

**Industrial Physics Forum on
Mesoscale Science and Technology of Materials and Metamaterials**

*At the AVS International Symposium and Exhibition
October 19-20, 2015, San Jose Convention Center*

Monday 10/19/2015, Room: 210F

Session IPF1+MS Materials for Energy Generation and Storage, 8:20-10:20 am, *Moderator: Gary Rubloff, University of Maryland*

Sang Bok Lee, University of Maryland, "Synthesis and behavior of Nanostructures in Mesoscale Architectures"

William Carter, HRL Laboratories, LLC, "Ultralight Microlattices: Defining the Limits of Lightweight Materials"

Eli Yablonovitch, Univ. California, Berkeley, "Can Opto-Electronics Provide the Motive Power for Future Vehicles?"

Symposium-wide break, 10:20 – 10:40 am

Session IPF2+MS Mesoscale Phenomena in the Biosciences, 10:40-12:00 am and 2:20-3:40 pm, *Moderator: Carolyn Larabell, University of California, San Francisco*

William Bentley, University of Maryland, "The Convergence of Synthetic Biology and Biofabrication: Guiding Biological Function at the Mesoscale"

Anna Balazs, University of Pittsburgh, "Using Mesoscale Modeling to Design Materials That Compute: Coupling Self-Oscillating Gels and Piezoelectric Films"

Lunch break 12:00 - 2:20 pm

(Session IPF2+MS continued)

Gerry McDermott, University of California, San Francisco, "Mesoscale Imaging in Cell Biology"

Elizabeth Lobo, North Carolina State University, "Biomimetic Material Approaches to Tissue Engineering, Regenerative Medicine, and Wound Healing"

Session: IPF3+MS Metamaterials, 3:40-5:40 pm, *Moderator: Mark Brongersma, Stanford University*

Federico Capasso, Harvard University, "Flat Optics based on Metasurfaces: Molding Wavefronts and Surface Waves"

Nader Engheta, University of Pennsylvania, "Quest for Extreme Photonics"

Tony Heinz, SLAC & Stanford University, "2D Materials: Graphene and Beyond"

Tuesday 10/20/2015, Room: 210F

Session: IPF4+MS Degradation Science, 8:00-10:00 am, *Moderator: Alain Diebold, SUNY College of Nanoscale Science and Engineering.*

Roger French, Case Western Reserve University, "Mesoscale Evolution & Temporal Analytics of Photovoltaic Energy Materials: A Degradation Science Approach"

Anthony Rollett, Carnegie-Mellon University, "Why Structural Failure is Mesoscale: From Dislocations to Fatigue Cracks"

Paul Braun, University of Illinois at Urbana-Champaign, "Engineered 3D Mesoscale Battery Electrodes: Opportunities and Issues"

Symposium-wide break, 10:00 – 11:00 am (free coffee in Exhibit Hall)

Session: IPF5+MS Electrochemistry from Nano to Meso Scale, 11:00 am -12:20 pm, *Moderator: Stacey Bent, Stanford University.*

Kristin Persson, Lawrence Berkeley National Laboratory, "A Materials Genome Approach to Design of Novel Materials and Liquids for Energy Conversion and Storage"

Henry White, University of Utah, "Electric Double Layer-Limited Operation of Solid-State Thin Film Batteries"

Lunch break, 12:20 - 2:20 pm

Session: IPF5+MS Frontiers in Physics, 2:20 - 6:20 pm, *Moderator: Jim Hollenhorst, Agilent*

Angela Belcher, Massachusetts Institute of Technology, "Giving New Life to Materials for Energy, the Environment and Medicine"

John Spence, Arizona State University, "XFEL movies of molecular machines at work"

Symposium-wide break, 3:40 - 4:20 pm

Moderator: Cathy O'Riordan, AIP

Susan K. Avery, Woods Hole Oceanographic Institution, "Frontiers in Ocean Sensing"

Joel Moore, University of California Berkeley, "New states of electronic matter and their potential for science and computation"

Michael Zucker, Massachusetts Institute of Technology, "The Universe in Motion: Listening to Gravitational Waves with LIGO"