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CALL FOR PAPERS

ABSTRACT DEADLINE: JUNE 21, 2005

REMINDER: *In fairness to all potential authors, late abstracts will not be accepted.*

MRS Symposium H: Multifunctional Energetic Materials

Synthetic multifunctional materials (SMFM) are substances that are intended to perform more than one function in a system. Most often, SMFM integrate desirable mechanical characteristics with at least one other designed functionality. Multifunctional energetic materials (MFEM) are a subset of SMFM that are concerned with the manipulation and storage of chemical energy.

In recent years, many techniques have been developed that make it possible to exploit the benefits of the "nano" structure and to design energetic materials with desired energy release rates and energy densities, while also improving their safety and reliability as well as providing load-bearing capability. At the same time, advances in modeling and characterization of the nanostructure have made it possible to determine the mechanisms controlling the thermal, chemical, and mechanical behavior of nanomaterials. The design, preparation, processing, characterization, modeling, and applications of these materials are important for new materials and systems in the areas of defense, aerospace, homeland security, and microelectronics. An in-depth fundamental understanding of their synthesis and fabrication mechanisms, atomic- and molecular-scale structural characteristics and modeling, and correlation of the structure with properties is required to realize the full potential of MFEM.

Papers are solicited in the following areas:

- Methods of fabrication, e.g., from sol-gel techniques, vapor-phase deposition, self-propagating high-temperature or combustion reactions, critical phenomena (extreme thermodynamics), and mechanical alloying
- Processing techniques for MFEM (e.g., sintering, pressing, extrusion, and passivation)
- Modeling and characterization of multifunctional energetic materials
- Design and simulation capabilities for MFEM and their integration into systems
- Chemical, thermal, and mechanical properties of energetic or reactive materials
- Impact/shock initiation of reactions; shear banding and (hot-spot) heating; and nano-shock
- Research-based applications of MFEMs

A half-day tutorial on subjects associated with synthesis, toxicology, fast/shock reaction characteristics, and applications of energetic and reactive nanomaterials is tentatively planned. Further information will be included in the program that will be available in September.

Invited speakers (tentative) include: **Troy Barbee** (Lawrence Livermore National Lab), **Andrew Barron** (Rice Univ.), **Barbara Baschung** (STL, France), **Patrick Broussard** (Defence Ministry of Canada), **Joe Cochran** (Georgia Inst. of Technology), **Dana Diott** (Univ. of Illinois), **G. Drake** (AFRL/PRSP), **Ed Driezden** (NJIT), **Keith Gonthier** (Louisiana State Univ.), **William Grise** (Morehead State Univ.), **Prakash Joshi** (Physical Sciences, Inc.), **Andrew Kesby** (DSTL, United Kingdom), **Marie Kissinger** (Univ. of Florida), **Michael Kramer** (Eglin AFB), **John Moore** (Colorado School of Mines), **Vitali Nesterenko** (Univ. of California-San Diego), **Michelle Pantoya** (Texas Tech Univ.), **Suhitha Peiris** (NSWC-Indian Head), **William Proud** (Univ. of Cambridge, United Kingdom), **Jan Puszynski** (South Dakota School of Mines), **Betsy Rice** (Army Research Lab), **Steve Son** (Los Alamos National Lab), **C. Suryanarayana** (Univ. of Central Florida), **Alex Tappan** (Sandia National Labs), **Fred Tepper** (Argonide Corp.), **Albert van der Steen** (TNO PML, The Netherlands), **Timothy Weihs** (Johns Hopkins Univ.), **Dennis Wilson** (Nanotechnologies, Inc.), and **Michael Zachariah** (Univ. of Maryland).

Symposium Organizers

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