*koinotika kriteria*) of the Ottoman period from the central Aegean islands, the law court of the ‘guild’ of Greek traders in Sibiu – Transylvania, the dragomans of the Ottoman fleet in the Aegean islands during the 17th and 18th century, the first Neo-hellenic lawcourts, the decisions of the *Thalassio Dikasterio* (Naval Court) 1828-1829.

D. Edition and commentary of the most important documents of the General Secretariat of Justice during the governorship of I. Kapodistrias (1828-1831) and the reign of Otto (1833-1862).

E. Edition and commentary of the early laws, decrees, and law courts decisions of the post-revolutionary period and of the first period of the Neo-hellenic State.

II.2 Research programme for the years 2007 to 2012: Outline of the history of post-Byzantine law (under the supervision of the Director of the Centre Dr. Jur. Lydia Paparriga. Research team: Lydia Paparriga, I. Chatzakis, I. Arnaoutoglou).

The need for a scholarly corpus of the Byzantine and post-Byzantine legal sources was felt already during the early stages of the shaping of the Neo-hellenic State. A collection of the written and unwritten monuments of Greek legal history, would not only illustrate their direct or indirect role in the implementation of Byzantine legal rules, but it would also serve a very practical purpose, associated directly with the needs of the current, at that time, judicial practice: to support, through the study and comparison of the sources, the building blocks of the nascent Neo-hellenic civil legislation. The dominant, 20th-century view that a collection of Greek legal documents, composed under foreign occupation and during the decade after the revolution, would highlight the influence of Byzantine on post-Byzantine law and clarify legal questions bedeviling late Byzantium, has inspired Demetrios Ginis, a distinguished researcher in the field of legal history, to proceed to the first systematic collection of unknown at the time manuscripts, as well as the already published sources of that period in his monumental work “An outline of the history of the Post-Byzantine law” (in the series *Pragmateiai tes Akademias Athenon* vol. 26). Published in 1966, the book led to a renewed scholarly interest in post-Byzantine legal institutions and inspired many publications of post-Byzantine legal sources, whose sheer volume necessitated a new collection and presentation.

This need led to a new research programme whose aim was to systematically collect and present the whole of post-Byzantine legal sources, published in the last 45 years, in order to revitalize scholarly interest and the further development of research in areas that were *terra incognita*. This research programme was carried out between 2007 and 2012 and its results were published in two new volumes of the *Outline of the history of Post-Byzantine law* in the series *Pragmateiai tes Akademias Athenon* vol. 63 & 65.

1. Lydia Paparriga, Ilias Arnaoutoglou, Ioannes Chatzakis, *Outline of the history of Post-Byzantine Law. The Greek texts*, Athenai 2011 (*Pragmateiai tes Akademias Athenon* vol. 63, pp. 726; also available online: <https://digitallibrary.academyofathens.gr/archive/item/2200>). The publication includes all the Greek legal sources fully published between 1978 and 2007, as well as those published before 1978 but not included in the 1966 edition of D. Ginis and its two supplements (in *EEBS* 39-40 (1972-73) pp. 201-46 and 43 (1977-78) pp. 152-87, respectively).

2. Ioannes Chatzakis, *Outline of the history of Post-Byzantine Law. The Latin, Italian and French texts*, Athenai 2012 (*Pragmateiai tes Akademias Athenon* vol. 65, pp. 471; also available online: Available in <https://digitallibrary.academyofathens.gr/archive/item/2164>). It includes legal sources of the post-Byzantine period written in the above languages. Since Ginis' *Outline* contains only a few Latin or Italian texts, it was thought expedient to collect the numerous publications of post-Byzantine legal texts published since the middle of the 19th century.

II.3. Legal history studies

The publications of the Research Centre for the History of Greek Law are a testimony to the multifaceted research that is being carried out at the Centre, in cooperation with other law historians. The publication record of the Centre includes, so far, more than 243 research papers and sixteen monographs. The publications are regularly reviewed and indexed in renowned international journals like *Byzantinische Zeitschrift*, *Zeitschrift für Savigny-Stiftung*, *Gnomon*, *L'Année Philologique*, *Classical Review*, *Greece & Rome*, *Dike* (Milano), and in Greek law journals like *Νομικό Βήμα*. Doctoral dissertations, monographs, and articles by the researchers of the Centre have been published in the series of the Centre, and presented at the legal history Seminar for the History of Law, organised by the Law School of the University of Athens, in postgraduate seminars at the Aristotelian University of Thessaloniki, in conferences at the Centre for Byzantine Research (Thessaloniki), in the annual meeting of the Greek Society for the History of Law, organised by the Law School of the Democritus University of Thrace (Komotini), as well as in various colloquia and international conferences in Greece and abroad. The Centre's publications were presented on various occasions to academic audiences by the Director of the Centre, Dr. Jur. Lydia Paparriga, and other distinguished legal historians. The directions of recent research on the history of law, carried out in Greece in recent years, and its outcomes were presented in an academic event whose proceedings were published in *EHHD* 48 (2018), pp. 193-287.

II.3.1. Post-Byzantine period and the Neo-Hellenic State

Beyond the collection, critical edition, and commentary of the post-Byzantine and Neo-hellenic legal literature, the main research field of the Centre since its foundation, is the systematic study of the post-Byzantine Greek world, a period marked by the appearance of a mosaic of socio-legal institutions at its beginning and at its end. At the beginning of the period there are constitutional formations developed on Frankish (1192-1489) and Venetian Cyprus (1489-1571),

the Duchy of Athens (1204-1456), the Principality of Achaia or of Moreas (1205-1452), on Venetian Crete (1211-1669), the Duchy of the Aegean (1212/14-1566), the Venetian Heptanesos (mid-14th cent. - late 18th cent.), on Hospitaller's Rhodes (1346/7-1522), and Genoese Chios (1346-1566). At the end of this period, of special socio-political interest are the constitutions of the *Heptanesos Politeia* (1800-1807) and the Union of the Ionian islands (1815 to 1841: introduction of the Ionian Civil Code; 1864: integration into the Greek State), the Principality of Samos (1832 to 1897: introduction of the Samian Civil Code; 1913: integration into the Greek State), and the various constitutions for Crete beginning with the period of semi-autonomy (1867-1898), and the autonomous Cretan State (1898-1903: introduction of Cretan Civil Code; 1913: integration into the Greek State).

A series of doctoral dissertations, monographs, essays, and articles published in the *Annual* of the Centre explore and clarify the legal particularities of the post-Byzantine world. Several of these studies are regarded as reference works in the discipline, because of the exhaustive and original treatment of their subject matter, indicating thus new research directions. In conclusion, the articles published in the *Annual* of the Centre dealing with legal affairs of the post-Byzantine period and of the Neo-hellenic State can be classified in the following categories:

- A. Local variations of the customary, Byzantine, Ottoman, and Venetian law as well as their validity and their binding character.
- B. The evolution (formal and of substance) of the Byzantine legal institutions during the post-Byzantine period, the influence of Byzantine law on the legislative compilations issued in the Trans-Danubian Principalities, and the tracing of common legal practices in the Balkans.
- C. The administrative and judicial organisation of the Greek 'communities' during the Ottoman occupation and the evolution of their jurisdiction,
- D. The survival of widely or locally applied customs into the fabric of the dominant legal orders and the relation between customary law, Byzantine law and feudal, Venetian, and Ottoman legal institutions.
- E. Analysis of the content of the post-Byzantine legal collections or of other sources of the post-Byzantine legal literature.

The legal sources of the post-revolutionary and Kapodistrian period are of equal, if not greater, interest regarding legal practice. They reveal the evolution of Greek law into modernity, the particularities of the Neo-hellenic legal reality, but also the survival and/or the transformation of institutions, originally shaped in the Byzantine or the post-Byzantine period. Research, so far, has focused on the legal foundation of the Neo-hellenic State, on commentaries of opinions by distinguished legal experts of the Kapodistrian period about vital legal and financial affairs and the associated political intrigues, and on questions of the history of

Greek and Roman law related to modern legal experience. Finally, articles on legal historiography, theory and methodology at different periods appeared in the publications of the Centre.

III.3.2. Byzantine period

Throughout the 20th century eminent University Professors (Demetrios Pappoulas, Konstantinos Triantaphyllopoulos, Georgios Maridakis, Georgios Petropoulos, Panagiotis Zepos) and distinguished scholars (Iakovos Visvizi, Meneleos Tourtoglou) have argued that an illustration of the written monuments of the Greeks living under foreign occupation, as well as of those of the early years after the 1821 revolution, would highlight the influence of the Byzantine to the post-Byzantine law, but also the formal and content-related evolution of Byzantine institutions in the post-Byzantine legal environment. Vice versa, the study of post-Byzantine law would contribute to clarifying various legal questions of the late Byzantine era. Therefore, in the publications of the Centre there are studies and articles by Greek and foreign historians dealing with questions of Byzantine law. They can be classified in the following sections:

- A. The legal realities of Byzantium.
- B. The statehood of the Byzantine Empire.
- C. The ecclesiastical administration and organisation.
- D. Critical editions and commentaries on sources of the Byzantine legal literature, and
- E. Various questions of Byzantine law.

III.3.3. Ancient Greek, Hellenistic, and Roman period

The entwining of ancient Greek and Roman law and the view that the Byzantine law is the product of a creative interweaving of the former two, supported by distinguished Romanists of the 19th and 20th century (O. Lenel, F. Regelsberger, Vito La Mantia, C. Ferrini, L. Siciliano-Villanueva, F. Brandileone, K. Krumbacher, P. Collinet, H. E. Troje, etc), led, in the course of time, to the chronological expansion of the Centre's research field to include also ancient Greek and Roman law. Articles dealing with the legal position of women in Hellenistic and Roman Egypt, as well as in the Greek cities of the classical and Hellenistic period, do occupy a privileged space in the publications of the Centre. Among the remaining studies, some deal with fundamental aspects of the system of dispensing justice and some other with private law institutions. Authors usually focus on a particular literary genre, or on the text of an inscription, or a contract preserved on papyrus.

II.4. Series of Academic Meetings on Byzantine and post-Byzantine law.

Ruptures, continuities, and extensions to the modern legal reality

Organised by the Director of the Centre, Dr. Jur. Lydia Paparriga, in cooperation with Prof. Eleutheria Papagianni (Law School of the National and Kapodistrian University of Athens)

Given that no other academic or scientific institute in Greece specialises in the study of Byzantine and post-Byzantine Law, these meetings, organised under the auspices and with the financial support of the Academy of Athens, are of great importance, since they constitute the only venue for the scholarly development of this discipline. It is hoped that this series will highlight the legal culture of a particularly long and eventful period of Greek legal history, and explores its contribution to the formation of the modern Greek legal life.

II.5. Participation in the Programme “Digital Library” of the Academy of Athens, 2014-2016

The programme “Digital Library” was initiated by the General Secretary of the Academy of Athens, the late Prof. N. Matsaniotis. In the framework of this programme, the Supervising Committee of the Centre, endorsed the proposal of the Centre’s Director, Dr. Jur. Lydia Paparriga, to digitize the following holdings: i) “Outline of the history of post-Byzantine law”, and ii) all the volumes of the *Annals* together with its Supplements (approximately 18,000 pages). For the needs of the digitizing project, the researchers of the Centre collected, classified, and indexed the legal sources that have appeared, so far, in the publications of the Centre, so that they will be accessible to a wider audience of specialists in other disciplines.

III. Activities of the Centre in 2021

- A. Under the general editorship of the Director, Dr. Jur. Lydia Paparriga, the Centre published the 50th volume of its *Annual* including four articles of Greek and foreign researchers on aspects of Greek legal history, from Greco-Roman antiquity to post-Byzantine law.
- B. Dr. I. Chatzakis (Research Director) published a monograph entitled *The Codex no. 85 in the General State Archives of Greece (Γενικά Αρχεία του Κράτους - ΓΑΚ 85), of the Public Notary of Naxos Ioannes Miniates (1668-1676). Notarial Acts of the Ottoman period*, 2 vols, Athens. The published notarial codex, marked by unity and consistency, contains 620 notarial acts of *Ioannes Miniates* active in Naxos as “public notary” in the period 1668-1705. The fact

that the whole codex covers a period of continuous activity for eight years and includes transactions from all the branches of private law, allows researchers to confirm the particularities of legal life in post-Byzantine Naxos, and detect possible Byzantine, Latin, or Ottoman influences on the customary law implemented on the island, as well as an 'eclectic affinity' or differentiation from legal institutions established on other islands of the Central Aegean during the Ottoman period.

- C. The Director of the Centre has assembled the contributions to the next volume of the *Annual*, which marks the 50th anniversary since its first volume appeared.

IV. Research programmes of the Centre in process

IV.1. *Publication of the monuments of Byzantine law.*

The particularities of post-Byzantine law in the spheres of public and private life, due to the simultaneous and parallel function of different legal systems, necessitates the continuation of this programme that aims to collect, publish, comment, and systematically study still unpublished texts of the post-Byzantine legal literature. In this context, the Centre plans the publication of the following critical editions and commentaries of archival sources precious for modern Greek history.

A. *The autograph Nomokanon (Nomimon) of the notary of Thebes Manouel Malaxos. Critical edition and restoration of the original text.* (under the supervision of the Director of the Centre, Dr. Jur. Lydia Paparriga)

In the Byzantine empire, where State and Church were inextricably associated, there was no ground for an absolute separation of ecclesiastic rule - making from civil legislative sources. This reality contributed to the creation of a distinct typology of compilatory legal treatises, appearing already in the sixth century, but identified from the eleventh century onwards by the terms *Nomokanon*, or *Nomokanonon* and later known as *Pedalion* or *Nomimon*. These were systematic collections of provisions of imperial laws and ecclesiastical rules organised according to their subject matter. By their very nature, these *Nomokanones* were subjected to interpretations and rearrangements, so that they would be adapted to the law and the changes of the legal praxis. The Church, already trained in dispensing justice and issuing legislative provisions during the last two centuries of the Byzantine Empire, continued, even after the Ottoman conquest, to make its presence felt in legal affairs.

Among the various compilations surviving in Greece and in the Balkans in hundreds of manuscripts, due to their extensive usage by the Christian subjects, the most important were: the *Hexabiblos*, a late Byzantine private collection of legal rules, by the judge of Thessaloniki K. Armenopoulos, and the *Nomokanon* (or *Nomimon*, or *Biblion ton Nomon*) by Manouel Malaxos (*term. ante quem* for the standard manuscript tradition 30/4/1561). Due to its great diffusion both in the Ottoman East and the West, the *Hexabiblos* was printed several times since 1540 and was inaugurated as the first civil law of the Neo-hellenic State by virtue of the decrees issued by the governor I. Kapodistrias and the decree of 1835. In contrast, the *Nomokanon* of Manouel Malaxos, the law handbook that inspired the first legal code of ecclesiastical, canon and secular law in Vlachia and other Romanian lands, while its variations in the vernacular dominated in the Greek speaking world up to the mid-eighteenth century, remains still unpublished.

The value of a critical edition of Manuel Malaxos' Nomimon

Several eminent Greek and foreign scholars (among them also renowned Byzantinologists and palaeographers), such as K. Duobouniotes, D. Ginis, K. Triantaphyllopoulos, G. Kasimates, G. Markou, Dieter Simon, Paul Canard, and most recently Giuseppe De Gregorio, have already stressed that a critical edition of the official text of Malaxos' *Nomokanon* is a work of paramount importance. The value of the scholarly edition of any primary source is self-evident; in the particular case of Manuel Malaxos' *Nomokanon*, however, this value is further underlined by the following four main arguments:

- A. Malaxos' *Nomokanon*, as a Byzantine legal standard, had a very early influence (well before the Phanariot period of the late 18th-early 19th cent.) on the first compilations of canon and secular law in the Balkans.
- B. The legal importance of the *Nomokanon*, not only as a collection, but as a compilation of Byzantine legal texts.
- C. The comparison of the standard edition of the text with its paraphrases and variants will bring out the changes, additions or deletions, made by later compilers, in order to adapt Byzantine legal texts to the law implemented during the Ottoman domination. Therefore, such a process will highlight the significance of this *Nomokanon* as the most important legal source of the period, a text depicting the strong influence of customary law and the reforms brought on Byzantine law by the Church during the Ottoman occupation.
- D. The critical edition of Malaxos' *Nomokanon*, will bring forward scientific data of great importance for other disciplines, such as theology, sociology, ethnology, Greek linguistics, etc.

B. Edition and commentary of notarial sources from the Cyclades (under the supervision of Dr. Jur. I. Chatzakis, Research Director)

This research programme, still in progress, aims to publish the notarial transactions drafted by the Naxos notaries, Stamatis Tourou (1580-1614) and Nikolaos Anapliotis (1665-1709).

IV.2. Byzantine documents of Southern Europe: an outline of the history of law among the Mediterranean Greek speaking populations.

The presence of Greek-speaking populations in the Roman and later in the Byzantine Empire allowed the preservation of several elements of their cultural identity (that is Greek language and education) and of their legal particularism. The political and cultural reality of the following centuries, especially between the 6th and the 11th centuries, was sealed by the Greek language, and the Byzantine law and administration. These developments, however, did not have the same duration (and endurance) everywhere around the Mediterranean. Forced population movements due to invasions and conquests (Arabs in Egypt and Sicily, Normans in S. Italy and Sicily) occurred already in the mid-7th cent. AD. The collection and study of a coherent corpus of legal documents of the conquered populations will highlight their legal institutions, their features, the social, political, and economic particularities, the multifaceted relations between conquerors and conquered and also the regulations to achieve social peace.

The first part of the programme that deals with information provided by published Greek legal papyri from early Arab Egypt and the Middle East has been completed. The research results will be published by Dr. I. Arnaoutoglou (Research Director), in a monograph entitled *Anthology of Greek legal documents from early Arabic Egypt (7th-mid 8th cent AD / 1st - mid 2nd cent. A.H.)*, which will provide a valuable comparison and an extensive study of legal documents compiled before and after AD 642.

RESEARCH CENTRE FOR GREEK PHILOSOPHY

The Research Centre for Greek Philosophy - RCGP (in Greek: Κέντρον Ερεύνης της Ελληνικής Φιλοσοφίας - ΚΕΕΦ) is the only public Research Centre for the study of the history, reception, and the transformation(s) of Greek philosophical thought from its beginnings to the present day. It began operating in the spring of 1970, nearly four years after the signing of its founding Royal Decree (1966) [Fig. 1], the implementation of which was suspended due to the Junta.

In March 1970, Ioannis N. Theodoracopoulos [Fig. 2], General Secretary of the Academy of Athens, appointed two of his associates to RCGP, Linos Benakis and Evangelos Roussos. The following year Linos Benakis was appointed as the first Director of RCGP and the editorial board consisted of the following members: Evangelos Roussos, Myrto Dragona-Monachou, Anna Kelesidou, Grammatiki Alatzoglou-Themeli [Figs. 7-10]. The first Supervising Committee of the Centre consisted of the following Academicians: Ioannis N. Theodoracopoulos (Chairman), Panagiotis Bratsiotis, Panagiotis Kanellopoulos, Konstantinos Tsatsos, Philon Vassiliou and Othon Pylarinos (Members).

Anna Kelesidou and Anna Aravantinou were the consecutive Directors. All former Directors now hold the position of non-stipendiary Academic Associates.

During the first years of its operation, the greatest concern of the first Director was to create a Philosophical Library for the benefit of the research staff, as well as the academicians, and the broader scholarly community, the researchers, and students. Thus, with funding from the Academy of Athens, and the generous donation that the Humboldt scholars, Linos Benakis and Evangelos Roussos, managed to secure from the Alexander von Humboldt Foundation, the goal began to be realised. Many titles were obtained, and the library was gradually enriched. The Library of the Research Centre for Greek Philosophy today numbers about 11,000 titles, and it is being further enriched either with the purchase of new books or with donations.

In 1979 the Greek Government decided the disposal of the Elli Lambridis bequest to the Academy of Athens, through which the Elli Lambridis Philosophical Library, situated on 9 Hypsilantou St. in Athens, was bestowed to RCGP. The Library contains the books of Elli Lambridis, the first renowned Modern Greek

female philosopher, and contains approximately 4,000 titles of books (and twice as many which have not been registered so far) on Greek Philology and Greek and European Philosophy. It is directed by Linos Benakis under the supervision of RCGP, it is managed by one employee and is open to the public. The Elli Lambridis Library, whose aim is to promote the work of Elli Lambridis and scientific research on topics related to her own philosophical interests, has published several volumes regarding her work and related topics. It is also the main venue for the Monthly Philosophical Seminar of RCGP.

Throughout its history, RCGP was staffed by distinguished academicians, researchers, and experts in the field of Greek Philosophy with international renown and influence on Greek thought and the philosophical studies. For the most part of its operation, RCGP was supervised by the Academician, Professor of Philosophy, Evangelos Moutsopoulos (1997-2021).

Today, its staff includes six researchers, who are experts in Platonic, Aristotelian, Hellenistic, Byzantine, Modern Greek philosophy, and Logic, and a qualified administrator, who acts as editor of all the publications of RCGP.

Initial purpose

The main purpose of the Research Centre for Greek Philosophy since its foundation has been the study and promotion of Greek philosophy, the research of its sources and its timeless influence from pre-classical Antiquity until nowadays. Since its actual operation in spring 1970, the Centre has been devoted to the systematic research and the in-depth study of the sources and texts of the ancient Greek philosophers, as well as the recording and evaluation of the modern international bibliography. More specifically, the fields of scientific study include Presocratic Philosophy, Philosophy of the Classical and Hellenistic periods, Philosophy of the Greco-Roman period, Philosophy of the Byzantine period and Modern Greek Philosophy, as well as Logic.

Special emphasis has been placed on the research of ancient Greek philosophy, with the aim of highlighting and exploring all aspects and trends of this philosophical tradition.

The involvement of Greek scholars in the research of Greek philosophy, a domain usually marked by the work of foreign researchers, was considered imperative, as they are also able to leave their own mark in the study and interpretation of this scientific field. The need to correlate and connect the ancient and the Byzantine philosophy with the Modern Greek and the European philosophy, but also with other sciences such as physics, cosmology, psychology, law, theology, was also self-evident.

To fulfill its founding purpose, the Centre carries out a series of activities:

- The publication of the Yearbook *Philosophia* [Figs. 3-6].

- The publication of monographs by academicians, researchers of the Centre and in some cases external collaborators.
- The publication of the results of the concluded research projects.
- The continuous enrichment of the Library with books and scientific journals focused mainly on Greek Philosophy, but also on the European philosophical tradition.
- Internships for students from the Schools of Philosophy of various Greek Universities, and scientific assistance to young scholars, who make use of the Library and the Centre's other facilities.
- The diffusion and updating of the Greek philosophical publications, followed by summaries, which were published in the *Bibliographie Internationale de la Philosophie* (up to 1997).
- The organisation of scientific events (Seminars, Conferences, International Conferences, lecture series and workshops), some of which are held in collaboration with other academic and research institutions, to keep up to date with current philosophical research and new interpretative approaches.

