

# DEPARTMENT OF PHYSICS

## UNDERGRADUATE STUDIES

### OVERVIEW

PHYSICISTS ARE INVESTIGATORS AND PROBLEM SOLVERS. FROM THE SMALLEST CONSTITUENTS OF MATTER TO THE LARGEST SCALES OF THE OBSERVABLE UNIVERSE ITSELF, PHYSICISTS TRY TO UNDERSTAND HOW THE WORLD AROUND US WORKS.

THE **DEPARTMENT OF PHYSICS** AT THE UNIVERSITY OF ALBERTA HAS DEVELOPED A STRONG, POSITIVE TEACHING AND RESEARCH ENVIRONMENT AND A TRADITION OF ACCOLADES. WE ARE ALSO COMMITTED TO SERVING THE COMMUNITY WITH OUTREACH PROGRAMS FOR SCHOOLS AND THE GENERAL PUBLIC.

### DEGREE PROGRAMS

In a physics degree program, students learn fundamental principles of physics and develop the important conceptual, analytical, mathematical, and experimental skills needed to understand and test these principles.

Students can select from a range of programs:

#### PHYSICS

Gain a strong foundation in core physics topics such as mechanics, quantum physics and electromagnetism while developing mathematical, computational and experimental skills. Explore different topics with options including condensed matter physics, particle physics, biophysics, cosmology, plasma physics and computational physics. Expand human knowledge with your own undergraduate research project which might even lead to a published paper.

#### ASTROPHYSICS

Explore a wide range of open questions about the physics and properties of stars, galaxies and the Universe. Astrophysicists probe how stars and stellar systems evolve, the properties of and the physics behind the most extreme astrophysical objects (neutron stars, black holes, and quasars), and the physics and structure of the Universe on cosmological scales.

#### GEOPHYSICS

Advance the understanding of Earth's structure and evolution through the application of physical principles. Geophysicists apply experimental, theoretical, computational and field study techniques to do fundamental research to further the economic development and environmental protection of our planet.

#### MATHEMATICAL PHYSICS

Mathematics is the fundamental language of physics. Learn the core principles of physics with a strong focus on developing a deep, mathematical understanding of the field in a program that is co-taught with mathematicians. Explore further with advanced option courses from either mathematics or physics and complete your own undergraduate research project.

See [ualberta.ca/admissions](http://ualberta.ca/admissions) for admission requirements.

## RESEARCH AREAS

- + Astronomy and Astrophysics
- + Biophysics
- + Computational Physics
- + Condensed Matter Physics
- + Cosmology and Gravity Physics
- + Geophysics
- + Global Geodynamics and Seismology
- + Particle Physics
- + Plasma Physics
- + Space Physics

## UNIQUE OFFERINGS

### CAMPUS OBSERVATORY

Everyone is invited to see the skies through the telescopes at the Department of Physics Astronomical Observatory, located atop the Centennial Centre for Interdisciplinary Science. The observatory is open on Thursdays at lunchtime for solar observing all year round. During the university's academic year, the observatory is open on Thursday evenings for night sky observing. No previous experience is necessary and admission is free.

### THE SHACK: SCIENCE HARDWARE MAKERSPACE

Have a project idea? The Shack provides resources and assistance to students from any and all faculties across the university who want to pursue their own projects that are both scientifically useful and engaging. Tools include a wide range of 3D printers, benchtop machinery, and a laser cutter. Access to cutting-edge design and manufacturing technologies means that students can leverage their university education and their creative skills to bring their ideas to life.

## CAREERS

A degree in Physics prepares students for employment or further studies in many areas, including:

- + Air Traffic Management
- + Aerospace systems engineer
- + Astronomer
- + Astrophysicist
- + Data Analyst
- + Diagnostic Imaging Specialist
- + Environmental Auditor
- + Exploration Geophysicist
- + Laser Spectroscopy Specialist
- + Medical Physicist
- + Occupational Health and Safety Officer
- + Pollution Control Technologist
- + Radiation Oncology
- + Satellite Development
- + Seismologist

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**For more information on the programs and opportunities in Physics, visit: [uab.ca/physics](http://uab.ca/physics)**

## CONTACT

For admission related questions, contact [science.recruiting@ualberta.ca](mailto:science.recruiting@ualberta.ca).

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