



2020 **MRS**<sup>®</sup>  
 SPRING MEETING & EXHIBIT  
 April 13–17, 2020 | Phoenix, Arizona  
 mrs.org/spring2020

# CALL FOR PAPERS

Abstract Submission Opens—September 26, 2019

Abstract Submission Closes—October 31, 2019 (11:59 PM ET)

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

## Symposium CT06: Local and Global Fluctuations in Plasticity

Many materials exhibit large fluctuations in their plastic response that, for example, can be a result of abrupt changes in the evolving dislocation network, collective depinning from static or dynamic pinning points, strain localization into shear bands, phase transformations, etc. All of these processes led to spatiotemporal plastic deformation dynamics in a variety of materials, such as pure single and poly crystals, solid solutions, high-entropy alloys, or glassy systems. In this symposium, we seek to discuss the underlying structural mechanisms for strain localization, avalanche dynamics, and intermittent deformation across all length and time-scales of metals or condensed matter in general. We also welcome topics that focus on the evolution of defect populations and how this dictates the macroscopic behavior in response to a thermal or mechanical stimulus. The symposium aims at covering the experimental characterization of these fluctuation phenomenon, novel model development, and also simulations and theory.

The *Local and global fluctuations in plasticity* symposium brings together a broad range of materials researchers for a technical exchange and a discussion of the scientific issues driving research in this field.

### Topics will include:

- Discrete deformation of crystalline materials across all length scales
- Shear-band formation and dynamics in metallic glasses
- Dislocation avalanche dynamics
- Dislocation network evolution
- Structural excitations and defect distributions in metallic glasses
- Intermittency in fracture
- Serrated flow of high entropy alloys
- Avalanches in granular and other disordered materials
- Statistical characterization of intermittent deformation and self-organized critical behavior
- General theory and microstructural modelling describing avalanche behavior
- Emerging experimental methods to trace intermittent deformation in single as well as polycrystalline systems
- Constitutive model development for strain localizing materials
- Incorporating structural and temporal stochasticity in theories of deformation and failure

### Invited speakers include:

<b>Wei Cai</b>	Stanford University, USA	<b>Tomoaki Niiyama</b>	Kanazawa University, Japan
<b>Yinan Cui</b>	Tsinghua University, China	<b>Darren Pagen</b>	Cornell University, USA
<b>Michael Falk</b>	Johns Hopkins University, USA	<b>Ruitao Qu</b>	Institute of Metal Research, Chinese Academy of Sciences, China
<b>Yue Fan</b>	University of Michigan, USA	<b>David Rodney</b>	Université de Lyon, France
<b>Daniel Gianola</b>	University of California Santa Barbara, USA	<b>Anne Tanguy</b>	INSA Lyon, France
<b>Eric Homer</b>	Brigham Young University, USA	<b>Lev Truskinovsky</b>	École Supérieure de Physique et de Chimie Industrielles, France
<b>Todd Hufnagel</b>	Johns Hopkins University, USA	<b>Alexei Vinogradov</b>	Norwegian University of Science and Technology, Norway
<b>Abigail Hunter</b>	Los Alamos National Laboratory, USA	<b>Gang Wang</b>	Shanghai University, China
<b>Lasse Laurson</b>	Tampere University, Finland	<b>Gerhard Wilde</b>	University of Münster, Germany
<b>Jaime Marian</b>	University of California Los Angeles, USA	<b>Jian-Min Zuo</b>	University of Illinois at Urbana-Champaign, USA
<b>Amit Misra</b>	University of Michigan, USA		

### Symposium Organizers

#### Robert Maass

University of Illinois at Urbana-Champaign  
 Department of Materials Science and Engineering  
 USA  
 Tel 2179044329, rmaass@illinois.edu

#### Irene Beyerlein

University of California Santa Barbara  
 Department of Mechanical Engineering  
 USA  
 Tel 1 805 893-4458, beyerlein@engineering.ucsb.edu

#### Peter Derlet

Paul Scherrer Institut  
 Condensed Matter Theory Group  
 Switzerland  
 Tel +41 (0)56 310 3164, peter.derlet@psi.ch

#### Peter Ispanovity

Eötvös Loránd University  
 Department of Materials Physics  
 Hungary  
 Tel 36 1 372 2812, ispanovity@metal.elte.hu