Physics

Acoustical Physics

- Development
- Testing
- Consulting
- Education

Acoustical Physics Employers

Colleges and universities

Government:

- Department of Defense
- Naval Research Laboratory
- Los Alamos National Laboratory
- Lawrence Livermore National Laboratory

Industry:

- Medical instrumentation
- Bioacoustics
- Transportation
- Electronics
- Architecture

Industry:

- Engineering
- Communication
- Musical

Nonprofit research centers

Acoustical Physics Strategies

- Supplement program with courses in engineering, environmental science, urban planning, remote sensing, physiology, performing arts, audio broadcasting, speech communication, film production, or other areas of interest.
- Seek internship experience in your specialty area.
- Stay abreast of federal, state, and local environmental regulations for the environmental impact positions.
- Become familiar with technologies used to measure/monitor noise levels.
- Obtain a graduate degree for additional opportunities in industry and education.

Astronomy and Astrophysics

- Research
- Consulting
- Writing
- Public relations
- Education

Astronomy and Astrophysics Employers

Colleges and universities

Government:

- Department of Defense
- National Aeronautics and Space Administration
- National Oceanic and Atmospheric Administration
- Federal Aviation Administration
- Naval Observatory
- Naval Research Laboratory

Industry:

- Aerospace
- Scientific supply
- Computer software
- Remote sensing
- Communications

Observatories

Planetariums

Science museums

Nonprofit foundations

Astronomy and Astrophysics Strategies

- Supplement a physics major with coursework in astrophysics, observational methods, galaxies and cosmology, computational methods, optics.
- Obtain experience through part-time or volunteer positions in a planetarium, observatory, or science museum.
- Cultivate broad knowledge of astronomy and speaking skills for jobs working with the public.
- Develop strong writing skills for preparing scientific reports.
- Seek undergraduate research opportunities with professors in the field.
- Develop a specialty area of expertise such as remote sensing, instrumentation, computer applications, etc.
- Obtain a Ph.D. for teaching and advanced research positions.

Biophysics

- Research
- Development
- Consulting
- Administration

Biophysics Employers

Colleges and universities

Government:

- National Institutes of Health
- Department of Energy

Industry:

- Biotechnology
- Medical equipment

Industry continued:

- Environmental
- Pharmaceuticals
- Food science
- Toxicology

Nonprofit research centers

Medical and dental schools

Hospitals

Biophysics Strategies

- Biophysics is considered an interdisciplinary field at the undergraduate level. Most students prepare to enter by majoring in physics, chemistry, or mathematics with supplementary courses in biology; or by majoring in biology, biochemistry or molecular biology with supplementary courses in chemistry, physics, and mathematics.
- Plan to specialize in an area such as experimental biophysics or computational biophysics and choose courses accordingly.
- Seek research experience through work with a professor or internships.
- Earn a bachelor's degree for most technician positions.
- Obtain advanced degree for higher-level positions in industry or academia.

Chemical Physics

- Research
- Development
- Consulting

Chemical Physics Employers

Colleges and universities

Government:

- Department of Energy
- National Institute of Standards and Technology
- National Institutes of Health

Industry:

- Biotechnology
- Chemical
- Electronics
- Petroleum
- Pharmaceutical

Chemical Physics Strategies

- Pursue a physics, chemistry, or related major (e.g., engineering or mathematics) for preparation in this interdisciplinary field.
- Seek undergraduate research experience to develop laboratory and computer skills.
- Gain experience in physics and chemistry fields, as most researchers practice in both over the course of a career.
- Become familiar with the various forms of spectroscopy.
- Obtain advanced degree for more opportunities in industry, research, or education.

Condensed Matter

- Research
- Development
- Consulting

Condensed Matter Employers

Colleges and universities

Government:

- National Aeronautics and Space Administration
- Department of Defense
- Department of Energy

Electronics industry:

- Microprocessors
- Magnetic imaging
- Communications

Electronics industry continued:

- Automotive
- Navigation/guidance systems

Condensed Matter Strategies

- Condensed matter physics is the largest subfield of physics and is closely related to other fields including materials science and chemistry.
- Develop strong mathematical and computer science skills through coursework studying physical, electronic, and magnetic properties of matter.
- Seek research experience through internships or by assisting faculty with projects.
- Acquire advanced degree for opportunities in industry, research, or education.
- Become familiar with various forms of characterization techniques such as optical and electron spectroscopy and neutron scattering.

Engineering Physics

- Engineering (process and testing)
- Research
- Quality control
- Development
- Instrumentation
- Consulting

Engineering Physics Employers

Colleges and universities

Government:

- National Aeronautics and Space Administration
- Department of Commerce
- Department of Defense

Industry:

- High technology
- Chemical
- Aerospace
- Agriculture
- Energy

Industry continued:

- Fuel
- Computer
- Transportation

Engineering firms

Manufacturing and processing firms

Hospitals

Engineering Physics Strategies

- Choose a major in engineering physics or supplement physics major with engineering minor, all of which require proficiency in mathematics and problem solving.
- Seek internship or co-op experience in interest area.
- Develop strong oral and written communication skills for working on interdisciplinary teams.
- Complete applicable licensure through professional organizations which is regulated by state in the engineering profession.
- Pursue advanced degree in engineering, engineering physics, or physics for increased opportunities.

