Southern California Society
for
Microscopy & Microanalysis

Fall Meeting

Thursday
November 7, 2013
Starts at 5:30 pm

USC University of Southern California

INVITED SPEAKERS:

Paul S. Weiss, CNSI (UCLA)

The Ultimate Limits of Miniaturization: Exploring and Controlling the Nanoscale World in Science, Engineering, and Medicine

Adam Z. Stieg CNSI (UCLA)

From Atoms to Organisms: Bridging the Mesoscale with Correlative Microscopy

Address: University of Southern California
814 Bloom Walk
CEM Building, Room 101B
Los Angeles, CA 90089-1010
Tel: 213-740-1990

FROM THE DIRECTOR

Welcome to the 2013 / 2014 season of the Southern California Society for Microscopy and Microanalysis. We have two meetings planned for this year – in November and February.

Our Fall Meeting we would like to dedicate to the UCLA California NanoSystem Institute (CNSI) which in the very short time since its operation started in 2007 became a world recognized frontier in nanoscience and nanotechnology. And I am particularly pleased that for our Fall Meeting we have as our featured speakers Dr. Paul Weiss, Director of the CNSI, Fred Kavli Chair in NanoSystems Sciences, Distinguished Professor of Chemistry and Biochemistry & Materials Science and Engineering, UCLA and Dr. Adam Stieg Scientific Director of the Nano & Pico Characterization Lab at CNSI. We will be meeting at University of Southern California (USC). Program details are elsewhere in this mailing.

Our Spring Symposium will once again be an all-day meeting. We are very fortunate that every year for a number of years we have had either an MAS or an MSA national tour speaker at one of our meetings. For our spring meeting we are negotiating to have Barry Carter be our MAS tour speaker. He gave an excellent talk at M&M 2013 and his tour talk will be based on that. We are in the process of putting together a full program, but there will be a student session and a poster session. Once again, there will be a $500 award for the best platform presentation and $300 award for the best poster. The awards are to support travel to the national M&M meeting – August 3-7, 2014, Hartford, CT. Our tentative venue for the Spring Symposium is UCI and a very tentative day for it is February 15 to avoid the conflict with the abstracts deadline submission for the M&M 2014.

Our dues this year will remain $25 for professionals and $10 for students and that includes 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! This year we came with new underwriting opportunities for our supporters; the details are elsewhere in this mailing. We hope that it will make it easier for vendors to support our society. We are very grateful for our sponsors' support.

Our Society is going through some changes. We have new board members along with some very long serving old members. This year we finally got all our board positions filled. 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

2013 Fall Symposium Program

5:30 PM **Happy Hour**
Sponsored by Gatan, Inc.

6:30 PM **Dinner (buffet)**
Sponsored by Oxford Instruments and AppFive LLC.

Business Meeting

7:30 PM **Scientific Program**

The Ultimate Limits of Miniaturization: Exploring and Controlling the Nanoscale World in Science, Engineering, and Medicine

Paul S. Weiss, CNSI/UCLA

8:00 PM Vendor talk

Electron Microscopy Sciences

8:15 PM From Atoms to Organisms: Bridging the Mesoscale with Correlative Microscopy

Adam Z. Stieg, CNSI/UCLA

Registration & RSVP

Respond no later than 5:00 p.m. Monday, November 4th, 2013.
Please contact:
Mark Armitage
Micromark@juno.com