The main achievements of RCGP until 2020

RCGP's main research and scientific achievements are articulated around five domains:

A. Research

It includes:

- I. the personal production of researchers and academicians (publications, participation in conferences and scientific projects of the Academy and other Research Institutions),
- II. the conduct of research projects by the researchers of RCGP and the publication of their scientific results in collective thematic volumes, which are published by the Academy of Athens.

II. Research projects

1. Dictionary of Presocratic Philosophy.
 - *Dictionary of Presocratic Philosophy*, vol. I, Athens 1988.
 - *Dictionary of Presocratic Philosophy*, vol. II, Athens 1994.
2. The Concept of Freedom in Modern Greek Thought.
 - G. Vlachos, A. Kelesidou, A. Glykofrydi-Leontsini, R. Argyropoulou, *The Concept of Freedom in Modern Greek Thought*, vol. A, foreword by E. Moutsopoulos, Athens 1996.

- R. Argyropoulou, A. Koukis, K. Petsios, A. Kelesidou, A. Glykofrydi-Leontsini, *The Concept of Freedom in Modern Greek Thought*, vol. B: *Nineteenth century*, foreword by E. Moutsopoulos, Athens 1997.
- 3. Philosophers in the Aegean.
 - A. Kelesidou, E. Maraggianou-Dermousi, A. Manos, M. Protopapas-Marneli, R. Argyropoulou, *Philosophers in the Aegean*, foreword by E. Moutsopoulos, Athens 1998.
- 4. The Concept of Hope in Neoplatonic Thought.
 - E. Moutsopoulos, A. Kelesidou, A. Aravatinou, A. Manos, *The Concept of Hope in Neoplatonic Thought*, foreword by E. Moutsopoulos, Athens 1998.
- 5. *Tyche and Anagke* – Chance and Necessity
 - ΤΥΧΗ ΚΑΙ ΑΝΑΓΚΗ. *Hasard et Nécessité dans la Philosophie Grecque*, foreword E. Moutsopoulos, Athens 2005.
 - *PHILOSOPHY* 37 (2007), half volume II, Proceedings of the 1st International Conference “Need, Fate and Freedom in Ancient Greek Philosophy”, Athens, October 2006.
 - *Necessity-Chance-Freedom in Ancient Philosophy*, E. Moutsopoulos – M. Protopapas-Marneli (eds), Athens 2008 (reissue of the conference proceedings).
- 6. The Notion of Citizenship in Ancient Greek Philosophy.
 - *The Notion of Citizenship in Ancient Greek Philosophy*, E. Moutsopoulos – M. Protopapas-Marneli (eds), Athens 2009.
- 7. The Reception of Ancient Greek Philosophers from the beginning to the 17th century.
 - *The Reception of Ancient Greek Philosophers from the beginning to the 17th century*, E. Moutsopoulos – M. Protopapas-Marneli (eds), Athens 2017.
 - VII PROCLUS *Lexicon*, *Ancient Philosophy Lexicon Series*, Dir. R. Radice, edited by E. Moutsopoulos, in collaboration with C. Polycarpou, S. I. S. Brumana and R. Radice, electronic edition by R. Bombacigno, Academy of Athens, Research Centre for Greek Philosophy (RCGP), published with the financial support of “Orizzonti Filosofici”, Centro Leoni, Milan 2018.

The following research projects are currently being conducted at RCGP:

- 8. Translation into Modern Greek and Philosophical Commentary on Aristotle’s *Prior Analytics* (expected date of publication: 2022).
- 9. Cleanthes’ extant fragments. Modern Greek translation and philosophical commentary (expected date of publication: 2022-23).
- 10. Empedocles (expected date of publication: 2022-23).

B. Publications (texts, thinkers and ideas)

RCGP has a rich and continuous publishing work on the Greek philosophical tradition and its history, which is addressed to academicians, students and scholars, but also to a broader audience. Three of its publications are currently selected and distributed as university textbooks, via the EUDOXUS electronic service for students at Greek Universities [Fig. 22].

In particular, the publications of RCGP include:

1. *Philosophia. Yearbook of the Research Centre for Greek Philosophy*

From 1971 until now, 50 volumes have been published with articles, book reviews and announcements by academically renowned Greek and foreign scientists (philosophers, philosophy researchers and intellectuals), as well as four (4) semi-annual volumes (43.II, 46.II, 48.II and 49.II) of lectures on philosophical topics delivered by professors and researchers from Greece and abroad at the Monthly Seminar of RCGP, which is usually held at the “Elli Lambridis” Philosophical Library.

2. *Translations*

- W. G. Tennemann, *Synopsis of the History of Philosophy*. Translated by K. M. Koumas, Preface I.N. Theodoracopoulos, Postface, “Koumas as a philosopher”, R. D. Argyropoulou (first published in 1973), 2nd publication, Athens 2009.
- G. P. Henderson, *The revival of Greek thought 1620-1830: Greek philosophy in the years of Ottoman rule*, translated by F. K. Voros, (first published in 1977; 2nd publ. 1994), 3rd publ. Athens 2009.
- K. Oehler, *Subjectivity and Self-Consciousness in Antiquity*, translated by Ch. Karanasios, foreword by E. Moutsopoulos, Athens 2005.
- G. Reale, *Socrates. Towards the discovery of ancient wisdom*, foreword by E. Moutsopoulos, edited by M. Economidou, Athens 2008.
- J. L. Vieillard-Baron, *Traditions of Platonic philosophy*, translation of a Franco-German text by A. Kelesidou, foreword by E. Moutsopoulos (first published in 1991), 2nd publ. Athens 2009.
- J. M. Gabaude, *The Logocracy of Epicurus*, translated by V. Grigoropoulou, foreword and edited by E. Moutsopoulos, Athens 2009.
- L. Couloubaritsis, *The Physics of Aristotle*, translated by M. Yossi, Athens 2012.
- L. Rossetti, *Introduction to Ancient Philosophy. Philological data and other methodological tools*, translated and edited by A. Tatsi (first published in 2015), 2nd publ. (annotated) Athens 2017.

- A. Brancacci, OIKEIOS LOGOS. *The Philosophy of Language of Antisthenes*, translated by E. Svitzou, edited by D. Toulidou - A. Tatsi, Athens 2016.
- K. Popper, *Unended Quest. An Intellectual Autobiography*, introduction-translation by K. Alatzoglou-Themeli, edited by K. Alatzoglou-Themeli - E. Delli (first published in 2018), 2nd ed., Athens 2019.

3. Monographs and studies

- A. Szabo - E. Macla, *Ἑγκύκλιος - Untersuchungen zur Frühgeschichte der griechischen Astronomie, Geographie und der Sehnentafeln*, Athens 1982.
- A. Kelesidou-Galanou, *The Concept of Salvation in Platonic Political Philosophy*, foreword by G. Michailidou-Nouarou (first published in 1982), 2nd ed., Athens 2009.
- C. Despotopoulos, *Philosophy of History in Ancient Greece*, Athens 1991.
- A. Kelesidou, *Studies in Presocratic Ethics*, foreword by G. Vlachos (first published in 1994), 2nd ed., Athens 2008.
- K. I. Despotopoulou, *Philosophy of Plato*, Athens 1997.
- E. Moutsopoulos, *Philosophie de la culture grecque*, Athens 1998.
- G. Mitsopoulos, *The Problem of the Notion of Legal Fiction*, Athens 2001.
- T. Pentzopoulou-Valala, *The Challenge of the Sceptics*, Athens 2002.
- Andrea Kalvou, *Philosophy Courses*, (Published by P. Alimbrantis, Edited by L. Benakis, Preface by E. Moutsopoulos), Athens 2002.
- E. Moutsopoulos, *Structure, Presence and Functions of kairos in Proclus*, Athens 2003.
- E. Moutsopoulos, *The Philosophy of Music in the system of Proclus*, Athens 2004.
- E. Moutsopoulos, *L'univers des valeurs, univers de l'homme*, Athens 2005.
- M. Renieri, *Research and Conjectures on Vlossios and Diophanes*, foreword by K. Despotopoulos, introduction by A. Arambatzis - C. Baloglou, Athens 2005.
- E. Moutsopoulos, *Thought, Culture, Action. Studies in the Theory of Values and its Greek Sources*, Athens 2006.
- G. Mitsopoulos, *Themes of general theory and logic of the law*, Athens 2006.
- G. Arambatzis, *Education and Science in Michael of Ephesus. On the parts of animals, A 1,3-2,10*, Athens 2006.
- K. Adamou-Fika, *The Ideal States. From Plato to Campanella*, Athens 2006.
- E. Moutsopoulos, *Kairicité et liberté*, Athens 2007.
- G. Mitsopoulos, *Topics, rhetorical novelty and science of law*, Athens 2008.
- E. Moutsopoulou, *The Aesthetics of Ethics*, Athens 2009.
- E. Roussou, *Contribution to the bibliography of Presocratic concepts*, Athens 2010.
- E. Moutsopoulos, *Reflets et résonances du kairos*, Athens 2010.

- T. Pentzopoulou-Valala, *In the footsteps of the ancient Greek philosophers*, Athens 2011.
- E. Moutsopoulos, *Le problème de l'imaginaire chez Plotin*, reprint, Athens 2011.
- T. A. Szlezák, *What Europe owes to the Greeks* (first published in 2012), 2nd ed., Athens 2014.
- E. Moutsopoulos, *Philosophical Suggestions*, Athens 2013.
- G. Mitsopoulos, *Le déclin de la philosophie analytique du droit*, Athens 2013.
- M. Renieri, *Armonie della storia dell'umanità*, Athens 2014.
- T. Pentzopoulou-Valala, *Studies in Philosophy and Aesthetics*, Athens 2019.

4. Translations and publications of Greek philosophical texts

- I. N. Theodoracopoulos, *Plato's Theaetetus, Introduction, ancient and modern Greek text* (first published in 1980), Athens 2017⁴.
- A. Kelesidou, *The Philosophy of Xenophanes. Metric Modern Greek translation of excerpts. Bibliography*, Foreword by E. Moutsopoulos, Athens 1996.
- Petrou Vraïla-Armeni, *Philosophical works*. Volume G', E. Moutsopoulos – E. Margaritou-Andrianessi (eds), *Corpus Philosophorum Graecorum Recentiorum* I7, Athens 1998.
- Démétrius Cydonès, *Thomas d'Aquin: Somme Théologique, traduite en grec*, volume 19, A. Glykofrydi-Leontsini, I. D. Spyralatos (eds), Athens 2011.
- L. Benakis, *Iamblichou. Protrepticus on Philosophy*, introduction-translation-interpretation, Athens 2012.
- Démétrius Cydonès, *Thomas d'Aquin: Somme Théologique, traduite en grec*, volume 20, A. Glykofrydi-Leontsini, I. D. Spyralatos (eds), Athens 2019.

5. Thematic collective volumes

- *Necessity-Chance-Freedom in Ancient Philosophy*, Athens 2006, *Proceedings of the 1st Philosophy Conference*, E. Moutsopoulos – M. Protopapas-Marneli (eds), (first published in 2006), 2nd ed., Athens 2008.
- *The Notion of Citizenship in Ancient Greece, Proceedings of the 2nd Conference of Philosophy, Alexandria, Patriarchate of Alexandria, 2010*, E. Moutsopoulos – M. Protopapas-Marneli (eds), Athens, 2011.
- *Plato, Poet and Philosopher: In memory of Ioannis N. Theodoracopoulos. Proceedings of the 3rd International Conference of Philosophy, Magoula - Sparta, 26-29 May 2011*, E. Moutsopoulos – M. Protopapas-Marneli (eds), (first published in 2013), 2nd ed., Athens 2014.
- *Aristotle, timeless and scientifically timely, 2400 Years of Aristotle, International Conference*, E. Moutsopoulos – M. Protopapas-Marneli (eds), Athens 2018.

- *Aristotle and Medicine. Proceedings of the One-Day Conference (May 17, 2017, IIVEAA-KEEF)*, Athens 2020.

C. Seminars, workshops and conferences

The Monthly Philosophical Seminar started in 2008 on a pilot basis, at the initiative of the Director of Research and Director of RCGP, Dr. Maria Protopapas-Marneli, and is officially held continuously since 2009 at the “Elli Lambridis” Philosophical Library (occasionally at the Academy of Athens East Hall) with presentations on philosophical issues delivered by professors and researchers from Greece and abroad. The seminar is also attended by postgraduate students and it is open to the public.

(<http://www.academyofathens.gr/el/research/centers/philosophy/seminar>).

During the coronavirus pandemic, due to the emergency conditions related to the sanitary restrictions, the seminars are conducted online uninterruptedly.

Indicative Lectures

1. David Charles (Oxford University), *Aristotle, On Taste and Touch*, 09/12/2009 (East Hall) [Fig. 13]
2. Malcolm Schofield (St John's College, Cambridge), *Aristotle's Political Anthropology*, 28/04/2010 (East Hall)
3. John Cooper (Princeton University), *Notes on Aristotle's Theory of Agents' Responsibility for What They Do*, 27/04/2011.
4. Denis O'Brien (Trinity College Dublin - Trinity Plato Center), *On Empedocles*, 14/03/2012.
5. Rusty Jones (Harvard University), *Felix Socrates? (Was Socrates Happy?)*, 2012 (East Hall).
6. Thomas A. Szlezák (Universität Tübingen), *A rather unknown text: Plato's criticism of writing (Phaedrus 274 b - 278 e)*, 29/05/13.
7. Vincent Müller (Technical University Eindhoven & University of Leeds & Alan Turing Institute), *Is the Brain a Computer?*, 5/11/2014.
8. David Sedley (Christ's College, Cambridge), *On the iconography of the School of Athens painting at the Academy*, 6/6/2018 (East Hall).

The Conferences and Meetings organised by RCGP are supported by the Academy of Athens and through sponsorships from the private and Public sector.

- 2006 (20/10), 1st International Conference, *Chance, Freedom and Necessity*, Athens, University of Athens, Drakopoulos Hall. [Fig. 14]

- (Sponsored by Sony Hellas, the Organisation of Youth and Sports of the Ministry of Education, Pepsico-Ivi and the Academy of Athens).
- 2010 (4-6/03), 2nd International Conference, Egypt, Alexandria, Patriarchate of Alexandria, *The notion of citizenship in Greek philosophy*. [Figs. 15-16]
(Sponsored by the National Bank of Greece and the Hellenic Estate Company).
 - 2010 (18-20/11), Co-organisation with the University of Cyprus, International Conference, *Philosophy, Literature, Philology-Philosophy, Literature, Scholarship Transmission and Fragments*, Hilton, Cyprus. [Figs. 11-12]
(Sponsored by the University of Cyprus).
 - 2011 (26-29/03), 3rd International Conference, Sparta, Magoula at the I. N. Theodoracopoulos Foundation, *Plato, Poet and Philosopher-Platonic Dialogues. In memory of Ioannis N. Theodoracopoulos: 30 years after his death*. [Figs. 17-19]
(Sponsored by Petros Haris's Foundation).
 - 2012, Lecture at the East Hall of the Academy of Athens, in the course of the Monthly Philosophical Seminar, by Rusty Jones, (Harvard University), *Felix Socrates; (Was Socrates Happy?)*.
(Sponsored by the Rotary Club of Greece).
 - 2017 (14-17/01), 4th International Conference, East Hall of the Academy of Athens, *Aristotle, Timeless and Scientifically Timely*. [Fig. 20]
(Sponsored by the Stavros Niarchos Foundation and the Finnish Institute at Athens).
 - 2017 (17/05), Conference of the Research Centre for Greek Philosophy and the BioMedical Research Foundation of the Academy of Athens, *Aristotle and Medicine*, in the amphitheatre of BRFAA.
(Sponsored by BRFAA, which also financed the publication of the Proceedings).
 - 2018 (7-9/6), *Symposium Thomisticum* in Athens, Greece. The third *Symposium Thomisticum*. Co-organised by the Research Centre for Greek Philosophy and the University College Dublin at the initiative of Professor Fran O'Rourke (East Hall of the Academy of Athens).
(Supported and sponsored by the University College Dublin).
 - 2019, International Conference of the Research Centre for Greek Philosophy, Athens, "Elli Lampridis" Philosophical Library, *Hellenistic Philosophy, its representatives, and reception*.
 - 2019, East Hall of the Academy of Athens, *Karl Popper. Unended Quest - Event for the 25 years since the death of the great philosopher*. [Fig. 21]

D. Continuous cooperation with greek and foreign universities, research centres, academic institutes and specialists in the history of greek philosophy.

With the aim to expand its network of international collaborations for the promotion and deepening of research in the field of Greek philosophy, RCGP also co-organises seminars and lecture series with Academic and Research Institutions from Greece and abroad, such as the National and Kapodistrian University of Athens (UOA), the British School at Athens, the Finnish Institute at Athens, the Netherlands Institute at Athens, the University of Vienna, the French National Centre for Scientific Research (CNRS), the University of Paris-Sorbonne, the University of Oxford, the Society for Pre-Socratic Philosophy, Eleatica (Elea-Veglia, Italy). At the same time, the researchers of RCGP participate in international research programs and workshops on topics within their field of research, with important scientific results.

For example, RCGP has participated in:

- the co-organisation with the British School at Athens of an annual two-day Seminar delivered by distinguished professors of Greek Philosophy that has been taking place since 2011;
- the co-organisation with the Netherlands Institute at Athens of a lecture series in 2017 on “Concepts of Crisis”, and in 2021 on “Aspects of the Intellectual and Social History of the Greek Revolution”.

E. Internships of young scientists

The cooperation with the Public Universities in Greece is also reflected in the ever-increasing number of graduate students (from Classical Philology, Philosophy, History and Philosophy of Science), who since 2018 select RCGP, through the ATLAS digital platform, to carry out their internship, promoting their cognitive and research skills through their active participation in the scientific work of RCGP. From 2018 until today, fifteen students interested in Greek philosophy have successfully completed their internship at RCGP.

Main achievements of the Research Center for Greek Philosophy in 2021

Publications

1. *Philosophia. Yearbook of the Research Center for Greek Philosophy*, vol. 50 (2020).
2. Republication of *Philosophia*, vol. 43 (2013).

3. Reedition of L. Rossetti, *Introduction to Ancient Philosophy. Philological data and other methodological tools*, translated and edited by A. Tatsi.
4. Republication of I. N. Theodorakopoulos, *Plato's Theaetetus. Introduction, ancient and modern Greek text*.
5. The RCGP's edition entitled *The reception of ancient Greek philosophers from the beginning to the 17th century*, E. Moutsopoulos – M. Protopapas-Marneli (eds), Athens 2017, was included by the Democritus University of Thrace as university textbook, via the EUDOXUS electronic service for students at Greek Universities.

Seminars

1. Weekly web seminar in the course of the research project Cleanthes' fragments. Modern Greek translation and philosophical commentary".
2. Weekly web seminar in the frame of the research programme "Translation into Modern Greek and Philosophical Commentary on Aristotle's *Prior Analytics*".
3. Monthly web seminar of RCGP, for the general and academic public, with the participation of Greek and foreign speakers. The most recent presentations include:
 - 20/1/2021, Andrei Timotin, *La prière dans la tradition néoplatonicienne*.
 - 24/1/2021, Danilo Costa Leite, *Cleanthes' corpus and commentary: an ongoing work*.
 - 27/1/2021, Katerina Ierodiakonou, *Perceptual Attention and Reflective Awareness in the Aristotelian Tradition*.
 - 2/6/2021, Alexandra Deligiorgi, *The Heideggerian deconstruction of Platonism, the forerunner of Antiplatonism in the so-called metaphilosophy*.
 - 9/6/2021, Xanthippi Bourlogianni, *From the 'appears' in the image: the imagination in Plato's Theaetetus and Sophist*.

Co-organisation of lectures

1. Two-day online seminar, in collaboration with the British School at Athens. Invited speaker: Voula Tsouna (UC Santa Barbara),
 - 31/3/2021, *Issues in Epicurean philosophy of mind and science: The Epicurean notion of 'ἐπιβολή'*.
 - 1/4/2021, *Issues in Epicurean philosophy of mind and science: The method of multiple explanations in Epicureanism*.
2. Online lecture series entitled "Aspects of the Intellectual and Social History of the Greek Revolution", in collaboration with the Netherlands Institute at Athens and the participation of Greek and Dutch scholars:

- 10/5/2021, I. Political agenda and national awareness in the horizon of the Late Enlightenment and the 19th c. revolutionary movements in Europe.
- George Kalpadakis, *Enlightenment visions of the post-Ottoman Balkans: Rhigas and Kapodistrias*
 - Annelien de Dijn, *Key aspects of French political thought as a link between the Greek war of Independence and the French Revolution*.
 - Gianna Tzourmana, *Constitutionalism and Reform Politics in the Age of Revolutions*.
- 10/6/2021, II. The concept and the reality of revolution in the 21th century. Philosophical, political, and anthropological challenges.
- Nicholas Vrousalis, *Was the Greek Revolution of 1821 “Bourgeois”?*
 - Judith Vega, *The fragmented revolution? Struggles against domination and the defence of the lifeworld*.
 - Anna Machaira, *Celebrating revolutions, adjusting definitions*.
3. Workshop (15/10/2021) on *Classical Wisdom and Modernity within the vision of National Rebirth. Revival and impact of ancient Greek philosophy in the Neo-hellenic Enlightenment* in the Eastern Hall of the Academy of Athens, in collaboration with the Netherlands Institute of Athens.

Main future objectives of RCGP

1. The continuation and further promotion of scientific knowledge in the field of Greek philosophy.
2. The amplification of the diffusion of the research work produced within RCGP to the international academic community and the general public, through the targeted use of Digital Humanities tools, including the online version of *Philosophia*, the digitization of selected RCGP's publications and the creation of an audiovisual archive of lectures given at the Centre.
3. The broadening of scientific extroversion together with the expansion of collaboration networks with other Research Centers of the Academy of Athens, Greek universities and academic institutions, on an interdisciplinary basis, in Greece and abroad. The expansion of the collaboration networks aims at the mobility of researchers, the deepening of their research projects and mainly the improvement of international partnerships in research programs and the organisation of interdisciplinary “Summer Schools” with the participation of specialists of international renown.



