Career Paths

PHYSICS

The field of physics is evolving and features many specialties.

Someone who obtains a bachelor's degree in physics may work with solving complex, technical problems, often extending for long periods of time. Physics features a Acquire a strong mathematics and computer science background, and scientific computing and data analysis skills are essential. Join relevant professional associations and attend meetings to stay current on research/publications. Acquire excellent oral, written, and interpersonal skills for sharing findings and collaborating with interdisciplinary teams and gain experience using scientific instruments and equipment. Computer skills are critical. Participate in summer research institutes and make sure to 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 candidates 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 and a doctorate is required for college or university teaching, advanced research, and administrative positions.

Acoustical Physics

Example Career Paths: Development | Testing | Consulting | Education

Potential Employers: Colleges and universities | Nonprofit research centers

Government: Department of Defense | Naval Research Laboratory | Los Alamos National Laboratory | Lawrence Livermore National Laboratory

Industry: Medical instrumentation | Bioacoustics | Transportation | Electronics | Architecture | Engineering | Communication | Musical

Professional Associations: Acoustical Society of America | Institute of Noise Control Engineering | Audio Engineering Society

Related Occupations: Physicist | Acoustical Engineer | Audio Signal Processing Engineer | Underwater Acoustician | Psychoacoustics Researcher | Biomedical Acoustics Specialist | Environmental Noise Analyst | Forensic Audio Analyst

Astronomy/Astrophysics

Example Career Paths: Research | Education | Consulting | Writing | Public relations

Potential Employers: Observatories | Planetariums/Science museums | Nonprofits foundations | Government agencies | 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

Professional Associations: American Astronomical Society | International Astronomical Union

Related Occupations: Astrophysicist | Atmospheric and Space Scientist | Data Scientist - Astronomy and Space | Aerospace Engineer | Instrumentation Specialist | Planetary Geophysicist

Biophysics

Example Career Paths: Research | Development | Consulting | Administration

Potential Employers: Colleges and universities | Medical and dental schools | Hospitals

Government: National Institutes of Health | Department of Energy

Industry: Biotechnology | Medical equipment | Environmental | Pharmaceuticals | Food science | Toxicology | Nonprofit research centers

Professional Associations: Biophysical Society | American Association of Physicists in Medicine | American Geophysical Union

Related Occupations: Biophysics Scientist | Physicist | Geneticist | Nanosystems Engineer | Biophysics Researcher | Biomedical Acoustics Specialist

Chemical Physics

Example Career Paths: Research | Development | Consulting

Potential Employers: Colleges and universities | Research facilities

Government: Department of Energy | National Institute of Standards and Technology | National Institutes of Health

Industry: Biotechnology | Chemical | Electronics | Petroleum | Pharmaceutical

Professional Associations: International Union of Pure and Applied Chemistry | Society for Chemical Physics

Related Occupations: Physicist | Chemical Engineer | Chemist | Materials Scientist | Nanosystems Engineer | Natural Science Manager | Computational Chemist | Theoretical Physicist

Condensed Matter

Example Career Paths: Development | Consulting

Potential Employers: Colleges and universities

Government: National Aeronautics and Space Administration | Department of Defense | Department of Energy

Electronics industry: Microprocessors | Magnetic imaging | Communications | Automotive | Navigation/guidance systems

Professional Associations: American Vacuum Society | Materials Research Society

Related Occupations: Physicist | Materials Scientist | Nanosystems Engineer | Theoretical Physicist | Research Scientist | Quantum Computing Researcher | Cryogenics or Superconductivity Specialist | Experimental Physicist | Computational Physicist

Engineering Physics

Example Career Paths: Engineering (process and testing) | Research | Quality control | Development | Instrumentation | Consulting

Potential Employers: Colleges and universities | Engineering firms | Manufacturing and processing firms | Hospitals

Government: National Aeronautics and Space Administration | Department of Commerce | Department of Defense

Industry: High technology | Chemical | Aerospace | Agriculture | Energy | Fuel | Computer | Transportation

Professional Associations: American Institute of Physics | American Society of Mechanical Engineers

Related Occupations: Physicist | Materials Scientist | Nanosystems Engineer | Industrial and Systems Engineer | Robotics Engineer | Research and Development Engineer | Optical Engineer | Quantum Engineer

