

SYMPOSIUM ES13

Interfaces and Interphases in Electrochemical Energy
Storage and Conversion
April 17 - April 21, 2017

Symposium Organizers

David Mitlin, Clarkson University
Yuyan Shao, Pacific Northwest National Laboratory
Jin Suntivich, Cornell University
Lynn Trahey, Argonne National Laboratory

Symposium Support
Army Research Office

Proceedings Statement

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* Invited Paper

TUTORIAL

Electrolytes for Electrochemical Energy Storage—Materials, Interfaces and Interphases

Monday Morning, April 17, 2017
8:30 AM – 12:00 PM
PCC North, 200 Level, Room 227 AB

Batteries are critical for today's society and are also hot topic in material research community. Electrolytes and the electrode/electrolyte interfaces/interphase play a determining role in batteries—a thermodynamically unstable but kinetically stable system enabled by electrolytes and the interfaces/interphases.

This tutorial will cover from fundamental interfacial electrochemistry, electrolyte materials, to electrode/electrolyte interfaces/interphases related to electrochemical energy storage. It will bring attendees both the fundamental knowledge and updates in this rapidly evolving field. The tutorial consists of three sections:

8:30 AM - 9:30 AM

Part I: **Kang Xu**

Electrode/Liquid Electrolyte Interfaces and Interphases

The basic concepts of electrochemical interfaces and interphases in liquid electrolytes will be covered, including a general overview of electrochemistry concepts in both nonaqueous solutions and aqueous solutions, solid/electrolyte interphases (SEI), dynamic evolution of interfaces and interphases and its characterization. Application examples may include SEI on metal anodes, graphite, silicon, sulfur cathodes, selected metal oxide cathodes. This part provides the knowledge foundation of the whole tutorial.

9:30 AM BREAK

11:00 AM - 12:00 PM

Part II: **Nancy J. Dudney**

Glass Solid State Electrolytes (GSSE) and their Interfaces/Interphases

Moving beyond electrode/liquid electrolyte systems, the electrode/GSSE is one of the enablers of solid state batteries. Topics include the basic concept of GSSE, GSSE materials and their properties, ion transport mechanisms, electrode/GSSE interfaces and interphases, and the difference (advantages/disadvantages) between electrode/liquid electrolyte systems and electrode/GSSE systems.

11:00 AM - 12:00 PM

Part III: **Chunsheng Wang**

Ceramic Oxide Crystalline Electrolytes and their Interfaces/Interphases

Great challenges exist for the application of ceramic oxide crystalline electrolytes in batteries, but they also present broader advantages that the above liquid electrolyte and GSSE do not have. In this section, the basic concept of ceramic oxide crystalline electrolytes, ion transport mechanisms, electrolyte materials and interface/interphase engineering will be covered. It also contains a sub-section to compare the three electrolytes (liquid, GSSE, ceramic oxide crystalline electrolytes), their interfaces/interphases and battery device engineering using these three electrolytes.

Instructors

Kang Xu, U.S. Army Research Laboratory

Nancy Dudney, Oak Ridge National Laboratory

Chunsheng Wang, University of Maryland, College Park

SESSION ES13.1: Electrocatalysts and Battery Interfaces

Session Chairs: Yuyan Shao and Jin Suntivich

Monday Afternoon, April 17, 2017

PCC North, 200 Level, Room 227 AB

1:30 PM *ES13.1.01

Analytical Microscopy of Complex Alloy Catalysts, Hybrid Supports and Battery Materials [Gianluigi A. Botton](#); McMaster University, Canada.

2:00 PM ES13.1.02

Revealing the Structure Evolutions of the Ni-Co-OH OER Electrocatalyst by *In Situ* Liquid Cell XANES [Kaiyang Niu](#)^{1,2}; ¹Lawrence Berkeley National Laboratory, United States; ²University of California, Berkeley, United States.

2:15 PM ES13.1.03

Facile Synthesis of Nanostructured Phosphide Electrocatalysts [Nicola Pinna](#); Humboldt-Universität Berlin, Germany.

2:30 PM ES13.1.04

Facile Synthesis of Colloidal β -FeOOH Nanorod Catalysts Doped with Transition Metals for Efficient Water Oxidation [Tomiko M. Suzuki](#); Toyota Central R&D Labs Inc, Japan.