ΕΦΗΜΕΡΙΣ ΤΗΣ ΚΥΒΕΡΝΗΣΕΩΣ

ΤΟΥ ΒΑΣΙΛΕΙΟΥ ΤΗΣ ΕΛΛΑΔΟΣ

ΕΝ ΑΘΗΝΑΙΣ
ΤΗ 24 ΣΕΠΤΕΜΒΡΙΟΥ 1966

ΤΕΥΧΟΣ ΠΡΩΤΟΝ

ΑΡΙΘΜΟΣ ΦΥΛΛΟΥ
190

ΠΕΡΙΕΧΟΜΕΝΑ

ΝΟΜΟΘΕΤΙΚΑ ΔΙΑΤΑΓΜΑΤΑ

4545. Περί τροποποιήσεως και συμπληρώσεως των περί της Ακαδημίας Αθηνών ισχυουσών διατάξεων. 1
4546. Περί τροποποιήσεως και συμπληρώσεως του Ν. 3217/1955 «περί αγοράς υπό του Δημοσίου εκτάσεων του ΟΔΕΠ». 2

ΝΟΜΟΘΕΤΙΚΑ ΔΙΑΤΑΓΜΑΤΑ

ΝΟΜΟΘΕΤΙΚΟΝ ΔΙΑΤΑΓΜΑ ΥΠ' ΑΡΙΘ. 4545

Περί τροποποιήσεως και συμπληρώσεως των περί της Ακαδημίας Αθηνών ισχυουσών διατάξεων.

ΚΩΝΣΤΑΝΤΙΝΟΣ ΒΑΣΙΛΕΥΣ ΤΩΝ ΕΛΛΗΝΩΝ

Έχοντας υπό όψει τὰς διατάξεις του άρθρου 35 του Συντάγματος και την από 1 Σεπτεμβρίου 1966 σύμφωνον γνώμη της κατά την παράγραφο 2 του αὐτοῦ άρθρου 35 Ειδικῆς Επιτροπῆς ἐκ Βουλαιῶν, προέδρου τοῦ Ἡμετέρου Ὑπουργικοῦ Συμβουλίου, ἀπεφασίσαντες καὶ διατάξαντες:

Ἄρθρον 1.

Τὰ Ἐπιστημονικά Ἀρχεῖα καὶ τὰ Γραφεῖον Ἑρευνῶν τῆς Ακαδημίας Αθηνῶν, τὰ ἰερούμενα ὑπὸ αὐτῆς ἢ ὑπαχθέντα εἰς αὐτήν, μετανομαζόνται ὡς ἀκολούθως:

- 1) Τὸ Ἀνταρχαϊκὸν Ἀρχεῖον εἰς Κέντρον Ἑρευνῆς τῆς Ἑλληνικῆς Ἀνταρχαίης.
- 2) Τὸ Ἱστορικὸν Λεξικὸν τῆς Ἑλληνικῆς Γλώσσης εἰς Κέντρον Συντάξεως τοῦ Ἱστορικοῦ Λεξικοῦ τῆς Νέας Ἑλληνικῆς Γλώσσης.
- 3) Τὸ Μεσαιωνικὸν Ἀρχεῖον εἰς Κέντρον Ἑρευνῆς τοῦ Μεσαιωνικοῦ καὶ Νέου Ἑλληνισμοῦ.
- 4) Τὸ Ἀρχεῖον Ἱστορίας Ἑλληνικοῦ Δικαίου εἰς Κέντρον Ἑρευνῆς τῆς Ἱστορίας τοῦ Ἑλληνικοῦ Δικαίου.
- 5) Τὸ Ἀρχεῖον Ἐκδόσεως Ἑλλήνων Συγγραφέων εἰς Κέντρον Ἐκδόσεως Ἑργῶν Ἑλλήνων Συγγραφέων ἀπὸ τῶν ἀρχαίων χρόνων μέχρι τῆς ἀλώσεως τῆς Κωνσταντινουπόλεως.
- 6) Τὸ Ἱστορικὸν Ἀρχεῖον Νεωτέρου Ἑλληνισμοῦ εἰς Κέντρον Ἑρευνῆς τῆς Ἱστορίας τοῦ Νεωτέρου Ἑλληνισμοῦ.
- 7) Τὸ Γραφεῖον Ἑρευνῶν καὶ Ὑπολογισμῶν εἰς Κέντρον Ἑρευνῶν Ἀστρονομίας καὶ Εφαρμοσμένων Μαθηματικῶν.

Αἱ 4 Κλάσεις Κέντρον Ἑρευνῆς τῆς Ἑλληνικῆς Φιλολογίας.

1 ὅτις: Διευθυντοῦ ἐπὶ βιβλίου 2φ—1φ.

4 ὅτις: συντακτῶν ἐπὶ βιβλίου 7φ—2φ.

Ἄρθρον 2.

1. Ἐρβόνται παρὰ τῇ Ακαδημίᾳ Αθηνῶν τὰ κατωτέρω Ἐπιστημονικά Κέντρα, Ἀρχεῖα καὶ Γραφεῖα, τὰ ὅποια, ὡς καὶ πάντα τὰ Ἐπιστημονικά Κέντρα καὶ Ἀρχεῖα τῆς Ακαδημίας, εἶναι ἀνσπαστα ἐπιστημονικά τμήματα αὐτῆς:

1) Κέντρον Ἑρευνῆς τῆς Ἑλληνικῆς Φιλολογίας.

2) Ἀρχεῖον Τοπωνυμῶν καὶ Κυρίων Ὑποτύπων (προσπερτιμένον εἰς τὸ Κέντρον Συντάξεως Ἱστορικοῦ Λεξικοῦ τῆς Νέας Ἑλληνικῆς Γλώσσης καὶ ἔχον ὡς σκοπὸν τὴν συλλογὴν καὶ μελέτην τῶν Ἑλληνικῶν τοπωνυμῶν, κυρίων ὀνομάτων καὶ οἰκονομικῶν ἐπιθέτων).

3) Γραφεῖον Ἐπιστημονικῶν Ὁρῶν καὶ Νεολογισμῶν.

2. Ἐκάστη τῶν διὰ τῆς προηγουμένης παραγράφου ἱερουμένων ὑπηρεσιῶν τελεῖ ὑπὸ τὴν ἐποπτείαν Ἑρευναικῆς Ἐπιτροπῆς, ἐλεγερομένης καὶ ἀνανεωμένης κατὰ τὰς διατάξεις τῶν άρθρων 10 καὶ 12 τοῦ Ν. 4398/1929 «περί καρέσεως καὶ τροποποιήσεως τῆς ἀπὸ 18 Μαρτίου 1926 Συντακτικῆς Ἀποφάσεως περὶ Ὁργανισμοῦ τῆς Ακαδημίας Αθηνῶν».

Τὰ τοῦ σκοποῦ εἰδικότερον καὶ τὰ τῆς λειτουργίας τῶν ὑπηρεσιῶν τούτων καθέως καὶ τὰ ἀφορώντα εἰς τὴν σύνθεσιν καὶ τὴν λειτουργίαν τῶν οἰκείων Ἑρευναικῶν Ἐπιτροπῶν αὐτῶν δὲ καθορίζονται δι' Ἐσωτερικὸν Κανονισμὸν, συντασσόμενον, φερόμενον καὶ τροποποιούμενον κατὰ τὰ ἄρθρα 112 τοῦ Ν. 4398/1929.

3. Ἡ διάταξις τοῦ άρθρου μόνου τοῦ Ν. Δ. ὑπ' ἀριθμὸν 1899/1942 (ΦΕΚ Α' ἀριθ. 271) ἀρκεῖται καὶ ἐπὶ τοῦ προσωπικοῦ τῶν διὰ τοῦ παρόντος ἱερουμένων ὡς καὶ πάντων τῶν Κέντρων, Ἀρχείων καὶ Γραφείων τῆς Ακαδημίας Αθηνῶν.

4. Ἐκαστον τῶν Ἐπιστημονικῶν Κέντρων, Ἀρχείων καὶ Γραφείων τῆς Ακαδημίας Αθηνῶν δύναται νὰ τελῇ ὑπὸ τὴν ἄμεσον ἐποπτείαν Ἀκαδημαϊκοῦ, ἐρριζομένου καὶ διεσέως ὑπὸ τῆς Συγκλήτου. Συγκρατηθεὶς τῆς οἰκείας Ἑρευναικῆς Ἐπιτροπῆς, ὁ Ἐπίτιμος ἐρίεται ἐκ τῶν μελῶν τῆς Ἐπιτροπῆς, μετὰ πρότερον αὐτῆς ὅπως ἐνεργεῖ ἐξ ἀνάγκης τῆς Ἐπιτροπῆς, ἡ δὲ θῆσις τοῦ εἶναι κατ'ὅρους καὶ ἰσχύοντος πρὸς τὴν θῆσιν αὐτῆς.

Ἄρθρον 3.

1. Αἱ θέσεις τοῦ προσωπικοῦ τῆς Ακαδημίας Αθηνῶν ὀρίζονται καὶ διαρβύονται κατὰ κατηγορίας, κλάδους καὶ βαθμοῦ ὡς ἀκολούθως:

τῆς κρινόμενης. Ἡ ἀπόρριξις τῆς Συγκλήτου λαμβάνεται μετὰ γνώμην τῆς οἰκείας Ἑρευναικῆς Ἐπιτροπῆς ἢ, ἐν ἀλλοίᾳ τοιαύτης Ἐπιτροπῆς, τοῦ οἰκείου Ἀκαδημαϊκοῦ Ἐπόπτου.

3. Αἱ ἰσχύοντες διατάξεις περὶ ὀρίου ηλικίας διὰ τὸν διο-

Fig. 1. Greek Government Gazette, Decree-Law concerning the Founding of the Research Centre for Greek Philosophy of the Academy of Athens (24/9/1966).



Fig. 2. Ioannis N. Theodoropoulos
Academician, Secretary General of the Academy of Athens (1966-1981) and founder of the
Research Centre for Greek Philosophy (RCGP) of the Academy of Athens.

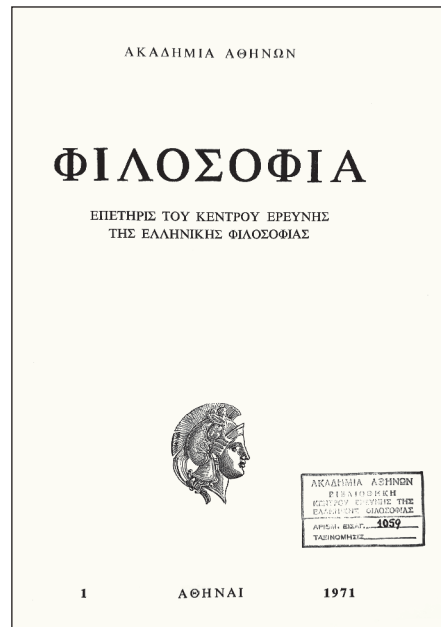


Fig. 3. Frontispiece of the first volume of *Philosophia. Yearbook of the Research Centre for Greek Philosophy of the Academy of Athens* (1971).

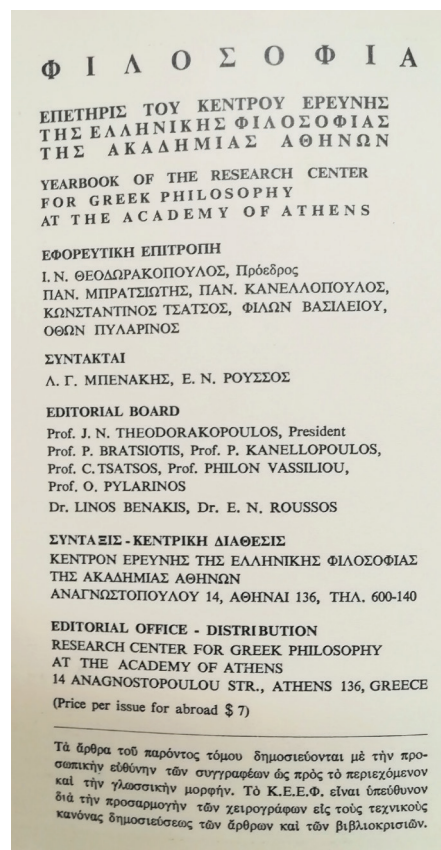


Fig. 4. Inner cover of the first volume of *Philosophia. Yearbook of the Research Centre for Greek Philosophy of the Academy of Athens* (1971).

Η ΕΚΔΟΣΙΣ ΤΗΣ «ΦΙΛΟΣΟΦΙΑΣ»

Ἐχρησάθησαν ἐξ περίπου ἑτη ἀπὸ τῆς εἰσόδου ὁρισμένον νέων μελῶν εἰς τὴν Ἀκαδημίαν Ἀθηνῶν, διὰ τὴν ἰδρυθῆναι τὸ 1966 τὸ Κέντρον Ἑρεῦνης τῆς Ἑλληνικῆς Φιλοσοφίας, τὸ ὁποῖον ἔχει τὸν προορισμὸν νὰ μελετήσῃ ἐξ ὑπαρχῆς τὰ προβλήματα τὰ ἀναγόμενα εἰς τὸν χώρον τῆς ἑλληνικῆς Φιλοσοφίας. Μετὰ τὴν ἑναρξιν τῆς λειτουργίας του — καὶ τοῦτο ἔγινε μόνον τὴν ἁνοίξιν τοῦ 1970 — ἡ πρώτη σκέψις τῶν μελῶν τῆς Ἐφορευτικῆς Ἐπιτροπῆς ἦτο ἡ ἐκδοσις Ἐπιστημονικῆς Ἐπετηρίδος, ἡ ὁποία νὰ καλύψῃ τὸ μέγα κενὸν ποὺ ὑπάρχει εἰς τὴν ἑλληνικὴν ἐπιστημονικὴν βιβλιογραφίαν εἰς τὸν τομέα τῆς Φιλοσοφίας.

Τὸ κενὸν τοῦτο νοεῖται καὶ ἀπολύτως καὶ σχετικῶς πρὸς συγκεκριμένην ἐποχὴν, πρὸ τοῦ Β' παγκοσμίου πολέμου, ὅποτε ἐξεδίδετο εἰς Ἀθήνας τὸ «Ἀρχεῖον Φιλοσοφίας καὶ Θεωρίας τῶν Ἐπιστημῶν» (1929-1940). Δὲν εἶναι ὑπερβολὴ νὰ λεχθῇ σήμερα, ὅτι ἡ ἐκδοσις τοῦ Περιодиκοῦ ἐκείνου ἐνημείωσεν ἐποχὴν εἰς τὴν πνευματικὴν ζωὴν τοῦ τόπου. Τοῦτο ἀποδεικνύεται καὶ ἀπὸ τὴν συνεχισομένην ζήτησίν του. Τὸ γεγονός αὐτὸ ὑπῆρξεν ἄλλωστε καὶ ὁ ἀντικειμενικὸς λόγος, διὰ τὸν ὁποῖον περιελήφθη εἰς τὸν παρόντα τόμον, τὸν πρῶτον φιλοσοφικῆς περιοδικῆς ἐκδόσεως ἀπὸ τῆς ἐποχῆς ἐκείνης, Ἀναλυτικὸν Ἐνδρετήριον τῆς ἑλῆς τῶν 11 τόμων τοῦ «Ἀρχείου».

Ἐνῶ ὅμως τὸ «Ἀρχεῖον Φιλοσοφίας καὶ Θεωρίας τῶν Ἐπιστημῶν» ὑπῆρξεν ἐκδοσις μιᾶς ὁμάδος, ἡ «Φιλοσοφία» εἶναι ἐκδοσις τοῦ ἀνωτάτου πνευματικοῦ Ἰδρύματος τῆς χώρας, τῆς Ἀκαδημίας Ἀθηνῶν. Δὲν ἀποτελεῖ βεβαίως ἁπλὴν σύμπτωσιν τὸ γεγονός ὅτι τρία μέλη τῆς Ἐφορευτικῆς Ἐπιτροπῆς τοῦ Κέντρου Φιλοσοφίας ὑπῆρξαν τὰ ἰδρυτικὰ μέλη τοῦ «Ἀρχείου». Ἀποτελεῖ ὅπωσδήποτε ὁμως τομὴν ἡ νέα ἐκδοσις καὶ ἀπὸ τῆς ἀπώσεως τῆς ἐπιστήμης ἀναγνωρίσεως τῆς ἀνάγκης καλλιέργειας τῆς Φιλοσοφίας εἰς τὴν Ἑλλάδα καὶ ὑπὸ τὴν ἐννοίαν τῆς συστηματικῆς ἐρεῖνης. Ἡ «Φιλοσοφία»

θέλει νὰ εἶναι πράγματι ὁ χώρος ἐκείνος, ὁ ὁποῖος θὰ προσφέρῃ στέγην εἰς ὅλους τοὺς ἀξιολόγους, νέους κυρίως, ἐρευνητὰς τῶν φιλοσοφικῶν προβλημάτων τῆς ἐποχῆς μας καὶ τοῦ παρελθόντος. Καὶ ἐπειδὴ ὑπάρχοντι πολλοὶ ἀξιόλογοι Ἕλληνες ἐπιστήμονες ἀσχολούμενοι μὲ τὴν Φιλοσοφίαν ἐπὶ τὸς καὶ ἐκτὸς τῆς Ἑλλάδος, ἡ «Φιλοσοφία» φιλοδοξεῖ νὰ ἀποτελέσῃ τὸ βῆμα διὰ αὐτῶν τῶν πνευματικῶν δυνάμεων τοῦ ἔθνους.

Πέραν τούτου ἡ Ἐπετηρὶς ἔρχεται νὰ καλύψῃ καὶ τὴν βασικὴν ἀνάγκην τῆς ἐπικοινωνίας τοῦ Κέντρου Ἑρεῖνης τῆς Ἑλληνικῆς Φιλοσοφίας μὲ ἀντίστοιχα ἐπιστημονικὰ Ἰδρύματα τοῦ ἐξωτερικοῦ διὰ τῆς ἀνταλλαγῆς τῆς ἐκδόσεώς του. Τοῦτο σημαίνει ταυτοχρόνως καὶ προβολὴν τῆς ἑλληνικῆς παρουσίας εἰς ἕνα χώρον, τὸν ὁποῖον ἐλάμπρυναν τόσα ὀνόματα τῆς Ἱστορίας τῆς Ἑλληνικῆς Φιλοσοφίας. Ἐντεῦθεν ἡ «Φιλοσοφία» ἐτοιμίζεται τὸ βαρὺ χρέος, νὰ ἀνανεώσῃ καὶ νὰ συνεχίσῃ τὴν μακρὰν ἑλληνικὴν παράδοσιν εἰς τὸν χώρον αὐτὸν τοῦ πνεύματος. Δι' αὐτὸ καὶ καλεῖ ὅλας τὰς νέας δυνάμεις τοῦ τόπου νὰ συμβάλουν εἰς τὴν ἐκπλήρωσιν αὐτοῦ τοῦ χρέους.

Ἡ Ἐφορευτικὴ Ἐπιτροπὴ τοῦ Κέντρου Ἑρεῖνης τῆς Ἑλληνικῆς Φιλοσοφίας τῆς Ἀκαδημίας Ἀθηνῶν δοκιμάζει ἀπὸ τοῦδε βαθεῖαν ἱκανοποίησιν, διότι ἤδη εἰς τὴν πρώτην πρόσκλησίν της ἀνταπεκρίθησαν δυνάμεις τῆς ἑλληνικῆς διασποράς καὶ τοῦ ἐσωτερικοῦ εἰς βαθμὸν τὸσον ἱκανοποιητικόν, ὥστε νὰ δικαιωθῇ ἡ ἀνάγκη τῆς ἐκδόσεως αὐτῆς. Ἡ πρώτη ἐμφάνισις τῆς Ἐπετηρίδος πρέπει νὰ θεωρηθῇ κατὰ ταῦτα ὡς μία πρώτη ἀπογεωγραφικὴ δυνάμειν, ἡ ὁποία εἰς τὰ προσεχῆ ἑτη καὶ ἀκριβεστέρα θὰ εἶναι καὶ πλέον ὑπεύθυνος.

ΙΩΑΝΝΗΣ Ν. ΘΕΟΔΩΡΑΚΟΠΟΥΛΟΣ

Πρόεδρος τῆς Ἐφορευτικῆς Ἐπιτροπῆς
τοῦ Κέντρου Ἑρεῖνης τῆς Ἑλληνικῆς Φιλοσοφίας

Figs. 5 and 6. Foreword by I. N. Theodoracopoulos to the first volume of *Philosophia* (1971).



Fig. 7. I. N. Theodoracopoulos (then, Secretary General of the FISP) with the invited speakers at the 2nd International Symposium on *Reflection on Death*, Magoula-Sparta, 1976 (from the photographic archive of G. Alatzoglou-Themeli).



Fig. 8. From the 2nd International Symposium on *Reflection on Death*, organised by I. N. Theodoracopoulos, Magoula-Sparta, 1976. In the front row of the audience, second from left, appears Karl Popper (from the photographic archive of G. Alatzoglou-Themeli).



Fig. 9. The first researchers and the Director of RCGP, Linos Benakis, at the 2nd International Symposium on *Reflection of Death*, Magoula-Sparta, 1976. From left: Anna Kelesidou, Myrto Dragona-Monachou, Grammatiki Alatzoglou-Themeli (from the photographic archive of G. Alatzoglou-Themeli).



Fig. 10. Evangelos Roussos, researcher at RCGP since 1970.



Fig. 11. Evangelos Moutsopoulos, Academician and Supervisor of RCGP (1997-2021), at the International Conference on *Philosophy, Literature, Philology. Tradition and Excerpts*, organised by the University of Cyprus in collaboration with RCGP and the Research Centre of Greek and Latin Literature of the Academy of Athens, Nicosia, 2010.

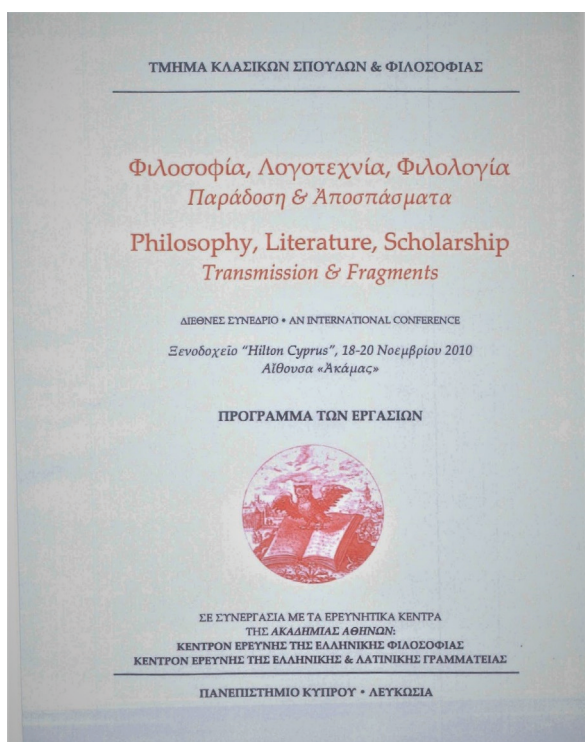


Fig. 12. Poster of the International Conference on *Philosophy, Literature, Scholarship. Transmission and Fragments*, Cyprus, 2010.



