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Winter (May) 2006 ASM HARTFORD

The Macrogram

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

MONTHLY MEETING – TOPICS

May 9, 2006 - Student Night
Topic: UConn Research Presentations *and*
Tour of Department of Chemical,
Materials, and Biomolecular Engineering
Competition Poster Session

Speaker: UConn Students
Members of UConn Materials Advantage Student Chapter

Directions: Willington Pizza House
25 River Road, Rt 32 · Willington, CT
860-429-7433
www.willingtonpizza.com
Willington's is located on Route 32 half a mile north of the intersection of Routes 195 and 32 on the left.

From Hartford
Take exit 68 (Route 195 exit), take a right off the ramp and follow 195 towards Storrs. After 6 miles, turn left onto Route 32 at the Xtra Mart. Willington Pizza House is half a mile down on the left.

From Storrs
Route 195 towards Willington. Turn right onto Route 32. Willington Pizza House is half a mile down on the left.

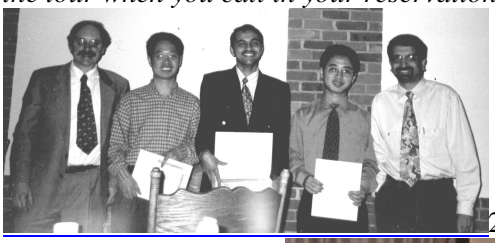
Agenda:	**Program Charges:**
Cocktails: 5:45-6:45 PM	Regular Members - $20.00
Dinner: 6:45 7:30 PM	Retirees - $10.00
Program: 7:45- 8:45 PM	Full Time Students - $5.00

Technical Chairperson: Ramamurthy Ramprasad

Reservations: Please specify Tour or Dinner or Both
Call Ashley at Dynamic Metals (860) 583-3336 *by noon May 5th*. Students contact Ramamurthy Ramprasad (860) 486-4102. **Thanks!**

Abstract - Presentations:
The over seventy research projects of the Graduate and Undergraduate 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.

Tour of Department of Chemical, Materials, and Biomolecular Engineering
The Materials Science and Engineering Program is joining with Chemical Engineer and Biomolecular Engineering, in three part harmony, forming a new department in the School of Engineering at the University of Connecticut. The effective date of the new Department of Chemical, Materials & Biomolecular Engineering (www.engr.uconn.edu/cmbe/) is July 1, 2006. It was selected to ensure proper planning and smooth transitioning, though implementation of the merger commenced on January 1, 2006.
The Faculty and Students of Materials Science and Engineering will conduct tours of MSE and *Institute of Materials Science* (IMS) facilities starting at 3:30 PM.
IMS houses approximately $20 million in research facilities. General purpose laboratories, which are freely accessible to all IMS members, contain common instrumentation for materials characterization such as electron microscopy, mechanical testing, x-ray diffraction, surface analysis, rheology, thermal analysis and magnetic resonance. Further details about the IMS can be found at www.ims.uconn.edu.
Meet in the lobby adjacent to Institute of Material Science Room 20. It is suggest that you park in the North Parking Garage which is at the intersection of North Eagleville and North Hillside Roads. IMS is on North Eagleville Road, just east of the garage. *Please indicate that you will take the tour when you call in your reservation for dinner.*


2002


2004


2005

Speaker: Robin Bright
Advisor: Dr. Harris Marcus

Bio: Robin Bright graduated with a Bachelor of Science and Engineering degree (BSE) in Materials Science and Engineering (MSE) from the University of Connecticut in 2005 and is currently working toward his Masters degree in MSE. Prior to entering graduate school, he worked for three summers at Saint-Gobain High Performance Materials Research and Development in Worcester, MA. He has been an active participant in the Materials Advantage.

Topic: Preliminary Observations of Metallurgical Phenomena in Laser Drilled Nickel-Based Superalloys.

Abstract:
Laser drilling is becoming an increasingly popular method for creating cooling holes in a variety of high temperature gas turbine engine components. The present communication summarizes the initial effort currently being conducted at the Institute of Materials Science (IMS) at the University of Connecticut in terms of investigating the local metallurgical phenomenon that can occur during laser drilling of nickel-based superalloys. Preparation of samples, observed local features, as well as microstructural and chemical analysis of laser drilled specimens will be discussed. This research is funded by the Connecticut Center for Advanced Technology (CCAT).

Speaker: Neal Madefrau
Advisor: Mark Aindow

Bio: Neal is a local Connecticut resident who received his B.S. in Metallugy and Materials Engineering from UConn in 2005 and has continued on to pursue a Master's degree. His research interests include characterization of nanoscale microstructures in metallic systems using electron microscopy. Currently he is working on a research project involving amorphous alloys for the aerospace industry. He is also the current President of the UConn Materials Advantage Chapter.

Topic: Characterization of Phase Transformations in Pseudoelastic B-Titanium Alloys

Abstract:
Titanium alloys have been the primary choice for biocompatible materials for implants and medical equipment. In particular, pseudoelastic alloys have found their way into the human body due to their unique mechanical properties. Although Nitinol (~50% Ni, 50% Ti) is the most widely used pseudoelastic alloy, nickel is known to cause allergic reactions in the body. This talk focuses on a senior design project sponsored by Memry Corporation, specifically on the characterization of a new nickel-free alloy known as Flexium. In general, pseudoelasticity in these alloys can be found only when transforming the metastable beta-phase (BCC) to orthorhombic martensite. Unfortunately, small particles of omega-phase (hexagonal) are known to form in this alloy. This talk focuses on the characterization of this unwanted phase and determining its stability range as a means of preventing its formation and retaining good pseudoelastic properties.

Speaker: Will Osborn
Advisor: Leon Shaw

Bio: Will Osborn earned his BS in Materials Science and Engineering from the University of Washington in Seattle in 2004. After focusing on structural composite materials as an undergraduate, Will is currently pursuing his PhD and has interests in fuel cell and energy materials.

Topic: Li3N Based Materials for Solid State Hydrogen Storage

Abstract:
Deploying hydrogen-powered automobiles on a national scale requires a viable low-pressure hydrogen storage system. Lithium nitride is capable of 11.5 weight percent reversible H2 storage, but suffers from high operating temperatures. The presented work summarizes current efforts to mechanically destabilize lithium amide and lithium hydride to create metastable structures that offer operating temperature reductions of 50°C. Further reductions in operating temperatures via electronic destabilization are discussed. Additionally, the kinetic issues associated with operating these storage materials at lower temperatures are addressed. The necessity for catalysts in this system is shown.