



*Southern California Society
for
Microscopy & Microanalysis*

Fall Meeting

**Thursday
October 23, 2014
Starts at 5:30 pm**



KEY-NOTE SPEAKER:

Thomas J. Deerinck, UCSD

Advances in Correlated Light and Electron Microscopic Imaging
Probes

Address: City of Hope
Arnold and Mabel Beckman Center
Argyros Auditorium
1500 East Duarte Road
Duarte, CA 91010-3000
Tel: 626-301-8265

FROM THE



PRESIDENT

Welcome to the 2014/2015 season of the Southern California Society for Microscopy and Microanalysis. We have two meetings planned for this year – in October and February.

For our Fall Meeting we are focusing on Correlative Light and Electron Microscopy. And I am particularly pleased that for this Meeting we have as our key-note speaker Thomas J. Deerinck, a staff research scientist at the National Center for Microscopy and Imaging Research (NCMIR) and the Center for Research in Biological Systems at the University of

California, San Diego. He is currently working with teams headed by Mark Ellisman, director of NCMIR and Roger Tsien, recipient of the 2008 Nobel Prize in Chemistry. He is also well known in scientific community due to his stunning microscopy images. In addition, we have as our invited speaker Grayson Chadwick, who is a young researcher from Victoria Orphan's lab in Caltech where he is developing pioneering techniques for correlated light microscopy and nanoscale secondary ion mass spectrometry with Dr. Shawn McGlynn.

Our Spring Symposium will, once again, be an all-day meeting. We are in the process of putting together a full program including student platform and poster sessions. Once again, there will be a \$500 award for the best platform presentation and a \$300 award for the best poster. The awards are to support travel to the national M&M meeting - August 2-6, 2015, Portland, OR.

Our dues this year will remain at \$25 for professionals and \$10 for students and will include all meeting costs. Clearly, the bulk of our costs are covered by our sponsors, so please take time to talk to our vendor representatives and maybe even buy their instruments! Details on underwriting opportunities for our sponsors are elsewhere in this mailing. We hope that our adopted procedure on sponsorship makes it easier for vendors to support our society. We are very grateful for our sponsors' support.

Our Society and board is going through some changes. At our fall meeting I will be handing over the Presidency of the SCSMM to Ariane Briegel, our current VP Biological Science. We have new board members along with some very long-serving old members. Our board members are identified in this newsletter and I would like to thank all of them for their hard work. We hope you support our team.

Sergey V. Prikhodko, President

2014 Fall Meeting Program

5:30 PM Happy Hour

6:30 PM Dinner (buffet)

Mediterranean Bar including grilled chicken breast, chickpea salad, white beans salad, cucumber salad, hummus, fattoush salad with tzatzik sauce and pita bread.

Business Meeting

7:30 PM Scientific Program

Advances in Correlated Light and Electron Microscopic Imaging Probes

Thomas J. Deerinck, UCSD

8:10 PM Single-cell resolution activity measurements of uncultured anaerobic methanotrophs

Grayson Chadwick, Caltech

Registration & RSVP

Respond no later than **5 p.m. Friday, October 17th**, 2014

Please contact

Mark Armitage

Micromark@juno.com

Regular annual membership for the 2013-2014 term is \$25 and \$10 for students.