2:45 PM ES13.1.05

Magnetic-Structure Determined Concentration and Mobility of the Oxygen Vacancy in LaBO_3 (B=Cr, Mn, Fe, Co) Perovskite Materials of Solid Oxide Fuel Cell Cathode [Lei Zhang](#); Georgia Institute of Technology, United States.

3:00 PM BREAK

3:30 PM *ES13.1.06

Electrode-Electrolyte Interface at Positive Electrodes in Li-Ion Batteries—Mechanisms of Formation, Chemical Composition and Implications for Battery Performance [Yang Shao-Horn](#); Massachusetts Institute of Technology, United States.

4:00 PM ES13.1.07

Cathode/Electrolyte Interface—Revisiting the Electrochemical Stability of Solid Electrolytes [Fudong Han](#); University of Maryland College Park, United States.

4:15 PM ES13.1.08

Electrolyte and Interface Optimization for High Voltage Phospho-Olivine Based Li-Ion Batteries [Jan Allen](#); U.S. Army Research Lab, United States.

4:30 PM ES13.1.09

Evaluation of Tris(2,2,2-trifluoroethyl) Phosphite (TTFP) Additive as a Cathode Electrolyte Interphase (CEI) Forming Agent [Ritu Sahore](#); Argonne National Laboratory, United States.

4:45 PM ES13.1.10

Sulfide Solid Electrolytes—Long-Range and Local Li-Ion Dynamics in the Glass-Ceramic Li_3PS_4 [Denise Prutsch](#); Graz University of Technology, CD-Laboratory for Lithium Batteries, Austria.

SESSION ES13.2: Battery Anodes and Interfaces
Session Chairs: David Mitlin and Yuyan Shao
Tuesday Morning, April 18, 2017
PCC North, 200 Level, Room 227 AB

10:30 AM *ES13.2.01

Observation of Ionic Transport and Electrochemistry at Nanoscale Reza Shabbazian-Yassar; University of Illinois at Chicago, United States.

11:00 AM ES13.2.02

Activation with Li Enables Facile Sodium Storage in Germanium David Mitlin; Clarkson University, Canada.

11:15 AM ES13.2.03

Dendrite-Free Sodium Metal Interface in Highly Concentrated Na⁺-Conductive Inorganic Electrolyte Juhye Song; Hanyang University, Korea (the Republic of).

11:30 AM ES13.2.04

New Insights on SEI Formation and Its Effects on Long-Term Cycling Life of Na/C Batteries Clement Bomnier; Oregon State University, United States.

11:45 AM ES13.2.05

Anode Surface Evolution in Aqueous Sodium-Ion Batteries Xiaowen Zhan; University of Kentucky, United States.

SESSION ES13.3: Electrocatalysis
Session Chairs: David Mitlin and Jin Suntivich
Tuesday Afternoon, April 18, 2017
PCC North, 200 Level, Room 227 AB

1:30 PM *ES13.3.01

The Oxygen Evolution Reaction on Nano-Scaled Perovskites Thomas J. Schmidt^{1,2}; ¹Paul Scherrer Institute, Switzerland; ²ETH Zurich, Switzerland.

2:00 PM ES13.3.02

Electrocatalysis on Epitaxially Grown, Single-Crystal Transition-Metal Oxides Jin Suntivich; Cornell University, United States.

2:15 PM ES13.3.03

Adsorbates Energy during Oxygen Evolution Reaction—A Theory-Experiment Comparison Jan Kloppenburg; UCLouvain, Belgium.

2:30 PM BREAK

3:00 PM *ES13.3.04

Electrocatalytic Challenges in High pH Environment Sanjeev Mukerjee; Northeastern University, United States.

3:30 PM ES13.3.05

Bifunctional CoP and Co-Ni-P Nanowire Electrocatalysts for Efficient and Ultrasensitive Electrochemical Water Splitting Lifeng Liu; International Iberian Nanotechnology Laboratory, Portugal.

3:45 PM ES13.3.06

Unified View of Cation Segregation, Precipitation and Surface Reconstruction in (La,Sr)FeO_{3-δ} Michael L. Machala; Stanford University, United States.

