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 exceeded 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.

### RESEARCH GROUPS

The department has active research in the following programs and groups:

- Astrophysics
- Biophysics
- Condensed Matter Physics
- Physics Education
- Imaging and Chemical Analysis
- Montana Space Grant Consortium
- Atomic, Molecular and Optical Physics
- Relativity, Gravitation and Cosmology
- Solar Physics
- Space Science and Engineering
- eXtreme Gravity Institute

### DEGREE OPTIONS IN PHYSICS

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.

**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.

**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.

**TEACHING OPTION:** This option is intended primarily as preparation for secondary school teachers.
Options within Major
- Physics, Interdisciplinary
- Physics, Professional
- Physics, Teaching

Specialized Areas of Study/Minors
- Materials
- Optics
- Physics (non-teaching)

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

What can I do with a degree in Physics?
- Aerodynamics
- Aerospace testing
- Astronomer
- Astrophysicist
- Atomic physicist
- Biophysicist
- Chemical physicist
- Computer system engineer
- Engineer
- Environmental analyst
- Environmental health
- Fluids physicist
- Forensic scientist
- Geophysicist
- Hydrologist
- Laboratory technician
- Meteorologist
- Molecular physicist
- Nuclear magnetic resonance
- Nuclear physicist
- Nuclear power plant manager
- Occupational safety specialist
- Oceanographer
- Particle accelerator operations
- Plasmas physicist
- Physics researcher
- Plasma physicist
- Quality control manager
- Radiological laboratory director
- Research & development
- Satellite mission analyst
- Seismologist
- Solid state physicist
- Systems analyst
- Teacher
- Technical illustrator
- Technical writer
- Test engineer

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

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.

For additional information, contact:
Department of Physics
Montana State University
264 Barnard Hall
P.O. Box 173840
Bozeman, MT 59717-3840
Tel: 406-994-3614
Fax: 406-994-4452
www.physics.montana.edu
physics@montana.edu

Assistant professor John Sample received a NASA grant to lead a team of undergraduate students in developing a terrestrial gamma-ray flash recorder.