



Personalities

IN MEMORY OF THE SCIENTIST AND EXECUTIVE SECRETARY OF THE JOURNAL FLUID DYNAMICS

GREGORY A. LYUBIMOV (1932 – 2023)



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G.A. Lyubimov, Honored Scientist of the Russian Federation, Honored Researcher and Member of the Academic Council of Moscow State University, Doctor of Sciences in Physics and Mathematics, Professor, laureate of the Russian Federation National Award, the S.A. Chaplygin Award, and L.I. Sedov Prize, an outstanding scientist in the field of continuum mechanics, the founder of the school for the development of engineering flow models in MHD channels, one of the leading specialists in respiratory mechanics, the chairman of the Scientific Council of the Russian Academy of Sciences on biomechanics, a member of the presidium and deputy chairman of the Russian National Committee on Theoretical and Applied Mechanics, holder of the Order of Holy Faithful Prince Daniel of Moscow of the third class.

ABSTRACT

On March 7, 2023, Gregory A. Lyubimov, the principal researcher of the laboratory of general hydromechanics of the Research Institute of Mechanics of the M.V. Lomonosov Moscow State University, Honored Scientist of the Russian Federation, Honored Researcher of MSU, Doctor of Sciences in Physics and Mathematics, Professor, laureate of the Russian Federation National Award, S.A. Chaplygin Award, and L.I. Sedov Prize, passed away.

G.A. Lyubimov was an outstanding scientist in the field of continuum mechanics, the author of fundamental research in magnetohydrodynamics, electric gas discharges, and biomechanics. He became one of the creators of a general and physically substantiated model of near-electrode processes and became the founder of the school for the development of engineering flow models in MHD channels. He was one of the most authoritative in Russia specialists in the mechanics of respiration.

From the day of foundation in 1966 to 2020, G.A. Lyubimov was the executive secretary of the journal "Proceedings of the Russian Academy of Sciences. Fluid and Gas Mechanics" ("Fluid Dynamics" in English version). For many years he was the chairman of the Scientific Council of the Russian Academy of Sciences on biomechanics, a member of the presidium and deputy chairman of the Russian National Committee on Theoretical and Applied Mechanics, a member of the Academic Council of Moscow State University.

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Biography

On March 7, 2023, the principal researcher of the laboratory of general hydromechanics of the Research Institute of Mechanics of the M.V. Lomonosov Moscow State University, Honored Scientist of the Russian Federation, Honored Researcher of MSU, Doctor of Sciences in Physics and Mathematics, Professor Gregory A. Lyubimov passed away.

G.A. Lyubimov was born on June 23, 1932 in Moscow. In 1959, after the postgraduate course at the Faculty of Mechanics and Mathematics of Moscow State University (Department of Hydromechanics) he came to work at the Institute of Mechanics of Moscow State University, with

which his entire working life is connected. He was the founder of the laboratory of general hydromechanics and for many years its head. He managed to create a scientific team in which creative freedom is combined with an orientation towards the most promising research. In the laboratory, under his leadership, many remarkable scientists have grown up.

G.A. Lyubimov was an outstanding scientist in the field of continuum mechanics, the author of fundamental research in magnetohydrodynamics, electric gas discharges, and biomechanics. Belonging to the school of Academician L.I. Sedov, he was at the same time the first student of G.G. Cherny, under whose guidance he wrote his PhD thesis. A characteristic feature of his creative method was the study of scientific problems simultaneously from the theoretical

and applied sides. This approach and its first-class implementation allowed G.A. Lyubimov to become the undisputed leader in a number of new scientific directions.

G.A. Lyubimov owns outstanding results in the field of magnetohydrodynamics. He carried out studies of MHD discontinuities and their structure, in particular, pioneering work on ionizing and detonation waves. He became one of the creators of a general and physically substantiated model of near-electrode processes and made a significant contribution to solving the problem of increasing the service life of an electrode to practically acceptable times. He became the founder of the school for the development of engineering flow models in MHD channels. In co-authorship with A.G. Kulikovskiy, he published in 1962 the book "Magnetohydrodynamics", one of the first monographs in the world literature on this branch of science, and together with A.B. Vatazhin and S.A. Regirer in 1970 the monograph "Magnetohydrodynamic flows in channels". Both of these books have played an important role in the subsequent development of magnetohydrodynamics.

