

IN MEMORY OF A.A. RUKHADZE



(1930-2018)

Anri Amvrosievich Rukhadze passed away at the age of 88 on March 7, 2018.

A.A. Rukhadze was born in Tbilisi (Georgia) in the family of a famous mathematician A.K. Rukhadze. After receiving his education at MIFI (now MIPT RAS) he entered a post-graduate course at FIAN (now LPI RAS). At the age of 28 he defended a Ph.D. Thesis and at the age of 34 he received the degree of Doctor in Physics and Mathematics. He was awarded with two USSR State Prizes, held the status of “Honoured Scientist of Russia”. He was a laureate of the “M. Lomonosov Prize I degree”, honoured with the orders of “Labour Red Banner” and “Badge of Honour”, medals “For Valorous Labour” and “Veteran of Labour”.

A.A. Rukhadze was an academician of the Russian Academy of Natural Sciences and A.M. Prokhorov Engineering Academy, honorary doctor of Sophia University St.Kl. Ohridski and N.N. Bogolyubov Institute for Theoretical Physics of NAS of Ukraine. Its name is associated with electrodynamics of material media, plasma physics and plasma electronics. He began his scientific work under the direction of I.E. Tamm at FIAN (LPI RAS) and was the first, who advanced a completely renormalized deuteron theory. He, in joint authorship with V.P. Silin, formulated the general fundamentals of electrodynamics of plasma-like spatial-dispersive media, as well as, revealed the nature of magnetic medium permeability as dispersion development. These investigations provided a basis for their known monograph “Electromagnetic properties of plasma and plasma-like media”.

A.A. Rukhadze had made an important contribution to the theory of nonequilibrium and irregular plasma oscillations and stability. He, together with V.P. Silin, developed an asymptotic theory of nonequilibrium medium oscillations and formulated the “quantization levels” for determining the spectra of oscillations and analysis of their stability. Using the investigation results he had written the monographs “Waves in magnetoactive plasma” (co-author V.L. Ginzburg), and “Oscillations and waves in plasma media” (co-authors A.F. Aleksandrov and L.S. Bogdankevich).

A.A. Rukhadze is, by right, regarded as an author of relativistic plasma microwave electronics. He developed, jointly with experimenters and his followers-theoreticians, a theoretical basis of this field of science and realized unique plasma generators of coherent electromagnetic radiation. The articles issued in this field were compiled in the monographs “Physics of high-current relativistic electron beams” (co-authors V.G. Rukhlin and S.E. Rosinsky), “Physics of dense electron beams in plasma” (co-author M.V. Kuzelev), as well as, in the encyclopedic monograph “Relativistic plasma microwave electronics” (co-authors M.V. Kuzelev and P.S. Strelkov).

A.A. Rukhadze laid the basis of a new field in physics of gas discharge – physics of gas discharge in emitting plasma. He formulated the conditions of transforming a major part of electric energy being contributed to the gas discharge, to the optical radiation in the broad spectral region. Basing on the evolved theory of such discharges, the effective gas-discharge light sources were developed for energy pumping of high-current gas lasers. The results of investigations obtained in co-authorship with A.F. Aleksandrov were used in their monograph “Physics of high-current light sources”.

A.A. Rukhadze was the author of more than 600 scientific publications including 60 reviews and 14 monographs. He established the school on relativistic microwave electronics, educated more than 65 candidates and 30 doctors of science. He was the editor-in-chief of the journal “Engineering Physics”, a member of the editorial board of the journals: “Applied Physics”, “Brief Communications on Physics” and “Applied and Mathematical Physics”. He was a remarkable professor and teacher delivering lectures during more than 45 years at the physical faculty of MSU and MIPT RAS. In co-authorship with A.F. Aleksandrov and L.S. Bogdankevich the course “Fundamental plasma electrodynamics” was written. He delivered and published, together with A.F. Aleksandrov, a special course “Lectures on electrodynamics of plasma-like media” in two parts for students of the sub-faculty of physical electronics and, together with M.V. Kuzelev, a course “Methods of the theory of waves in dispersive media”.

In 1988 A.A. Rukhadze organized a theoretical department in GPI RAS and was a leader of this department during many years. More than 50 years ago A.A. Rukhadze initiated a seminar on theoretical physics for discussing topical problems practically in all the fields of physics and conducted workshops until last days.

We will forever retain A.A. Rukhadze’s memory in our hearts.