

**Laboratory of Organic Chemistry:**  
**Contribution to the historical development of the Department of Chemistry**  
**during the 1st century since its foundation**

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The Laboratory of Organic Chemistry (LOC) of the National and Kapodistrian University of Athens (NKUA) was created in 1912 and headed by Professor **G. Mattheopoulos** (1912-1939). It resulted from the division of Physical Chemistry into Inorganic Chemistry, headed by Professor K. Zeggelis, and Organic Chemistry. The two professors G. Mattheopoulos and K. Zeggelis, succeeded A. Christomanos, who is considered to be the founder of the Chemistry at NKUA.

G. Mattheopoulos<sup>1</sup> (1873-1958) was a Chemical Engineer with a bachelor's degree (1895) and a doctorate (1896) from the Technical University of Zurich (ETH). He was Christomanos' Lecturer (*epimelitis*) (1898) and was in charge of the NKUA morgue (1899-1912). For a short time, he served as Rector of NKUA (1928-29). His research interests were related to food chemistry, and was the first President of the Association of Greek Chemists (April 1924), immediately after its foundation by a group of active young chemists of the time.

G. Mattheopoulos wrote two textbooks on Organic Chemistry. The first is the "Handbook of Organic Chemistry" (FAT COMPOUNDS, 1917), and the second is a more concise book covering the entire syllabus of Organic Chemistry taught at that time, entitled, "Summary of Organic Chemistry", 1923. As one might expect, these two books constitute an evolution in terms of the knowledge provided to students at the time, particularly with respect to the preexisting textbook by Professor A. K. Christomanos, "Organic Chemistry" (1889). Among

others, there is an effort to update the nomenclature of organic compounds to conform to that of Europe, with the characteristic example that alcohols are no longer called “spirits”.

The next Director of the LOC was **Professor L. Zervas** (1939-1968). L. Zervas<sup>2</sup> (1902-1980) was a Chemist with a bachelor's degree (1924) and a doctorate (1926) from the University of Berlin, under the guidance of Max Bergmann, who studied under Emil Fischer. He was a Research Fellow at the Max Planck Institute in Dresden (1926-29) and Head of the Department of Organic Chemistry and Deputy Director of the Institute (1929-34). He then worked as a researcher at the Rockefeller Institute for Medical Research in New York (1934-1936), following M. Bergmann, who was forced to leave Germany at the time because of his Jewish descent. In 1932 L. Zervas and M. Bergmann published<sup>3</sup> the famous carbobenzoxy method of synthesis of peptides that opened new horizons in the scientific field of peptides<sup>4</sup>, allowing for the synthesis of peptides of high biological activity (eg glutathione, oxytocin), glycopeptides of D-glucosamine and various peptides with amino acids of defined stereochemistry for the study of the activity of proteolytic enzymes. Having achieved international recognition, L. Zervas returned to Greece initially as Professor of Organic Chemistry and Biochemistry at the University of Thessaloniki, (1936-38) and then as Professor of Organic Chemistry and Director of the LOC of NKUA (1939). Due to his enormous efforts, it became possible to reconstruct the Laboratory after the calamities brought upon by the German Occupation, which included imposing an enforced mobilization on the entire Chemistry Department, as well as his own imprisonment as a member of the resistance organization **National Republican Greek League (E.D.E.S.)**.

In the field of research, Zervas guided many young scientists in the preparation of more than 30 doctoral dissertations (1940-1980) the results of which were published in the best scientific journals of Organic Chemistry (mainly JACS, but also JOC, J. Chem. Soc., Perkin I, and others).

L. Zervas was a member of the Academy of Athens (1956), *ex officio* member of the Supreme Health Council, the Supreme Chemical Council of the State, as well as Chairman of the Hellenic Atomic Energy Committee. He was also a pioneer in the effort to establish the National Research

Foundation (then R.R.F., i.e. Royal Research Foundation), of which he served as a Vice President (1958-68) and President (1974-79).

