
MYKHAILO SEMENOVYCH BRODYN (to the 75th Anniversary of his Birthday)



On September 30-th, Mykhailo Semenovych Brodyn — the outstanding scientist in solid-state physics, nonlinear optics, and quantum electronics, laureate of the Lenin and State Prizes of the USSR, the UkrSSR, and Ukraine, the Honored Worker in Science and Engineering of Ukraine, the Honorary Director of the Institute of Physics of the NAS of Ukraine, Academician of the NAS of Ukraine — turned seventy five.

M.S. Brodyn was born in the village of Sivka (the Voinyliv district of the Stanislav region — nowadays the Kalush district of the Ivano-Frankivsk region — of Ukraine) in the peasant family. After leaving, with a silver medal, the secondary school at the town of Burshtyn, he entered the Faculty of Physics and Mathematics at the I. Franko Lviv State University in 1948. After graduating from the University with distinction, M.S. Brodyn was recommended by the

Academic council and directed to the postgraduate study for the further education. In November 1953, he became the post-graduate student of the Institute of Physics of the AS of the UkrSSR.

All further scientific and labor activity of M.S. Brodyn has been connected with the Institute of Physics of the NAS of Ukraine, where he has come a way from a post-graduate student to the Academician, the Director of the Institute, the outstanding scientist, whose name is widely known to experts in our country and abroad. The first serious success in M.S. Brodyn's scientific activity was associated with the researches of the optical properties of molecular crystals, in particular, with the studies of exciton processes, which were carried out under the direction of his teacher, Academician A.F. Prykhotko. Owing to M.S. Brodyn's experimental skill, there had been developed precision low-temperature techniques, which allowed fine effects in the structure of exciton spectra as well as the light absorption and dispersion peculiarities in the vicinity of exciton resonances to be revealed. He obtained the first experimental data that testified to the importance of spatial dispersion effects for strong dipole-active exciton transitions. Further researches of M.S. Brodyn and his disciples involved such important problems of exciton physics as the exciton band structure, in particular, the effects of band non-analyticity and their manifestations in optical spectra, the influence of polariton effects on the structure formation of luminescence and light scattering spectra in molecular crystals with strong exciton resonances. Surface excitons were experimentally discovered and studied for the first time in anthracene crystals.

In 1966, for the cycle of experimental and theoretical researches of excitons in crystals, M.S. Brodyn and other scientists were awarded the Lenin Prize, the highest and the most prestigious scientific award in the USSR at that time.

The extension of the scientific interests of M.S. Brodyn has determined the versatility of his research activity. In the mid-sixties, he began to work actively in a direction of physics new at that time, quantum electronics and nonlinear optics. In 1965, at the Institute of Physics of the AS of the UkrSSR, there was created the laboratory and, at some later time, the Department of Nonlinear Optics. Mykhailo Semenovych became its head and has been invariably remaining at this position till now. His eager activity and the activity of his collaborators in this branch of science was marked, even in the first years, by such sound achievements as the creation of lasers based on homogeneous mixed A_2B_6 semiconductors with frequency tuning in all the visible and near ultraviolet spectrum ranges. Those works were recognized and awarded the State Prize of the UkrSSR in 1974. Substantial results were also achieved by M.S. Brodyn and his disciples in studying the effects of exciton—exciton interaction in A_2B_6 semiconductors subjected to the intense laser excitation.

M.S. Brodyn and his disciples made a significant scientific contribution to the study of the fundamental problems of nonlinear optics and dynamic holography. In particular, he discovered, for the first time, a new form of the self-action of light beams – the self-deflection of laser beams with an asymmetric intensity profile on their propagation in a nonlinear medium. On the basis of the researches of the nonlinear refraction in wide-band-gap semiconductors, scalar and vector dynamic holograms with the highest recording speed and the high efficiency were created. Later, in 1982, M.S. Brodyn and other collaborators of the Institute were awarded the State Prize of the USSR for the cycle of fundamental works in the field of dynamic holography and nonlinear optics.

