

Physics



The Juniata Advantage

- **Research and Presentations:** Gain research experience through **faculty mentored projects** or at **national labs** in specialties such as laser optics, radiation detection, and observational astronomy. Then, present your findings at a professional conference or at Juniata's Liberal Arts Symposium.
- **Facilities:** **Three large teaching laboratories, 10 smaller laboratories, a machine shop, adjustable cavity HeNe lasers, and an optical tweezers lab** are just some of Juniata's physics facilities. Customized labs include laser physics, nuclear studies, astronomy, and electronics. The **Paul E. Hickes Observatory** is outfitted with a permanently mounted 16-inch computerized reflecting telescope and an electronic CCD camera. Juniata physics students also have a **dedicated student lounge**.
- **Customization:** Individualize your physics Program of Emphasis (POE) by blending physics with another discipline. Or pursue an **engineering physics** POE. Juniata has cooperative programs for dual degrees in engineering with four universities (Penn State, Clarkson, Washington University in St. Louis, and Columbia) where you can study physics and engineering. You can also combine **physics with education** courses and, if you complete necessary requirements, gain a teaching certificate.

Juniata's Outcomes

Juniata physics students have been **accepted into graduate programs** at prestigious universities around the country, including Stanford, MIT, Princeton, the University of Rochester, and Penn State, where several have landed National Science Foundation Graduate Research Fellowships. They've **obtained professional positions** at Woods Hole Oceanographic Institute, Microsoft, Ford Motor Co., and others, and are **teaching at high schools and colleges throughout the U.S.** Others have used their degrees as stepping stones into a wide range of fields, including information technology, environmental science, entrepreneurship, and business.

Our Recent Graduates

- Alexander Debrecht '15 is currently **studying physics in graduate school** at the University of Rochester thanks to a fellowship.
- Nate Higgins '13 is currently **enrolled in Notre Dame's ESTEEM Masters program**, an entrepreneurial program where he will study a combination of science and business.
- Will McGrew '14 is **enrolled in a doctoral program in atomic optics** at the University of Colorado, Boulder, a leading school in the field of physics.
- David Milligan '14 is currently **employed as a staff scientist** with the research and development team at Axion Power.

To read about more outstanding physics graduates, which include winners of Fulbright Fellowships, NSF Graduate Research Fellows, and Goldwater recipients, visit:

www.juniata.edu/academics/departments/physics/outcomes.php

"I love studying physics at Juniata because I feel trained to explain the basics of how things work in our environment."

—Jabari Fuller '16

PHYSICS

A Sampling of Courses

Astronomy
Classical Mechanics
Electricity and Magnetism
Electronics
Engineering Mechanics I and II
Mathematical Methods in Physics
Musical Acoustics
Nuclear Threat
Optics
Physics Seminar
Quantum Mechanics
Theoretical Modern Physics
Thermal Physics

A Physics POE Story

Interested in how things work? From sub-atomic particles to vast galaxies, Juniata's physics department is prepared to give you the hands-on learning that will help you to pursue graduate study, attend professional school, or step into an exciting career. Choose a POE in **physics**, **engineering physics**, or **engineering physics secondary education**. You can also engage in a **3-2 engineering dual degree program** based on Juniata's cooperative agreements with Washington University in St. Louis, Penn State, Columbia, or Clarkson University.

Whichever POE you choose, you'll have the opportunity to **develop physics demonstrations** for outreach events, participate in high-quality, hands-on research, and more. Some students even intern at the National Institute of Standards and Technology, home institution of Bill Phillips, a Juniata alumnus who has won the **Nobel Prize in Physics**.

When combined with close **student-faculty interaction**, it's no secret why Juniata physicists have successful careers in teaching, research, and industry. So, go ahead—hone your problem-solving skills, laboratory techniques, and technological prowess. Begin your journey in physics at Juniata and you will soon find yourself in a graduate program or career that will enable you to **expand your universe**. But don't just take our word for it.

"In the Physics Department at Juniata, there's always someone in the lounge to help you with your labs or problem sets, and the professors are very supportive and helpful," says MaryElizabeth Petrie '15.



Student Opportunities

Clubs: Every year the Juniata Chapter of the **Society of Physics Students**, which has enjoyed more than a decade of Outstanding Chapter Awards, sponsors a Physics Phun Night. Engage community audiences with demonstrations like breaking a wine glass using sound waves, turning a skateboard into a rocket, or burning bubbles.

Study Abroad: India, Australia, England, France, Japan, Germany, and beyond—we have programs on every continent, except Antarctica.

Nanotechnology: Delve into a deep study of nanotechnology thanks to a cooperative agreement between Juniata and Penn State University.

Undergraduate Research: Gain **research experience** on campus with Juniata faculty or off-campus at national labs including Jefferson Labs in Newport News, Va.; National Institute of Standards and Technology in Gaithersburg, Md.; Lowell Observatory in Flagstaff, Ariz.; and Pacific Northwest National Labs in Hanford, Wash. **Recent examples:** Alex DeBrecht '15, "Comparison of Conducting Styles Using Accelerometer Data;" Teresa Turmanian '16, "Magnetic Ground State of Industrial Sensors."



Faculty

At Juniata, the physics faculty serve, first and foremost, as professors. In addition to teaching and working with undergraduates, one serves as a consultant on nuclear forensics to the U.S. Department of State. Another hosts observatory nights on Juniata's campus, which are open to the public, and takes students to the Lowell Observatory in Flagstaff, Ariz. A third owns a laser company. To read more about the broad range of our faculty expertise, visit: www.juniata.edu/academics/departments/physics/faculty.php

Physics Department Chair and Book Professor of Physics: Jamie White, B.A., M.Ed., Ph.D.



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