NESM News

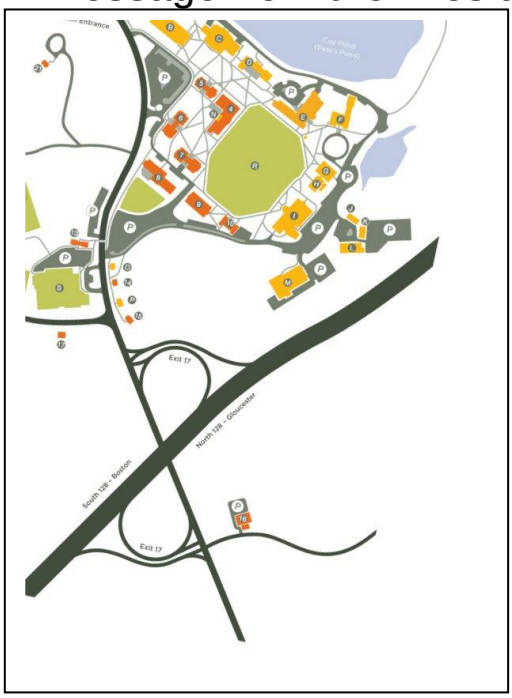
Semiannual on-line newsletter published by the New England Society for Microscopy **NOVEMBER 2009**
Visit our web page at http://nesm.cims.harvard.edu/

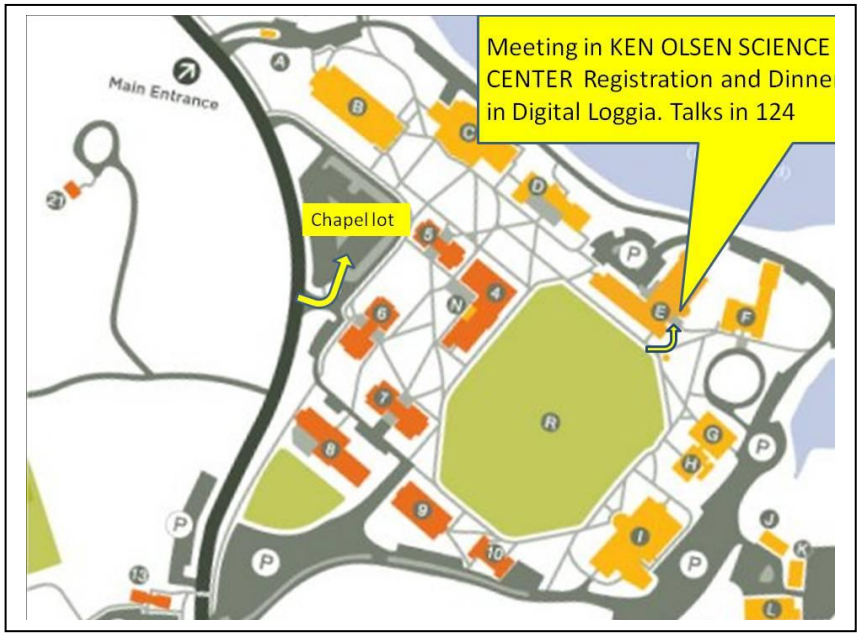
Gordon Collge hosts NESM's 43rd Annual Fall Symposium on December 3. Meeting program in this issue.

Please RSVP by Monday, November 30 to Dan Gibson at:

dgibson@wpi.edu. We can call this our first international symposium because Dan is compiling and filing from Venice, Italy until December!

Registration fee for regular members: $35 if you RSVP by the 30th, $40 if you don't.
Students $15. Everyone can pay at the door.
We won't have it for this meeting, but coming soon you will be able to pay on line with a credit card through pay pal (see the message from the President, next page)





Dear NESM Members,

The beginning of Fall brings the return of New England Society for Microscopy activities. We had an evening meeting at JEOL, USA in Peabody on Tuesday, Oct. 20 (reviewed in this newsletter) and our half-day meeting at Gordon College is coming up on Dec. 3. I hope that you are able to attend.

