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Dynamic Behavior of Materials VI – An SMD Symposium in Honor of Professor Marc Meyers

The dynamic behavior of materials encompasses a broad range of phenomena associated with extreme environment and with relevance to technological applications in military and civilian sectors. The field of dynamic behavior of materials comprises diverse phenomena such as deformation, fracture, fragmentation, shear localization, damage dissipation, chemical reactions under extreme conditions, and processing (combustion synthesis; shock compaction; explosive welding and fabrication; shock and shear synthesis of novel materials). It has evolved considerably in the past twenty years and is now at a stage where its significance to all classes of materials, including metals, ceramics, polymers, and composites, is becoming relevant. It is recognized today, as evidenced by the contributions herein, that materials aspects are of utmost importance in extreme dynamic loading events. The macro mechanical and physical processes that govern the phenomena manifest themselves at the microstructural level, by dazzling complexity of defect configurations and effects. Nevertheless, these processes/mechanisms can be quantitatively treated on the basis of accumulated knowledge. We are entering an exciting stage where our capabilities, from continuum and molecular dynamics computations, enable realistic predictions of materials performances and are starting to guide not only the design process but also our further micromechanical understanding of deformation processes at every level, including the basic dislocation mechanisms. The multiple technology applications of this field include crashworthiness, machining, and important military effects of armor and projectile designs, ballistic penetrations, and explosive dynamics leading in general to the design of conventional and nuclear weapons. Applications in the medical field are also becoming important, with recent developments aimed at understanding traumatic brain injury and drug delivery. The dynamic behavior of materials during processing, including during compaction, synthesis, welding, forming, etc., is also of considerable importance. The symposium organizers hope that, through the publication of the symposium articles, the materials community will become more exposed to this research field.

Organizers for this symposium include:

Naresh Thadhani, Georgia Institute of Technology
Rusty Gray, Los Alamos National Laboratory

Abstract Deadline is July 1, 2013.
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