Fig. 13. From left: Professor David Charles, Dr. Maria Protopapas-Marneli (Director of RCGP), the Academician Konstantinos Despotopoulos (President of the Supervising Committee of RCGP), and David Landsman (Ambassador of Great Britain in Athens) at the opening lecture of the “Monthly Philosophical Seminar” of RCGP in 2009, in the East Hall of the Academy of Athens.

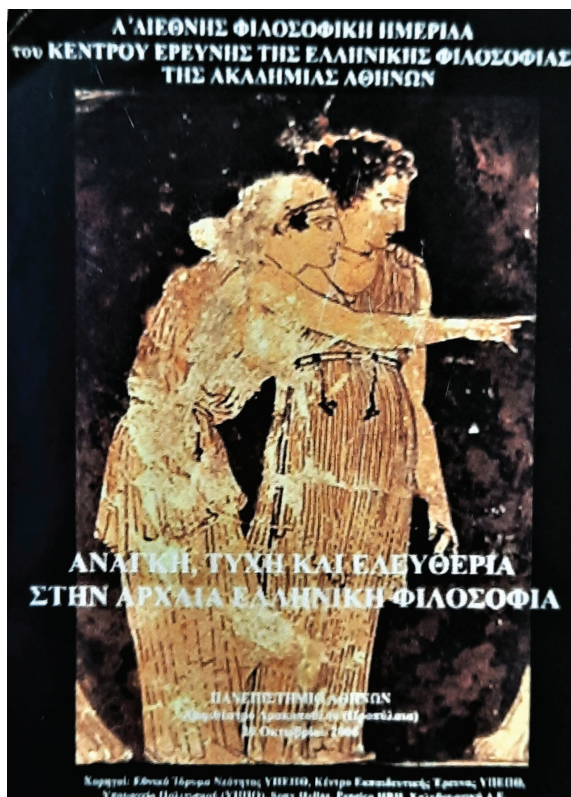


Fig. 14. Poster of the 1st International Conference of Philosophy organised by RCGP on *Need, Fate and Freedom in Ancient Greek Philosophy*, Athens, University of Athens, 2006.



Fig. 15. Opening of the 2nd International Conference of Philosophy of RCGP on *The Notion of Citizenship in Greek Philosophy*, by the Director of RCGP, Maria Protopapas-Marneli, Alexandria, Greek Orthodox Patriarchate of Alexandria, 2010

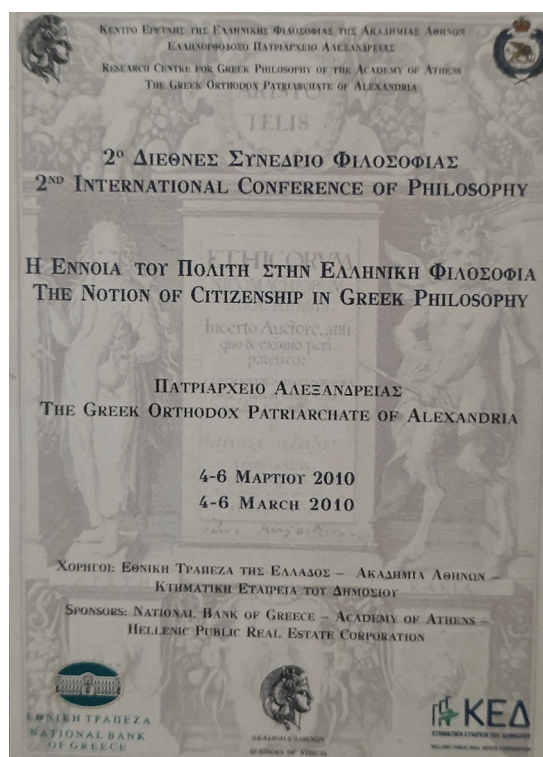


Fig. 16. Poster of the 2nd International Conference of Philosophy of RCGP, Alexandria, 2010.

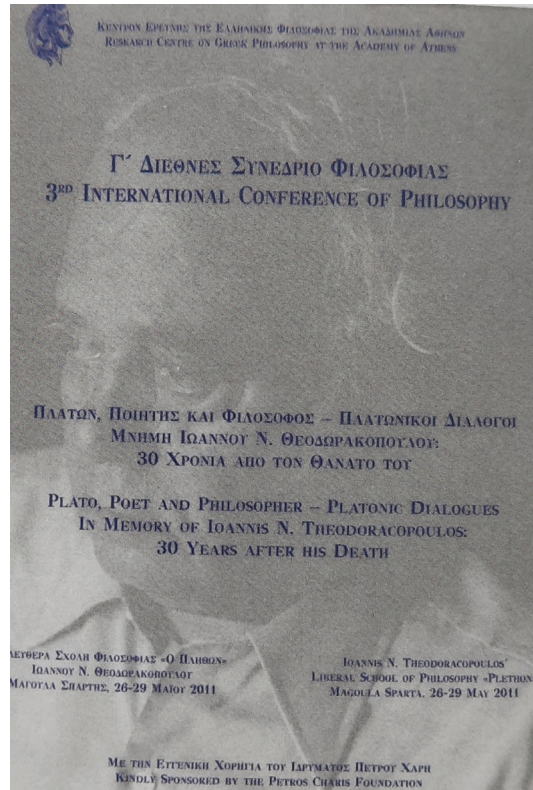


Fig. 17. Poster of the 3rd International Conference of Philosophy of RCGP on *Plato, Poet and Philosopher - Platonic dialogues. In Memory of Ioannis N. Theodoracopoulos: 30 years after his death, Free School of Philosophy "Plethon", Magoula-Sparta, 2011.*



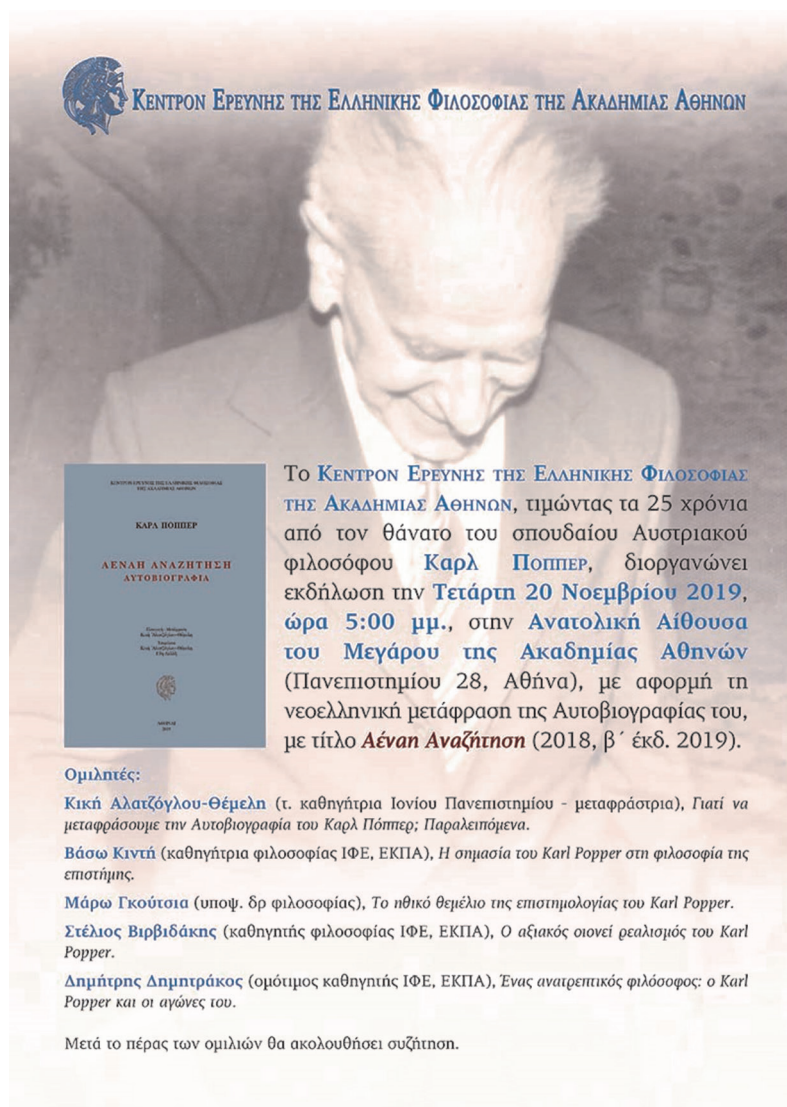
Fig. 18. Linos Benakis at the 3rd International Philosophy Conference of the RCGP on *Plato, Poet and Philosopher - Platonic dialogues. In Memory of Ioannis N. Theodoracopoulos: 30 years after his death, Free School of Philosophy "Plethon", Magoula-Sparta, 2011.*



Fig. 19. Myrto Dragona-Monachou, at the 3rd International Philosophy Conference of RCGP, Free School of Philosophy “Plethon”, Magoula-Sparta, 2011.



Fig. 20. Poster of the 4th International Conference, in celebration of the 2400th anniversary from Aristotle's birth, on *Aristotle, timeless and scientifically timely*, co-organised by RCGP and the Finnish Institute at Athens, 2017, Academy of Athens, East Hall.



ΚΕΝΤΡΟΝ ΕΡΕΥΝΗΣ ΤΗΣ ΕΛΛΗΝΙΚΗΣ ΦΙΛΟΣΟΦΙΑΣ ΤΗΣ ΑΚΑΔΗΜΙΑΣ ΑΘΗΝΩΝ

Το ΚΕΝΤΡΟΝ ΕΡΕΥΝΗΣ ΤΗΣ ΕΛΛΗΝΙΚΗΣ ΦΙΛΟΣΟΦΙΑΣ ΤΗΣ ΑΚΑΔΗΜΙΑΣ ΑΘΗΝΩΝ, τιμώντας τα 25 χρόνια από τον θάνατο του σπουδαίου Αυστριακού φιλοσόφου **Καρλ Ποππερ**, διοργανώνει εκδήλωση την **Τετάρτη 20 Νοεμβρίου 2019**, ώρα **5:00 μμ.**, στην **Ανατολική Αίθουσα του Μεγάρου της Ακαδημίας Αθηνών** (Πανεπιστημίου 28, Αθήνα), με αφορμή τη νεοελληνική μετάφραση της Αυτοβιογραφίας του, με τίτλο **Αέναν Αναζήτηση** (2018, β' έκδ. 2019).

Ομιλητές:

Κική Αλατζόγλου-Θέμελι (τ. καθηγήτρια Ιονίου Πανεπιστημίου - μεταφράστρια), *Γιατί να μεταφράσουμε την Αυτοβιογραφία του Καρλ Πόππερ; Παραλείπόμενα.*

Βάσω Κιντή (καθηγήτρια φιλοσοφίας ΙΦΕ, ΕΚΠΑ), *Η σημασία του Karl Popper στη φιλοσοφία της επιστήμης.*

Μάρω Γκούτσια (υποψ. δρ φιλοσοφίας), *Το ηθικό θεμέλιο της επιστημολογίας του Karl Popper.*

Στέλιος Βιβιδάκης (καθηγητής φιλοσοφίας ΙΦΕ, ΕΚΠΑ), *Ο αξιακός οιονεί ρεαλισμός του Karl Popper.*

Δημήτρης Δημητράκος (ομότιμος καθηγητής ΙΦΕ, ΕΚΠΑ), *Ένας ανατρεπτικός φιλόσοφος: ο Karl Popper και οι αγώνες του.*

Μετά το πέρας των ομιλιών θα ακολουθήσει συζήτηση.

Fig. 21. Poster of the Meeting organised by RCGP in 2019 for the 25th anniversary of Karl Popper's death on the occasion of the publication of his *Unended Quest: An Intellectual Autobiography* translated in Greek, East Hall of the Academy of Athens. Karl Popper's photo is from the photographic archive of G. Alatzoglou-Themeli.

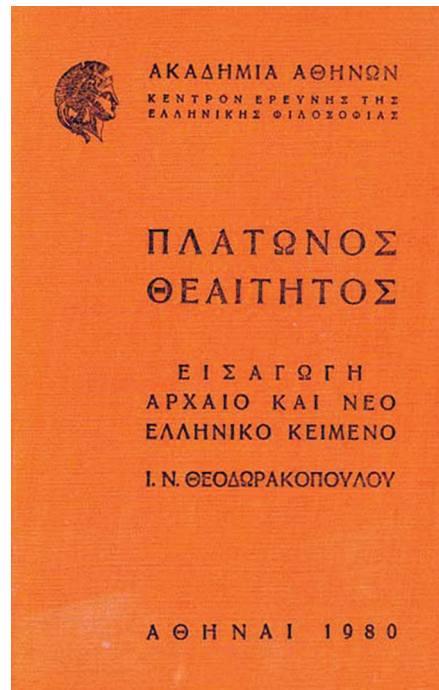
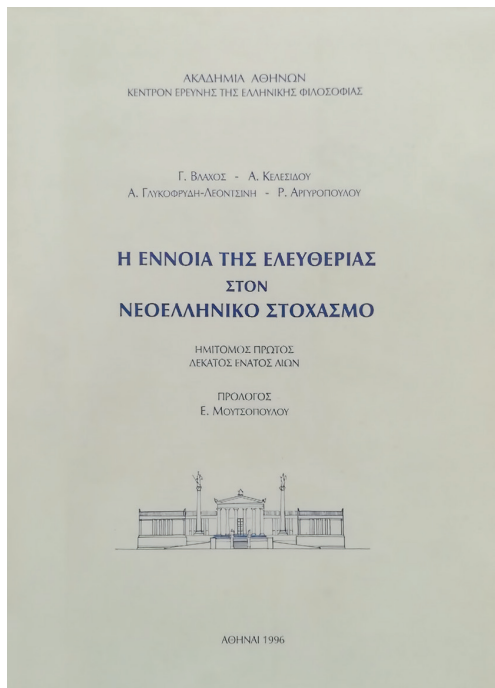


Fig. 22. RCGP publications, selected as academic resources and University textbooks (via EUDOXUS).

RESEARCH CENTRE FOR THE GREEK SOCIETY

The Research Centre for the Greek Society – RCGS (in Greek: Κέντρον Ερεύνης της Ελληνικής Κοινωνίας – ΚΕΕΚ) was established in August 1978 and its aim is the recording, understanding and interpretation of the economic social, cultural and political transformations of contemporary Greek society.

Main research of RCGS thematically (1980 – 2020)

RCGS has conducted the following thematic research projects from 1980 to 2020:

Greece and Europe: 1. Greece's entry in the European Community: Financial Impact and Perspectives, 2. The Educational System in the European Union Countries. Comparative Research of the Educational Systems of Member – Countries of the European Union, 3. The Problem of Illiteracy in the European Economic Community (EEC): the case of Greece, 4. Perspectives of the regional Politics in European Union: New tendencies in the European problematization of the peripheral development, 5. Delimitation of the Public Sector in Greece: Comparison with what is valid in the countries of EEC, 6. European Integration and Peripheral Development: Centrifugal and Centripetal Tendencies of the Regionality.

Greek society and family: 1. Organisation and Structure of the Greek Community and Greek Family, 2. Structure and Organisation of Family in the Peloponnese at the end of the 19th and the beginning of the 20th century, 3. Family in Contemporary Macedonia. Strategies of Social Reproduction according to the types of Financial Activity, 4. The crisis of the Greek family: myth and reality, 5. The Greek Family during circumstances of fast financial and social transformation: Folk family in the capital city, 6. Farmer images in the Greek society of the 19th and 20th centuries.

Greece – local societies: 1. The development of Northeast Greece: the case of Thrace: Contemporary Challenges, New Perspectives, 2. Family in Contempo-

rary Macedonia. Strategies of Social Reproduction according to the types of Financial Activity.

Immigration to Greece: 1. The Social and Financial Impacts of Immigration in the Greek Society, 2. The economic immigrants in Greece: formal data, bodies and services, 3. Immigration in Greece: The legal system, 4. Economic Immigrants: Influences in social life, 5. Detection of informal behaviours and new informal forms of economy, 6. The second generation of immigrants between school and work in the civic and rural space, 7. Education of Foreigners and Returnees students in the Greek educational system, 8. Educators' Experiences from their work in multicultural school environments, 9. Immigrant students and educational support, 10. Immigration and social transformations of family in Greece: The case of unsegregated marriages in Aitolokarnania county, 11. Greek family and foreigner workers in the dawn of the 21st century: Transformations, inactions, resistances and social pathogenesis, 12. Transnational family: immigration and family in contemporary times, 13. Immigrants and Immigrants without documents, 14. Minor Immigrants Without Guardians in Greece, 15. Human Trafficking: Penal suppression and protection of victims' rights, 16. The impacts of immigration in Greek economy.

Education in Greece: 1. Education in Greece: the ephemeral and the structures, 2. The evaluation of fairy tale as a learning process and culture of language in the contemporary school reality in Greece, 3. Financial crisis, middlebrow classes and access to private education, 4. Anthropology and Education in the multicultural era.

Financial crisis and society: 1. Poverty and social marginalisation in the Greek society. Forms and mechanisms of social restructuring in the urban and rural space, 2. The poor and the social issue: a brief retrospect in history, 3. Rural Crisis and Social Pathology. The case of the county of Aitolokarnania, 4. Financial crisis and health system in the urban space – periphery of Attiki, 5. Financial crisis and middle classes: aspects of personal and social suffering and pathogenesis of small and medium sized business owners and of public sector executives, 6. The role and identity of the educator in circumstances of financial crisis and educational changes, 7. The minor without guardians and unprotected immigrants during the age of poverty and crisis, 8. Family, unemployment and impact of poverty in health during the contemporary social circumstances, 9. The social implications of poverty in family and the contemporary Greek diaspora, 10. Financial crisis, private education and organised extracurricular activities in Athens, 11. The crisis and suffering of the Self in relation to the institutional crisis in the contemporary Greek society: concerns about the individual and collective identity.

Consequently, the following report presents work undertaken by the research

staff at RCGS on research projects that have been already concluded, or are still in progress in 2021.

Dr. Dr. Nikolaos Kaberis, the Centre's current Acting Director and researcher at RCGS since 2005, conducted the following research projects and main publications during 2005-2020:

January 2005 – December 2006: Principal investigator of the research project “Women of the Countryside and Foodstuffs. Social Attitudes and Entrepreneur Initiatives in Local Level”. The results of his research were published in 2008 in a book entitled *From the daughter to the wife and from the housewife to the entrepreneur: transformations of the meanings and of the roles of alimony*.

September 2005 – September 2009: Principal investigator of the research project “Transformations of the Greek Family, Dynamics of Immigration to Greece”. The results of his research were published in 2011 in a book entitled *Immigration and wedding market. Unsegregated marriages of Greek farmers with Albanian women. An empirical research project in the county of Aitoloakarnania for the period 1990-2005*, as well as in a relevant article that appeared in the *RCGS Yearbook* (vols. 8-9).

2009-2011: Principal investigator of the research project “Forms and Mechanisms of Poverty and Social Marginalisation in the Urban and Rural Space”. The results of his research were presented in the following two books: *Rural crisis, working insecurity and social uncertainty in young farmers*, published in 2013, and *Deadlocks and despair in the Greek countryside: the suicides of farmers. Research in the county of Aitoloakarnania, 1994-2008*, published in 2016.

2015-2017: Principal investigator of the research project “Financial crisis, working insecurity and health risk. Forms of medical support and social solidarity in the Metropolitan Community Clinic at Helliniko (District of Attiki)”. Interim reports on this research have already been presented in conferences, while the final results will be published in a book (in preparation), and two relevant articles (to appear in the forthcoming volume of the *RCGS Yearbook*).

2020-2021: Principal investigator of the following two research projects: “Financial crisis, social suffering and political manipulation: aspects of the ‘pathology’ of middle classes”, and “New symbiotic schemata: homosexual couples and homosexual parenthood”. The results of this research will be presented in two separate monographs, whose publication is scheduled for 2023-2024.

Aliki Vaxevanoglou holds a PhD in Greek and European social history and since 2000 she has participated in all the collective research of RCGS, carrying out her own research projects, and successfully collaborating with external scientific bodies. Dr. Vaxevanoglou completed a study on Greek Gypsies from a historical point

of view and, in collaboration with the University of Ioannina, she published a relevant monograph entitled *Greek Gypsies: Marginalised Figures and Family Men* (Athens 2001, 184 pages). The research was presented at postgraduate seminars, conferences and in articles (*RCGS Yearbook*, vol. 5, 2001, pp. 29-66).

Later on, she completed a historical project on poor families in Greece that was presented at postgraduate seminars, and in 2005, in collaboration with the National Hellenic Research Foundation, she published the results of another research project in a book entitled *Sivitanidios School of Crafts and Arts* (Athens 2005, 300 pages). At the same time, she concluded a study on the educational level of the Greeks, and published her results in two articles; the first one appeared in the *RCGS Yearbook* (vol. 7, 2007, pp. 29-66), and the second one in the journal of the Bulgarian Academy of Sciences, *Etudes Balkaniques* (XLVI / 1-2, 2010, pp. 30-59), under the title "Education in Greece: Appearance and Structure". With the help of 12 trainee students, she carried out a social study on the immigrants in Greece (statistics). Next, in collaboration with local United Nations agencies, her investigation focused on undocumented migrants and quality data (obtained through interviews), resulting thus to a valuable body of biographical information on about 1.351 undocumented immigrants (among them 315 minors). This research, expanded in 2017 to the phenomenon of the informal economy ("paraoikonomia"), was presented in postgraduate seminars, international conferences and articles (*RCGS Yearbook*, vol. 6, 2007, pp. 51-70 and *RCGS Yearbook*, vols. 10/11, 2021).

More recently, Dr. Vaxevanoglou embarked on a historical research on poverty during the Middle Ages, which, since 2010, has been presented at postgraduate seminars of the Ionian University. In 2021, the results of this study were published in a book entitled *The poor and the social bond in the Western Middle Ages* (Crete University Press, 2021, p. 508). Since 2017, Dr. Vaxevanoglou has delivered papers in 9 international conferences abroad. Because of her current research on informal economy and the poor, she was invited to participate in an international conference (September 2021, Austria) and a postgraduate seminar at the University of Athens (November 2021).

