

Yuriĭ Andreevich Osip'yan (on his sixtieth birthday)

Zh. I. Alferov, A. F. Andreev, A. S. Borovik-Romanov, B. K. Vaĭnshteĭn, V. F. Gantmakher, L. V. Keldysh, V. I. Nikitenko, E. G. Ponyatovskii, V. B. Timofeev, I. M. Khalatnikov, V. Sh. Shekhtman, and I. F. Shchegolev

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On 15 February 1991 Academician Yuriĭ Andreevich Osip'yan, a prominent Soviet physicist, the vice-president of the Academy of Sciences of the USSR, and the director of the Institute of Solid-State Physics, Academy of Sciences of the USSR, celebrated his sixtieth birthday.

Yu. A. Osip'yan began his scientific career in 1955 after graduating from the Institute of Steel and Alloys in Moscow. Already at the early period of his career Osip'yan clearly demonstrated his outstanding scientific talent, and his remarkable intuition, which enabled him to discover striking and beautiful effects even in traditional scientific fields. His first investigations carried out at the Central Scientific-Research Institute of Ferrous Metallurgy under the direction of G. V. Kurdyumov were devoted to the theory of martensite transitions in solid state at low temperatures. He carried out a theoretical investigation of the influence of quantum effects on the kinetics of phase transitions in crystals unaccompanied by diffusion. He also carried out experimental investigations of the mechanical properties of filamentary crystals and demonstrated that their actual strength is close to the theoretical limit.

However, Osip'yan's principal contribution to the evolution of science is the development of a new field of solid-state physics associated with the study of the interaction of electrons with extended defects in crystals. This field had its origin in Osip'yan's first experiments carried out in 1966–1967. During this period he discovered a very interesting and unexpected phenomenon—the significant influence of optical excitation on the plastic properties of semiconductors. In scientific literature this phenomenon is known as the photoplastic effect.

Osip'yan's subsequent articles also gave rise to considerable scientific response. Here one should mention the discovery of such interesting new effects as the electroplastic effect in semiconductors, the existence of clusters of "broken" valence bonds in dislocation centers in silicon, electron spin resonance and the spin-dependent recombination at dislocations, the production of recombination waves in plastically deformed crystals. Elegant experiments on electron spin resonance and high-frequency conductivity led to the discovery of quasi-one-dimensional bands of electron dislocations.

All these articles served as a foundation of a new successfully developing field—the physics of dislocations in crystals. The contributions by Osip'yan and the scientific school created by him to the development of this field of solid-state physics have been internationally recognized, and Soviet science in the field of dislocation solid-state physics has achieved a leading position in world science. In 1984



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Yu. A. Osip'yan in recognition of this work was awarded by the Academy of Sciences of the USSR one of the highest marks of recognition in physics—the P. N. Lebedev gold medal.

His broadly-based knowledge of his field and his outstanding intuition enabled Osip'yan on the discovery of high-temperature superconductivity to participate actively in the investigation of this problem and to become an acknowledged authority in this field. On his initiative many interesting investigations were carried out of structural and physical properties of single crystals of high-temperature superconductors including the study of the nature of twinning, the structure of magnetic flux, the anisotropy of conductivity, etc. One should make a special note of Osip'yan's scientific-organizational activity associated with the development in our country of this new field, which is of great interest both from the points of view of fundamental science and of applications. He is the chairman of the Council on the Problem of High-temperature Superconductivity which coordinates research in this field, and he is a member of the editorial board of the international journal *Physics. Ser. C* which publishes papers on HTSC.

The list of scientific publications of Academician Yu. A. Osip'yan includes approximately two hundred papers in leading scientific journals. Osip'yan's considerable scientific achievements led to his being elected a member of a number

of foreign academies and scientific societies.

Yu. A. Osip'yan is one of the organizers of the Institute of Solid-State Physics of the Academy of Sciences of the USSR and is the head of this Institute since 1973. He devoted much energy to the establishment of the Institute, to the process of selection, professional training and development of the scientific personnel, to the establishment and maintenance of a high scientific level of the research carried out within the Institute, and to the establishment of that benevolent and creative atmosphere which is so necessary for the activity of a scientific group.

Osip'yan devotes much attention to the education of young scientists, to the creation of a scientific school. During approximately two decades he has been in charge of the Department of Solid-State Physics of the Moscow Physicotechnical Institute. Each year the department selects the most gifted students of the Moscow Physicotechnical Institute which then undergo training and scientific development in the Institute of Solid-State Physics of the Academy of Sciences of the USSR.

Osip'yan was elected a corresponding member of the Academy of Sciences of the USSR in 1972, and a full member in 1981. He is a member of the executive of the Division of General Physics and Astronomy of the Academy of Sciences of the USSR, chairman of the Scientific Councils on "Physics, chemistry and mechanics of surfaces" and "Cos-

mic materials science" associated with the presidium of the Academy of Sciences of the USSR, he is chairman of the joint Scientific Council on the complex problem "Solid-state physics." Osip'yan is the editor-in-chief of the journal "Kvant," and a member of several editorial boards. Recognition of Osip'yan's outstanding scientific-organizational ability was his election in 1990 to the position of President of the International Union of Pure and Applied Physics (IUPAP).

Osip'yan's scientific and community activity achieved high recognition. He was awarded the title of Hero of Socialist Labor and he has received the orders of Lenin and the Red Banner of Labor.

Osip'yan's character traits include remarkable benevolence and liking of people, gentleness, personal charm, and innate intelligence. Yu. A. Osip'yan is a person of great erudition, of many different talents and interests, and is a brilliant scientist-organizer. He is full of energy and of new creative ideas, and continues to work intensively and fruitfully.

In these days of his jubilee his friends and colleagues in his work, and all those who are fortunate to know Yu. A. Osip'yan closely wish him from the bottom of their hearts good health, good fortune, and successes in carrying out his creative ideas.

Translated by G. M. Volkoff