Geophysics

Example Career Paths: Research | Development | Environmental consulting | Law

Potential Employers: Colleges and universities | Nonprofit research centers | Consulting firms | Law firms

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

Industry: Petroleum | Mining | Hydrogeology

Professional Associations: Society of Exploration Geophysicists | American Geophysical Union

Related Occupations: Geoscientist | Physicist | Hydrologist | Materials Scientist | Nanosystems Engineer | Natural Sciences Manager | Petroleum Engineer | Seismologist | Energy Systems Engineer | Environmental Geophysicist | Volcanologist | Geothermal Energy Specialist

Medical/Health Physics

Example Career Paths: Research | Development | Clinical service | Consulting | Monitoring | Enforcement

Potential Employers: Colleges and universities | Hospitals, clinics, medical centers | Nonprofit research firms | Environmental firms

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

Professional Associations: American Association of Physicists in Medicine | Health Physics Society | American College of Radiology

Related Occupations: Physicist | Biomedical Engineer | Nuclear Medicine Technologist | Petroleum Engineer | Biomedical Acoustics Specialist | Radiological Medical Technologist | Nuclear Medicine Physicist | Radiation Oncology Physicist

Nuclear Physics

Example Career Paths: Research | Development | Consulting | Instrumentation

Potential 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

Professional Associations: American Nuclear Society | International Atomic Energy Agency

Related Occupations: Nuclear Physicist | Nuclear Engineer | Radiation Physicist | Nuclear Weapons Physicist/Defense Researcher | Accelerator Physicist | Nuclear Data Analyst | Isotope Production Specialist | Fusion Energy Researcher

Optical Physics

Example Career Paths: Research | Development | Consulting

Potential Employers: Colleges and universities | Nonprofit research centers

Government: National Aeronautical and Space Administration | Department of Energy | Department of Defense

Industry: Medical scanners | Eyeglasses | Binoculars | Microscopes | Lasers | Holography | Display technologies | X-ray | Ultraviolet spectra | Fiber optics

Professional Associations: Optica | SPIE – The International Society for Optics and Photonics | International Commission for Optics

Related Occupations: Physicist | Photonics Engineer | Photonics Technician | Laser Physicist | Optical Communications Specialist | Quantum Optics Researcher | Biomedical Optics/Imaging Scientist | Optical Systems Designer | Metrology and Inspection Engineer | Holography/Display Scientist

Particle/High Energy Physics

Example Career Paths: Research | Consulting | Instrumentation | Operations and maintenance

Potential Employers: Colleges and universities | Department of Energy | Lawrence Berkeley National Lab | Nonprofit research centers | Health and medicine

Professional Associations: American Physical Society | International Particle Physics Outreach Group

Related Occupations: Experimental Particle Physicist | Theoretical Particle Physicist | Instrumentation Engineer | Computational Physicist | Quantum Technology Scientist | Medical Applications Physicist

Science Education

Example Career Paths: Teaching | Computer software development | Educational research | Writing and editing | Library and information science

Potential Employers: Public school systems, K-12 | Private schools, K-12

Publishing companies: Books | Magazines | Videos | Software developers | Libraries | Museums

Professional Associations: American Association of Physics Teachers | Society of Physics Students | American Association of University Professors

Related Occupations: Physics Instructor, Postsecondary | Science Educator (K-12) | Science Curriculum Developer | Science Outreach Coordinator | Museum Educator | Educational Technology Specialist | Science Communication Writer | Educational Researcher | Science Education Policy Analyst

Preparing for your Career

- Acquire a strong mathematics and computer science background. Scientific computing and data analysis skills are essential.
- Develop excellent communication skills, verbal and written, for interacting with students, colleagues, and parents.
- Visit laboratories or research centers to learn more about opportunities in the field.
- Supplement training with courses in engineering, environmental science, urban planning, remote sensing, physiology, speech communication, or other areas of interest.
- Become skilled in the use of computers and laboratory equipment.
- Gain experience working with age group of interest through volunteering and tutoring.
- Plan to study the most fundamental aspects of the universe if pursuing this physics specialty.
- 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.
- Join relevant professional associations to learn of challenges and opportunities in the field.
- Pursue a graduate degree and post-graduate experience to advance in the field.

This resource was adapted from What Can I Do With My Major.
For more, visit https://web.uri.edu/career/wcidwmm/

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