G.A. Lyubimov was one of a group of prominent scientists who began to develop in the Soviet Union biomechanics, a new field of science that arose at the intersection of mechanics and physiology. In 1973, the first in a series of annual seminars on biomechanics took place in Leningrad, and such seminars (now they are called symposiums) continue to this day. G.A. Lyubimov actively participated in the organization and holding of both these seminars and conferences on biomechanics, heading their organizing committees for many years.

The main works of G.A. Lyubimov in the field of biomechanics relate to the mechanics of respiration, in which he became one of the most authoritative specialists in Russia. Evidence of this is the summary of the fundamental principles of the mechanics of respiration, accessible to physiologists and doctors, in the book "Physiology of Respiration" (St. Petersburg, 1994), published in the series "Fundamentals of Modern Physiology".

G.A. Lyubimov (together with A.I. Dyachenko) created a multiphase model of the parenchyma, which made it possible to solve important problems of sound propagation in the lungs. He developed an effective zero-dimensional model of the lung, on the basis of which, in collaboration with the Institute of Pulmonology (St. Petersburg), he performed an extensive series of studies that covered almost all clinical tests (including measurements in the wholebody plethysmograph), various respiratory maneuvers, some types of pathologies, and spatial heterogeneity of lung properties. These works were continued in the study of cough, when he managed not only to build a mathematical model of this phenomenon, but also to substantiate the hypothesis about

the relationship between the anatomical structure of the trachea and the effectiveness of coughing.

G.A. Lyubimov was at the forefront of research into the mechanics of the eye, based on effective models that make it possible to directly link the results of clinical measurements with the actual mechanical characteristics of the eyeball, which significantly increases the information content and diagnostic value of such measurements. This approach was applied to the analysis of clinical procedures of tonometry and tonography, on the basis of which, in collaboration with the Helmholtz Research Institute of Eye Diseases, new diagnostic criteria for primary open-angle glaucoma were developed.

Scientific activity of G.A. Lyubimov received wide recognition. He is a laureate of the Russian Federation National Award, the S.A. Chaplygin Award, and L.I. Sedov Prize. He was awarded the medal of the International Communications Group on magnetohydrodynamics and power generation.

Prof. Lyubimov did a lot of work on the organization of science. For many years he was the chairman of the Scientific Council of the Russian Academy of Sciences on biomechanics, a member of the presidium and deputy chairman of the Russian National Committee on Theoretical and Applied Mechanics, a member of the Academic Council of Moscow State University. In 1993–1997, he worked as Deputy Academician-Secretary of the Department of Mechanics, Mechanical Engineering and Control Processes of the Russian Academy of Sciences.

From the day of foundation in 1966 to 2020, G.A. Lyubimov was the executive secretary of the journal "Izvestiya RAN. Mekhanika Zhidkosti i Gaza" ("Proceedings of the Russian Academy of Sciences. Fluid and Gas Mechanics") – the leading edition in this field of science in the USSR and Russia. The English version of this edition is being published as "Fluid Dynamics". Since the beginning of the publication of the Russian Journal of Biomechanics, he was a member of its international editorial board.

G.A. Lyubimov was distinguished by the breadth of interests and indefatigable social activity. The historical school calendar "Glory of Russia" created by him has withstood more than one edition. It was he who took the initiative to recreate the Church of Holy Martyr Tatiana at Moscow State University. He was awarded the Order of Holy Faithful Prince Daniel of Moscow, the third class.

The memory of the outstanding Russian scientist and remarkable person Gregory A. Lyubimov will forever be preserved by all those who were happy to see him and work with him, and the influence of his scientific achievements and his personality did not end with his passing.