
IN MEMORIAM

Yurii Viktorovich Gorelkinskii (1939–2008)

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Management and research workers of the Physicotechnical Institute (Almaty, Kazakhstan) with deep regret announce the death of the eldest researcher, Doctor of Physics and Mathematics, winner of the State Prize of Kazakhstan Republic, Professor Yurii Viktorovich Gorelkinskii (December 13, 1939–July 27, 2008)

Yurii Viktorovich Gorelkinskii was a prominent Kazakhstan physicist whose scientific activity was closely related to the Institute of High-Energy Physics of the Academy of Sciences of the Kazakh Soviet Socialist Republic and then to the Physicotechnical Institute (Alma-Ata, Kazakhstan).

Yu. V. Gorelkinskii was born in 1939. After graduating from Kazakh State University in 1965, he was assigned to the Institute of Nuclear Physics of the Academy of Sciences of Kazakh Soviet Socialist Republic, where he was engaged in technical aspects of the method of electron spin resonance (ESR). He defended a thesis of candidate dissertation in 1969 in Ul'yanov Electrotechnical Institute in Leningrad. Since 1970, Gorelkinskii was a scientific worker at the Institute of High-Energy Physics of Academy of Sciences of the Kazakh Soviet Socialist Republic as the supervisor of a team and then as the head of a laboratory. Since the foundation of the Physicotechnical Institute in 1991

(Almaty, Kazakhstan), all his scientific activity was related to the institute, where he successfully defended his thesis to become a doctor of physical and mathematical sciences in 1999.

In 1971–1972, Gorelkinskii suggested for the first time and supervised the realization of the method of magnetoresonance ESR tomography. He detected and studied the effects of bistability of the electronic structure of shallow donors formed as a result of irradiation of silicon with protons. Gorelkinskii also studied properties of complex clusters of defects in silicon; these clusters included helium atoms. In 1985–1990, in studies of hyperfine interaction with nuclei of the ^3He isotope, direct proofs of involvement of helium atoms in complexes stable at temperatures much higher than 300 K were obtained for the first time.

In 1986–1987, Gorelkinskii used the ESR method to detect a hydrogen analogue of the anomalous state of muonium in crystalline silicon; fundamental constants of interstitial atomic hydrogen in this semiconductor were also reliably determined. Previously, indirect information about states of atomic hydrogen in semiconductors was extracted from experiments with the use of meson beams (the μSR method).

Gorelkinskii should be given credit for detection and study of a number of new physical effects in semiconductors, including radiation-stimulated low-temperature migration of aluminum impurity atoms in silicon, electronic states of hydrogen atoms at interfaces and in the bulk of semiconductors, hydrogen-related phenomena of clusterization of vacancies and self-interstitials in the case of irradiation with protons, properties of noble gases in solids, and quantum-dimensional effects.

As a result of the studies initiated by Gorelkinskii and based on the ESR method, 18 new paramagnetic centers were identified; these centers were designated as Si-AA1, ..., Si-AA18 in international classification (abbreviation AA stands for Alma-Ata).

Professor Gorelkinskii is a winner of the State Prize of Kazakhstan Republic in the field of science and technology (2001) for a series of studies "Radiation-ion modification of the properties of silicon as the main material of modern semiconductor electronics". He repeatedly delivered invited lectures at various international conferences dedicated to ion implantation.

Gorelkinskii was a member of the international scientific society EPR JESR.

A number of candidate and doctorate theses were prepared and successfully defended under his guidance. The great erudition, refinement, and benevolence of Gorelkinskii always attracted colleagues and friends to him. Until recently, he actively pursued scientific activity; his brilliant creative life came to an end suddenly, so that his new scientific ideas and projects remained unrealized.

Colleagues, friends, and pupils of Gorelkinskii deeply grieve over his untimely death. We suffered an unreparable loss and express our sincere condolence to relatives of Gorelkinskii. We will forever keep a fond memory of Gorelkinskii in our hearts.

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