2005 Boston, MA FALL MEETING NOVEMBER 28 - DECEMBER 2

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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 Q: Degradation Processes in Nanostructured Materials

While degradation processes are initiated at molecular (subnanometer) scale, the nanostructure and nanoconfinement of materials alter the degradation processes occurring in materials at micron or larger scales and eventually trigger new degradation routes. The symposium aims to initiate a debate over the effect of nanometer-scale structure and confinement on degradation processes and to analyze the experimental and theoretical approaches used to estimate the lifetime of nanostructured and nanoconfined materials in various environments. The authors are cordially invited to submit contributions that reveal, analyze, quantify, and model the effect of nanometer-scale structure and confinement on degradation processes.

The symposium will concentrate on the following major topics:

- Degradation processes in magnetic nanostructured materials for spintronics and quantum computing
  It was speculated that neutrons' background at earth level will shuffle the orientation of the electronic spins via the electron spin - neutron spin interaction, affecting the reliability and reducing the lifetime of magnetic nanostructured materials. The survivability of these materials in hostile environments has not yet been assessed.
- Degradation processes in self-assembled materials
  Various materials, such as block copolymers, exhibit self-assembly capabilities that result in ordered structures at nanometer scale. The degradation effect on the nanostructure of self-assembled materials has a tremendous technological importance. An instructive example is the effect of the environment on the drug-release kinetics.
- Degradation processes in nanostructured and nanopatterned materials
  The modification of degradation processes occurring in electronic and photonic nanostructured or nanopatterned materials due to their nanometer-scale structure.
- Effect of nanometer scale structure and confinement on degradation processes
  This topic will collect contributions focused on nanowires, ultrathin films, multilayers, and quantum dots. Recent studies revealed that, in confined materials, some specific transition temperatures (such as the glass transition temperature in polymers or the Curie temperature in magnetic materials) depend on the size of the confinement. Hence, the degradation of these materials is expected to be controlled by their nanoconfinement and nanostructure.
- Effect of hostile/extreme environments (earth, space, and nuclear environments) on the degradation processes that are affected or triggered by the nanometer scale structure or confinement of materials
  Particular attention will be paid to the effect of nanometer scale structure or confinement on radiation-induced degradation of materials and to nanodosimetry; the simulation of adverse environments and the estimation of the lifetime of nanomaterials and nanostructured materials in adverse environments.

A tutorial complementing this symposium is tentatively planned. Further information will be included in the program that will be available in September.

Invited speakers include: **Paul Von Allmen** (NASA), **R. Artiaga** (Univ. LaCoruna, Spain), **E.V. Barrera** (Rice Univ.), **B. Briskman** (Karpov Inst. Chem. Phys., Russia), **M.C. Celina** (Sandia National Labs), **S.Z.D. Cheng** (Univ. of Akron), **G. Compagnini** (Univ. of Catania, Italy), **T. Endo** (Mie Univ., Japan), **J.T. Fourkas** (Boston College), **S. Frankland** (USA), **L. Grocholl** (Aldrich Chemical Co.), **E. Grossman** (Space Environment Div., Israel), **L. Jay Guo** (Univ. of Michigan), **S. Gupta** (Southwest Missouri State Univ.), **D. Hui** (Univ. of New Orleans), **D. Ila** (Alabama A&M Univ.), **W. Kappel** (ICPE-CA, Romania), **K.T. Lau** (Hong Kong Polytechnic Univ., Hong Kong), **L. Li** (Univ. of Pittsburgh), **S.-H. Liou** (Univ. of Nebraska), **K. Lozano** (Univ. of Texas PanAM.), **I. Morjan** (INFLPR, Romania), **J. Murphy** (Univ. of Kent, United Kingdom), **C.S. Ozkan** (Univ. of California-Riverside), **C. Park** (NASA), **J.J. Pireaux** (Univ. Notre Dame de la Paix, Belgium), **Y. Qiang** (Univ. of Idaho), **R. Raffaele** (Rochester Inst. of Technology), **N. Ramachandran** (NASA & BAE Systems), **J.R. Reyes** (Central Univ. Caracas, Venezuela), **J. Sankar** (North Carolina State A&M Univ.), **D.J. Sellmyer** (Univ. of Nebraska), **S. Serebrinski** (California Inst. of Technology), **K. Shin** (Gwangju Inst. of Science & Technology, Korea), **P. Sokol** (Indiana Univ.), **M. Sorescu** (Duquesne Univ.), **R. Spence** (Boston Univ.), **L. Spinu** (Univ. of New Orleans), **S. Tomczak** (U.S. Army), **M. Toulemonde** (CIRIL, France), **J.M. Tour** (Rice Univ.), **E. Wetzel** (U.S. Army), **R. Wilkins** (NASA Ctr. for Applied Radiation Research), **K. Wooley** (Univ. of Washington-St. Louis), **Z. Xiao** (Argonne National Lab), and **J.M. Zaleski** (Indiana Univ.). *Additional invited speakers will be selected from the authors of submitted abstracts.*

Symposium Organizers

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