4:00 PM ES13.3.07

Ultrasensitive Probing of the Local Electronic Structure of Nitrogen Doped Carbon and Its Applications to 2D Electronics, Catalysis and Bio-Physics Charles J. Titus; Stanford University, United States.

4:15 PM ES13.3.08

Core/Shell Interface and Surface Nanophase Structure-Controlled Functionality of Metallic Catalysts by Resonant High-Energy X-Ray Diffraction Valeri Petkov; Central Michigan University, United States.

4:30 PM ES13.3.09

Gold Micromeshes as Highly Active Electrocatalysts for Methanol Oxidation Reaction Jingying Sun; University of Houston, United States.

4:45 PM ES13.3.10

Rational Design of Solid Electrode Interface for Highly Reversible Lithium-Metal Battery Snehashis Choudhury; Cornell University, United States.

SESSION ES13.4: Solid-State and Concentrated Electrolytes

Session Chairs: David Mitlin and Jin Suntivich
Wednesday Morning, April 19, 2017
PCC North, 200 Level, Room 227 AB

8:15 AM *ES13.4.01

Evolution of the Lithium Metal/Solid Electrolyte Interface Nancy J. Dudney; Oak Ridge National Laboratory, United States.

8:45 AM ES13.4.02

Engineering Interfaces and Performances for All Solid State Li-Battery Architectures and Novel Types of CO₂ Sensing Devices Based on Li-Garnet Electrolytes Jennifer L. Rupp; Massachusetts Institute of Technology, United States.

9:00 AM ES13.4.03

Atomic Layer Deposition of Conformal Solid State Batteries Alexander Pearse; University of Maryland, College Park, United States.

9:15 AM ES13.4.04

Na₂S Based Glassy Electrolytes for Solid State Sodium Ion Batteries—A Modeling-Based Study Soumik Banerjee; Washington State University, United States.

9:30 AM ES13.4.05

Design of Stable Non-Oxide Sodium Superionic Conductor Amitava Choudhury; Missouri University of Science and Technology, United States.

9:45 AM BREAK

10:15 AM *ES13.4.06

Forming Interphase in Aqueous Media Kang Xu; U.S. Army Research Laboratory, United States.

10:45 AM *ES13.4.07

Ultraconcentrated “Solutions” for Alkali Metal and Multivalent Energy Storage Electrolytes—Common Features and Ionicities C. Austen Angell; Arizona State University, United States.

11:15 AM ES13.4.08

Asymmetric Supercapacitors with Vertically Scaled 3D Porous Current Collectors Husam N. Alshareef; King Abdullah University of Science and Technology (KAUST), Saudi Arabia.

11:30 AM ES13.4.09

In Operando SEM of Plating in All-Solid-State Lithium-Ion Battery with Carbon Anodes Alexander Yulaev^{1,2,3}; ¹National Institute of Standards and Technology, United States; ²University of Maryland, United States; ³University of Maryland, United States.

11:45 AM ES13.4.10

On the Interface and Role of Interlayers between High Voltage Cathode LMNO and Solid State Electrolyte LLZO Alejandro N. Filippin; Empa, Switzerland.

SESSION ES13.5: Li-S/Li-O₂ Batteries
Session Chairs: Yuyan Shao and Wu Xu
Wednesday Afternoon, April 19, 2017
PCC North, 200 Level, Room 227 AB

1:30 PM *ES13.5.01

Anion-Redox Solid Nanolithia Cathode for Li-Ion Battery Jun Lu; Argonne National Laboratory, United States.

2:00 PM ES13.5.02

Real Time Study of a Working Li-Oxygen Battery Using *In Situ* TEM in Organic-Based Liquid Electrolyte Kun He; University of Illinois at Chicago, United States.

2:15 PM ES13.5.03

Enhanced Cycling Stability of Lithium-Oxygen Batteries through *In Situ* Formed Electrode Interface Layers Wu Xu; Pacific Northwest National Lab, United States.

2:30 PM BREAK

3:30 PM *ES13.5.04

Lithium Sulfur Batteries—Fundamental Understanding and Materials Design Yi Cui; Stanford University, United States.

4:00 PM *ES13.5.05

Protected Lithium Anodes for Enhanced Cycle Life of Lithium – Sulfur Batteries Kevin R. Zavadil; Sandia National Labs, United States.