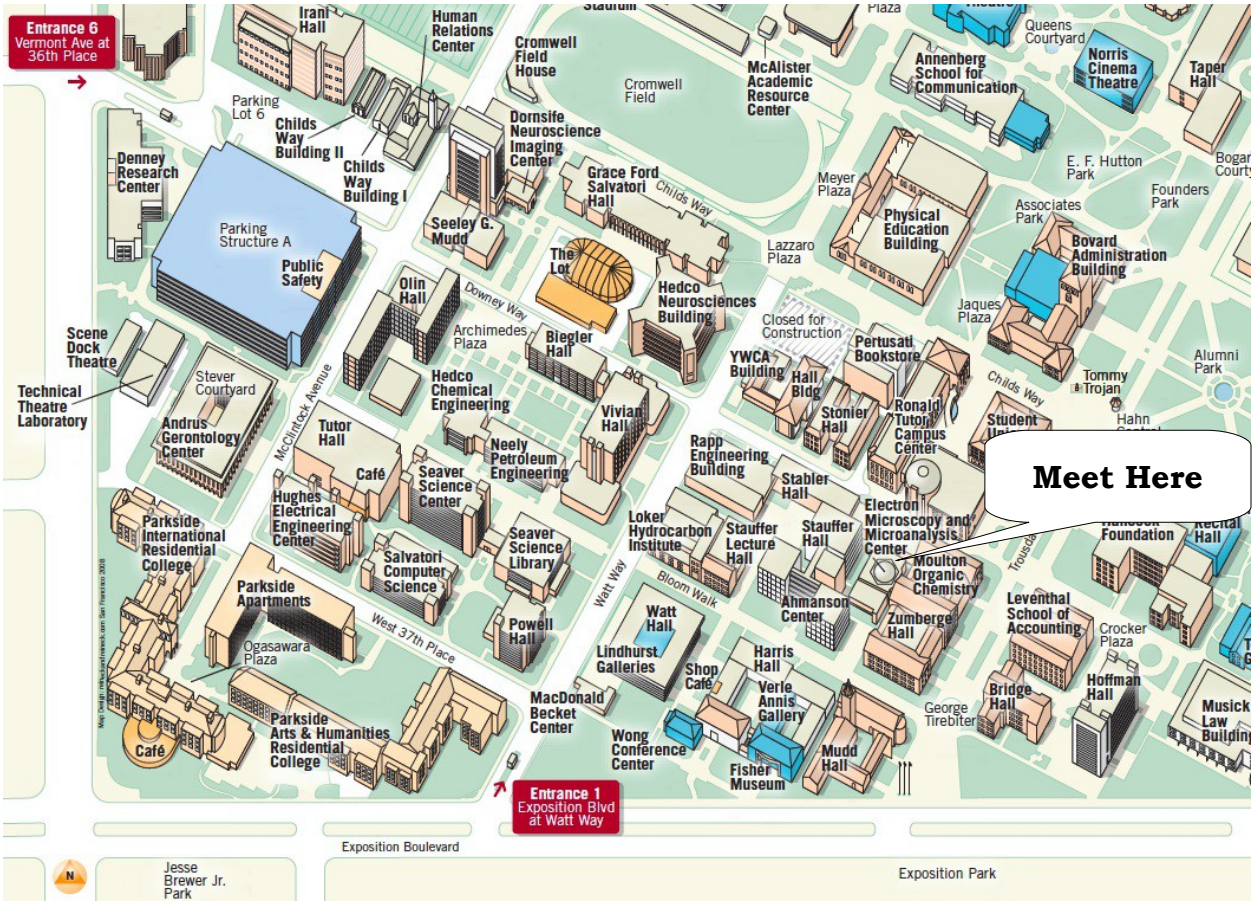
Regular annual membership for the 2013-2014 term is $25 for regular members and $10 for students.

For further details, please see the enclosed membership application or visit the SCSMM web site at www.scsmm.org

Map and Directions

Exit the I-110 Freeway at Exposition Blvd. Go west on Exposition Blvd and enter the campus at Gate #1, Watt Way. Park in Parking Structure A. After parking, walk down Bloom Walk to the Center for Electron Microscopy and Microanalysis, which will be on the left.

For the Map and Directions please refer to:
http://transnet.usc.edu/guest_services/campus-map.aspx



Southern California Society for Microscopy & Microanalysis

Membership Application 2013 - 2014

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 and helps to defray the cost of the mailings. 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.

Southern California Society for Microscopy & Microanalysis

Membership Application 2013 - 2014

Membership Valid Through August 31, 2014

Name: _____

Institution: _____

Address: _____

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City, State Zip_____

Phone: _____

E-mail address: _____

Web Site: _____

Please check the appropriate membership category:

- ❑ Regular @ $25.00
- ❑ Student @ $10.00
- ❑ Corporate @ $100.00

Corporate Memberships are entitled to two individual member listings. If you have selected a Corporate Membership, please copy this form and provide details for the second listing. Write "**2nd Listing**" at top of form.

Please attach a check for the appropriate amount made payable to SCSMM. You may bring this form along with your dues to any of our meetings or mail to:

SCSMM
c/o Mark Armitage
Micro Specialist
587 Ventu Park Road #304
Thousand Oaks, CA 91320

SCSMM Vendor Sponsorship Benefits and Recognition

$500 (Gold) level

- Instrumentation display during spring meeting (table).
- Scheduled (15 min) talk during spring or fall meeting.
- 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. Acknowledgment 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 for the year it was made and only after vendor's contribution has been received.

Abstracts

The Ultimate Limits of Miniaturization: Exploring and Controlling the Nanoscale World in Science, Engineering, and Medicine

Paul S. Weiss

California NanoSystems Institute and Departments of Chemistry & Biochemistry and Materials Science & Engineering, UCLA, Los Angeles, CA 90095, USA

Since we have learned to measure the precise structures, environments, interactions, and functions of molecules at the nanoscale, we are now learning to direct molecules into desired positions to create nanostructures, to connect functional molecules to the outside world, and to serve as test structures for measurements of single or coupled molecules. Interactions within and between molecules can be designed, directed, measured, understood, and exploited. We examine how these interactions influence chemistry, dynamics, structure, electronic function, and other properties. Such interactions can be used to advantage to form precise molecular assemblies, nanostructures, and patterns, and to control and to stabilize function. By understanding interactions, function, and dynamics at the smallest possible scales, we hope to improve synthetic systems at all scales. We are also using these strategies to control and to understand interactions, function, and structures of biological systems. I will discuss upcoming opportunities to make inroads into refractory problems in biology and medicine, and will discuss our first results and approaches in these areas.

