

ANDREI ANDRIESH—PHYSICIST OF GOLDEN GENERATION AND THIRD PRESIDENT OF THE ACADEMY OF SCIENCES OF MOLDOVA

This autumn, we commemorated the 80th anniversary of the third President of the Academy of Sciences of Moldova, a famous scientist, teacher, and patriot—academician Andrei Andriesh. This event aimed at our local science ancestors was an opportunity to review the progress in our research and its position in the annals of the national history. Simultaneously, we had an opportunity to illustrate the personality and activities of scientist Andrei Andriesh, who is regarded as an undeniable part of our academic and spiritual dowry as a whole.

Academician Andrei Andriesh was a physicist of the postwar gold generation: Sergiu Rădăuțanu, Dumitru Gitsu, Mircea Bologa, and Alexei Simashkevich—graduates of the Kishinev State University (at present, Moldova State University). Before them, twin-brothers Svyatoslav and Vsevolod Moskalenko and Victor Kovarski successfully graduated from the same faculty; over the years, they have become scholars with a ponderous contribution to science and, in a sign of high appreciation and gratitude, have been elected academicians in our national scientific forum and beyond. We say today without hesitation that this *was a golden generation of physicists*. Their work fell within the most spectacular developments of physics and material technology in the second half of the XX century. Apparently, the dramatic rise in physics and engineering in the 1950s and the 1960s has brought them into the realm of research. Each of them, returning to Chisinau after a successful performance in various research institutes, have become nucleation centers of national investigations and have founded scientific schools recognized worldwide. We are sure that the research seeds implanted by our predecessors at the beginning bore the imprint of centers where they have been initiated into the mysteries of science. After post-graduates studies at the well-known scientific laboratory of Prof. Boris Kolomiets in the Ioffe Physical Technical Institute in Leningrad (at present, St. Petersburg), young researcher Andrei Andriesh returns to Chisinau with "genes" of amorphous semiconductor physics and technology.

Through hard work for over 45 years at the laboratory of photoelectric properties and in the Center of Optoelectronics of the Institute of Applied Physics, which was organized by him, he has founded a scientific direction of physics of noncrystalline semiconductors based on chalcogenide glasses, which has been appreciated in the international community. Thus, in 2005, for the undeniable merits in the development of this domain, the Moldovan physicist was awarded the international award named after one of the patriarchs of amorphous semiconductor physics Stanford R. Ovshinsky. Another patriarch in this domain—academician Radu Grogorovici—have mentioned in the collective monograph dedicated to the 65th anniversary of the birth of Academician Andrei Andriesh, "It is remarkable that the celebrity continues working and publishing even more intensively addressing fundamental issues related to photoinduced and nonlinear phenomena in chalcogenide glasses as well as practical applications of these materials in optoelectronics."

Through painstaking and systemic research, along with his colleagues, with new ideas and approaches, he tries to decoder the miraculous characteristics of amorphous materials and makes innovative proposals to reconfigure and enhance their functionality. He shows that the distribution spectrum of localized states, which is an inherent attribute of these materials due to chaotic arrangement of atoms, can be modified using some factors, such as composition, temperature, and light irradiation. In this context, under his supervision, new methods and materials for holographic optical information recording have been developed. In recent years, inspired by the rapid development of nanotechnology, academician Andrei Andriesh have

initiated extensive research into nanocomposites based on organic and inorganic materials considering them very attractive for new optoelectronic and photonic devices.

Systematic studies and research results have been published in over 500 scientific papers, including monographs, while his engineering developments have been certified by 45 patents. He has trained 17 doctors and 8 doctors habilitated in physics and engineering.

Physicist Andrei Andriesh has conducted research for nearly 50 years in the same institution—Academy of Sciences. Within the walls of the academic fortress, he went the way of a researcher, a laboratory head, a general scientific secretary, and a president of the Academy of Sciences of Moldova. He came to the helm of the Academy in 1989, when high waves of the national movement engulfed the entire country. According to the number of those who have succeeded in this high office, he became *the third president of the Academy of Sciences of Moldova* with a noble mission, which was, at the same time, very difficult: to conduct the scientific supreme body of the republic through the turbulence and disintegration of the colossus called the Soviet Union; it was necessary to rapidly find solutions to reposition the research system and to find ways to stem the disintegration of activities under conditions of an economic collapse. Time will tell whether he succeeded or not. Unfortunately, he did not write a book with memories of those times. However, one fact remains indisputable: the Academy of Sciences has survived and is trying to develop under new conditions as a result of a reform in science and innovation according to the Code of Science and Innovation adopted by the Parliament in 2004 and implemented by the new administration of the Academy.

