## Materials in Nuclear Energy Systems Conference (MiNES 2021)

*Confirmed Presenters: The yellow boxes indicate a presenter has registered to attend.*

*Last update: October 20, 2021*

| **Tuesday, November 9** | | |
|---|---|---|
| 8:00 AM | | |
| Fundamental Irradiation Damage- Session I | Nuclear Fuel Cycles- Session I | Versatile Test Reactor |
| On the Exploitation of Databases to Predict the Embrittlement of Reactor Pressure Vessels: Marta Serrano, Ciemat | Recent Advances in Pyroprocessing of Light Water Reactor Fuel: Krista Hawthorne, Argonne National Laboratory | Overview of in Reactor Mechanical Testing in the Versatile Test Reactor: Tarik Saleh, Los Alamos National Laboratory |
| Next Steps for Improved Defect Production and Mixing Parameters: Beyond NRT DPA, ARC-DPA and RPA: Steven Zinkle, University of Tennessee | Instrumentation in Molten Salt Systems: Commercial Availability, Custom Solutions, and Gaps: Adam Burak, University of Michigan | In Situ Mechanical Testing Method for Materials in Gaseous Environments: Peter Beck, Oregon State University |
| Comparison of Temperature-dependent Swelling Behavior in FCC Compositionally Complex Alloys and 316H Stainless Steel under Heavy-ion Irradiation: Calvin Parkin, University of Wisconsin-Madison | Deliquescence of Eutectic LiCl-KCl Diluted with NaCl for Interim Waste Salt Storage: Claire M Decker, University of Utah | Emissivity Measurements of Silicon Carbide Cladding Samples for Use in Gas Cooled Fast Reactor: Noah Sutton, TA&M Thermal Hydraulics Lab |
| Free Surface Impact on Radiation Damage in Pure Nickel by In-situ Self-ion Irradiation: Can It be Avoided?: Marie Loyer-Prost, CEA | Perovskite-derived Cs2SnCl6-Silica Composites as Advanced Waste Forms for Chloride Salt Wastes: Jie Lian, Rensselaer Polytechnic Institute | Design and Operation of an Out-of-pile Liquid Sodium Experimental Facility for Mechanical Testing: Dustin Mangus, Oregon State University |
| Pushing towards the Limits in Characterization of Radiation Damage: Grace Burke, University of Manchester | A First-principles Database Approach to Predicting Trans-uranic Waste Forms: Amir Mofrad, University of South Carolina | Fracture Mechanics-based Testing and DCPD in FLiNaK : Xavier Quintana, Oregon State University |
| | | |
| 10:30 AM | | |
| Fuels and Actinide Materials-Fabrication Methodology | Fundamental Irradiation Damage- Session II | Nuclear Fuel Cycles- Session II |

| **Wednesday, November 10** | | |
|---|---|---|
| 8:00 AM | | |
| Fuels and Actinide Materials-Metallic Fuels I | Fundamental Irradiation Damage- Session IV | Integrated Phenomena-Session I |
| 3D-reconstruction via Genetic Algorithms: Application to Metallic Fuel: Fabiola Cappia, Idaho National Laboratory | Low Temperature Hardening-embrittlement Phenomenon IN 9-14% Chromium Based Ferritic-martensitic and Oxide Dispersion Strengthened Steels: Arunodaya Bhattacharya, Oak Ridge National Laboratory | Radiation-decelerated Corrosion of Nuclear Structural Materials in Gen IV Reactor Environments: Michael Short, Massachusetts Institute of Technology |
| Identifying Crystalline Phases in Irradiated U-Pu-Zr Fuels Using TEM: Assel Aitkaliyeva, University of Florida | Decoupling Thermal and Irradiation Effects on Clustering and Chemical Redistribution in 14YWT ODS: Amrita Sen, Purdue University | Mitigating Irradiated Assisted Stress Corrosion Cracking with Minor Refractory Element Modification – A High-throughput Approach Using Compositionally-graded Specimen: Jingfan Yang, Auburn University |
| Does the Fuel Fabrication Method Have an Impact on the Fuel Performance Microstructure in Uranium-molybdenum?: Maria Okuniewski, Purdue University | Dose and Temperature Effect on Dispersoids in Neutron Irradiated Oxide Dispersion Strengthened (ODS) Alloys: Samara Levine, University of Tennessee | Determination of Tritium Trapping Mechanisms in the TPBAR Aluminide Coating : Anne Chaka, Pacific Northwest National Laboratory |
| Zirconium Redistribution in a High Burnup U-10Zr Metallic Fuel: Tiankai Yao, Idaho National Laboratory | The Subtle Effects of Nitrogen on Radiation Effects in Tempered Martensitic Steels: Stuart Maloy, Los Alamos National Laboratory | Understanding Tritium Permeation in FeCrAl Alloys: Rajnikant Umretiya, GE Research |
| Constructing Multi-component Diffusion under Irradiation in U-Mo Alloys: Benjamin Beeler, North Carolina State University | Defect Cluster Configurations and Mobilities in \\945-zirconium: Implications for Breakaway Irradiation Growth: Jose March-Rico, University of Tennessee, Knoxville | |
| | | |
| 10:30 AM | | |
| Fuels and Actinide Materials-Metallic Fuels II | Fundamental Irradiation Damage- Session V | Integrated Phenomena-Session II |

