

CALL FOR ABSTRACTS

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**TMS 2018**  
147<sup>th</sup> Annual Meeting & Exhibition



**MARCH 11 – 15, 2018**  
**PHOENIX, ARIZONA**

**SUBMIT AN ABSTRACT TO:**

## **MATERIALS DESIGN**

### **INTEGRATIVE MATERIALS DESIGN III: PERFORMANCE AND SUSTAINABILITY**

The challenges in modern materials design revolve around the successful integration of several important and sometimes competing concepts such as performance and reliability, sustainability and societal impact, and economics. This context generates fertile opportunities for the ingenious materials engineer to develop a holistic approach in which experimental, analytical, and computational knowledge is coupled with suitable and sustainable application-driven design and manufacturing strategies, ultimately leading to a final component with the right balance between performance, manufacturability, sustainability, and affordability.

This symposium will address these aspects in the context of needs and developments, focusing on important factors that contribute to material-process-component design, performance, and sustainability. Topics will include fundamental developments and design considerations related to:

- Effects of traditional and novel bulk and surface processes on micro-/nano-structure evolution of materials (e.g. cast and wrought alloy processing, additive manufacturing, cold spray technology, gradient and functional materials fabrication, friction stir welding/processing, metal matrix (nano) composites, shot/laser-shock/ultrasonic/cavitation peening, low plasticity burnishing, etc.)
- Multi-scale microstructural effects on the behavior of materials (i.e., static properties, fatigue, fatigue crack growth, thermo-mechanical fatigue, impact, high-temperature properties and creep) and their integration in design
- Interfacial and residual stress effects (both surface and bulk—measurement, effects on properties and life, and design approaches)
- Advanced material/behavior characterization methods (e.g. DIC, EBSD, tomography, and other in-situ and ex-situ methods)
- Testing advances and non-destructive evaluation techniques for damage detection and monitoring
- Advances in integrated computational materials engineering (ICME) related to microstructure and properties simulation and prediction
- Sustainable approaches to material-process-component design, life-cycle analyses, and recycling considerations

A student poster competition will be held. To be considered for this competition, select “Student Poster” as your presentation type when submitting your abstract.

## **ORGANIZERS**

**Diana A. Lados**, Worcester Polytechnic Institute, USA

**Brad Boyce**, Sandia National Laboratories, USA

**Corbett Battaile**, Sandia National Laboratories, USA

**Anastasios Gavras**, Riley Power, USA

## **SPONSORS**

TMS Materials Processing & Manufacturing Division; TMS Structural Materials Division

TMS Integrated Computational Materials Engineering Committee; TMS Mechanical Behavior of Materials Committee; TMS Additive Manufacturing Bridge Committee

**ABSTRACT DEADLINE IS JULY 1, 2017. SUBMIT ONLINE AT [www.programmaster.org/TMS2018](http://www.programmaster.org/TMS2018).**

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