Special Issue

Heterogeneous Nanostructuring for Enhanced Mechanical Properties in Metallic Materials

Message from the Guest Editor

Metals and their alloys are major workhorse materials in industrial and structural applications—largely because they exhibit high levels of deformability that permit arbitrary changes in shape without cracking—and continue to remain irreplaceable even today. Recently, heterostructured (HS) materials are emerging as a major research field because of their superior properties and excellent application potential. Heterodeformation-induced (HDI) strengthening and HDI hardening are responsible for the superior mechanical properties of HS materials and are major factors determining their mechanical behavior, complementing conventional dislocation-based strengthening and hardening to provide additional enhancements in strength and ductility. In addition, grain boundaries and interphase interfaces in metals have been shown to play a fundamental role in material properties such as strength, fracture resistance, work hardening, and damage evolution. In particular, heterophase interfaces play a crucial role in deformation microstructures and thus govern the mechanical properties of multilayered composites.

Guest Editor

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Nanoscience and nanotechnology are exciting fields of research and development, with wide applications to electronic, optical, and magnetic devices, biology, medicine, energy, and defense. At the heart of these fields are the synthesis, characterization, modeling, and applications of new materials with lower nanometer-scale dimensions, which we call “nanomaterials”. These materials can exhibit unusual mesoscopic properties and include nanoparticles, coatings and thin films, metal–organic frameworks, membranes, nano-alloys, quantum dots, self-assemblies, 2D materials such as graphene, and nanotubes. Our journal, *Nanomaterials*, has the goal of publishing the highest quality papers on all aspects of nanomaterial science to an interdisciplinary scientific audience. All of our articles are published with rigorous refereeing and open access.

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