Physics, BS, BA

Emphases: Professional; Applied
Department: Physics Department
College: College of Science

Overview

About This Degree

Physics is the study of matter and energy and their interactions. Students study both the theory of physics and experiment using those theories as a guide. At USU, all students participate in faculty-mentored research, gaining valuable experience in campus research centers and laboratories. This makes USU students better prepared for entrance into either the workforce or graduate school.

Beyond the experimental facilities at USU, many students are involved in theoretical work, data analysis, and computer simulations in general relativity and field theory, space weather forecasting, surface science, and complex system applications. There is also a Physics Learning Center available for undergraduate physics students where physics graduate students provide individualized help with homework concerns.

The Physics Department is home to an active, national-award-winning chapter of the Society of Physics Students. Its students and faculty have also been recipients of prestigious national awards, including a Rhodes Scholar, two Carnegie Professors, Goldwater Scholars, and more.

Students receive a **BS** by completing all required courses in the major. To receive a **BA**, students must also gain proficiency in one or more foreign languages.

The BA and BS degree without an emphasis is designed for students with a strong interest in physics, but no intention of pursuing the study of physics or a related discipline at the advanced level.

Career Options

While students who graduate in physics commonly continue on to graduate school, they can also pursue careers in the following areas:

- Lab technician
- Engineer aide
- Technical writer
- Research in industrial laboratories and governmental laboratories
- Technological industry
- Business

Career Services provides counseling and information on hundreds of job and internship opportunities and even helps students apply and interview.

What it takes

Admissions Requirements

In addition to Utah State University's admissions requirements, the physics program has additional requirements:

- **Freshmen:** New freshmen admitted to USU in good standing qualify for admission to this major.
- **Transfer students:** Transfer students from other institutions need a 2.2 total GPA for admission to this major. Students transferring from other USU majors need a total GPA of 2.0 for admission to this major.

International students have additional admissions requirements.

Major Requirements

Click here to see course requirements for the **Bachelor of Science**.

Click here to see course requirements for the **Bachelor of Arts**.

Contact

Advising

All new USU students participate in a New Student Orientation program, where they receive detailed information about major requirements, registering for classes, and other important advising information.

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Get Involved

Professional Organizations, Honor Societies, and Clubs

American Physical Society: APS is a nonprofit organization committed to the advancement and diffusion of the knowledge of physics. The unit provides opportunities for its members to interact with colleagues that have similar interests and ensure new developments are being used in their specialized fields.

American Association of Physicists in Medicine: AAPM is a scientific and professional organization, founded in 1958, composed of more than 7,000 scientists, whose clinical practice is dedicated to ensuring accuracy, safety, and quality in the use of radiation in medical procedures, such as medical imaging and radiation therapy. Members are generally known as medical physicists and are uniquely positioned across medical specialties due to their responsibility to connect the physician to the patient through the use of radiation-producing technology in both diagnosing and treating people. The responsibility of the medical physicist is to assure that the radiation prescribed in imaging and radiation therapy is delivered accurately and safely.

American Institute of Physics: AIP is a nonprofit membership corporation created for the purpose of promoting the advancement and diffusion of the knowledge of physics and its application to human welfare. AIP supports 10 member societies and provides a spectrum of services and programs devoted to advancing the science and profession of physics. A pioneer in digital publishing, AIP is also one of the world's largest publishers of physics journals and produces the publications of more than 25 scientific and engineering societies through its New York-based publishing division.

Get-Away-Special Team: The GAS team welcomes students of all majors. During the fall, the team spends most of its time writing project proposals, researching project options, and volunteering in outreach programs. For the outreach program, GAS members visit local schools to give demonstrations related to its projects, as well as encouraging the students to stay in school and persue science and technology fields. During spring semester, students spend time completing GAS projects and sending a group of members to Houston to operate experiments on the “Vomit Comet.” The Vomit Comet is a microgravity aircraft used to test experiments.

Society of Physics Students: SPS is a professional association explicitly designed to help students become contributing members of the professional community. It helps students develop needed skills to flourish professionally, such as effective communication, leadership experience, establishing contacts, presenting scholarly work, and participating in outreach service. The USU chapter has won the Outstanding Chapter Award for 2006, and a Sigma Pi Sigma induction ceremony grant. USU’s chapter takes hands-on learning experiences into local schools; it participates in Physics Day at Lagoon, offering an educational activity that gives high school and middle school students the chance to explore the reality of physics in a fun way, and Science Unwrapped, a free, monthly presentation series. SPS students interact with about 10,000 pre-college students each year.

Sigma Pi Sigma: SPS is a national physics honor society, which elects members on the basis of outstanding academic achievement. This unique two-in-one society operates within the American Institute of Physics, an umbrella organization for 10 other professional science societies.

Labs, Centers, Research

With the second oldest undergraduate research program in the nation, USU offers students a wide range of

opportunities to gain hands-on research experience. The Undergraduate Research and Creative Opportunities program allows students to apply for grants and receive funding. USU's Honors Program prepares students for excellent graduate programs by helping them build relationships with professors, participate in research projects, take smaller, more intensive classes, and develop leadership skills.

Center for Active Sensing and Imaging: CASI uses radar-like, laser-based LIDAR technology to measure distances instead of radio waves for a variety of industrial applications, including sitting wind farms, controlling emissions, and rapid replacement of bridges, runways, and other infrastructure.

Center for Atmospheric and Space Sciences: CASS is recognized nationally and internationally as a progressive research center with advanced space and upper atmospheric research programs. CASS scientists are tackling the adverse consequences of space weather. Undergraduate and graduate students are involved in numerous research projects in CASS that provide opportunities to program computers, analyze data, and build instrumentation.

Center for Integrated BioSystems: The CIB leads a progressive, interdisciplinary effort in research, core services, and education serving agriculture and life sciences. The CIB is where the first hybrid animal, a mule, was cloned, and was named one of "30 Awesome College Labs" by Popular Science magazine. The CIB has a research program with several active projects in diverse areas of life science that encompass plant, animal, and microbe functional genomics.

Energy Laboratory: This lab seeks to develop solutions to America's most intractable energy problems through scientific and technological innovation. It provides a cohesive framework permitting faculty, students, and partnering institutions to focus on contemporary energy-related research issues.

Rocky Mountain NASA Space Grant Consortium: RMNSGC is one of 52 National Space Grant Consortia in the United States. As a member of the consortium, USU has awarded more than 100 fellowships to students interested in aerospace-related education and careers. The majority of Space Grant student awards include a mentored research experience with university faculty and NASA scientists, engineers, and technologists.

Space Dynamics Laboratory: SDL is known for sending 500+ successful experiments into space and brings in $54 million per year in revenue, the majority coming from grants, contracts, and appropriations. SDL's expertise in the development of sensors and calibration, small satellites and real-time intelligence has made it an internationally known organization in the space arena.

Space Weather Center: SWC is developing innovative applications for mitigating space weather in technical systems. The ionosphere is a key region that affects communication and navigation systems of the space environments that are affected by space weather. The USTAR initiative is developing products to reduce adverse effects of the ionosphere on these types of systems.