



Spectroscopy Society of Pittsburgh

April Meeting

Wednesday – April 16, 2014 Duquesne University



5:30 PM	Technology Forum Speaker's Presentation - Laura Falk Hall located in Mellon Hall
5:30 to 6:30PM	Social Hour - City View Café (6th Floor of Union)
6:30PM	Dinner - City View Café (6th Floor of Union)
8:00PM	Business Meeting– Laura Falk Hall located in Mellon Hall
8:15PM	Technical Program Speaker's Presentation– Laura Falk Hall located in Mellon Hall

Deadline for Dinner Reservations 4/10/14 at NOON

[On-line Reservations](#)

TECHNICAL PROGRAM - 8:15 PM

Dr. Rick McCreery, University of Alberta

“Molecules in Circuits: A Revolution in Microelectronics”



Molecules may be considered electronic systems, with electrons rapidly moving through molecular orbitals and also long distances in biological metabolism and photosynthesis. The prospect of incorporating molecules into microelectronic circuits based on silicon and metallic conductors has great potential for enhancing consumer electronics, providing solar energy conversion and permitting new functions not possible with silicon. In order to combine the electronic properties of molecules with conventional microelectronics, we need to understand how to “connect” to molecules as well as how electronics are transported through molecules. Once the “rules” of charge transport through molecules are understood, it should be possible to “rationally design” new molecular electronic devices for valuable functions not currently possible with silicon. While Molecular Electronics holds great promise, it also presents significant challenges in handling and fabrication of devices with dimensions of only a few nanometers. We use surface chemistry, spectroscopy and conjugated organic molecules to make “molecular junctions” consisting of a single

layer of molecules between conducting carbon and copper electrodes, then we study the behavior of molecules as circuit elements. The primary goal is to design and build functional molecular electronic components to greatly enhance the already powerful world of silicon microelectronics.

Richard L. McCreery is currently Professor of Chemistry at the University of Alberta, with a joint appointment as a Senior Research Officer at the National Institute for Nanotechnology. Until 2006, he was Dow Professor of Chemistry at the Ohio State University. He received his B.S. in chemistry from the University of California, Riverside, in 1970, and Ph.D. under Ralph Adams at the University of Kansas in 1974. His research involves spectroscopic probes of electrochemical processes, the electronic and electrochemical properties of carbon materials, and carbon-based molecular electronics. Much of the research involves collaborations with materials scientists and engineers, as well as surface scientists and electrochemists. He leads an effort at NINT and UofA to investigate hybrid devices for molecular electronics, which combine existing CMOS technology with new electronic and optoelectronic devices containing active molecular components. McCreery has written over 230 refereed publications, including one book and ten U.S. Patents, with three of those extended to Europe and Japan. He has served as an Associate Editor for the American Chemical Society journal *Analytical Chemistry* since 2004.

TECHNOLOGY FORUM - 5:30 PM

Eric Helm, M.D., University of Pittsburgh Medical Center

“The Integrative Approach to Treating Lower Back Pain”



The incidence of an episode of low back pain ranges from 5% to 36%, with 1 year episode re-exacerbation rates around 50%. Multiple etiologies exist in low back pain. The treatment approach should be multi-faceted, utilizing physical therapy, exercise programs, medications, interventions, and holistic methods.

Eric R. Helm, MD, a graduate of the University of Pittsburgh Medical Center Department of Physical Medicine and Rehabilitation residency program, joined the faculty as an assistant professor after completing the Pain Medicine Fellowship in the University Of Pittsburgh Medical Center Department Of Anesthesiology. He completed medical doctorate studies in 2008 at the University Of Toledo College Of Medicine. His interests include: musculoskeletal and sports medicine, chronic pain medicine, diagnostic ultrasound

examinations, ultrasound guided procedures, neuromodulation, implantation and management of intrathecal medication delivery systems, axial spine and peripheral nerve blocks. His Board Certifications include American Board of Physical Medicine and Rehabilitation and Subspecialty in Pain Medicine

Dinner Reservations:

Please register on-line at <http://www.ssp-pgh.org/monthly-meeting-rsvp/> to make dinner reservations NO LATER THAN Thursday, April 10, 2014 at noon. Dinner will cost \$10 (\$5 for students) and checks can be made out to the SSP. This month's entrée will be Roasted Tenderloin of Beef or a Vegetarian Option. If you have any dietary restrictions, please indicate them when you RSVP.

Parking Instructions:

The Duquesne University Parking Garage is located on Forbes Avenue. Upon entering the garage, receive parking ticket and drive to upper floors. Pick up a parking chit at the dinner or meeting.