In an effort to better serve the NESM membership, the NESM Board has implemented a number of administrative changes in the operation of the society. In particular, the Board has identified two critical areas that require additional attention and improvement. First, membership retention, recruitment, and feedback need more consistent attention. Second, the Board needs more sophisticated communication between and within the Board and membership. To address these needs the Board has decided to designate a Biological Director and a Physical Science Director with the responsibilities for membership oversight and for web-based services. These formal changes occur after several years of considerable informal efforts have been unsuccessful in producing needed changes.

In addition to better serving the NESM community, these changes will also substantially ease the workload burden of both the Treasurer and the Corresponding Secretary. As examples of changes, we will begin using PayPal to register for meetings and for paying membership dues. Also, web-based banking and database procedures will be implemented. We don't anticipate that all attempts at improving and strengthening the Society will succeed; therefore, these changes will occur on a trial basis, evaluated and adjusted as required. Foremost on the minds of the Board is that these changes build on the traditions and customs of the Society and that the changes will maintain the spirit and respect for the history and traditions of NESM. Some of these changes may affect different members differently, so if you have any concerns, comments, complaints or suggestions, please contact myself (rschalek@fas.harvard.edu) or other Board members.

The Board will also begin to more actively promote the local New England Society for Microscopy with the national Microscopy Society of America and the Microbeam Analysis Society. In particular, we are also exploring ways of expanding the NESM membership by working with other local societies and becoming more involved in Project Micro. Currently, we have a heavy emphasis on charged particle beam microscopy. We would like to create a similar excitement and participation in optical microscopy and spectroscopy.

We would like to encourage the membership to more actively participate in the functioning of the society. In particularly, we would like to solicit ideas for meeting venues, speakers, workshop topics and other activities. As a start, we are currently generating a slate of candidates for the following offices: Corresponding Secretary, Treasurer, and a Biological and Physical Sciences Director. If you would like to volunteer for one of these positions, or would like more information concerning the duties and responsibilities, please contact Chris Santeufemio (Christopher_Santeufemio@uml.edu).

I would like to leave you with a note of thanks. I want to thank you for your continued participation and support of NESM. I also want to thank the Corporate Sponsors, without whose support we would cease to function. I hope that in the coming months and years NESM provides you a forum for listening to exciting speakers and collegial interactions with interesting people that share a common interest in science and microscopy.

Sincerely, Richard Schalek, NESM President

43rd Annual Fall Symposium and Business Meeting

Gordon College · 255 Grapevine Road · Wenham, MA 01984 · 978.927.2300 (http://www.gordon.edu)

Thursday, December 3, 2009

1:00 pm - **Registration**—Presidential Dining Room (Lane Student Center)

1:15 pm - 1:25 pm **Welcome**: Richard Schalek, NESM President

Introduction to nonlinear harmonic generation microscopies: CARS, SHG, SRS, FWM and THG Microscopy
Speaker: **Dr. Evangelos Gatzogiannis, Center for Nanoscale Systems, Harvard University.**

2:10 pm **Spectroscopic imaging of (solvated) radiation-sensitive soft materials in the cryo-STEM**
Speaker: **Prof. Mathew Libera, Stevens Institute of Technology, NJ**

2:55 pm **Project MICRO update**
Speaker: **Mary McCann**, **Project Micro Delveloper, Coordinator for MA**

3:10 pm Coffee Break & Project MICRO Demo

3:30 pm **In-situ TEM studies of nanowire growth**
Speaker: **Cheng-Yen Wen, Ph.D., IBM-Yorktown & Purdue University, IN**

4:15 pm **Introducing the concept of intracellular ecology: A study of an algal/bacterial mat from a geothermal hotsprings in New Mexico**
Speaker: **Prof. Wayne Fagerberg, Univ. New Hampshire**

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**:** **Probing the Mechanical Properties of Nanostructures in the TEM**
Speaker: **Prof. Andrew Minor, UC Berkeley & Lawrence Berkeley Labs, CA**

8:30 pm **Closing Remarks:** Richard Schalek, NESM President

Directions to Gordon

From Points West:

- Take an east-bound highway (e.g., Mass Turnpike, Route 90) to Route 95 North
- Stay on Route 95 North until it separates from Route 128
- Take Route 128 North towards Gloucester, passing through Peabody, Danvers and Beverly
- Take Exit 17, Grapevine Road
- Turn left at end of ramp, going 0.5 mile to chapel parking lot on right, *just before main entrance*

