



► PRESIDENT'S LETTER - NESM KICKS OFF 2012 WITH A SUCCESS..... 1

○ 28

○ April

○ 2012



► 29TH ANNUAL SPRING SYMPOSIUM HOSTED BY THE MARINE BIOLOGICAL LABORATORY 2



► PAST & FUTURE MEETINGS: THE YEAR SO FAR 5

NESM news

PROMOTING THE INTERCHANGE OF KNOWLEDGE OF MICROSCOPY AND ITS TECHNIQUES IN NEW ENGLAND

President's Letter – NESM Kicks off 2012 with a Success

Dear Fellow Microscopists,

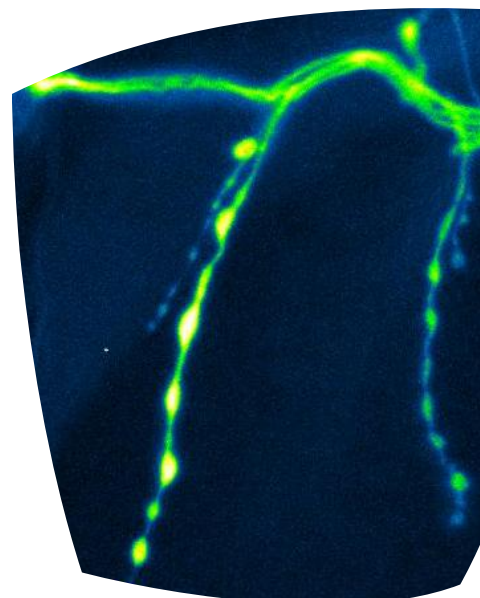
We have all the ingredients for making 2012 a very productive and memorable year for the NESM community: a super-enthusiastic board, an active membership, new information technology tools, and great momentum to kick off 2012. Part of this momentum comes from two very successful and well-attended NESM meetings: the Fall Symposium at Gordon College saying good-bye to 2011 and the February Meeting at Saint-Gobain welcoming 2012, which were attended by 38 and 44 members, respectively. Last but not least, we have our new president-elect for 2013, Dr. Ming Zheng, who is very dynamic and dedicated. Congratulations Ming!

One of our top goals this year is to reach out to a larger community in New England and to find new ways to increase our membership. NESM needs fresh blood. What better way is there than attracting more student members! We lowered our fees for student members and updated our society bylaws to expand the definition of a student member to: "current bona-fide students AND those two (2) or fewer years post-school." In addition, we are planning to invite student presenters to our future meetings.

Our next meeting is the largest of the four meetings we organize every year: the Woods Hole Symposium. This year it will be held on May 3rd and 4th, so make sure to mark these dates on your calendar. On Thursday

May 3rd, there will be an afternoon of short workshops. This short workshop format has proven to be a big hit among our members, as witnessed during the Fall Meeting at Harvard. Hence, we decided to offer short workshops at the Woods Hole meeting as well. The speaker presentations, poster session, and vendor tables will be on Friday May 4th. You can find information about all these workshops and events in the next few pages.

Thanks to our new website, a new Wiki, resources such as EventBrite, PayPal and Doodle, and new NESM accounts on Facebook and Twitter, scheduling events, spreading the news, paying membership dues, and registering for meetings have become simpler and more efficient. These new tools were designed and launched in large part by NESM secretary Blair Rossetti and have made the NESM Board's tasks easier as well. We meet every 6-8 weeks to plan each one of our four annual meetings and make policy decisions. We also discuss and decide on the presenter and venue selections. We are trying to keep a balance between biology and materials, as well as between light and electron/ion microscopy. However, we still need your help and guidance: we welcome your feedback, speaker recommendations, venue suggestions, constructive criticism, and fresh new ideas. Please do not hold back, we would like to hear from you.



Maximum intensity projection of *Drosophila* neuromuscular junction – Dr. Trevor Wardill

Chris Rieken, one of our board members, has moved to West Coast. I would like to say farewell to Chris and thank him for all his past contributions to our society. I would like to welcome our two new board members, George Bell and Trevor Wardill. Next, I would like to thank last year's Interim President Richard Schalek for handing over the society in such a great health. Finally, on behalf of the NESM Board, I would like to thank *you*, our loyal members, and *you*, our corporate sponsors, for your continuous support and suggestions. These events would be neither possible nor meaningful without you! Please keep supporting NESM. I hope to see you at the Woods Hole Meeting on May 3rd and 4th.

