The Materials Information Society

The Macrogram

Hartford Chapter of the ASM International
Build on our Strengths - Leverage our Diversity - Network to Succeed

MONTHLY MEETING – TOPIC

May 13, 2008 - Student Night
Topic: UConn Research

Speakers: Student members of UConn Materials Advantage Chapter

Directions: Chuck's Steak House & Margarita Grill Mexican Cantina - 1428 Stafford Rd., Storrs Mansfield, CT, Ph: (860) 429-1900

Agenda:	**Program Charges:**
Cocktails: 5:30-6:30 PM	Regular Members - $28.00
Dinner: 6:30-7:30 PM	Retirees - $15.00
Program: 7:30-8:30 PM	Full Time Students - $15.00
	UCMA Members - $7.50

Technical Chairperson: Rainer Hebert

Reservations: Call Linda at Dynamic Metals (860) 583-3336 *by noon April 9th*. Students contact Rainer Hebert (860) 486-3155. **Thanks!**

Abstract - Presentations:

Over seventy research projects of the graduate students of UConn's Materials Science and Engineering Program pass through extensive peer and faculty review with the best competing to be the three selected for presentation to the Hartford Chapter.

Speaker 1 Bio: Satyesh Kumar Yadav

Undergraduate school: Indian Institute of Technology Roorkee (2004-2008), in Metallurgical and Materials Engineering. Graduate School: University of Connecticut (Fall 2008), in materials science.

Area of research: Ab initio study of II-VI semiconductors.

Abstract: Although Zn based II-VI semiconductors are abundant, stable, and environmentally benign, their band gap energies are too large for optimal photovoltaic efficiency. If band gap can be engineered to desired level they can be excellent materials for photovoltaic application; especially in form of core/shell nanowire (that could improve the carrier collection in solar cells by reducing the excitation recombination rate). One way to engineer band gap is through strain. By using pseudopotential density functional theory calculations, we systematically study how the band gap, optical absorption of Zn based II-VI semiconductors changes with strain. We find that by suitably straining, band gap can be engineered to desired level. ZnO/ZnS core/shell nanowire with band gap of 2.07 eV matches with Shockley-Quiesser efficiency limit of 23%.

Speaker 2 Bio: Xuefei Wan

Xuefei received a bachelor and master degrees from Department of Materials Science and Engineering at Tianjin University, China, She entered the University of Connecticut in Aug. 2006 and then joined Prof. Leon Shaw's group in Jan.2007 to study the hydrogen storage materials.

Abstract: Currently, lithium borohydride (LiBH4) has been studied extensively as a reversible hydrogen storage materials for on-board energy carrier applications because of its high gravimetric hydrogen density (18.5 wt% H2). However, to date, LiBH4 has always been dehydrogenated/rehydrogenated at the high temperature because of its high temperature stability. Our study is focusing on destabilizing the LiBH4 system and decreasing its dehydrogenated/rehydrogenated temperature through nanoengineering and mechanical activation.

Speaker 3 Bio: Arif Mubarok

Arif received a BS in Materials and Metallurgical Engineering (MME) from Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh in November 2004. He enrolled as a PhD student in University of Connecticut in August 2006. In January 2007, he became a Research Assistant in "Nano-structured Metallic Materials" group. His supervising faculty is Prof Rainer Hebert.

Abstract: Bulk metallic glasses currently attract significant attention in the field of materials science with many unique and desirable properties, such as high strength, good hardness, good wear resistance etc. Thermal expansion behavior is very important but very few studies were done to elucidate the factors affecting the true thermal expansion of bulk metallic glass. Several factors affect the thermal expansion of amorphous alloy such as structural relaxation, viscosity, crystallization, heat-treatment condition etc and they are considered as non-reversible factors. We have synthesized a new Cu50Hf41.5 Al8.5 bulk glassy alloy in our lab and we used a new approach i.e. temperature modulated TMA to separate the true thermal expansion from other non-reversible affects.

The **Institute of Materials Science Associates Program** at the University of Connecticut will present a short course this spring, "**Polymer Nanocomposites – Why Bother**" on June 3-4, 2009, taught by Dr. Thomas Seery. Details can be found on the IMS Associates web site at www.ims.uconn.edu/about/short%20course.html.

Course Description:

This course will provide background on critical issues in synthesis, fabrication, processing, and characterization of nanocomposites to guide the practitioner in assessing the utility of nanocomposite applications. We will discuss the underlying scientific principles that guide the study of structure-property relationships and will touch on parallel fields of investigation with high relevance to polymer nanocomposites. The course will also cover the incorporation of a variety of nanophases into polymeric matrixes to provide functional materials, the importance of controlling surface energy, methods for achieving dispersion and common techniques for characterizing nanocomposite materials.

Registration deadline May 19, 2009

For additional information, contact Mark Dudley (860-486-2256), mdudley@ims.uconn.edu