A primary merit of the third president of the Academy of Sciences of Moldova is that he defended and mobilized scientists in this period of transition, which continues in some aspects today, in order to retain the place of the Academy of Sciences in the structure of the independent Republic of Moldova. During the years of independence of the country (1991–2003), when he served as a chairman of the Academy, the concept of development of research divisions and academic institutions was radically revised in correspondence with the country's needs and objectives of international science. The Academy has significantly contributed to the development of the Concept and Law on the state policy on science and technology development and the Law of the Academy of Sciences of Moldova and their approval by the Parliament. Under the auspices of the Academy, the activities of the Supreme Council for Scientific Research and Technological Development of the Government have been developed.

Through his efforts, other members of the Academy of Sciences have found a way to avoid the effects of "academy cloning," i.e., the establishment of academies specialized in certain areas. Divisions on Medical, Agricultural, and Engineering Sciences were organized in the framework of the Academy. They have consolidated, to some extent, the national research citadel. It was certainly logic to concentrate research institutes in the above areas under the auspices of the Academy of Sciences in that period; and this was implemented later, after 2004, under the initiated reform of the Code on Science and Innovation. It was necessary to avoid some of those irrecoverable losses, particularly in engineering sciences, and the Academy of Sciences could have structured scientific platforms for the refurbishment of the national economy. Through the creation of the above Divisions, the academic body has expanded involving a large part of national values in its composition and thus opening new possibilities in promoting the staff.

The third president of the Academy of Sciences supported, with all his ardor, scientific and cultural personalities from the Republic of Moldova, Romania, and elsewhere for being elected as honorary members of the Academy of Sciences of Moldova. In 1991, the honorary title of the supreme scientific forum in Chisinau was awarded to scientists Alexander Bârlădeanu

(Bucharest, Romania), Eugene Coșeriu (Tubingen, Germany), Eugen Grebenicov (Moscow, Russia); in 1992, writer Nicholas Costenco and artist Mihai Grecu, scientists Radu Grigorovici and Mihai Drăgănescu (Bucharest, Romania), while writers Ion Druță and Mihai Cimpoi and composer Eugen Doga were elected members of the Academy of Sciences of Moldova.

Another undeniable merit of President Andrei Andriesh was his resistance to the temptation to join any political party and politicize the Academy of Sciences. He was and will remain in the history of the independent Moldovan state only as a member of the party of science. In this context, recall that in 1994 he and members of the Presidium and the Academy of Sciences assumed the responsibility to recognize and declare in public that the language spoken in Moldova is Romanian. Since then, members of the Academy hundreds of times referred to this act of courage and scientific integrity. It remains, even after 20 years, to correct that article of the Constitution. It is time for our politicians to show their courage and wisdom.

President Andrei Andriesh has made a substantial contribution to the development of international relations. In the 1990s, the Academy of Sciences was a structure maximally open for international cooperation. After the proclamation of Moldova's independence, the basis for international scientific cooperation was immediately created. In this period, bilateral scientific relations with Academies of Ukraine, Belarus, Romania, Hungary, Poland, Bulgaria, France, and the United Kingdom were established and developed. The Academy of Sciences, jointly with Academies of the new independent states, co-founded the International Association of Academies of Sciences in Eastern Europe and Asia, which was subsequently recognized by UNESCO. The Moldovan Academy also became a member of the Federation of European Academies of Sciences (ALLEA) and a member of the International Council of Scientific Unions (ICSU). Cooperation agreements were concluded with UNESCO, NATO Scientific Committee, with scientific organizations of the countries bordering the Black Sea, with the IAEA, foundations INTAS, Copernicus, CRDF, World Federation of Scholars, etc.

