
IN MEMORY OF OLEG VYACHESLAVOVYCH SNITKO (to the 80th Anniversary of His Birthday)



This year, a well-known scientist in the domain of semiconductor physics, the winner of the State Prize of Ukraine, Doctor of Science in physics and mathematics, Professor, Academician of the Academy of Sciences of the UkrSSR, Oleg Vyacheslavovich Snitko (1928–1990) would have been 80 years of age.

O.V. Snitko was born in Kyiv on April 30, 1928, in the family of a military servant. He successfully graduated from the Faculty of physics of the Taras Shevchenko Kyiv State University. All his labor activity had been connected with the Academy of Sciences of the UkrSSR, where he worked his way up from a post-graduate student to the Director of the Institute of Semiconductor Physics, being one of its founders. O.V. Snitko began his carrier at the Institute of Physics of the Academy of Sciences of the UkrSSR, in the department headed by a famous scientist Prof. V.I. Lyashenko, the founder of the scientific direction “semiconductor surface

science” in Ukraine. O.V. Snitko became a main assistant to V.I. Lyashenko; therefore, he was charged to carry out researches in a challenging region of this physical branch, namely, studying photo-electric processes on semiconductor surfaces and in thin films. A number of publications in central journals and transactions of the Institute of Physics dealing with this scientific direction evidenced for an extremely thoughtful attitude of the young scientist towards the formulated problems.

The further scientific researches of O.V. Snitko encompassed a wide range of objects to study: germanium and silicon, i.e. semiconductors which remain actual till now; two- and multicomponent CdS, CdSe, CdTe, GaAs, InP, and HgCdTe crystals; as well as PbS and PbSe films which are sensitive to irradiation in a wide spectral range – from ultraviolet to infrared wavelengths. During the whole period of his scientific activity, O.V. Snitko paid a large attention to studying photo-electric and optical phenomena, as well as to the development of corresponding experimental methods. He, together with his colleagues and disciples, considered in detail – for the first time – the effect of surface sticking of nonequilibrium charge carriers and fulfilled a large cycle of works devoted to studying the influence of surface-related factors upon the photoeffect phenomenon in semiconductors and semiconductor-based surface-barrier structures.

Simultaneously, he carefully researched physical processes running at the interfaces of various types: on an atomically clean surface of semiconductors (in particular, dynamical phenomena and phase-structural atomic transformations), on the so-called “real surface”, in metal–semiconductor heterojunctions of the Schottky type, in thin films and multilayered structures.

Many works of O.V. Snitko were devoted to studying the nature of surface states. He put forward the idea of controllable creation of surface states by surface doping. In the realization of this idea, the large progress was achieved, and the results of corresponding

researches were summarized in a monography. The importance of those works was mentioned by such famous scientists in the surface science as V.L. Bonch-Bruevich and V.M. Sandomirskii in their review devoted to the 70th anniversary of Professor F.F. Volkenshtein. An important tool of surface state researches at a quantitative level became thermally induced capacitor depolarization, the method of surface and near-surface electron state spectroscopy generalized by O.V. Snitko. He stood at the beginning of researches dealing with galvano-magnetic surface phenomena and surface polariton spectroscopy.

The following cycle of his works was connected with processes proceeding in materials and structures of microelectronic industry. In particular, he, together with his collaborators, discovered the effect of deep nonequilibrium depletion of a semiconductor under the action of ac electric fields, which constitutes the basis for a new, extremely important class of microelectronic devices, the so-called charge-coupled devices (CCDs).

Well-known is the cycle of works, carried out by O.V. Snitko and V.A. Tyagai and devoted to the study of the light absorption in semiconductors making use of electromodulation methods. Their results allowed a conclusion to be made that the exciton effects in both indirect- (germanium, silicon) and direct-band-gap (group A^{II}B^{VI}) semiconductors can manifest themselves at both electroabsorption and electroreflection, and not only at low but also at high temperatures (up to room one).

O.V. Snitko paid a large attention to studying the electrophysical and photoelectric processes in semiconductors at cryogenic temperatures. In particular, under his direction, the researches were carried out concerning the influence of the surface on the formation of photo-electric memory in gallium arsenide at temperatures of liquid hydrogen and helium. He was also an initiator of researches which revealed an important role of surface-related factors in the phenomenon of high-temperature superconductivity.

Being the Director of the Institute of Semiconductor Physics from 1970, O.V. Snitko attentively monitored the work of all departments of the Institute. He was a responsive person accessible to the Institute's employees and numerous scientists from other institutions who asked his advice of a lot of issues.

O.V. Snitko published more than 300 scientific papers, including six monographies. He is a holder of many author's certificates and an author of several popular papers about semiconductors and their application. Much attention was paid to the education of his successors in science: he trained 8 Dr.Sci.'s and 35 Ph. D.'s.

O.V. Snitko successfully combined his fruitful scientific activity with managerial and social one: he was the Head of the Scientific Council of the AS of the UkrSSR on the "Semiconductor Physics" problem, a member of the Bureau at the Division of Physics and Astronomy of the AS of the UkrSSR, a member of the Scientific Council on the "Physics and Chemistry of Semiconductors" problem and the section of the AS of the UkrSSR on the "Semiconductor Surface Science" problem. O.V. Snitko headed the "Semiconductor Surface Science" branch of the Institute composed of six departments. He was a member of Editorial boards of such known scientific journals as "Fizika i Tekhnika Poluprovodnikov" (English translation: "Semiconductors") and "Poverkhnost" ("Surface").

O.V. Snitko was awarded the State Prize of the UkrSSR, the K.D. Sinelnikov prize, and the Order of the Badge of Honor.

According to a well-advised selection of the personnel, which O.V. Snitko carried on being at the position of the Director of the Institute, he managed to create a solidary scientific staff, which, meeting the requirements of time, has been continuing its successful activity till today.

*A.G. Naumovets, M.S. Brodyn, V.G. Machulin,
V.G. Lytovchenko, A.V. Sachenko*