Sander Zandbergen

Graduate Institution: The University of Arizona

Graduate Discipline: Semiconductor Quantum Optics

Hometown: Edinboro, PA

Relevant SC Research: Basic Energy Sciences

Research Interest:

I am a semiconductor physics experimentalist whose research focuses on fundamental light-matter interactions in quantum-confined III-V semiconductor nanostructures. My current research interests include (i) cavity quantum electrodynamics and cavity optomechanics, (ii) nonlinear and quantum optics of quantum dot photonic crystal slab nanocavities, (iii) quantum dot - photon entanglement, (iv) molecular beam epitaxy and site-selective growth and patterning of semiconductor quantum dots, (v) 1D photonic crystal nanobeam cavities, (vi) adiabatic fiber taper construction, and most recently, (vii) pump-probe investigation of Ag split-ring resonator metamaterials coupled to quantum wells/wires/dots. The motivation for these devices and research is in the area of next-generation telecommunications applications, such as efficient single photon sources, on-chip nanolasers, and high speed optical switches.

About Me:

As an undergraduate student at Case Western Reserve University in Cleveland, OH, I worked for Tom Shutt, co-spokesperson for the Large Underground Xenon project which looks for Weakly Interacting Massive Particles, one proposed solution to the dark matter problem. While I loved working for Tom, I also love learning new things and traveling. I decided to spend a semester abroad in the Netherlands, where my father is from, working in a quantum optics/quantum information group. My project involved two-dimensional photonic crystals in the form of photonic graphene, an optical analogue of electronic graphene.

I just finished the second year of my Ph.D program at the College of Optical Sciences at the University of Arizona in Tucson. I joined the Quantum Nano Optics of Semiconductors (QNOS) group, headed by Galina Khitrova, when I started my Ph.D. This group is best known for first observing strong coupling between a single quantum dot and a 2D linear 3-hole defect photonic crystal cavity. Joining this group proved to be one of the best decisions I ever made. We collaborate with groups all over the world, so not only do I get to participate in fascinating research; I've also had the pleasure of traveling and working in Korea and Germany.

When I'm not in the lab, I enjoy reading, exercising and playing sports, especially any and all racket sports. I love hiking the majestic mountain ranges surrounding Tucson, and I've recently taken up AcroYoga. I also involve myself with the various outreach programs at the College of Optical Sciences.