L. Zervas was the recipient of many honorary awards and some of them are briefly mentioned: Doctor *honoris causa* (1960, Basel), Minister of Industry in the Service Government of Paraskevopoulos (1964), honorary member of the American Society of Biological Chemists (1969) and foreign member of the Academy of Sciences of the Soviet Union (1976). He was awarded the Scientific Value Medal, First Class by the Academy of Sciences in the Socialist Republic of Romania (1976), as well as the 1st Gold Medal by the Max Bergmann Scientific Institute of German-speaking peptide chemists of Central Europe (1981). He was also honorably appointed President of all European Peptide Symposia (1956-73). He retired in 1968 at the age of 65, due to the lowering of the retirement age by the government at that time.

Since then, the leadership of the Laboratory has been assumed by:

Emeritus Professor of the Department of Pharmacy **Georgios Tsatsas** (1968-69), followed by Emeritus Professor **Georgios Varvoglis** (1969-73).

G. Varvoglis was a Chemist with a bachelor's degree from NKUA and a doctorate from the University of Munich. During the period 1940-69 he served as Professor of Organic Chemistry at the School of Physics and Mathematics of the Aristotle University of Thessaloniki, of which he was also Rector (1960-61). He had previously served in the LOC (1928-40) in various positions.

The leadership of the Laboratory was then unofficially assumed by I. Vourvidou-Photaki (1973-1975), and, after invitation from the United States, **Gerasimos Karabatsos** (Michigan 1974-75). G. Karabatsos taught NMR, mechanisms and other contemporary topics of organic chemistry for two years at the LOC. He was appointed professor in January 1975 (Government Gazette of appointment (transfer): 6 / 13-1-75 vol. C) but resigned a few months later (Government Gazette of resignation: 434 / 11-10-75).

During the historical course of the 1949-67 period, two female Chemists and members of the LOC (out of a total of four women scientists in the School of Physics and Mathematics), managed to ascend to senior academic positions, a fact of exceptional importance that has been the subject of historical research<sup>5</sup>. These scientists were I. Papadimitriou-Dilari and I. Vourvidou-Photaki.

**Irini Papadimitriou-Dilari** (1917-2008) was a Chemist with a bachelor's degree (1940) and a doctorate (1948, L. Zervas) from NKUA.

In the difficult years during the War and the German occupation (1940-48) the contribution of I. Papadimitriou as a Laboratory Assistant was crucial in carrying out its teaching duties. (Historical Archive of NKUA, Minutes of Meetings of the School of Physics and Mathematics 15.1.1977 and 20.1.1977)<sup>5</sup>. In 1951 she became a Lecturer (*epimelitis*) and in 1958 a Senior Lecturer (*yphigitis*) with L. Zervas as rapporteur. In 1967 she was elected as an Appointed Senior Lecturer (*entetalmenos yphigitis*) in the Department of Physics and Mathematics but was subsequently fired by the military dictatorship at the time due to her political persuasions. She worked in the industry until the transition to democracy in 1974, at which time she returned to the LOC as an Adjunct Faculty (*ektakti kathigitria*), (SW 4542/66). She served as President of Association of Greek Chemists (1975-79), Chair of the Department of Chemistry (1982) and President of the Association of female Greek Scientists (1985-89). She authored a textbook entitled "Mechanisms of Organic Chemical Reactions".

Professor **Iphigenia Vourvidou-Photaki** (1921-1983) was a Chemist<sup>6</sup> with a bachelor's degree (1946) and a doctorate (1950, L. Zervas) from NKUA.

From 1953-56, with the support of a scholarship from the State Scholarship Foundation (IKY), she furthered her training in Basel, Switzerland, under Professors Brenner and Erlenmeyer. She also worked as a researcher (1962-63) with Professor V. du Vigneaud (Nobel Prize 1955) at Cornell University (New York). In 1965 she became a Senior Lecturer (*yphigitis*) (rapporteur L. Zervas) and in 1967 she was elected as an Appointed Senior Lecturer (*entetalmenos yphigitis*) in the School of Physics and Mathematics, but her appointment was delayed for two years because the Ministry of Education and Religious Affairs at the time expressed reservations about her political views. In 1970 she received the "In Memoriam G. Panopoulos" Award from the Academy of Athens for her research work. In 1975 she was appointed Adjunct Professor (*ektakti kathigitria*) and in 1977 she was elected Full Professor of the LOC, of which she was also the Director during 1978-83. She authored two textbooks, "Introduction to the Chemistry of Amino Acids, Peptides, Proteins" and "Chemistry of Heterocyclic Compounds". She also authored a review monograph entitled "The Role of Sulfur in Amino Acid Protective Group Chemistry," which was included in the book series entitled *Topics in Sulfur Chemistry*. Iphigenia Vourvidou-Photaki passed away at the age of 62, while still