4:30 PM ES13.5.06

Chemical Routes for the Formation of Solid Electrolyte Interphase Layers on Sulfur Cathodes in Li-S/Na-S Batteries Luning Wang; University of Maryl, College Park, United States.

SESSION ES13.6: Li-Ion Batteries—Cathode
Session Chairs: David Mitlin and Lynn Trahey
Thursday Morning, April 20, 2017
PCC North, 200 Level, Room 227 AB

8:15 AM *ES13.6.01

Structural Stability of Layered Oxide Cathode Materials for High Energy Density Lithium Ion Batteries Xiqian Yu; Institute of Physics, Chinese Academy of Sciences, China.

8:45 AM *ES13.6.02

Deterioration of Interfaces/Interphases in Lithium Ion Battery Cathodes and Their Solutions Jaephil Cho; Ulsan National Institute of Science and Technology, Korea (the Republic of).

9:15 AM ES13.6.03

Surface Nano-Coating as a Novel Approach to Improve the Structural Stability of Layered Oxide Cathodes in Li-Ion Batteries Soroosh Sharifi-Asl; UIC, United States.

9:30 AM BREAK

10:00 AM *ES13.6.04

Advanced Diagnosis Tools for Probing Interfaces and Surfaces in Electrochemical Systems Y. Shirley Meng; University of California, San Diego, United States.

10:30 AM *ES13.6.05

Meso and Micron Scale Chemical and Morphological Heterogeneities in High Energy Density Lithium-Ion Electrodes Jagjit Nanda; Oak Ridge National Laboratory, United States.

11:00 AM *ES13.6.06

Insight into Microstructural Evolution in Lithium-Based Batteries by Electron Microscopy Dean J. Miller; Argonne National Laboratory, United States.

11:30 AM ES13.6.07

Depth and Width of Interfaces—Assessment Soft X-Ray Electronic Structure of Battery Electrodes Operando with Hard X-Rays Artur Braun; EMPA, Switzerland.

11:45 AM ES13.6.08

The Dissociation of Dimethyl Carbonate (DMC) on Layered Oxide LiCoO₂(110)—A First-Principles Study Jun Li; NIMTE, China.

SESSION ES13.7: Li-Ion Batteries—Anodes

Session Chairs: Yingge Du and Jun Wang
Thursday Afternoon, April 20, 2017
PCC North, 200 Level, Room 227 AB

1:30 PM *ES13.7.01

Advanced Electron Microscopy Probing of Functioning Mechanisms of Nanoscale Surface Coating Layer for Mitigating Capacity Fading of Lithium Ion Battery Chongmin N. Wang; Pacific Northwest National Lab, United States.

2:00 PM ES13.7.02

Li Ion Intercalation and Conversion Reactions in WO₃ Thin Film Electrodes Studied by *In Situ* TEM Yingge Du; Pacific Northwest National Lab, United States.

2:15 PM ES13.7.03

Artificial Solid Electrolyte Interphase-Protected Li_xSi Nanoparticles—An Efficient and Stable Preolithiation Reagent for Lithium-Ion Batteries Jie Zhao; Stanford University, United States.

2:30 PM ES13.7.04

***In Situ* Electrochemical Atomic Force Microscopy of the Solid Electrolyte Interphase Formed on HOPG in Superconcentrated Electrolyte** Ngoc Duc Trinh^{1,2,3}; ¹Universite de Montreal, Canada; ²Regroupement Québécois pour les matériaux de pointe, Canada; ³Centre Québécois sur les matériaux fonctionnels, Canada.

2:45 PM BREAK

3:15 PM *ES13.7.05

Designing Silicon Based High Energy Cells through Active Materials Surface Modification and Process Optimization Jun Wang; A123 Systems, LLC, United States.

3:45 PM ES13.7.06

Elucidating Li₄Ti₅O₁₂ (111) Surface Evolution upon Electrochemical Cycling Jokin Rikarte; CIC-energiGUNE, Spain.

4:00 PM ES13.7.07

First-Principles Study of the Reduction Mechanisms of Ethylene Carbonate on the Amorphous Lithiated Surfaces of Silicon Anodes in Lithium-Ion Battery Chin-Lung Kuo; National Taiwan University, Taiwan.