Thanks to this cooperation, especially the projects launched by Romania, we managed to more or less keep on the line to new research. As a result, even under austere conditions of transition, the number of publications per researcher has increased. Recall that, over the past 10 years (until 2003), the Academy of Sciences was financed from the budget of the country only in terms of salary: 90% of the allowances and remuneration according to the rate schedule of a scientist was below the level of normal existence. Under these conditions, a way to survive and remain in research was participation in international projects. At that time, the Academy did not schedule (not a single leu!) allowances for capital construction, current repairs, renewal of scientific equipment, trips, international conferences, etc., which as a whole creates a favorable atmosphere for work in a research institution. The working conditions in laboratories were dispiriting: the equipment was obsolete and new instruments were not purchased. Chemists and physicists took new materials and structures prepared by them in their bags and left, at their own expense, for the neighboring countries to make the necessary measurements. Moreover, frequent power cutoff and things like that made the life of scientists intolerable. Looking through the press of that time, I found the interview "The Academy militates for different times," signed by Aneta Grosu and published on October 22, 1998 in the "Flux." The journalist asked the president of the Academy of Sciences of Moldova Andrei Andriesh, "Why have not I been able to communicate by telephone with any service of the Academy for a week?" The answer was unexpected: "I have never thought that research work can be marginalized by disconnecting the phone. But this happened. Today, all communications of the scientists with the world are broken. Economic difficulties do not allow us to pay to the "Telecom" in time; therefore, not only telephones are

silent. Any of our computers connected to telephone networks does not operate. Internet connection is made through the phone line. Now this possibility is also excluded for us."

As a result, the number of researchers has reduced by 54.4% by 2003. Scientific service personnel have suffered most of all: their number has decreased by 64.6% percent. Nevertheless, the academic structure, its core, and most of the assets were saved. Even President Vladimir Voronin unequivocally expressed at a meeting of scientists: "Only fanatics could keep the Academy under the harsh conditions of transition!"

For the lack of money, the Central Scientific Library of the Academy of Sciences could not subscribe for foreign journals. It is impossible to work without being informed of what is done in your research domain and make references to the works of your colleagues without reading them. During a long period, Acad. Svyatoslav Moskalenko has been putting the same question from the rostrum of the Academy's meetings, "When will we have profile scientific journals from abroad in the academic library?"

This problem of scientific documentation and access to specialized information was of permanent concern for President Andrei Andriesh as an additional reason to promote information technology in the system of research. Recall that Internet was created in the period of his leadership in the Academy of Sciences of Moldova and he was one of the main promoters of the formation of the national information network in science and higher education—RENAM—and switching it to the international network GEANT. He attracted substantial funding of over a few million dollars to create the equipments and tools necessary for modern scientific research process; in 1999, RENAM became operational.

This was probably the most cherished offspring of academician Andrei Andriesh until his last breath. In later years, after he had left the post of President of the Academy of Sciences of Moldova, he was a general director of RENAM. At the end of 2011, being already seriously ill, he personally presented a report and a development plan for the coming years to the Council of RENAM.

During the presidency of academician Andrei Andriesh in the Academy of Sciences of Moldova, attempts were made to strengthen the collaboration with universities; this is an urgent problem both for that period and for today. I remember how he, as a member of the Presidium, raised problems of more active involvement of the Academy in the system of higher education, the reforming of academic programs, the formation of an integrated doctoral studies, and, why not, the formation of a ministry of research and higher education. But he was not deeply caught in these initiatives and believed this was not a mission of the Academy.

A year and a half have passed after the death of acad. Andrei Andriesh, the third president of the Academy of Sciences of Moldova and physicist of gold generation. Today, going by the Center of Optoelectronics of the Institute of Applied Physics of the Academy of Sciences of Moldova, whose director he has been for many years, we still see a gentle and bright image concerned about the daily imperatives of research in the field of applying nanotechnology to change the material properties and form new optoelectronic elements. We thank this man for what he has achieved in research, in training of highly skilled scientific personnel, and as a president of the Academy of Sciences of Moldova for a period of almost 15 years. Let us mention that Eminescu once said, "The humaneness requires humaneness, and the honour honour!" Let his memory be eternal light in our academic city!

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