

PNNL[®]



2024 SPRING



Pacific
Northwest
NATIONAL LABORATORY

SYMPOSIUM SESSIONS

Symposium CH01: Characterizing Dynamic Processes of Materials Synthesis and Processing via *In Situ* Techniques

Symposium Organizer: Dongsheng Li

Session Chairs: Dongsheng Li, Jim De Yoreo

Session CH01.05: Poster session I | Session Chair: Dongsheng Li

Session CH01.06: Crystal Assembly and Transformation | Session Chair: Dongsheng Li

Session CH01.08: Poster session II | Session Chair: Dongsheng Li

Session CH01.10: Characterization of Catalytic Materials | Session Chair: Dongsheng Li

Symposium CH02: Utilizing Advanced *In Situ/Operando* Transmission Electron Microscopy and Spectroscopy for the Investigation of Functional, Energy and Quantum Materials

Symposium Organizer: Yaobin Xu

Session CH02.03: Exploration of Complex Oxide Heterostructures and Microelectronics Devices via *In-Situ* Electron Microscopy III | Session Chair: Yaobin Xu

Session CH02.04: Exploration of Catalysts and 2D materials Dynamics via *In-Situ/Cryogenic* Electron Microscopy | Session Chair: Yaobin Xu

Session CH02.06: Investigation of Energy Storage Materials via advanced *In-Situ/Cryogenic* Electron Microscopy I | Session Chair: Yaobin Xu

Session CH02.07: Investigation of Energy Storage Materials via advanced *In-Situ/Cryogenic* Electron Microscopy II | Session Chair: Yaobin Xu

Session CH02.09: New Applications in *In-Situ* Microscopy and Spectroscopy | Session Chair: Yaobin Xu



Session EL06.06: Epitaxial Growth—Microstructures and Functionalities | Session Chair: Dongsheng Li

Symposium ES04: Metal Anodes in Rechargeable Batteries—Electrolyte, Interface and Mechanism

Symposium Organizer: Wu Xu

Session ES04.04: Li Metal—Structure and Substrate | Session Chair: Wu Xu

Session ES04.07: Poster session II | Session Chair: Wu Xu

Session ES04.08: Non-Li Metal—Aqueous | Session Chair: Wu Xu

Session ES04.09: Lithium Metal and Beyond | Session Chair: Wu Xu

Symposium ES05: Materials Challenges for Flow-based Energy Conversion and Storage

Symposium Organizer: Ruozhu Feng

Session ES05.01: Flow Based Energy Storage I | Session Chairs: Ruozhu Feng, Wei Wang

Session ES05.02: Flow Based Energy Storage II | Session Chair: Ruozhu Feng

Session ES05.03: Poster Session: Flow Based Energy Storage | Session Chair: Ruozhu Feng

Session ES05.04: Flow Based Energy Storage III | Session Chair: Ruozhu Feng

Session ES01/ES05/MT02: Joint Virtual Session | Session Chair: Ruozhu Feng

Symposium ES06: Sulfur and Sulfide Chemistry in High Performance Electrochemical Energy Storage

Symposium Organizer: Dongping Lu

Session Chair: Dongping Lu

Session ES06.01: Lithium-Sulfur Batteries I | Session Chair: Dongping Lu

Session ES06.03: Poster Session: Sulfur and Sulfide Chemistry for Electrochemical Energy Storage | Session Chair: Dongping Lu

Session ES06.06: Sulfide-Based Solid-State Batteries—Cathode and Devices | Session Chair: Dongping Lu

Session ES06.07: Virtual Session | Session Chair: Dongping Lu

Symposium SF02: Actinide Materials

Symposium Organizer: Edgar Buck

Session SF02.02: Advanced Characterization | Session Chair: Edgar Buck

Session SF02.08: Poster Session | Session Chair: Edgar Buck



TUESDAY, APRIL 23

Presentations

Jim De Yoreo | CH01.01.01 | An *In Situ* look at Interfacial Structure and Dynamics during Nucleation and Self-Assembly | 10:30 am, Tuesday | Room 442, Level 4, Summit