4:15 PM ES13.7.08

Multi-Graft Copolymer Polymer Binder for Silicon Anode Tomonori Saito; Oak Ridge National Laboratory, United States.

4:30 PM ES13.7.09

Suppression of Lithium Dendrites using Graphene Oxide Tara Foroozan; University of Illinois at Chicago, United States.

4:45 PM ES13.7.10

Conditioning of Na⁺ Conductivity in a Glass Electrolyte by Dipole - Dipole Interactions, “Role of Electric Dipoles in a Na⁺ Glass Electrolyte” Andrew Murchison; University of Texas Austin, United States.

SESSION ES13.8: Poster Session

Session Chairs: David Mitlin, Yuyan Shao, Jin Suntivich and Lynn Trahey
Thursday Afternoon, April 20, 2017
8:00 PM - 10:00 PM
Sheraton, Third Level, Phoenix Ballroom

ES13.8.01

Amorphous Molybdenum Disulfide as a Hydrogen Evolution Reaction Catalyst for Photoelectrochemical Water Splitting Ahmad M. Fallatah; Iowa State University, United States.

ES13.8.02

Computational Insights to Charge Transfer Reactions at Electrode/SEI/Electrolyte Interface Yunsong Li; Michigan State University, United States.

- ES13.8.03**
Electrochemical Impedance Spectroscopy Investigation of Solid-Electrolyte Interphase Formation in Lithium-Ion Battery Anodes [Yige Li](#); University of California, Riverside, United States.
- ES13.8.04**
Tungsten Disulfide as a Photocatalyst for Efficient Solar Water Splitting [Tian Lan](#); Iowa State University, United States.
- ES13.8.05**
Metal-Organic Frameworks Derived Metal Embedded Carbons Materials as Catalysts for Efficient Electrocatalysis [Yan Liang](#); Monash University, Australia.
- ES13.8.06**
Co and N Co-Doped Carbon Nanotubes for Efficient Oxygen Reduction Reaction Electrocatalyst [Yinggang Zhu](#); South University of Science and Technology of China, China.
- ES13.8.07**
Controllable Synthesis of Inorganic Electrocatalysts for Energy Conversion Related Reactions [Yong Zhao](#); Henan University, China.
- ES13.8.08**
The Effect of Electrochemical Modification of the Glass Carbon Surface in Conditions of Chemisorption of Fluorine-Containing Nanogroups on Its Electrophysical Properties [Sergey M. Karabanov](#); Ryazan State Radioengineering University, Russian Federation.
- ES13.8.09**
Designing Bifunctional Catalyst for Oxygen Reduction/Evolution Reactions with Long Life Time and High Efficiency [Niranjanmurthi Lingappan](#)^{1,2}; ¹Sungkyunkwan University, Korea (the Republic of); ²Center for Integrated Nanostructure Physics, Korea (the Republic of).
- ES13.8.10**
 α -Hematite -Molybdenum Disulfide Nanocomposite Films for Photoelectrochemical Applications [Hussein S. Alrobei](#); University of South Florida, United States.
- ES13.8.11**
Silicon Nanoparticles-Conducting Hydrogel Composite Wrapped with Reduced Graphene Oxide as Anodes for Lithium-Ion Batteries [Changling Li](#); University of California, Riverside, United States.
- ES13.8.12**
Using COMSOL to Study Electrochemical Dynamics at Electrode-Electrolyte Interface of a Lithium-Ion Electrode [Bo Dong](#); University of California, Riverside, United States.
- ES13.8.13**
Efficient Nanostructured Brass for Water-Splitting Applications [Dina S. Eissa](#); American University in Cairo, Egypt.
- ES13.8.14**
CeO₂ Doped FeN_x/C Catalyst with Enhanced Durability toward Oxygen Reduction Reaction [Jianguo Liu](#); Nanjing University, China.
- ES13.8.15**
Using *In Situ* Neutron Reflectometry to Study Solid-Electrolyte Interphase Formation in aSi and Sn Anode Materials [Jim Browning](#); Oak Ridge National Laboratory, United States.
- ES13.8.16**
