

In memory of Pavel Andreevich Zhilin (1942–2005)

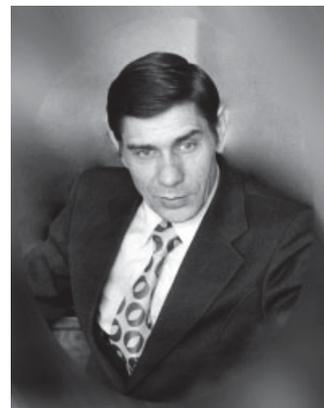
Pavel Andreevich Zhilin was born on February 8th, 1942, in Velikiy Ustyug (Vologda region, Russia), where his family found themselves during the World War II. He spent his childhood in Volkhov and Podporozhie, where his father, Andrey Pavlovich Zhilin, has been employed as a chief engineer at the coordinated hydroelectric system of Svir river. Zoya Alexeevna Zhilina, the mother of P.A. Zhilin, was bringing up the sons and kept the house. In 1956 the family moved to Leningrad. The elder brother, Sergey Andreevich Zhilin, followed in his father's footsteps, became an engineer and now participates in creating high-voltage electric apparatus.

In 1959 P.A. Zhilin left the secondary school and entered the Leningrad Polytechnical Institute. Yet at school Pavel Zhilin met his future wife, Nina Alexandrovna, who was his faithful friend and helpmate all his life long. While studying at the institute P.A. Zhilin became keen on table tennis and was a captain of the student and later institute team for many years. Not once did the team win different student and sport team championships. P.A. Zhilin got a qualification of the candidate master of sports (the highest qualification in this sport discipline at that time).

In the period of 1959–1965 P.A. Zhilin studied at Leningrad Polytechnical Institute in the Department of “Mechanics and Control Processes” at the Faculty of Physics and Mechanics. Later on his daughter, Olga Zhilina, graduated from the same Department (in addition, she got her Candidate of Physical and Mathematical Sciences degree for the thesis “On the influence of the elasticity of bodies, which are in contact, on the development of dynamical effects under wear conditions”). After graduation, P.A. Zhilin got the qualification of engineer-physicist (specialization “Dynamics and Strength of Machines”), and from 1965 to 1967 he worked as an engineer at the “Water Turbine Strength Department” in the Central Boiler Turbine Institute. In 1967 he accepted a position of Assistant Professor at the Department of “Mechanics and Control Processes”, later he worked there as a Senior Researcher, as an Associate Professor, and as a Full Professor. The founder of the Department was the Corresponding Member of the Academy of Sciences of the USSR Prof. Anatolij Isaakovich Lurie, worldwide recognized scientist in Mechanics and Control Processes. Pavel Zhilin became the closest disciple of A.I. Lurie and spent many hours working together with him. Scientific ideology of P.A. Zhilin was developing to a great extent under the influence of A.I. Lurie. He got his Candidate degree (CSc) in Physical and Mathematical Sciences in 1968 (the topic of his thesis was “The theory of ribbed shells”) and his Doctor degree (DSc) in Physical and Mathematical Sciences in 1984 (the topic of his DSc-thesis was “The theory of simple shells and its applications”). In 1989 he was appointed as a Professor of Rational Mechanics at the Department of “Mechanics and Control Processes”.

In 1974–1975 P.A. Zhilin worked as a visiting researcher at the University of Technology of Denmark. While working at the Department of “Mechanics and Control Processes”, P.A. Zhilin delivered lectures on Analytical Mechanics, Theory of Oscillations, Theory of Shells, Tensor Analysis, and Continuum Mechanics. In 1988 he was invited in the Yarmuk University (Jordan) to present a Course on Continuum Mechanics at the Faculty of Physics. From 2001 he was several times a visiting scientist at the Martin-Luther-Universität Halle-Wittenberg (Chair of Engineering Mechanics). At the same time P.A. Zhilin actively carried out scientific work in the field of the Theory of Plates and Shells, Nonlinear Theory of Rods, Theory of Elasticity, and Continuum Mechanics. He gained three certificates of invention in the area of vibroinsulation and hydroacoustics, he was awarded with the Inventor of the USSR insignia.