From Points North:

- Take Route 95 South to Route 128 North
- Remain on Route 128 North, passing through Peabody, Danvers and Beverly
- Take Exit 17, Grapevine Road
- Turn left at end of ramp, going 0.6 mile to main entrance

From Points South:

- Stay on Route 95 North until it separates from Route 128.
- Take Route 128 North towards Gloucester, passing through Peabody, Danvers and Beverly
- Take Exit 17, Grapevine Road
- Turn left at end of ramp, going 0.5 mile to chapel parking lot on right, *just before main entrance*

From Logan Airport:

- Leaving the Boston/Logan Airport, look for signs for 93 North
- Take 93 North to Route 95 North
- Follow the directions (above) for "From Points South"

Minutes from the 42nd annual NESM business meeting, Dec. 4, 2008

The 42nd New England Society for Microscopy Fall Symposium was held in the Ken Olsen Science Center at Gordon College in Wenham, MA on Dec. 4. The annual business meeting convened at 5:30 PM. President Renee Dickie opened the business meeting. Secretary Dan Gibson presented the minutes from the 2008 business meeting minutes. The minutes were approved as read. Tim McClure presented the treasurer's report. After a short discussion of the total assets, the treasurer's report was approved as read. The slate of candidates for the 2009 elections were announced by Chris Santeufemio. A paper ballot vote was taken and the following people were elected Neils Rowland (Physical Sciences Director), Ellen Lavoie Hodges (Biological Sciences Director), and Warren Moberly-Chan (President-Elect). Two proposed changes in the Society bylaws, as published in the fall Newsletter, were discussed and approved by majority vote: Article IV, section 5: Dues were raised from $15 to 25, $5 to 10, and $5 to 10, and $100 to 150 for regular, student, retired, and corporate members, respectively; and: Article V, Section 2 and Article VI, section 7, were amended to provide for notifications of meetings and distribution of ballots for officers by electronic mail, in the interest of paperless communication for reasons of conservation and economy. Renee Dickie thanked the society for privilege of serving and then passed the President's gavel to President-elect Richard Schalek. Richard thanked Renee for all of her efforts and then a motion to adjourn the meeting was made and seconded.
Respectfully submitted, Dan Gibson, Secretary.

Rebecca Sterns Retires as HSPS Microscope Facility Manager

After 27 years of service as the Microscopy Facility Manager in the Harvard School of Public Health, Rebecca Sterns is retiring. Rebecca has been an active member of the New England Society for Microscopy for many years. In 1996 she served as the NESM President. Congratulations Rebecca!!! We wish you good luck.

UPCOMING NESM MEETINGS

Bruker AXS, Inc will sponsor the NESM meeting on February 9, 2010 at their facility in Billerica, MA

NESM Spring Symposium April 30-May 1 2010 in Woods Hole at Marine Biological Laboratory, with Thursday April 29 reserved for a pre-meeting workshop TBA

Our most recent meeting at JEOL on Oct. 20: Recap

By Richard Schalek

JEOL USA, Inc. hosted the latest New England Society for Microscopy meeting on Tuesday, Oct. 20 in Peabody, MA. JEOL is celebrating their 60th year anniversary. Approximately, 30 people attended the meeting. JEOL graciously provided tours of the facility, prior to dinner and the speaker's presentations. After dinner, there were two technical talks. The first speaker, James Mansfield of Cambridge Research and Instrumentation, Inc., discussed how the advances in multispectral imaging enable the simultaneous imaging and quantification of multiple analytes in the presence of spatial and spectral overlap. This technique has unique applications in pathology. Also, machine-learning software can be trained to analyze images so that different classes of objects (cancer, stroma, etc.) can be accurately and automatically segmented. Tom Isabell, JEOL's manager of the Transmission Electron Microscope product division was the second speaker. Tom presented a talk on the future of TEM microscopy. In particular, examples of how the spherical abberation (Cs) corrector has and is changing materials characterization were presented. Sub-Angstrom imaging and fast atomic scale spectroscopy combine to permit atomic structure characterization as well as structural chemistry at unprecedented information levels.