Dr. Aikaterini Vassilikou, an RCGS associate researcher since 2016, has been engaged in research related to contemporary migration and family and, in particular, to what is bibliographically defined as "transnational family". Following her monograph on *Immigrant Women and Human Rights* (Academy of Athens, Bureau of International and Constitutional Institutions, Athens, 2007), her recent research, through interviews based on the biographical method, examines the immigrant population and, in particular, the immigrant women in Greece with a special focus on family. Some of the main topics of her research concern the role of immigrant woman in the formation of the transnational family, the new networking

technologies and their role in forming new types of family, such as transnational families, the relation of domestic work, social reproduction and global household with transnational-type families, and the interaction between the Greek migration reality of recent decades and the transnational family. The final publication of this research has been scheduled for 2021, in the series of Publications of the Research Center for Greek Society of the Academy of Athens.

Dr. Vassilikou presented the results of her research in a keynote lecture entitled “Migration and Transnational Family: Women Domestic Workers in Greece” at the Czech Academy of Sciences (Institute of Sociology), in the framework of the Bilateral Educational Exchange Programme: Greece-Czech Republic (October 7-13, 2019). Two more communications entitled “Domestic Work, Precariousness and Transnational Family in Times of Recession” and “Immigrant family and domestic work in the years of crisis” were delivered at the Interdisciplinary Postgraduate Seminar on “The Social Impact of Crisis” at the University of Durham (School of Applied Social Sciences, United Kingdom, December 2-6, 2018), and the 7th Online Conference of the Hellenic Sociological Society on “Societies after the crisis, societies without crisis?” (September 23-25, 2020), respectively.

Furthermore, results acquired during this research led to the following publications in Greek and international scientific journals: 1) “Migrant Domestic Workers: Family, Community, and Crisis” (with N. Xypolytas and Th. Fouskas), *Journal of Modern Greek Studies* 35, Johns Hopkins University Press, 2017, pp. 88-109; 2) “From migrant to transnational family: The role of immigrant woman and informal work”, in I. Psimmenos (ed.), *The migrant workforce. Relationships, Perceptions, Actions*, Papazisis, 2020, pp. 223-249; 3) “Migration and Family in the Globalized World: the Greek Case”, in S. Vukadinović, I. Radulović, S. Boškov (eds.), *Migrations from Antiquity to the Present Days*, Novi Sad: Faculty of Philosophy, 2020, pp. 379-388.

Nowadays, Dr. Vassilikou focuses on the “Social effects of the crisis on family and the new Greek diaspora”, in the framework of the RCGS research project “Poverty and social marginalization”. Following her research on migrant population and the forms of migrant family patterns, the Greek family is now studied in the context of Greek economic migrants who leave the country and constitute a new diaspora. Greek economic immigrants who left Greece after 2010, and representatives of local associations have already been interviewed in Belgium, a country with a long tradition as recipient of Greek immigrants. This research will highlight issues related to social categorization, professional activity, educational level, age, etc.

From 2016 to 2020, Dr. Alkistis Verevi, an RCGS associate researcher since 2016, focused on the following subject areas in the framework of the RCGS project “Economic crisis and suffering in relation to the crisis of institutions in Modern Greek society: queries about the individual and collective identity”:

- a. In collaboration with the RCGS Acting Director, Dr. N. Kaberis, she studied a Community Clinic that started providing free primary medical care and medication to uninsured and needy patients during the Greek economic crisis. The results of this study were published in the article entitled “Social solidarity and volunteerism: A case study: The case of the Metropolitan Community Clinic at Helliniko”, *Proceedings of the 3rd International Scientific Conference of the Institute of Humanities and Social Sciences (IAKE)* (in Greek, 2017; with N. Kaberis and F. Bersimis). Two more papers relevant to this research will appear in the *RSGS Yearbook* for 2021: (with N. Kaberis and F. Bersimis) “Demographic characteristics and social trends of the patients who visit the Metropolitan Community Clinic at Helliniko, 2011-2015”, (with N. Kaberis) “Motivations for volunteering at times of economic crisis: the case of the Metropolitan Community Clinic at Helliniko” (in Greek).
- b. Her book on *The transformations of the teacher’s identity in times of crisis* (in Greek), are being published by RCGS in 2020. Three more papers relevant to this topic are being published in 2021: 1) “Understanding teachers through their life journey, their ambitions and their practices”, *SN SocSci* 1(3), 72, pp. 1-24; 2) “Teachers’ job satisfaction during the economic crisis through their narratives” (in Greek), in the forthcoming *RCGS Yearbook*, vols. 10-11, and “Economic crisis and educational changes: four teachers’ caricatures in the whirl of decisions and adaptations” (in Greek), *Mentor*, 19, pp. 136-170. Dr. Verevi expanded her research with a pilot study on the transformation of teachers’ role during the Covid-19 pandemic, which was presented in a communication (together with D. Fotinaki) entitled “Teacher’s role during the pandemic” (in Greek) at the 7th International Scientific Conference of IAKE (July 2021).
- c. Between 2016-2018, she participated in a collaborative project aiming to create a database at the University of Thessaly, which would contain scholarly literature specifically used for teaching science to students with learning and other disabilities. This research was presented in the following papers: 1. Vavougiou, D., Verevi, A., Papalexopoulos, P., Verevi, C.-I., Panagopoulou, A., “Teaching Science to Students with Learning and Other Disabilities: A Review of Topics and Subtopics Appearing in Experimental Research 1991-2015”, *International Journal of Higher Education*, 5(4), 2016; 2. Kaliampou, G., Verevi, A., Panagopoulou, A. S., Papalexopoulos, P., Vavougiou, D., “Designing a Database of Research Papers Focused on Teaching Science to Students with Learning Disabilities”, *Asian Journal of Education and e-Learning*, 5(3), 2017; 3. Panagopoulou, M. S., Tsihouridis, Ch., Panagopoulou, A.S., Verevi, A., Papalexopoulos, P., Vavougiou, D., “Science Education Adaptations for Non-Textbook Instruction to Students With Learning and Other Disabilities: A Chronological Literature Review”, *US-China Education Review A*, 8(4), 2018.

Main aims of the Centre for the future

The research projects that RCGS has planned for the future concern the following topics:

1. **Climate Change:** This research project will investigate the perceptions, experiences and practices of the aliquot socio-professional groups regarding the climate change in local, national and trans-border human-geographical entities and sensitive ecosystems, as well as the possibilities of a new bioclimate spatial planning for the best utilisation of public expenses, the reduce of contaminants and energy saving. The project will also explore possible new forms of climate tele-education and training.
2. **Demographic issue:** Research will focus on the realities, the possibilities and the prerequisites of new forms of parenthood and assisted reproduction in specific social groups (homosexual couples, singles, childless couples, immigrants, refugees), in order to draw attention to the necessary legal regulations concerning marriage, pregnancy, birth, adoption and fosterage.
3. **Financial poverty and social marginalisation:** The project will explore the economic, cultural and political implications of black economy and informal employment, as well as their relation to xenophobia and racism in specific groups of the working force (local workers, immigrants, refugees).
4. **Health risk and social pathogenesis:** Bearing in mind the current and anticipated mass diseases (pandemics), this research will explore ways of handling social and psychological disorders, as well as persuasion methods in specific groups, so that they abide more strictly to the necessary precautions and cures.
5. **Social solidarity and volunteerism:** This research will focus on organised and occasional volunteer organisations, in order to investigate, on the one hand, the motives of participation and the actions of their members, and, on the other hand, the new forms of education and training that ensure that these organisations are able to respond adequately to the new social problems emerging from climate change, poverty and potential health risks.
6. **Education:** In close collaboration with teachers and official educational authorities, this research project will investigate developments regarding the inclusion of students, who belong to vulnerable groups, in general education, the distance learning and the so called “digital school”. Furthermore, the project will study forms of training and evaluation that are prerequisites for the successful participation of educators in the aforementioned forms of education and the maintenance of their fundamental role in education and society.

OFFICE OF INTERNATIONAL AND CONSTITUTIONAL INSTITUTIONS

Address: 84, Solonos St., GR-106 80, Athens

Board of the Office

The Academicians: Emmanuel Roucounas, Apostolos S. Georgiades,
Anna Benaki-Psarouda, Michael Stathopoulos, Nikiforos Diamandouros

Alternate Member

The Academician Epaminondas Spiliotopoulos

Supervisor

The Academician Emmanuel Roucounas

Research Assistants: A. Bredimas, A. Gourgourinis, E. Papastavridis, M. Papadaki

Foundation and Purposes

The Office was founded in 1997. It implements research programmes on the international commitments and the foreign policy of Greece, as well as on the international protection of human rights. It assesses the problems and evaluates the priorities of the participation of Greece in international organisations. It elaborates proposals for the more efficient membership of Greece in the European Union. The Office adopts research projects regarding the compliance of Greece's international obligations within the framework of the Constitution.

Current research projects

1. The COVID -19 pandemic and the global health crisis. The situation of Greece in relation to the World Health Organisation and the European Union.
2. The legal regime for the protection of foreign investment in Greece under public international law.
3. The legal status of Greek seafarers and fishermen, with reference to the regulations of the European Union.
4. Greece and the Law of the Sea.

Publications of the Office [in Greek]

Anastasios Gourgourinis, *The Loan Agreements of Greece and the Structural Adjustment Programmes (2010-2018). From the Perspective of Public International Law* (2021)

Efthymios Papastavridis, *The Protection of Merchant Shipping from internationally illicit acts* (2015)

Ioannis Stribis, *Developments in the International Protection of Seafarers* (2015)

Ioannis Stribis, *La manifestation des lacunes en droit international* (2009)

Ekaterini Vasilikou, *Female Migration and Human Rights* (2007)

FOUNDATIONS

BIOMEDICAL RESEARCH FOUNDATION

The Biomedical Research Foundation of the Academy of Athens - BRFAA (in Greek: Ίδρυμα Ιατροβιολογικών Ερευνών της Ακαδημίας Αθηνών - ΙΙΒΕΑΑ) is a research institute under the auspices of the General Secretariat for Research and Innovation and the Academy of Athens. Unlike the other research centers of the Academy of Athens, BRFAA is a legal entity governed by private law and is self-governed by its own Board of Directors. It was founded in 1991 with the mission to investigate the molecular mechanisms and principles that underlie human health and disease and to translate this knowledge into clinical practice. Today, it is the largest and most modern research center in the field of biomedical sciences in Greece. BRFAA is located 3km away from the center of Athens, housed in a modern complex of four buildings of 32,000 m² building space. (Fig. 1). A tender for the construction of a new, additional 22,000 square meter building through a Public-Private Partnership (PPP) has been announced. The new building will house research and business activities for the development of new innovative products and services within the field of Precision Medicine, that is in collaboration with pharmaceutical, biotechnological, and bioinformatics companies of the private sector.

BRFAA's Aim and Activities

The aim of BRFAA is to promote biomedical sciences in Greece. The fundamental principle upon which both its establishment and its operation are based, is to combine basic and clinical research under the same roof. This offers the ideal ba-



Fig. 1. BRFAA's main research buildings.

sis for directly transferring basic biological research findings into innovative medical applications – in other words, the development of “translational research”. BRFAA is still the only Translational Research Institute in Greece and one of the first in Europe.

BRFAA is dynamically expanding its activities to the fields of Precision Medicine and Public Health through the functional integration of basic research and clinical research findings with epidemiological data. These data are acquired from patient studies and from healthy individuals, and through the use of artificial intelligence approaches and the functional interface with the pharmaceutical and IT industry will provide a significantly beneficial effect to the community.

BRFAA's scientific structure

BRFAA consists of four Research Centers (Institutes), which operate in the general fields of: a) Basic Research, b) Clinical, Experimental Surgery and Translational Research, c) Systems Biology, and d) Environmental Effects on Health. There are also special research support units, which are equipped with state-of-the-art equipment in order to best pursue scientific and technological activities relevant to their scientific scope.

- a. The activities of the Center of Basic Research aim toward understanding basic biological mechanisms through the exploration of physiological and pathophysiological cell functions. The utilisation of new basic knowledge has a direct effect on the development of novel clinical, diagnostic and therapeutic applications. These studies include, among others, regulation of gene expression, cellular signaling and communication, aging, cell differentiation and organism development, the biology of stem cells, and more. In order to achieve these research goals, a very broad spectrum of molecular, biochemical, genomics, proteomics, cellular, imaging and computing methods is employed, using cell cultures and model organisms such as the small *C. elegans* worm, the *drosophila* fly, zebrafish and mice.
- b. The activities of the Center of Clinical, Experimental Surgery and Translational Research include studies in the pathophysiology of various diseases, the development of new and advanced surgical techniques using traditional and robotic systems, as well as studies of cell and tissue transplantations in animal models. Translational Research includes activities that cover all stages from basic research discoveries to their implementation into clinical practice. Contrary to basic research, in order to achieve its goals, translational research should have an interdisciplinary nature and is conducted by interdisciplinary groups of collaborating research scientists, within and outside BRFAA. BRFAA focuses on the research of issues related to **cancer, cardiovascular, neurodegenerative, inflammatory, autoimmune, infectious and metabolic**

diseases. In order to support these areas of focus, the Foundation's facilities include a 6-bed day clinic specialised in cardiovascular, metabolic and hematological conditions, with all of the necessary medical equipment, and is supported by specialised medical, nursing, and technical personnel.

- c. The Center of Systems Biology is the first research institute in Greece supporting this growing scientific discipline and was created with the aim to establish a scientific entity that would closely follow the international advances and initiatives in the Life Sciences sector. Today, the main aim in biology and medicine is the in-depth understanding of the various parts that biological systems are comprised of, and the integration of information describing their activity on a molecular, cellular and organ systems level. The addition of this new approach, in order to study the function of complex biological systems in-depth, reflects a new research approach aiming at the integration, normalisation, and synthesis of biological and medical data for the development of predictive biological models for diseases.
- d. The Center for Environmental Effects on Health investigates the various impacts of environmental factors, such as pollution and climate change, on human health and its studies and measurements span from the macroscopic scale to the genomes emphasizing on the spread of contagious diseases.

All Research Centers are supported by highly specialised research infrastructures carrying out scientific and technological activities relevant to their scientific focus. The BRFAA Research Centers represent an operational internal organisation of BRFAA's scientific life. BRFAA researchers within the four Thematic Areas organise much of the scientific life, including common activities, seminars, lectures, etc. However, BRFAA does not have rigid boundaries between its research areas, but promotes and encourages close interactions between groups from different research areas, thus, stimulating interdisciplinary research. To strengthen further scientific exchanges and networking between scientists, all PIs participate in Faculty Retreats. A lack of departmental barriers, a flat hierarchy and an open atmosphere promote strong interactions and free exchange of information and ideas between all of the BRFAA teams pursuing research programmes, thus, stimulating productive collaborations both within and outside the Foundation. Moreover, all these activities promote fruitful interactions with the private sector, mainly the pharmaceutical and IT industry.

Research Infrastructures

Biomedical research relies heavily on the availability of high-end technologies and infrastructures. In order to use these efficiently, they require expertise and resources often beyond the scope of individual research groups. Accordingly,

BRFAA's technology platforms and scientific infrastructure support all researchers and provide expertise that has been critical for the success of numerous research projects at BRFAA. The research activities performed at BRFAA are supported by modern research facilities and laboratories. Specifically, there are 22 fully equipped laboratories of Molecular and Cellular Biology in the Foundation. The infrastructures contain the necessary equipment for state-of-the-art biomedical and clinical research. The heavy equipment includes, among others: DNA microarrays, mass cytometry (CyTOF), modern flow cytometry, laser microdissection, a pharmacology and pharmacotechnology laboratory equipment, the bioimaging unit including an array of confocal and deconvolution microscopes, a positron emissions tomography for small animals (microPET/CT), and histology and computational biology units. A multiphoton microscope will be installed at the BRFAA within the next 4 months. BRFAA is also equipped with advanced proteomics and genomics units. The **Greek Genome Center** (donated by the Stavros Niarchos Foundation and the late Eugenia Theochari) is the first and still only laboratory of advanced genomics analysis in Greece. It is equipped with five state-of-the-art next-generation DNA sequencers (with low, medium, high and very high throughput), with specialised equipments for the identification and mapping of up to 1,000,000 genetic polymorphisms at a large scale through genotyping and analysis of samples using new-generation and extremely high-definition DNA microarrays (SNP arrays) for the classification of genotypes in various populations, automated systems for sample preparation robots, etc. It also includes two state-of-the-art supercomputer arrays for storing and analysing the genome of patients suffering from cancer, cardiovascular conditions, infectious diseases, metabolic diseases, neurodegenerative diseases, etc., as well as for the modelling of physiological and pathophysiological processes. The BRFAA Proteomics Platform accurately and precisely quantifies proteins in complex samples. The platform also develops new methods, such as multi-omics profiling analysis of plasma samples and post-translational modifications. In addition, the Proteomics Platform has developed and currently applies an innovative, patented approach termed "Trophometry", aiming at analysing in-depth the vast majority of food samples.

The BRFAA houses a meticulously organised laboratory animal facility, housing 24,000 mice in individually ventilated cages, as well as other animal models such as rats, rabbits and swine. The majority of the housed mice consists of transgenic (genetically modified) laboratory animals, which have been generated using advanced genetic engineering technologies, in order to study basic biological mechanisms, the molecular basis of human diseases, as well as to conduct targeted preclinical studies for the development of novel therapeutic treatments. The facility is also supporting behavioural studies for assessing the phenotype related to genetic manipulations, ageing phenomena, or the screening of novel pharma-

ceuticals. The experimental surgery unit is a model unit in which any type of surgical intervention can be performed using animal models such as mice, rats, rabbits and swine, thus supporting the BRFAA investigators as well as investigators across Greece and abroad. Veterinary supervision is also available on a daily basis and the unit has long been accredited by the competent European and National Committees.

Educational Activities

BRFAA is the largest School of Biomedical Research in Greece; today, more than 650 investigators of all levels perform their research activities at the Foundation. This number includes 34 principal investigators (group leaders), 22 staff research scientists, 15 university faculty affiliated investigators, 45 affiliated investigators, 82 post-doctoral fellows, 120 PhD candidates, 32 laboratory technicians, 65 Master's degree students, and 78 undergraduate students carrying out their research projects at the Foundation. BRFAA activities are supported by 52 administrative employees specialising in finance, general administration, technical support, and engineering. Scientific events, conferences, workshops, meetings, seminars, etc. are held at the Foundation's amphitheater that seats 300 people (Fig. 2).



Fig. 2. BRFAA's amphitheater.

BRFAA carries out 6 post-graduate courses in collaboration with the National and Kapodistrian University of Athens, the Agricultural University and the National Technical University of Athens, which are attended by 150-200 post-graduate students every year. Many of these students decide to carry out their thesis at BRFAA.

So far, 205 doctoral theses have been completed, while 120 are ongoing. Furthermore, the experimental theses of 174 Master's students and 279 undergraduate students from universities within Greece and abroad, have been carried out at BRFAA.

At the Center of Experimental Surgery, more than 5,000 physicians and military physicians have been trained in advanced methods of robotics and laparoscopic surgery, as well as in the management of multiple-trauma patients.

In collaboration with the Ministry of Education, BRFAA has created and is running an outreach programme (Open School), in which more than 6,000 Lyceum students have visited its research facilities and have participated in hands-on training seminars.

Research Programmes – Funding

All research programmes conducted by the Foundation's investigators (staff and collaborating investigators) are exclusively supported by competitive research grants from Greece, the European Union, the USA, non-profit funding organisations, as well as from contracts with private pharmaceutical and biotechnological companies. The Foundation also provides its own grants to support young scientists' research, based on their individual needs and accomplishments. BRFAA has established a very powerful international network of strategic collaborations (partnerships) with other European and USA Research Organisations and Centers through funding programmes (FP6, FP7, Horizon 2020, NIH USA, etc.) and has entered memorandums of cooperation for joint research programmes and exchange of scientific personnel. It is also utilising the funding mechanisms of the Marie Curie and the ERC (European Research Council) programmes aiming at repatriating distinguished Greek bioscientists from the diaspora. Since its establishment, BRFAA has attracted competitive funding of more than 110 million Euros. More specifically it has participated in more than 500 research programmes, 167 of which were financed by the EU (European Research Council, FP6, FP7, Horizon 2020, Marie Curie, etc.) and the European Economic Area (EEA). Besides national and European grants, research at BRFAA is also being funded by other international sources, such as the National Institute of Health (NIH) of the USA, the Association for International Cancer Research (AICR), the American Leukemia and Lymphoma Society, the Juvenile Diabetes Research Foundation, the Mi-

chael J. Fox Foundation for Parkinson's Research, the March of Dimes, the Human Frontiers Science Foundation, the Fondation Santé, etc., as well as by various pharmaceutical and biotechnology companies. In its effort to conduct Precision Medicine, it has entered into memoranda of cooperation with some of the most prominent cancer institutes globally, such as the Harvard University's Dana Farber Institute, the Columbia University in New York, as well as the New York Genome Center, all of which are leaders in innovation and major players in the development and application of Precision Medicine.

Publications – Awards – Distinctions – International Initiatives

Research conducted at BRFAA has been internationally recognised. Its investigators have published a high number of scientific papers (over 2,900 international publications, Source: Scopus), out of which, 514 were published in journals with an impact factor >8 (Scopus).

BRFAA's investigators have received several prestigious international scientific distinctions. They have been elected in the European Academy of Sciences (Academia Europaea) and in the Board of Directors of EMBO (European Molecular Biology Organisation), and have received scientific awards from international science academies and global organisations, and grants from the European Research Council. They have served as chairmen or members of scientific committees in many international conferences, and as members of editorial boards for international scientific journals; they have participated as chairpersons or members in the scientific advisory boards of international academic and research centers, in national and European scientific committees for policy making regarding research directions; they have received scientific awards in international conferences, European awards for innovation, and honorary scholarships by national and international organisations. They have also been elected in the Board of Directors of Greek and International Scientific Societies, etc.

BRFAA's graduates (doctorate and post-doctorate) have already occupied faculty positions in Universities and Research Centers in Greece, the US, and Europe, as well as in Pharmaceutical and Biotechnological companies in Greece and abroad.

BRFAA is Greece's representative in the European Strategy Forum on Research Infrastructures (ESFRI) for the creation of Biobanks (BBMRI) and infrastructures for Translational Research (EATRIS). The Greek National Biobank collects and stores tissues, liquid samples, and surgical samples. This infrastructure has been officially integrated as full member in the European Research Infrastructure Biobanks, "BBMRI-GR". The Greek Infrastructure for Translational Research (EATRIS-GR), which began operation in collaboration with the neigh-

bouring “Sotiria Thoracic Diseases Hospital of Athens”, has established a 36-bed clinical unit for Phase I clinical trials and for pharmaceutical bioequivalence studies (e.g. evaluation of generic drugs and original drugs).

BRFAA is also the national representative in the Pan-European Initiative for the genome sequencing of more than 1,000,000 Europeans. The aim of this initiative is the unlimited functional connection between national databases with genomics data and biobanks, in order to contribute to the provision of improved healthcare for European citizens (effective prevention of diseases and highly accurate individualised treatments, especially for cancer, neurodegenerative, and rare diseases).

