PHYSICS What can I do with this major?

AREAS

EMPLOYERS

STRATEGIES

Some areas of specialization follow.	Most
students specialize at the graduate le	evel.

ACOUSTICAL PHYSICS

Development Testing Consulting Administration Education Colleges and universities Military Government laboratories Nonprofit research centers Industry e.g., electronics, building design, medical instrumentation, communications, engineering, noise pollution, petroleum, sound recording, film production 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.

<u>ASTRONOMY</u>

Research Consulting Writing Public Relations Education

- L F S N
- Observatories Laboratories Planetariums Science museums Nonprofit foundations Colleges and universities Industry e.g., aerospace, scientific supply, computer software, remote sensing, communications Federal government: National Aeronautics and Space Administration, National Oceanic and Atmospheric Administration, Federal Aviation Administration, U.S. Naval Observatory, U.S. Naval Research Laboratory
- Obtain experience through part-time or voluntary position 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.

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AREAS	EMPLOYERS	STRATEGIES
ASTROPHYSICS Consulting Administration Research	Research centers Colleges and universities Observatories Planetariums Aerospace industry Scientific supply industry Federal government: Military, National Aeronautics and Space Administration, National Oceanic and Atmospheric Administration (NOAA), Federal Aviation Administration (FAA) Airports	 Seek lab courses for direct experience with equipment and observatory tools. Participate in research with scholars in the field. Complete an internship with a research organization or related industry. Develop computer and oral and written communicatior skills. Learn to be effective in both independent research role and team environment. Earn an advanced degree for most teaching and research positions.
BIOPHYSICS Basic and Applied Research Development Consulting Administration	Colleges and universities Medical and dental schools Government laboratories Nonprofit research centers Industry e.g., biotechnology, environment, pharmaceuticals, food science, toxicology Hospitals	 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 in academia.
CHEMICAL PHYSICS Basic and Applied Research Administration	Colleges and universities Government laboratories Government agencies Industry	 Take courses in physics, chemistry, and mathematics for graduate school preparation in this interdisciplinary field. Seek undergraduate research experience to develop laboratory and computer skills. Gain research experience in both physics and chemistry. Become familiar with the various forms of spectroscopy. Obtain advanced degree for more opportunities in industry, research, or education.

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AREAS	EMPLOYERS	STRATEGIES
CONDENSEDMATTER		
Basic and Applied Research Development Consulting Administration	Government laboratories Nonprofit research centers Colleges and universities Electronics industry e.g., microprocessors, magnetic imaging, communications, automobile, navigation/ guidance systems Government agencies e.g., National Aeronautics and Space Administration, Department of Defense, Department of Energy	 Develop strong mathematical, chemistry, and computer science skills. 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) Quality Control Research Development Instrumentation Consulting	Colleges and universities Government laboratories Government agencies e.g., Department of Commerce, Department of Defense Engineering firms Manufacturing and processing firms Industry e.g. high technology, chemical, aerospace, agriculture, energy, fuel, computer, transportation Hospitals	 Choose a major in engineering physics or supplement physics major with engineering minor. Seek internship or co-op experience in area of interest. Develop strong oral and written communication skills. Complete applicable certification or licensure through professional organizations. Pursue advanced degree in engineering, engineering physics, or physics for increased opportunities.
GEOPHYSICS Basic and Applied Research Development Environmental Consulting Law Administration	Colleges and universities Nonprofit research centers Government e.g., State and Federal Geological Survey, Army Map Service, Naval Oceanographic Office Government laboratories Military Industry e.g., petroleum, mining, hydrogeology Consulting firms Law firms	 Specialize in geophysics at the undergraduate level or supplement physics degree with geology major or minor. Develop solid computer, mathematics, chemistry, engineering, and physics knowledge. 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 good physical condition and be open to travel.

AREAS

MEDICAL/HEALTH PHYSICS

Basic and Applied Research Development Clinical Service Consulting Administration Monitoring Enforcement

EMPLOYERS

Colleges and universities Government laboratories Government agencies e.g., Department of Defense, Department of Energy, Nuclear Regulatory Commission, Department of Health and Human Services Nonprofit research centers Industry e.g., medical instrumentation, nuclear power, nuclear accelerator, food sterilization, petroleum Environmental firms Hospitals, clinics, medical centers STRATEGIES

Gain experience with air and water testing techniques
Develop strong communication skills for training
radiation workers and members of the general
public and for collaborating with physicians in
healthcare settings.
Maintain current knowledge of government standards and regulations.
Learn medical uses of radiation for work in the healthcare industry.
Seek certification from the National Registry of
Radiation Protection Technologists for some positions.
Complete a master's degree and certification by the
health physicist positions.
Earn a Ph.D. and certification by the American Board
of Health Physics (ABHP) for top university
teaching, research, and administrative positions.
Gain experience at a hospital or clinic to prepare for
work in healthcare settings; clinical residency
training may be required.

NUCLEAR PHYSICS

Basic and Applied Research Development Consulting Instrumentation Administration Law Quality Control Operations and Maintenance Colleges and universities Military Industry e.g., security/weapons, nuclear

accelerators, nuclear reactors, nuclear instrumentation, radioisotope products, transportation, healthcare, environmental protection, food irradiation Government laboratories and research centers Government agencies e.g., Department of Defense, Department of Energy Acquire a strong mathematics, computer science, and chemistry background.
Choose a theoretical or experimental track.
Seek internship experience in your specialty area.
Pursue master's degree or Ph.D. for advanced positions in industry.

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AREAS	EMPLOYERS	STRATEGIES			
OPTICAL PHYSICS					
Basic and Applied Research Development Consulting Administration	Colleges and universities Government laboratories Nonprofit research centers Industry e.g., medical scanners, eyeglasses, binoculars, microscopes, lasers, holography, display technologies, x-ray, ultraviolet spectra, fiber optics Federal agencies e.g., NASA, Department of Energy, Department of Defense	 Gain experience in the optics field through internships or research with professors. Supplement program with courses in electricity, magnetism, quantum mechanics, and electronics. Obtain a master's degree for positions in industry. Understand lasing and optical media. 			
PARTICLE/HIGH ENERGY PHYSICS Basic and Applied Research Development Consulting Instrumentation Administration Operations and Maintenance	Government laboratories Nonprofit research centers Colleges and universities	Acquire a strong mathematics, computer science, and chemistry background. Choose a theoretical or experimental track. Seek internship experience in your specialty area. Pursue Ph.D. for advanced positions in academia.			
SCIENCE EDUCATION Teaching Computer Software Development Educational Research Writing and Editing Library and Information Sciences	Public school systems, K-12 Private schools, K-12 Publishing companies: books, magazines, videos Software developers Libraries	 Develop excellent communication skills, verbal and written. Gain experience working with age group of interest through volunteering and tutoring. Become skilled in the use of computers and laboratory equipment. Maintain current knowledge of state and national legislation regarding teacher licensure. Acquire appropriate state teacher certification for K-12 teaching opport unities 			

12 teaching opportunities. Seek advanced degree required for specialists, education administration, college teaching, and other professional positions.

GENERAL INFORMATION

- Physicists are interested in solving complex, technical problems.
- 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.
- Join relevant professional associations. Attend meetings and stay up-to-date on research/publications.
- Acquire excellent oral and written communication skills.
- 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 willingness to relocate is helpful due to limited opportunities in specialized areas.
- A bachelor's degree will qualify 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.
- An earned doctorate is required for college or university teaching, advanced research, and administrative positions.
- A bachelor's degree and state teacher certification are required for K-12 teaching opportunities.
- Become familiar with government job application process for positions in federal, state, or local government.