



Spectroscopy Society of Pittsburgh January Meeting

Duquesne University – Mellon Hall of Science (Laura Falk Hall)

Wednesday – January 21, 2009

Technology Forum Speaker's Presentation **5:30PM**

Social Hour **6:00PM**

Dinner in the City View Café (6th Floor) **6:30PM**

Business Meeting **8:00PM**

Technical Program Speaker's Presentation **8:15PM**

Deadline for Dinner Reservations **1/16/09**

Carolyn Benga crbssp@yahoo.com or (412) 487-0915



TECHNOLOGY FORUM - 5:30 PM

Dr. Jeffrey B. Peterson - Carnegie Mellon University

"Dark Energy"

Not only is the Universe expanding, but there is mounting evidence that the expansion is speeding up. This acceleration is the opposite of the expected effect due to ordinary gravity. The antigravity agent of the acceleration has been given the name "Dark Energy". The evidence for the acceleration will be presented, along with plans to build a telescope to study dark energy.

Bio

Professor Peterson received his BS at University of Illinois, and PhD at the University of California at Berkeley. He has served on the faculty of the Department of Physics at Princeton and at Carnegie Mellon. His research group has built telescopes at the South Pole, in China and in India. These radio-telescopes have been used to weigh the Universe, and to study Dark Energy, the anti-gravity agent that seems to be accelerating the expansion of the Universe.

TECHNICAL PROGRAM - 8:15PM

Dr. Xi-Cheng Zhang - Rensselaer Polytechnic Institute

"Recent Progress of Broadband THz Wave Sensing and Imaging"

Terahertz (THz) radiation, which occupies a large portion of the electromagnetic spectrum between the infrared and microwave bands, offers innovative imaging and sensing technologies that can provide information not available through conventional methods (i.e. microwave and X-ray techniques.) Historically, THz technologies were mainly used within the astronomy community for searching far-infrared radiation (cosmic background), and the laser fusion community for the diagnostics of plasmas. Since the first demonstration of THz wave time-domain spectroscopy in the late 80's, there has been a series of significant advances (particularly in recent years) as intense THz sources and more sensitive detectors provide new opportunities for understanding the basic science within the THz frequency range.



A progress report on THz wave sensing and imaging science, technology and its applications, with an emphasis on spectroscopic capability, will be provided. The most recent results of using air (and selected gases) as the emitter and sensor material for both generation and detection of broadband THz waves will also be reported. Air, especially ionized air (plasma), has been used to generate intense THz waves (>300 kV/cm) with a broadband spectrum (0.1 THz to 30 THz). As THz wave (T-ray) technology improves, we believe new THz wave sensing and imaging capabilities will impact a range of interdisciplinary fields, including: communications, imaging, medical diagnosis, health monitoring, environmental control, and chemical and biological identification. Continued advances are pivotal for the protracted use of THz technology for non-destructive evaluation (immediate application), for homeland security (three to five years), and for medical diagnosis or even clinical treatment in biomedical applications (five to ten years).

Bio

Dr. Xi-Cheng Zhang – Eric Jonsson Professor of Science, Professor of Physics and Professor of Electrical Engineering at Rensselaer. Dr. Zhang has received 20 US patents, published 14 books and book chapters, and has authored or co-authored over 300 refereed journal papers. He is a Fellow of IEEE, the Optical Society of America, and the American Physics Society.

Dinner Reservations:

Please email Carolyn Benga at crbssp@yahoo.com or call (412) 487-0915 to make dinner reservations NO LATER THAN FRIDAY, January 16, 2009. This month's entrée will be Home-style Meatloaf, Mashed Potatoes with Gravy and Green Beans. Garden Salad along with Tomato Bisque will start the meal, and German Chocolate Cake will be served for dessert. Dinner will cost \$8 and checks can be made out to the SSP. If you have dietary restrictions, please let Carolyn know 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. If any difficulties arise, contact Dr. Mitch Johnson at Duquesne University.