UPCOMING MEETING OF THE HISTOCHEMICAL SOCIETY IN Woods Hole

The Histochemical Society's 2010 Annual Meeting, ***New Trends in Microscopy and Immunohistochemistry*** is March 21-23, at the Marine Biology Laboratory, in Woods Hole, MA. The meeting focus will be breakthroughs in new 3D imaging technologies and the tools required to achieve the technologies full potential and advance cell biological and biomedical research.

Scientific sessions will be a mixture of invited presentations and those chosen from submitted abstracts. There is no charge for the first submitted abstract. More detailed information can be found at: http://www.histochemistry2010.org/index.html

HCS's successful Short Course ***Immunohistochemistry and Microscopy*** immediately follows the meeting utilizing the MBL laboratories. The course includes lectures and hands-on lab sessions and is limited to 30 participants, March 23-26, 2010. More detailed information can be found at: http://immunohistochem.com/

You may also download a two page brochure detailing both programs here: http://bit.ly/3ckTA5

Registration and Abstract submission is now open. We hope to see you in March!

William Stahl
Executive Director
The Histochemical Society

2009 MSA M&M Annual Meeting

Richmond, Virginia

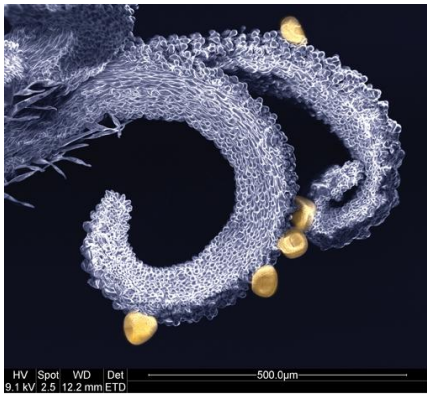
Reported by Chris Santeufemio

The Microscopy Society of America holds its annual meeting in the summer in a different city each year. This year the meeting was in Richmond, Virginia.

It was a good meeting with attendees traveling in from worldwide. Numerous courses were offered and presentations in both Biological and Materials Science fields were given.

The opening talk was a highlight of the meeting; Microscopy of Mars! We saw real optical and AFM images of Martian soil samples that were collected on the Mars Rover and analyzed using advanced microscopy platforms. The microscopes were designed into the Rover vehicle and included sampling and analytical hardware. The designers of the next generation vehicles are trying to come up with ways of including an electron or ion beam column-type microscope into the planetary rovers of the future. Of course, shrinking an SEM into the size of a backpack remains a challenge, but maybe they can use the vacuum of space and not need any pumps!

The MSA is the world's largest organization of microscopists. It relies on the LAS Local Affiliate Societies for membership and support. As such, NESM would like to encourage all its members to join MSA and help support microscopy worldwide.



The Spring Symposium in Woods Hole last May was, as usual, lively and well-attended. We had 82 attendees, and we went from Confocal imaging at the workshop that Gary Laevsky of Andor Technology conducted on Thursday, to the 3D imaging provided by serial sectioning with scanning EM that Joel Mancuso talked about on Saturday, making stops in between to image everything from neuronal circuits to ovarian cancer to cardiac cells on the biological side, to focusing ion beams on anything possible on the physical/industrial side. Dr. Michael Kersker gave an amazing after dinner talk which introduced us to real-time mass spectroscopy and scanning electron microscopy at environmental pressures, and he topped off his talk with an encyclopedic performance of Tom Lehrer's Element song. A grad student from Brown University, Yuko Hasegawa, took first in the poster competition with *Application of fluorescence in situ hybridization and spectral imaging to visualize bacterial diversity.* Nancy Piatczyc's very octopus-looking picture (this page) won the microscopy as art award, fitting for Marine Biological Laboratory, but it is actually a *Geranium*! We are as always indebted to our exhibitors, and we drew their cards out of a hat to see who would get to be profiled in the current newsletter. And the winners are: Leica Microsystems and MolmeX Scientific! See following pages for their profiles.

The conditions for the post-meeting horseshoe crab tour of Little Sippewissett Marsh were perhaps the worst ever but the dozen or so explorers were game and braved knee high water and pelting rain to see where the crabs go, and they actually found one that their guide (me) completely missed.

