Minnesota Microscopy Society

Local affiliate of the ***Microscopy Society of America***
and the ***Microbeam Analysis Society***

Newsletter

November 2000

MMS November Meeting

Thursday, November 9, 2000

"Everything you wanted to know about SPM but were afraid to ask…"

Speaker: Chuck Mooney, SPM Assistant Product Manager, JEOL USA, Inc.,
11 Dearborn Road, Peabody, MA 01960
e-mail: mooney@jeol.com

Program:

6:00-7:00 PM	Dinner
7:30-7:45 PM	Business meeting
7:45-8:30 PM	Speaker

Dinner: New King Buffet
5927 John Martin Drive
Brooklyn Center
The New King Buffet is a full menu Chinese buffet. Cost is $10.00 per person.

Meeting: Medtronic, Inc.
6700 Shingle Creek Parkway
Brooklyn Center
(***see map on page 2 for locations***)

We will first meet at the New King Buffet for dinner. After dinner, we will reconvene at Medtronic for the business and technical meetings.

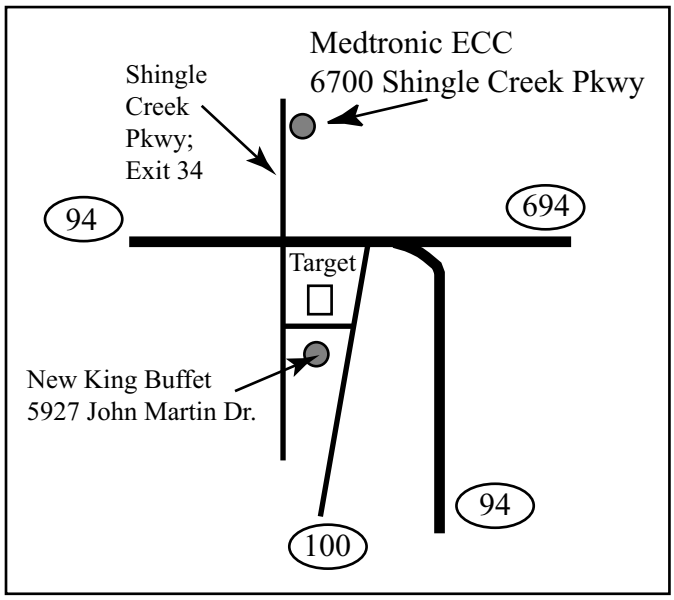
Make Your Reservations Today

For reservations contact Mike Coscio **by Friday, November 3** (763-514-1331, or mike.coscio@medtronic.com).

Abstract:

The first scanning probe microscope (SPM), the scanning tunneling microscope, was introduced to the world in 1981 as a frightfully complex laboratory experiment where conductors could be probed at the atomic scale. Five years later, the Nobel Prize in Physics was awarded to its inventors, even as the basic technique was expanded to include probing insulators with the invention of the atomic force microscope (AFM). Since that time, many new methods have been added to the general field of scanning probe microscopy that allow for the probing of all manner of samples and forces. Recent breakthroughs have allowed the measurement of the strength of bonds between atomic species as well as the potential for 3-D sub-surface imaging and spectroscopy of atomic species near the sample surface. Many research laboratories have added scanning probe microscopy techniques to their analytical arsenals aided by the introduction of commercially available instruments. Unfortunately, the strengths and weaknesses of SPM remain a mystery to many who could benefit from a better understanding of both the techniques that are routine and those that are difficult, the relative levels of information that can be extracted from those techniques, and the types of samples that are suitable for most SPMs. In the time allowed, an introduction to the various SPM techniques will be given, applications examples shown, as well as providing insight into the future of probe microscopy.

November Meeting Location Map



Scanning Probe Microscope (SPM) Demonstrations

Besides being the speaker at our November MMS meeting, Chuck Mooney will also be in town for three days to do demonstrations on JEOL's JSPM 4200 Multi-Environment Scanning Probe Microscope. This AFM/SPM microscope is "multi-environmental", allowing for heating up to 800 K and cooling down to 130 K. Its operational modes included: Static AFM(Contact Atomic Force), Dynamic AFM (Non-contact AFM, Discrete Contact AFM), STM (Scanning Tunneling), STS (Scanning Tunneling Spectroscopy), CITS (Current Imaging Tunneling Spectroscopy), LFM (Lateral Force), LFM (Lateral Modulation), Force Modulation, Phase Detection, and Magnetic Force Microscopy.

From November 7th to 9th Chuck will be at Medtronic ECC in Brooklyn Center. Anyone interested in arranging a demonstration can contact Robb Mierzwa, JEOL Midwest District Sales Manager at 920-803-8945 or mierzwa@jeol.com. Demonstrations typically take about 3-4 hours.

Last MMS Meeting Review

The MMS October meeting speaker, Mark B. Edlund of the Science Museum of Minnesota, provided an interesting and entertaining talk on diatoms. Diatoms play an important role in monitoring water quality, and our understanding of them has been intertwined with the development of microscopy. The importance of diatoms as an environmental indicator was shown by the correlation between regional development and changes that have taken place in the diatoms of local lakes. Areas of Minnesota that have undergone extensive lake-shore development show changes in both the number and composition of diatom species in the lakes.