| **Thursday, November 11** | | |
|---|---|---|
| 8:00 AM | | |
| Advanced and Novel Materials-Session II | Fuels and Actinide Materials-Thermal Properties, UN and UC Fuels II | Material Properties Evolution-Session II |
| Advanced Manufacturing for Novel Material Design and Development: Isabella Van Rooyen, Idaho National Laboratory | Thermal Analysis of Advanced Nuclear Fuels during Simulated Off-normal Events: Elizabeth Sooby, University of Texas at San Antonio | Mesoscale Simulations of Interactions between Dislocation Loop and Point Defects in bcc Iron: Haixuan Xu, University of Tennessee |
| Additive Manufacturing (AM) of Oxide Dispersion Strengthened (ODS) FeCrAl Using In Situ Oxidation: Ty Austin, University of Tennessee, Knoxville | Development and Application of a UN Potential to Defect Properties and High Temperature Elastic Constants: Vancho Kocevski, Los Alamos National Laboratory | Mechanical Response of HT9 and T91 under Dual-ion and Neutron Irradiations: Pengcheng Zhu, University of Tennessee, Knoxville |
| Ultra-fine Lattice Wicking Structures Additively Manufactured from Tungsten: Carly Romnes, University of Illinois at Urbana-Champaign | Chemical Interaction and Incorporation of Lead with Uranium Nitride Fuels: Andre Broussard, Rensselaer Polytechnic Institute | Rapid Simulation of the Irradiated Microstructure in Flux Thimble Tubes to High Dose Using Ion Irradiation : Gary Was, University of Michigan |
| Innovative Elaboration Method of ODS Ferritic Steels Reinforced by Y2Ti2O7 Pyrochlore Phase Oxide: Guillaume Josserand, CEA | Phase and Thermodynamic Analysis of Uranium Mononitride in High-temperature Steam Light Water Reactor Atmospheres: Geronimo Robles, University of Texas at San Antonio | Atomistically Informed Cascade Overlap Model to Predict Alloy 800H Microstructure Evolution during High-dose Neutron Irradiation: Samuel Morris, University of Tennessee Knoxville |
| Strengthening Effects across Ultrasonic Additive Manufacturing (UAM) Interfaces: Michael Pagan, University of Tennessee Knoxville | | Solute Segregation and Precipitation Across Damage Rates in Dual Ion Irradiated T91 Steel: Valentin Pauly, University of Michigan |
| | | |
| 10:20 AM | | |
| Advanced and Novel Materials-Session III | Fuels and Actinide Materials-Oxide Fuels I | Early Career Development in Nuclear Materials - Panel |

