



The Macrogram

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

MONTHLY MEETING – TOPIC

November 18, 2008

Topic: High Speed Atomic Force Microscopy

Speaker: Dr. Bryan D. Huey, Assistant Professor
Institute of Materials Science
Department of Chemical, Materials &
Biomolecular Engineering
University of Connecticut

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

Agenda: Cocktails: 5:30-6:30 PM
Dinner: 6:30-7:30 PM
Program: 7:30-8:30 PM

Program Charges: Regular Members - \$28.00
Retirees - \$15.00
Full Time Students - \$15.00

Entrée Selections: (Please specify)

- Prime Rib
- Grilled Chicken
- Bake Fish

Technical Chairperson: Rainer Hebert
Reservations: Call Shirley at Dynamic Metals (860) 583-3336 by noon November 14th. **Thanks!**

Abstract:



Applications of Scanning Probe Microscopy have grown dramatically since its invention, particularly for measuring surface properties. With few exceptions, however, imaging speed has remained relatively slow, generally requiring up to 4 minutes per frame for most commercial equipment. To address this limitation, High Speed Scanning Property Mapping is a new SPM variation developed at UConn that allows full frame image acquisition in less than a second. This makes previously impractical studies feasible, including high throughput imaging, high resolution large area scanning, and efficient mapping of surface dynamics as a function of time or some other dimension (voltage, temperature, magnetic field, etc). Focusing on dynamics, the early stages of ferroelectric domain nucleation and growth are uniquely monitored during switching with <20 nm spatial resolution and microsecond scale temporal resolution. The resulting

'movies' provide significantly enhanced statistics over data from standard speed imaging, as literally thousands of domains are imaged in minutes. Significantly, this provides a novel method to locally and quantitatively measure independent activation energies and populations for nucleation and growth.

Bio:



Bryan Huey has been an Assistant Professor in Materials Science and Engineering at UConn since 2004. He earned his BS in MS&E in 1993 from Stanford University, a PhD in 1999 at the University of Pennsylvania, and performed postdocs in Oxford and at NIST-DC before moving to UConn and setting up the IMS NanoMeasurement Labs. His work developing and applying advanced variations of Atomic Force Microscopy (AFM) has been published in more than 40 papers. Recently, the nmLabs has focused on two primary areas of research: increasing AFM speeds, and coupling AFM with optics for biological and/or photovoltaic studies. His group is also extremely active in outreach, including teacher training workshops to incorporate nanotechnology into the high school curriculum as a tool to excite students about science and engineering. Professor Huey earned the UConn MSE outstanding faculty member award in 2007.

ASM Elects Roger J. Fabian 2008-9 President at MS&T'08 in October ASM Hartford Chair - 1975-6



A long-time member of ASM International and the ASM Heat Treating Society (HTS), Roger Fabian is the Business Development Manager for Bodycote Thermal Processing, Berlin, CT. Fabian received his BS in metallurgical engineering from Rensselaer Polytechnic Institute in 1962, and his MBA from RPI in 1980. He has participated in local chapter technical sessions and national ASM and HTS conferences, organizing sessions and presenting papers on vacuum heat treating, vacuum brazing, and other areas of heat treating and metal joining. Fabian currently is a Director-at-Large Industrial Liaison for the Center for Heat Treating Excellence (CHTE). For the past three years, he has rallied CT HT Companies for the Higgins Wagon at the Hartford Chapter Golf Outing.