



# NESM News

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## **Please save Thursday, December 14th for NESM's 40th Annual Fall Symposium at GORDON COLLEGE !**

Hello, NESM members! When we sent out our last Newsletter, days were getting longer and the weather was warming. Now we are on the slide into winter but have a great meeting to look forward to at Gordon College on December 14th, and gloomy weather shouldn't get microscopists down, anyway, since we spend most of our time in darkened rooms! Here is a little synopsis of what we (and we hope that includes you) have been up to since the Spring Newsletter:

We had great weather, great speakers, and a great turnout (almost 100 attendees!) for our Spring Symposium in Woods Hole in May (4th to 6th). Geoff Williams of Brown and Peter Lu of Harvard kicked off our pre-meeting workshop on confocal microscopy on Thursday afternoon and the 20 attendees learned all about optimization and applications of the technique. After dinner we got to see some state-of-the-art scopes in action, thanks to Jim McIlvain from Zeiss and Brad Calloway from Leica Microsystems. At the Symposium, we had talks on water in "anhydrous" minerals, cancer drugs, shear bands in amorphous metals, revival of the freeze-fracture techniques, and image analysis by fractals, and an after-dinner talk that included some encouraging research on spinal cord regeneration. If you would like to match up speakers to subjects, the list of speakers will be archived shortly and available at the NESM homepage. The meeting also featured a panel discussion on ethical issues in digital photography, where most of us had our eyes opened to the significant amount of fraud that is out there, and how much analysis some journals perform on submitted figures. As always, we had an enthusiastic and generous group of vendors, but we could have still used more participation at the Spring Symposium with POSTERS and PHOTOS-as-ART. After the meeting adjourned at noon, some of us took a walking tour of a local salt marsh, where tides and weather cooperated; others took the OceanQuest harbor cruise, which was not just scenic: they dredged up muck and animals and demonstrates oceanographic tools.

Our early autumn meeting was one that we co-sponsored with the Boston Chapter of AMS, at their kind invitation. We met at the MIT Faculty Club on September 21st for dinner and a great talk by Dr. David Williams of Lehigh University, who showed us atom-scale images made possible by aberration-corrected electron optics. Twenty NESM members were there, and everyone felt that the joint meeting had a very pleasant synergy and critical mass. We look forward to co-hosting with ASM again.

For the upcoming meeting at Gordon College, we are once again indebted to Dr. Russell Camp for all of his organizing efforts. Many of you have seen Russ's TEM with the great digital imaging system that long-time NESM member Jim Mancuso of AMT set up. I am twisting Russ's arm to have an open house at his microscope facility, shortly before the business meeting. Speaking of the business meeting, please keep in mind that we elect new board members and officers then, and if you would like to suggest a member (including yourself!!) for any of the open slots, please let us know. Here is the slate that the nominating committee needs to fill: President-elect; Clerk; one Biological Sciences Director; two Physical Sciences Directors. Any thoughts, please contact the chairman of the nominating committee, Steve Stokowski, at 508-881-6364 or by e-mail at [spcpetro@aol.com](mailto:spcpetro@aol.com).

I hope to see you all at Gordon College next month. We have some excellent talks scheduled and will post program and bios on the homepage. Here is a sneak preview: Dr. Andrzej Pietrzykowski from UMass Medical School is going to show us the channels in cell membranes that are affected by ethanol consumption, honing in on the still-unanswered question of why alcohol makes people drunk, and our after-dinner speaker is Dr. Ron Biederman, Emeritus Professor of Materials Science at WPI, who did an analysis of steel from Building 7 at the World Trade Center. He has quite a story to tell, and I am not going to spoil the punchline!

Dan Gibson  
President, NESM

# 40th Annual Fall Symposium and Business Meeting

Gordon College · 255 Grapevine Road · Wenham, MA 01984 · 978.927.2300

(<http://www.gordon.edu>)

**Thursday, December 14, 2006**

12:00 pm - **Registration**—Presidential Dining Room (Lane Student Center)

12:45 pm - **Welcome:** Dan Gibson, NESM President

1:00 pm       **CryoSEM on Agarose Beads**  
Speaker: **David Bell, Millipore Corporation**

1:45 pm       **Texture and Recrystallization of Annealed Nb-1Zr Refractory Alloy**  
Speaker: **Scott A. Speakman, Ph.D., MIT**

