Samuil Borisovich Kormer (Obituary)

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Professor Samuil Borisovich Kormer—an eminent scientist, winner of the Lenin Prize and State Prizes of the USSR, corresponding member of the Soviet Academy of Sciences, and doctor of physicomathematical sciences—died suddenly on August 10, 1982.

He was born on January 1, 1923, to the family of an office worker in Kostyukovichi, Belorussian SSR. After leaving school during the Great Patriotic War (World War II) he was drafted as a member of the Young Communist League, to serve as a metal worker and a milling-machine operator, repairing tanks. When called up into the Soviet Army, he became a soldier in an artillery regiment and a student at the Dzerzhinskiĭ Military Engineering Artillery Academy, which he completed in 1946. His interest in science appeared while he was still a schoolboy, but his talents as an experimental physicist became particularly clear when he began his work on the physics of high pressures and temperatures in 1947. Already in his very first papers in this little studied field of science we can discern his characteristic style: a huge capacity for work, a clarity in defining the problem, thoroughness in checking the results, an extreme sense of the new, and an effort to pursue research to its logical conclusion.

Kormer had excellent teachers: eminent scientists who were to have a strong effect on his career as a researcher and whom he strived to emulate all his life, according to his own words.

Like his teachers, Kormer was one of those rare scientists who successfully combined research depth with a wide variety of topics.

His earliest studies dealt with the physics of high pressure and temperatures, in particular, the equation of state of a substance and its thermal properties in the pressure range 0.1–10 Mbar. These results were embodied in his candidate's dissertation in 1956. Some unique experiments were carried out under his supervision on the optical properties of shock-compressed materials and on the brightness temperature of the medium behind intense shock fronts in condensed media. In particular, these studies yielded the first measurements of the melting curves of ionic crystals up to a pressure of 1 Mbar. The steepness and smoothness of shock fronts in dense media were determined experimentally for the first time. The absorption of light by shock-compressed insulators was studied, and it was found that the absorption coefficient is increased by a factor of as much as 100 under these conditions. A mechanism was proposed which had the shock wave generating donor levels, whose thermal excitation gives rise to free electrons in the conduction band. This mechanism explains the nature of the absorption and conductivity of shock-compressed ionic crystals.

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(1923-1982)

The screening of the radiation from a shock front by "cold" electrons was observed experimentally in ionic crystals. The kinetics of the electron temperature at shock fronts in these materials was determined. For this research, Kormer was awarded the degree of doctor of physicomathematical sciences.

Kormer and his colleagues carried out an extensive experimental study of the isentropic compressibility of hydrogen up to record high pressures and densities. They discovered an anomaly in the compressibility of molecular hydrogen at a pressure of 3 Mbar and a density of 1 g/cm^3. This anomaly was identified with a transition of hydrogen to a metallic state. These studies and also the studies of the equation of state of condensed matter won the recognition of scientists both in the USSR and abroad.

During the last 15 years of his scientific work Kormer devoted much attention to the study of the use of lasers as tools for concentrating energy in small volumes in order to achieve controlled thermonuclear reactions.

This research gave rise to a unique iodine photodissociation laser, capable of producing the most intense laser beam in the world. This laser was used for successful experiments on the compression of spherical targets, and fusion neutrons were obtained for the first time in experiments with lasers of this type.

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He made an important contribution to the physics of high-power lasers. Here we can only note the breadth of his interests and the uniqueness of many of his results. He took active part in the development of laser science and technology in the USSR and was on the editorial board of the journal *Kvantovaya élektronika* (*Soviet Journal of Quantum Electronics*).

He placed much importance on the development of a competent scientific team. He guided the academic careers of more than 20 doctors and candidates of science.

He had many colleagues in various cities around the country, with whom he stayed in close touch. His constant readiness to be of assistance, his sensitivity to others, and his interest in them were combined with high standards and a strong adherence to principles. He had limitless enthusiasm for his work.

His community work was significant. A member of the Communist Party of the Soviet Union since 1945, he served many years in elected Party positions.

His country valued his scientific, administrative, and community work highly. He was awarded two Orders of Lenin, the Order of the Red Banner of Labor, and many medals. He was awarded the Lenin Prize and three State Prizes of the USSR.

To his last day he set an example of selfless and devoted service to the high ideals of science and his country.

Samuil Borisovich Kormer will never be forgotten by anyone who knew and worked with this eminent scientist, communist, and remarkable man.

Translated by Dave Parsons