



ConnMS

The Connecticut Microscopy Society Newsletter

[HTTP://www.ConnMS.org](http://www.ConnMS.org)

April 2008

From the President



It has once again been a pleasure to serve as an officer of the Connecticut Microscopy Society this year. What makes this a particular joy are the many opportunities to meet and interact with people who share my passion for microscopy. Our upcoming Spring meeting is just such an opportunity. I'd like to express my gratitude to the many people who have contributed to the society this year. First and foremost, I'd like to acknowledge the strong work of our Vice President, **David Knecht**, who is never at a loss for interesting topics for our meetings. Thanks also go out to **Gary Laevsky** who has been so helpful in his role as secretary. It has been both tremendous fun to work with both of them!

Spring meeting: This year's spring meeting will be held Tuesday May 22nd at the Yale University School of Medicine in a lovely new building on the medical campus. We once again

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Barry Carter



Dr. C. Barry Carter received his BA in Natural Science from Cambridge and is D.Phil. in Metallurgy and Science of Materials from Oxford. Dr. Carter was on the Faculty at Cornell for 12 years before accepting an endowed chair at the Uni-

versity of Minnesota in 1991. He moved to UConn in July 2007 to be the Head of the Department of Chemical, Materials and Biomolecular Engineering. He served as an Editor of the "Journal of Microscopy" and "Microscopy and Microanalysis" and is presently Editor in Chief of the "Journal of Materials Science". He is co-author of "Transmission Electron Microscopy: A Textbook for Materials Science" (with Dave Williams) and of "Ceramic Materials: Science and Engineering" (with Grant Norton). He is the current General Secretary of the International Federation of Societies for Microscopy (IFSM). Dr. Carter's interests generally concern applying microscopy to improve our understanding of defects in materials, interfaces and reactions between materials, and the growth of nanomaterials. One aim of his current research is to improve in situ experimental techniques in microscopy.

John Carson



John Carson received a BA from Reed College and a PhD from MIT. After postdoctoral training at the University of Bern and at McGill University he joined the faculty at the University of Connecticut Health Center where he is currently Professor in the

Department of Molecular, Microbial and Structural Biology. He is a faculty member of the Center for Cell Analysis and Modeling, also at UCHC. His current research is focused on RNA trafficking in neural cells.

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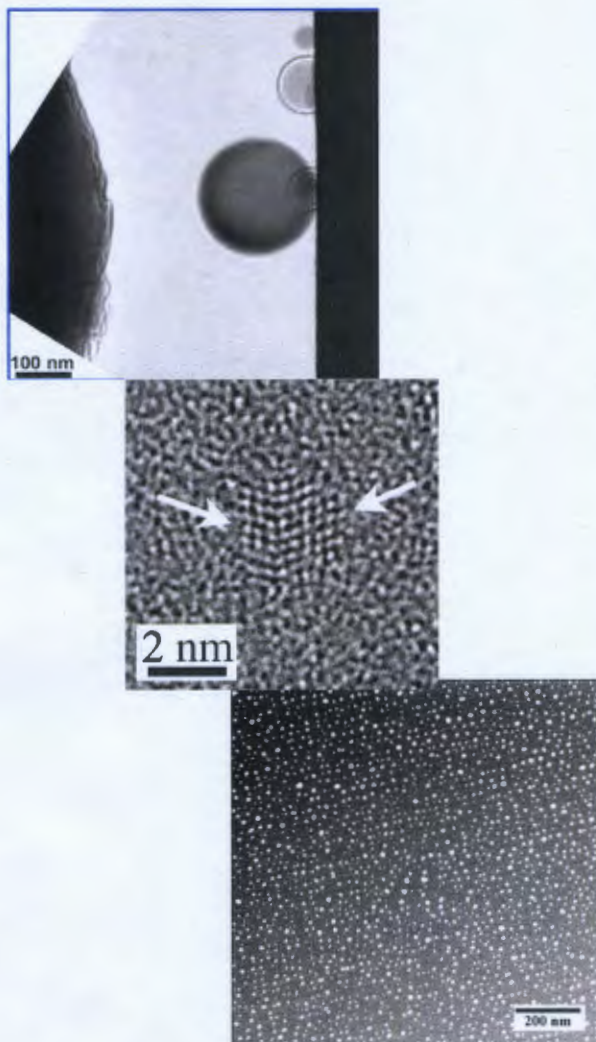
Directions to meeting at Yale University