Xin Zhang (Xiaoxu Li, Sebastian Mergelsberg, Lili Liu, Mark Bowden, Ping Chen, Maria Sushko, Carolyn Pearce, Jim De Yoreo, Kevin Rosso) | CH04.01.03 | Understanding Particle-Mediated Growth Pathways by using Advanced Transmission Electron Microscopy and X-Ray Scattering Techniques | 11:15 am, Tuesday | Room 443, Level 4, Summit

Yangang Liang | MT03.01.04 | Development of a High-Throughput Electrochemical Device for Data-Driven Electrolyte Materials Discovery | 11:45 am, Tuesday | Room 322, Level 3, Summit

Jie Xiao | ES01.02.05 | Single Crystal Ni-Rich Cathodes for Advanced Li-Ion Batteries | 2:30 pm, Tuesday | Room 425, Level 4, Summit

Wei Wang | MT02.02.03 | Data-driven Research for Aqueous Organic Redox Flow Batteries | 2:30 pm, Tuesday | Room 321, Level 3, Summit

Le Wang (Bethany Matthews, Mark Bowden, Yingge Du) | EL06.02.06 | Fe Substitution Suppresses Oxygen Vacancy Formation and Stabilizes High-Valence Ni in Epitaxial $\text{La}_{0.5}\text{Sr}_{0.5}\text{Ni}_{1-x}\text{Fe}_x\text{O}_{3-\delta}$ Thin Films | 3:30 pm, Tuesday | Room 343, Level 3, Summit

Wu Xu (Ridwan Ahmed, Ju-Myung Kim, JiGuang (Jason) Zhang) | ES04.02.04 | Stable and Ion-Conductive Polymeric Lithicone for Lithium Metal Anode Protection | 2:45 pm, Tuesday | Room 422, Level 4, Summit

Ji-Guang (Jason) Zhang (Xia Cao, Wu Xu) | ES04.02.05 | Lithium Metal Batteries with Improved Thermal Stabilities | 3:30 pm, Tuesday | Room 422, Level 4, Summit

WEDNESDAY, APRIL 24

Presentations

Chongmin Wang | ES04.03.03 | Integrating Multi-Functionality that enables *In-Situ* TEM probing of Solid Electrolyte Interphase Characteristics | 8:30 am, Wednesday | Room 422, Level 4, Summit

Xiaoxu Li (Sebastian Mergelsberg, Kevin Rosso, Xin Zhang) | NM03.01.02 | Nanoconfinement Facilitates the Precipitation of Iron Hydroxides in Porous Amorphous Aluminum Oxides | 8:45 am, Wednesday | Room 329, Level 3, Summit

Yuna Bae (Jim De Yoreo, Dongsheng Li) | CH01.03.03 | Formation of Highly Branched Nanocubes through Multi-Stage Oriented Attachment of Pt Nanoparticles | 9:00 am, Wednesday | Room 442, Level 4, Summit

Yingge Du (Jeffrey Dhas, Zihua Zhu, Peter Sushko) | EL01.04.03 | Understanding the Formation and Evolution of Surface Oxidation Layers in Nb Thin Films | 9:15 am, Wednesday | Room 348, Level 3, Summit

Steven Spurgeon | QT06.05.01 | Machine-Guided Understanding of Functional Oxides in Extremes | 10:45 am, Wednesday | Room 447, Level 4, Summit



Juejing Liu (Carolyn Pearce, Kevin Rosso, Zihua Zhuy, Xin Zhang) | CH01.04.02 | Direct Observation of Key Aluminum Hydroxide Oligomers for Gibbsite Crystallization in Bayer Liquor by ToF-SIMS | 1:45 pm, Wednesday | Room 442, Level 4, Summit

Ping Chen (Trent Graham, Duo Song, Xiaodong Zhao, Zheming Wang, Carolyn Pearce, Kevin Rosso, Xin Zhang) | CH04.06.03 | Effects of Anions on Phase Transformation and Crystallization of Aluminum Hydroxide | 4:00 pm, Wednesday | Room 443, Level 4, Summit