BRFAA has received 24 national and international patents in the fields of prenatal diagnosis, neurodegenerative diseases, cancer, trophometry, immunology, renal diseases, etc.

Provision of Specialised Health Services

The provision of specialised health services to the general population is another one of BRFAA's remarkable activities. In this context, BRFAA has incorporated a single-person société anonyme under the name “Biomedical Sciences and Technologies S.A.” (BMS), which belongs to BRFAA. BMS's aim is the economical exploitation of research findings, the management of income from the provision of specialised health or other services, and in general the overall utilisation of the knowledge produced by BRFAA. In order to achieve its aims, BMS acts autonomously, in collaboration with organisations and agencies of the public and private sector, as well as with individuals or other legal entities. The main specialised health services offered by BRFAA through BMS include among others:

1. The Hellenic Cord Blood Bank, the first and largest Public Bank of Hematopoietic Progenitor Cells in Greece. It has collected, processed and frozen for long-term storage more than 5,000 units of cord blood for the allogeneic transplantation in patients with hematological diseases. The Hellenic Cord Blood Bank has been granted an operating license by the Ministry of Health and is accredited by the FACT-NETCORD international organisation for non-relative allogeneic transplantation of hematopoietic progenitor cells. To date, it has provided 26 units for transplantation in patients with hematological diseases in Greece and across the world, and has registered 3,330 units of cord blood in the International Bone Marrow Donor Registry (BMDW) ready to be transplanted. The Hellenic Cord Blood Bank performs research in the area of cellular therapies and, specifically, in the area of Regenerative Medicine and Tissue Engineering.
2. Positron Emission Tomography for the diagnosis of oncological and neuro-

logical conditions mostly, as well as for the study of myocardium viability in advanced stages of ischemic heart disease. More than 33,000 citizens have visited and have been examined in the Positron Emission Tomography unit of BRFAA (Fig. 3). The timely and reliable diagnosis for patients with neuroendocrine tumors is a crucial step in their treatment, due to the complexity of such tumors. This test is now available in Greece and the specialised radiopharmaceutical to be used is exclusively produced by a highly specialised Gallium-68 generator at BRFAA's Positron Emission Tomography Unit. This ensures the unobstructed and constant supply of the tracer for the timely examination of patients. Up until now, many of these patients had to travel to Europe or America to have this test. Due to its optimal and targeted diagnostic accuracy, compared to other imaging modalities, it contributes to a better staging and follow-up and thus, to the more appropriate management of treatment for these patients. In November 2021, the first new Digital System of Positron Emission Tomography and Computed Tomography (PET/CT) in Greece will be installed.

3. Specialised molecular tests for the diagnosis of chronic myelogenous leukemia, myelohyperplastic diseases, as well as more rare hematological conditions (eosinophilia, mastocytosis, chronic myelomonocytic leukemia, etc.).



Fig. 3. BRFAA's Positron Emission Tomography Unit.

More than 14,000 molecular examinations have been performed in BRFAA's hematological laboratory.

4. The Greek Genome Center offers a significant number of unique genomic analysis services to the general public, to public and private healthcare agencies, the pharmaceutical industry, as well as in the context of BRFAA's participation in flagship research activities in the fields of Precision Oncology, Cardiology, and Neurodegeneration. More than 20,000 genomics tests have been performed in BRFAA's Genome Center. In addition, the laboratory performs high definition histocompatibility antigen typing for volunteer bone marrow donors, as well as for the Hellenic Transplantation Organisation.
5. The laboratory animal house facility, the Center of Experimental Surgery, and the Positron Emission Tomography Unit for small animals are staffed by scientists possessing unique know-how in the provision of a wide range of preclinical services. These services include pharmacokinetics, pharmacodynamics, and toxicology studies on animal models mimicking human diseases, such as cardiovascular conditions (atherosclerosis and cardiomyopathies), cancer (bladder, lung, melanoma, leukemia, etc.), respiratory conditions (asthma, asthma exacerbations, pulmonary fibrosis, acute respiratory distress syndrome), autoimmune disorders (arthritis, inflammatory bowel disease, multiple sclerosis), sepsis and neurodegenerative diseases (Alzheimer's, Parkinson's disease). BRFAA provides preclinical services to the largest Greek pharmaceutical companies and to a significant number of international pharmaceutical companies and universities. The installation and operation of the Positron Emission Tomography Unit for small animals at BRFAA, which is currently the only one that exists in Greece, enables the optimisation of preclinical imaging strategies to enhance diagnostic capabilities, as well as studies to test the efficacy of new drugs on animal models.
6. BRFAA has newly renovated a fully functioning wing at the "Sotiria Thoracic Diseases Hospital of Athens", which exclusively hosts the clinical trials research unit of the Foundation. It has a 36-bed capacity, in which clinical trials of generics and prototype drugs from Greek and international pharmaceutical companies are conducted. The BRFAA's accredited Pharmacology and Pharmacotechnology laboratory performs pharmacokinetic and bioequivalence analyses using state-of-the-art mass spectrometry methods.
7. BRFAA's Center for Environmental Effects on Health, which is linked to a satellite, uses high-end technologies and equipment for the continuous monitoring of the solar ultraviolet radiation spectrums, total ozone column and sulfur dioxide. It constantly monitors climate changes (ozone levels, solar radiation, and air pollutants) and informs the competent State agencies. BRFAA also has a vehicle equipped with specialised monitoring systems for

measuring various pollutants related to human health especially in environmentally burdened areas.

8. BRFAA also offers diagnostic cardiovascular tests in its echocardiography, cardiopulmonary and stress test units, cytogenetics tests to detect chromosome abnormalities, and molecular tests in the context of developing the new scientific field of trophometry.

BRFAA's contribution to the management of the COVID-19 pandemic caused by the SARS-CoV-2 virus

Having identified early-on how critical the situation with the evolving COVID-19 pandemic was, BRFAA has played a leading role in the national effort for the molecular, genomic and immunological diagnosis and study of the disease caused by the SARS-CoV2 virus. BRFAA is a co-coordinator of Flagship Research Activity "Epidemiological study of SARS-CoV-2 in Greece through extensive testing for the detection of the virus, viral genome sequencing, and genetic analysis of patients", directly aiming at the effective management of the pandemic, through reliable molecular and immunological identification, as well as the genetic and epidemiological identification of the virus and its carriers. This action is supported by the General Secretariat for Research and Innovation of the Ministry of Development and Investments. Since September 2020, BRFAA has performed more than 300,000 PCR molecular tests for the detection of coronavirus, on samples sent to it daily (approximately 1,200 samples per day) from the 1st Health Regional District (Hospitals and Health Centers of Attica), the National Public Health Organisation (NPHO), the General Secretariat for Civil Protection (airports, ports and land borders), as well as from various public agencies (Fig. 4).

BRFAA is the central hub of the national network for the study of mutations in the genome of the virus (Genomic Surveillance) where coronavirus samples from all main molecular testing laboratories are being sent for genomic analysis at the Greek Genome Center to identify the genetic identity of circulating SARS-CoV-2 strains. The goal of the national genome surveillance programme is to closely monitor the spread of emerging and highly infectious new coronavirus strains in the community, as well as the representative historic and geographic molecular representation of the SARS-CoV-2 strains circulating in the country from the beginning of the pandemics. This ensures that the constantly emerging mutations of the virus are closely monitored and promptly identified.

The contribution of BRFAA in the coronavirus genome surveillance across the country was a key element for the management of various issues related to tourism in the summer of 2021. In the context of SARS-CoV-2 genome surveillance, BRFAA has performed full genome sequencing of approximately 35,000

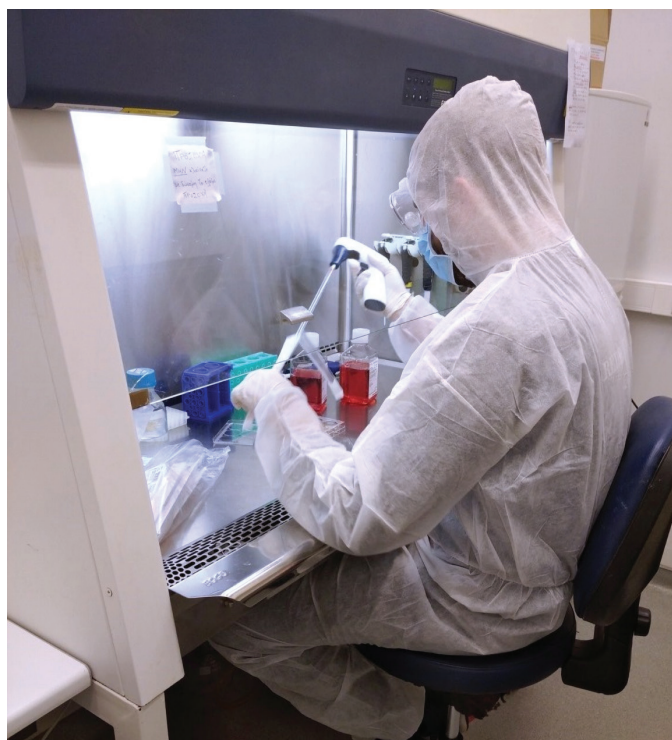


Fig. 4. Molecular analysis for the detection of SARS-CoV-2.

SARS-CoV-2 samples from a respective number of cases from the 1st, 2nd, 3rd and 4th wave of the pandemic throughout Greece (Fig. 5). In collaboration with the Civil Protection and the National Public Health Organisation, it has promptly identified the first cases carrying variants of concern in Greece, such as the UK B.1.1.7 strain (alpha), the “South-African” B.1.351 strain (beta), the “Brazilian” P.1 strain (gamma), and the “Indian” B.1.617.2 strain (delta). The genomic surveillance across the country has also led to the identification of many other coronavirus strains of special interest, apart from the variants of concern circulating in the country (e.g. B.1.1.318, B.1.621, UGANDA, B.1.525, etc.), as well as in the molecular representation of the dynamic progression of the pandemic per geographical area. Since the onset of the pandemic, more than 150 different strains have been identified in Greece.

BRFAA is also a leader in the analysis of vaccine efficacy and building immunity in the country. Its research teams, in close collaboration with the medical, scientific and technical personnel of the hospitals “Sotiria” and “Attikon” (COVID wards and ICU), study the immune and molecular mechanisms responsible for the disease and for the development of immunity through the testing of blood samples (serum, plasma, and cells) from COVID-19 patients using the cutting edge analytical-research laboratories of the Foundation. BRFAA researchers per-

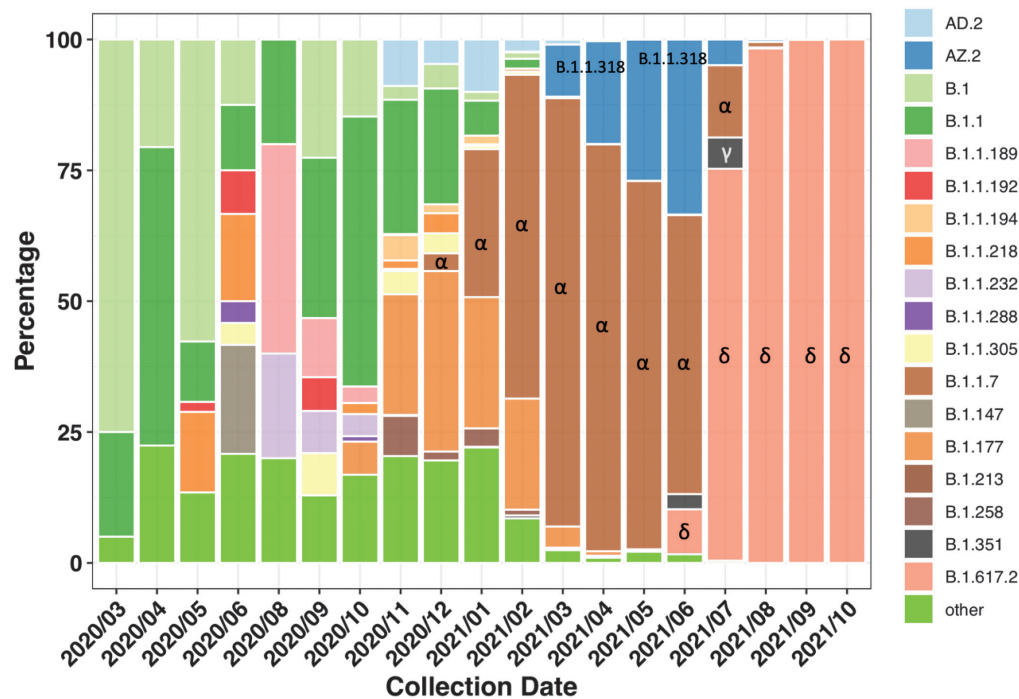


Fig. 5. Percentage distribution of the different coronavirus variations, with the highest incidence per month of samples collection.

form highly specialised tests analysing T-cell immunity, the major mechanism protecting the body from the SARS-CoV-2 virus, since antibodies offer only partial and short-term protection. BRFAA also tests the efficacy of vaccination in high risk groups, such as immunocompromised patients, patients with underlying conditions, immunodeficiencies and others. The combined genomic and immunological surveillance of the population examines the efficacy of vaccination or past infection in terms of immunity versus the mutated virus strains, such as alpha, beta, gamma, and delta, for the prompt and targeted protection of the population.

Research directions and prospects

BRFAA is at an exponential growth phase, despite the fact that for the most part of its operation it was faced with the extremely strict fiscal conditions imposed by the economic crisis that hit the country. The main goals during this period, to the extent that it was feasible, was to create “critical masses” of researchers in the areas of cardiovascular, nervous and immune system, and cancer, along

with the constant upgrading and enrichment of research infrastructure. BRFAA is strengthening and expanding its research activities in the fields of molecular epidemiology and environmental health, infectious diseases, and metabolic disorders. Its areas of research reflect the scientific fields with the highest priority at the European level.

The main, strategically defined, aim and vision of BRFAA for the next 10 years is to further its development through the continuous and significant enhancement of its main activities in basic and applied research in the prioritised scientific fields, as well as to functionally link with the two major initiatives that the Foundation has invested in, for the materialization of Precision Medicine.

Basic and Preclinical research: The main sectors of research which are based on the fundamental principles governing the establishment and operation of BRFAA, are briefly described below. These are based on the fact that “there is no applied science if there is no science to apply it to” and on the fact that “what is already strong, must be further strengthened”. In this context, the activities in the main research and technological development sectors will be strengthened further, as described below.

Cancer: The general term “cancer” refers to a very broad and heterogeneous group of diseases. All types of cancers are characterised by the fact that some cells of the body start to divide continuously and spread to the adjacent tissues and organs. In the cancer research field, BRFAA investigators exploit technological progress in Genomics and Bioinformatics, in combination with their unique capacity to develop specific tools to study advanced models of human cancer. These models are created in cells, in cancer patient xenografts which are grown in laboratory animals with the use of organoids, mimicking the development of organs and tumors in vitro, and finally, with the generation of animal models for the disease. The goal is to identify and study in detail the carcinogenic mechanisms for various types of cancer, to allow the development of suitable treatment approaches designed for the specific type of cancer (individualised approaches). In particular, the research activities aim to understand the molecular mechanisms leading to carcinogenesis through the epigenetic regulation of gene expression at a post-transcriptional level through microRNAs and chromosomal instability during cell proliferation (Fig. 6). Research also includes the molecular basis of tumor heterogeneity responsible for treatment resistance and the different response of patients to anticancer treatments, the role of premature cell aging as a major anticancer barrier, the development of new targeted small molecules for individualised cancer treatment, and the identification of new biomarkers with clinical significance for the diagnosis, treatment selection, and follow-up of patients with malignancies and preneoplastic conditions. New pathogenic genetic variations in patients with cancer are identified in tumor samples and free circulating DNA

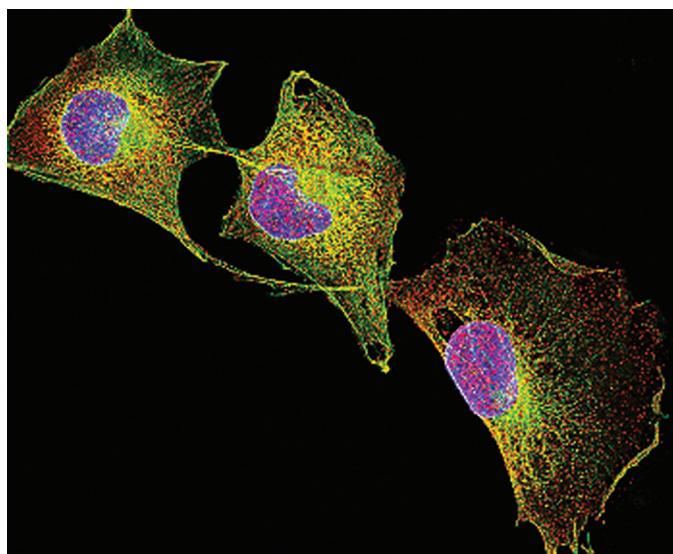


Fig. 6. Communication between cancer cells of the thyroid gland.

with the ultimate goal of monitoring the patients' disease progression based on their molecular profile in real time. Innovative technologies, based on molecular simulations and the High-Performance Computing systems available at BRFAA and in Europe are being used for the rational designing of new candidate drugs against carcinogenic proteins, for more efficacious treatments with less adverse events than conventional treatments. The main goal of the above is the individualisation of treatment strategy of Precision Medicine.

Immunity and Inflammatory Conditions: A major problem that living organisms are facing is the need to protect themselves against external invaders (immunity), maintaining at the same time control of their defensive mechanism (homeostatic regulation of immune responses). The fact that many of the active molecules being produced during immune responses are extremely potent, means that their prolonged and uncontrolled action may inevitably cause collateral damages to the affected tissues (inflammation). Therefore, a complex network of regulatory mechanisms has been evolved in order to prevent uncontrolled immuno-inflammatory reactions, which are directly related to the immune system, such as autoimmune conditions, immunodeficiencies, transplants rejection, as well as multiple other conditions that have an inflammatory basis, such as cancer, cardiovascular, metabolic, and neurodegenerative diseases. The deregulation of these mechanisms often leads to the development of pathologies such as allergies, hypersensitivity, chronic inflammatory and autoimmune conditions. In this research field, BRFAA is very active in two distinct, but interconnected, research areas: the study of the basic immunity mechanisms involved in maintaining homeostasis, and the investigation of various pathologies. The basic research field studies the mecha-

nisms responsible for the reprogramming of the genome guiding the expression of cytokines and other proteins during the immune response. Inflammation is studied in the context of infectious, allergic, inflammatory, and autoimmune conditions. The goal is to clarify the basic molecular mechanisms which connect pathogenic immuno-inflammatory actions with tissue remodeling processes as, for example, in viral respiratory infections (e.g. influenza, COVID-19). The main goal is to clarify the molecular defence mechanisms against viral and bacterial infections, as well as to study the development of allergic, inflammatory and autoimmune diseases (e.g. Systemic Lupus Erythematosus) through the creation of specialised animal models mimicking human diseases and the use of clinical samples from pertinent groups of diseases, and to validate the clinical consistency between the results of basic and preclinical research. Particular emphasis is also placed in the study of the immune mechanisms of resistance to cancer immunotherapy, the molecular mechanisms of action of regulatory lymphocytes in cancer and in autoimmune conditions, as well as in the metabolic reprogramming of lymphocytes, aiming to identify new treatment goals for enhancing immune response against tumors. The ultimate goal is the development of targeted treatment approaches and the identification of new biomarkers for these diseases.

Neurosciences and Neurodegenerative diseases: BRFAA's thematic area of neurosciences and neurodegenerative diseases investigates the normal and pathological function of the nervous system from the molecular and gene level to the level of neural cells and their synapses up to the highest level of neural networks' function, and their role in learning, memory, and behaviour through the use of appropriate animal models and clinical samples (Fig. 7). Special emphasis is placed on understanding the molecular mechanisms of gene regulation, in order to study neurodevelopmental, neurological and oncological conditions, as well as on the role of neural stem cells in the development of the central nervous system for the control of limb movement and their role in managing trauma or neurodegenerative diseases. Intracellular signaling mechanisms, which control the proliferation and the differentiation of neural cells involved in autism and gliomatogenesis are studied. The research activities include studies in the regulation of neuroendocrine cellular signaling controlling the life span, responses to stress, and growth. In the neurodegenerative diseases' area, the research groups at BRFAA study main neurodegeneration mechanisms, focusing on the genetic causes of Parkinson's disease. The Hellenic Biobank for Parkinson's disease has been created and is operating at the BRFAA; it stores invaluable biological samples and clinical data, and is a founding member of the European Biobanks Infrastructure. Its primary research focus is to clarify the molecular basis of the pathological intracellular accumulation of α -synuclein due to its incorrect folding, thus leading to aggregation and accumulation of toxic particles. The mechanisms regulating its levels of expression,

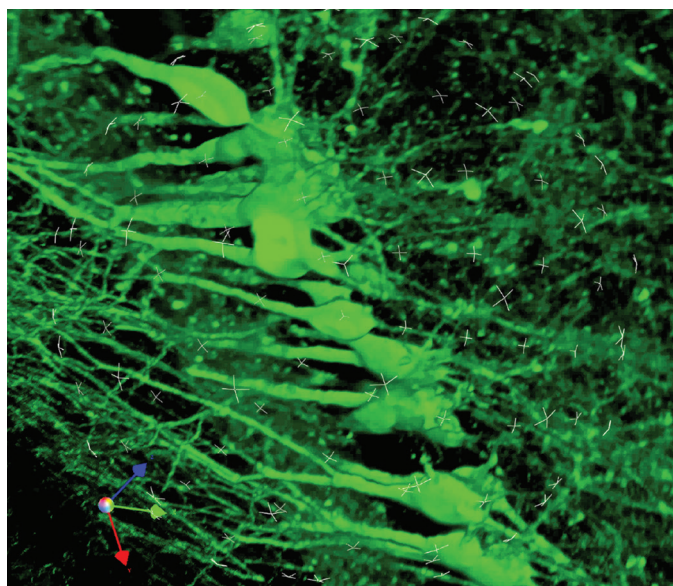


Fig. 7. 3D imaging and analysis of brain neurons.

as well as therapeutic approaches for removing α -synuclein from the brain of Parkinson's patients, are being studied. Moreover, innovative high sensitivity methods are being developed for identifying toxic substances in biological fluids, to be used as biomarkers for the timely and accurate diagnosis of Parkinson's disease, as well as other α -synuclein related conditions, such as Multiple System Atrophy. The role of the functional connection between the central nervous system and the peripheral immune system in the pathogenicity of Alzheimer's disease is being studied with the use of specialised animal genetic models, highlighting the relationship of Alzheimer's disease with autoimmune conditions or/and neoplasms for the development of innovative treatment approaches.

