

PHYSICS

The Department of Physics has a long history of providing students with a great educational experience. The department awarded its first Ph.D. in 1899. Since then, physics students have earned degrees in virtually every area of physics, and the department's faculty has played key roles in a myriad of important research efforts.

Physics is the science of the properties of matter, radiation, and energy in all forms. As such, it is the most fundamental of the sciences. It provides the underlying framework for the other physical sciences and engineering and for understanding physical processes in biological and environmental sciences.

CHOOSE TO BE A PHYSICS MAJOR

WHY STUDY PHYSICS?

- **Intellectual Satisfaction.** First, and foremost, physics satisfies our deep desire to understand how the universe works. Physics is interesting.
- **Intellectual Challenge.** By striving for fundamental understanding, the physicist accepts the challenge to move past a merely descriptive approach of our world and probes deeply into how and why it works.
- **Physics Produces New Technology.** Today's esoteric physics research will become tomorrow's technological advances.
- **Technical Expertise.** Physicists exploit forefront technologies in their pursuits.
- **Flexibility.** In a fast-paced and changing world, it is much more important to have a broad substantive education than to be trained in a specific skill. We teach people how to think, and how to apply and extend what they know to new types of problems.
- **Physics is Analytical and Quantitative.** People who can reason analytically and quantitatively are essential for the success of almost any pursuit.

A degree in physics helps prepare students for employment in industry, research, government, and academia. A bachelor's degree from the undergraduate physics program will provide an overall view of both classical and modern physics along with problem-solving ability and the flexibility to continue learning.

Your education can:

- Prepare you for employment in industrial or governmental laboratories.
- Prepare you for graduate studies for master's or doctoral degrees in experimental or theoretical physics.
- Provide a broad background for further work in other sciences, such as materials sciences, aerospace, astronomy, computer science, geophysics, meteorology, radiology, medicine, biophysics, engineering, and environmental studies.
- Provide a science-oriented liberal education. This training can be useful in some areas of business administration, law, or other fields where a basic knowledge of science is useful.
- Provide part of the preparation you need to teach physics. To teach physics in high school, you will also take education courses to become certified. You will need a doctoral degree to become a college or university professor.

OTHER PROGRAMS

AMEP

A program in applied mathematics, engineering and physics (AMEP) (<http://guide.wisc.edu/undergraduate/letters-science/mathematics/applied-mathematics-engineering-physics-bs-amep/>) is described in its own section of the *Guide*.

Astronomy–Physics

Students interested in an astronomy–physics major should contact the astronomy department (<http://guide.wisc.edu/undergraduate/letters-science/astronomy/>).

Education–Physics

A student working toward the Bachelor of Science–Education degree may major or minor in physics. Interested students should contact the School of Education (<http://guide.wisc.edu/undergraduate/education/>). Upon request, the physics department will assign an advisor.

Medical Physics

A suggested curriculum for students interested in graduate study in medical physics is available in the medical physics (<https://www.medphysics.wisc.edu/>) department office.

DEGREES/MAJORS/CERTIFICATES

- Physics, B.A. (<http://guide.wisc.edu/undergraduate/letters-science/physics/physics-ba/>)
- Physics, B.S. (<http://guide.wisc.edu/undergraduate/letters-science/physics/physics-bs/>)
- Physics, Certificate (<http://guide.wisc.edu/undergraduate/letters-science/physics/physics-certificate/>)

PEOPLE

FACULTY

Yang Bai (<https://www.physics.wisc.edu/people/yangbai/>), Professor

Baha Balantekin (<https://www.physics.wisc.edu/people/bahabalantekin/>), Eugene P. Wigner Professor

Vernon Barger (<https://www.physics.wisc.edu/people/vernon-dbarger/>), Vilas Professor and Van Vleck Professor

Keith Bechtol (<https://www.physics.wisc.edu/people/keithbechtol/>), Assistant Professor

Uwe Bergmann (<http://www.physics.wisc.edu/people/uwebergmann/>), Martin L. Perl Endowed Professor in Ultrafast X-Ray Science

Kevin Black (<https://www.physics.wisc.edu/people/kevinblack/>), Professor, Associate Chair for Graduate Program

Stas Boldyrev (<https://www.physics.wisc.edu/people/stanislavboldyrev/>), Professor

