In memory of a renowned scientist – professor Vagif Mirsalimov

Doctor of physical and mathematical sciences, honored scientist, professor Vagif Mirahmad oglu Mirsalimov died at the age of 81 at 02 Mart, 2022. Vagif Mirsalimov is a well-known scientist in the field of deformable solid mechanics, the author of fundamental research on the theory of strength and fracture of materials and structural elements. His scientific activity is characterized by the breadth of the considered problems in many areas of mechanics and scientific foundations of materials science in mechanical engineering. The highest level of research performed by prof. V.M. Mirsalimov, their significant importance for the development of science, characterize him as a major scientist.

Vagif Mirsalimov was born on January 30, 1941 in Baku. In 1964 he graduated from the Mechanical Department of the Novocherkassk Polytechnic Institute with a degree in "Operation of road transport", in 1966 - the Mechanical and Mathematical Department of the Rostov-on-Don State University with a degree in "Mechanics". In 1967-1970 he was a postgraduate student at the Institute of Problems of Mechanics of the USSR Academy of Sciences. In 1970 he defended his PhD thesis at Lomonosov Moscow State University. In 1970-1972 – junior researcher at the Institute of Mathematics and Mechanics of the Academy of Sciences of the Azerbaijan SSR, in 1972-1978 – associate professor of the Department of Higher Mathematics of the Lipetsk Polytechnic Institute, in 1978-1983 – deputy Director for scientific work of the SCB at the IMM of the Academy of Sciences of the Azerbaijan SSR. From 1983 to 2011 – Head of the Department "Resistance of Materials", after the merger of the departments "Theoretical Mechanics" and "Resistance of materials" from 2011 to 2016 – Head of the "Technical Mechanics" Department. Since 2016 – Professor of the Department of Mechanics. In 1980 he defended his doctoral dissertation at Kazan State University. Since 1985 – Professor, since 1983 – Laureate of the USSR Council of Ministers Prize in the field of science and technology, since 2011, he has the title of Honored Scientist.

V.M. Mirsalimov is the author of about 500 published works, including three monographs: "Destruction of elastic and elastoplastic bodies with cracks" (Baku: Elm Publ., 1984), "Non-dimensional elastoplastic problems" (Moscow: Nauka Publ., 1987), "Stress state and quality of a continuous ingot" (Moscow: Metallurgy Publ., 1990). Under his leadership, 107 candidates and 15 doctors of sciences from different countries have been trained.

The name of V.M. Mirsalimov is associated with important achievements in science in the field of fracture mechanics of structural materials, the study of the structure of plastic deformations at the tip of a crack in a deformable metal, the development of methods for solving numerous specific problems of the theory of plasticity and the methodology for determining crack resistance.

The formulation of the considered problems takes into account the complexity of the geometry of bodies (as a rule, multicoupled bodies were considered), a variety of properties (mainly plasticity and viscoelasticity, as well as microstructure and anisotropy), the effect of different forces, stamps, temperature fields. Prof. Mirsalimov developed a number of effective methods for studying the plane stress-strain state of multicoupled anisotropic and isotropic bodies with holes and cracks, an assessment of the influence of multicoupling on the stress intensity coefficients at the crack vertices is given. An in-depth theoretical analysis of the problem of multi-connectivity in the mechanics of deformation and destruction of structural elements, devices, structures and mountain massifs has been carried out. The issue of energy storage sites near mine workings has been studied, which makes it possible to choose the optimal form of production or find a more rational reinforcement of it. The results of fundamental research of V.M. Mirsalimov and his students allow to give specific solutions to a whole range of applied problems related to the material intensity and reliability of

components and parts of machines, devices, building structures. The works of Professor Mirsalimov in the field of elastic-plastic fracture mechanics are distinguished by a close connection with the practice of designing and creating products in various branches of mechanical engineering.

Effective methods of analyzing the stress-strain state of perforated plates and panels in the forward and reverse formulation make it possible to determine the lightweight forms of equal-strength structural elements of the bearing type according to the initial prerequisites for deformation of elastic and elastoplastic bodies. Priority scientific achievements in the field of mechanics of deformation and fracture of heterogeneous media created a scientific basis for strength calculations of structures of complex geometry made of composite materials for power equipment and instrumentation. The created methods for solving the problems of thermoelasticity for multicomponent bodies are the basis for accurate strength calculations for fuel elements of nuclear reactor cores.

Professor Mirsalimov conducted research of complex interrelated phenomena and factors influencing the process of continuous casting ingot formation. The peculiarities of thermal operation of continuous steel casting machines are considered.

Vagif Mirsalimov has obtained significant results in the field of contact-fracture mechanics, inverse problems of elasticity theory and fracture mechanics, optimal design problems, modeling of crack nucleation and development in deformable bodies and structures. Vagif Mirsalimov was one of the greatest mechanics scientist of our time.

He will forever be in our hearts!

On behalf of the editorial board