2:30 pm       **Autophagy Against Parasites**  
Speaker: **George Yap, Ph.D., Brown University**

3:15 pm       **Coffee Break**

3:30 pm       **Alcohol Effects on BK Channels Using Confocal and Immuno Microscopy**  
Speaker: **Andrzej Pietrzykowski, Ph.D., University of Massachusetts Medical School**

4:15 pm       **Development Dynamics of *in vitro* Plant Microspore Embryogenesis**  
Speaker: **Tiffany Hurlbut, Senior Biology Major, Gordon College**

5:00 pm       **NESM Annual Business Meeting**  
                  I. Elections  
                  II. President's and Treasurer's Reports  
                  III. Introduction of New Officers

6:30-7:30      **Dinner**, with dinner music provided by Gordon College music majors!

7:30 pm       **After Dinner Talk:**  
**"Microstructural Analysis of the Steel from Buildings 7, 1 and 2 from the World Trade Center"**  
Speaker: **Ronald R. Biederman, Ph.D., Professor Emeritus, WPI**

8:30 pm       **Closing Ceremony:** Special Honorary for Russ Camp

# Advance Registration Form

Registration after December 6th will not include dinner.

**Registration Deadline  
December 6th, 2006**

To register, please fill out this form below and send it with your check, payable to NESM, to:

Elke Pravda

Children's Hospital Boston

Karp Family Research Laboratories, #11215.1

300 Longwood Ave.

Boston, MA 02115

617-919-2436 **If you have questions, please email Elke at: [elke.pravda@childrens.harvard.edu](mailto:elke.pravda@childrens.harvard.edu)**

First Name \_\_\_\_\_ Last Name \_\_\_\_\_ Dr. Ms. Mr.

Company \_\_\_\_\_ Title \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_ Fax \_\_\_\_\_ E-mail \_\_\_\_\_

## Advance Registration

- |   |          |
|---|----------|
| <input type="checkbox"/> NESM Member                | \$20.00  |
| <input type="checkbox"/> Non-member                 | \$35.00* |
| <input type="checkbox"/> Student/retired member     | \$5.00   |
| <input type="checkbox"/> Student/retired non-member | \$10.00* |
| <input type="checkbox"/> Dinner**                   | \$ 5.00  |
| <input type="checkbox"/> Guest Registration         | \$10.00  |

Guest Name \_\_\_\_\_

- |   |         |
|---|---------|
| <input type="checkbox"/> Guest Dinner** | \$15.00 |
|---|---------|

Gordon College staff and students register free of charge

## MENU CHOICES

Please select one of the following:

- |  |
|--|
| <input type="checkbox"/> Chicken Cordon Bleu |
| <input type="checkbox"/> Vegetarian          |

Note: All meals will include a fresh salad with walnuts and raspberry vinaigrette, and chocolate sorbet with ice cream for dessert!

## REGISTER TODAY!

### ◆ Meeting Date

December 14, 2006

12 Noon-8:30 pm

### ◆ Meeting Location

Gordon College

### ◆ Highlights-2 Scientific Sessions

◆ Dinner with live music/After dinner talk

### ◆ Meeting Deadline

December 6, 2006



Thank you for  
your continued  
support!  
AMT

- Barry Scientific Inc.
- Boekeler Instruments Corp.
- Denton Vacuum Inc.
- E.A. Fischione Instr, Inc.
- Eastman Kodak
- EDAX Inc.
- Electro-Image, Inc.
- Emispec Systems, Inc.
- EMS/Diatome
- Energy Beam Sciences
- Ernest F. Fullam Inc.
- EXTEC Corp.
- FEI Philips Electron Optics
- GATAN Inc.
- Geller MicroAnalytical Lab
- Hitachi Scientific Instruments
- HKL Technology
- International Instrument Sales
- Invitrogen
- JEOL-USA Inc.
- Kimball Physics, Inc.
- LADD Research Ind., Inc.
- LEICA Microsystems, Inc.
- MEDTEC
- Micro Star Technologies, Inc
- Nanotech Consulting
- Optechs, Inc.
- Oxford Instruments America
- Princeton Gamma-Tech, Inc.
- Quality Images
- Quantomix
- Rontec USA, Inc.
- SCANNING/FAMS, Inc.
- SSSC
- SEMTECH Solutions
- SensIR Technologies
- Technotrade International
- Thermo Electron
- Tousimis

