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ION AGARBICEANU
(1907-1971)

It is our duty and privilege to commemorate this year the birth centennial of Ion Agarbiceanu, a prominent Romanian scientist, who trained numerous researchers in optics and lasers and blazed new trails in these areas of physics research that has never ceased to grow and increase in relevance in Romania, ever since.

He was born January 6, 1907, in Bucium, Alba, to the priest and noted novelist Ion Agarbiceanu. From "George Baritiu" High School that he attended in Cluj in 1917-1925, he went on to the Bucharest University, Electro-technical Institute, from which he graduated in 1929. He continued his studies at the prestigious Faculté des Sciences of Sorbonne University in Paris, where he earned his PhD (1934). In his doctoral thesis on "Researches on the fluorescence and absorption spectra of I_2 vapors", supervised by the distinguished French physicist Aimé Cotton, Agarbiceanu presented his experimental results on the resonance spectrum of molecular iodine. He also identified, based on his own calculations, the anti-Stokes transitions and put forward an original quantum mechanical explanation for the anti-Stokes series. His thesis went down as a major reference work in optical spectroscopy and Peter Pringsheim quoted it as such in his famous book on "Fluorescence and Phosphorescence" (Ch. II, Part B).

In 1935, with support from the local Malaxa industrial group, Agarbiceanu was offered a postdoctoral fellowship at the British company Vickers-Armstrong, in their laboratory of metal spectroscopy.

He started out an academic career after WWII, teaching general physics first at the Bucharest Oil and Gas Institute from 1948 to 1951 and then at the Bucharest University, Faculty of Physics and Mathematics, until 1955. For the next 16 years,

he held a similar tenure at the Polytechnic Institute in Bucharest, where he also headed the Chair in Physics I. His teaching activity was highly appreciated and earned him a Professor Emeritus title, in 1964.

In 1956, Professor Horia Hulubei, director of the Institute of Atomic Physics (IFA) that had just been established in Bucharest, invited him over to set up a laboratory in charge of "Optical methods in nuclear physics". Agarbiceanu's lab promptly engaged in leading edge researches. The valuable experimental results on isotopic and hyperfine atomic structures, on which Nicolae Ionescu-Pallas gave an original theoretical interpretation, won international recognition from, among others, the group led by Professors Alfred Kastler, later a Nobel laureate and Pierre Jacquinot, at Ecole Normale Supérieure, in Paris. Another key researcher in this lab was Laurentiu Blanaru, who distinguished himself in the area of dielectric thin films. His results materialized in a doctoral thesis, defended at the Technical University of Clausthal, Germany, under supervision of Professor Herbert Mayer, himself a native of the Romanian province of Bukovina. Agarbiceanu's lab also obtained interesting results in magneto-optical resonance: Ionescu-Pallas made remarkable theoretical contributions to this field, while Ion M. Popescu, with Agarbiceanu's support, produced major experimental results, especially after a successful specialized training at Kastler's Hertzian Spectroscopy Laboratory. The achievements of the lab's creative young researchers were far more numerous, but it is beyond our scope to list them here. We only cited these few examples as an illustration of Agarbiceanu's great talent as a research leader - an arduous task in an advanced science laboratory, where one has got not only to propose and oversee major activities, but also to tune up together powerful and often conflicting personalities. Moreover, it should be remembered that all this was happening in a period of moral strain and material deprivations, from which Agarbiceanu was not spared.

His reference monograph "Polarized Light" was published in 1956, but his scientific career did not reach its acme until 1962, when, on his initiative and under his coordination, a team led by Blanaru designed and set up Romania's first ever helium-neon laser, as early as a year after its creation in the United States. This result, which was all the more outstanding in view of the modest circumstances of its occurrence, was reported in the paper "Contributions á l'étude des lasers aux gas" by I. Agarbiceanu, A. Agafitei, L. Blanaru, N. Ionescu-Pallas, I.M. Popescu, V. Vasiliu and V.G. Velculescu, Proc. 3d Intl. Congress on Quantum Electronics, Paris, 11-15.02.1963. From there, the 'Agarbiceanu Lab', as it was widely known, moved on to new types of lasers and laser applications, including solid state lasers (developed by G. Nemes and V.I. Vlad), carbon dioxide ones (V.G. Velculescu, L. Blanaru, A. Agafitei, V. Vasiliu, I.M. Popescu, V. Draganescu, I. Gutu, A. Ciura, D. Dutu, D. Dumitras etc.), ionized argon ones (C. Berenyi, V.G. Velculescu) and many more.

In that period, taking advantage of the short time opening of Romanian foreign relations to the Western countries, Agarbiceanu encouraged the resumption of ties with foreign laboratories, especially French ones, where he had many former colleagues and close friends such as Jacquinot, Abeles, Chabannes, Françon, and Laures. He would also recommend his junior coworkers for training spells in such laboratories, which often gave a decisive push to their scientific careers.

In 1963, Professor Agarbiceanu was elected a corresponding member of the Romanian Academy.

By 1969, his lab had developed and improved largely on its own all the main types of lasers that were available in the world's foremost research centers. It was then converted into a Radiation and Plasma Department specializing in the physics and technology of gas and solid lasers, laser applications (materials processing, holography, optical data processing, metrology, medical equipment), and laser-matter interactions (particularly laser plasma and nonlinear optics). Agarbiceanu's last monograph, "Optical Methods in Hertzian Spectroscopy," with I.M. Popescu as coauthor, appeared in 1970.

Unable to withstand the strain and harassment of new regulations conditioning the scientific research on contracts with the domestic industry and depressed by an unfortunate twist in his private life, he fell sick of a merciless disease. He passed away March 9, 1971, at peace with those around him and was buried in the family vault in Cluj.

Professor Agarbiceanu served as Romania's representative to IUPAP (Intl. Union of Pure and Applied Physics), EGAS (European Group for Atomic Spectroscopy), the Moscow-based Space Physics Standing Working Group and the peace movement Pugwash.

He was married to Mona Giurascu from 1954 to 1968. They had no children.

Agarbiceanu was an orderly, earnest person, but close to his coworkers, constantly seeking, within the limits of his power and office, to provide fair solutions to the numerous, tricky problems that an advanced research team would pose. He encouraged competition (even against the official policy of avoiding 'parallel' tasks) and this may well have been a key factor behind the achievements of his team, but also behind some tensions among his coworkers. He would regularly hold informal meetings to let off the pressure and appease conflicts arising from rivalry and passions down to manageable levels. He reviewed research progress on a weekly basis and was a faithful patron of the IFA Library, always keeping abreast with news (articles and patents) in physics. His close coworkers remember him as a fine person, a gentleman, a man who evidently belonged to a civilized world.

He was along with Horia Hulubei, Eugen Badarau, Serban Titeica, Florin Ciorascu, Radu Grigorovici, Aurel Ionescu, and others a founder of Romania's institutional research in physics.

The Lasers and Applications Department, heir and continuator of the Agarbiceanu Laboratory, has grown into one of the largest, most active departments of IFA, then of the Central Institute of Physics, and of what is now the National Institute of Laser, Plasma, and Radiation Physics. Important, relevant researches are currently conducted here in areas such as laser-surface-plasma interactions, nonlinear photonics, laser induced chemical reaction and nano-material production, solid state lasers, laser advanced materials processing, laser interferometers and metrology, and laser applications to life sciences and environmental protection.

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