

Ioan Ursu, a life dedicated to Romanian Physics

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(IFIN-HH, Magurele)*



Ioan Ursu was born on 5 April 1928 in the Transylvanian village of Mănăstireni; studied at the Faculty of Physics and Mathematics at Babes-Bolyai University in Cluj, obtaining degrees PhD in Physics (1956) and Doctor Habilus (1967).

He initially devoted himself to an intense didactic activity recognized by obtaining the degree of Professor (1960) and then Professor Emeritus (1969). He was Head of Nuclear Physics, Optics and Electromagnetism Department at the University of Cluj (1960-1968) and Head of the Atomic and Nuclear Physics Department at the University of Bucharest (1968-1976). For Professor Ioan Ursu, didactic activity has always been closely linked to scientific research work. Thus, starting with 1951, at Cluj branch of the Institute of Atomic Physics (IFA), he studied the isotopic separation (especially hydrogen) and the characterization of isotopes, including catalytic methods.

During the period 1959-1960, thanks to a scholarship sponsored by the International Atomic Energy Agency (IAEA) Vienna and the Academy of Sciences of the United States, he worked as a visiting scientist at Princeton University. Here he collaborated with Professor John Turkevich, studying the catalytic properties and magnetic resonance of the Li-Al-H₄ system. He also worked in centers of excellence in England, Russia, Switzerland, Italy and Germany, becoming known in advanced fields of atomic physics, nuclear physics and solid state physics. The papers in the field of catalytic properties and isotopic exchange, magnetic resonance methods in catalysts, semiconductors and irradiated doped crystals, determined his nomination as a Corresponding member of the Romanian Academy (1963). At Bucharest, starting with 1968, besides the essential fields of Atomic and Nuclear physics, he also approached the new field of Laser physics.

Ioan Ursu proved at the same time an excellent organizer and animator of the research groups and teams, asserting over time as an authentic school founder, making it possible to obtain scientific results that have ensured Romanian physics the top positions at international level. In the field of laser, Professor Ursu initiated a new field of research on the line of quantum electronics, thus developing the studies of the founder of the laser field in Romania, Professor Ion Agarbiceanu. This field was expanded by including research on the use of laser spectroscopy in nuclear energy, laser photochemistry, interaction of laser radiation with matter and surface processes, the use of lasers in medicine - pioneering studies in Romania; under the leadership of Professor Ioan Ursu, are made the first laser instruments for neurosurgery and ophthalmology.

These concerns were continued during the period 1991-1994 at the International Center for Theoretical Physics (ICTP) in Trieste, at the invitation of Professor Abdus Salam, Nobel Prize winner, Director of the Center.

In the field of Nuclear physics and Engineering, Professor Ursu has initiated and developed research on nuclear materials and the nuclear fuel cycle, advanced reactors, nuclear energy systems and nuclear safety.

At international academic level, Ioan Ursu is a reference name in areas of physics such as: electronic and nuclear magnetic resonance - the basis of the cutting-edge investigative techniques and medical diagnosis through tomography; nuclear materials and technologies - fundamental to nuclear power generation; interaction of radiation with substance - base theoretical of the laser industry. He is the author of more than 300 scientific papers and specialized books published in the country and abroad: Magnetomechanical Effects on Oxygen (Romanian Academy Publishing House, 1959); Electron spin resonance (Romanian Academy Publishing House, 1965); La résonance paramagnétique électronique (Dunod, Paris, 1968); Atomic Energy (Scientific Publishing House, Bucharest, 1973); Magnetic Resonance in Uranium Compounds (Romanian Academy Publishing House, 1979); Magnitnyi resonans v soedineniyah urana (Energia Publishing House, Moscow, 1982); Physics and Technology of Nuclear Materials (Romanian Academy Publishing House, 1982); Physics and Technology of Nuclear Materials (Pergamon Press Ltd., London, 1985); Fizika i tehnologhia iadernih materialov (Energoizdat, Moscow, 1988). In 1986 he published at the Romanian Academy Publishing House, together with the Nobel Prize winner for Laser, A.M. Prokhorov, et al., "The Interaction of Laser Radiation with Metals," whose revised and augmented edition appears in 1988 in Moscow ("Vzaimodeistvie lazernovo izlucheniya s metallami", Nauka Publishing House, 1988). In the same association, in 1990, at the Publishing House Adam Hilger, appears "Laser Heating of Metals".

