

## In memory of Yurii Andreevich Osip'yan

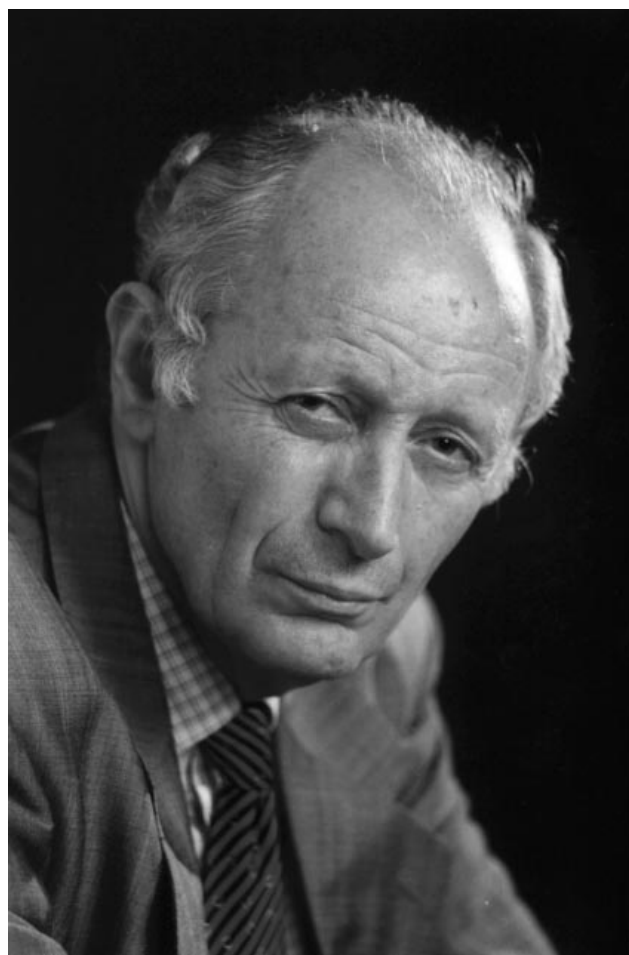
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Yurii Andreevich Osip'yan, Full Member of the Russian Academy of Sciences, outstanding scientist and organizer of science in this country, passed away on 10 September 2008 at the age of 78, much too soon. It is hardly possible to overestimate his contribution to progress in the condensed matter physics and the physics of strength and plasticity of solids. Yurii Andreevich was the founder of the Institute of Solid State Physics of the Russian Academy of Sciences (RAS) in Chernogolovka, a member of the Russian Academy of Sciences Presidium, and a member of the Presidium of the Scientific Center, RAS in Chernogolovka. The death of Yurii Andreevich is a sad loss for the scientific community of Russia and the world.

Yurii Andreevich Osip'yan was born on 15 February 1931 in Moscow. In 1955, he graduated from the Moscow Institute for Steel and Alloys, having majored in metallurgical engineering, and began his research career at the Institute of Metal Science and Physics of Metals affiliated to the Central Research Institute of Ferrous Metallurgy. He concurrently received additional theoretical education at the Mathematics and Mechanics Department of the M V Lomonosov Moscow State University. In 1962, with Academician G V Kurdyumov as his science supervisor, he presented and defended his candidate dissertation.

Osip'yan's exceptional talents as scientist and organizer of science manifested themselves in full during the creation, maturation, and expansion of the Institute of Solid State Physics (IFTT in *Russ. abbr.*). From 1962 to 1963 he was deputy director for research at the Institute of Crystallography of the USSR Academy of Sciences. Between 1963 and 1973 Yurii Andreevich was deputy director for research at IFTT, and from 1973 until 2002 was IFTT director. In 2002, Academician Yu A Osip'yan became science supervisor of the Institute of Solid State Physics, RAS.

Yurii Andreevich devoted his outstanding talent as a scientist to solid state physics. He published more than 200 papers on physics of phase transitions, physics of strength of materials, physics of electric and magnetic phenomena, physics of semiconductors, optics of dielectrics and semiconductors, and other fields of the condensed matter physics. At the beginning of the 1960s, Yu A Osip'yan began his pioneering experimental research into the interaction between electrons and extended defects in crystals. During that period he discovered an unexpected and fascinating phenomenon, now known as the photoplastic effect. Together with his students, Yu A Osip'yan discovered the electroplastic effect and the presence of electric charge on dislocations in semiconducting II–VI compounds, the existence of clusters of 'dangling' valent bonds in dislocation cores in silicon, electron spin resonance, and spin-dependent



Yurii Andreevich Osip'yan  
(15.02.1931 – 10.09.2008)

recombination on dislocations. Elegant experiments on high-frequency conduction led them to the discovery of quasi-one-dimensional electron bands bound up with dislocations, and combined electron resonance on dislocations in silicon. The effect of magnetic field on plastic deformation in superconductors was established and it was shown that the state of the electron system strongly affects plastic deformation, i.e., the motion of dislocations through the crystal; in turn, the introduction of dislocations changes the properties of the electron system in plastically deformed crystals. The pioneering experiments on the dangling bond electron paramagnetic resonance have by now engendered a powerful tool for semiconductor diagnostics — the electron paramagnetic resonance spectroscopy of defects in semiconductors.

