

# Fission Battery Workshop 2021

*Wednesday, February 10, 2021*

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

## **Fission Battery Initiative**

Technology Innovations for Fission Batteries: Modeling & Simulation and Soft & Virtual Sensors

**Moderator: Izabela Gutowska, Ph.D.**

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

Autonomous controls and operation are 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.

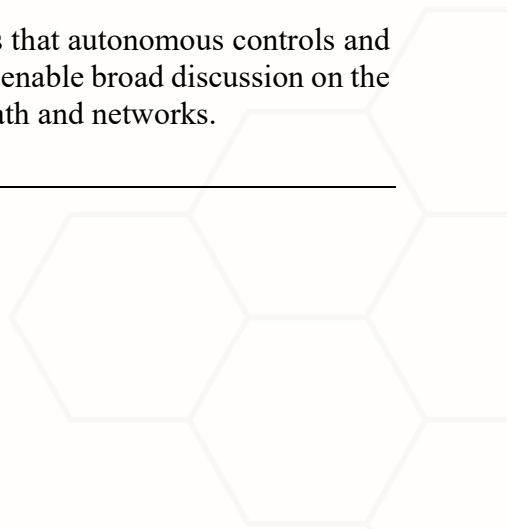
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The aim of this *Workshop* is to:

- Understand technological challenges, knowledge gaps, and limitations (development, demonstration, and deployment) associated with autonomous controls and operation of fission batteries.
- Role of Multiphysics and multi-scale modeling and simulation, reduced order methods, machine learning and artificial intelligence, and digital twins achieving autonomous controls and operation of fission batteries.

The expected outcome of this workshop is to identify technological goals that autonomous controls and operation a fission battery must achieve. 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

Derek Gaston, Ph.D.  
Computational Frameworks  
Idaho National Laboratory

Phil Sharpe, Ph.D.  
Vice President for Innovation and Special Projects  
Studsvik Scandpower, Inc.

W. David Pointer, Ph.D.  
Head, Advanced Reactor Engineering and Development  
Nuclear Energy and Fuel Cycle Division  
Oak Ridge National Laboratory

Brandon Haugh  
Director, Modeling and Simulation  
Kairos Power

Patrick Calderoni, Ph.D.  
Director, Advanced Sensors and Instrumentation  
Manager, Measurement Science Department  
Idaho National Laboratory

Richard Vilim, Ph.D.  
Senior Nuclear Engineer  
Department Manager, Plant Analysis & Control & Sensors  
Nuclear Science and Engineering Division, Argonne National Laboratory

John Labram, Ph.D.  
Assistant Professor  
Electrical & Computer 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	Adaptable Multiphysics Simulation.....	Derek Gaston Idaho National Laboratory
11:40-12:05	Connecting M&S Tools for Fission Battery & Microreactor Performance .....	Phil Sharpe Studsvik Scandpower, Inc.
12:05-12:30	Advancing Fission Battery Deployment through Modeling and Simulation .....	David Pointer Oak Ridge National Laboratory
12:30-12:45	Break .....	
12:45 – 1:10	How Advanced Modeling and Simulation with Multi-Physics could help advance Fission Battery Systems.....	Brandon Haugh Kairos Power
1:10 – 1:35	Measurement Systems for Autonomous Operation of Nuclear Reactor .....	Patrick Calderoni/Richard Vilim Idaho National Laboratory/Argonne National Laboratory
1:35 – 2:00	Perovskite Retinomorphic Sensors .....	John Labram Oregon State University
2:00 – 3:00	.....	Panel Session