AUGUSTA STATE UNIVERSITY
CAREER CENTER

Linking Student Success to Employer Satisfaction

What can I do with a degree in Physics?

The information below describes typical occupations and employers associated with this major. Understand that some of the options listed below may require additional training. Moreover, you are not limited to these options alone when choosing a possible career path.

DESCRIPTION OF PHYSICS:

Physics is a branch of science concerned with the discovery and characterization of universal laws which govern matter, energy, space, and time. The role of physics, then, is to provide a logically ordered picture of nature in agreement with experience. Physics is the study of energy and the behavior of single atoms and their component pieces. Physicists consider themselves the most fundamental of scientists, for they are the ones who examine the basic laws of nature that govern our universe and apply these laws to explain the behavior of increasingly more complex systems. Physics is at the base of all modern science and technology and even at an elementary level this fundamental nature can be appreciated. Physicists seek to study and understand what happens when atoms and subatomic particles break down and assemble, how they react to collisions with one another and to electro-magnetic radiation. They use mathematics to understand, explain, and predict their theories and equations. They often apply their predictions and theories to other fields-chemistry, biology, geophysics, engineering, communication, electronics and health.

POSSIBLE JOB TITLES OF PHYSICS GRADUATES*:

Aerospace Testing
Aeronautical Engineer
Agricultural Scientist
Air Traffic Controller
Airplane Pilot
Applied Physicist
Astronomer
Astrophysicist
Automotive Engineer
Biophysicist
Cardiac Imaging Researcher
Chemical Physicist
Civil Engineer
Computer Programmer
Design Engineer
Electrical Engineer
Engineer
Environmental Analyst
Environmental Health Specialist
Fluid Physicist
Geophysicist
Health Physicist
Industrial Hygienist
Industrial Health Specialist
Mathematician
Medical Physicist
Meteorologist
Molecular Physicist
Nuclear Medicine Technologist
Nuclear Physicist
Nuclear Plant Manager
Occupational Safety Specialist
Oceanographer
Optical Devices Designer
Optical Physicist
Physics Researcher
Physics Teacher
Physiognomist
Project Manager
Quality Control Manager
Research Assistant
Research Physicist
Sales Engineer
Satellite Data Analyst
Satellite Missions Analyst
Science Teacher
Science Writer
Seismologist
Software Engineer
Solid State Physicist
Stratigrapher
Systems Analyst
Teacher/Professor
Technical Consultant
Test Engineer

* Many of these occupations may require graduate degrees.

POSSIBLE EMPLOYERS WHO MIGHT HIRE PHYSICS GRADUATES

Aircraft and Instrument Manufacturers
Center for Disease Control
Chemical Manufacturers
Defense Manufacturing
Companies
Dept. of Agriculture
Dept. of Commerce
Dept. of Defense
Dept. of Energy
Dept. of Health and Human Services
Dept. of the Interior
Electrical Equipment Companies
Environmental Protection

Agency
Food & Drug Administration
NASA
National Institutes of Heath
National Oceanic Atmospheric Administration
National Science Foundation
National Weather Service
Occupational Safety & Health Administration
Scientific journals
US Patent and Trademark Office

SAMPLE WORK SETTINGS:

Airlines
Chemical Companies
Computer Companies
Crime Laboratories
Development Firms
Electronic Firms
Field Sites
Geological Industry
Hospitals
Laboratories
Launch Sites
Manufacturing/Production Facilities
Medical Centers
Mining Industry
Museums
Network News Stations
Newspapers
Nonprofit Research Centers
Oilfields
Patent Law Firms
Power Plants
Private Industry
Radio Stations
Recycling Plants
Research and Development Departments
Schools and Colleges
Scientific Journals
Technical consulting firms
Testing labs
Water Treatment Plants
Weather Channel

SKILL SETS AND INTERESTS ASSOCIATED WITH PHYSICS MAJORS:

Leadership Skills:

- Identifying people who can contribute to the solution of a problem or task
- Unwillingness to automatically accept the status quo
- Identifying priorities and parameters

Communication/Writing Skills:

- Comprehending written material
- Writing factual material clearly and concisely
- Summarizing

Analytical/Research /Problem Solving Skills

- Manipulating information using expertise in mathematics
- Breaking down principles into parts
- Perceiving and defining cause and effect relationships
- Applying appropriate methods to test the validity of data
- Formulating questions to clarify a particular problem or issue using laboratory techniques
- Designing an experiment, plan, or model that systematically defines a problem
- Ability to conduct and clearly explain scientific research
- Ability to make critical observations and appropriate decisions

Artistic/Creative Skills

- Designing and using audio-visual aids

Other Skills:

- Ability to work independently and as a team
- Ability to operate, and use information derived from computers
- Good vision and manual dexterity
- Strong background in mathematics

PRINT AND WEB RESOURCES

Books

Alternative Careers in Science
Careers for Number Crunchers and Other Quantitative Types
Careers for Problem Solvers and Other Methodical Types
Careers in Science
Guide to Nontraditional Careers in Science
Physical science and Mathematics