Cardiovascular system: BRFAA's research activities in the field of the cardiovascular system cover significant aspects of mechanisms related to the development of diseases, both at a basic and a clinical research level. The role of the cytoskeleton of cardiac myocytes in the development of heart failure and in the homeostasis of the mitochondria producing the energy required for cardiac muscle contraction, as well as the role of genes regulating the intracellular concentration of calcium ions in heart failure due to arrhythmia, are being studied. Equally important is the study of cellular connections and the role of cytoskeleton function, in order to understand how the mechanical properties of the cardiac muscle cells affect its function. The mechanisms of cardiac inflammation and remodeling through the paracrine activities of macrophages are studied in respect of their role in promoting heart fibrosis and failure. Also, the molecular mechanisms involved in the development of the pathophysiology in dilated and arrhythmogenic

cardiomyopathies are also studied, highlighting the role of immunological factors, such as the complement, as well as the blood coagulation system in the development of the disease. At the same time, the role of hemodynamic flow in the activation of intracellular signaling pathways controlling the development and regeneration of heart valves is studied, using the tropical zebra fish as experimental animal model for the identification of new bioactive molecules that can inhibit angiogenesis. Innovative imaging studies of the cardiovascular system have led to the evaluation and management of cardiac inflammation, as well as the effects of atherosclerosis on the wall of the vessels, blood flow, and on the myocardium, before and after the administration of therapeutic pharmaceutical molecules. Positron emission tomography studies have revealed the importance of brain metabolism as a marker for different types of depression comorbidity in patients with chronic systolic heart failure, and have also identified different clinical phenotypes in sarcoidosis. Clinical studies are being conducted in collaboration with cardiovascular clinics regarding the remodeling of the myocardium post ischemic events, the impact of cholesterol on inflammatory, apoptotic and thrombogenic factors in the vessels and the myocardium, and the process of aortic valve stenosis.

Stem Cell Biology, Regenerative Medicine and Gene Therapy

Since its establishment, BRFAA developed infrastructures and technologies specifically dedicated to the innovative fields of cell and gene therapy, as well as tissue engineering (Regenerative Medicine), the active component of which includes cells, genes, tissues, or combinations of the above. This unique approach constitutes the most promising therapeutic potential for the treatment of severe hereditary and acquired diseases, many of which were considered untreatable until recently. To accomplish these goals, BRFAA develops research programmes studying the differentiation of stem cells into specialised tissues, as well as studies on transforming mature differentiated cells into stem cells which can then be differentiated into mature tissues. For example, skin cells from patients with Parkinson's disease are converted into stem cells in the laboratory, which are then differentiated into neurons that are used to study the electrophysiological, biochemical and molecular aspects of the disease, as well as the impact of candidate drugs. Equally important is the effort to convert in the test tube cardiac fibroblasts into functional cardiomyocytes to treat heart failure.

Over the last three years, BRFAA's researchers have developed the new technology of modern cell biology, that is the development and culturing of organoids. Organoids are three-dimensional multicellular structures derived from individual stem cells or cancer cells of mature tissues, that share similar structural and functional characteristics with the tissue of origin (Fig. 8). BRFAA studies focus on:

a) organoids of the human pancreas, deriving from normal tissue in order to explore the regeneration mechanism of insulin-producing β -cells, b) organoids derived from pancreatic, lung and bladder cancer, which are used as a platform for functional trials and the selection of anticancer drugs for individualised treatments, and c) organoids derived from brain cells (mini-brains), which contain all types of brain cells and constitute an ideal model for the study of developmental mechanisms and the effects of various medications on the human brain.

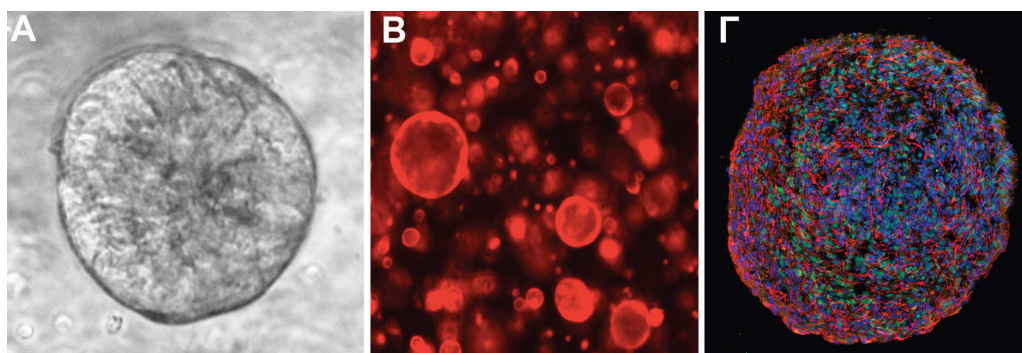


Fig. 8. (A) Organoid from the pancreas of a patient with pancreatic adenocarcinoma, (B) Organoids of a normal pancreas, and (C) Spheroid of human cerebral cortex with premature (green) and mature (red) neurons.

In the gene therapy area, the main subject of the studies carried out at BRFAA involves the development of novel highly improved therapeutic viral vectors for the treatment of severe hemopoietic disorders, such as β -thalassemia, sickle cell anemia, multiple myeloma, and other malignancies. The therapeutic potential of mesenchymal stem cells is studied in animal models with human diseases (acute liver failure, bladder cancer, etc.). Also, methods are being developed for the production of T-lymphocytes with chimeric receptors against the **CD19 molecule (Chimeric Antigen Receptor T-cells, CAR-T cells)** for the successful treatment of patients with aggressive CD19+ B-lymphomas, which have been successfully used against lymphoma cell-lines.

Systems Biology and Medicine: Taking into consideration the recent technological developments towards a holistic understanding of functional interactions (in space and time) of all the components of biological systems, BRFAA is investing on attracting new scientists in the fields of Systems Biology and Molecular Epidemiology, aiming to exploit its current and future research activities in the areas of basic, preclinical and clinical research, for the development of prognostic models for diseases. The smooth transition of BRFAA's activities into this new era of science is based on the accumulated experience and scientific excellence that has

already been established in many research fields. A decisive factor for the transition into the new era is the fact that unique high-technology research infrastructures such as, the Greek Genome Center, the supercomputer infrastructure, the imaging facilities and the clinical research unit, are already operating in the Foundation, while the laboratories of Biosafety level 3+ and radiogenomics are currently under construction. Of course, all advances will become meaningful only through the recruitment of a new generation of excellent investigators, who have matured scientifically in the new post-genomic era of biological research. Another critical prerequisite for the described transition is the adoption of nearly global interdisciplinary approaches, which are enhancing significantly the capabilities of developing new technologies and computational tools. Overall, this approach is based on the utilisation of Artificial Intelligence based computational models in an iterative process of experimentation and modelling, enabling researchers to simulate, explore and predict the behaviour of the biological system under investigation. A third contributing factor will be the expansion of multidisciplinary approaches, not only through the recruitment of new investigators, but also by fostering close collaborations with other Institutes within Greece and abroad.

BRFAA will launch the COHORT-GREECE programme, which entails the whole genome sequencing of a representative sample of the Greek population, consisting of 17,000 individuals. This study incorporates clinical, epidemiological and biological data, as well as data regarding the donors' lifestyle. The collected genomic data will be correlated with their epidemiological data which, after being updated, will be linked with other health databases (e.g. e-prescription from the large databank of the National Organisation for Healthcare Services). The aim is to obtain important information regarding the role and the impact of specific genetic variants, as well as the lifestyle and environmental conditions, in the development of diseases through the use of cutting-edge biostatistical analyses and artificial intelligence methods. The contribution of the proposed programme will be equally critical in archeological/historical studies of special national interest. The proposed number of Greeks whose genome will be analysed will offer a complete and adequate basis of reference for conducting paleogenomics studies in order to validly reconstruct the demographic history of the Greeks. COHORT-GREECE will generate a precious digital platform from which molecular, clinical, pharmacological, environmental and lifestyle data could be extracted, providing thus (after appropriate processing, analysis and integration), new information for targeted therapies, prediction and prognosis on an individual basis. Of course, all advances will become meaningful only through the recruitment of a new generation of excellent investigators, who matured scientifically in the new post-genomic era of biological research.

The New BRFAA's Precision Medicine Building

The recent revolutionary advances in Life Sciences and Medicine, both at the conceptual and technological levels, continue to grow exponentially but have reached an inflection point necessitating drastic solutions for urgent health problems, such as cardiovascular diseases and cancer (the top life threatening conditions). Considering the progress that has already been achieved in genomics, proteomics, metabolomics, non-invasive imaging approaches, biology of stem cells (with a significant impact in cell therapies), computer-aided drug design and Information and Communication Technologies (ICT), the exciting opportunity now arises to match each patient with his/her personal treatment (precision or personalised medicine). In other words, the opportunity arises to implement for the first time the idea expressed by the medical doctrine that “there are no diseases, but patients”, which underlines the importance of administering targeted treatment to the specific patient at the appropriate time point.

BRFAA has already made significant investments on the development of cutting-edge research infrastructures (e.g. the one and only Genome Center in Greece) and programmes regarding cancer, cardiology, immuno-inflammatory, and neurodegenerative diseases, in the context of Precision Medicine. For this purpose, BRFAA's activities are dynamically expanding to the Precision Medicine field with the construction of a new 22,000 sq.m. building through the Public-Private Partnerships (PPP) instrument, in order to provide the necessary laboratory space and equipment to young researchers in the field of Precision Medicine, house new integrated state-of-the-art research facilities, and host start-ups and other innovative companies operating in the bioinformatics, biotechnology, diagnosis, and medical applications sectors (Fig. 9). Such companies will have direct access to the research infrastructures of BPMB and the main BRFAA building and, in addition, the unique opportunity to interact productively with BRFAA scientific personnel for planning and technology transfer.

BRFAA's Precision Medicine Center has been designed in the context of a business model, which is fully harmonized with the spirit of collaboration between the academic and business sectors, for the research, development and provision of highly specialised medical services in collaboration with universities, university clinics, research centers, hospitals-clinics, pharmaceutical companies, diagnostic centers, and IT companies in the healthcare sector.

BRFAA's new Precision Medicine facility will host the following research activities and will provide the following services:

- Digital Medicine (*Precise determination of the appropriate pharmaceutical treatment for individualised therapies. Identification and evaluation of biomarkers for the diagnosis and prognosis of diseases and for assessing treatment*



Fig. 9. General view of the existing (right) and the planned new facilities of BRFAA (left).

efficacy. Support of clinical trials for the evaluation of novel and generic drugs in appropriately selected patient groups).

- Hellenic Biological Material Bank (BBMRI-GR headquarters)
- Preclinical Trial Platform
- Platform for advanced cellular therapies-Advanced Therapy Medical Products-ATMPs (EATRIS-GR headquarters)
- Unit of Clinical Genetics Consultation Service

Provisions have been made to dedicate BPMB space to the hosting of start-up and other innovative companies, operating in the sectors of biotechnology, diagnostics, and medical applications. Such companies will have direct access to the research infrastructures of the BPMB and the main BRFAA building and, in addition, the unique opportunity to interact productively with the BRFAA scientific personnel for planning and technology transfer.

Apart from the construction of the BRFAA's new Precision Medicine building, the Loverdeio building in the neighbouring "Sotiria Hospital", which has been granted to the Foundation for 35 years, will be renovated and fully equipped. This building will house the BRFAA's Clinical Studies Unit for evaluating original drugs and generics. This building, covering a total area of 555 sq.m., will be fully furnished and equipped to house an independent Clinical Trials Unit for testing novel and generic drugs (bioequivalence studies between original and generic

drugs). This Clinical Research Unit with a 30-bed capacity and specialised hematology and biochemistry laboratories, as well as medical equipment for monitoring and resuscitation, is expected to closely collaborate with the private sector (pharmaceutical industry) with favorable material impacts on the society.

This hybrid developmental model will function bilaterally in a catalytic way for a dynamic synergy between academic and business entities towards new applications, to the benefit of public health, innovation and the economy. In addition, a direct result of the implementation of this project will be the reduction of unemployment, and at the same time, a substantial reversion of the catastrophic for the Greek economy trend of young Greek scientists moving abroad (“brain drain”).

Creation of a Biosafety 3+ Laboratory

The unprecedented global public health crisis due to the COVID-19 pandemic has highlighted in the most emphatic way the need for infrastructures with high specifications dedicated to research of contagious infectious diseases. This is the way to effectively meet the needs for the immediate development of methods for the identification and diagnosis of emerging infectious diseases and new treatments. It has also highlighted how vulnerable societies are against health threats caused by infectious diseases. In the last 20 years, infectious pathogens such as influenza virus strains (e.g. H1N1/09 and H5N1) and the coronaviruses SARS-CoV, MERS-CoV and SARS-CoV-2, have caused health, humanitarian and economic crises at a global level. In order to minimize the impact of emerging infectious diseases on human health, immediate action in the biomedical and scientific sector is needed. The development of appropriate research infrastructures for the effective mitigation of emerging infectious diseases is at the heart of such activities, in order to allow their identification, classification, and detailed study, and develop appropriate diagnostic tools for the identification and isolation of infected individuals. In the context of the European Investment Bank's tender for the development of national research and diagnostic infrastructures, BRFAA submitted a proposal for the creation of a specialised **Biosafety Level 3+** laboratory (Biosafety Laboratory +3, BSL3+) with the most demanding specifications for the management, diagnosis, and research on extremely infectious agents, such as the SARS-CoV-2 virus responsible for the COVID-19 pandemic, the avian and swine flu viruses, the tuberculosis bacillus, etc. The activities in the new laboratory will be supported by cutting-edge technologies that BRFAA already possesses, such as the Genome Center for the genomic identification of infectious agents, the single cell analysis using mass cytometry, etc. The BSL3+ infrastructure that will be constructed will also include a special animal housing facility for performing preclinical trials to test antimicrobial and antiviral drugs. **There is no BSL3+ laboratory currently**

in Greece. The BSL3+ laboratory will be housed in a new five-floor, 1,200 sq.m. building, which will be constructed next to the existing BRFAA facilities. The construction and equipment of the BSL3+ laboratory project will be funded by the Recovery and Resilience Fund, as well as by the European Investment Bank.

Creation of a Radiogenomics Laboratory

Medical imaging plays a significant role in the early diagnosis and follow-up of most diseases' progression. Imaging offers significant advantages compared to other diagnostic molecular, biochemical and cellular/histological methods, because it is non-interventional and offers very rapid results. The creation of a Radiogenomics unit aims at the development and improvement of new and existing research activities, the enhancing of the medical services provided by BRFAA, and the shielding of the country from current and future public health threats. The project is directly interwoven with the development of Precision Medicine at BRFAA, which is expected to lead to the creation of new scientific knowledge with high added value, as well as to the increase of income through the development of new complex diagnostic and treatment products, through the combined use of advanced biomedical imaging technologies and genomic analysis. Specifically, the technology that will be developed will allow linking the patients' genetic profile with the clinical and imaging characteristics of the disease through the use of Artificial Intelligence and Machine Learning approaches. An underground facility with two floors and a surface area of 890 sq.m. will be constructed. It will be equipped with a PET-MRI imaging system (the first in Greece) and a cyclotron (radioisotope production system) to generate specialised radiopharmaceuticals, currently not available in Greece. The new unit will generate the appropriate technological infrastructure to acquire high definition medical images that will be combined with databases containing genetic information for diseases by using artificial intelligence applications. This new approach is anticipated to offer rapid and individualised diagnosis for a multitude of oncology and non-oncology conditions. The development of the Radiogenomics Unit will contribute significantly to scientific advancements and tool development, leading to the digital transformation of healthcare services. With the development of these new activities, BRFAA, a pioneer in Greece in implementing modern biomedical technology methods, will develop innovative products and complex services through close cooperation with knowledge-intensive companies operating in the sectors of informatics, biotechnology, and biomedicine. The construction and equipping of the Radiogenomics Unit project is funded by the Recovery and Resilience Facility, as well as by the European Investment Bank.

CENTER FOR ENVIRONMENTAL EFFECTS ON HEALTH

1. Purpose and activities

The Center for Environmental Effects on Health (CEEH) of the Biomedical Research Foundation of the Academy of Athens (BRFAA) focuses on the continuous monitoring of the dangerous solar ultraviolet (UV) radiation, the total column of ozone and sulfur dioxide, as well as the measurements of gaseous components and meteorological parameters related to the environment and health. CEEH has a Brewer type spectrophotometer, pyranometers of total and ultraviolet solar radiation and a mobile Health-Environment unit with modern laser radar technology as well as instruments for the measurement of air pollution. All these equipments are used to monitor the structure and composition of the atmosphere, in collaboration with the National Technical University of Athens and the Navarino Environmental Observatory at Costa Navarino in collaboration with the University of Stockholm. CEEH has participated in a number of national and international activities, including the free offer of the erythemal doses of solar UV radiation to the Olympic athletes of ATHENS 2004, through the website www.uvnet.gr. The ozone and ultraviolet spectrophotometric station is part of the World Ozone and Ultraviolet Radiation Data Center of WMO.

Since the Center began its operation, its researchers have participated in a series of international competitive European research projects, including CANDIDOZ, QUOBI, SCOUT-O3, QUANTIFY, GEMS, CIRCE, GEOMON, AMFIC, MACC, DARECLIMED, MACC II and III, CAMS, GEO-CRADLE, SMURBS ERA-PLANET, etc., as well as in national competitive research projects such as UVNET, ΠΕΝΕΔ 2003 (Research Capacity Building Programme), ΕΔΗΕ (National Network for Solar Energy), PANACEA and CLIMPACT. CEEH has participated in the organisation of important international conferences, including the Scientific Symposium marking the 20th anniversary of the Montreal Protocol for the protection of the ozone layer (co-organised with international organisations and the International Ozone Commission), featuring the participation of three Nobel laureates: P. Crutzen, S. Rowland, and M. Molina (Fig. 1).

In December 2009, a trilateral Agreement was signed between BRFAA, the Bert Bolin Center of Stockholm University and the development company of Costa Navarino, TEMES S.A., in order to create an Observatory of climatic and environmental changes in the area of Costa Navarino of Messinia, under the name Navarino Environmental Observatory (N.E.O.). The activities of the Observatory focus on research on Climate Change and its impact on the natural environment and human activities in the Mediterranean area.



Fig. 1. The Scientific Symposium marking the 20th anniversary of the Montreal Protocol for the protection of the ozone layer (Athens, September 2007). Some of the distinguished participants (all scientists and officials from NASA, NOAA, CNRS and the Max Planck Institute), include (in the first row) the Nobel winners, Prof. S. Rowland, Prof. M. Molina and Prof. P. Crutzen, Prof. G. Brasseur (Director of NCAR), Dr. S. Solomon, and Prof. C. Zerefos (Director of CEEH).

2. Publications-Awards-Distinctions

The research conducted at CEEH has been internationally recognised as its researchers have published a significant number of scientific papers in peer-reviewed journals, 70 of which in journals with an increased h-index. The director of the Center has received international awards including the Blaise Pascal Medal of the European Academy of Sciences (2015), the Yoram Kaufman Award of the American Geophysical Union (2015), Honorable Mention from the United Nations Environment Programme (UNEP) (2013), Order of Honour from the President of the Hellenic Republic (2020), French Government Decoration “Commandeur dans l’ordre de Palmes académiques” (2015), Honorary Member of the International Ozone Committee (2016), Award Certificate and Letter from UNEP and from IPCC for his substantial contribution to the reports of IPCC, which shared the 2007 Nobel Peace Prize with the former Vice President of USA, Al Gore (2008), Award and “Ioan Ursu” Medal of the Balkan Physical Union (2015, 2018), the “European Union Prize for Cultural Heritage / Europa Nostra Award”

awarded to the National Observatory of Athens for the establishment of the Geostrophysics Museum and the rehabilitation of the buildings, the laboratories and the astronomical Library under his supervision (2010). In the past decades the director of the Center has acted as author, contributor, or reviewer in almost all WMO/UNEP Scientific Assessments of Ozone Depletion.

3. Participation in experimental field campaigns

The mobile Health-Environment unit of BRFAA has participated in various experimental field campaigns aimed at measuring the optical properties of the suspended particles that is, basic parameters of air pollution. The main experimental field campaigns in Greece, during the period 2012-2018, were the following:

a. Participation in the international CHARMEX experiment (2012)

The international CHARMEX experiment aimed at studying the transport mechanisms of particulate pollution in the wider Mediterranean area. In the context of the CHARMEX experiment, the mobile Health-Environment unit of BRFAA moved to the Navarino Environmental Observatory (June 2012) where it measured the transported (incoming) particulate pollution from the Sahara Desert and Central Europe towards Western Greece, in parallel with all the stations of the European lidar station network (EARLINET).

b. Participation in the international AQUA-AGRO experiment (2012)

The international AQUA-AGRO experiment aimed at studying the change of the optical properties of aerosols on the Athens-Evia-Bucharest axis. In the context of the AQUA-AGRO experiment, the mobile Health-Environment unit of BRFAA moved to Oxylithos, Evia (Central Aegean) in September 2012, where it measured the transported (incoming) particulate pollution from the Sahara Desert, Western Turkey and Russia, before it entered the Athens Basin. The results of the international AQUA-AGRO experiment were published in the Final Report of the GSRT 11 Greek-Romania Cooperation project (ROM 36_5_ET30) (2014) and in the scientific publication (Papayannis et al., 2014).

c. Participation in the international HYGRA_CD experiment (2014)

The international HygrA-CD experiment which was conducted in the context of the ITARS project (www.itars.net) aimed at studying the role of aerosols in cloud creation over the Athens Basin. In the context of the HygrA-CD

experiment, the mobile Health-Environment unit of BRFAA moved to NCSR-DEMOCRITOS in May-June 2014, where it measured the produced particulate pollution in the Athens Basin, as well as the transported (incoming) particulate pollution from the Sahara Desert, Western Turkey and Russia, as it was entering the Athens Basin. A typical example of measurement of the suspended particle backscatter factor is presented in Fig. 2.

