Physics & Astronomy at Union College

The best of both worlds – small classes and personal attention of faculty in a small liberal arts college environment combined with instrumentation and research opportunities typically found only at larger universities.

Research Laboratories

- Observatory (20-inch telescope, CCD cameras, spectrograph, 7.5-foot radio telescope)
- Ion-Beam Analysis Lab (1.1-MV Pelletron tandem accelerator, radiation detectors)
- Conservation of Cultural Heritage Lab (Ir:YAG laser, near-IR camera, microscopes)
- High Energy Theory Computational Lab (Mac workstations)
- Two Astrophysics Computational Labs: Extragalactic and Radio (Linux workstations)
- Nuclear Physics Lab (Mossbauer spectrometer, beta-ray spectrometer, cosmic-ray detectors)
- Laser Cooling Lab (high-power diode lasers, fiberoptics, ultra-high vacuum system, single photon detection system)
- High-Speed Photography Lab for innovative teaching techniques
- Nano-Thermodynamics Lab (power compensated calorimeter, mid-infrared spectrometer, electron microscopes)
- Interdisciplinary Research Instrumentation Suite (Electron and atomic-force microscopes, micro-Raman and micro-IR spectrometers)
- Machine Shop (milling center, tool-room lathe)

Community

We strive to maintain an inviting department with a strong sense of community supported by:

- Faculty with generous office hours and an open-door policy
- A student lounge near faculty offices for group or independent study
- A weekly, lunch-time, colloquium series to help keep students and faculty in touch with exciting developments elsewhere
- A First-Year Seminar in Physics to help integrate new students into the department
- An active chapter of the Society of Physics Students (SPS) that sponsors field trips, social events, and outreach programs
- An active chapter of Sigma Pi Sigma, the physics honor society
- Monthly pot-luck luncheons in the department
- Outreach programs run by students and faculty for K-12 teachers and students
- Monthly observatory open houses
- An active chapter of Sigma Xi, the scientific research society, that inducts student members each year
- Weekly astronomy discussion group

Contact Us

We welcome visitors to our facilities. If you would like to visit or if you seek additional information, please call Lynnette Stec at (518) 388-6254 or send e-mail to physicschair@union.edu. Also, you can visit our web page at www.physics.union.edu.
Curriculum

In Physics and Astronomy at Union College:

- Classes are small and personal
- All classes and labs are taught by regular faculty
- Instruction is characterized by individual attention
- The faculty are thoroughly dedicated to teaching, regard research as an essential part of their profession, and welcome students to join them in the joy of discovery
- Courses are innovative and employ active learning strategies
- The curriculum emphasizes hands-on experimentation
- The equipment holdings are comparable to those of a much larger institution
- All of the equipment is really used by students
- The curriculum is designed to develop a wide range of analytical and practical skills
- We offer core courses in undergraduate physics plus more specialized courses in areas such as astrophysics, biophysics, and nuclear physics
- Students may pursue a B.S. degree in physics, a B.A. degree in astronomy, and/or minors in physics, astronomy, and astrophysics
- Independent research with a faculty colleague is required for the major

Student Research

The best education a young scientist can acquire occurs beyond the classroom, and the department provides a variety of extracurricular opportunities with this in mind. These include:

- Student-faculty research during the school year
- Departmental summer research program (typically 15-20 students)
- Stipends for summer research from faculty grants, Union College, and the departmental undergraduate research fund
- Summer research opportunities at research institutions, national, and industrial labs
- Student presentations at regional, national, and international conferences
- Student co-authored publications in scientific journals
- Membership in the Association for Research at University Nuclear Accelerators (ARUNA) and a collaboration of accelerator groups at small colleges
- Membership in the NASA NY Space Grant
- Collaborations with research universities (Cornell, RPI, Albany) and industry (IBM)
- Lead institution for the NSF-funded Undergraduate Arecibo Legacy Fast ALFA Team

Teaching Faculty and Staff

- **Samuel Amanuel**, Associate Professor
  Ph.D., Southern Illinois University
  Material science

- **Reuben Gann**, Visiting Assistant Professor
  Ph.D., University of California at Riverside
  Surface physics

- **Gregory Hallenbeck**, Visiting Assistant Professor
  Ph.D., Cornell University
  Radio astronomy

- **Rebecca Koopmann**, Professor and Department Chair
  Ph.D., Yale University
  Extragalactic observational astronomy

- **Scott LaBrake**, Senior Lecturer and Accelerator Manager
  Ph.D., The University at Albany
  Accelerator and environmental physics

- **Seyfollah Maleki**, Professor
  Ph.D., Rensselaer Polytechnic Institute
  Laser optics and scientific analysis for art conservation

- **Nelia Mann**, Assistant Professor
  Ph.D., University of California at Santa Barbara
  High energy theoretical physics

- **Jonathan Marr**, Lecturer and Laboratory Manager
  Ph.D., University of California at Berkeley
  Radio astronomy

- **Chad Orzel**, Associate Professor
  Ph.D., University of Maryland
  Atomic physics

- **Gary Reich**, Professor
  Ph.D., Rutgers University
  Statistical mechanics and physics education research

- **John Sheehan**, Machinist/Technician

- **Lynnette Stec**, Administrative Assistant

- **Michael Vineyard**, Associate Professor of Physics
  Ph.D., Florida State University
  Experimental nuclear and environmental physics

- **Heather Watson**, Visiting Assistant Professor
  Ph.D., Rensselaer Polytechnic Institute
  Geophysics

- **Francis Wilkin**, Senior Lecturer and Observatory Manager
  Ph.D., University of California at Berkeley
  Extrasolar planet observations and star formation theory