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SUBMIT AN ABSTRACT TO:

NANOSTRUCTURED MATERIALS

HETEROSTRUCTURED AND GRADIENT MATERIALS (HGM IV): TAILORING HETEROGENEITY FOR SUPERIOR PROPERTIES

This is the fourth international symposium, which will focus on the fundamental science and technology of Heterostructured and Gradient Materials (HGM), which include, but are not limited to, heterostructured materials, gradient materials, laminate materials, dual-phase materials, harmonic (core-shell) materials, etc. HGM is characterized with large differences in mechanical behaviors among heterostructured zones. The large mechanical incompatibility leads to strong inter-zone interactions. This produces back stress in the soft zones and forward stress in the hard zones, which collectively produce hetero-deformation induced (HDI) strengthening to enhance yield strength and extra HDI work hardening, in addition to conventional dislocation hardening, to retain ductility. This unique deformation behavior is reported to produce a superior combination of high strength and high ductility that is not accessible to either nanostructured or coarse-grained homogeneous materials.

HGMs represent an emerging class of materials 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 banding, strain gradient near zone interfaces, geometrically necessary dislocations, and evolution and interaction of internal stresses 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.

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Abstract Deadline is July 1, 2020. Submit online at www.programmaster.org/TMS2021.

Questions?
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