**Microscopy Society of America**  
 230 East Ohio Street, Suite 400 ▪ Chicago, IL 60611-3265 ▪ 800-538-3672  
 FAX: 312-644-8557 ▪ E-mail: BusinessOffice@microscopy.org

*Please see MSA website ([www.msa.microscopy.com](http://www.msa.microscopy.com)) for further*

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## **WOODS HOLE-SPRING SYMPOSIUM 2006**

### **\*\*Winners\*\***

#### ~Best Student Posters~

1st Place: **Paul Troccolo**, Worcester Polytechnic Institute,  
Department of Biology

2nd Place: **Ellen Lavoie**, University of New Hampshire,  
Department of Plant Biology

#### ~Photo-As-Art~

1st Place: **Karen Boisvert**, Harvard University, Division of  
Comparative Pathology

2nd Place: **Nancy Piatczyc**, Williams College, Bronfman Science  
Center

### Congratulations to you all!

NESM would also like to thank all the students who participated and  
the corporate sponsors who donated prize money for these well-  
deserving recipients:

## REPORTS FROM PAST MEETINGS

**NESM President-Elect Christopher Santeufemio** attended the **M&M Meeting in Chicago** in August. It was a great meeting. Chicago is a beautiful metropolis with amazing architecture. The convention center was located on the Navy Pier, which was an unusual setting for the meeting, as it is a tourist attraction for summer-time fun.

It was a heat wave then, with many days reaching 100.

There were talks on everything microscopic. Nanotech, ESEM, EDS and WDS, TEM, SEM, FESEM, AFM, NSOM, confocal, etc...

Chris got to speak with NESM Past President David Harling about the direction of local microscopy societies.

We went to a Cubs game at historic Wrigley Field, courtesy of Bruker AXS guy Robert Brandom. Too bad the Cubs game got rained out...

Special thanks to the M&M Council for providing a great meeting!

## Meetings, Conferences, & Courses

**December 14, 2006**

**NESM Fall Symposium**

Gordon College  
Wenham, MA

**Nov 27-Dec 1, 2006**

**Matl's Research Society**

Boston, MA  
info@mrs.org

**December 9-13, 2006**

**American Society for Cell Biology**

San Diego, CA  
www.ascb.org

**Jan 7-12, 2007**

**CryoEM Course**

UC Berkeley, CA  
<http://em-lab.berkeley.edu/EML/class/cryoem-course.php>

**January 15-20, 2006**

**Composites**

Ventura, CA  
Contact: Alan Lesser  
Email: [ajl@polysci.umass.edu](mailto:ajl@polysci.umass.edu)

**Feb 5-9, 2007**

**Microscopy 2007**

Auckland, New Zealand  
[www.microscopy2007.org.nz](http://www.microscopy2007.org.nz)

**March 11-16 2006**

**PITTCON 2007**

New Orleans, LA  
[www.pittcon.org](http://www.pittcon.org)

### ASM Meeting in September

The ASM Meeting was well attended, with members from NESM, ASM, and SAMPE all joining in. The talk by Dr. David Williams on aberration correction was fascinating. It was very technical, but not too far over the layman's head.

We saw STEM images showing all of the atoms in a material together, not just a dark space where an oxygen atom should be.

The MIT Faculty Lounge was a particularly nice venue.

### Mark Your Calendars!

#### Future Dates for Woods Hole Symposium:\*

	2007	5/3-5/5		
2008	5/1-5/3		2009	4/30-5/2

**\*Note: These dates include a reservation for Thursday also in case we run more workshops**

# **“Electron Microscopy: Fundamental Limits and New Science”**

**Workshop sponsored by the Kavli Institute at Cornell, July 13-20, 2006**

According to its introductory brochure, the Kavli Institute at Cornell for Nanoscale Science is a “think tank” charged with exploring the major challenge and opportunities for the science of very small structures. As part of this mission, it sponsored (together with a number of other Cornell entities and independent organizations) this workshop on the current state and future promises of developments in electron microscopy.

