

# David Campbell

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## SUMMARY

Looking for a summer internship to prepare for physics graduate school.

## EDUCATION

### UMASS LOWELL

**BACHELOR OF SCIENCE, DOUBLE MAJOR PHYSICS AND MATHEMATICS**  
Expected August 2015 | Cum. GPA: 3.80

## COURSEWORK

### PHYSICS

Waves and Optics, Electromagnetism I and II, Intro to Quantum Mechanics I and II, Statistical Thermodynamics, Modern Physics, Classical Mechanics

### MATHEMATICS

Mathematics of Signal Processing, Linear Algebra I and II, Probability and Statistics I, Applied Math I and II, Complex Variables, Partial Differential Equations, Discrete Structures

## COMPUTER SKILLS

Matlab • Python • LabVIEW • C •  $\LaTeX$  • XML • AutoCAD • Shell

### Familiar:

Mathematica • MathCAD • Unix • Windows

## AWARDS

Arthur Zamanakos Scholarship (excellence in Mathematics) • Ye-Yung Teng Memorial Scholarship (excellence in Physics) • Kennedy Family Merit Scholarship (June 2012, June 2013)

## INTERESTS

Acting, golfing, basketball, and chess.

## EXPERIENCE

### DRAPER LABORATORIES | SENSORS AND IMAGING SYSTEMS Co-OP

Jan. 2014 – May 2014 | Cambridge, MA

- Wrote a Monte Carlo simulation in Matlab to model shot and background noise in an image sensor, and the uncertainty in the image center.
- Used a schematic to order, build, and set up a wireless sensor network.
- Set up hardware to test CMOS sensors, and developed an interface in Python that linked the frame grabber of the sensor to the motion of the interacting laser.
- Improved an electro-optical computer model by integrating a Python package for unit parsing and writing XML files for easy data importation.

## RESEARCH

### AMO PHYSICS LAB | REU UNIVERSITY OF OKLAHOMA

June 2014 – July 2014 | Norman, OK

- Worked with **Prof. James Shaffer's** quantum optics to develop micro-machining methods for fabricating atom chips.
- Varied milling parameters of a micro-machine, and analyzed test cuts to determine which parameters produced the finest features.
- Presented findings to the OU physics faculty.

## LAB WORK

### PHYSICS OF MATERIALS AND DEVICES

- Designed circuitry to characterize electrical devices and materials such as operational amplifiers, active filters, diodes and semiconductors.
- Applied an input signal to the circuit and varied its frequency and amplitude.
- Observed, collected, and analyzed data from the varying output signal, due to input modifications, to determine the properties of the device or material.

### PRINCIPLES OF LAB AUTOMATION

- Implemented LabVIEW software by setting up the experimental hardware to conduct a computer-controlled experiment that would acquire and display data.
- Analyzed the acquired data to determine the AC response of mutual inductors, RC circuits, and LRC circuits.

### ADVANCED PHYSICS LAB I

- Used advanced experimental hardware, such as the Michelson Interferometer and Prism Spectrometer, to make precise measurements of physical constants.
- Maintained an up-to-date laboratory notebook of qualitative and quantitative observations made during the experiments.
- Wrote formal papers that summarized the experimental measurements, with data tables and graphs, and used statistics to analyze the results.