an active Professor, after a long illness which she faced with heroism without abandoning, until the end, her collaboration with the students she advised scientifically. The author of this article was a student of I. Photaki and her last scientific collaborator.<sup>7</sup> Having had an intimate knowledge of the personal qualities, cultivation, and sensitivity of Ifigenia Photaki, she would like to express her gratitude to this important teacher and great woman.

The year 1982 was a year of institutional changes for the University, brought upon by the 1268/82 law. The inclusion of serving members of the teaching staff at the various levels (Lecturers, Assistant Professors, Associate Professors and Professors), the abolition of the chair and the creation of Divisions, the possibility of tenure for teaching staff, and the possibility of research independence that the new law afforded, created large upheavals at the University. The Laboratory of Organic Chemistry was included in Division II (Organic Chemistry, Organic Chemical Technology, Food Chemistry, Biochemistry and Clinical Chemistry) of the Department of Chemistry.

The direction of the Laboratory was taken over by Associate Professor **Michael-Gerasimos Loverdos-Stelakatos** (1923-2016) who was a Chemist with a bachelor's degree (1949) and a doctorate (1954, L. Zervas) from NKUA. From 1954-1959 he was trained in the laboratory of Organic Chemistry of M.I.T. as well as in the Biochemistry laboratory of N.I.H. (USA). In 1970 he became a Senior Lecturer (*yphigitis*) (rapporteur L. Zervas).

He served in the Medical School of NKUA as an Appointed Senior Lecturer (*entetalmenos yphigitis*) (1971-77) and in the LOC initially as an Assistant Professor (ND 1268/82), and later on as an elected Associate Professor. He served as the Director of the LOC (1984-91) and Division II (1984-91), as well as the Vice-Chair of the Department of Chemistry (1986-87).

He was a scientist with a wide range of knowledge, who fought his own challenging battles during those turbulent times.

In the following years, the LOC was enriched with new subjects in addition to Peptide Chemistry, and developed collaborations with distinguished laboratories abroad. Almost all of its serving members at the time continued their training in large international universities and research centers after the completion of their doctoral dissertations. Overall, the laboratory evolved in order to successfully respond to the new era, that of the establishment of postgraduate studies (1994). We will briefly refer to the retired colleagues from that period (1991-2012).

**Professor Emeritus A. Giotakis** was the Director of the LOC for a number of years (1991-93, 1996-99, 2001-08). He is a Chemist with a bachelor's degree (1967) as well as a doctorate from NKUA (1973, L. Zervas- I. Photaki). He performed research work at the Department of Chemistry at Case Western Reserve University (Cleveland Ohio, USA) as well as at the French Nuclear Research Center (Saclay). His main research work was related to the synthesis of selective and potent phosphine inhibitors Zn metalloproteases. In 2000 he was elected Professor, and the LOC acquired this academic position after 17 years. Through his efforts, the LOC first acquired instruments such as NMR (200 MHz), MS, HPLC, and others, which were crucial for the continuation and evolution of its research activities.

**Professor Emeritus Ch. Tzougraki** served as a Director of the LOC (1999-2001). She is a Chemist with a bachelor's degree (1969) as well as a doctorate from NKUA (1976, I. Vourvidou-Photaki). She worked as a researcher in the laboratories of Hoffmann-La Roche, Nutley, N.J., (USA) as well as in the Department of Peptide Chemistry, Max-Plank-Institut für Biochemie (Munich). She was also Director of Division II (2001-02) as well as Vice Chair and Supervisor of the Chemistry Building (1995-99). She co-authored<sup>8</sup> the book, "Topics of Bioorganic Chemistry" with Professor G. Kokotos.