Since 1989 P.A. Zhilin was the Head of Department of Theoretical Mechanics at the Leningrad Polytechnic Institute (now State Technical University). In the period of his direction five of his colleagues defended their DSc-theses, for the four of them P.A. Zhilin was a scientific advisor. While working in the Department of Theoretical Mechanics P.A. Zhilin read original courses on Tensor Algebra, Rational Mechanics, and the Rod Theory. During this period Pavel Zhilin worked hard in the field of investigating and developing foundations of mechanics. His investigations on spinor motions in mechanics and physics, phase transitions and phenomena of inelasticity, binary media (suspensions), electrodynamics from the positions of the Rational Mechanics and Logical Foundations of Mechanics relate to this period. Since 1994 Pavel Zhilin was the Head of “Dynamics of Mechanical Systems” laboratory at the Institute for Problems in Mechanical Engineering of the Russian Academy of Sciences. Since 1999 he was a member of the Scientific Committee of the Annual International Summer School – Conference “Advanced Problems in Mechanics”, held by the Institute for Problems in Mechanical Engineering.



Pavel Andreevich Zhilin died on December 4th, 2005. His track has become a part of history of science. It is difficult to overestimate his influence on his disciples, colleagues, and all who were lucky to know him personally. He had an extraordinary ability to inspire interest to science, to give you a fresh unexpected look at the world around. P.A. Zhilin was a man of heart, a responsive, kind person, who found time for everyone, always giving his full support and benefit of his wise advice. One was amazed by his remarkable human qualities, his absolute scientific and human honesty. Being his disciples we are grateful to life for the chance to have known such a wonderful person and an outstanding scientist, who became for us an embodiment of spirituality. He left his wife, his daughter, and his grandson Pavel.

Pavel Andreevich Zhilin was a member of the Russian National Committee for Theoretical and Applied Mechanics, a member of the Society of Applied Mathematics and Mechanics (GAMM), a member of Guidance Board Presidium for Applied Mechanics (Ministry of Higher Education of Russian Federation), Full Member of Russian Academy of Sciences for Strength Problems. He was an author of more than 200 scientific papers, monographs “Second-rank Vectors and Tensors in 3-dimensional space” (2001), “Theoretical mechanics: fundamental laws of mechanics” (2003) [1–4]. Sixteen PhD theses (Candidate of Science) and six Professorial theses (Doctor of Science) were defended under his supervision.

This issue of the ZAMM is devoted to the memory of P.A. Zhilin. The papers presented here were prepared by his colleagues, scholars, and friends.

H. Altenbach, D. Indeitsev, E. Ivanova, A. Krivtsov

February 2007, Halle/St. Petersburg

References

Textbooks

- [1] P.A. Zhilin, Vectors and second-rank tensors in three-dimensional space (Nestor, St. Petersburg, 2001, in Russian).
- [2] P.A. Zhilin, Theoretical mechanics. Fundamental laws of mechanics. Tutorial book (St. Petersburg State Polytechnical University, 2003, in Russian).
- [3] P.A. Zhilin Applied mechanics. Foundations of the theory of shells. Tutorial book (St. Petersburg State Polytechnical University, 2006, in Russian).
- [4] P.A. Zhilin, Applied mechanics. Theory of the thin elastic rods. Tutorial book (St. Petersburg State Polytechnical University, 2006, in Russian).