Biography: Paul S. Weiss is director of the California NanoSystems Institute, Fred Kavli Chair in NanoSystems Sciences, and distinguished professor of chemistry & biochemistry and of materials science & engineering at UCLA. He received his S.B. and S.M. degrees in chemistry from MIT and his Ph.D. in chemistry from UC Berkeley. He was a postdoctoral member of technical staff at Bell Laboratories and a visiting scientist at IBM Almaden Research Center. Before coming to UCLA, he was a distinguished professor of chemistry and physics at Penn State. His interdisciplinary research group includes chemists, physicists, biologists, materials scientists, mathematicians, electrical and mechanical engineers, and computer scientists. Their work focuses on the atomic-scale chemical, physical, optical, mechanical, and electronic properties of surfaces and supramolecular assemblies. He and his students have developed new techniques to expand the applicability and chemical specificity of scanning probe microscopies. They have applied these and other tools to the study of catalysis, self- and directed assembly, and molecular and nanoscale

devices at the ultimate limits of miniaturization. Two current major themes in his laboratory are cooperativity in functional molecules and single-molecule biological structural and functional measurements. He has published over 300 papers and patents, and has given over 500 invited and plenary lectures.

Weiss has been awarded a NSF Presidential Young Investigator Award, the Scanning Microscopy International Presidential Scholarship, the BF Goodrich Collegiate Inventors Award, an Alfred P. Sloan Foundation Fellowship, the ACS Nobel Laureate Signature Award for Graduate Education in Chemistry, a John Simon Guggenheim Memorial Foundation Fellowship, and a NSF Creativity Award, among others. He has been elected a Fellow of: the American Association for the Advancement of Science, the American Physical Society, the American Vacuum Society, and the American Chemical Society, and an Honorary Fellow of the Chinese Chemical Society. He is the founding Editor-in-Chief of the leading nanoscience journal *ACS Nano*.

From Atoms to Organisms: Bridging the Mesoscale with Correlative Microscopy

Adam Z. Stieg

California NanoSystems Institute – UCLA, Los Angeles, CA 90095, USA

Fundamental and applied research relies on the detection and characterization of physical observables related to matter, energy, and time. To overcome the limitations imposed by any one individual technique, the Core Laboratories in the California NanoSystems Institute (CNSI) at the University of California, Los Angeles (UCLA) seek to merge an extensive knowledge base in multiple modes of microscopy and spectroscopy to generate multidimensional datasets that bridge spatiotemporal resolution gaps, integrate structural information, and elucidate functional relationships. Through a state-of-the-art collection of instrumentation, a team of active research scientists, and world-class facilities, these open-access user facilities provide the capacity to investigate the vast array of physical, chemical, and electrical properties necessary for complete study of an experimental system under a wide range of experimental conditions.

One class of methods, Scanning Probe Microscopy (SPM), differs from other far-field microscopic techniques that use light or beams of charged particles. SPM systems exploit a direct, near-field interaction in order to achieve the limits of spatial resolution in a diverse range of environments, including temperatures from 4°K to 1273°K, pressures ranging from ultrahigh vacuum (UHV) to atmospheric and liquid environments (including biofluids and electrolytes), as well as a unique opportunity to gain insight into local properties including friction, electrical charge and magnetism. In addition, the capacity to apply controlled forces enables quantitative measurement of nanomechanical properties with extraordinary sensitivity such as intermolecular binding,

unwinding, or conformational changes as well as stiffness (modulus) and adhesion on the soft surfaces of biomaterials, cells, and even small organisms.

In this talk, I will introduce the Core Facilities at CNSI, with specific focus on the Nano and Pico Characterization Laboratory – a multi user facility specializing in SPM methods. Following a brief overview of recent developments in the field, a few representative examples of collaborative efforts involving a merger of multiple measurement modalities that have enabled fundamental discovery, enhanced understanding, and innovative applications will be provided. Finally, ongoing challenges and opportunities for future development will be discussed.

Biography: Adam Z. Stieg is a scientist and educator who joined the UCLA faculty in 2009 where he currently serves as Scientific Director of the Nano and Pico Characterization Core Facility at the California Nano Systems Institute and Director of the Sci|Art NanoLab Institute. He earned his B.S. in Chemistry from Drew University and both his C.Phil. and Ph.D. in Inorganic and Physical Chemistry from UCLA. Dr. Stieg's research seeks to bridge the gap between our fundamental understanding of nanomaterials with how these systems tend toward complexity at mesoscopic scales by focusing on the development of multi-environment, high-performance scanning probe microscopes and real-time, multichannel data acquisition systems. Numerous ongoing, collaborative efforts involve the study of molecular machines, nanoparticles for targeted drug delivery, inorganic carbon-based materials, directed stem cell differentiation and the pursuit of physically intelligent systems through neuromorphic computation. Since 2003, he has collaborated with artists in a variety of projects, installations, and public exhibitions that provide inspiration and motivation for bringing the power of such creative approaches to the forefront of education.

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 2013 – 2014 year.

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