Controlled Crystallization of Cesium Lead Halide Perovskite Films on Modified TiO₂ Surfaces for Photovoltaic Applications [Kara Saunders](#); University of Arizona, United States.
- ES13.8.17**
***In Situ* Characterization of ZnO Formation during Electrodeposition of Zn** [Dian Yu](#); University of California Los Angeles, United States.
- ES13.8.18**
Characterization of Lithium Batteries Electrodes Using Glow Discharge Optical Emission Spectrometry [Matthieu Chausseau](#); HORIBA Scientific, United States.
- ES13.8.19**
Study of Cuprate Thin Film Heterostructures Combining La₂CuO₄ and LaCuO_{3- δ} for Fuel Cell Applications [Nicholas A. Prill](#); University of St. Thomas, United States.
- ES13.8.20**
Selective Electrochemical Reactions on Superhydrophobic Plastron-Supporting Electrodes [Hamed Mehrabi](#); University of Arkansas, United States.
- ES13.8.21**
Nanoscale Surface Evolution in Li-Rich Mn-Rich Layered Oxide Cathodes [Chengcheng Fang](#); University of California, San Diego, United States.
- ES13.8.22**
Microscopic Origin of High Open Circuit Voltage in Solid State Dye Solar Cells with Polymer Electrolyte [Tea-Yon Kim](#); Hanyang Univ, Korea (the Republic of).
- ES13.8.23**
Lithiation Mechanism and Lithium Storage Capacity of Reduced Graphene Oxide Nanoribbons—A First-Principles Study [Chin-Lung Kuo](#); National Taiwan University, Taiwan.
- ES13.8.24**
Surface and Interface Engineering of Lithium Metal Anodes for Next Generation Secondary Batteries [Taner Zerrin](#); University of California Riverside, United States.
- ES13.8.25**
Pushing the Cycling Stability Limit of Polypyrrole for Supercapacitors [Tianyu Liu](#); University of California, Santa Cruz, United States.
- ES13.8.26**
Nanopores Reveal Interface and Mesoscale Ion Transport Properties of LiClO₄-PMMA Gel [Timothy S. Plett](#); University of California, Irvine, United States.
- ES13.8.27**
Aqueous Solutions of Protic Ionic Liquids for Enhanced Stability of Polyoxometalate-Carbon Supercapacitor Electrodes [Chenchen Hu](#)^{1,2}; ¹Georgia Institute of Technology, United States; ²Huazhong University of Science and Technology, China.
- ES13.8.28**
Template-Free Synthesis of N, P and S Ternary-Doped 3D Aerogel of Graphene-Based Carbon as Excellent Electrocatalyst for the Oxygen Reduction Reaction [Md. Selim Arif Sher Shah](#); Sungkyunkwan University, Korea (the Republic of).
- ES13.8.29**
Alkali Metal Fullerides—Applications in Electrochemical Energy Storage [Kurumi R. Austin](#); The University of Arizona, United States.
- ES13.8.30**
All-Solid-State Batteries Based on Nanocrystalline LiBH₄ [Marlena Uitz](#); Graz University of Technology, CD-Laboratory for Lithium Batteries, Austria.
- ES13.8.31**
Lower Symmetry Bimetallic (Co & Fe) Corrole N4 as an Efficient Electrocatalyst for Oxygen Reduction Reaction [Satyanarayana Samireddi](#)^{2,3}; ²Academia Sinica, Taiwan; ³National Tsing Hua University, Taiwan.
- ES13.8.32**
Improved Ionic Conductivity in NASICON-Type Sr²⁺ Doped LiZr₂(PO₄)₃ [Sunil Kumar](#); Indian Institute of Technology Indore, India.
- ES13.8.33**
Molecular Ni-Complex Containing Tetrahedral Nickel Selenide Core as Highly Efficient Electrocatalyst for Oxygen Evolution Reaction in Alkaline Medium [Manashi Nath](#); Missouri University of Science and Technology, United States.

ES13.8.34**Novel Battery Architecture for Next Generation Lithium Ion Battery Materials Based on Sulfur and Silicon Utilizing Smart Lithium**Placement [Rachel Ye](#); University of California, Riverside, United States.