Selected Papers

- [5] P.A. Zhilin, Mechanics of Deformable Directed Surfaces, *Int. J. Solids Struct.* **12**, 635–648 (1976).
- [6] H. Altenbach and P.A. Zhilin, General Theory of Elastic Simple Shells, *Adv. Mech.* **11**(4), 107–148 (1988) (in Russian).
- [7] P.A. Zhilin, A New Approach to the Analysis of Euler-Poinsot Problem, *ZAMM* **75**, 133–134 (1995).
- [8] P.A. Zhilin, A New Approach to the Analysis of Free Rotations of Rigid Bodies, *ZAMM* **76**, 187–204 (1996).
- [9] P.A. Zhilin, Rotations of Rigid Body with Small Angles of Nutation, *ZAMM* **76**, 711–712 (1996).
- [10] A.M. Krivtsov and P.A. Zhilin, Particle Simulation of Large Inelastic Deformations. *Trans. of the 14th Intern. Conf. on Structural Mechanics in Reactor Technology (SMiRT 14)*, Lyon, France, August 17–22, 1997, pp. 121–128.
- [11] P.A. Zhilin and S.A. Sorokin, The Motion of Gyrostat on Nonlinear Elastic Foundation. *ZAMM* **78**, 837–838 (1998).
- [12] P.A. Zhilin, Dynamics of the two Rotors Gyrostat on a Nonlinear Elastic Foundation, *ZAMM* **79**, 399–400 (1999).
- [13] E.F. Grekova and P.A. Zhilin, Basic Equations of Kelvin’s Medium and Analogy with Ferromagnets, *J. Elast.* **64**, 29–70 (2001).
- [14] P.A. Zhilin, Rigid body Oscillator: a General Model and some Results, *Acta Mechanica* **142**, 169–193 (2000).
- [15] H. Altenbach, K. Naumenko, and P.A. Zhilin A Micro-polar Theory for Binary Media with Application to phase-transitional flow of fiber suspensions, *Contin. Mech. Thermodyn.* **15**, 539–570 (2003).
- [16] H. Altenbach and P.A. Zhilin, The Theory of Simple Elastic Shells, in: *Critical Review of The Theories of Plates and Shells and New Applications*, edited by R. Kienzler, H. Altenbach, and I. Ott (Berlin, Springer, 2004), pp. 1–12.
- [17] H. Altenbach, K. Naumenko, P.A. Zhilin, A note on Transversely-isotropic Invariants, *ZAMM* **86**, 162–168 (2006) / DOI 10.1002/zamm.200510227.

Papers published in P.A. Zhilin Advanced Problems in Mechanics, Vol. 2, 2006

- [18] P.A. Zhilin, Classical and Modified Electrodynamics, pp. 32–42.
- [19] P.A. Zhilin, A General Model of Rigid Body Oscillator, pp. 43–65
- [20] E.F. Grekova, P.A. Zhilin, Ferromagnets and Kelvin’s Medium: Basic Equations and Magnetoacoustic Resonance, pp. 66–88.
- [21] M. Wiercigroch and P.A. Zhilin, On the Painleve Paradoxes, pp. 89–111.
- [22] P.A. Zhilin, The Main Direction of the Development of Mechanics for XXI Century, pp. 112–125.
- [23] P.A. Zhilin and A.I. Lurie, Works on Mechanics, pp. 126–139.
- [24] P.A. Zhilin, Phase Transitions and General Theory of Elasto-Plastic Bodies, pp. 140–152.
- [25] Ya.E. Kolpakov and P.A. Zhilin, Generalized Continuum and Linear Theory of Piezoelectric Materials, pp. 153–164.
- [26] H. Altenbach, K. Naumenko, P.A. Zhilin, A Micro-Polar Theory for Binary Media with Application to Flow of Fiber Suspensions, pp. 165–203.
- [27] P.A. Zhilin, Symmetries and Orthogonal Invariants in Oriented Space, pp. 204–226.
- [28] P.A. Zhilin, Nonlinear Theory of Thin Rods, pp. 227–249.
- [29] P.A. Zhilin and Ya.E. Kolpakov, A Micro-Polar Theory for Piezoelectric Materials, pp. 250–262.
- [30] P.A. Zhilin, The Main Direction of the Development of Mechanics for XXI Century, pp. 112–125.