Prof. Tzougraki introduced the topic of Chemistry Education at the Department of Chemistry and also founded the postgraduate program "Teaching Chemistry and New Educational Technologies, DIHNET".

**Professor Emeritus V. Ignatiadou-Ragousi** holds a bachelors' degree in Chemistry from the Department of Chemistry of NKUA (1968) and a doctorate (1974, Doctorat d 'Etat) from the Université de Paris Sud, Faculté des Sciences d' Orsay. She introduced the subject of natural products to the LOC and wrote<sup>8</sup> the book, "Chemistry of Natural Products".

**Professor Emeritus N. Ferderigos** holds a bachelors' degree in Chemistry (1969) from the Department of Chemistry of NKUA, as well as a doctorate (1973, L. Zervas). He worked as a researcher in the Department of Biochemistry, School of Medicine, Mount Sinai (USA). He worked on the solid phase synthesis of peptides not only in the LOC but also in other research centers, such as the Laboratory of Immunopeptide Chemistry (NCSR, Democritus).

**Professor Emeritus A. Valavanidis** is a graduate the Department of Chemistry of the Aristotelian University of Thessaloniki (1968). He holds an MSc from the Department of Chemistry, University of Manchester, Institute of Science & Technology, UK (1969-70) and a

PhD from the Department of Chemistry, King's College, University of London (1973-77). For a short time, he assumed the directorship of the LOC (11/2011-06/2012). He developed the subject of Environmental Chemistry from the point of view of Organic Chemistry and wrote nine books on environmental issues and safety rules in the chemical laboratory.<sup>9</sup>

**Associate Professor S. Paraskevas** served as Director of the LOC (1993-95) as well as of Division II (1994-95). Mr. Paraskevas is a Chemical Engineering graduate of the Technical University of Stuttgart (1965) and obtained a doctorate from the Institute of Technical Chemistry of the same Technical University (1968, Professor K. Dialer). He was involved in the synthesis and study of complexes of organic compounds with metals (e.g. Cu, Pd), as well as the study of organic reactions with metal catalysts.

Retired colleagues of the same period also include:

The **Associate Professors L. Lapatsanis** (peptide chemist), **S. Mylonas** (synthesis of compounds with anti-cancer activity), **K. Frousios** (synthetic organic chemistry).

The **Assistant Professors M. Zouridou-Liapi** (chemistry of natural products and organic synthesis using microwaves), **K. Dimitropoulos** (enzymatic chemistry). Our colleague **V. Theodorou-Kassioumi** transferred to the Department of Chemistry of the University of Ioannina, where she retired as a Professor.

Other colleagues include: **V. Voukouvalidis** (Assistant, *voithos*), **P. Mazaraki** (Secretariat), **Z. Athanasopoulou** (Secretariat), **Aik. Papantonaki-Dimitropoulou** (Technical Staff), **M. Stara** (Technical Staff), **S. Atsikbasis** (Technical Staff), **E. Antonouli** (Technical Staff), **K. Leventi** (Technical Staff) and **A. Xanthi** (Clerk).

At this point, we feel obliged to refer to two colleagues and dear friends, both worthy and highly promising young scientists, who left us at a time when their careers were flourishing. Assistant Professor **Stefanos Karanikas** (1948-1991, 43 years old) earned a bachelor's degree and a doctorate from NKUA (1979, L. Zervas-I. Photaki) followed by postdoctoral studies at the Department of Pharmacology of the Sherbrooke Medical School (Canada).

Assistant Professor **Miltiadis Kolovos** (1947-1994, 47 years old) earned a bachelor's degree and a doctorate from NKUA (1981, L. Zervas-I. Photaki), followed by postdoctoral studies at M.I.T. (USA). Their passing was a great loss for the LOC.

