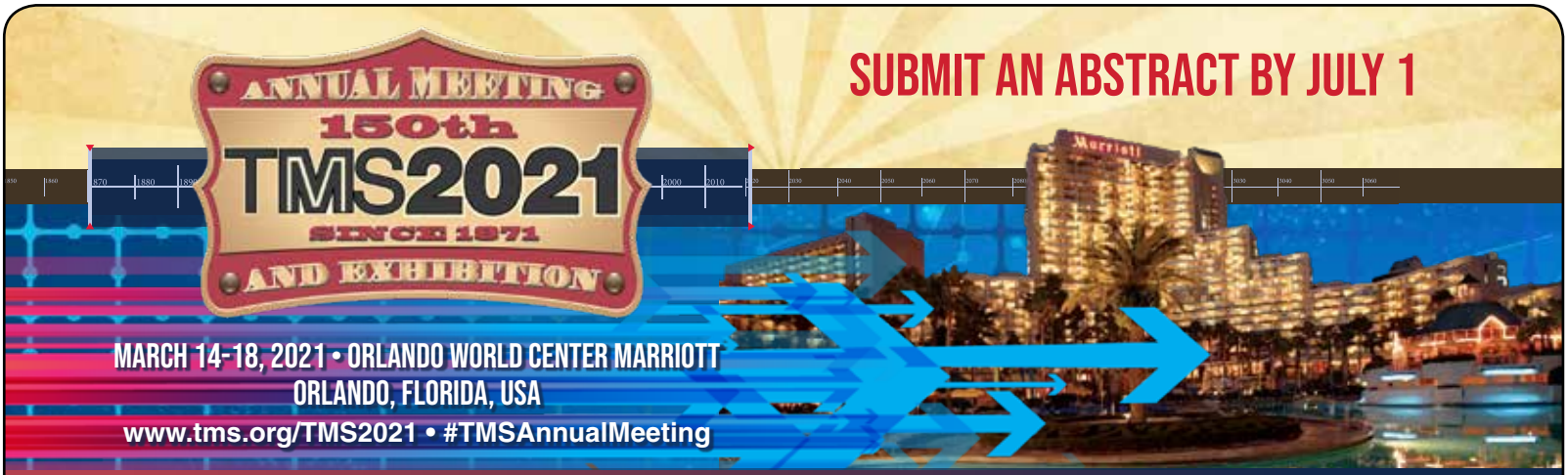

SUBMIT AN ABSTRACT TO:

NUCLEAR MATERIALS

ACCELERATED DISCOVERY AND QUALIFICATION OF NUCLEAR MATERIALS FOR ENERGY APPLICATIONS

Materials used in nuclear energy applications usually operate in harsh operating conditions combining high temperature, irradiation, stress, and corrosive environments, with long in-cycle service lives lasting from years to decades. Nuclear materials are purposely processed for controlled chemistries and microstructures to mitigate physical degradation caused by exposure to extreme environments. The requirements for a purposely designed nuclear material must carefully consider a number of functional and safety concerns that exceed the demands for general structural bearing materials. As the demands on materials are even higher in advanced nuclear reactors, including high temperatures and fluences, the acceleration of nuclear materials development becomes a critical path in the readiness of future nuclear technology. At the bottleneck of developing and qualifying nuclear materials, however, is addressing the traditional materials development for nuclear-grade materials. Successful stories of accelerated material design have emerged in many other fields other than nuclear energy, and the experiences and knowledge may be transferrable to nuclear materials.

In line with the Nuclear Materials Discovery and Qualification Initiative (NMDQI) established by the Nuclear Science User Facilities (NSUF), this symposium focuses on novel tools and approaches that accelerate our understanding of nuclear material behaviors and the development of advanced materials for nuclear energy applications. In particular, we look for tools and approaches that can be used to reduce the time and cost for discovery, advanced manufacturing, testing, and qualification, including both fuels and structural materials.

The topics of interest include but are not limited to:

- Modeling and experimental tools for accelerated discovery and optimization of nuclear materials by constructing the processing-structure-property-performance links.
- First-to-learn modeling approaches and strategies that can reduce the number of needed steps to enhance the efficiency and utility of in-pile irradiation tests.
- Physics-based and reduced-order modeling of in reactor materials behavior.
- Advanced manufacturing of nuclear materials with controlled chemistry and selective microstructures.
- Higher throughput characterization techniques that can maximize the efficiency of in-pile and out-of-pile testing.

ORGANIZERS

Yongfeng Zhang, University of Wisconsin-Madison, USA
Adrien Couet, University of Wisconsin-Madison, USA
Michael Tonks, University of Florida, USA
Jeffery Aguiar, Idaho National Laboratory, USA

SYMPOSIUM SPONSORS

TMS Materials Processing & Manufacturing Division
TMS Structural Materials Division
TMS ICME Committee
TMS Nuclear Materials Committee
TMS Additive Manufacturing Committee

Abstract Deadline is July 1, 2020. Submit online at www.programmaster.org/TMS2021.

Questions?
Contact programming@tms.org