

# Physics

## Undergraduate Programs:

The department offers a Bachelor of Science with the following options:

- Physics, interdisciplinary
- Physics, professional
- Physics, teaching

## Minors available in:

- Physics, non-teaching

## Graduate Programs:

The department offers research-oriented programs culminating in a Master of Science or Doctor of Philosophy degree.

## Research Groups:

The department has active research groups in the following areas:

- Astrophysics
- Biophysics
- Condensed matter physics
- Education
- Gravitational waves
- Optics and lasers
- Solar physics
- Space science and engineering

## Faculty:

For a list of current faculty:  
[www.physics.montana.edu/people/faculty.asp](http://www.physics.montana.edu/people/faculty.asp)

For additional information, contact:

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264 EPS Building  
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Bozeman, MT 59717-3840  
Tel: (406) 994-3614  
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[www.physics.montana.edu/](http://www.physics.montana.edu/)

## College of Letters and Science

As a physics major at Montana State University, you will study some of the most exciting aspects of our world, and indeed our universe, alongside leading scientists whose commitment to discovery is matched only by their commitment to your learning. Many of our faculty have received teaching awards at the college and state levels, and MSU takes pride in the number of nationally competitive science and mathematics scholarships won by our physics students.

With a degree in physics, you will have the opportunity to enter the workforce directly, where your skills will be highly valued by employers, or continue your studies in graduate school where you will find that physics provides an excellent background for entering a wide variety of fields such as engineering, computer science, teaching and business.

We offer a Bachelor of Science degree in the following options:

### Professional Option

Intended primarily as preparation for graduate work in one of the physical sciences, the professional option provides a sound background in the fundamentals of physics and mathematics.

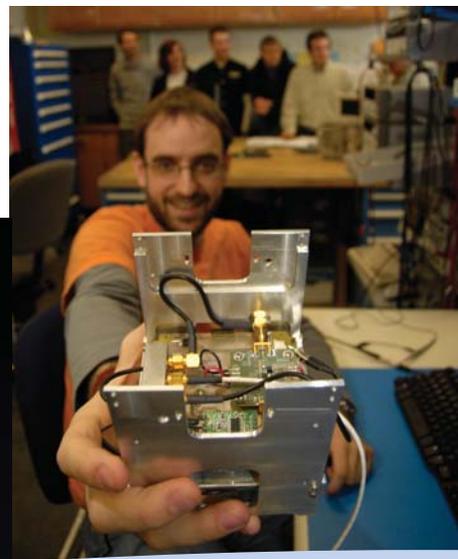
### Interdisciplinary Option

This option requires a minimum of 16 credits in the declared area and is designed for those who desire a firm background in mathematics and physics coupled with a concentration in another discipline such as chemistry, biology, computer science, engineering, or technical writing.

### Teaching Option

This option is intended primarily as preparation for secondary school teachers.

*Small satellites developed by undergraduate research students.  
Photos at top and right by Kelly Gorham, MSU News.*



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# Physics

Some examples of careers for physics majors include:

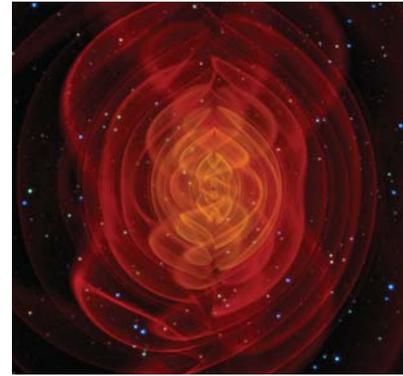
- Aerodynamics
- Aerospace testing
- Air traffic controller
- Astronomer
- Astrophysicist
- Atomic physicist
- Automotive engineer
- Biophysicist
- Cardiac imaging researcher
- Chemical physicist
- Computer system engineer
- Engineer
- Environmental analyst
- Environmental health
- Fluids physicist
- Forensic scientist
- Geodesist
- Geophysicist
- Hydrologist
- Industrial hygienist
- Laboratory technician
- Lawyer, technology specialty
- Mathematician
- Medical devices designer
- Medical physicist
- Meteorologist
- Molecular physicist
- National laboratory research
- Nuclear magnetic resonance
- Nuclear physicist
- Nuclear power plant manager
- Occupational safety specialist
- Oceanographer
- Particle accelerator operations
- Physicist
- Physics researcher
- Physiognomist
- Plasma physicist
- Quality control manager
- Radiological laboratory director
- Research & development
- Satellite missions analyst
- Seismologist
- Solid state physicist
- Stratigrapher
- Systems analyst
- Teacher
- Technical illustrator
- Technical writer
- Test engineer

Many of our students continue their studies in M.S. or Ph.D. programs.

## College of Letters and Science

### Undergraduate Research

At MSU, your physics education will not stop in the classroom. You will work closely with faculty on cutting-edge research projects where, using the latest in high-tech equipment, you will be probing the fundamental workings of our universe. This combination of high-quality, small-class instruction and research opportunities with nationally recognized physicists is something that few other physics departments in the country can offer. Undergraduate students are involved in research in the following areas:



#### Astrophysics

This research group studies neutron stars, which contain the densest and most exotic matter known, and massive black holes, which generate most of the radiation from the brightest galaxies.

#### Condensed Matter (Solid State Physics)

Research opportunities for undergraduate students include: fabricating and investigating the behavior of films only a few atoms thick, using the “spin” of an electron to run computers, developing novel superconductors and unusual magnetic materials, and developing new materials for use in fuel cells for future energy needs.

#### Gravitational Wave Astronomy

Research is focused on fluctuations in large gravitational fields detected as gravitational waves by the Laser Interferometer Gravitational Wave Observatory (LIGO) and the proposed Laser Interferometer Space Antenna (LISA).

#### Lasers and Optics

Research projects involving undergraduates include: developing and studying new types of optical materials, sensors and lasers; using crystals as novel computer memory devices; and exploring the response of molecules to laser pulses with durations less than a trillionth of a second.

#### Solar Physics

The solar physics group investigates the million-degree solar atmosphere, X-ray flares, spectacular eruptions and the origin of the solar magnetic field.

#### Space Science and Engineering Laboratory

The SSEL seeks to involve students in the design, fabrication and operation of space flight hardware.

*The MOSES suborbital rocket experiment was designed, built and tested mainly by undergraduate students. Photo by Kelly Gorham, MSU News.*



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