

PHYSICS



"I feel confident jumping into my career and graduate coursework knowing that the MU physics faculty have given me the quantitative and analytical skills to be successful."

– Kevin Piaskowski, Physics '16



Physics is a mathematical study that attempts to understand the physical universe. It addresses fundamental questions about the nature of matter and energy, and the forces by which objects interact. Beginning with these basic principles and simple models, physicists build descriptions of atoms, organic material, stars and the origin of the universe. Physics also has an applied side: scientists and engineers use their understanding of physical principles to solve practical problems in areas such as product development, process control and instrumentation.

DEGREES/CONCENTRATIONS

BACHELOR OF SCIENCE (B.S.)

The physics degree demands the most intense concentration of physics and mathematics. Students graduating with the B.S. in physics are prepared to go on to graduate school in physics and engineering, or to enter the private sector in a technical area.

BACHELOR OF ARTS (B.A.)

This degree allows the greatest breadth of experience in designing a physics major curriculum. A year of a foreign language is required (two years of a foreign language in high school will satisfy this requirement). Students with the B.A. in physics have become doctors, technical writers, bioengineers and patent examiners. A student wishing to graduate with a double major (such as physics-chemistry or physics-math) has more flexibility in creating a four-year schedule if the physics major is a B.A.

BACHELOR OF SCIENCE IN EDUCATION (B.S.E.)

This degree follows the same physics curriculum as the B.A. program. A foreign language is not required. The program uses the flexibility of the B.A. to include the "junior block" of education courses and the senior semester of student teaching. In addition to the degree, the graduating student is certified to teach secondary education physics.

4/2 PROGRAM

This program combines a B.S. degree in physics with a Master of Science degree in engineering. The student will complete their B.S. at Millersville and enter the graduate program of Pennsylvania State University's Graduate Department of Engineering Science and Mechanics as a master's degree candidate. Students can transfer up to six MU credits in physics and mathematics to the Penn State program, shortening the time needed to complete their master's degree.

3/2 PROGRAMS IN ENGINEERING AND MATERIALS SCIENCE

Pennsylvania State University - This combines a B.A. degree in physics with a B.S. degree in engineering. Approximately three years are spent at Millersville, and two years are spent at PSU.

University of Delaware - This program grants a Master's of Science degree in materials science from Delaware, with a B.A. degree from Millersville.

BACHELOR OF ARTS (B.A.) OPTIONS

The flexibility of the B.A. program allows students to choose their courses to satisfy a wide variety of intellectual interests. The computer science, meteorology and philosophy options each lead to a minor in those subjects.

Computer Science - Learn the computer skills necessary to solve the most complex physics problems.

Meteorology - This program fulfills the minimum course requirements for employment by the National Weather Service.

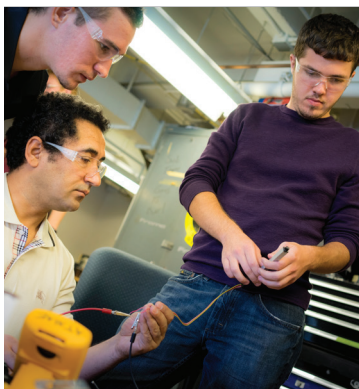
Nanotechnology - This option includes 18 credits at the Penn State Nanofabrication Facility.

Polymer Chemistry - Become part of the growing field of polymer physics by learning the basics of macromolecules.

Philosophy - The "Great Minds" program combines the quantitative nature of physics with the qualitative nature of philosophy.

PHYSICS MINOR

A minor in physics is a great option for students in any STEM field who are interested in a deeper understanding of the physical principles that form the basis of chemistry, biology, astronomy and earth sciences. It is also a good choice for students interested in pursuing advanced degrees in any of those fields.



DID YOU KNOW . . .

- All students are provided the opportunity to engage in faculty-mentored research, a requirement for all degree pathways within the department.
- At any time we have 50 to 70 physics majors.
- On average, eight students graduate every year from our department.
- All resources, time, funding and energy are focused on doing one thing extremely well: undergraduate physics.
- The department holds regularly scheduled seminars in which students meaningfully interact with the speaker in a post-program event. A portion of the seminar speakers are also program alumni.
- We have a low student/faculty ratio (16 to 1).
- All lectures, laboratories and recitation classes are taught by Ph.D.s (no graduate assistants).

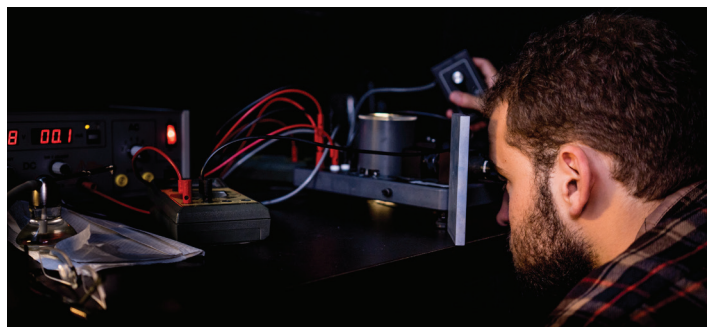
CLUBS AND ORGANIZATIONS

Society of Physics Students (SPS)

The SPS is open to all students, even non-majors. They meet on a bi-weekly basis to talk physics and plan events throughout the semester. Some events include the Annual Welcome Barbecue in September, where we welcome new students to the program, and an annual trip to a national meeting of the American Physical Society (APS).

Within SPS, students can join up with the Demo Team or the Telescope Team. The Demo Team presents physics demonstrations to local schools. The Telescope Team uses the department's two 10.5" Celestron telescopes for public viewing nights of the stars and planets.

Our top students are inducted into Sigma Pi Sigma, the Physics Honors Society within the SPS, during a banquet held each April, where faculty and fellow students celebrate their academic achievements and their dedication to understanding the world around them through the study of physics.



ABOUT OUR GRADUATES

Physics graduates will learn:

- to solve complex problems.
- to think clearly.
- to work individually and in groups.
- to use the real world as a test of their skills, but not as a limit to their thoughts.

CAREERS

- Physics provides the necessary training for entering careers in research, engineering and teaching.
- Physics is valuable for other interdisciplinary fields, such as medicine, bioengineering, law, computer system analysis and technical writing.
- Further career opportunities have been generated by demands in industrial research and development, on hospital staffs and in national laboratories. For more information, please visit www.aip.org/career-resources.

ALUMNI SPOTLIGHT

Dr. Hugh Herr '90

Associate Professor, Media Arts and Sciences and
Associate Professor, Harvard-MIT Division of Health Sciences
and Technology

Director of the Biomechanics group at the MIT Media Lab.

Keynote speaker at Millersville University's Spring Commencement in 2011.

Steven Bromley '15

Clemson University physics graduate student

"Millersville's physics courses really prepared me for grad school. After talking to some of the other graduate students, I found out that most of them hadn't had an optics or thermodynamics course. The faculty at Millersville did a wonderful job; after speaking to other grad students, I realized how diverse Millersville's physics catalog was."

Millersville University

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