



Physics

Physicists study the fundamental laws of nature. The scope of physics is truly enormous, and physicists analyze everything from nuclear reactors to lasers, cosmology to chaos theory. Given the extraordinary rate of change and growth in the field, students interested in studying physics must possess creative insight, intellectual curiosity, and a commitment to proper scientific method.

THE PROGRAM

Gonzaga University's Physics Department offers a **major in Physics** (54 credits) leading to a Bachelor of Science degree. Course topics include mechanics, electricity and magnetism, optics, statistical physics, nuclear physics, and quantum mechanics. Students develop a basic knowledge of experimental procedure and analysis through accompanying laboratory sessions. Additionally, students majoring in physics are expected to achieve a familiarity with computer programming and computational physics methods. Students are expected to declare their major in physics in their freshman year; however, sophomore students and students in the Gonzaga-in-Florence study abroad program can make special arrangements with the department.

Students who wish to major in another field, but have a strong interest in physics, may pursue a **Physics minor** (28 credits).

The Department's student-to-faculty ratio is about 3-to-1. This results in upper-division courses that typically have just five students. Such small classes allow for better and more personalized instruction.

Frequently, Physics majors have participated in summer **research projects** on campus with GU physics faculty or off campus in the National Science Foundation's (NSF) Research Experience for Undergraduates summer research programs. These programs, offered by a wide variety of schools, give undergraduates the opportunity to be part of a NSF-funded research project. Students may spend one summer on a GU physics project and then apply for NSF programs the next summer. GU students have had very positive experiences either on campus or

in the NSF program and have found these experiences instrumental in identifying a career path.

In order to expand and improve the program's laboratory offerings, the Physics Department has made several recent equipment purchases. These include equipment for gamma ray spectroscopy, electron diffraction, a Michaelson interferometer, and an Atomic Force microscope. A linear electronics laboratory has also been introduced. This equipment is used in the upper-division lab courses.

OUTCOMES

A recent survey by the American Institute of Physics indicated that Physics graduates were evenly split between those who sought immediate employment and those who opted for graduate studies. Of those acquiring immediate employment, the majority accepted positions in industry and government. Of those pursuing graduate studies, 60 percent remained in the area of physics.

Gonzaga's Physics Department recognizes the diversity of careers being pursued by Physics graduates today. The 54 required credits for a major in Physics gives students flexibility in their program of study, depending on their academic and career goals. The student planning on graduate studies in physics will likely take additional upper-division Physics Department courses beyond what is required for the major. However, students planning to pursue graduate studies in other areas may complete a second major, or a minor in other areas. The flexibility may also be used simply to take elective courses in other disciplines (engineering, chemistry, philosophy, etc.) that may be of interest or use.

Recent Gonzaga Physics students have entered a wide array of fields following graduation. Recent Physics degree recipients are pursuing graduate studies in physics, mathematics, philosophy, medicine, law, medical physics, and engineering. Additionally, recent graduates seeking immediate employment have found jobs in education, engineering, and finance.

THE PEOPLE

The Physics Department faculty emphasize teaching, but are also active in research. In addition, they hold positions on regional and national physics committees such as the American Association of Physics Teachers and the Board of Directors for the Pacific Northwest Association for College Physics.

Erik Aver

Ph.D., University of Minnesota
theoretical and computational physics, astronomy, and classical and quantum mechanics
current research: astrophysics/cosmology
aver@gonzaga.edu

Jeffrey Bierman

Ph.D., University of Washington
Dept. Chair
advanced mechanics, and intermediate laboratory technique
current research: heavy ion reactions
bierman@gonzaga.edu

John Byrne

Ph.D., Fordham University
Professor Emeritus
mechanics, optics, and quantum mechanics
current research: chaotic structures and acid rain

Adam Fritsch

Ph.D., Michigan State University
nuclear and particle physics, computational physics
current research: nucleon clusters in nuclei
fritscha@gonzaga.edu

Matthew Geske

Ph.D., Penn State University
classical mechanics and modern physics laboratory
current research: cosmic ray physics
geske@gonzaga.edu

Allan Greer

Ph.D., College of William and Mary
mechanics, electricity and magnetism, astronomy, laboratory technique
current research: high temperature superconductors
greera@gonzaga.edu

Eric Kincanon

Ph.D., University of Missouri, Columbia
statistical mechanics and time
current research: potential structures from scattering data and the philosophy of time
kincanon@gonzaga.edu

Nicole Moore

Ph.D., University of Rochester
optics and quantum mechanics
current research: optical tweezers
mooren@gonzaga.edu