Sincerely,
Fettah Kosar
NESM President

29th Annual Spring Workshops at the Marine Biological Laboratory

Thursday, May 3, 2012

- 1 : 00 PM** **Welcome:** Louie Kerr, *NESM Biological Sciences Director*
- 1 : 10 PM** **Workshops Part I:** Advanced SEM Part I, Laser Microdissection and Optical Tweezers, and Intro to Confocal and 2P
- 2 : 30 PM** **Afternoon Break:** Coffee and refreshments
- 3 : 00 PM** **Workshops Part II:** Advanced SEM Part II, Live Cell Imaging, and Spectral Imaging
- 5 : 00 PM** **Closing Remarks:** Louie Kerr, *NESM Biological Sciences Director*

Workshop Abstracts

Advanced SEM Workshop Part I & II – John Yorston, Carl Zeiss Microscopy & Richard McLaughlin, Oxford Instruments

In this workshop, we will demonstrate the capabilities of a field emission variable pressure SEM outfitted with EDS and EBSD detectors. We will image coated and uncoated samples to compare and contrast high vacuum and variable pressure modes on a Zeiss Supra 40VP SEM within the Central Microscopy Facility at MBL. We will also introduce STEM imaging of ultra-thin sections. Then we will demonstrate the use of analytical techniques, specifically EDS and EBSD; again we can compare high vacuum and variable pressure modes as well as working distance and beam profiles.

Laser Microdissection and Optical Tweezers & Live Cell Imaging Workshop – Blair Rossetti, MBL & Jim McIlvain, Carl Zeiss Microscopy

Laser capture microscopy includes the ability to catapult a subset of a thin sample off of the slide and into a sample vial as well as the capability to ablate specific components of a sample and to provide force measurements of small samples. The spinning disc confocal microscope has the capability to rapidly collect images of a sample using the confocal technique. This instrument is configured with an incubation system for temperature sensitive time-lapse imaging. This workshop will spend time on the two instruments, a Zeiss PALM CombiSystem and the Zeiss Cell Observer SD.

Introduction to Confocal and 2P & Spectral Imaging Workshop – Trevor Wardill, MBL & Blair Rossetti, MBL

Related but different from standard confocal microscopy, two-photon microscopy utilizes an infrared laser to excite visible wavelength labels. The advantages and differences of two-photon imaging will be demonstrated. Most confocal and widefield fluorescent microscope systems utilize glass filters to separate excitation light and emission signal. This approach limits the number and wavelength proximity of signals. Spectral imaging opens new possibilities through instrument and computational approaches. The Zeiss LSM 710 NLO system will be used for the two-photon imaging and the Zeiss LSM 780 will be used for the spectral confocal work.

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Registration Closed

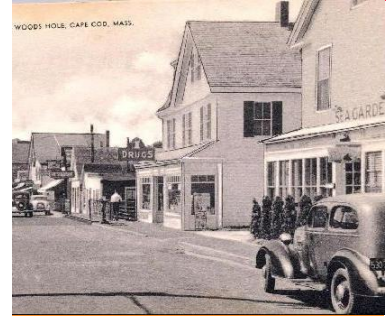


29th Annual Spring Symposium at the Marine Biological Laboratory

Friday, May 4, 2012

- 9:00AM Registration (Swope Center):** Coffee and refreshments
- 10:00AM Welcome (Meigs Room):** Louie Kerr, *Biological Sciences Director*
- 10:10AM “Confocal and super-resolution imaging of muscle”,** Elizabeth Brainerd, Ph.D., *Brown University*
- 10:50AM “Microscopy and authenticity in the art museum: How microscopes shed light on the origins of cultural artifacts”,** Richard Newman, *Museum of Fine Arts, Boston*
- 11:30AM Vendor/Poster Session**
- 12:30PM Lunch (Swope Center)**
- 1:50PM Keynote: “TEM: The key tool for nanotechnology”,** Barry Carter, D.Phil., Sc.D., *University of Connecticut*
- 2:15PM Afternoon Break:** Coffee and refreshments
- 3:00PM “Ion microprobe analyses at WHOI: Using micron-scale measurements to understand global scale processes”,** Brian Monteleone, Ph.D., *Woods Hole Oceanographic Institute*
- 3:40PM “The juvenile ALS2 gene product Alsin encodes a protein that regulates IGF-1 receptor endocytosis and cell signaling”,** Justin Topp, Ph.D., *Gordon College*
- 4:20PM “Making improved neural activity indicators: Genetics and calcium imaging methods”,** Trevor Wardill, Ph.D., *Marine Biological Laboratory, Woods Hole*
- 5:00PM Closing Remarks:** NESM Board

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Registration Closed



Student Poster Session



*The 29th Annual NESM
Spring Symposium
Student Poster
Session*

*Friday, May 4th, 11:30 - 12:30^{PM}
in Swope Center*

***PRIZES AWARDED TO
THE BEST STUDENT
POSTERS!***



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Past & Future Meetings: The Year So Far

