

Solomon Meerovich Ryvkin (Obituary)

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Professor Solomon Meerovich Ryvkin, a prominent Soviet scientist, has died at the age of 62 after a short illness. Soviet science has sustained a heavy loss. The founder of a number of new trends in semiconductor physics, Lenin Prixe Laureate, Director of the Laboratory at the A. F. Ioffe Physico-Technical Institute of the USSR Academy of Sciences, and Editor-in-Chief of the All-Union journal "Fizika i Tekhnika Polyprovodnikov," left us prematurely.

Ryvkin's life was a brilliant and glorious one. Immediately on graduation from the Physicomathematical Department of the Leningrad Polytechnic Institute in 1941, he went to the front, where he fought throughout the entire Great Patriotic War from the beginning to its final days. After returning to the Physico-Technical Institute in 1945, he developed into a prominent scientist who came to enjoy well-deserved worldwide fame in a short time by virtue of his extraordinary talent as a physicist, his tremendous devotion to work, and his total commitment to science.

In his earliest papers, Ryvkin became the first to invoke the concept of the exciton to explain anomalous relationships that he had observed in the photoconductivity of cuprous oxide. It was in the cuprous oxide crystal that the optical spectrum of this quasiparticle was subsequently observed.

In his next major cycle of studies of photoelectric phenomena in semiconductors, Ryvkin thoroughly covered and systematized carrier generation-recombination processes and transport phenomena. In so doing, he laid the foundations for a unified phenomenological theory of photoconductivity. An exceptionally lucid and consistent exposition of this theory will be found in his monograph on "Photoelectric Phenomena in Semiconductors," which has become a ready reference for a whole generation of investigators.

Basic research in the field of nonequilibrium processes in semiconductors led to the discovery of such phenomena as the current-convective instability of the electron-hole plasma in a magnetic field and the scattering of phonons with frequency change, an effect governed by the nonlinear polarizability of the medium.

Ryvkin was awarded a Lenin Prize in 1964 for his work relating to the development of semiconductor lasers.

A broad range of problems that Ryvkin posed and developed productively until the end of his life related to



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(1918–1981)

the interaction of radiation with semiconductors. Here we should note first of all the studies of optical phenomena that led to the creation of the first Soviet photodiodes and recently to the appearance of a new class of photodetectors using the dragging of carriers by photons and heat-induced photoconductivity.

The development of semiconductor photography with fundamentally new ionization-type image converters was an important advance.

Studies of the interaction of nuclear radiation with semiconductors, on which Ryvkin embarked back in the 1950's, made it possible to establish the nature of the processes that unfold under the action of ionizing radiation. His work in this area revealed the nature of radiation defects and served simultaneously as a basis for the emergence of a new branch of semiconductor instrumentation—the production of a broad class of detectors for nuclear radiation.

Ryvkin's talents as a researcher were harmoniously combined with those of a teacher. He founded an important scientific school, generously sharing his profound scientific knowledge with his many students and imbuing them with high human and citizenship qualities.

Ryvkin's scientific legacy comprises 280 articles and the more than 50 Doctors and Candidates of Sciences who entered science under his direction.

In his last years, Ryvkin devoted much time and effort to scientific-organizational activity. He was a member of a number of scientific councils and of the Executive of the Scientific Council on "Semiconductor Physics and Chemistry" in the Division of General Physics and Astronomy of the USSR Academy of Sciences.

His rich scientific intuition unfailingly allowed him to identify the most promising directions and studies. This quality came most productively into evidence in

his direction of the journal "Fizika i Tekhnika Poluprovodnikov", which won international recognition with its very first issues.

As a veteran of the Great Patriotic War and for his career successes, Ryvkin was awarded the "Red Star" and "Badge of Honor" Orders and eleven medals.

The glowing memory of S. M. Ryvkin will long remain in the hearts of his colleagues and grateful students.

Translated by R. W. Bowers