In 1990, a new branch of the scientific researches directed by M.S. Brodyn — laser photoacoustic spectroscopy of materials for electronic equipment — was started. The successful activity in this direction gave rise to a number of important scientific results and led to the creation of a unique diagnostic complex, the laser thermal-wave introscope. For the cycle of works devoted to this subject, M.S. Brodyn, among other participants, was awarded the State Prize of Ukraine in science and engineering in 1994.

M.S. Brodyn is the author of over 350 scientific works, including five monographies, published both in our country and abroad. He has created the authoritative scientific school, the representatives of which work fruitfully in the fields of nonlinear optics,

laser physics, and solid-state physics. Among his disciples, there is one Corresponding member of the NAS of Ukraine, 8 Doctors of science, and more than 40 PhDs. M.S. Brodyn is actively teaching, heading the Faculty of Quantum Electronics, Nonlinear Optics and Holography at the Scientific and Educational Center of the NAS of Ukraine. He was the Professor of the Faculty of Instrument-Making Industry at the National Technical University of Ukraine “Kyiv Polytechnic Institute”. He also lectured at the Kyiv and Lviv National Universities. In 2000, for his fruitful activity in training young scientists, the Academic council of the Lviv National University conferred M.S. Brodyn the rank of “Honorary Doctor of the I. Franko Lviv National University”.

M.S. Brodyn expends much efforts in organizing science. For more than 10 years, he has been the Academician-Secretary of the Division of Physics and Astronomy of the NAS of Ukraine, and, from 1987 to May 2006, he was Director of the Institute of Physics of the NAS of Ukraine. Mykhailo Semenovych preserved and developed the best traditions of the Institute of Physics, which is the oldest physics-oriented scientific institution in Ukraine. At the Institute, such new scientific directions as the physics of liquid crystals, the physics of biological systems, and nanophysics got an impetus to development. At the world level are carried out works in the fields of laser physics and nonlinear optics, solid state physics and physical electronics. The high level of investigations that are executed at the Institute is corroborated by the grants of various international scientific funds; by the number of those grants, the Institute is among the leading institutions of the National Academy of Sciences of Ukraine. M.S. Brodyn is the head of the Scientific council of the NAS of Ukraine on quantum electronics, as well as a member of several other scientific councils of the NAS of Ukraine and the Russian Academy of Sciences. He is also the Editor-in-Chief of the “Ukrainian Journal of Physics” and the member of the editorial boards of well-known international journals “Quantum Electronics”, “Materials Science”, “Semiconductors Physics, Quantum and Optoelectronics”, and the “Ukrainian Journal of Physical Optics”.

M.S. Brodyn’s scientific and scientific-managerial activity has been widely recognized. Besides the State Prizes indicated above, he is the laureate of the K.D. Sinelnikov prize of the NANU. In 1992, he was conferred the rank of the “Honored Worker in science and engineering of Ukraine”. M.S. Brodyn

was awarded high government rewards: the medal “For Valorous Labor” (1970), the order “The Sign on Honor” (1981), the “October Revolution” order (1986), the order “For merits” of the 3rd degree (1999). He was also awarded the sign of the D.S. Rozhdestvenskii Optical society — the S.I. Vavilov medal (2000).

M.S. Brodyn meets his 75-th anniversary full of creative power. He continues to work fruitfully for the development of the domestic science. The

scientific community sincerely congratulates Mykhailo Semenovich on his anniversary and wishes him sound health and inspiration for further creative achievements.

*V.G. Bar'yakhtar, I.V. Blonsky, A.O. Borshch,
V.M. Loktev, V.S. Manzhara, A.G. Naumovets,
A.M. Negriko, Yu.G. Ptushynsky, S.M. Ryabchenko,
O.G. Sarbei, I.O. Soloshenko, M.S. Soskin,
A.P. Shpak, P.M. Tomchuk, Ya.S. Yatskiv,
I.R. Yukhnovsky, A.G. Zagorodny*