Sergey Victorovich Iordanskii

(1929-2020)

D.Sc., Professor, Honored Scientist of the Russian Federation.

Sergey Victorovich Iordanskii, a world-recognized physicist, passed away on 14 June 2020 after a heavy fight with corona-virus. Iordanskii is mostly known for his work on force acting on to quantum vortices. In 2011, Iordanskii was awarded the Francis Simon Memorial Prize "For calculations and predictions of the fundamental forces acting on quantized vortices in super fluids, superconductors and other ordered systems". The Prize (together with his Landau Institute colleague, N.B. Kopnin) was awarded for the discovery of two kinds of forces acting on quantum vortices in addition to the Magnus force. One of these forces is named in literature the "Iordanskii force". Iordanskii derived this force in 1964-65. Much later, the fundamental topological origin of the Iordanskii force has been understood as one of the manifestations of the Aharonov-Bohm effect. Nowadays, this force has been recognizedin cosmology as the one acting on spinning cosmic strings.

S.V. Iordansky was born on 27.09.1929 in Orenburg. In 1956 he graduated from the Department of Physics and Technology of the Moscow State University. This Department was transformed into the Moscow Institute of Physics and Technology (MITP). Thus, Iordanskii was among the very first alumni

of the MITP. In the early part of his scientific career, Iordanskii worked on problems of hydrodynamics under the supervision of his PhD advisor, the famous mathematician M.A. Lavrentyev. For his original work made in Sarov, Iordanskii was awarded by the Order of the Red Banner of Labour (Orden Trudovogo Krasnogo Znameni). In 1956, soon after graduation, Iordanskii moved to the Steklov Institute of Mathematics.

In mid-sixties, scientific interests of S. V. Iordanskii shifted from classical hydrodynamics and plasma physics toward the low-temperature physics. After works about mutual friction between the normal and superfluid components in rotating Bose-liquid, he developed a theory for the rate of the vortex rings production due to the thermal fluctuations.

In 1967, in order to realize his desire to work in a more physics-oriented environment, Iordanskii joined the Institute for Theoretical Physics, now the Landau Institute. His first paper there gave an elegant solution of the problem of critical current of an accelerated particle when its motion is limited by emission of excitations. This work was continued together with his PhD student G.E. Volovik.
In 1972-73, together with another PhD student, A. Finkel'stein, Iordanskii published pioneering papers on the quantum decay of a macroscopic system in a metastable state (the so-called problem of the "false vacuum"). They have found the instant on solutions describing the processes of quantum-tunneling decay of such states.

In 1980, S.V. Iordanskiiwas invited to be the Head of Theoretical Division at the Institute of Solid State Physics (IFTT). His healthy-spirit character and sincere interest to physics made him very successful atthis post. His solid mathematical background allowed S.V. Iordanskii to work with young colleagues on a broad spectrum of problems, from thegrowth of dendrites (with E. Brenner) to the drifting of Bloch lines in a ferromagnet (with V.I. Marchenko).

Iordanskii was deeply interested in the Quantum Hall Effect. In 1982 he proposed the semiclassical explanation of this effect. Together with his peer colleagues, Yu.A. Bychkov, G.M. Eliashberg, and E.I. Rashba, he developed a quantum-mechanical theory of two-dimensional electron systems in strong magnetic fields. His most cited work in the solid-state physics is about the spin-orbit interaction in heterostructures (co-authored with Yu.B. Lyanda-Geller and G.E. Pikus; JETP Letters, 1994, and subsequent publications).
In the beginning of this century, Iordanskii made an original attempt to describe the Fractional Quantum Hall Effect (FQHE) in terms of the vortex lattices.Though it is still unclear how this daring workrelates to the celebrated scheme of the composite fermions, all the principalproperties of the FQHE have been reproducedby his theory.

Soon after coming to the Landau Institute, S.V. Iordanskii became an active member of the Chair for "Problems in theoretical physics" in Moscow Institute of Physics and Technology. During 1999-2003 years, S.V. Iordanskii headed this Chair. He was a successful PhD adviser. Besides already mentioned Finkel'stein and Volovik, he supervised untimely passed Sergey Korshunov, the world recognized expert in Statistical Physics and Quantum Systems, as well as V.V. Avilov, A.E. Koshelev, B.A Muzykantskii, and others.
His students and colleagues conserve thankful memory of Sergey Iordanskii, outstanding personality and a devoted scientist.

Finally, it is worth to mention that S.V. Iordanskii was one of the most active authors of JETP Letters. He published about twenty papers in our journal.

I.S. Burmistrov, G.M. Eliashberg, M.V. Feigelman, A.M. Finkel'stein,
Ya.V. Fominov, D. E. Khmelnitskii, I.V. Kolokolov, V.P. Mineev,
L.P. Pitaevskii, V.L. Pokrovsky, V.M. Pudalov, A.A. Starobinsky, G. E. Volovik,
and the Editorial board of the JETP Letters

http://www.itp.ac.ru/ru/memorial/iordanskii-obituary/

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