

## Physical Electronics for Scientists: PY 371 & PY 681

The eLab experience consists of hands-on design, specification, construction and analysis of classic electronic circuits. Each intern will develop a thorough understanding of the “art” of electronics. As in any industrial, national or academic lab, each electronician has her/his own workstation, complete with a microprocessor, some 30 transducers, scope, VOMs, DVMS, signal generator, power supplies, transformer, batteries, developer’s breadboard, and parts cabinets (with ICs, transistors, diodes, resistors, capacitors, chokes, LEDs, bulbs *etc.*).

The eLab will give you experiential understanding of electronic circuits, components, manufacturers. You will learn to make choices about building or purchasing solutions to state-of-the-art problems that face researchers daily. Interns experience the realities of devices and circuits that do not follow the “mathematical” rules. Each researcher will learn why the recommended text carries the word “art.” Often equipment required to advance science simply do not exist and have to be built or assembled from scratch. Measuring, monitoring, calibrating, examining and recording data is the essence of successful invention. This course provides a thorough understanding of the circuits and tools necessary to solve a myriad of problems that scientists face continually in the real world.

As in a professional lab, we meet in the lab a block of ~8 hours, with breaks allocated for lunch (or for a concurrent class that conflicts with the lab hours). The typical uninitiated intern must prepare for an hour before each session to be prepared to construct the circuits of each lab session. You do this by reading the lab manual before entering the lab; the instructor will review the critical concepts, and answer any questions as they arise while you perform the lab measurements.