Many, though certainly not all, of the presentations emphasized high spatial resolution investigations. Modern microscopes from several sources are capable of resolutions below 0.1nm. This presents challenges from the purely practical perspective of providing an adequately isolated environment, free from acoustic, electromagnetic, and thermal interference and the effects of residual air movement. Not only that, but as virtually all these microscopes use electron probes, the current density in the sample can get extremely high, leading to major issues of sample damage. A third area of challenge is in understanding the interactions that take place between the electron beam and the sample; for example, the phenomenon of de-localization can lead to an electron interacting with an atom at some significant distance (depending inversely on the energy of the interaction). Nevertheless, we saw examples of chemical identification of single atoms in a crystalline lattice (using electron energy-loss spectroscopy), measurement of the band gap in BN nanotubes, and some fascinating measurements of the electronic structure of grain boundaries of different structures in ceramics. David Williams presented the work that NESM members will recall from his talk at the September ASM/NESM meeting, where he is using multivariate statistical analysis to extract large amounts of information from seemingly impossibly noisy images.

Other topics included time-resolved microscopy, using pulses of electrons lasting a few nanoseconds to investigate dynamic phenomena, and imaging of thermal effects in nanoscale systems, amongst others. Several poster presentations demonstrated how many of these techniques are already being applied to real research problems.

To this observer, the lasting lessons included the need to have a clear understanding of what was being measured and how – no longer can one put a sample in the microscope, take a picture, and interpret it intuitively by looking at it. Modeling and calculation are an integral part of the experiment. The care that has gone into the design of the new microscopy suite at Cornell was also impressive – from selecting the site when it was still bare ground (a luxury denied to most of us), the design of the temperature control and ventilation systems, to the detailed specification of the fans used in the various computers, it is hard to imagine that any detail has been overlooked, but it makes one wonder how many institutions will be able to make facilities like this actually work.

All in all, a very interesting week!

**Tony Garratt-Reed**

Clerk and Past-President, NESM

# NESM Application for Membership

## New Members:

- |  |          |
|--|----------|
| <input type="checkbox"/> Regular Member    | \$15.00  |
| <input type="checkbox"/> Student Member    | \$5.00   |
| <input type="checkbox"/> Retired Member    | \$5.00   |
| <input type="checkbox"/> Corporate Member* | \$100.00 |

\*Each Corporate Membership entitles two representatives to receive our newsletter. Please duplicate mailing information form as needed.

To register, please fill out this form below and send it with your check, payable to NESM, to:

**Elke Pravda**  
**Karp Family Research Laboratories, #11215.1**  
**Children's Hospital Boston**  
**300 Longwood Ave.**  
**Boston, MA 02115**

## Current Members:

- Change of Address Only

## Mailing Information:

Date \_\_\_\_\_  Dr.  Ms.  Mr.

Name \_\_\_\_\_

Mailing Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

## NESM Membership News 2006

*The New England Society for Microscopy (NESM), a local affiliate of the Microscopy Society of America (MSA), is a professional organization dedicated to the promotion and advancement of the science and practice of all microscopical imaging, analysis, and diffraction techniques.*

*Each year, NESM holds at least three local meetings which feature speakers from both biological and physical science backgrounds. Social hours and buffet dinners are enjoyed at each meeting.*

**New Members:** NESM has a calendar-year membership; new members may join at anytime. To join, please check one of the member categories, and return the above application along with your check payable to NESM.

**Membership Renewal:** An invoice for annual membership dues may be sent with the first newsletter each year. Dues are payable at meeting registration, or by check no later than May 31st.

**Please make check payable to NESM.** Send to Elke Pravda, Karp Family Research Laboratories #11215.1, Children's Hospital Boston, 300 Longwood Ave., Boston, MA 02115.

## NESM Officers 2006

<b>President</b> 2006	Daniel G. Gibson WPI (508) 831-5543 dgibson@WPI.EDU	<b>Corresponding Secretary</b> 2006	Elke Pravda Children's Hosp. Bost. (617) 919-2436 elke.pravda@childrens.harvard.edu
<b>President-elect</b> 2007	Christopher Santeufemio Millipore Corp. (781) 533-2812 Chris_Santeufemio@millipore.com	<b>Materials Science Directors</b> 2006	David C. Bell-DEAS, Harvard University (617) 496-6794; dcb@deas.harvard.edu
<b>Past President</b> 2006	Steve Stokowski Stone Prod. Cons. (508) 881-6364 spcpetro@aol.com	2007	Donna Guarrera-JEOL (USA), Inc. (978) 536-2224; guarrera@jeol.com
<b>Treasurer</b> 2006	Richard Schalek DEAS, Harvard Univ. (617) 496-9682 rschalek@deas.harvard.edu	<b>Biological Sciences Directors</b> 2006	Renee Dickie-HSPH (617) 432-0123; rdickie@hsph.harvard.edu
<b>Clerk</b> 2006	Tony Garratt-Reed MIT (617) 253-4622 tonygr@MIT.EDU	2007	William Fowle-Northeastern University (617) 373-3075; w.fowle@neu.edu
		2008	Karen Dalecki Boisvert-Harvard University (508) 624-8013; karen_boisvert@hms.harvard.edu