**To all the aforementioned colleagues, who, with the glorious past of the Laboratory of Organic Chemistry as a guiding light, led the Laboratory on a journey of new oceans, as**

well as to all colleagues and associates who have served in the LOC since its inception until today, many THANKS . Their names are listed on the website below:

[http://jupiter.chem.uoa.gr/chem/events/Chem-100/2018-04-18\\_Organikh.pdf](http://jupiter.chem.uoa.gr/chem/events/Chem-100/2018-04-18_Organikh.pdf)

### The Laboratory of Organic Chemistry today

The LOC currently has the following nine faculty members:

**G. Kokotos**, Professor and Director of the LOC (2008- 11/2011 and from 6/2012-today). Prof. Kokotos also served as Director of Division II (2004-09 and 2010-2011) as well as Chair of the Department of Chemistry (2013-17). He is a Chemist with a bachelor's degree (1979) and a doctorate (1984) from NKUA. His research interests include (a) Design, synthesis and study of enzyme inhibitors with anti-inflammatory and anti-cancer activity, and (b) Study of bioactive compounds and lipidomics using high resolution mass spectrometry.

**Th. Mavromoustakos**, Professor. He was the Director of Division II (2013-15). His research interests are (a) Study of understanding the molecular basis of biological activity of AT1 antagonists to design molecules with improved biological activity, and (b) Design of new formulations of AT1 antagonists and generally lipophilic molecules with particular emphasis on natural products which improve their biological activity and selectivity. Prof. Mavromoustakos is the author of seven books<sup>8</sup> related mainly to NMR spectroscopy and molecular modeling.

**P. Mouteveli-Minakaki**, Professor. She was Vice Chair and Supervisor of the Chemistry Building of the Department of Chemistry (2009-13) and Director of Division II (2015-17). Her research interests include synthesis of optically active 2-pyrrolidinones and study of their activity as (a) anti-inflammatory and (b) organocatalysts.

**A. Gimisis**, Associate Professor. His research interests include: (a) Independent synthesis of oxidative DNA damage products with emphasis on bases. Structure and stability analysis studies. Development of a synthetic methodology and protecting groups, and (b) Synthesis of potential glycogen phosphorylase inhibitors. Kinetic, crystallographic, *in vivo* and *in vitro* study of anti-diabetic and anti-cancer activity. Biochemical study of the catalytic center.

**D. Georgiadis**, Associate Professor. His research interests include: Design and synthesis of inhibitors and related biochemical tools for the study of Zn proteases, the largest family of proteolytic enzymes in humans.



**V. Magrioti**, Assistant Professor. Her research interests include: Design and synthesis of enzyme inhibitors.

**S. Vassiliou**, Assistant Professor. Her research interests include: Synthesis and biological studies of organophosphates-Synthesis and biological studies of polyphenolic derivatives.

**G. Vougioukalakis**, Assistant Professor. His research interests include: Catalysis, Organic Synthesis and Advanced Materials with Biological and Technological Applications.

**Ch. Kokotos**: Assistant Professor. His research interests include: (a) Organocatalytic oxidation and (b) Photocatalysis.

Other LOC members include: **A. Mores** (Laboratory Teaching Staff), **Aik. Paschalidou** (Laboratory Teaching Staff), **E. Sakki** (Laboratory Teaching Staff), **A. Hatzigiannakou** (Assistant) and **S. Vraimakis** (Technical Staff).

## **Educational work**

### **Undergraduate level**

In contrast to the past, when the LOC faculty taught the Organic Chemistry courses in many departments (Physics, Physics, Medicine, as it appears from the respective yearbooks), today the LOC faculty only teaches courses in the Department of Chemistry, as well as in the Department of Biology in the School of Natural Sciences..

From the year 1993 when the undergraduate thesis was introduced until 2016-17, 590 students have completed their thesis in the LOC, which includes, according to the regulation, an experimental part.