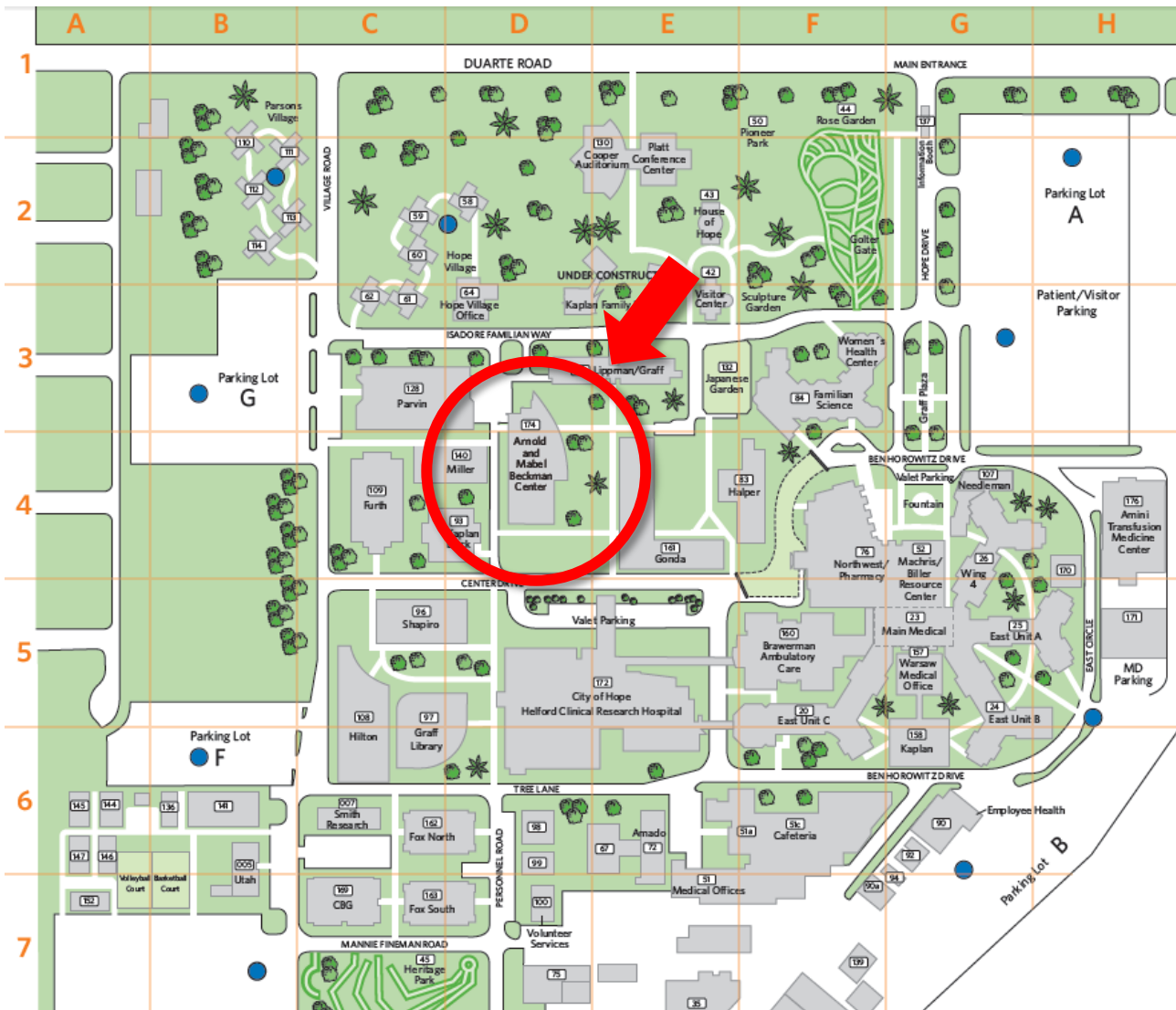
For further details visit SCSMM web site

www.scsmm.org

Map and Directions

For the Map and Directions to **City of Hope - Duarte** please refer to:

<http://www.cityofhope.org/maps-and-directions>



Parking: Lots **A** and **G** are the closest to the **Arnold and Mabel Beckman Center**. Street parking is also available at the south side of Duarte Road.

The location of **Arnold and Mabel Beckman Center** is circled in red in the campus map. The **Argyros Auditorium** is on the first floor.



