



2019 **MRS**<sup>®</sup>  
 SPRING MEETING & EXHIBIT  
 April 22–26, 2019 | Phoenix, Arizona  
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# CALL FOR PAPERS

Abstract Submission Opens—September 28, 2018  
 Abstract Submission Deadline—October 31, 2018 (11:59 PM ET)

REMINDER: *In fairness to all potential authors, late abstracts will not be accepted.*

## Symposium CP03: Advances in *in situ* Techniques for Diagnostics and Synthetic Design of Energy Materials

Discovery of new functional materials has always been at the forefront of energy technologies. While tremendous R&D efforts are needed for the long journey from the early material discovery to the use in real devices, they often rely on the tools and techniques for material diagnostics and synthetic design. Over the last decade, much progress has been made in developing electron, X-ray and neutron based *in situ* diagnostic techniques enabling the investigation of time dependent structural and chemical changes within materials, at interfaces and in devices under real working conditions. In particular, the recent development in sample environment and *in situ* capabilities open new opportunities for probing electron, proton, lithium, oxygen, and other charge/mass carriers, and tracking their transport in liquid, solid and across liquid-solid/solid-solid interfaces. This symposium focuses on advances in electron, X-ray and neutron scattering, spectroscopy, spectro-imaging techniques of improved spatial/temporal resolution and chemical sensitivity and their use in characterizing materials, interfaces and devices relevant to energy sciences. Applications include electrochemical energy storage, fuel cells, photocatalysis, photovoltaics, thermoelectrics and nuclear energy systems.

### Topics will include:

- Emerging techniques in electron, X-ray and neutron scattering, diffraction, spectroscopy, and holography for energy sciences
- Advances in spectro-imaging of liquid, solid and liquid-solid/solid-solid interfaces in energy technology devices
- *In situ, operando* techniques for probing materials, interfaces and devices under working conditions
- Advances in ultrafast diffraction, spectro-imaging for capturing metastable and transient states in organic/inorganic materials during chemical/photochemical/electrochemical reactions and other dynamic processes
- Techniques/approaches for multimodal characterization at multiple spacial dimensions and time scales
- Fundamental understanding and controlling of radiation damage by intense electron, X-ray and neutron beams
- *In situ* investigation of reactions and transformation in molecules, particles, thin films and solids in the gas, liquid or solid state during synthesis or processing of materials for energy technology

A tutorial complementing this symposium is tentatively planned. Further information will be included in the MRS Program that will be available online in January.

### Invited speakers include:

<b>Jianming Bai</b>	Brookhaven National Laboratory, USA	<b>Anatoly Frenkel</b>	Stony Brook University, USA
<b>Mahalingam Balasubramanian</b>	Argonne National Laboratory, USA	<b>Ashfia Huq</b>	Oak Ridge National Laboratory, USA
<b>Hendrik Bluhm</b>	Lawrence Berkeley National Laboratory, USA	<b>Robert Schlögl</b>	Fritz Haber Institute of the Max Planck Society, Germany
<b>Jennifer Dionne</b>	Stanford University, USA	<b>Jeroen van Bokhoven</b>	Swiss Federal Institute of Technology Zurich, Switzerland
<b>Zhenxing Feng</b>	Oregon State University, USA	<b>Renske van der Veen</b>	University of Illinois at Urbana-Champaign, USA

### Symposium Organizers

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### Keywords for Abstract Submission

Diagnostics, Energy Materials, *in situ*, spectro-imaging, Synthetic Design, X-rays