

Professor Pavel Leonidovich Kirillov on His 90th Birthday



Professor Pavel L. Kirillov is a well-known scientist, researcher, and educator in the field of nuclear engineering, thermalhydraulics, heat transfer, and two-phase flow. He was born on the Aug. 20, 1927 in Russia and received his M.A.Sc. degree in thermal physics in 1950 (Moscow Power-Engineering Institute (MPEI), Faculty of Physics and Power Engineering, Ph.D. and Doctor of Technical Sciences degrees in 1959 and 1969 from the Institute of Physics and Power Engineering (IPPE) (Obninsk, Russia), respectively.

After graduating from the MPEI in 1950, Pavel Kirillov joined the IPPE (Obninsk, Russia), currently, State Scientific Center of the Russian Federation Institute of Physics and Power Engineering by the name of A. I. Leypunsky as a junior scientist in 1950 (he has participated in construction and operation of the world's first nuclear power plant in Obninsk, AM-1 ("Atom Peaceful"—1 in Russian abbreviations, which was commissioned at the IPPE on June 27, 1954), and worked there on various positions: senior scientist (1953–1954); head of laboratory (1954–1969); head of branch (1969–1975); director of thermal-physics division (1975–1995); deputy director of thermal-physics division (1995–2010); advisor of the director of thermal-physics division (from 2010).

He was an associate professor (1959–1965); professor (1965–1972); chair of the thermal-physics department (1972–1985); chair of the nuclear power plant department at the Obninsk Branch of the Moscow Engineering Physics Institute (MEPhI) (1985–1992). Professor Pavel Kirillov has prepared a large number of undergraduate and master-degree students and Ph.D. candidates.

Dr. P. L. Kirillov is a role model and mentor to numerous generations of researchers/scientists in nuclear engineering, thermal-hydraulics, heat transfer, and two-phase-flow fields. He is definitely one of the most admired and ingenious researchers in these fields. His many researches and achievements include contributions in such special areas as molten metals nuclear reactor coolants; supercritical water; research (BR-10 and BOR-60); power (BN-350 and BN-600), transportation (lead bismuth-cooled), and spacecraft (BUK and TOPAZ) nuclear reactors. Professor Kirillov is well respected among his colleagues in the nuclear engineering community all over the world.

Professor P. L. Kirillov is a Fellow of the International and National Engineering Academies; member of the Russian Nuclear Society and ASME; member of Scientific Councils of

the Institute of Atomic Energy by the name of I. V. Kurchatov (1985–1990) and IPPE (from 1975); member of the Journal Editorial Boards of the Atomic Energy (from 1977) and the ASME Journal of Nuclear Engineering and Radiation Science (from 2014).

During his work at the IPPE and Obninsk Branch of MEPhI, Professor Kirillov has published over 350 technical handbooks, reference books, textbooks, papers, inventions, and reports (see selected publications listed below).

For his outstanding work, Professor P. L. Kirillov was awarded with the following honored titles: Honored Scientist of Science and Engineering of the Russian Federation (1988) and Honored Worker of the Atomic Industry of the Russian Federation (2016); with three state orders: (1) Order of Merit for the Fatherland (1995); (2) Order of the Red Banner of Labour (1981); and (3) Order of the Badge of Honor (1966); and with a number of state medals including Veteran of Labour (1985); 800 years of the Russian fleet (1996); and others.

On the occasion of his 90th birthday, on behalf of the Journal Editorial Board, his colleagues, students, and friends all over the world, we wish him a very happy birthday and a continuous active life in a good health and happiness!

Selected Publications of Professor P. L. Kirillov

- (1) **Handbook of Generation IV Nuclear Reactors**, 2016, Elsevier—Woodhead Publishing (WP), Duxford, UK, 940 pages. (https://www.gen-4.org/gif/jcms/c_9373/publications) **Chapter 1:** Pioro, I. L., Duffey, R., Kirillov, P. L., and Panchal, R., Introduction: A Survey of the Status of Electricity Generation in the World, 34 pages; **Appendix A1:** Pioro, I. L., and Kirillov, P. L., Additional Materials (Schematics, Layouts, T-s Diagrams and Basic Parameters) on Thermal and Nuclear Power Plants, 40 pages; **Appendix A6:** Pioro, I. L., and Kirillov, P. L., Comparison of Thermophysical Properties of Selected Gases at Atmospheric Pressure, 4 pages.
- (2) Kirillov, P. L., Zhukov, A. V., Loginov, N. I., Makhin, V. M., Pioro, I. L., and Yur'ev, Y. S., 2013, *Handbook on Thermalhydraulics Calculations in Nuclear Engineering: 3 Volumes* (In Russian), Editor: P. L. Kirillov, Izdat Publishing House, Moscow, Russia (1st edition in 1984 and 2nd edition in 1990).
- (3) **Materials and Processes for Energy: Communicating Current Research and Technological Developments**, Energy Book Series #1, Editor: A. Méndez-Vilas, Formatex Research Center, Badajoz, Spain, 2013.