SESSION ES13.9: Interfaces/Interphases—Characterization/Simulation

Session Chairs: Yuyan Shao and Lynn Trahey

Friday Morning, April 21, 2017

PCC North, 200 Level, Room 227 AB

8:15 AM *ES13.9.01***In Situ* and Operando Investigations of Electrochemical Interfaces Using Ambient Pressure XPS** [Ethan J. Crumlin](#)^{1,2}; ¹Lawrence Berkeley National Laboratory, United States; ²Lawrence Berkeley National Laboratory, United States.**8:45 AM ES13.9.02****Structures at the Solid-Ionic Liquid Interface—A Complementary X-Ray Reflectivity and Molecular Dynamics Approach** [Andreas Magerl](#); University of Erlangen-Nurnberg, Germany.**9:00 AM ES13.9.03****Ultrasensitive Probing of Local Electronic Structure in the Soft X-Ray Regime** [Dennis Nordlund](#); SLAC National Accelerator Laboratory, United States.**9:15 AM ES13.9.04****Ultrafast Current-Voltage Measurements in Scanning Probe Microscopy** [Suhas Somnath](#); Oak Ridge National Laboratory, United States.**9:30 AM ES13.9.05****Enabling Local Electrochemistry with Fast, High-Resolution Scanning Probe Microscopy** [Nathan D. Kirchofer](#); Asylum Research, United States.**9:45 AM BREAK****10:15 AM *ES13.9.06****Understanding the Nature of Chemical and Electrochemical Stability of Electrolytes at Mg Anode Surfaces** [David Prendergast](#); Lawrence Berkeley National Lab, United States.**10:45 AM *ES13.9.07****Modeling Spatial Heterogeneity and Potential Effects at Battery Reactive Anode/SEI Interfaces** [Kevin Leung](#); Sandia National Laboratories, United States.**11:15 AM ES13.9.08****Validating Structure of the Solid/Liquid Interface with First Principles Molecular Dynamics and X-Ray Reflectivity** [Kendra Letchworth-Weaver](#); Argonne National Laboratory, United States.**11:30 AM ES13.9.09****Towards Realistic Continuum Models of Electrified Interfaces** [Artem Baskin](#)^{1,2}; ¹Lawrence Berkeley National Lab, United States; ²Lawrence Berkeley National Laboratory, United States.**11:45 AM ES13.9.10****Uncovering the Interfacial Properties of Hybrid Perovskite Films on Metal Oxides via Conductive Probe AFM** [James G. Stanfill](#); University of Arizona, United States.

SESSION ES13.10: High Temperature Electrochemistry

Session Chairs: Yuyan Shao and Lynn Trahey

Friday Afternoon, April 21, 2017

PCC North, 200 Level, Room 227 AB

1:30 PM ES13.10.01**Improving Oxygen Electrocatalysis in Perovskite Thin Films by Epitaxial Strain** [Dongkyu Lee](#); Oak Ridge National Laboratory, United States.**1:45 PM ES13.10.02*****In Situ* Probing of Interfacial Phenomena in Solid Oxide Electrochemical Cells** [Jiaxin Zhu](#); University of Massachusetts Amherst, United States.**2:00 PM ES13.10.03****Colloidal Nanocrystal Films as Model Materials for Intermediate Temperature Proton Conductivity in Porous Metal Oxides** [Gary K. Ong](#)^{2,1}; ¹University of Texas at Austin, United States; ²University of California, Berkeley, United States.**2:15 PM ES13.10.04****Interfaces in Doped LaGaO₃ and Their Impact on Solid Oxide Fuel Cell Performance** [Aoife K. Lucid](#); Trinity College Dublin, Ireland.**2:30 PM ES13.10.05****Evolution in Crystal Structure and Electronic Structure of Functional Oxides Probed *In Situ* during Electrochemically Driven Phase Transition** [Qiyang Lu](#)^{1,2}; ¹Massachusetts Institute of Technology, United States; ²Massachusetts Institute of Technology, United States.**2:45 PM ES13.10.06****Sodium-Based Batteries—Engineering Interfaces for Optimized Performance** [Erik D. Spörcke](#); Sandia National Laboratories, United States.**3:00 PM ES13.10.07****The Impact of Interfaces on Oxide Ion Diffusion in Doped Ceria** [Aoife K. Lucid](#); Trinity College Dublin, Ireland.