| | | |
|---|---|---|
| Advanced Technology Fuel Accelerated Development at Bangor University: Simon Middleburgh, Bangor University | Physical Understanding of Radiation Hardening of Neutron Irradiated FeCr Alloys : Cristelle Pareige, University of Rouen | How Does PUREX Actually Work and What Do Chemists Do?: Jenifer Shafer, Colorado School of Mines |
| Synthesis of UN-U3Si2 Composite Fuels by Spark Plasma Sintering and Properties Characterization: Bowen Gong, Rensselaer Polytechnic Institute | The Kinetics and Stability of Alpha Prime (a') Precipitates in FeCr Binary Alloy under Ion Irradiations: Steven Zinkle, The University of Tennessee | Development and Application of an Interatomic Potential for the Investigation of Mixed Oxide Compounds Containing Americium: Marjorie Bertolus, CEA |
| Fabrication of Potentially High Burnup Annular U-10Zr Fuel by SPS: Dong Zhao, Rensselaer Polytechnic Institute | Effect of Cr and Temperature on Dislocation Loops in Heavy Ion Irradiated Ultra-high Purity FeCr Alloys: Yao Li, University of Tennessee Knoxville | Radiation Damages Bohr's Metrics: The Elemental Landscape: Jean-Christophe Sublet, IAEA |
| | | |
| | | |
| 1:30 PM | | |
| Fuels and Actinide Materials-HTGR Fuels | Fundamental Irradiation Damage- Session III | Nuclear Fuel Cycles- Session III |
| Cluster Dynamics Simulations of Fission Gas and Product (Xe, Ag) Diffusivities in TRISO UCO Fuel Kernels : David Andersson, Los Alamos National Laboratory | Cavity Formation in Ion Irradiated Fe and Fe-Cr Ferritic Alloys: Yan-Ru Lin, University of Tennessee | The Effect of Phase Structure on the Aqueous Corrosion of Yttrium Disilicate: Keith Bryce, Rensselaer Polytechnic Institute |
| High Density TRISO Fuel: Daniel Talbot, United States Air Force | Explorations in Automated Cavity Detection Using an Expanded Machine Learning Training Data Domain: Matt Lynch, University of Michigan - Ann Arbor | Beta Transmutations in Apatite with Ferric Iron as an Electron Acceptor – Implication for Nuclear Waste form Development: Jianwei Wang, Louisiana State University |
| Microstructural Analysis of Oxidized Tristructural Isotropic Particles (TRISO) in Mixed Gas Atmospheres : Katherine Montoya, University of Texas at San Antonio | Impact of Grain Boundary and Surface Diffusion on Fission Gas Release in UO<SUB>2</SUB> Nuclear Fuel Using a Phase Field Model: Md Ali Muntaha, University of Floirda | Predicting Phase Stability of Potential Actinide-bearing Hollandite Waste Forms Using First Principles Calculations: Amir Mofrad, University of South Carolina |

| | | |
|---|---|---|
| The Challenges of \\945;-uranium: Fundamental Understanding of a Past and Future Nuclear Fuel Material: Andrea Jokisaari, Idaho National Laboratory | Radiation Effects and Thermal Stability in Ferritic Steels and High Entropy Alloys: Eda Aydogan, Middle East Technical University | Kinetics of SiC Reaction with Water and Oxygen Under Light Water Reaction Conditions: Peter Doyle, Oak Ridge National Laboratory |
| Impact of Zirconium Concentration Variation on Metal Fuel Constituent Redistribution : Thaddeus Rahn, University of Florida | Effect of Damage Rate and Cascade Size on \\945;' Precipitate Stability in Fe-15Cr: Katey Thomas, University of Michigan | Structural Materials Testing for the Westinghouse Lead Fast Reactor: Mike Ickes, Westinghouse Electric Company |
| Electron Probe Microanalysis of Fuel from EBR-II Experiment X441A: Effects of Varying U:Pu:Zr Elemental Ratios: Assel Aitkaliyeva, University of Florida | A New Statistical Approach for Atomistic Calculations of Point Defect Formation Energies in Multicomponent Solid-solution Alloys: Yongfeng Zhang, University of Wisconsin | 3D Reconstruction and Quantification of Oxide Nano-porosity in Zirconium Alloys: Hongliang Zhang, University of Wisconsin Madison |
| | Effect of Helium Injection Rate on Cavity Microstructure in Dual Ion Irradiated T91 Steel : Valentin Pauly, University of Michigan | |
| | | |
| 1:30 PM | | |
| Fuels and Actinide Materials-Metallic Fuels III | Fundamental Irradiation Damage- Session VI | Integrated Phenomena-Session III |
| Transmission Electron Microscopy of the Uranium-22.5 Atom% Zirconium System Following Casting, Cold-working, and Annealing: Maria A Okuniewski, Purdue University | Radiation Enhanced Diffusion (RED) and the Coupled Effects of Irradiation and Corrosion in Fe<SUB>2</SUB>O<SUB>3</SUB>: Blas Uberuaga, Los Alamos National Laboratory | Irradiation Creep and Fatigue Observed via In-situ Electron Microscopy: Khalid Hattar, Sandia National Laboratories |
| An Investigation of FCCI Using Diffusion Couple Test between UMTZ Alloys and Cladding: Weiqian zhuo, Virginia Tech | Radiation-induced Segregation in Nanocrystalline FeCrNi under Concurrent Grain Boundary Movement: Aashique Rezwan, University of Wisconsin Madison | Wear and Friction Behavior of Fuel Pebbles in Molten Fluoride Salt: Lorenzo Vergari, University of California Berkeley |
| First-principles Study of the Interfaces between Gamma-U and Uranium Carbide: Benjamin Beeler, North Carolina State University | Suppressing Irradiation Instabilities in Nanocrystalline Tungsten through Grain Boundary Doping: Jason Trelewicz, Stony Brook University | Thermal Gradient Effect on the Helium and Intrinsic Defects Transport Properties in Tungsten: Enrique Martinez Saez, Clemson University |

