

## Report from the 90th Annual Meeting of the Optical Society of America

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From October 8 to 12, 2006, the Optical Society of America (OSA) held its 90th annual meeting in Rochester, New York jointly with the 22nd annual meeting of the Laser Science division of the American Physical Society (APS). The meeting attracted hundreds of professionals, academics and students to its many sessions. Session topics ranged from holography and digital imaging to chirped lasers and Bose-Einstein Condensates (BECs).

I attended the OSA conference at the suggestion of Prof. Nicholas Bigelow, who directs the quantum optics lab where I work. Several undergraduates who worked in his group last summer were presenting their work in the student sessions. Not only would the conference give me a chance to meet them and learn what they contributed to the group, but it also would give me a chance to immerse myself in research side of optics.

The focus of my time at the conference was the Symposium on Undergraduate Research, held Monday afternoon as part of the Division of Laser Science's meeting. A two-hour poster session started the afternoon. Twenty six students presented their work in this session, with topics ranging from atomic clocks to biophotonics.

Azure Hansen, a senior at Stony Brook University, presented work she conducted at the National Institute of Standards and Technology (NIST). Hansen studied the use of interfering laser beams to create a rotating optical lattice. This can be used to give controlled amounts of angular momentum to a BEC, a collection of atoms that is trapped and cooled to such a low temperature that their wave functions overlap and the

collection of atoms act like one atom. Oscar Herrera, a junior at the University of Rochester, presented the results of his studies on light propagation in optical cavities. He compared a traditional, mathematically-heavy approach of calculating trajectories to a simpler ray tracing method.

I was curious to hear how students started working in their labs and got into their projects. Brian Smith, a junior at the University of Maryland, related to me how his lab involvement started with a simple question. Smith asked his professor about circular birefringence patterns he observed with polarizer in thick lenses. Without a satisfying answer, his professor gave him the opportunity to formally look at the effects Brian had observed in the lab. While his poster presentation was on the intensity of diode lasers, Smith says that the project that got him into the lab is still underway.

Other students started in their lab through the National Science Foundation's Research Experience for Undergraduates (REU) program. Erin Riley, a senior at the University of Central Florida (UCF), researched the formation of silver nanoparticles in a special glass that contains silver at the University of Bordeaux in France. She took advantage of an REU exchange program operated by the Chemistry Department at UCF that places students in French laboratories for a summer.

I asked Dr. Eric Van Stryland, the President of OSA, what advice he would give to undergraduate physicists who are interested in optics. He suggested emphasizing electromagnetics in coursework, "and if you

can get some hands-on experience, all the better." I also asked him what the highlight of the conference was for him. He responded, "Meeting my colleagues is always the highlight of my attending conferences."

After the poster sessions, the student talks started. After a talk on trapping polar molecules and another on optical excitation of nanorods, I cut out to sample the smorgasbord of offerings at the other technical sessions. There was so much to choose from! On Monday, I sampled talks from the "Quantum Degenerate Gases" and "Diffractive Micro and Nanostructures for Sensing and Information Processing" sessions. Later in the week, I attended talks in both the "Atoms in Strong and Ultrastrong Fields" and "Computational Imaging" sessions.

I wrapped up my visit to the conference at the end of the week with a visit to the exhibits floor, where vendors from various companies and organizations had set up booths. At one of the booths, along with free pins proclaiming "PHOTONYICS Rochester", there was a small table covered with reject optics. With aberrations just large

enough to deem them unfit for lab use, the lenses, mirrors, and occasional prism filled a goodie box. Each was appropriately wrapped up in tissue paper. The representative manning the booth was giving them away for free – these reject optics usually end up in the trash. As I was sorting through the optics, the representative told me how these imperfect lenses attract attention. At one conference, a group of scientists spent a morning building telescopes out of the spare parts from the box. I was nowhere near that dedicated, and after sifting through fisheye lenses and trying to figure what I could make from a handful of tiny lenses and mirrors, I walked away with a glass convex lens and a close-range magnifier.

I came away from the conference with a renewed passion for the work in my lab and curiosity about areas of optics that I previously knew little about, such as quantitative color science and digital imaging. For me, as an undergraduate physics major, attending the OSA conference was a window to the greater community of scientists and an affirmation that this community is where I belong.



Lydia Mishchenko, from the University of Maryland, Baltimore County, discussing her project with Andrew Kowalik, a graduate student from the University of Rochester at the poster session.



Participants in the Symposium on Undergraduate Research, held October 9, 2006.



Conference programs and other free optical toys.