Overview of METL, Argonne’s Foremost Liquid Sodium Test Facility

Abstract: The sodium fast reactor (SFR) is one of the more promising Generation-IV nuclear reactor designs, providing many passive safety features lacking in the current water cooled fleet. The Mechanisms Engineering Test Loop (METL) is an 800-gallon liquid sodium experimental user facility providing nuclear reactor grade sodium for thermal hydraulic testing for advancing the SFR. An overview of this facility will be presented, detailing the unique componentry used for high temperature (≤650 °C) liquid metal research. METL was filled within the past year; an overview of the initial fill, preliminary testing and future experimental work will be presented including the Thermal Hydraulic Experimental Test Article (THETA) to be used for CFD and sodium reactor systems code validation.

Biography: Dr. Matthew Weathered recently completed his Ph.D. at the University of Wisconsin-Madison in December 2017 under the advisement of Professor Mark Anderson. His thesis work pioneered the use of optical fiber instrumentation to characterize thermal hydraulic features in liquid sodium, yielding the highest fidelity temperature data of phenomena, such as thermal striping, in liquid metal to date. This work lent itself to his current position at Argonne National Laboratory as an engineer working to commission, operate and design experimental test articles for the Mechanisms Engineering Test Loop, an 800-gallon reactor grade sodium facility.