Spring Meeting Abstracts

Barry Carter, PhD

"A Few of My Favorite Things: Reflections on TEM, SEM, STM, AFM and VLM imaging"

In this talk I will illustrate the work of my group over the past 30 years. I'll include examples of studies using TEM, SEM, STM, AFM and, of course, VLM. Our favorite material is always sapphire but materials like Au, Pt, magnesia, the spinels, GaAs, GaN and even Si appear periodically. To be topical(ish), I'll also include a little on FIB, EBSD and aberration-corrected TEM and STEM.



John Carson, PhD

"Using fluorescence correlation spectroscopy to measure binding constants in live cells"

Most cell biological processes are mediated by molecular interactions. In many cases all of the molecular components of a system are known and all of their interacting partners have been identified. However quantitative modeling of the system requires knowledge of concentrations and diffusion coefficients for each molecular component and on rates and off rates for each interaction inside the cell. These numbers are often not available but can be determined by fluorescence correlation spectroscopy (FCS), which measures fluorescence fluctuations as fluorescent particles traverse a small (< 1 fl) observation volume created by either confocal optics or two photon excitation.

The FCS observation volume can be positioned at various locations inside a living cell. Autocorrelation analysis is used to measure concentrations, diffusion coefficients, transport rates and kinetic constants. Photobleaching analysis is used to measure immobile components. Cross correlation analysis of dual channel fluctuation data is used to measure binding between differentially labeled components. In this talk I will describe how to use FCS to measure binding constants in live cells..



from the President continued

have two excellent speakers! **Barry Carter** is the Head of the Department of Chemical, Materials and Biomolecular Engineering at the Storrs UConn campus. He will be speaking about “a few of his favorite things”, which turns out to not be a small number! He will share with us his reflections on instrumentation and applications—old, new, and the bleeding edge.

John Carson, from the Farmington UConn campus, will speak on a powerful technique that is becoming increasingly important – Fluorescence Correlation Spectroscopy (FCS). FCS is a technique that both David Knecht and I were interested in learning more about. Clearly one of the benefits of being an officer of this society is that we can pick the speakers and the topics! John will explain it all to us with exemplary imaging of its application to the measurements of diffusion and binding constants of molecules within cells in real time.

Yale Microscopy Workshop

I would like to take this opportunity to draw your attention to another event to be held June 10th-12th at the Yale School of Medicine, co-organized by myself and Derek Toomre. The Yale Microscopy Workshop provides investigators from the regional research community access to cutting edge optical microscopy instrumentation as well as expertise in advance microscopy techniques. In the morning symposia, talks will be given by academic researchers that employ emerging techniques in optical microscopy such as FRET and in vivo imaging using multiphoton laser scanning microscopy. Please see the website for a complete description of the schedule (<http://microscopy.med.yale.edu/events.html>).

Throughout the 3-day Workshop, we will have many fully functional microscopes available from 6 different vendors, including Zeiss, Leica, Nikon, Olympus. Attendees are invited to bring samples or just peruse using samples available on site. These microscope vendors will be bringing many of their newest instruments, including those employing laser capture, structured illumination and of course laser scanning optical microscopes. This year we are introducing two-photon systems made by LaVision, Prairie Technologies and Zeiss that will also be available for use. The confocal microscopes include some that have only recently been released, including the Nikon A1, Leica SP5X and Zeiss LSM 710. Last year's event was extremely successful and we invite you and your colleagues to attend all or part of this free workshop. Free registration online is required: (<http://microscopy.med.yale.edu/registration.html>). Feel free to contact me with any questions you might have (ann.haberman@yale.edu). Please note that the hands-on practicals for FRET and optical sectioning are unfortunately now full. Access to the instruments does not require participation in the classes or symposia, but does require registration.

