

Lightweight Materials Workshop

Location: 2525 Fremont Ave, Idaho Falls, Idaho 83402- EROB Conference Rm.159 A, B, & C

November 8, 2022, 8:45 am to 5:00 pm (MST)

8:00 a.m.- Visitor badging will be at Willow Creek Building, located at 1955 Fremont Ave, Idaho Falls, Idaho

November 9, 2022, 9:00 am to 4:00 pm (MST)

Purpose: To understand technological challenges, knowledge gaps, and research needs associated with the development, demonstration, and application of light-weight materials for successful deployment and operation of simplified advanced reactor technologies.

Attire: Business Casual

Idaho National Laboratory

Allen Roach, Ph.D.

*Department Manager for Irradiated Fuels & Materials
Director, Advanced Materials & Manufacturing Initiative*

Andrea Jokisaari, Ph.D.

*Technical Area Lead for Environmental Effects, Advanced Materials
and Manufacturing Technologies (AMMT)*

Colin Judge, Ph.D.

Director, Characterization and Post Irradiation Examination

Jason Schulthess

Senior Staff Scientist

Sam Bays, Ph.D.

Reactor Physicist

Xiaofei Pu, Ph.D.

Instrument Scientist

Vivek Agarwal, Ph.D.

Senior Research Scientist

Youssef Ballout

Director of Reactor Systems Design & Analysis

Massachusetts Institute of Technology

Alexander O'Brien

Michael Short, Ph.D.

*Associate Professor of Nuclear Science & Engineering
Associate Director, Plasma Science & Fusion Center*

University of New Mexico

Zeev Shayer, Ph.D.

Research Professor, Department of Nuclear Engineering

Oregon State University

Megumi Kawasaki, Ph.D.

Associate Professor, Mechanical Industrial & Manufacturing Engineering

Tianyi Chen, Ph.D.

Assistant Professor, Nuclear Science and Engineering

North Carolina State University

Jacob Eapen, Ph.D.

Professor and Director of Undergraduate Program, Department of Nuclear Engineering

Afsaneh Rabiei, Ph.D.

Professor of Mechanical and Aerospace Engineering

Scott Palmtag, Ph.D.

Research Professor, Department of Nuclear Engineering

Yousry Azmy

Duke Energy Distinguished Professor, Department of Nuclear Engineering

The Ohio State University

Nate Ames, Ph.D.

Director, Center for Design and Manufacturing Excellence

Marat Khafizov, Ph.D.

Associate Professor, Mechanical and Aerospace Engineering

Hosts:

INL NS&T- V. Agarwal & INL NUC-D. Daubaras

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Engineering Research Office Building EROB 159 and via Microsoft Teams

8:45 Welcome, Agenda Overview	Vivek Agarwal and Youssef Ballout <i>Idaho National Lab</i>
9:00 Introduction to Fission Battery Initiative	Vivek Agarwal <i>Idaho National Lab</i>
9:30 Preliminary Estimates of the Mass of the Shielded Spent Fission Battery	Scott Palmtag and Yousry Azmy <i>North Carolina State University via Teams</i>
10:00 Shielding of Transportable Fission Batteries – Issues and Potential Solutions	Sam Bays <i>Idaho National Lab</i>
10:30 Break, Resume at 10:45	
10:45 Light-Weight Reflector/Shielding Material with Expectation of Enhancing Fuel Efficiency and Economic Performance of Fission Battery	Zeev Shayer <i>University of New Mexico</i>
11:30 The Combinatorial Approach to Testing and Characterization of Irradiated Fuels and Reactor Structural Materials	Colin Judge <i>Idaho National Lab</i>
12:00 Lunch Presentation	TBD
1:15 TBD	Nate Ames <i>The Ohio State University</i>
1:45 Applying Advanced Materials and Manufacturing Technologies to Achieve Fission Batteries ...	Andrea Jokisaari <i>Idaho National Lab</i>
2:15 Composite Metal Foams and Their Application in Nuclear Structures.....	Afsaneh Rabiei <i>North Carolina State University</i>
2:45 Break, Resume at 3:00 pm	
3:00 TBD	Michael Short <i>Massachusetts Institute of Technology via Teams</i>
3:30 Synthesis of Lightweight Nanostructured Metals Through Solid-State Bonding Under High-Pressure Torsion	Megumi Kawasaki <i>Oregon State University via Teams</i>
4:00 Round Table Discussion Day 1	All Presenters/ Participants
5:00 Adjourn	

November 9, 2022

Engineering Research Office Building EROB 159 and via Microsoft Teams

- 9:00 Overview of the INL Advanced Materials and Manufacturing Initiative Allen Roach
Idaho National Lab
- 9:30 Thermal Energy, Atomic, and Radiation Transport Phenomena in Composite Materials Marat Khafizov
The Ohio State University
- 10:00 Lattice Structure Design of Low-Density Resilient Materials for Advanced Reactors Xiaofei Pu
Idaho National Lab
- 10:30 Break, Resume at 10:45
- 10:45 Moderator Materials for Fission Batteries Jacob Eapen
North Carolina State University via Teams
- 11:15 Application of 3D Printing for Improving Material Survivability Alexander O'Brien
Massachusetts Institute of Technology
- 11:45 Tensile Test Using Standard Capsule and Automated Mechanical Testing System Jason Schulthess
Idaho National Lab
- 12:15 Lunch Presentation TBD
- 1:00 Science-Based Acceleration of Development, Testing, and Qualifying Materials:
Lessons Learned from Materials Tianyi Chen
Oregon State University
- 1:30 Round Table Discussion Day 2 All Presenters/ Participants
- 2:30 Round Table Closeout Day 1 and Day 2 All Presenters/ Participants
- 3:15 Break, Resume at 3:30 pm
- 3:30 Final Closeout Presenters/ Participants
- 4:00 Adjourn