Southern California Society for Microscopy & Microanalysis

Membership Application 2014 - 2015

About SCSMM

The **SOUTHERN CALIFORNIA SOCIETY FOR MICROSCOPY & MICROANALYSIS** is dedicated to increasing interest and information in all areas of microscopy and microanalysis, including, but not limited to: transmission electron, scanning electron and electron microprobe, ion probe, microbeam analysis, optical and confocal microscopies, and microspectroscopies. You are invited to join, or renew your membership in the society.

The Society generally meets two times per year at various locations throughout the greater Los Angeles area. The program usually begins with a Social Hour followed by Dinner, then a brief Business Meeting and finally the Scientific Program which consists of one or two presentations in the biological and physical sciences selected to be of sufficient breadth and interest to appeal to the entire membership.

Among our current members are students (graduate and undergraduate), post-docs, college and university professors and research assistants, laboratory directors, vendors of electron microscopes, microanalysis and/or related equipment, laboratory technicians, technologists, assistants, and many others. Their professional work spans the full range of the biological, medical and physical sciences.

In order that we may have precise records, please complete all of the information included on this application, including both your work and home addresses. You may indicate at which address you wish to receive SCSMM mailings. Fax numbers and e-mail address will be used to notify you of last minute changes in scheduled events. This information will be used only for SCSMM business. **The published list of members will include only your work address, phone number, and/or e-mail address and will only be made available to members and meeting sponsors of SCSMM. You may request that your name not be included in the published list.** If your company or laboratory has a web site, we would like to publish this in a directory of services available to Southern California microscopists.

CORPORATE MEMBERSHIP: Corporate members are entitled to place two individual's names on the rolls per membership. Your membership will be acknowledged throughout the year via SCSMM Meeting Announcements and Newsletters. Corporate members are invited to place advertising in our Meeting Announcements and Newsletters. The cost for this is \$175 per 8½ x 11" page. You are also invited to sponsor one of our meetings at which you may give a short presentation or product demonstration. For more information on Corporate Memberships, please contact Chris Rood at crood@jeol.com, phone 760-476-1980.

SCSMM Vendor Sponsorship Benefits and Recognition*

\$500 (Gold) level

Scheduled (15 min) talk during spring or fall meeting
Instrumentation display during spring meeting (table)
Announcement/acknowledgment from the stage as a Gold sponsor of SCSMM
Listing as a Gold sponsor in all press and media materials of the SCSMM
Invitation for two to attend the spring and fall meeting

\$250 (Silver) level

Instrumentation display during spring meeting (table)
Announcement/acknowledgment from the stage as a Silver sponsor of SCSMM
Listing as a Silver sponsor in all press and media materials of the SCSMM
Invitation for two to attend the spring and fall meeting

\$150 (Bronze) level

Announcement/acknowledgment from the stage as a Bronze sponsor of SCSMM
Listing as a Bronze sponsor in all press and media materials of the SCSMM
Invitation for two to attend the spring and fall meeting

\$100 Regular Corporate membership

Listing as a Corporate Member in SCSMM spring and fall pre-meeting newsletters
Invitation for one to attend the spring and fall meetings

Vendors are also most welcome to sponsor with "in-kind" support of our meetings, such as providing wine with dinner (fall meeting) or a prize for a raffle or student talk/poster. Acknowledgements of such sponsorship will be made during the meeting and in the meeting announcement - and are always much appreciated!

*Sponsorship is effective and recognized by SCSMM only the year it was made (starts in fall) and only after vendor's contribution got SCSMM corporate membership.

Abstracts

Advances in Correlated Light and Electron Microscopic Imaging Probes

Thomas J. Deerinck

The National Center for Microscopy and Imaging Research and the Center for Research in Biological Systems, University of California, San Diego, La Jolla, CA, 92093

Tremendous advances are occurring in the fields of light and electron microscopy, both in terms of the resolution achievable using light, and the depth, breadth and scale over which biological specimens can now be imaged in 3-D using electrons. While a major strength of light microscopy is the ability to chronicle dynamic cellular processes in living systems, the electron microscope offers superior resolution in a contextual tableau rich in information. While some see a rivalry spurred by the success of “super-resolution” light microscopy techniques, the reality is that both approaches are in fact complementary, and techniques that allow a synthesis of both data are highly desirable.