Krishna Prasad Koirala (Le Wang, Minju Choi, Peter Sushko, Scott Chambers, Chongmin Wang, Yingge Du) | EL06.06.02 | Unravelling the Effect of Nitrogen Doping on The Structure of LaFeO_3 Epitaxial Thin Films | 4:00 pm, Wednesday | Room 343, Level 3, Summit

Posters

Shannon Lee (Carinna Lapson, Colin Campbell, Ajay Karakoti, Dan Thien Nguyen, Vijay Murugesan) | ES02.03.01 | Substitution Effects on Nucleation and Crystal Growth of Lead Sulfate on Barite for Battery Applications | 5:00 pm, Wednesday | Flex Hall C, Level 2, Summit

THURSDAY, APRIL 25

Panel

Steven Spurgeon | Materials Needs for Energy Sustainability by 2050: AI-assisted Materials Development for a Sustainable Future | 5:30 pm, Thursday

Presentations

Mark (Jon) Weller (Hyungkyu Han, Eugene Polikarpov, Kee Sung Han, David Reed, Vincent Sprenkle, Vaithiyalingam Shutthanandan, Yilin Wang, Guosheng Li) | ES04.05.02 | Low-Cost Carbonaceous Metal-Free Wetting Layer as Sodiophilic Treatment for Solid and Molten Na Batteries | 9:00 am, Thursday | Room 422, Level 4, Summit

Wei Wang | ES05.04.03 | Accelerate Material Discovery and Expand Chemistry Space for Aqueous Organic Redox Flow Batteries | 10 am, Thursday | Room 431, Level 4, Summit

Karen Kruska (Gabriel Hall, Shalini Tripathi, Edgar Buck) | SF02.10.01 | Visualizing Non-Classical Growth of f-Element Oxalates with Cryo-TEM | 10:15 am, Thursday | Terrace Suite 2, Level 4, Summit

Edgar Buck (Dallas Reilly, Sergey Sinkov, Eugene Ilton) | SF02.10.04 | Evidence for Particle Attachment of Plutonium Solids in TX-118 Hanford Tank Waste | 11:00 am, Thursday | Terrace Suite 2, Level 4, Summit

Chenyang Shi (Jim De Yoreo) | CH01.06.02 | Multiphase Silk Assembly for Two-Dimensional Bio-Crystal Film | 11:00 am, Thursday | Room 442, Level 4, Summit



Qingpu Wang (Elias Nakouzi, Chinmayee Subban) | EN06.10/EN03.10.04 | Selective and Sequential Precipitation for Critical Mineral Extraction from Electronic Waste | 11:30 am, Thursday | Room 333, Level 3, Summit

(Robert) Gian Surbella III (Edgar Buck, Bruce McNamara, Ana Arteaga, Aaron Nicholas) | SF02.11.01 | Exploring the Photochemistry and Bonding of Trivalent Americium within Metal-Organic Constructs | 1:30 pm, Thursday | Terrace Suite 2, Level 4, Summit

Peter Sushko (Jeffrey Dhas, Yingge Du) | QT04.09.05 | Towards Atomic Precision in Superconducting Qubits: Mechanisms of Ta Oxidation and Strategies for Oxidation Suppression | 4:30 pm, Thursday | Room 445, Level 4, Summit

FRIDAY, APRIL 26

Presentations

Steven Spurgeon | CH02.08.01 | Towards Artificially Intelligent Microscopy of Functional Materials | 8:30 am, Friday | Room 440, Level 4, Summit

Xiang Wang (Duo Song, Maria Sushko, Xin Zhang, Kevin Rosso) | CH02.08.03 | *In-Situ* Observations of Non-Classical Crystal Growth of Au Nanoparticles on Hematite | 9:30 am, Friday | Room 440, Level 4, Summit

Dan Thien Nguyen (Venkateshkumar Prabakaran, Ying Chen, Karl Mueller, Vijay Murugesan) | ES04.08.12 | Promoting Room Temperature Aluminum Deposition Through Rapid Ligand Exchange Complexes | 11:15 am, Friday | Room 422, Level 4, Summit

Dongsheng Li | CH01.10.02 | Effects of Crystal Lattice Deformation on Catalytic Activities | 2:00 pm, Friday | Room 442, Level 4, Summit