Journals
American Journal of Physics
http://scitation.aip.org/aip

ONLINE CAREER RESOURCES:
Career Information:
www.careercornerstone.org/physics/physics.htm

Careers Using Physics:
www.spsnational.org/cup/

Occupational Outlook Handbook
www.bls.gov/oco/ocos052.htm (Physicists)
www.bls.gov/oco/ocos049.htm (Materials Scientist)
www.bls.gov/oco/ocos027.htm (Engineers)
www.bls.gov/oco/ocos043.htm (Mathematicians)

Georgia Career Information Center
http://www.gcic.peachnet.edu

EMPLOYMENT OPPORTUNITY ELECTRONIC RESOURCES

American Institute of Physics Career Services
www.aip.or/careersvc

American Physical Society
www.aps.org/jobs/index.cfm

Physics Today
www.physicstoday.org/jobs/

Spotlight on Careers
www.spotlightoncareers.org

PROFESSIONAL ASSOCIATIONS/INSTITUTES

Acoustical Society of America
http://asa/aip.org/

American Association for the Advancement of Science
www.aaas.org

American Astronomical Associations
www.aas.org

American Institute of Aeronautics and Physics
www.aiaa.org

American Institute of Physics (AIP)
www.aip.org

American Nuclear Society
www.ans.org

American Physical Society
www.aps.org

Biophysical Society
www.biophysics.org

Federation of American Scientists
www.fas.org

Institute of Physics
www.iop.org

National Academy of Science
www.nas.edu

National Science Foundation
www.nsf.gov

National Society of Professional Engineers
www.nspe.org

The Center for Simulational Physics
http://www.physast.uga.edu/research/csp

The National Academy of Sciences: Board on Physics and Astronomy
http://www7.nationalacademies.org/bpa/index.html

WAYS TO GAIN EXPERIENCE AND STRENGTHEN YOUR RESUME

- Join physics related clubs and organizations
- Keep abreast of related journals and publications
- Attend conferences, lectures, symposiums on related subjects
- Gain strong computer skills and computer programming skills
- Operate a ham radio or repair electrical equipment (radio, TV, stereo)
- Work part-time or volunteer in Physics Department research or lab activities
- Obtain an internship/co-op at a local engineering firm or manufacturer

WAYS TO PREPARE FOR DIFFERENT CAREER PATHS

A Physics major provides a strong background for employment in a number of different areas, and you certainly do not need to know what you are going to do after graduation in order to design your initial curriculum. As students proceed through their undergraduate years, however, they become more aware of their interests, strengths, and limitations, and may wish to tailor their coursework to their expected employment after graduation. Some suggested strategies follow:

Students Planning Graduate Study in Physics, Mathematics, or another Science:

Graduate schools pay the most attention to GRE scores, grades in math/science courses, letters of recommendation, and undergraduate research. Courses in other disciplines and extracurricular activities may make you a better person but probably won't help much with your graduate school application. However, communications skills are important, so it would be useful to take at least a few courses where you are required to do a lot of writing. And, obviously, the more physics and math courses (as well as perhaps courses in related disciplines, such as chemistry, astronomy, or geology) that you take, the better prepared you will be. Students interested in pursuing theoretical physics are particularly well advised to take as many math courses as possible; students interested in experimental physics should try to get as much lab experience as possible.

Students Planning Employment in Industry or the Government:

Detailed knowledge of physics or mathematics is probably less important here than communication and interpersonal skills. You will quite likely spend a lot of your time writing or making verbal presentations, so anything you can do to brush up these skills will be helpful. Computer skills always seem to be in demand, so taking computer courses or teaching yourself computer skills on your own is a good idea. Other applied courses, in areas such as statistics, applied physics, electronics, or optics, are also useful. Industry, in particular, values the team player much more than the brilliant prima donna. Accordingly, extracurricular activities that demonstrate your ability to work with others could enhance your resume.

Students Planning to Teach High School:

There are actually two routes to follow. Students looking for a position in a public school system will need to be certified in the state they will be working in. To do this you will probably need to attend a certified Master's program. To teach in a private school, on the other hand, you need not have a teaching certificate; you just have to impress the headmaster or principal of the school you want to teach in. In either case, communication and interpersonal skills are obviously essential. What is less obvious is that you will have a greater chance of being hired if you can present yourself as being qualified in several different areas. Most high schools cannot afford someone who teaches physics only; they would like to hire someone who could teach, for example, physics, chemistry, and general science, or perhaps physics, biology, and mathematics. Accordingly, the more classes in a wide variety of sciences you take, the better prepared you will be.

Students Interested in Jobs in the Financial Sector:

It turns out that many financial companies, such as banks, insurance companies, investment firms, etc., are interested in hiring math and science majors. They find that these students often have a facility with numbers and are not afraid of computers or messy-looking equations. To impress a potential employer in this area, experience with numerical computation would be helpful; experience with statistics and perhaps differential equations would also be helpful. And it wouldn't hurt to take a few economics course or even an accounting course.

Students Interested in the Medical Professions:

Students planning to apply to medical school, dental school, etc. are encouraged to seek advice from the pre-medical advisor early in their careers to determine which other courses (e.g., biology, chemistry) will be required.