| | | |
|---|---|---|
| Opportunities for Advanced Concepts in Nuclear Fuel Development: Andrew Nelson, Oak Ridge National Laboratory | Atomic Scale Investigation of Thermodynamic and Defect Properties of (U,Pu)O<SUB>2</SUB> Mixed Oxide: Marjorie Bertolus, CEA | |
| Metal Hydride Moderator Development at Los Alamos National Laboratory: Tarik Saleh, Los Alamos National Laboratory | Phase-field Simulations of Fission Gas Bubbles in High Burnup UO2 during Steady-state and LOCA Transient Conditions: David Andersson, Los Alamos National Laboratory | |
| Radiation Tolerance of Capacitive Discharge Resistance Welded 14YWT: Calvin Lear, Los Alamos National Laboratory | Thermal Diffusivity of Nuclear Materials at the Miniature Scale: Najeb Abdul-Jabbar, Los Alamos National Laboratory | |
| In-situ Nanomechanical Characterization of Neutron-irradiated HT-9 Steel: Assel Aitkaliyeva, University of Florida | | |
| | | |
| 1:10 PM | | |
| Advanced and Novel Materials-Session IV | Fuels and Actinide Materials-Oxide Fuels II | Material Properties Evolution-Session III |
| Novel Nickel-based Alloys for Molten Salt Fast Reactor Structural Applications: Vijay Vasudevan, University of North Texas | New Microscopic Insights into the Fuel Cladding Interaction Layer of High Burnup Fuel: Sarah Finkeldei, University of California-Irvine | IASCC Initiation Testing of ex-PWR Baffle-former Bolts: Mike Ickes, Westinghouse Electric Company |
| Contextualizing Dispersoid Evolution within Friction Stir Welded and Ion Irradiated MA956: Elizabeth Getto, United States Naval Academy | Three-dimensional Characterization of Microstructural Features in Oxide Fuels: Casey McKinney, University of Florida | Mesoscale YellowJacket: A Phase-field Model for Microstructure Dependent Corrosion of Ni-Cr Alloys by Molten Fluoride Salts: Chaitanya Bhave, University of Florida |
| Temperature-controlled Friction Stir Welding: A Potential Crack Repair Technology for 304L Stainless Steel Spent Nuclear Fuel-dry Storage Canisters (SNF-DSC): Saumyadeep Jana, Pacific Northwest National Laboratory | Modeling the Mechanisms of Fuel Pulverization Using Cluster and Molecular Dynamics: Michael Cooper, Los Alamos National Laboratory | Atom Probe Tomography Study of Elemental Segregation and Precipitation in Ion-irradiated Advance Austenitic Alloy A709: Dominic Piedmont, University of Illinois at Urbana-Champaign |

