

GTIIT MECHANICAL ENGINEERING SEMINAR

Monday, January 19, 2026, at 14:30 Israel time (20:30 China time)

Online: <https://technion.zoom.us/j/92090702088>

Axial-Flow-Induced Vibration Studies on Cantilever Rods for Nuclear Reactor Applications

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Hosted by: Prof. Pinhas Bar-Yoseph

With over 400 nuclear power reactors currently operating worldwide, 66 units under construction, 85 more in the planning stage and an additional 344 proposed, nuclear power plays a key role in the global low-carbon electricity production, and will remain a key player in the years to come. A frequent cause of unplanned and costly outages in water-cooled nuclear power plants is the premature failure of the fuel rods due to excessive flow-induced vibration in the reactor core. Turbulence and unsteadiness in the coolant water flowing through the reactor core can cause excessive vibration of the fuel rods, which in turn can result in fretting wear that eventually leads to the fuel rod cladding perforation and subsequent failure. The economic burden of unplanned reactor outages has motivated extensive research into flow-induced vibration, with a view at better understanding the fundamental physics of the problem to inform the design of more fatigue-resistant nuclear fuel rods.

The talk focuses on recent research on flow-induced vibration of cantilever rod systems, which are paradigmatic test configurations that have been instrumental to advance the fundamental physical understanding of axial-flow-induced vibration for nuclear reactor applications. The talk covers both experimental and numerical studies, and concludes with a list of topics for future research.

Andrea Cioncolini completed his studies at the Polytechnic University of Milan, Italy, with a Laurea degree in 2000 and a PhD in 2005 in Nuclear Engineering. Successively, he completed a MSc in Mathematics at the University of Pavia, Italy, in 2018. From 2005 to 2007 he was senior engineer/scientist at Westinghouse Electric Company in Pittsburgh (PA), USA. From 2007 to 2012 he was post-doctoral researcher first at the Chalmers University of Technology in Gothenburg, Sweden, and then at the Swiss Federal Institute of Technology (EPFL) in Lausanne, Switzerland. He joined the University of Manchester, UK, in 2013 as Lecturer in thermal-hydraulics, and was successively promoted to Senior Lecturer in 2018 and then to Reader in 2021. He joined the Guangdong Technion-Israel Institute of Technology, China, in 2022 as Associate Professor. His research interests include experimental and computational thermo-fluid dynamics, convective flow boiling and

Seminars Coordinator: Prof. Sefi Givli

Note: the seminar will be given in English

multiphase flows, flow-induced vibrations and fluid-solid interactions, and mechatronics.