- Chapter:** Pioro, I. and **Kirillov, P.**, Current Status of Electricity Generation in the World, pp. 783–795. Free download from: <http://www.formatex.info/energymaterialsbook/book/783-795.pdf>
- Chapter:** Pioro, I., and **Kirillov, P.**, Current Status of Electricity Generation at Thermal Power Plants, pp. 796–805. Free download from: <http://www.formatex.info/energymaterialsbook/book/796-805.pdf>
- Chapter:** Pioro, I. and **Kirillov, P.**, Current Status of Electricity Generation at Nuclear Power Plants, pp. 806–817. Free download from: <http://www.formatex.info/energymaterialsbook/book/806-817.pdf>
- Pioro, I., and **Kirillov, P.**, Generation IV Nuclear Reactors as a Basis for Future Electricity Production in the World, pp. 818–830. Free download from: <http://www.formatex.info/energymaterialsbook/book/818-830.pdf>
- (4) **Kirillov, P. L.**, 2016, “Colligation of Experimental Data on Heat Transfer in Liquid Metals,” *Atomic Energy*, **120**(4), pp. 248–251.
 - (5) Dragunov, A., Saltanov, E., Pioro, I., **Kirillov, P.**, and Duffey, R., 2015, “Power Cycles of Generation III and III⁺ Nuclear Power Plants,” *ASME J. Nucl. Eng. Radiat. Sci.*, **1**(2), p. 021006.
 - (6) **Kirillov, P. L.**, 2015, “Calculation of the Heat Emission From Rod Bundles to Supercritical Pressure Steam,” *Atomic Energy*, **118**(4), pp. 242–246.
 - (7) Pioro, I., and **Kirillov, P. L.**, 2014, “Generation IV Nuclear Reactors as a Basis for Future Electricity Generation in the World (In Russian),” *Atomic Techniques Abroad (Атомная Техника за Рубежом)*, Vol. 2, pp. 3–12.
 - (8) Kalyakin, S. G., **Kirillov, P. L.**, Baranaev, Y. D., Glebov, A. P., Bogoslovskaya, G. P., Nikitenko, M. P., Makhin, V. M., and Churkin, A. N., 2014, “Prospects for Development of an Innovative Water-Cooled Nuclear Reactor for Supercritical Parameters of Coolant,” *Therm. Eng.*, **61**(8), pp. 551–557.
 - (9) Richards, G., Harvel, G. D., Pioro, I. L., Shelegov, A. S., and **Kirillov, P. L.**, 2013, “Heat Transfer Profiles of a Vertical, Bare, 7-Element Bundle Cooled with Supercritical Freon R-12,” *Nucl. Eng. Des.*, **264**, pp. 246–256.
 - (10) Mokry, S., Pioro, I. L., Farah, A., King, K., Gupta, S., Peiman, W. and **Kirillov, P.**, 2011, “Development of Supercritical Water Heat-Transfer Correlation for Vertical Bare Tubes,” *Nucl. Eng. Des.*, **241**(4), pp. 1126–1136.
 - (11) **Kirillov, P. L.**, Pomet’ko, R. S., Smirnov, A. M., Grabezhaia, V. A., Pioro, I. L., Duffey, R. B., and Khartabil, H. F., 2005, “Experimental Study on Heat Transfer to Supercritical Water Flowing in Vertical Tubes, Proceedings of the International Conference GLOBAL-2005,” *Nuclear Energy Systems for Future Generation and Global Sustainability*, Tsukuba, Japan, Oct. 9–13, Paper No. 518.
 - (12) Aksan, N., Ambrosini, W., Ammirabile, L., Anderson, M., Bae, Y. Y., Chen, Y., Churkin, A., Haenninen, M. J., Jackson, J. D., **Kirillov, P. L.**, et al., 2014, “Heat Transfer Behaviour and Thermohydraulics Code Testing for Supercritical Water Cooled Reactors (SCWRs),” IAEA TECDOC Series, IAEA-TECDOC-1746, International Atomic Energy Agency, Vienna, Austria. Free download from: <http://www-pub.iaea.org/books/IAEABooks/10731/Heat-Transfer-Behaviour-and-Thermohydraulics-Code-Testing-for-Supercritical-Water-Cooled-Reactors-SCWRs>
 - (13) Bobkov, V. P., Vinogradov, V. N., Groeneveld, D. C., **Kirillov, P. L.**, Leung, L. K., et al., 1997, “1995 Look-up Table for Calculating Critical Heat Flux in Tubes,” *Therm. Eng.*, **44**(10), pp. 823–840;
 - (14) Groeneveld, D. C., Leung, L. K. H., **Kirillov, P. L.**, et al., 1996, “The 1995 Look-Up Table for Critical Heat Flux in Tubes,” *Nucl. Eng. Des.*, **163**(1–2), pp. 1–23.

**Igor Pioro, Ph.D., Dr. Tech. Sc., P.Eng.,
Fellow ASME, CSME & EIC**

**Editor of Journal of Nuclear Engineering and Radiation Science,
Professor,
Faculty of Energy Systems and Nuclear Science,
University of Ontario Institute of Technology,
Oshawa, ON L1H 7K4, Canada**

**Andrey Churkin, Ph.D.,
Associate Editor, Journal of Nuclear Engineering
and Radiation Science,
Head of Department
Experimental-Design Department of Thermalhydraulics, OKB
“GIDROPRESS,” Podolsk 142103, Russia**

**Laurence Leung, Ph.D.,
Manager, R&D Facilities and Operations Research,
Canadian Nuclear Laboratories,
Chalk River, ON K0J 1J0, Canada**