Dan Gibson

Leica Microsystems – Your Image Starts Here

by Todd Perez, Account Executive, Leica Microsystems, Nanotechnology

In an era where technology must keep up with the ever changing needs of breakthrough research, Leica Microsystems supports science with new tools and insights, helping users to further explore the world of microstructures.

Leica Microsystems' history, and the history of its ancestral companies such as Leitz, Reichert, Jung, and Cambridge Instruments, reads as a long list of pioneering technology breakthroughs in microscopy, imaging, and specimen preparation. In 1954, for example, Carl Reichert's company launched production of ultramicrotomes. For the first time, a device made it possible to create extremely thin sections of embedded specimens with structures that could be examined using an electron microscope.

Now a new tradition has begun. In March, 2008, Leica Microsystems welcomed Bal-Tec AG into our Nanotechnology product line, a company with its own rich history. In 1957, Liechtenstein-based Balzers AG, now known as Oerlikon Balzers, launched a new product line for EM specimen preparation and sold its first instrument the following year. Over the years, the product range continuously expanded to meet the needs of its customers.

With the acquisition of Bal-Tec AG, Leica Microsystems is now the only supplier to offer product solutions for the entire biological and materials sample preparation process, which provides a new level of convenience for users. Leica Microsystems' long tradition of partnership with our customers allows us to progress with new technologies that make our users' work faster, more precise, and more comfortable. We offer innovative instruments for the following specimen preparation tasks, including:

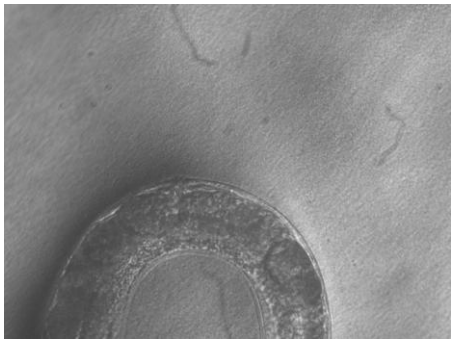
- Ultramicrotomy (room temperature and cryo)
- Contrasting/Labeling (automation of immunogold and grid contrasting)
- Tissue Processing (routine EM and LM, and microwave)
- Freeze Substitution (automated with FSP)
- Sample Block Trimming
- Cryo Fixation (High pressure freezing, grid plunge, slam freezing)
- Freeze Etching/Freeze Fracture
- Cryo Transfer Systems
- High and Low Vacuum Coating
- Freeze and Critical Point Drying
- Solid State Technology

Leica Microsystems offers the most complete product portfolio for high-quality TEM, SEM, AFM, and LM sample preparation. For all of your specimen preparation needs, please contact Todd Perez, Leica Microsystems, Account Executive for Nanotechnology, New England area, 508-212-8416.

MolmeX Scientific Inc is the US agent for Nanonics Imaging Ltd and Kramer Scientific Inc.

Nanonics provides the only multiprobe Scanning Probe Microscope which incorporates the NanoToolKit to measure force, light, current, heat on nanometric length scales. Thanks to optically transparent probe tips, the AFM-based systems integrate seamlessly into any optical microscope including AFM/Raman with special vacuum versions for SEM and Cryo. The multiprobe is creating a new field of pump/probe experiments at the nanometric length scale in materials science and biology. Look for Nanonics at Fall MRS in Boston and Cell Biology in San Diego.

Through Kramer Scientific, we are introducing the FBS 10, a new optical microscope specifically designed for rapid and efficient sorting of living fluorescently tagged organisms, like C. elegans. The very affordable FBS 10 provides a long working distance with a large field of view that allows the researcher to switch between fluorescence and DIC to accurately determine the tag location. Below is a DIC of C. elegans with embryos imaged *live on nutrient agar in a plastic petri dish* and a similar worm tagged with GFP. We are now scheduling appointments for on-site demonstrations.



C. elegans 400x, DIC on lawn

C. elegans 200x, GFP on lawn

MolmeX is located in Northampton, MA and can be contacted at 413-237-4309 or info@molmexscientific.com.