



A handwritten signature in dark ink, appearing to be 'H. J. ...' followed by a series of connected loops and a final vertical stroke.

YURI A. OSSIPYAN

1931–2008

Elected in 1993

“For contributions to materials science and engineering and leadership in international cooperation and understanding.”

BY EUGENE SHCHUKIN

YURI ANDREEVICH OSSIPYAN died September 10, 2008.¹ He was born February 15, 1931, in Moscow into an intelligent and very warm family. In 1955 he graduated from the Moscow Institute of Steel and Alloys, Department of Metallurgy Engineering, and began his research work at the Institute for Metal Physics of the Central Research Institute of Ferrous Metallurgy. At the same time, he took theoretical courses at the Faculty of Mechanics and Mathematics of Lomonosov Moscow State University. In 1962 he defended his thesis under the guidance of Georgy V. Kurdyumov.

In 1962–1963 he was deputy director for research at the Crystallography Institute of the USSR Academy of Sciences. His outstanding talents as both scientist and founder of departments and institutions soon became evident in the formation and development of the Institute of Solid State Physics (ISSP) of the USSR Academy of Sciences (Chernogolovka, Moscow region). From 1963 to 1973 he was the ISSP’s deputy director for science, and in 1973–2002 director of the institute, after which he continued his work as ISSP’s scientific leader.

¹ His name is also spelled Osip’yan, following the Russian orthography Осипьян.

Ossipyan devoted his scientific life to progress in solid-state physics. He published more than 200 scientific papers on the theory of phase transitions, the physics of strength, the physics of electric and magnetic phenomena in semiconductor physics, optics, and other areas.

In the second half of the 1950s, ideas and experimental methods of the theory of dislocations presented in the work and famous books of Alan Cottrell, William T. Read, John J. Gilman, Egon Orowan, and other Western scientists were met with great interest in Russia by researchers in crystallography and then in materials science. Ossipyan took a very active and productive part in this broad area. Especially impressive are his pioneering studies of interactions between dislocations and electric fields. His precise studies in this important research area were further developed by Albert R.C. Westwood and his team in the United States, and by Vladislav I. Savenko and Dina I. Leikis in the USSR.

In the early 1960s Ossipyan discovered an unexpected and interesting dislocation phenomenon, now known in scientific literature as the photoplastic effect, and made advances in studying the electroplastic effect. In collaboration with his students, he observed the presence of charge on dislocations in A2B6 semiconductors and the existence of clusters of broken valent bonds in the dislocation cores in silicon, and did research on the electron spin resonance and spin-dependent recombination at dislocations.

His elegant experiments with high-frequency conductivity led to discovery of the quasi-one-dimensional electron bands associated with dislocations and combined electron resonance on dislocations in silicon. His research also showed the magnetic field effect on the plastic deformation in superconductors, along with the strong influence of the state of the electron system on plastic deformation. Thus, both the electric field effect on the movement of dislocations through crystal and, in turn, the effect of dislocations on changing the electronic properties of a system in plastically deformed crystals were analyzed. Since those first experiments with electron spin resonance on ruptured bonds, a powerful method for semiconductor quality

control has been developed—electron paramagnetic resonance (EPR) spectroscopy of defects in semiconductors.

Such studies led to successful achievements in the physics of dislocations in semiconductor crystals. The work of Ossipyan and his scientific school obtained broad recognition and made valuable contributions toward promoting Russian research in this field of solid state physics to a leading position.

In 1972 Ossipyan was elected a corresponding member of the Academy of Sciences of the USSR and in 1981 he became a full academician. For his research in the physics of dislocations, he was awarded in 1984 one of the highest honors in physics, the Lebedev Gold Medal of the USSR Academy of Sciences, and in 1988 he received the Karpinskii International Prize and Gold Medal. In 2005 he received the highest award of the Russian Academy of Sciences, the Lomonosov Grand Gold Medal, for fundamental contributions to the physics of dislocations in solids and opening photoplastic effect.

Ossipyan demonstrated his talent as a leader in organizing and directing the USSR state program on high-temperature superconductivity. At the ISSP, he led a series of studies of the structural and physical properties of crystals in high-temperature superconductors, particularly of the characteristics of magnetic flux in superconductors, and of conductivity anisotropy. Under his leadership, research in these areas gained recognition and credibility, and in his various senior positions in the Presidium of the Russian Academy of Sciences he made essential contributions to the organization of research.

He was both a distinguished authority and an amazing teacher. Thanks to his activity at the ISSP, departments were established in solid state physics at the Moscow Physical-Technical Institute and in physical chemistry at the Moscow Institute of Steel and Alloys. For many years, he led undergraduate and upper-level lecture courses, and he chaired solid state physics at the Moscow Physical-Technical Institute until his last days; under his guidance, many future successful Russian scientists defended their dissertations. Later, he participated in the establishment of the Physicochemical Department at Moscow State University.

His work was internationally recognized. He was elected as a foreign member of the National Academies of Bulgaria, the Czech Republic, Hungary, Poland, the US National Academy of Engineering, and the International Academy of Astronautics, and he took part in leading the International Union of Pure and Applied Physics (IUPAP). In his homeland he was given the honorary title of Hero of Socialist Labor (1986) and the Order “For Merit to Fatherland” (1999).

Yuri’s parents, Andrey and Berta Ossipyan—his well educated, wise father and his good, hospitable mother—inoculated their son with the perfect qualities of openness and readiness to help, hard work and responsibility, curiosity, and love of knowledge. Despite defective heart valves, he successfully mastered boxing, and one event in his life became well known: he dispersed a band of hooligans menacing a young woman.

Yuri Ossipyan dedicated himself to development of the ISSP, the search for promising researchers and staff, permanent attention to their successes and needs, and maintaining the highest level of scientific research. The ISSP is now one of the leading Russian academic institutions in physics and an excellent scientific center, with a broad spectrum of research in condensed matter physics and materials science.

His attributes—to overcome difficulties and mistakes; to meet conflicts with unexpected results; and to fight and conquer, to never surrender, but to use force only when necessary—accompanied him all his bright life.

Yura was a bright presence. A shining memory of him will be preserved in the hearts of all who knew him.

