

PHYSICS

We have a long history of providing our students with a great educational experience. Our physics department awarded its first PhD in 1899. Since then, our students have earned degrees in virtually every area of physics, and our faculty have 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.

The undergraduate physics program will provide an overall view of both classical and modern physics with the flexibility to continue learning in fields that interest you. It will also help you develop skills in analysis, problem-solving, and quantitative reasoning that will aid you in whatever career you pursue after graduation.

A MAJOR IN PHYSICS 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.

Interested in the undergraduate physics program? Check out the physics undergraduate page (<https://www.physics.wisc.edu/academics/undergrads/>) or browse the Undergraduate Physics Majors Handbook (<https://www.physics.wisc.edu/undergrads/handbook.pdf>).

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 on the medical physics webpage (<https://www.medphysics.wisc.edu/graduate-program/admissions/#requirements>).

DEGREES/MAJORS/CERTIFICATES

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

PEOPLE

PEOPLE FACULTY

More details about each faculty member (<https://www.physics.wisc.edu/people/faculty/>) and the research areas can be found on the Physics website.

Yang Bai, Professor
 Baha Balantekin, Eugene P. Wigner Professor
 Vernon Barger, Van Vleck Professor and Vilas Research Professor
 Keith Bechtol, Associate Professor
 Kevin Black, Professor
 Stanislav Boldyrev, Professor
 Uwe Bergmann, Martin L. Pearl Professor in Ultrafast X-Ray Science
 Tulika Bose, Professor
 Victor Brar, Van Vleck Associate Professor

Rogerio Manuel Jorge, Assistant Professor
Duncan Carlsmith, Professor
Daniel Chung, Professor
Susan Coppersmith, Emeritus Robert E. Fassnacht Professor and Vilas Research Professor
Kyle Cranmer, Professor & Data Science Institute Director
Sridhara Dasu, Professor
Jan Egedal, Professor
Mark Eriksson, John Bardeen Professor and Department Chair
Ilya Esterlis, Assistant Professor
Lisa Everett, Professor
Ke Fang, Assistant Professor
Cary Forest, Prager Professor of Experimental Physics
Pupa Gilbert, Vilas Distinguished Achievement Professor
Francis Halzen, Gregory Breit Professor, Hilldale Professor, & Vilas Research Professor
Kael Hanson, Professor
Aki Hashimoto, Professor
Matthew Herndon, Professor
Robert Joynt, Emeritus Professor
Albrecht Karle, Professor
Roman Kuzmin, Dunson Cheng Assistant Professor
Alex Levchenko, Professor
Lu Lyu (aka Lu Lu), Assistant Professor
Dan McCammon, Professor
Robert McDermott, Professor
Moritz Muenchmeyer, Assistant Professor
Matthew Otten, Assistant Professor
Yibin Pan, Associate Professor
Brian Rebel, Professor
Mark Rzchowski, Associate Chair and Professor
Mark Saffman, Professor
John Sarff, Professor
Tiancheng Song, Assistant Professor
Gary Shiu, Professor
Paul Terry, Professor
Peter Timbie, Professor
Justin Vandenbroucke, Associate Professor
Maxim Vavilov, Professor
Thad Walker, Vilas Distinguished Achievement Professor
Sau Lan Wu, Enrico Fermi Professor, Hilldale Professor, and Vilas Research Professor
Deniz Yavuz, Professor
Vladimir Zhdarkin, Assistant Professor
Ellen Zweibel, William L Kraushaar Professor of Astronomy & Physics

Richard Townsend, Professor, Astronomy
Ying Wang, Assistant Professor, Materials Science & Engineering
Jun Xiao, Assistant Professor, Materials Science & Engineering

AFFILIATED FACULTY

David Anderson, Professor, Electrical & Computer Engineering
Paul Campagnola, Professor, Biomedical Engineering
Jennifer Choy, Assistant Professor, Engineering Physics
Elena D'Onghia, Professor, Astronomy
Chang-Beom Eom, Professor, Materials Science & Engineering
Chris Hegna, Professor, Engineering Physics
Sebastian Heinz, Professor, Astronomy
Mikhail Kats, Associate Professor, Electrical & Computer Engineering
Jason Kawasaki, Associate Professor, Materials Science & Engineering
Irena Knezevic, Professor, Electrical & Computer Engineering
Alexandre Lazarian, Professor, Astronomy
Daniel Rhodes, Assistant Professor, Materials Science & Engineering
Oliver Schmitz, Professor, Engineering Physics
Micheline Soley, Assistant Professor, Chemistry
Carl Sovinec, Professor, Engineering Physics