| | | |
|---|---|---|
| Oxidation Performance of High Uranium Density Fuels for Light Water Reactors: Joshua White, Los Alamos National Laboratory | Point Defect Evolution under Irradiation: Finite Size Effects and Spatio-temporal Correlations: Enrique Martinez Saez, Clemson University | |
| Fabrication and Properties of Uranium Dioxide-uranium Boride Composites: Erofili Kardoulaki, Los Alamos National Laboratory | | |
| A Review of Current Understanding of Fluff Formation in Metallic Fuel via EBR-II Data and Modelling and Simulations.: Jake Fay, Rensselaer Polytechnic Institute | | |
| | | |
| 4:00 PM | | |
| Plenary | | |
| The Xe-100 Advanced Reactor Concept: Eben Mulder, X-energy | | |
| | | |
| | | |

| | | |
|---|---|---|
| Three-dimensional Characterization of Pore Evolution in High-burnup U-Mo : Maria A. Okuniewski, Purdue University | Correlating Properties of Irradiation Produced Nanoscale Superlattices with Irradiation Condition Parameters: Anton Schneider, University of Wisconsin Madison | Dependence of Sink Strength Effects on Defect Evolution in Dual-ion Irradiated Additive-Manufactured HT9: Pengyuan Xiu, University of Michigan |
| | Study on Role of Irradiation Induced Vacancies and Voids on Strain-induced Martensitic Transformations by Molecular Dynamics: Chao Yang, Purdue University | |
| | | |
| | | |
| 4:00 PM | | |
| Advanced and Novel Materials-Session I | Fuels and Actinide Materials-Thermal Properties, UN and UC Fuels I | Material Properties Evolution-Session I |
| Overview of Fuel System Options for Nuclear Thermal Propulsion: Kelsa Palomares, Analytical Mechanics Associates | Utilization Potential for the Molten Salts Thermal Properties Database – Thermochemical (MSTDB-TC) in Operational and Safety Analysis for MSRs: Theodore Besmann, University of South Carolina | Development of a Multicomponent Ideal-solution (MCIS) Free Energy Phase-field Model for Simulation of Nuclear Materials Microstructural Evolution: Chaitanya Bhave, University of Florida |
| Grain Growth and Mechanical Properties of Nano ZrO2 Oxide Dispersion Strengthened Mo30W: Neal Gaffin, University of Tennessee - Knoxville | Determination of Chromium Corrosion Potential in the Na-K-Mg-U(III) Chloride Molten Salt : Jacob A. Yingling, University of South Carolina | Effect of the Inner Liner on Radial Delayed Hydride Cracking: Aaron Colldeweih, PSI |
| A Study of the Corrosion Behavior of Cold-sprayed 304L Stainless Steel for Dry Storage Canisters: Richard Chiang, University of Cincinnati | Insights into Prediction of Thermodynamic Properties for Chloride Salts for Generation IV MSRs: Juliano Schorne Pinto, University of South Carolina | Effects of Heat Treatment, Build Angle and Radiation Type on the Hardness and Microstructure of Inconel 625 and 718 Fabricated via Laser-powder Bed Fusion Additive Manufacturing: John Gahl, University of Missouri |

