
ANATOLY GLIBOVYCH ZAGORODNY
(to the 60-th Anniversary of His Birthday)



On January 29, 2011, the outstanding scientist in statistical physics and plasma theory, Academician of the National Academy of Sciences of Ukraine Anatoly Glibovych Zagorodny is 60 years of age.

A.G. Zagorodny was born in the settlement of Velyka Bagachka (the Poltava region). After the secondary school, he entered the Faculty of Radiophysics of the Kharkiv State University. His subsequent scientific activity is closely connected with Bogolyubov Institute for Theoretical Physics, where he started to work in 1972. A.G. Zagorodny passed, step by step, a way from a trainee researcher to the Scientific secretary and, later on, the Deputy Director, the Head of the department, and, since 2003, the Director of the Institute.

Already at the beginning of A.G. Zagorodny's creative development, his outstanding talent in theoretical physics and his features typical of a diligent researcher, who combines deep theoretical knowledge with a sensible perception of physical reality, are clearly revealed.

A.G. Zagorodny together with I.P. Yakimenko and Yu.L. Klimontovich made a substantial contribution to the theory of plasma-molecular systems. On the basis of a consistent statistical approach, he studied the influence of interaction between plasma and molecular components on electromagnetic fluctuations in bounded systems. In particular, he derived kinetic equations (of the Balescu–Lenard type) for the distribution functions

of free and bound charged particles in confined plasma-molecular media. He also found an explicit expression for collision integrals and studied the influence of a medium boundary on the distributions of electrons, ions, and molecules in its vicinity.

Continuing those researches, A.G. Zagorodny developed a theory of bremsstrahlung in plasma-molecular systems that consistently takes into account every possible process of scattering of charged particles and molecules (with regard for ionization and recombination), as well as the scattering of electrons and molecules by collective fluctuations. He predicted a number of new effects that can be observed in hot plasma with a molecular component.

A.G. Zagorodny together with Academician of the NAS of Ukraine A.G. Sitenko became one of the creators of the theory of turbulent plasma with diffusion-drift fluid-like motions. In particular, the dynamic form-factors of such a plasma were determined, and their unusual features associated with large-scale turbulent motions that are excited and persist in plasma, were examined. A model was proposed for the non-Markovian diffusion of particles in turbulent plasma, which enabled the saturation of plasma instabilities in the cases of both weak and strong turbulence to be described. The kinetic equations for systems with non-Markovian relaxation processes that were formulated by A.G. Zagorodny allow one to find the conditions required for the running of super- and subdiffusion processes in plasma. He developed the theory of electromagnetic fluctuations in a dusty plasma, by taking the fluctuations of dust particle charges into account, and studied the influence of the dust-particle charging dynamics on collective fluctuations and the scattering of electromagnetic waves in plasma. On the basis of the simulation of the structural and thermodynamic properties of strongly nonideal Coulomb systems, in particular, dusty and colloid plasma, a possibility of critical phenomena in such systems was demonstrated, and the qualitative conclusions concerning the critical values of the coupling constant and the charge number of the colloid component were drawn.

In his works published in recent years, A.G. Zagorodny developed a consistent kinetic theory of dusty plasma

proceeding from the first principles of statistical mechanics. He together with his disciples formulated rigorous microscopic equations and obtained Bogolyubov's chain of equations for a plasma with dust impurities. This enabled them to describe a wide class of new physical phenomena in dusty plasma that had not been explained before. For works on the statistical theory of plasma-molecular systems, A.G. Zagorodny and his colleagues were awarded the K.D. Sinelnikov Prize of the NAS of Ukraine, and, for the results obtained in plasma physics, the State Prize of Ukraine in science and engineering (2005).

Anatoly Glibovych made numerous reports at the most prestigious conferences on plasma physics. He was a member of program and organizing committees of many international conferences that took place in various countries. He is an author and a co-author of more than 200 publications, including the monography "Statistical Theory of Plasma-Molecular Systems", and numerous reviews in the most prestigious international journals.

Much attention and efforts are paid by the scientist to the pedagogical activity. He is a Professor of Taras Shevchenko Kyiv National University and the National University "Kyiv-Mohyla Academy", supervises the works of students and post-graduates. It is of importance that, owing to A.G. Zagorodny's initiative and support, Bogolyubov Institute for Theoretical Physics has held annual school-seminars for young theorists of Ukraine that have become now international.

Along with his active scientific and pedagogical activity, A.G. Zagorodny executes a huge body of scientific and organization work as the Principal scientific secretary of the NAS of Ukraine, the Director of Bogolyubov Institute for Theoretical Physics of the NAS of Ukraine, the Editor-in-Chief of the "Ukrainian Journal of Physics", a member of the scientific board of the State Fund for Fundamental researches. He is also a member of the Editorial Board of "Condensed Matter Physics" journal (Lviv), the Head of the Commission of the NAS of Ukraine on the Scientific Heritage of Academician V.I. Vernads'kyi, the head of a number of sci-

entific programs, the chairman of scientific councils and committees.

It would be desirable that some words concerning Anatoly Glibovych's personal features be added to the information given above. At the beginning of a working day, he, being always full of positive energy, comes to the Institute, where scientific problems, as well as managerial tasks – scientific and, sometimes, economic, – are waiting to be resolved, ranging by their importance and urgency. A specific feature of Anatoly Glibovych is his ability to switch over quickly to different kinds of activity. In the second half of Anatoly Glibovych's working day, his schedule is habitually filled with almost immense duties of the Principal scientific secretary of the NAS of Ukraine that detain him in the Presidium of the NAS of Ukraine till the late evening. Every day, a number of current issues are to be solved, among which rather difficult ones can be met, so that the steadfastness and the adherence to principles must be manifested sometimes.

At the same time, we know Anatoly Glibovych as a delicate person, who is always ready to help and to give support. Possessing a good sense of humor, he can relax a stress, using either a witty narration or a proper citation from the classical literature. His natural sincere openness, inherent goodwill, internal organization, and a feeling of high responsibility create a quiet steady atmosphere around him, which is necessary for the mental work and for keeping good relations between creative persons.

We sincerely congratulate Anatoly Glibovych with his 60-th anniversary and wish him a sound health, inspiration, and inexhaustible energy to realize his creative plans.

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