Geophysics

- Research
- Development
- Environmental consulting
- Law

Geophysics Employers

Colleges and universities

Government:

- State and Federal Geological Survey
- Army Corps of Engineers
- National Oceanic and Atmospheric Administration
- Naval Oceanographic Office

Industry:

- Petroleum
- Mining
- Hydrogeology

Nonprofit research centers

Consulting firms

Law firms

Geophysics Strategies

- Specialize in geophysics at the undergraduate level or supplement physics degree with geology major or minor.
- Develop solid mathematics, chemistry, engineering, and physics knowledge.
- Plan to develop skills in computer modeling, data analysis, digital mapping. Oral and written communication competence is integral for sharing reports with interdisciplinary teammates/clients.
- Seek experience with national labs or industry researching specializations of interest.
- Take business classes for increased marketability in advanced prospecting positions (risk analysis for drilling, mining, exploration).
- Maintain physical condition and be open to travel.

Medical and Health Physics

- Research
- Development
- Clinical service
- Consulting
- Monitoring
- Enforcement

Medical and Health Physics Employers

- Colleges and universities
- Hospitals, clinics, medical centers
- Government:
  - Department of Defense
  - Department of Energy
  - Nuclear Regulatory Commission
  - Department of Health and Human Services
- Industry:
  - Medical instrumentation
  - Nuclear power
  - Waste management/disposal
  - Food irradiation
  - Petroleum
- Nonprofit research centers
- Environmental firms

Medical and Health Physics Strategies

- Gain experience with air/water testing techniques and analysis and radiation detection instruments.
- Develop strong communication skills for training, protecting and collaborating with radiation workers, members of the general public, and with physicians in healthcare settings. Seek certification from the National Registry of Radiation Protection Technologists for some positions.
- Maintain current knowledge of government standards and regulations.
- Learn medical uses of radiation for work in the healthcare industry involving the protection, education, training of others.
- Pursue medical physics certifications offered by the American board of Radiology, the American Board of Medical Physics, or health physics certification offered by the American Board of Health Physics, depending on your specialty.
- Earn a master's degree or Ph.D. for university teaching, research, and healthcare positions.
- Gain experience at a hospital or clinic to prepare for work in healthcare settings; clinical residency or postdoctoral work in a hospital may be required.

Nuclear Physics

- Research
- Development
- Consulting
- Instrumentation

Nuclear Physics Employers

Colleges and universities

Government:

- National Aeronautical and Space Administration
- Department of Energy
- Department of Defense

Industry:

- Security/weapons
- Nuclear accelerators
- Nuclear reactors
- Nuclear instrumentation
- Radioisotope products
- Healthcare
- Environmental protection
- Food irradiation

Nuclear Physics Strategies

- Acquire a strong background of physics, mathematics, and computer science knowledge.
- Develop competence in experimental design, data collection, and data analysis.
- Choose a theoretical or experimental track and seek internship experience in industry, government, or academic settings alongside scientists and faculty.
- Pursue master's degree or Ph.D. for advanced positions in industry.

Optical Physics

- Research
- Development
- Consulting

Optical Physics Employers

Colleges and universities

Government:

- National Aeronautical and Space Administration
- Department of Energy
- Department of Defense

Industry:

- Medical scanners
- Eyeglasses
- Binoculars
- Microscopes
- Lasers
- Holography

Industry continued:

- Display technologies
- X-ray
- Ultraviolet spectra
- Fiber optics

Nonprofit research centers

Optical Physics Strategies

- Prepare to study the behavior and properties of light including generation and detection, linear and nonlinear optical processes, and spectroscopy.
- Supplement physics program with courses in electricity, magnetism, quantum mechanics, and electronics.
- Gain experience in the optics field through internships in industry or research with professors.
- Obtain a master's degree for positions in industry which largely consists of the design and manufacturing of devices.

Particle and High Energy Physics

- Research
- Consulting
- Instrumentation
- Operations and maintenance

Particle and High Energy Physics Employers

Colleges and universities

Government:

- Department of Energy
- Lawrence Berkeley National Lab

Nonprofit research centers

Particle and High Energy Physics Strategies

- Plan to study the most fundamental aspects of the universe if pursuing this physics specialty.
- Acquire a strong mathematics and computer science background. Scientific computing and data analysis skills are essential.
- Choose a theoretical or experimental track and seek research experience through work at national labs or with faculty.
- Pursue Ph.D. for advanced positions in academia and research.

General Physics Information

- Physicists are interested in solving complex, technical problems, often extending for long periods of time.
- Visit government laboratories or research centers to learn more about opportunities in the field. Schedule informational interviews to learn about the profession and specific career paths.
- Acquire excellent oral, written, and interpersonal skills for sharing findings and collaborating with interdisciplinary teams.
- Gain experience using scientific instruments and equipment. Computer skills are critical.
- Participate in summer research institutes. Submit research to local poster competitions or research symposiums.
- A bachelor's degree will qualify candiates for positions as research assistants, high-level technicians, or computer specialists, as well as nontechnical work in publishing or sales.
- An undergraduate degree also provides a solid background for pursuing advanced degrees in other employment areas such as law, business, or accounting.
- A graduate degree and post-graduate experience will allow for more responsibility and advancement in the field of physics.
- A doctorate is required for college or university teaching, advanced research, and administrative positions.
- Become familiar with the government job application process for positions in federal, state, or local government. Seek assistance from your career center professionals.