**Textbooks:** LOC faculty members under the general supervision of Professor G. Kokotos participated in the translation of highly successful Organic Chemistry textbooks, which are provided to students and have been highly regarded as very helpful by them, as evidenced by their written evaluations. The following books have been translated:

**"Organic Chemistry I" and "Organic Chemistry II"**, David Klein, 1st edition, Translation, Utopia Publishing, Athens, 2015, (G. Kokotos, D. Georgiadis, A. Gimisis, V. Magrioti, T. Mavromoustakos, P. Moutevelis-Minakakis, and others).

**"Organic Chemistry" Volume I and Volume II, Jonathan Clayden, Nick Greeves and Stuart Warren**, 1st edition, Translation, Utopia Publishing, Athens, 2016, (G. Kokotos, S. Vassileiou, G. Vougioukalakis, D. Georgiadis, X Kokotos, V. Magrioti, P. Mouteveli-Minakaki, and others).

**"Structure determination of Organic compounds by spectroscopic methods"**: L.D. Field, S. Sternhell, J.R. Kalman, H.L. Li, A.M. Magill, 1st edition, Translated by Utopia Publishing, Athens, 2016, (G. Kokotos, D. Georgiadis, and others)

### **Postgraduate level**

There are 2 postgraduate programs at the LOC, the **General postgraduate program** (1995-2018) and the interdepartmental MSc **Organic Synthesis and Applications in the Chemical Industry** (2003-present), each lasting 3 semesters.

Our postgraduate programs, especially the interdisciplinary program, have been widely accepted by students. We are very pleased to report that our graduates have all found employment, mainly in the Pharmaceutical Industry.

**A total of 162 postgraduate diplomas have been awarded in the LOC since 1994, and 58 doctoral dissertations have been completed since 1990.**

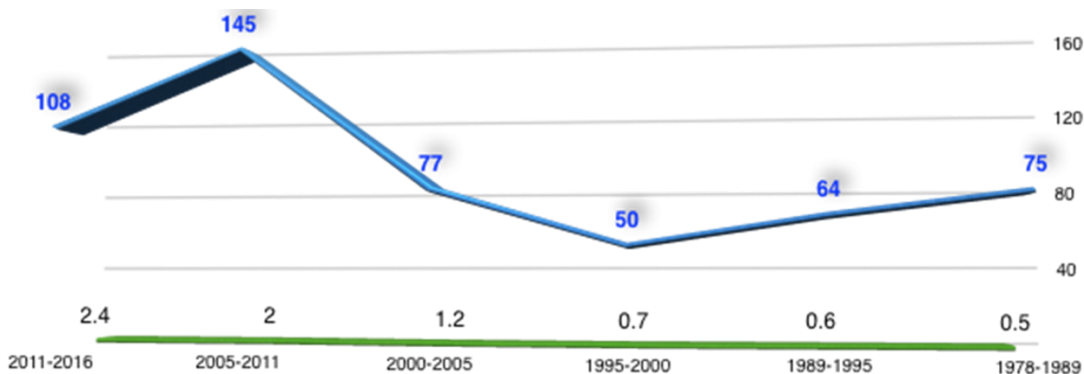
### **Scientific work**

The number of LOC faculty members has declined significantly following a steadily declining trend from 1987-88 to the present. For example, the number of faculty members during the academic year 1987-88 was 15, in 1997-98 it was 14, and today it is 9, i.e. **it gradually decreased by 40%**.

Taking into account the other members of the laboratory (assistants, scientific and technical staff), who are obviously involved in carrying out the overall research and training work, the reduction is equally impressive. The total number of members in the year 1987-88 was 24, in the year 1997-98 it was 20 and today it is 14, i.e. **the laboratory underwent a gradual reduction of its total members by ~ 42%**.

Despite the reduction of its members, as well as the meager financial support from the state, especially in recent years, the scientific performance of the laboratory is on an impressive upward trend, as shown in Figure 1. The number of our publications in high impact journals (IF > 5), the total number of patents (26 patents in the period 1990-2016), the achievement of funding

through competitive programs (for the years 2012-16, a total of ~ 2000000 €) and the continuous enrichment of the equipment of the laboratory<sup>10</sup> confirm the dynamic participation of the laboratory in projects of excellence and innovation<sup>11</sup> and allow auspicious predictions for the LOC, for the benefit to the Department of Chemistry and primarily that of our students.



