



## The Passion

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 (53 credits) leading to a Bachelor of Science degree. Courses of study 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. 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 3:1. 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 the National Science Foundation's Research Experience for Undergraduates (NSF REU) 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. Our students have noted how much these programs help in choosing 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, and a Michelson interferometer. A linear electronics laboratory has also recently been

introduced. This equipment is used in the upper-division lab courses.

## The Potential

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 recent changes in the physics major degree requirements recognize the diversity of careers and paths being pursued by the physics graduates of today. The number of required credits has been reduced to 53 from over 60. This added flexibility allows students to better create programs of study suited to their own individual desired goals. The student planning on further studies in physics will likely take additional upper-division physics offerings resulting in a preparation matching Gonzaga's previous major. However, students planning to pursue graduate studies in other areas may more easily complete a second major or a minor in other areas. The added flexibility may also be used simply to take elective courses in other areas (engineering, chemistry, philosophy, etc.) that may be of interest or use.

Current and recent Gonzaga students have embraced these changes and 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.

**Benjamin Beppler, Ph.D.**, Carnegie-Mellon University; specializes in introductory physics, intermediate mechanics, electricity, and magnetism; researching in controlled assembly of nanoparticles and organic molecules from solution. (beppler@gonzaga.edu)

**Jeffrey Bierman, Ph.D.**, University of Washington; specializes in classical and quantum mechanics, music and sound, and laboratory technique; researching in heavy ion reactions. (bierman@gonzaga.edu)

**John Byrne, Ph.D.**, Professor Emeritus, Fordham University; specializes in mechanics, optics, and quantum mechanics; researching chaotic structures and acid rain.

**Allan Greer, Ph.D.**, College of William and Mary; specializes in mechanics, electricity and magnetism, astronomy, computer applications and laboratory technique; researching in high temperature superconductors. (greera@gonzaga.edu)

**Eric Kincanon, Ph.D.**, University of Missouri-Columbia; specializes in statistical mechanics and time; researching potential structures from scattering data and the philosophy of time. (kincanon@gonzaga.edu)

**Christopher LaSota, Ph.D.**, College of William and Mary; specializes in optics, mechanics, and quantum mechanics; researching in complex systems, non-linear dynamics, and scientific computing. (lasota@gonzaga.edu)

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