| | | |
|---|---|---|
| Thermal Annealing and Irradiation Behavior of Ultrafine-grained and Nanocrystalline FeCrAl Alloys: Maalavan Arivu, Missouri University of Science and Technology | Experimental Characterization of the Chemical Behavior of Cs, I and Te in UO2 : Morgane Rochedy, CEA | The Role of Alloying Species on Radiation Tolerance of BCC Fe Binary Alloys: Patrick Warren, Purdue University |
| Finding a Balance in FeCrAl Alloys: Optimization of Alloy Chemistry for Balanced Properties: Andrew Hoffman, GE Research | | |
| | | |
| | | |
| 3:30 PM | | |
| Advanced and Novel Materials-Session V | Fuels and Actinide Materials-Oxide Fuels III | Material Properties Evolution-Session IV |
| MAX Phases for Nuclear Applications: Konstantina Lambrinou, SCK-CEN | Calculation of Irradiation Enhanced Diffusivities Using Centipede: Christopher Matthews, Los Alamos National Laboratory | Neutron Irradiation Effects on PM-HIP Inconel 625: Caleb Clement, Purdue University |
| Exploring the Radiation Response of Innovative Accident Tolerant Fuel Candidate Concepts Based on High-entropy Alloys: Matheus Araujo Tunes, Los Alamos National Laboratory | Defect Clustering in UO<SUB>2</SUB> Doped Systems Studied Using XAS and Neutron Scattering: Arjen van Veelen, Los Alamos National Laboratory | Influence of Different Heat Treatments and Ion Irradiation on the Microstructural Evolution and Microhardness of Inconel 625 Fabricated via Laser-powder Bed Fusion: John Gahl, University of Missouri |
| High Throughput Study of Hardening and Void Swelling in Ion Irradiated Compositionally Complex Alloys: Benoit Queylat, University of Wisconsin, Madison | Dislocation Loop Evolution in Fluorite Oxides : Marat Khafizov, Ohio State University | Mechanical Behavior of Additively Manufactured 316L Stainless Steel and SiC before and after Neutron Irradiation : Thak Sang Byun, Oak Ridge National Laboratory |

| | | |
|---|---|---|
| | | |
| | | |
| | | |
| 5:30 PM | | |
| Poster Session | | |
| SKAPHIA: Presentation of the Latest Shielded Electron Probe Micro Analysis (EPMA): Matt Pietrucha, CAMECA Inc. | | |
| ACTINIS: Shielded SIMS for Analysis of Highly Radioactive Samples: Matt Pietrucha, CAMECA Instruments Inc. | | |
| Atom Probe Tomography for Nuclear Materials: Matthew Pietrucha, Cameca Instruments, Inc. | | |
| Design of a Test System for Hot Hydrogen-facing Components in Nuclear Thermal Propulsion Systems: William Searight, Pennsylvania State University | | |
| Developing Neural Network Model for Automated Analysis of Radiation-induced Grain Growth in UO2: Xinyuan Xu, Pennsylvania State University | | |
| Atomistic Calculations on the Effective Bias of Cavities in BCC Fe: Yuhao Wang, University of Michigan - Ann Arbor | | |
| Quantifying the Impact of an Electronic Drag Force on Defect Production from High-Energy Displacement Cascades in \\945-zirconium: Jose March-Rico, University of Tennessee, Knoxville | | |
| Evaluation of Water Degradation in Medium Voltage Electric Cables Found in Nuclear Power Plants: Margaret Elmer-Dixon, University of Minnesota Duluth | | |
| Quantification of the Resistance to Dislocation Glide in Pre-deformed and Ion-irradiated FeCrAl Alloys Using in Situ Micro-mechanical Testing: Jian Wang, University of Nebraska-Lincoln | | |

| | | |
|---|---|---|
| Cold Spray for Repair of Nuclear Power Plant Components: Mike Ickes, Westinghouse Electric Company | Molten Salt Thermal Properties Database-Thermochemical (MSTDB-TC) Status and New Assessment of MF-UF<SUB>4</SUB> (M = Li, Na, K, Cs) Systems: Johnathon Ard, Johnathon Ard | Mechanical Testing of Fuel Cladding Tubes: Benjamin Eftink, Los Alamos National Laboratory |
| Metal and Amorphous Ceramic Composites for Extreme Conditions: Jian Wang, University of Nebraska-Lincoln | | Accessing High Damage Level Microstructures Using Combined Ion and Neutron Irradiation of a 304L Stainless Steel: Zhijie Jiao, University of Michigan |

| | | |
|---|---|---|
| Discerning the Effects of Solute Additions in FeCrAl on Dislocation Dynamics under Irradiation Using a Machine Learning Object Detection Algorithm: Priyam Patki, University of Michigan | Grain Growth Kinetic Models for Accident Tolerant Oxide Fuel: Tashiema Ulrich, Los Alamos National Laboratory | Plutonium Defect Characterization through Mechanical Deformation: C.A. Yablinsky, Los Alamos National Laboratory |
| | | |
| | | |
| 6:00 PM | | |
| Conference Banquet | | |
| What’s Driving the Acceleration of Nuclear Materials Technology?: Rita Baranwal, EPRI | | |