**Figure 1:** Publications of the faculty members of Laboratory of Organic Chemistry between 1979-2016. Blue numbers show the number of publications. The small numbers above the five-year periods indicate the number of publications/year/faculty member.

The organization of international conferences with the LOC Director, Professor G. Kokotos as President, should certainly be included in the scientific work of the LOC. The latter include the following conferences:

**"ORGANIC SYNTHESIS: From Chemistry to Biology, Medicine and Materials Chemistry"** (Athens 2004, 2007, 2009).

**"Lipases and Lipids: Structure, functions and biotechnological applications"** (Santorini, 1999)

**Athens International Catalysis Symposium, 2016** (Athens 2016)

**"Bioactive Lipids: From Chemistry to Biology and Medicine"** (Athens 2018)

**"32nd European Peptide Symposium"** (Athens 2012). It is worth noting that the 6th European Peptide Symposium (1963) was held in Athens with L. Zervas as President.

As a conclusion to this small reference to the life of the Laboratory of Organic Chemistry, the place where we lived for more than 40 years, the saying of the Colombian author (Nobel Prize for Literature 1982) **Gabriel García Márquez**<sup>12</sup> could be used:

**"Life is not only what we experience, but what we remember of it and how we remember it."**

All of us older people remember with emotion that over the past years we lived both pleasant and unpleasant moments, we experienced anxieties and turbulent situations, but above all a vision prevailed among us:

**To serve with high goals the science of Chemistry and to responsibly and conscientiously serve Greek students and therefore the Greek society.**

We hope for this vision, and we believe that it will remain as alive and bright in the years to come.

### **Acknowledgments**

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3. ÜbereinallgemeinesVerfahren der Peptidsynthese, M. Bergmann and L. Zervas,*Ber.* 65, 1192-1201 (1932).
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5. "The time when protons had sex. Women in the Faculty of Physical and Mathematics of the University of Athens (1922-1967) ", P. Kimourtzis, V. Sigountou, in the publication " Attempting Reform: Between Politics (Politics) and Politics (Politics) ", by Z. Gavriilidou and G. Stamelou, to the address:

[http://hepnet.upatras.gr/xfiles/pubs/Kladis\\_Inner.pdf](http://hepnet.upatras.gr/xfiles/pubs/Kladis_Inner.pdf) .

6 «CV and scientific work »IphigeniaVourvidou-Photaki (1968), Supplement to CV 1973 and 1976.

7 "Some applications of the Curtius Rearrangement", P. Moutevelis-Minakakis and I. Photaki, *J. Chem. Soc., Perkin Trans.I* 1985, 2277-2281 (Last publication of I. Photaki)

8 [http://www.chem.uoa.gr/?page\\_id=995](http://www.chem.uoa.gr/?page_id=995)

9 [http://www.chem.uoa.gr/?page\\_id=1009](http://www.chem.uoa.gr/?page_id=1009)

10 Internal evaluation of the Department of Chemistry 2011-16

at:[http://www.chem.uoa.gr/wp-](http://www.chem.uoa.gr/wp-content/uploads/aksiologiseis/eswterikh_axiologhsh_2012-2016.pdf)

[content/uploads/aksiologiseis/eswterikh\\_axiologhsh\\_2012-2016.pdf](http://www.chem.uoa.gr/wp-content/uploads/aksiologiseis/eswterikh_axiologhsh_2012-2016.pdf)

11 Scientific conference (28-11-2017): "Research and innovation in the School of Sciences and the School of Health Sciences of NKUA" Presentation of the Department of Chemistry by the then President of the Department, Professor G. Kokotos at:

[http://share.uoa.gr/protected/all-download/UoA\\_EREYNA\\_PAROUSIASEIS.zip](http://share.uoa.gr/protected/all-download/UoA_EREYNA_PAROUSIASEIS.zip)

12 Gabriel GarcíaMárquez (1927-2014), from his work «Living to tell the tale».

(Translated in English by Prof. T. Mavromoustakos and corrected by the Author and J. Stain)