Tulika Bose (<https://www.physics.wisc.edu/people/tulikabose/>), Professor

Victor Brar (<https://www.physics.wisc.edu/people/victorbrar/>), Van Vleck Assistant Professor

- Duncan Carlsmith (<https://www.physics.wisc.edu/people/duncancarlsmith/>), Professor
- Daniel Chung (<https://www.physics.wisc.edu/people/daniel-jchung/>), Professor
- Sridhara Dasu (<https://www.physics.wisc.edu/people/sridharadasu/>), Professor
- Jan Egedal (<https://www.physics.wisc.edu/people/janegedal/>), Professor
- Mark Eriksson (<https://www.physics.wisc.edu/people/markariksson/>), Department Chairperson and John Bardeen Professor of Physics
- Lisa Everett (<https://www.physics.wisc.edu/people/lisa-leverett/>), Professor
- Ke Fang (<http://www.physics.wisc.edu/people/kefang/>), Assistant Professor
- Cary Forest (<https://www.physics.wisc.edu/people/cary-bforest/>), Prager Professor of Experimental Physics
- Pupa Gilbert (<https://www.physics.wisc.edu/people/pupagilbert/>), Vilas Distinguished Achievement Professor
- Francis Halzen (<https://www.physics.wisc.edu/people/francis-lhalzen/>), Gregory Breit Professor and Hildale Professor
- Kael Hanson (<https://www.physics.wisc.edu/people/kael-dhanson/>), Professor, WIPAC Director
- Aki Hashimoto (<https://www.physics.wisc.edu/people/akihashimoto/>), Professor
- Matthew Herndon (<https://www.physics.wisc.edu/people/matthew-herndon/>), Professor
- Robert Joynt (<https://www.physics.wisc.edu/people/robert-jjoynt/>), Professor
- Albrecht Karle (<https://www.physics.wisc.edu/people/albrechtkarle/>), Professor, IceCube Associate Director, Science and Instrumentation
- Shimon Kolkowitz (<https://www.physics.wisc.edu/people/shimonkolkowitz/>), Assistant Professor
- James Lawler (<https://www.physics.wisc.edu/people/james-elawler/>), Arthur and Aurelia Schawlow Professor
- Alex Levchenko (<https://www.physics.wisc.edu/people/alexlevchenko/>), Professor
- Lu Lu (<http://www.physics.wisc.edu/people/lulu/>), Assistant Professor
- Dan McCammon (<https://www.physics.wisc.edu/people/danmccammon/>), Professor
- Robert McDermott (<https://www.physics.wisc.edu/people/robert-fmcdermott/>), Professor
- Moritz Cornelius Muenchmeyer (<http://www.physics.wisc.edu/people/moritz-corneliusmuenchmeyer/>), Assistant Professor
- Marshall Onellion (<https://www.physics.wisc.edu/people/marshall-fonellion/>), Professor
- Yibin Pan (<https://www.physics.wisc.edu/people/yibinpan/>), Associate Professor
- Brian Rebel (<https://www.physics.wisc.edu/people/brianrebel/>), Associate Professor
- Mark Rzchowski (<https://www.physics.wisc.edu/people/markrzchowski/>), Associate Chairperson and Professor
- Mark Saffman (<https://www.physics.wisc.edu/people/marksaffman/>), Professor
- John Sarff (<https://www.physics.wisc.edu/people/john-ssarff/>), Professor
- Gary Shiu (<https://www.physics.wisc.edu/people/garyshiu/>), Professor
- Paul Terry (<https://www.physics.wisc.edu/people/paul-wterry/>), Professor
- Peter Timbie (<https://www.physics.wisc.edu/people/peter-ttimbie/>), Professor
- Justin Vandenbroucke (<https://www.physics.wisc.edu/people/justinvandenbroucke/>), Associate Professor
- Maxim Vavilov (<https://www.physics.wisc.edu/people/maxim-gvavilov/>), Professor
- Thad Walker (<https://www.physics.wisc.edu/people/thad-gwalker/>), Professor
- Sau Lan Wu (<https://www.physics.wisc.edu/people/sau-lanwu/>), Enrico Fermi Professor and Vilas Professor
- Deniz Yavuz (<https://www.physics.wisc.edu/people/denizyavuz/>), Professor
- Ellen Zweibel (<https://www.physics.wisc.edu/people/ellen-gzweibel/>), William L Kraushaar Professor of Astronomy & Physics