

DEPARTMENT OF PHYSICS, ASTRONOMY, GEOLOGY, AND ENVIRONMENTAL SCIENCE

Department of Physics, Astronomy, Geology, and Environmental Science
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Welcome

Welcome to the Department of Physics, Astronomy, Geology, and Environmental Science at YSU! We are proud of the unique opportunities we provide for our students. We are dedicated to the idea that students learn best by doing the activities considered to be the work of physicists, astronomers, geologists, and environmental scientists. Housed within our department is the Clarence R. Smith Mineral Museum, a world-class collection of rare and amazing minerals and fossils from around the world, and the Ward Beecher Planetarium sporting a 40-foot projection dome, a Chronos GOTO Star Projector, and a SciDome HB full-dome 4k digital projector. The planetarium and the museum are free and open to the public and are maintained and operated in part by students.

Our students also have access to state-of-the-art research equipment in our research labs and in the field. This equipment includes an atomic force microscope and an x-ray photoemission spectrometer for surface studies; a photolithography semiconductor mask aligner; a magnetron sputtering deposition system and a HeCd laser photoluminescence spectrometer for developing and testing new semiconductor materials and devices; and a Vibrant OPOTek optical parametric oscillator and several pulsed YAG lasers for non-linear optics studies of layered polymer materials; an x-ray photoemission spectrometer for surface composition studies; an ICP spectrometer for plasma spectrophotometry; chromatography systems for both ion chromatography and gas chromatography; a laser particle size analyzer and a wide variety of other bench-top instrumentation.

Students also regularly use the Ohio Supercomputer Facility to simulate physical systems in the solid state. Some students learn to use the latest data analysis tools and work with imaging data from telescopes around the world in space. Some students become proficient in the use of field instrumentation using remote sensing and geophysical investigations. Field instruments include a DJI Matrice 600 drone with infra-red and optical imaging capability, ground penetrating radar, hand held x-ray fluorescence, 24 channel refraction seismograph, earth resistivity, proton magnetometer, high resolution GPS and total station surveying equipment.

Furthermore, the department has an endowment specifically for use to fund student employees working as assistants in our research labs. We strive to include students in our research projects, our planetarium shows, and in mineral museum site visits, and we are happy to discuss these opportunities with interested students.

Departmental Mission Statement

The Department of Physics, Astronomy, Geology, and Environmental Sciences strives to provide a high quality educational experience for its majors by involving undergraduate students in significant research activities to embody its philosophy of teaching through research; to continue and expand the research footprint of the department and the University; to serve the undergraduate population by offering challenging and essential course work; and to establish connections between the public and the scientific community and between the public and the University through outreach programs.

Courses are organized with the following aims:

- To provide well-rounded training in the physical sciences for those needing it for graduate study, industry, regulatory compliance, or secondary school teaching.
- To provide basic training for engineering and pre-professional students.
- To acquaint students from non-science programs with the methods, applications, and theories of the physical sciences in the modern world.

The program curricula, four-year plan, and minimum requirements for the degrees of Bachelor of Arts and Bachelor of Science are available through the links under the Programs of Study tab. These degrees may be earned in eight semesters if students average 15 hours per semester.

Program Directors / Coordinators

- **Ward Beecher Planetarium Director:**
Dr. Patrick Durrell (email: pdurrell@ysu.edu) (330) 941-7107
- **Geology Undergraduate Program Coordinator:**
Dr. Jeff Dick (Email: jcdick@ysu.edu) (330) 941-1756
- **Environmental Science Undergraduate Program Coordinator:**
Dr. Felicia Armstrong (Email: fparmstrong@ysu.edu) (330) 941-1385
- **Environmental Science Graduate Program Director:**
Dr. Jeff Dick (Email: jcdick@ysu.edu) (330) 941-1756