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**TMS2019**  
 148<sup>th</sup> Annual Meeting & Exhibition

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March 10–14, 2019  
 San Antonio, Texas, USA

**JOIN US FOR THIS TMS2019 SYMPOSIUM:**

**MATERIALS PROCESSING**

**Heterogeneous and Gradient Materials (HGM III): Tailoring Mechanical Incompatibility for Superior Properties**

This third international symposium will focus on the fundamental science and technology of Heterogeneous and Gradient Materials (HGM), which include, but are not limited to, gradient materials, heterogeneous materials, laminate materials, dual-phase materials, materials with voids, etc. HGM is characterized with large mechanical incompatibility among heterogeneous structural and/or compositional domains. The length scale of the heterogeneity could be in some cases comparable to the dimensions of the component. The large mechanical incompatibility leads to much higher non-uniform deformation than what is normally observed in conventional materials. This unique deformation behavior is reported to produce a superior combination of high strength and ductility that is not accessible to either nanostructured or coarse-grained homogeneous materials.

HGM represent an emerging area that is expected to become a major research field for the communities of materials, mechanics and physics in the next few years. The HGM strategy is not only capable of producing structural materials with unprecedented mechanical properties, but also efficient for developing multifunctional materials. Innovative top-down or bottom-up approaches and material architectures, some of which may be bio-inspired, need to be explored and developed to produce HGMs with superior or disruptive properties. There are many fundamental issues that need to be studied by experiments, analytical modeling and computer modeling. Particularly, interface engineering and interface-related phenomena such as strain gradient and back-stress buildup and their effect on the global properties are critical issues. This symposium, and the future biannual symposia that follow, will act as a forum to bring multidisciplinary researchers together to exchange ideas, discuss key issues, and promote industrial technology development for commercial production and applications.

**ORGANIZERS**

**Yuntian Zhu**, North Carolina State University, USA

**Kei Ameyama**, Ritsumeikan University, Japan

**Irene J. Beyerlein**, University of California Santa Barbara, USA

**Yves J.M. Brechet**, Grenoble-INP, France

**Huajian Gao**, Brown University, USA

**Hyoungh Seop Kim**, Pohang University of Science and Technology, South Korea

**Ke Lu**, Institute of Metal Research, China

**Xiaolei Wu**, Chinese Academy of Sciences, China

Nearly 4,000 presentations are planned at more than 80 symposia at TMS2019.

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