

Abstract Submitted
for the SES14 Meeting of
The American Physical Society

Using an Atomic Molecular Optics Laboratory for Undergraduate Research and Mentoring of Physics Students in Georgia HAUKE BUSCH, MICHELLE ALBER, CRISTALEI POLK, DIMITRIUS DENIZE, Georgia College — An Atomic and Molecular Optical (AMO) Physics research lab is an excellent tool to train and mentor undergraduate students in advanced laboratory techniques. Students gain valuable basic experience in experimental designs, data acquisition techniques, working with high precision optical equipment, building electronics, and working in the machine shop. Current projects include machining a laser mount and constructing a current supply circuit and temperature controller for a slave laser. Completed projects involved milling the vacuum chamber mounts to support the chamber, and machining Helmholtz coils for the chamber, which is being used to trap the atoms in a Magneto Optical Trap (MOT). This included designing, building and baking out the vacuum chamber, constructing a Rb getter for the chamber, and building the lasers for a saturation-absorption system that is used to probe the $5^2S_{1/2} \rightarrow 5^2P_{3/2}$ hyperfine energy transitions of the Rb-85 atom. These energy transitions will be used to frequency-lock a diode laser to trap Rb-85 atoms and then cool them to ultra-low temperatures. The atom cooling will permit observation and measurement of the fundamental properties of atoms. This lab has mentored and supported over ten undergraduate students in the last four years, of which one became a High School Teacher, three joined Ph.D. programs, and one went to optometry school.

Hauke Busch
Georgia College

Date submitted: 03 Sep 2014

Electronic form version 1.4