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### YURI GRYGOROVYCH PTUSHYNSKYI (to the 80th anniversary of his birthday)

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On November 29, 2007, an outstanding scientist in the fields of surface science, physical electronics, and vacuum physics Yuri Grygorovych Ptushynskiy – the Corresponding member of the NAS of Ukraine, Professor, Doctor of Science in Physics and Mathematics, Head of the Department of Adsorption Phenomena at the Institute of Physics of the NAS of Ukraine – will be 80 years of age.

Yuri Grygorovych was born in Kyiv, in the family of Grygorii Antonovych and Mariya Trokhymivna. His childhood and his youth fell on tempestuous years in the history of the USSR, when the everyday cares of his parents were to provide the family with a piece of bread and modest clothes, but their main trouble was to save the lives of their children. After Kyiv was liberated from fascist occupation, Yuri, following the profession of his father, studied at a technical school of railway transport. However, in 1946, getting interested

in physics, he became a student at the Faculty of Physics of the Taras Shevchenko Kyiv State University. After successfully graduating from the University in 1951, Yuri Grygorovych started his postgraduate study at the Institute of Physics of the Academy of Sciences of the UkrSSR – the institution, with which his destiny has been connected for all his further professional activity. The subject of Yu.G. Ptushynskiy's Ph.D. thesis, which he prepared under the guidance of the Corresponding member of the AS of the UkrSSR N.D. Morgulis and successfully defended in 1955, was devoted to studying the processes running in oxide cathodes. One should bear in mind that, in the early 1950s, the operation of all electronic facilities of civil and military destinations was based on vacuum electronic devices; and oxide cathodes were the most economical and widespread sources of electrons. By applying a tracer technique, new at that time, Yuri Grygorovych carried out complicated experiments to elucidate the role of diffusion of barium atoms from the interface between the metallic cathode base and barium oxide to the cathode surface for high cathode efficiency.

After the postgraduate course, Yu.G. Ptushynskiy was engaged in investigation of the processes of adsorption interaction between gases and metals. At that time, the laboratories over the world started to implement ultra-high vacuum (the pressure below  $10^{-9}$  mm Hg). This circumstance became a milestone at the beginning of a new stage in studying the surface phenomena, when, for the first time, it became possible to study them under guaranteed clean conditions. Yu.G. Ptushynskiy was one of the pioneers in the development of ultra-high vacuum technologies in the USSR. The peak of his achievements in this domain was a so-called black chamber which was created by Yu.G. Ptushynskiy together with his collaborator B.O. Chuikov for the first time in the world: first, in a glass variant and, then, in a metal one. It is a very complicated installation which has remained unique till

now and gives a possibility to register the mass-spectra of desorption products during a single flight through the ionization chamber of a mass-spectrometer. The installation allow one to work in the molecular bunch mode, and the temperature of the specimens can be varied from 4.2 to 3000 K. One of the major results obtained in those researches to establish that oxygen can be desorbed from a tungsten surface in the atomic form rather than the molecular one, as was assumed before. Yu.G. Ptushynskyi and his disciples continue to use this equipment until now to carry out fundamental researches concerning the interaction of gases with metals in a wide range of temperatures. This activity has an extremely great value for understanding the dynamics of adsorption and desorption processes, catalysis and corrosion, and the role of a surface structure and quantum effects in those processes.

In the 1960s in order to obtain the information about the electronic state of adsorbed particles, Yu.G. Ptushynskyi began to research the influence of adsorption on the electric resistance of thin films. In due course, following the O.A. Panchenko's initiative, this work led to the development of a unique method of probing the surface state by conduction electrons. While comparing the results of these experiments with the data obtained by studying the surface using the low-energy electron diffraction method, the correlation has been revealed between the structural variations in adsorbed films and the scattering of conduction electrons at the surface; namely, it has been demonstrated for the first time that the film ordering is accompanied by the increase in the specular reflection coefficient for electrons.

Yu.G. Ptushynskyi also paid a significant attention to the development of scientific instruments.

The scientific achievement of Yu.G. Ptushynskyi is highly appreciated by the physical community both in Ukraine and around the whole world. In 1988, he was awarded the State Prize of the USSR for the series of works "Surface-ionization and thermo-desorption researches of electronic, atomic, and molecular processes

on the solid surface and their application". In 2003, he won the A.F. Prikhotko Prize of the NAS of Ukraine for his work "Quantum-mechanical effects and phase transitions at low-temperature adsorption of hydrogen". In 1998, Yuri Grygorovych was conferred the title "Honoured Science Worker of Ukraine".

Yuri Grygorovych never confined himself to the purely scientific activity only; he spent a lot of time and efforts on scientific management and public activity as well. In 1970, he founded and then headed the Department of Adsorption Phenomena at the Institute of Physics; from 1970 to 1987, he worked as a Deputy Director of the Institute of Physics in scientific issues. From 1971 to 1982, Yu.G. Ptushynskyi was a deputy of the Moscow regional council in Kyiv, and, from 1980 to 1990, he worked as a member of the People's oversight committee of the UkrSSR. He was awarded the Order of the Red Banner of Labor and other government awards, being one of the most authoritative scientific collaborators at the Institute of Physics of the NAS of Ukraine.

Among the disciples of Yu.G. Ptushynskyi, there are three Doctors of Science and 8 Ph.D's who continue his scientific activity with dignity.

It is pleasant to note that you can meet Yuri Grygorovych everyday now in the laboratories, where he actively discusses the new results of researches and the plans for the future with his collaborators.

The scope of Yu.G. Ptushynskyi's interests is wide. He was fond of ping-pong, hunting, fishing. He was most active in amateur performances and he is interested in fine arts.

So, we wish him a good health and happiness for long years, and creative enthusiasm for new scientific achievements!

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