



# Condensed Matter and Interphases

Kondensirovannye Sredy i Mezhfaznye Granitsy  
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## Chronicle

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### **Pavel Pavlovich FEDOROV** **(April 16, 1950 – March 31, 2025)**

Professor DSc Pavel Pavlovich Fedorov, 74, passed away suddenly on March 31, 2025. He was an outstanding materials scientist, chemical engineer, and inventor of several new optical materials.

In addition to chemistry and physics, Pavel Pavlovich was actively interested in geology, anthropology, philosophy and history. In addition, he authored poetry under the pseudonym of Fedorov-Schastlivtsev.

Pavel Pavlovich inherited his interest in physical and chemical analysis and phase equilibria from his father, Prof. Pavel Il'ich Fedorov, to whom he dedicated his book "My Father: Documented Story".

The breadth of Pavels' scientific interests is partially reflected in his monographs, Fedorov P. P. Archaic Thinking: Yesterday, Today, Tomorrow (3-rd edition, essentially revised and supplemented), Moscow, Lenand, 2017, and Fedorov P. P. Where is the Boundary between Science and Pseudoscience? Quantitative Criterion and Features of Pseudoscience, Moscow, Lenand, 2019.

Pavel P. Fedorov graduated from M. V. Lomonosov Moscow Institute of Fine Chemical Technology with an MS degree in chemical engineering in 1972, while majoring in chemical technology of rare and trace elements. Upon graduation, Prof. Fedorov dedicated his entire professional life to scientific research and teaching activities.

Pavel Pavlovich successfully defended his PhD thesis titled "Study of the phase diagrams of



$\text{CaF}_2\text{-(Y,Ln)F}_3$  systems and polymorphism of rare earth trifluorides" (1977) and his DSc thesis titled "High-temperature chemistry of the condensed state of systems with rare earth trifluorides as a basis for obtaining new materials" (1991). In 2000, he attained the rank of full professor of crystallography and crystal physics.

After graduation, Pavel P. Fedorov worked at A. V. Shubnikov Institute of Crystallography of the Russian Academy of Sciences from 1972 to 2003, where he advanced in his career, starting as a laboratory assistant, eventually becoming a leading research fellow. From 2003, Prof. Fedorov was affiliated with the Scientific Center for Laser Materials and Technology at A. M. Prokhorov General Physics Institute of the Russian Academy



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of Sciences, where he served as the leading research fellow, group leader, and laboratory head of the laboratory for nanomaterials technology for photonics, head of the nanotechnology department, and chief research fellow.

Over the span of his extensive career Pavel Pavlovich published more than 1,000 research papers (including 33 reviews), and 5 textbooks, and authored an additional 31 patents.

In addition to his extensive publications, Prof. Fedorov was a prolific mentor, serving as a scientific advisor for more than 30 MS theses, 9 PhD theses, and a scientific consultant for 3 DSc theses.

Prof. Fedorov contributed to various areas of materials sciences, where he obtained unique results informing such fields as:

1. Features of heterovalent isomorphism in crystals and glasses.
2. Thermodynamic theory of morphotropy and bifurcation theory for phase diagrams of the binary systems, where he predicted and experimentally detected the saddle points on the melting surfaces of the ternary solid solutions.
3. More than 200 different phase diagrams of binary and ternary systems.
4. Generalization of the Tiller criterion for morphological stability of a flat crystallization front.

5. Technology for the synthesis of fluoride laser ceramic materials.

Pavel P. Fedorov focused his research papers specifically at application of the methods of physical and chemical analysis as well as studies of phase equilibria of various substances. In order to enhance such studies, he conducted “Physical and Chemical Analysis and Thermodynamics of Heterogeneous Equilibria” seminars at M. V. Lomonosov Institute of Fine Chemical Technology and taught the corresponding classes to undergraduate students. Later, under Prof. Fedorov’s guidance, the “Physical and at Chemical Processes in Condensed Matter and Interphases” conference (Voronezh, Russia) included a special section titled “Development of Methods of Physical and Chemical Analysis for Substances and Materials”.

The most important results, obtained by Prof. Fedorov in the aforementioned areas prior to 2020, were published in two monographs: Fedorov P. P. Etudes in physical and chemical analysis (collection of papers), Moscow, Science, 2019 (191 pp.) and Fedorov P. P. Etudes in crystal chemistry and crystal growth (collection of papers), Moscow, Science, 2020 (241 pp.)

Pavel Pavlovich was well-recognized within the scientific community, receiving numerous decorations and honorable citations for his scientific publications. This included the special



Prof. Pavel P. Fedorov delivers his presentation at VIII All-Russian Conference with International Participation “PHYSICO-CHEMICAL PROCESSES IN CONDENSED MEDIA AND AT INTERPHASE BOUNDARIES – FAGRAN-2018”, dedicated to 100-th anniversary of Voronezh State University, October, 2018.



Voronezh, September, 2024.

prize of the USSR Academy of Sciences and Czechoslovakia Academy of Sciences (1989), Guo Moruo Medal of the Chinese Academy of Sciences (1988), Paul Hagenmuller Medal (Bordeaux, France, 2018), 300-th Anniversary of the Russian Academy of Sciences Medal (2024), “100 best Russian Inventions” special citations of Federal Service for Intellectual Property Special Citations (2012 and 2013), Elsevier Outstanding Reviewer Citations (2012 and 2013), special citation for significant contribution in development of science and industry in the City of Moscow (2018).

Pavel Pavlovich also made significant contributions in the editorial activity of “Nanosystems: Physics, Chemistry, Mathematics”, “Inorganic Materials”, and “Condensed Matter and Interphases” scientific periodicals.

Pavel Pavlovich's passing is an irreplaceable loss for “Condensed Matter and Interphases” journal. He was an active member of editorial board and unflinching reviewer. He was also a famous scientist, publishing his papers in

top international periodicals, so his insight and experience were priceless. The high scientific quality of his papers, published in our journal, enhanced the standing of our journal in international bibliographic databases and undoubtedly had a positive effect on the citation of our publications. Thus, P. P. Fedorov and E. G. Yarotskaya review paper “Zirconium Dioxide. Review” (Condensed Matter and Interphases, 2021, volume 23, issue 2, pp. 169-187; DOI: 10.17308/kcmf.2021.23/3427) still remains the most highly cited article published in our journal.

The most important issue is that Prof. Pavel P. Fedorov was a great friend and a valued colleague, and he will remain in such a capacity in the hearts of his staff at Voronezh State University, Department of Chemistry.

Everyone, who personally knew Pavel Pavlovich, will remember him as a very talented scientist, skilled advisor, patient mentor and great human being.

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