A Call for Officers

Finally, I would like to invite you to consider serving as a society officer this upcoming year. Quite frankly, it is fun to choose speakers and topics for our meetings. And if you love to plan a party, you'll enjoy choosing the caterer and location for the meetings. Please consider taking a role in this society!

Best Regards,
Ann Haberman, President



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Connecticut Microscopy Society Spring Meeting

Barry Carter, Ph.D, University of Connecticut, Storrs CT

“A Few of My Favorite Things: Reflections on TEM, SEM, STM, AFM and VLM imaging”

John Carson, Ph.D, University of Connecticut, Farmington CT

“Using fluorescence correlation spectroscopy to measure binding constants in live cells”

Thursday May 22nd, 2008

Yale University School of Medicine
300 Cedar Street, New Haven CT
The Anlyan Center (TAC) auditorium

5:00-6:00 PM - Registration and Reception

6:00-6:45 PM - Barry Carter, Ph.D

6:45-7:30 PM - Dinner

7:30-8:15 PM - John Carson, Ph.D

Pre-registration is preferred by May 14th

Meeting registration fee: \$25 for regular members

\$30 for non-members

\$15 for students

To register: please contact G.Laevsky@andor.com or Ann.Haberman@yale.edu or go to ConnMS.org to print the registration form and fax or mail it as directed. Directions and a campus map can also be found on the website.

Directions

The Anlyan Center (TAC) building
300 Cedar Street
Yale School of Medicine
New Haven, CT

Taking I-95 North: Leave I-95 North at Exit 47 (Downtown New Haven/Rte 34). This is a LEFT side exit. This puts you onto an exit expressway. Merge onto CT-34 W toward Downtown New Haven and follow the directions below.

Taking I-95 South: Leave I-95 South at Exit 47 (Downtown New Haven/Rte 34), just after the bridge This is the center one of three exits. Merge onto CT-34 W toward Downtown New Haven and follow the directions below.

From I 91 South: Leave I-91 South at Exit 1 (Downtown New Haven/Rte 34). This exit puts you onto an exit expressway. Merge onto CT-34 W toward Downtown New Haven and follow the directions below.

If you want to park on the street, take EXIT 2 toward College St/ N. Frontage Rd. Turn Left onto College Street and continue for two blocks. Turn slight right onto Congress Ave. The Anlyan Center (TAC building) is at the next corner. If you will be parking in the garage suggested below, follow instead the directions listed below.

If you prefer to park in a garage, follow the short expressway to its end in New Haven. You will be next to a huge overhead parking garage (Air Rights Garage) at the intersection of York and North Frontage/Rte 34. Keep to your left on this final off ramp and then make a left into the garage before you reach the corner. Take the elevator to street level. Walk on York St. towards the Medical center (the corner with the Subway store) and cross the road (S. Frontage) and continue on York St. to the next intersection. Cross over and then make a left there on Cedar St. Walk about 1 long block to the intersection of Cedar St. and Congress Avenue. Cross there and enter the TAC Building (300 Cedar St) which is the huge building diagonally to your right at 11 O'Clock.

Connecticut Microscopy Society

www.ConnMS.org



Registration for the Spring Meeting

May 22nd, 2008

**Auditorium of The Anlyan Center Building (TAC)
Yale University School of Medicine, New Haven CT**

Name: _____

Affiliation: _____

Address: _____

Email: _____

Tel: _____

Field of Interest: Life Science _____ Materials Science _____ Both: _____

Membership in related societies: MSA: _____ NESM: _____

Registration fees (please check one)

_____ Regular Member \$25

_____ Guest / Non-Member \$30

_____ Student Member \$15

If you are registering after May 9th, please Fax the completed application and pay at the door. Alternatively, you can simply email Ann or Gary to let them know that you will be coming:

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G.Laevsky@andor.com

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