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Personalia

Taras Krokhmalskii's 60th birthday

Taras Krokhmalskii, a senior research fellow of the Institute for Condensed Matter Physics of the National Academy of Sciences of Ukraine (ICMP), a renowned specialist in the field of condensed matter physics celebrated his sixtieth birthday on February 6, 2013.

Taras Krokhmalskii was born in a village of Urizh in Drohobych region. The region is familiar to everybody in Ukraine and far beyond as a birthplace of a prominent Ukrainian intellectual Ivan Franko, who, along with Taras Shevchenko had a tremendous impact on modern literary and political thought in Ukraine. Being born in the village neighbouring to the Ivan Franko's birthplace and being Taras Shevchenko's namesake, Taras Krokhmalskii had no other way to carry on the professional life as to choose academic activities. Although he was eventually captured by theoretical physics, all who are lucky to know him in person admire his profound interest in Nature as a whole and his philosophical approach to life.

His way to mastering theoretical condensed matter physics was not simple and standard. After attending the secondary school he continued studies in the Drohobych petroleum tekhnikum – a technical school, designed for training technical staff working in petroleum industry (it is worth mentioning that the region of Drohobych remains to be an important center of petroleum and natural gas industries), which he finished in 1972. Later on he joked with his friends that all useful practical knowledge in applied maths he indebted to his studies there. As in every joke, there is a part of truth here as well: both his mates from the university (he graduated from the physical department of the Ivan Franko University of Lviv in 1977) and his colleagues from the ICMP noticed and acknowledged his familiarity with some practical mathematical tools beyond the usual university curriculum. Taras Krokhmalskii started his professional carrier as an engineer in the Physico-Mechanical Institute of the Academy of Sciences of Ukraine in Lviv (during 1978–1980) and since 1980 he has been working as a researcher in the Lviv Division "Statistical Physics" of the Institute for Theoretical Physics of the National Academy of Sciences of Ukraine. Since then, all his future career is connected with this institution (in 1990 it gave birth to the ICMP) and with the school of statistical physics formed here by academician Ihor Yukhnovskii. Here, his research interests were formed, here he learned various methods of theoretical analysis, here he obtained his first valid scientific results, published first papers and continues his work up to now making important contributions to the fields of phase transitions, low-dimensional spin systems, electron gas theory. By his research and organizational activities Taras Krokhmallskii contributed to the strengthening of the institute as well: in 1990–1995 he was the founder and head of the Department of computational physics at the ICMP and since 1996 he is the secretary of the Scientific council for defense of PhD and habilitation theses at the ICMP.

Already as a student Taras showed an exceptional interest in scientific studies, curiosity and desire to penetrate into fundamental physical problems. His studies of that time on relativistic mechanics of two particles under supervision of Prof. Roman Gaida were summarized in his first paper. However, the main knowledge, skills and achievements were gained while studying the properties of the electron gas in metals. Together with Prof. Markiyan Vavrukh, Taras Krokhmalskii examined various characteristics of an interacting degenerate electron gas, calculated the effective many-particle interactions in simple metals, obtained electron-ion potentials that constitute the basis of the modern many-particle theory of metals. These results form his PhD thesis "Electron correlations and many-particle interactions in metals" which was defended in 1987 in Taras Shevchenko University of Kyiv under the supervisorship of Prof. Yukhnovskii and Prof. Vavrukh.

Although the spectrum of the research carried out by Dr. Krokhmalskii after defending his thesis concerned a large variety of topics, profoundness and reliability remain to be characteristic features of his work. He elaborated numerical methods in the theory of phase transitions while constructing a hierarchical model of phase transitions (in collaboration with M. Kozlovskii and Yu. Kozitsky) and while evaluating field-theory graphs of high order (together with Yu. Holovatch). He investigated low-dimensional quantum spin models, suggesting, in particular, a numerical method for the study of the spin-$1/2$ XY chains (in collaboration with O. Derzhko, T. Verkholyak, J. Stolze, G. Müller, H. Büttner, J. Richter, and O. Zaburannyi). He studied quantum frustrated spin systems (together with O. Derzhko and J. Richter) and electron lattice models (together with J. Jędrzejewski and V. Derzhko). T. Krokhmalskii got interested in quantum informatics and published an extensive review paper in this field. Moreover, together with J. Jędrzejewski he uses the concepts from this field in describing phase transitions.

Taras Krokhmalskii also showed interest in applied studies for a wide range of physical phenomena. Together with M. Shovgenyuk and M. Kozlovskii he obtained important results for the properties of binary phase elements in the recognition image systems. Furthermore, they studied the fractal structure of the Winner spectra of binary phase elements of Kronecker type.

The research style of Taras Krokhmalskii is characterized by a transparent formulation of the problems, usage of subtle and sophisticated analytical methods for their solution, and entire numerical support of analytical argumentation. He collaborates with many researchers not only in Ukraine but also in Europe (Germany, Poland) and in the USA. Many papers were prepared within the framework of international research projects.

Taras Krokhmalskii is involved in lecturing for students of the Ivan Franko National University of Lviv (numerical methods, computational physics and quantum informatics). Many theoreticians remember his profound lectures at the Summer schools "Quantum Information" organized by the chair for theoretical physics of the National University of Lviv in Verkhnje Synjovydne (Ukraine). He is the author of about 70 research papers, an experienced theoretician, a teacher, an exceptionally responsible person and a reliable colleague. He has met his jubilee with noticeable achievements and new research plans. The editorial board of the "Condensed Matter Physics" joins numerous congratulations to him and wish him to stay in good health, implement his creative ideas, gain new achievements in science, and – last but not least – in his own peculiar way to grasp the Nature and tell us the tale.