# Directions to GORDON COLLEGE

Gordon College is easy to get to from the west, south or north. We are located just off exit 17 on Massachusetts State Route 128. Look on a map and we are located just about in the middle between Gloucester, Mass. and Salem, Mass.

## **From points West:**

**(New York State, Pennsylvania, Connecticut, Western Massachusetts)**

Take an east-bound highway (i.e. Mass Turnpike, Route 90) to Route 95 North. Stay on Route 95 until it separates from Route 128. Take Route 128 North toward Gloucester, passing through Peabody, Danvers and Beverly. Get off at Exit 17. Turn left at top of ramp, going one-quarter-mile to Gordon College, on Grapevine Road. \*At the AJ Gordon Chapel, take a right and park in the lot directly in front of it. There will be a sign **Event Parking-NESM**. Proceed to the Lane Student Center-Presidential Dining Room for the meeting. (*See enclosed map of campus for building/parking locations*)

\*(**Note:** If you miss this turn-off, you will come to the main entrance of the college, turn around at this point).

## **From points North:**

**(Maine, Vermont, New Hampshire, Manchester Airport)**

Take Route 95 South to Route 128 North. Remain on Route 128 North, passing through Peabody, Danvers and Beverly. Get off at Exit 17. Turn left at top of ramp, going one-quarter-mile to Gordon College. (follow directions above)

## **From points South:**

**(Boston, Logan Airport, Rhode Island, TF Green Airport)**

*As you leave Boston/Logan Airport, look for signs for 93 North. Take 93 North to Route 95 North, and then follow the directions below.*

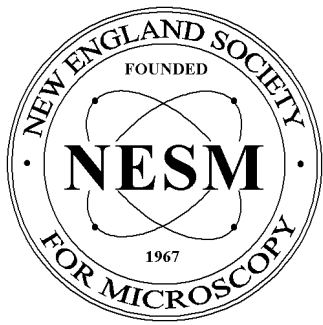
Stay on Route 95 until it separates from Route 128. Take Route 128 North toward Gloucester, passing through Peabody, Danvers and Beverly. Get off at Exit 17. Turn left at top of ramp, going one-quarter-mile to Gordon College. (follow directions above)

## **Please note:**

Routes 95 and 128 have similar exit numbers. Begin to pay attention to exit numbers once you get onto Route 128 North after it separates from Route 95.

**Please See Gordon College website for the color map of campus: [www.gordon.edu](http://www.gordon.edu)**





*Mark your Calendars!*

## High-Resolution Imaging Workshop

The New England Society for Microscopy is pleased to announce that it will sponsor a workshop on “Imaging with High Resolution in the Transmission Electron Microscope” on Thursday May 3<sup>rd</sup>, 2007. The workshop will be held at the Marine Biological Laboratory at Woods Hole, MA, and will be followed on Friday and Saturday, May 4<sup>th</sup> and 5<sup>th</sup> by the annual NESM Spring Symposium.

### *Who should attend:*

- Microscopists who are dissatisfied with their present micrographs
  - Students needing to learn skills for their research
- Practical microscopists desiring to learn some theoretical background to the subject
  - etc., etc.

The workshop will be presented by Dr. Douglas A. Blom, Staff Scientist in the Advanced Microscopy Laboratory at Oak Ridge National Laboratory. Dr. Blom is a member of the team operating the JEOL 2200FS aberration corrected (S)TEM, including remote access capability. This facility will be used remotely to illustrate the presentation.



### *More Information*

More information, including registration and lodging details, will be available around February 1<sup>st</sup>, 2007. Check the NESM Web site at <http://nesm.cims.harvard.edu>