

SPS Zone 16 Meeting

By Rebekah Theisen, SPS President ASU Chapter

The meeting started the evening of Friday April 3rd for a social mixer and registration. It was a great turn out with about 4-5 universities able to make it. We were able to keep the registration fee down to \$5 using the allocated funds from the national office wisely. The two largest expenses were food for the social mixer and for lunch the next day. The morning of April 4th we had a presentation from the graduate physics program, which gave students an insight into what they could expect going onto a graduate physics program. We then conducted the zone meeting where all the participating schools had a chance to share what their chapter was doing to be active in promoting physics and encouraging students. We did not have as many people send us their abstracts to present research, but we ended up with students who showed up with research presentations regardless. We had a keynote speaker, Dr. David Smith, talk about spectroscopy. We took a tour of two labs, one was a spectroscopy lab and the other was a new lab growing semiconductor materials. I was very proud to put this together with our staff advisor, Sabrina Mathues. The biggest expenses were the lunch (catered by Wildflower) that we provided and the food for the social mixer the night before. We also discussed the next location for the fall zone meeting, which may take place at Embry-Riddle. The meeting ended on Saturday with a vote to watch a “physically incorrect” movie. We had many new students show up for the zone meeting expressing interest in getting more involved. Here is the RSVP link: <http://physics.asu.edu/rsvp/732>



SPS Meeting Agenda

April 3rd and April 4th

Friday, April 3rd

6 p.m. - 8 p.m.

Registration (\$ 5) and social mixer in PS F462

Saturday, April 4th (all events in PS A118 unless otherwise noted):

8:30a.m. - 9:30 a.m. Breakfast sponsored by ASU Graduate Physics Program

9:30a.m. - 10:45 a.m. Zone Meeting

10:45a.m. - 11:00a.m. Break

11:00a.m. - 12:00p.m. Student Presentations

12:00p.m. - 1:30p.m. Lunch

1:30p.m. - 2:00p.m. Keynote Address by Regents' Professor Dr. David Smith

2:00p.m. - 3:00p.m. Lab Tours

3:00p.m. - 5:00p.m. Physically Incorrect Movie in PS F462 *or* Physics Jeopardy in PS A118

*The locations of PSA and PSF are shown on the map below.

The entrance to PS A118 is from the exterior of the building and is located by the picnic tables on the south side of PS A.*



LAB TOURS

Professor Robert Nemanich
Chair, Department of Physics
Phone - 480-965-3561
Email – Robert.Nemanich@asu.edu

Growth, processing and characterization of surfaces, interfaces and nanostructures

Modern electronic devices will be based on complex nanometer scale materials structures, and biological and chemical sensors will employ multifunctional nanostructures that integrate molecular, biological and electronic materials. It is only recently that techniques have been developed to image the dynamics of nanometer scale structures and to determine their properties. Our group has applied advanced microscopy and spectroscopy techniques to characterize the growth and properties of thin film interfaces and nanostructures. We have led the development of photo electron emission microscopy (PEEM) with tunable UV light from a free electron laser. Our students have explored the dynamics and interactions of nanostructures as they grow or evolve. Scanning probe systems have also been used as a basis for imaging polar materials including ferroelectric materials and wurtzite structured semiconducting materials such as GaN. These techniques offer the possibility to develop nanopatterning approaches that can drive self assembly of molecular, biological and electronic nanostructures.

Regents' Professor David Smith
Ph.D., University of Melbourne; D.Sc. University of Melbourne
Phone - 480-965-4540
E-mail - david.smith@asu.edu

Electron Microscopy and Materials Physics

My basic research centers around the development of quantitative high-resolution electron microscopy, aided by computer-controlled microscope operation and image simulation, which enables direct determination of atomic structure in defective materials. My research also involves using electron-microscopy-based methods to characterize advanced materials such as semiconductor heterostructures, magnetic thin films and multilayers, and nanostructures. Semiconductor systems of interest include ternary and quaternary Group III nitride alloys for light-emitting diodes and lasers, and II-VI alloys such as mercury-cadmium telluride for detectors of infra-red radiation. Magnetic materials being studied include shape-memory alloys, as well as magnetic tunnel junctions, which are based on ferromagnet-insulator-ferromagnet combinations, that have promising applications for non-volatile, high-storage-density recording media. Off-axis electron holography is a particularly powerful approach since it permits quantitative visualization of nanoscale electric and magnetic fields, and we are using the technique to investigate the magnetization behavior and fringing fields associated with patterned nanostructures.