All this work has helped in stimulating the growth of a new, successfully unfolding field — the physics of dislocations in semiconductor crystals. The contribution of Yu A Osip'yan and the scientific school he created to this field of solid state

physics received wide international recognition, the Russian branch of solid state physics of dislocations occupying the leading position. In 1972, Yuri Andreevich was elected Corresponding Member of the USSR Academy of Sciences, and in 1981 Full Member of the Academy. His work in the physics of dislocations brought him in 1984 one of the most prestigious awards of the USSR Academy of Sciences — The P N Lebedev Gold Medal.

Yu A Osip'yan proved his brilliant talent as a science administrator when he initiated the formation of the USSR State Program on High-Temperature Superconductivity and became its leader. At his proposal, a number of studies on the structural and physical properties of crystals of high-temperature superconductors were conducted at IFTT, RAS, including the investigation of the mechanism of twinning in crystals, the structure of magnetic flux in superconductors, and conduction anisotropy. Research programs carried out under his leadership rapidly gained authority and international recognition in this topical field of physics.

The contribution made by Yuri Andreevich to the organization of research on the scale of the country as a whole is immense; he achieved that while occupying highly placed positions in the structure of the Presidium of the Russian Academy of Sciences. Organizing the Institute of Solid State Physics, RAS and bringing it to its full potential, selecting and nurturing its research staff, ensuring and maintaining the high professional level of research emerging from IFTT — that became the focus of his whole life. At the moment, IFTT is one of the largest academic institutions of physics research in Russia, which is widely recognized as the scientific center where a broad range of research projects is being conducted on the condensed matter physics and physical materials science.

Yuri Andreevich Osip'yan was an excellent teacher and tutor for young scientists. On his initiative, the Chair of Solid State Physics of the Moscow Institute of Physics and Technology (MFTI in *Russ. abbr.*) was created using IFTT, RAS as its home base. For many years he lectured to students and postgraduates at MFTI. He remained Head of the MFTI Chair of Solid State Physics until his very last days. Dozens of his students, who later grew into outstanding Russian scientists, prepared their CandSc and DSc theses under his supervision. It was again on his initiative when the Department of Physical Chemistry of Moscow State University was created; it continues to work successfully, getting stronger and commanding more and more respect.

Between 1985 and 2008, Yuri Andreevich was Editor-in-Chief of *Kvant* (Quantum), a popular science magazine for children; he also headed the editorial board of the no less famous series 'Bibliotekha *Kvanta*' (Quantum Little Library). It is impossible to overestimate the role played in our country by such publications in attracting young people to careers in science. He fully understood the importance of drawing in and training new scientific personnel, and devoted a great deal of his energy, time, and attention to this activity. When serving as Deputy President of the USSR Academy of Sciences in difficult times for this country, he actively supported other scientific publications as well.

Yuri Andreevich's achievements received wide international recognition. He was a foreign member of the national academies of Bulgaria, Hungary, Poland, and Czechoslovakia, was a member of the National Academy of Engineering of the USA and the International Academy of Astronautics. He successfully headed for many years the International

Union of Pure and Applied Physics (IUPAP). The leaders of the country highly valued the merits of Yu A Osip'yan. In 1986, he was awarded the honorary title of Hero of Socialist Labor, and in 1999 he received the Order of Service to the Fatherland of the Second Class. In 2005, Yu A Osip'yan was awarded the highest distinction of the Russian Academy of Sciences — The M V Lomonosov Grand Gold Medal of the RAS for his fundamental contribution to the physics of dislocations in solids and for the discovery of the photoplastic effect.

Yuri Andreevich was always very special in his human qualities — friendliness, intelligence, wisdom, subtle sense of humor, sensitivity to human suffering, thoughtful and responsive attitude towards people surrounding him, ability to value the real merits of a person regardless of rank.

Yuri Andreevich Osip'yan was a happy person — he was able to dream, formulate goals, and plan for the future; he was not afraid of shouldering responsibility and knew how to achieve the goals he set for himself. He knew how to surround himself with intelligent, honest, and talented people with whom any joint effort was a pleasure. Owing to Yu A Osip'yan, the atmosphere at the Russian Academy of Sciences Institute of Solid State Physics was uniquely friendly and welcoming, supportive of creativity and success of talented young researchers.

This is how Yuri Andreevich will always be remembered by his close and now deeply grieving friends and colleagues — everyone in his circle, the people with whom he worked and whom he befriended, those who earned his respect, and those he loved.

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