While a number of different approaches to enable correlated light and electron microscopy (CLEM) have been or are actively being developed, we have focused our efforts on using molecular-genetic approaches to design novel molecular labels for both microscopies. These include the tetracysteine/biarsenical labeling system, the recombinant fluorescent protein MiniSOG (for Mini singlet oxygen generator), and APEX; a small and versatile genetically modified ascorbate peroxidase. The localization of proteins, macromolecules and organelles using these probes have a number of key advantages over other methods including: 1) excellent preservation of cell ultrastructure, since conventional EM fixation methods can be employed and no permeablizing detergents are required; 2) uniform 3-D labeling throughout relatively large volumes of tissue for 3-D LM and EM and; 3) high-resolution labeling. Recent developments with these probes and others will be discussed.

Biography: Thomas J. Deerinck is a staff research scientist at the National Center for Microscopy and Imaging Research (NCMIR) and the Center for Research in Biological Systems at the University of California, San Diego. He attended the program in electron microscopy at San Joaquin Delta College and since 1978 has been working to develop new techniques to facilitate all types of microscopic imaging including confocal, multiphoton and electron microscopy as well as electron tomography and serial blockface EM. He has co-authored over 100 scientific papers, abstracts and book chapters and his images have appeared in various popular periodicals including National Geographic, Scientific American, Discover and Time magazine.



He is currently working with teams headed by Mark Ellisman, director of NCMIR and Roger Tsien, recipient of the 2008 Nobel Prize in Chemistry, in advancing methods for correlated light and electron microscopic imaging and automated 3-D electron microscopy.

Single-Cell Resolution Activity Measurements of Uncultured Anaerobic Methanotrophs

Grayson Chadwick,

Department of Biological Sciences, University of Southern California, Los Angeles, CA 90089-0740

Natural microbial communities are often composed of close associations between diverse organisms, and the effect of these relationships on the individual cellular activities is an important aspect of microbial ecology. Unfortunately, due to the small spatial scales over which these interactions occur, as well as our inability to culture many environmentally relevant organisms, we have little data informing our understanding of these relationships. Here we have applied correlative fluorescence in situ hybridization and single-cell resolution secondary ion mass spectroscopy with stable isotope probing to begin to investigate how the spatial organization of multi-species consortia affects the activities of each individual cell. These techniques were applied to natural communities of methane oxidizing archaea and sulfate reducing bacteria which mediate the anaerobic oxidation of methane in marine sediments. The resulting single-cell data is used to constrain metabolic models which until now have been incorporating only bulk incubation data. Finally, the conclusions from our experimental and modeling efforts are considered in light of available genomic data. We hope to see these techniques applied more broadly to additional microbial systems to improve our understanding of the fine-scale interactions between microbes and their environments.

Biography: Grayson Chadwick received his B.S. in Biology from Caltech in 2011 where he conducted research in the lab of Victoria Orphan on syntrophic communities of Archaea and Bacteria that mediate the anaerobic oxidation of methane. He has continued this work as a technician in the Orphan lab, in particular developing techniques for correlated light microscopy and nanoscale secondary ion mass spectrometry (nanoSIMS) with Shawn McGlynn. His work aims at utilizing these high resolution techniques to apply classic ecological theory to the activity of individual microbial cells in complex, uncultured communities. He is currently a PhD student at USC in the labs of Ken Nealson and Jan Amend.





The Southern California Society for Microscopy and Microanalysis wishes to acknowledge the following Corporate Members who faithfully advertise in our Meeting Announcements, sponsor meetings and have renewed their commitment to our society for the 2014 - 2015 year.

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