Professor Ioan Ursu has performed, over the years, important academic and public positions: Vice-rector of Babeş-Bolyai University of Cluj (1961-1968); Manager of the Institute of Atomic Physics (1968-1976); Chairman of the State Committee on Nuclear Energy (1969-1976); Vice President of the Board of Governors of the International Atomic Energy Agency (IAEA, 1972-1973); President (1972-1979) and First Vice-President (1979-1990) of the National Council for Science and Technology. He is a member of numerous academic and scientific societies: Romanian Academy (1974) - President of the Physics Branch of the Romanian Academy (1988-1990); Member of the Executive Council (1965) and President of the European Physical Society (1976-1978); President of the Balkan Physical Union (1988-1990); a member of: the American Physical Society (1959), the International Committee of the Physics Association AMPERE (Atomes et Molecules Pare Etudes Radio-Electriques, 1964), the Scientific Council of the Unified Nuclear Research Institute Dubna (1965), the Society Belgian Physics (1969), the French Physical Society (1969), the International Magnetic Resonance Society (1971), the American Nuclear Society (1975), the Canadian Nuclear Association (1976), the IAEA Advisory Scientific Committee (1979), the Academy of Sciences of New York (1982), the American Association for the Advancement of Science (AAAS, 1984), the World Laboratory (1988), the Academy of Sciences of the USSR (1990), the European Society of

Optics (1991), the Ecuadorian Institute of Natural Sciences, the "Ettore Majorana" - Erice, Italy, the European Academy of Sciences, Arts and Letters, the World Cultural Council- Monterrey, and others. It is also worth noting the work carried out on editorial policy of scientific publications in the country and some prestigious scientific journals abroad: *Studii si Cercetari de Fizica* and *Revue Roumaine de Physique*, *International Journal of Energy Research* (John Wiley and Sons), *Magnetic Resonance Review* (Gordon and Breach Science Publishers), *Infrared Physics* (Pergamon Press). Ioan Ursu was the initiator of extensive and memorable international scientific events in physics in Romania. After the exhibition "Atoms for Peace" in Bucharest (1970), followed the AMPERE International Congress (September 1970), a large-scale meeting with a select participation , headed by Professor Alfred Kastler, Nobel Prize winner. Since 1973, has been started the period of the International Schools of Physics in Predeal and then in Poiana Braşov, allowing Romanian researchers and engineers to listen to first-class specialists from all fields of physics.

The year 1975 was marked by the third General Conference of the European Physical Society (around 1000 participants), over 500 participants from abroad. The success of this conference allowed for the organization in Bucharest in the 1980s of two divisional conferences of the European Society of Physics of the Conference "Trends in Quantum Electronics" with two permanent guests, standing figures in the scientific politics of those years , Professor A.M. Prokhorov and Professor Gan Fuxi, Vice President of the China Academy of Sciences.

The presentation of the personality of Professor Ioan Ursu would be incomplete without the evocation of his public activity, organically related to his scientific work. Thus, the name of Professor Ursu remains indissolubly linked to the creation in Romania of an integrated platform for education, research and production in atomic, nuclear and related fields - a concept initiated by the founding father of Romanian Atomic and Nuclear Physics, Professor Horia Hulubei, developed and put into operation by his disciple and his successor, Ioan Ursu. Carried out between 1972 and 1976 under the direct leadership of Professor Ursu, the project includes, among others, the new headquarters of the Physics Faculty of the University of Bucharest, the administrative building of the National Center of Physics and the National Physics Library. Together with the dedicated center and residential area, they remain essential elements of the Physics infrastructure in Romania, to which are added other memorable landmarks, such as the Tandem accelerator (1974), the Radioisotopes production center, the pavilions for Theoretical physics, Physics and technology of materials, Lasers.

As Chairman of the State Committee for Nuclear Energy, Professor Ioan Ursu has made a major contribution to the elaboration of specific legislation in the nuclear field regulating nuclear activities. Therefore, the right technical options are required in the orientation and structuring of the program for the achievement of the nuclear-electric power plants, in harmony with the natural resources, while ensuring the compliance of all the nuclear safety rules; a new area of the economy is inaugurated. It was a complex route, marked by two essential moments: in the strategic plan - the adoption of the CANDU option for the nuclear reactors, and in the organizational plan - the establishment as a distinct department within C.S.E.N., of the State

Inspectorate for Nuclear Activities Control (I.S.C.A.N.). Thus, were created the premises of the National Nuclear Program for the achievement of the nuclear-electric industry in Romania.

Professor Ioan Ursu will forever be a wonderful example of a man who believed in noble causes and in his fellow men. This creed has given him the power to overcome the shortcomings and difficulties that history has reserved for him.

Professor Ioan Ursu died on April 16/17, 2007 in Bucharest. His remarkable opera, it gives him a place of honor in the history of contemporary science and a steady honor from the contemporary generations and those who will follow.

In this year, 2018, Balkan Physical Union (BPU) has established medal “IOAN URSU MEDAL OF HONOR” (foto) as a sign of gratitude for the founding president of BPU, Professor Ioan Ursu. At the 10th General Conference of BPU held in Sofia, Bulgaria, in August 2018, this medal was awarded to the former presidents of BPU: Gediz Akdeniz (Turkey), Christos Zerefos (Greece), Ivan Lalov (Bulgaria), Metin Arik (Turkey), Victor Ciupina (Romania), Iesim Okten (Turkey), Alexander G. Petrov (Bulgaria).



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