

# Fission Battery Workshop 2021

*Wednesday, February 24, 2021*

*11:00 a.m. – 3:00 p.m. (Eastern Time)*

## **Fission Battery Initiative**

Technology Innovations for Fission Batteries: Advanced Manufacturing

**Moderator: Vivek Agarwal, Ph.D.**

**The initiative envisions** *developing technologies that enable nuclear reactor systems to function as batteries and to be referred as fission batteries.*

Additive manufacturing is one of the required technologies to achieve the initiative vision and to ensure expanded deployment of fission batteries to meet clean energy demands across broader applications and markets.

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The aim of this *Workshop* is to:

- Understand technological challenges, knowledge gaps, and limitations (development, demonstration, and deployment) associated with additive manufacturing and advanced materials for fission batteries.
- Role of Multiphysics and multi-scale modeling and simulation, machine learning and artificial intelligence, and digital twins would play in addressing technological challenges and knowledge gaps.

The expected outcome of this workshop is to identify technological goals that additive manufacturing approaches must achieve to standardize attribute of the fission battery initiative. Concurrently, the workshop will enable broad discussion on the potential of the new technologies and facilitate the creation of research path and networks.

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## INL & Guest Presenters

Vivek Agarwal, Ph.D.  
Senior Research Scientist,  
Instrumentation, Controls, and Data Science  
Idaho National Laboratory

Michael McMurtrey, Ph.D.  
Materials Scientist  
Idaho National Laboratory

Edward D. Herderick, Ph.D.  
Director Additive Manufacturing  
College of Engineering CDME  
The Ohio State University

Derick Botha  
Innovation Manager  
NuScale Power

Slade Gardner, Ph.D.  
President and Founder  
Big Metal Additive, LLC

Isabella J. van Rooyen, Ph.D., MBA  
National Technical Director: DOE – NE  
Advanced Methods for Manufacturing  
INL Distinguished Staff Scientist  
Reactor Systems Design and Analysis Division  
Idaho National Laboratory

Samuel Briggs, Ph.D.  
Assistant Professor  
School of Nuclear Science & Engineering  
Oregon State University

11:00-11:15	Fission Battery Initiative and Workshop Overview .....	Vivek Agarwal Senior Research Scientist Instrumentation, Controls, and Data Science (ICDS) Department Idaho National Laboratory
11:15-11:40	Qualification Challenges for Additively Manufactured High Temperature Nuclear Components.....	Michael McMurtrey Idaho National Laboratory
11:40-12:05	Industrialization of Metal AM: Progress and Future Vision .....	Ed Herderick The Ohio State University
12:05-12:30	Advanced Materials for Microreactors .....	Derick Botha NuScale Power
12:30-12:45	Break .....	
12:45 – 1:10	Design for “ _____ ” .....	Slade Gardner Big Metal Additive
1:10 – 1:35	A Paradigm Shift in Manufacturing as Opportunity for Fission Battery Success .....	Isabella J. van Rooyen Idaho National Laboratory
1:35 – 2:00	Perspectives on Materials Degradation Challenges for Fission Battery Deployment .....	Samuel Briggs Oregon State University
2:00 – 3:00	.....	Panel Session