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Thermal Hydraulics in Liquid Metal Fast Reactors

Thermal-hydraulics play a determining role in the design, operation and safety of liquid-metal reactors (LMRs) cooled by sodium, lead or lead-bismuth eutectic. The strong heat transfer performance and high boiling point of liquid metal enable the use of high working temperatures without pressurization. Because no pressure vessel is needed, most reactor designs then adopt a "pool-type" primary circuit, which minimizes the potential consequences of a primary leak and provides a large reserve of thermal inertia in accidental scenarios. While these common design characteristics of LMRs have direct advantages, they are also the source of complex thermal-hydraulic phenomena with potential high impact: strong temperature gradients must be controlled to avoid thermal fatigue on reactor structures, decay heat removal in pool-type designs depends on complex natural convection patterns. In this way, many key aspects of the justification of LMRs depend on understanding and simulating complex thermal-hydraulic phenomena. This webinar provides an overview of these phenomena and the current state-of-the-art for simulating them.

Free webcast

January 29, 2020 at 8:30 am EST (UTC-5)



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Who should attend: policy makers, managers, regulators, students, general public

Meet the Presenter...

Dr. Antoine Gerschenfeld obtained his PhD from Ecole Normale Supérieure, France, in 2012, and has been coordinating R&D on the thermal-hydraulics of Sodium Fast Reactors at the Commissariat à l'Energie Atomique et aux Energies Alternatives (CEA)'s Thermal-Hydraulics and Fluid Mechanics Section (STMF) since 2013. In that capacity, he has led the development of a subchannel thermal-hydraulics code (TrioMC) as well as the development of a tool for coupling coarse and fine models in a single reactor-scale simulation (MATHYS). He has also been involved in a number of collaborations : bilateral exchanges with DOE, JAEA and IPPE, as well as EURATOM projects.



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| 26 March 2020 | MicroReactors: A Technology Option for Accelerated Innovation , Dr. DV Rao and Dr. Jess Gehin |
| 29 April 2020 | GIF VHTR Hydrogen Production Project Management Board, Mr. Sam Suppiah |

For more information, please contact: Patricia Paviet at Patricia.Paviet@pnnl.gov or visit the GIF website at www.gen-4.org