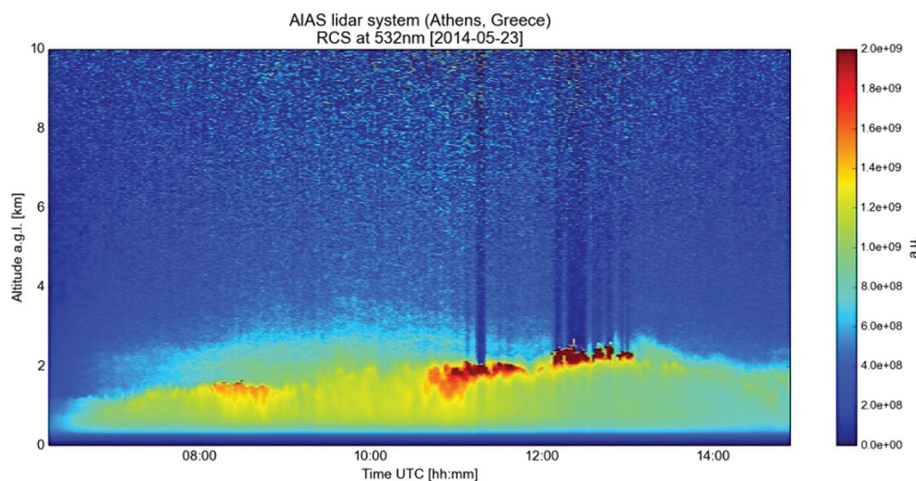


Fig. 2. Spatial-temporal change of the vertical distribution of the backscatter coefficient of suspended particles in the context of the experimental HYGRA_CD campaign (2014).

The results of the international HygrA-CD experiment were published by Papayannis et al. (2017).

d. Participation in the celebrations for the 180th anniversary of the National Technical Univeristy of Athens (NTUA) in 2017

The mobile lidar station actively participated in the event for the 180 years since the foundation of NTUA, entitled “NTUA opens the gates of its laboratories to the public”, on October 20-21, 2017 (Fig. 3).

In the period 2019-2021, the mobile Health-Environment unit of BRFAA participated in three experimental campaigns in the context of the PANACEA research programme. The aim of the PANACEA research project is to study the air pollution in various Greek urban areas with intense phenomena of air pollution. These studies correspond to the time period of the restrictive measures due to COVID-19.



Fig. 3. Participation of the AIAS mobile lidar station in the “180 years of NTUA” event.

e. Participation in the PANACEA experiment (July 2019) – Volos, Prefecture of Magnesia

A typical example of the backscatter coefficient of suspended particles is presented in Fig. 4.

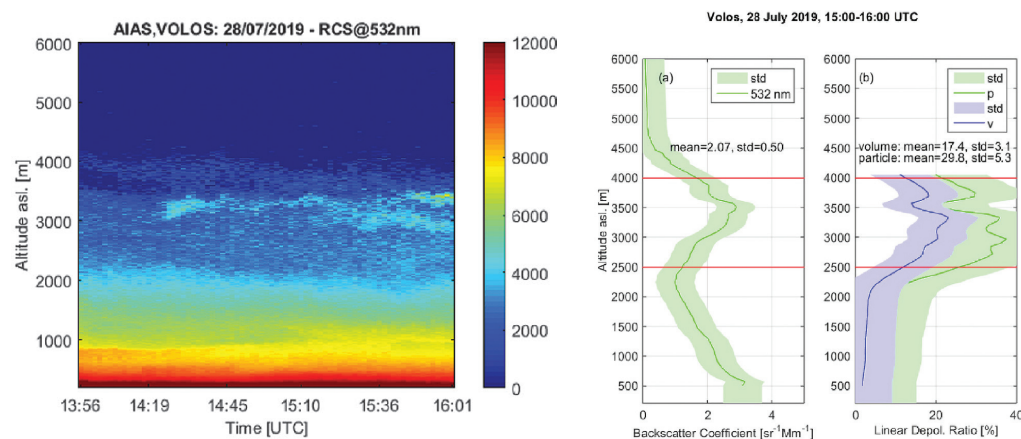


Fig. 4. Measurements of the vertical distribution of the spatial-temporal change of the lidar signal (532 nm) (left) and of the backscatter coefficient (right) of suspended particles in Volos, Magnesia (28.07.2019) (Mylonaki et al., 2021).

f. Participation in the PANACEA experiment (January-February 2020) - Ioannina (period of COVID-19)

In the winter of 2020, the mobile lidar station participated in the recording of aerosols in the Ioannina Basin with the aim of studying and measuring the op-

tical properties of the suspended particles and their impact on the inhabitants' health in Ioannina. A typical example of measurement of the backscatter coefficient of suspended particles is presented in Fig. 5.

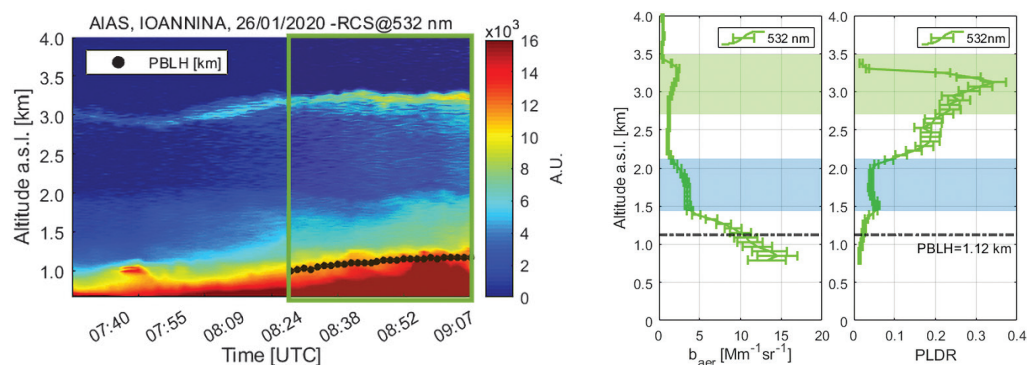


Fig. 5. On the left, measurements of the vertical distribution of the spatial-temporal change of the lidar signal (532 nm); on the right, measurements of the backscatter coefficient of suspended particles in Ioannina (26.01.2020).

g. Participation in the PANACEA experiment (October-November 2021) – Mount Helmos – Prefecture of Achaia

The international experimental campaign which took place in the context of the PANACEA project on Mount Helmos aimed to study the role of aerosols in cloud formation on Mount Helmos (Fig. 6).

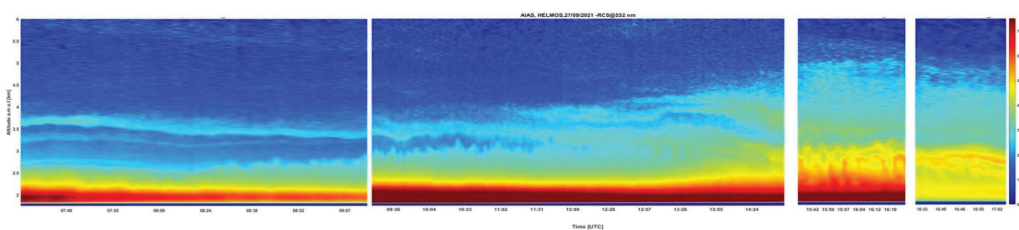


Fig. 6. Measurements of the vertical distribution of the spatial-temporal change of the lidar signal (532 nm) of suspended particles on Mount Helmos (01.10.2021).

4. Measurements of the quality of the atmospheric environment

a. Long-term measurements of the ozone layer and the optical depth of suspended particles in Athens

Fig. 7 presents the daily values of the total ozone column in Athens in the period 2003-2019, as measured by the Brewer type spectrophotometer which is installed on the roof of BRFAA. As seen on Fig. 7, there is a very good agreement between the ground measurements of BRFAA and the satellite observations from TOMS and OMI (correlation coefficients greater than +0.9). Accordingly, large correlations are also found with the measurements of the European satellites, Me-

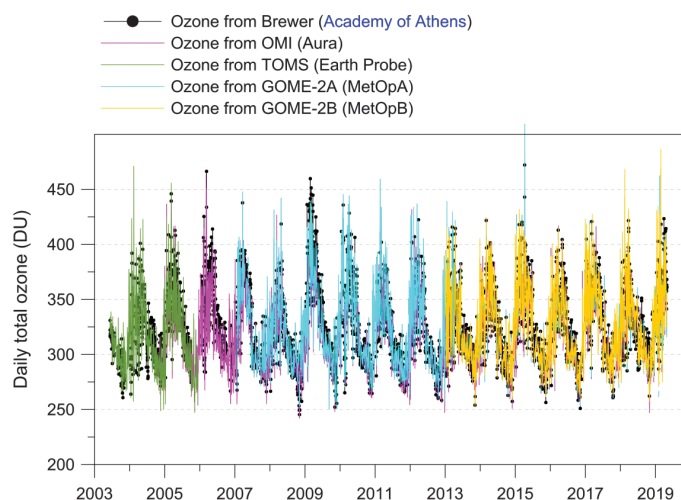


Fig. 7. Daily values of the ozone layer in Athens from the ground measurements in the Academy of Athens and the observations of the satellite instruments, OMI, TOMS, GOME-2A and GOME-2B (Eleftheratos et al., 2021).

tOpA and MetOpB. The ozone layer appears to be stabilised over Attica, with no significant change during the past 18 years or so. The average value of the ozone layer remains steady at 320 Dobson units, a quantity corresponding to a layer thickness of 3.2 mm. Respectively, the levels of the inhabitants' exposure to ultra-violet solar radiation remain constant, as confirmed by the satellite observations of the erythemal dose of solar radiation over the Athens basin. The results were presented in a recent scientific paper by Eleftheratos et al. (2021).

The measurements of the Brewer spectrophotometer were used to study the temporal changes of the aerosol optical depth (AOD) in Athens for the period 2008-2014. The results are presented in Fig. 8. The Brewer measurements showed

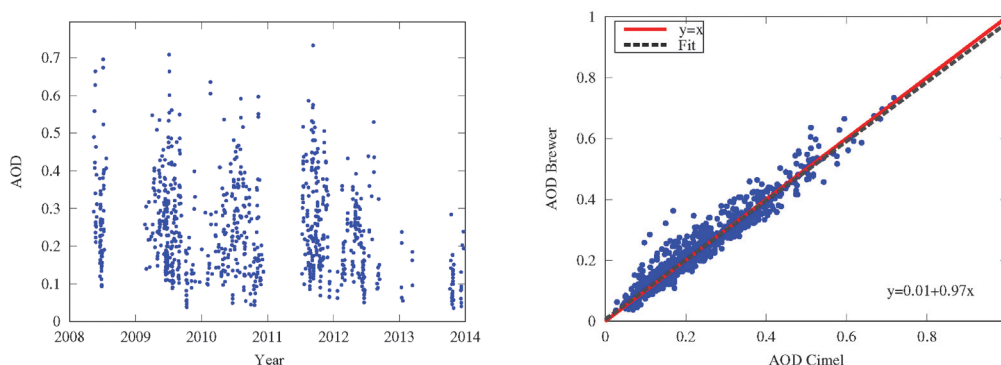


Fig. 8. Temporal changes of the aerosol optical depth in Athens during the period 2008-2014 from the measurements of the Brewer spectrophotometer at 437 nm. On the right, the Brewer measurements are presented in comparison to the corresponding measurements of the CIMEL photometer (Diémoz et al., 2016).

a downward trend of AOD at 437 nm during the period under study, as well as a very good agreement with the corresponding measurements from the CIMEL photometer of the international AERONET network of NASA. The results were presented in the scientific paper by Diémoz et al. (2016).

b. Measurements of sulfur dioxide, solar radiation and aerosol optical depth in Athens during forest fires

Fig. 9 presents the measurements of the total column of sulfur dioxide (SO_2) in Athens during the forest fire of August 2009 that hit areas in Northeast Attica,

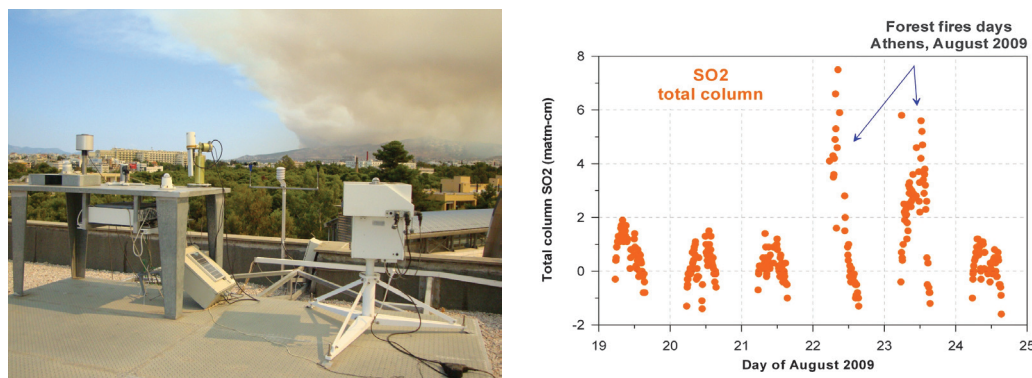


Fig. 9. On the right, measurements of the total column of sulfur dioxide (SO_2) at the BRFAA during the forest fire in northeast Attica in August, 2009. On the left, the cloud of suspended particles from the forest fire, which engulfed Attica.

from Grammatiko and Marathon to Pikermi and Pallene, burning part of Penteli in its passage. The concentrations of the total SO_2 column, as measured by the BRFAA spectrophotometer on August 22 and 23, were approximately 3 times higher than the normal values. The photo on the left shows the smoke that passed over BRFAA on August 22, 2009; the diagram on the right shows the measurements of SO_2 from the spectrophotometer.

The measurements of erythral solar radiation during the days of the forest fires (August 22-23) were compared to the measurements before the fires (August 19) as shown in Fig. 10. On August 23, the smoke remained over the station for the entire day, which resulted in the decrease of erythral radiation from 160 to 40 mW/m^2 . The comparison of the UV-MFR measurements at two wavelengths (311 nm και 368 nm) showed that the decreases of radiation at UV-B (311 nm) were greater than the radiation decreases at UV-A (368 nm). This is due to the increased scattering of aerosols at shorter wavelengths. The decreases were even up to 95% and 80%, for UV-B and UV-A solar radiation, respectively. The results were presented in the scientific paper by Amiridis et al. (2012).

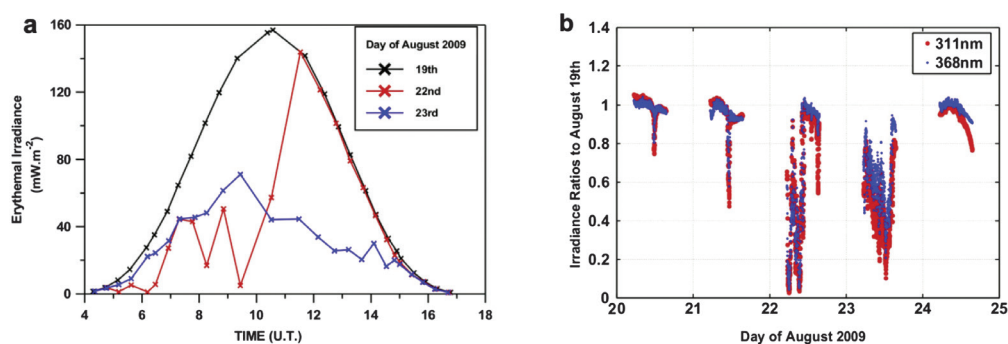


Fig. 10. (a) Measurements of erythral radiation from the BRFAA Brewer spectrophotometer before and during the forest fires of August 2009 in Attica. (b) Measurements at two characteristic wavelengths (311 nm και 368 nm) from the UV-MFR photometer (Amiridis et al., 2012).

Fig. 11 presents the measurements of SO_2 during the recent catastrophic fires of August 2021. The concentrations of the total SO_2 column that were measured at BRFAA during the first 11 days of August (period of forest fires) and on August 18-19 (forest fires in Lavreotiki and Vilia, Attica) were up to 8 times higher than the average value of SO_2 in August. The average value is from the days without forest fires. The top photos of Fig. 11 were taken at the BRFAA station on August 5, 2021 and they show the wildfire smoke in the morning and at sunset. The diagrams at the bottom of Fig. 11 illustrate the daily measurements of SO_2 and the average daily values of the optical depth of suspended particles at 320.1 nm from the Brewer spectrophotometer measurements in August 2021.

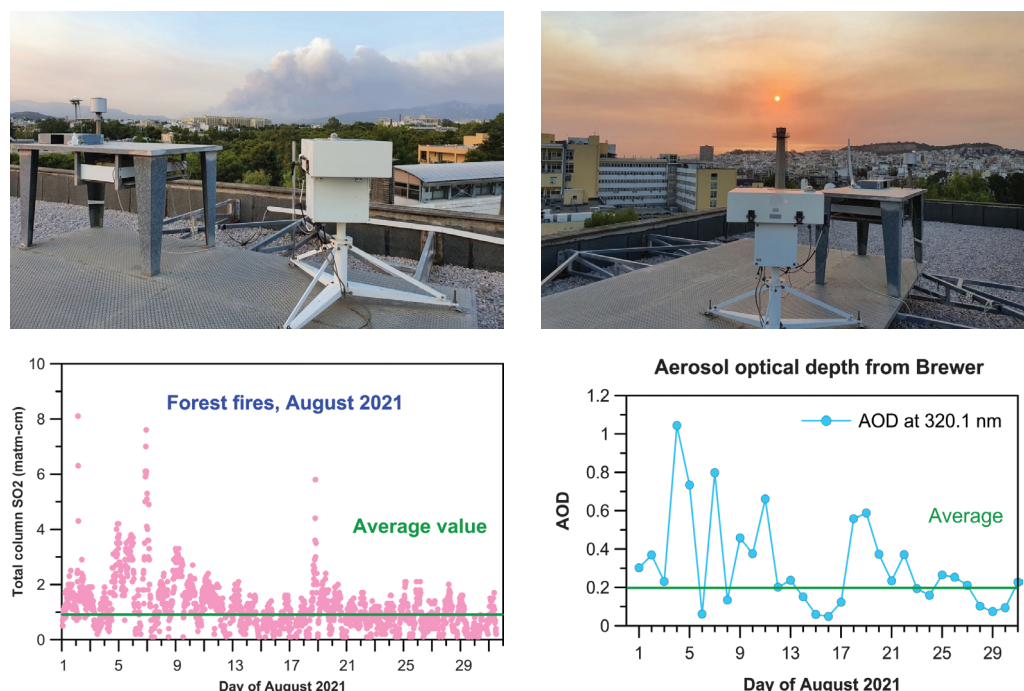


Fig. 11. Measurements of the total column of sulfur dioxide (SO_2) and of the optical depth of aerosols at 320.1 nm at BRFAA in August 2021.

c. Detection of transnational transport of sulfur dioxide of volcanic origin

The SO_2 measurements of BRFAA were included in an international study for the detection of SO_2 of volcanic origin from the existing network of Brewer spectrophotometers. Comparisons with independent ground and satellite measurements, as well as theoretical model calculations, confirmed the Brewer network's ability to detect volcanic concentrations of SO_2 . The comparison with OMI and GOME-2 satellite retrievals showed a statistically significant agreement between the Brewer network data and the collocated satellite overpasses in the case of the eruption of Kasatochi Volcano in Alaska in August 2008. The simulations of the total SO_2 column from the MACC project (Monitoring of atmospheric composition and climate) showed that the large increases of SO_2 in Europe following the eruption of Bárðarbunga Volcano in Iceland in September 2014 were not caused by local pollution sources or ship emissions, but were clearly linked to the volcanic eruption. The increase of SO_2 at ground level and in the troposphere of Europe was identified by other ground networks as well (Air-Base and EARLINET). It was suggested that the combination of the measurements of the existing Brewers network with other ground and satellite networks could create a useful tool to forecast high SO_2 values

both at ground level and in air flight corridors following future eruptions. The results were presented in the scientific paper by Zerefos et al. (2017).

d. Measurements of ozone and carbon monoxide at the N.E.O.

The researchers of CEEH of BRFAA analysed the atmospheric concentrations of ozone (O_3) and carbon monoxide (CO) in Messinia, from the measurements of the N.E.O. station which has been operating in Methoni since 2016. The station is part of the PANACEA national research infrastructure and its aim is to monitor on a long-term basis the concentrations of basic suspended particles and air pollutants, in order to understand the factors determining the levels and variability of pollution in remote areas. The measurements of air pollutants were compared to the corresponding measurements of Finokalia station in Crete. The correlation coefficient between the daily values of O_3 in Methoni and Finokalia is approximately +0.6. A similar correlation was also found for CO. The scientific results were presented at the 2nd scientific conference of PANACEA, which was held online between September 29 and October 1, 2020.

e. Educational activities at the N.E.O.

The 3rd educational Workshop of the AdaptNET project on the impact of climate change on agriculture was held at the Costa Navarino, Messinia, from February 3 to February 8, 2020. The AdaptNET project (Strengthening education, research and innovation for climate smart crops in India) is an ERASMUS+CAPACITY BUILDING project funded by the European Commission. The Workshop was attended by 29 Indian teachers/scientists, as well as 15 postgraduate students from Greece. The training was organised by Dr. Ioannis Kapsomenakis and Dr. Dimitris Voloudakis.

4. Infrastructure and Equipment

- One Brewer MK IV Spectrophotometer for measuring spectral ultraviolet solar radiation (UV-B) and the total columns of ozone, sulfur dioxide and nitrogen dioxide. The instrument had been operating for a decade in joint programmes of NASA and the European Union in Reykjavik within the Arctic Circle (donated by Professor Christos Zerefos).
- A multi-channel NILU-UV radiometer for measuring ultraviolet solar radiation (UVB, UVA) and photosynthetically active radiation (PAR) (station of the National Network for the Measurement of Ultraviolet Solar Radiation) (donated by Professor Christos Zerefos).

- A CM11 Pyranometer for the measurement of the incoming solar radiation (station of the Hellenic Solar Energy Network).
- Ecotech Serinus 10 ozone analyser and Ecotech Serinus 30 carbon monoxide analyser (collaboration with the Navarino Environmental Observatory).
- Mobile lidar station (AIAS) of single wavelength (laser beam emission at 532 nm) with the ability to measure the depolarization of the back-scattered laser beam. The mobile station was upgraded in July 2021 with an additional channel for the measurement of aerosols at 1064 nm. The AIAS lidar system of Greek construction (Professor Alexandros Papagiannis and associates, NTUA) is installed in a specially designed FORD Transit van (donated to BRFAA by the Hellenic Shipowners Association).
- Professional wireless Bresser 5-in-1 weather station (wind speed, wind direction, humidity, temperature, rain).
- Wireless air quality sensor, PurpleAir PA-II model, for measuring the concentration of the PM2.5 suspended particles (owned by the NTUA – Laser Remote Sensing Laboratory).
- One complete meteorological station (temperature, humidity, pressure, rainfall, wind intensity and direction).



Fig. 12. The former President of the Hellenic Republic, Mr. Prokopios Pavlopoulos, and the contracting parties (Ceremony on the occasion of the 5th anniversary of the N.E.O. May 18, 2015).



Fig. 13. The CEEH – BRFAA station for measuring the quality of the atmospheric environment, part of the global network for ozone/ultraviolet radiation measurements.



Fig. 14. The ISOBOX of the Navarino Environmental Observatory (N.E.O.) in Methoni.