Our understanding of diatoms has also evolved with the development of microscopy. Initially they were thought to be small animals, especially since certain species are mobile. However thanks to the development of better microscopes, diatoms were found to contain chlorophyll, and this led to their reclassification as a plant. The development of the SEM also has allowed the structure of diatoms to be better understood, and for their morphological features to be examined and function identified. Conversely, the use of diatoms (Amphipleura pellucida) as a calibration standard in optical microscopy is well known. The talk was an illuminating example of how something that we can easily take for granted has impact on our lives, and it was given by an dynamic speaker with good humor and passion. A talk not to have been missed.

Upcoming MMS Meetings

December ?	Imaging workshop, or ???
February 8	???
March 28	Joint meeting with ASM; "Nanomechanical Test Instruments"
April ?	Tour, possibly Medtronic
May 4	Spring Symposium "Investigative Microscopy"

Microscopy Community News

WANTED!!
Electron Microscopy/Histology Technician

Full-time position available for an Electron Microscopy/Histology Technician to work on a NSF funded research project on biological structural colors. Responsibilities include specimen preparation, observation, and imaging using transmission electron microscopy (TEM) and light microscopy. Additional opportunities for active participation in research and publication. Required qualifications: Bachelor's degree or equivalent in an appropriate field; previous experience in microscopy or histology; previous experience in laboratory research. Preferred qualifications: previous experience in specimen preparation and sectioning for TEM; previous experience operating transmission electron microscopes; previous experience in fixation, sectioning, and staining for light microscope histology; previous experience in computer data base management; graduate degree in an appropriate field. Salary: $25,000 per year (full-time) with benefits. Contact: Dr. Richard O. Prum, Natural History Museum, Dyche Hall, University of Kansas, Lawrence, KS 66045-2454; (785) 864-3897; prum@ukans.edu. Review of applications begins Nov. 1, 2000 and will continue until position is filled.

Upcoming National Meetings

Scanning 2001

Date: May 5-7, 2001
Location: Roosevelt Hotel
45th at Madison Ave.
New York City, New York
Sponsor: FAMS, Inc. (Foundation for the Advances in Medicine and Science) and *Scanning, The Journal of Scanning Microscopies*
Contact: Mary K. Sullivan, SCANNING 2001
201-818-1010; scanning@fams.org, or
www.scanning.org

Microscopy and Microanalysis 2001

Date: August 5-9, 2001
Location: Long Beach, California
Sponsor: Microscopy Society of America and Microbeam Analysis Society
Contact: MSA Business Office: 800-538-3672
www.msa.microscopy.com

Tutorial on Multi-Photon Excitation (MPE) Microscopy available from Coherent Laser Group

Multiphoton excitation (MPE) microscopy combines scanning microscopy with multiphoton fluorescence to create high-resolution, three-dimensional images of microscopic samples. MPE is particularly useful in biology because it can be used to probe delicate living cells and tissues without damaging the sample. Although multiphoton excitation has been demonstrated with high-power cw argon and krypton lasers, the laser source of choice for MPE microscopy is an ultra-fast Ti:Sapphire laser.

When compared to conventional confocal microscopy, MPE microscopy has many advantages:

- higher axial resolution
- greater sample penetration
- reduced photobleaching of marker dyes
- increased cell viability

A 20-page tutorial on multiphoton excitation microscopy is available at *www.coherentinc.com/cohrLasersAPPLICATIONS/html/multiphoton.html,* select "MPE tutorial" or contact Michael Boehlke at michael_boehlke@cohr.com

Sustaining Corporate Members

Sustaining members are the backbone of financial support for the Society. These members make it possible for the Society to support Project Micro, and to cover many expenses of the regular meetings and the Spring Symposium. We greatly appreciate the continued support of these individuals and corporations. To become a Sustaining Member, fill out the MMS membership form at the end of the newsletter.

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Steve Ziegler	**Digital Instruments**	512-912-1615

If any Sustaining Members are missing from this list, *please* contact either: Diana Kittleson (651-917-5859, dkittleson@pillsbury.com) or Peter McSwiggen (612- 624-7370, mcswi001@umn.edu)

MMS Patron Members

The Minnesota Microscopy Society would like to express our thanks to our Patron Members. These members provide financial support to the organization above the standard membership fee. This type of continued support makes it possible for MMS to maintain its financial well being. To become a Patron Member, fill out the MMS membership form at the end of the newsletter.

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Sue Okerstrom, Medtronic Inc., 7000 Central Ave. NE., Minneapolis MN 55432 (612) 514-4678, sue.okerstrom@medtronic.com

Your MMS Annual Membership dues are payable in September/October!

All microscopists are urged to support their Society at one of the membership levels offered below. The more dues-paying members we have, the more likely we are to attract sustaining corporate memberships which form the financial backbone of our Society. Often, supervisors will support MMS memberships out of their project budget because they recognize that it is a very inexpensive way to maintain and increase the skills of their microscopists. If you have been a member over the years and recognize the value of MMS to the community of microscopists it serves, consider upgrading your membership this year to the patron or sustaining level. Thank you.

Name_____ Dr____ Mr____ Ms____ Phone (_____)_____

Affiliation_____Position_____

Address_____ ZIP_____

Indicate the method by which you would like to receive the Newsletter: mail_____ e-mail/web_____ both_____

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Check here____ if you do NOT want your name and address to appear in the Society directory.

Area of interest: Bioscience _____ Materials Science _____ SEM _____ TEM _____ X-ray _____

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Make checks payable to MMS and mail to our treasurer:
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Minnesota Microscopy Society
Peter McSwiggen, MMS Editor
University of Minnesota
310 Pillsbury Drive, SE,
Minneapolis, MN 55455

October 12:

"Everything you wanted to know about SPM but were afraid to ask…"

Forwarding and Address
Correction Requested