45th Annual Fall Symposium & Business Meeting, Gordon College – December 1, 2011

The 45th Annual NESM Fall Symposium and Business Meeting was held on December 1, 2011 in Gordon College's Ken Olson Science Center. Four technical presentations were given in the afternoon session. Dr. John Calarco, a Bauer Fellow at the FAS Center for Systems Biology at Harvard University, kicked off the afternoon session at 1:15 pm with a presentation on using light to illuminate alternative splicing decisions in the nervous system. His talk focused on the mechanisms and functional consequences of tissue-specific alternative pre-mRNA splicing during neuronal differentiation. Dr. Yaping Dan, who is currently a postdoctoral fellow in the School of Engineering and Applied Sciences at Harvard University, presented his research on dramatic reduction of surface recombination by *in situ* surface passivation of silicon nanowires using near-field scanning photocurrent microscopy. After a brief coffee recess, two other scientists, also from Harvard University, presented their research. Dr. Praveen Arany

addressed two aspects of wound healing associated with bone growth and oral healing, as revealed through microscopic observations. Dr. Josh Morgan's talk focused on applying large scale serial electron microscopy to understanding the circuit organization of retinal ganglion cell axons through automated tape collection of sections and high speed acquisition of scanning electron micrographs. After a wonderful dinner served by Gordon students, the after dinner talk was given by Dr. Jennifer Ross of UMass Amherst. Dr. Ross presented her research on illuminating biological processes with fluorescence microscopy. She provided the attendees with fascinating results that were illustrated with beautiful images and time-lapse video captures, both generated by single molecule total internal reflection fluorescence microscopy of microtubule cytoskeleton. Dr. Ross made a highly technical presentation enjoyable, as done usually by any dynamic speaker. It is no wonder she has won several research and teaching awards in the last



several years. The Business meeting elected new board members, highlighted the annual budget status, discussed several issues related to the future operations of NESM, including by-law changes and recruiting student members. A majority of members agreed to reduce registration fees to attract more student members in order to grow the society.

-Ming Zheng
NESM President-Elect

Spring Meeting, Saint-Gobain, Northboro Research & Development Center, MA – February 15, 2012

Our February 2012 meeting was held at Saint-Gobain Northboro Research and Development Center (NRDC). This was the first NESM meeting hosted by Saint-Gobain. NESM is very grateful to the NRDC staff for excellently organized meeting. We had a great tour through the research facility and a great dinner.

Our host, NRDC Director Dr. Rakesh Kapoor, gave a warm welcome and provided a very interesting introduction to the company's long and rich history. We learned that Saint-Gobain was established in 1665! Dr. Kapoor set the stage for a very exciting meeting. He was followed by two superb technical talks:

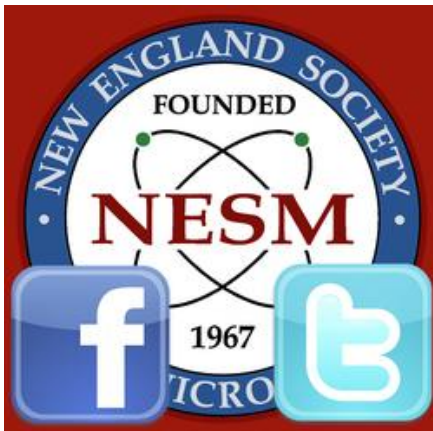
Dr. Charles Bateman of Saint-Gobain NRDC presented on crystals as stacked layers and the infinite world of intergrowths. At the beginning of his talk, Dr. Bateman helped the audience to better understand, using a crystal models made of ping pong balls, face centered cubic and hexagonal closed packed crystal structures. He then presented his high profile electron microscopy research on a number of zeolite systems and discussed methods on how to describe and understand their structures.

Dr. Paloma Gonzalez Bellido of the Marine Biological Laboratory, Woods Hole presented on the visual resolution of insect eyes. Dr. Gonzalez Bellido

showed us the amazing world of insect eyes. It was eye-opening to learn about interdependence between high visual resolution and the number of lenses in large compound insect eye; between large, heavy and energetically costly eyes, and the large body needed to carry them. It was incredible to learn how quickly predatory insects must, in order to carry out a successful attack, process and relay visual information from the brain to the wings.

The meeting was a great success. We had a good turnout and all attendees enjoyed the beautiful facilities and dynamic and intriguing presenters.

-Tigran Dolukhanyan
Physical Sciences Director



NESM News *Live*

Looking for upcoming meeting dates? Wondering how to become a NESM member? Interested in affiliated societies? Keep updated on all things NESM by checking us out on the web. Visit our homepage, nesmicroscopy.org, for the latest information on meetings and events. Peruse the website to find membership applications, Society documents, and contact information. Scan the QR codes below with your smartphone to find NESM on the web.



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NESM would like to extend our deepest thanks and appreciation to all of our Corporate Members. Your sustained commitment to NESM allows us to continue to promote excellence in microscopy here in New England. NESM would also like to thank our affiliated societies – MSA, MAS, and ConnMS – for their continued support.

