

# Igor Pioro, PhD

**Professor, Faculty of Energy Systems and Nuclear Science at University of Ontario Institute of Technology**

Oshawa, ON, CA

World-leading thermal physics expert developing new methods to enhance thermal efficiency of next generation nuclear power plants

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Electricity is one of the world's most vital resources; it powers industry, moves agriculture and enhances society's standard of living. Globally, a race is underway to develop the cleanest, most energy efficient and sustainable sources of electrical-power generation. A life's work, Igor Pioro, PhD, Professor and Associate Dean in the Faculty of Energy Systems and Nuclear Science, is exploring ways to improve the thermal efficiencies of nuclear power as the key energy for future generations. Founding Editor of the ASME Journal of Nuclear Engineering and Radiation Science, Dr. Pioro's co-authored paper Nuclear Power as a Basis for Future Electricity Generation comprises an extensive study on the current and future status of global electrical-power generation.

Working within the areas of supercritical pressures/fluids and participating in development of Canada's next generation SuperCritical Water-Cooled Reactor (SCWR) concept, Dr. Pioro has co-authored the world's first and most comprehensive review on Heat Transfer and Hydraulic Resistance at Supercritical Pressures in Power Engineering Applications. In collaboration with his students, Dr. Pioro has devised the world's most accurate empirical heat-transfer correlation to calculate heat transfer to supercritical water flowing in a bare tube. Using this correlation, he is examining how efficiently a reactor's fuel rod will be cooled with water, and his goal is to increase the water temperature inside a reactor and bolster thermal efficiency, thus generating more electricity and reducing wasted energy.

Throughout his esteemed career, Dr. Pioro has been named Fellow of the Canadian Society of Mechanical Engineers, the Engineering Institute of Canada, and the American Society of Mechanical Engineers. He has authored/co-authored more than 425 publications, including nine technical books, and received 26 patents for his inventions.

He joined UOIT in September 2006 as associate professor and served as director of the Nuclear Engineering Graduate Program from 2008 to 2013. He was appointed professor in 2011; and associate dean of the faculty in 2013. Previously, he spent six years as a senior scientist in the Thermalhydraulics Branch of Chalk River Laboratories (CRL) Atomic Energy of Canada, Ltd., and was a research associate and part-time professor in the Mechanical Engineering Department at the University of Ottawa between 1992 and 2000.

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Education/Learning, Nuclear, Program Development, Research

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Nuclear Engineering, Current Reactors, Generation-IV Nuclear Reactor Concepts, Thermalhydraulics, Supercritical-Pressure Fluids, Heat Transfer, Boiling, Forced, Convection, Thermal Engineering, Wickless Heat Pipes, Heat-Recovery Systems

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Canadian Society of Mechanical Engineers, Engineering Institute of Canada, American Society of Mechanical Engineers, Canadian Nuclear Society, Professional Engineers Ontario, American Nuclear Society

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**Innovative Approach to Correlate Heat Transfer Data to SuperCritical CO2 Flowing Upward in a Bare Tube in Forced Convection Regime**

23rd International Conference On Nuclear Engineering (ICONE 23)

**Chair and Panelist, National Future Energy Strategy, Nuclear Energy Strategic Plan, and Nuclear Power Basis for Future Energy Production in the World as**

22nd International Conference on Nuclear Engineering (ICONE 22)

**Specifics of Thermophysical Properties and Heat Transfer at Supercritical Pressures**

Workshop on Supercritical Fluids and Energy (SFE'13)

**Chair, Plenary Session, Nuclear Power Reactors and Fuel Cycle/Uranium Supply**

BIT's 3rd New Energy Forum 2013

**Keynote Lecture: Nuclear Power as a Basis for Future Electricity Production in the World**

22nd International Conference on Nuclear Energy for New Europe (NENE) September, 2013

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**Institute of Engineering Thermophysics, National Academy of Sciences of Ukraine**

Doctor of Technical Sciences Thermal Physics

**Institute of Engineering Thermophysics, National Academy of Sciences of Ukraine**

PhD Thermal Physics

**Kiev Polytechnic Institute, National Technical University of Ukraine**

MASc Thermal Physics

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**Fellow, Canadian Society of Mechanical Engineers (CSME)**

Appointed Fellow of the CSME in recognition of excellence in engineering, and for services rendered to the profession and to Canada.

**2014 Service Recognition Award, American Society of Mechanical Engineers (ASME)**

Dr. Piro received the 2014 Service Recognition Award from the ASME Nuclear Engineering Division for his contributions to nuclear engineering and his role in launching the ASME Journal of Nuclear Engineering and Radiation Science.

**Chief Scientific Investigator, International Atomic Energy Association**

Dr. Piro is leading the investigation under two coordinated research projects entitled: Application of Advanced Low Temperature Desalination Systems to Support Nuclear Power Plants and Non-Electric Applications, and Understanding and Prediction of Thermal-Hydraulics Phenomena Relevant to Supercritical Water-Cooled Reactors (SCWRs), between 2014 and 2017.

**Honorary Degree, National Technical University of Ukraine**

Received a 2013 Honorary Doctor of the National Technical University of Ukraine, Kiev Polytechnic Institute for his commitment to nuclear engineering education.

**Fellow, Engineering Institute of Canada (EIC)**

Appointed Fellow of the EIC in recognition of excellence in engineering and for service to the profession and society.

**Fellow, ASME**

Appointed Fellow of the ASME for his valued services in advancing the engineering profession as chair, Nuclear Engineering Division from 2011 to 2012.

**UOIT Research Excellence Award**

Recipient of the Senior Research Award for his contributions to education and research.

**Chair, International Conference On Nuclear Engineering**

Dr. Pioro was the first Canadian appointed to chair the world's largest International Conference On Nuclear Engineering (ICONE20 – POWER2012).

**Education and Communication Award, Canadian Nuclear Society (CNS)**

Recipient of the CNS Education and Communication Award for his significant efforts in improving the understanding of nuclear science and technology among educators, students, and the public.

**Chair, Executive Committee, ASME Nuclear Engineering Division**

Dr. Pioro was named the first Canadian to chair the Executive Committee of the ASME Nuclear Engineering Division comprised of more than 2,000 members, from 2011 to 2012.

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