Department of Physics

Physics Graduate Programs

Information about the Physics Department can be found at Physics Department Home Page (http://www.physics.montana.edu)

Details on Physics graduate programs, application process, and degree requirements can be found at: Physics Graduate Program Overview (http://www.physics.montana.edu/grad/)

Degrees Offered

M.S. Physics: The Department of Physics grants the Master of Science Degree under two options: Plan-A (thesis required), and Plan-B (without thesis).

Ph.D. Physics: The Physics Ph.D. degree has an option to obtain an M.S. degree en route to a Ph.D.

Ph.D. in Materials and Science: A collaborative Ph.D. program with UMT and MTech in materials science (MatSci).

M.S. Optics and Photonics: The M.S. Degree in Optics and Photonics is an interdisciplinary managed by the three participating departments: Physics, Electrical and Computer Engineering, and Chemistry and Biochemistry. There are two options: Option A (thesis) and Option B (professional paper).

Accelerated M.S. Optics and Photonics: The Integrated M.S. Degree in Optics and Photonics program is designed to allow qualified undergraduate students interested in optics and photonics the opportunity to complete a Master of Science in Optics and Photonics degree by extending their period of undergraduate study by one additional year past the traditional four-year undergraduate degree.

Department Head

Dana Longcope, Ph.D
Professor, Department Head
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Physics Department

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Research

Research programs in the Department of Physics are currently focused in several areas: optical science and laser technology, condensed matter physics, gravitational physics, astrophysics, solar physics, and science education. The MSU Gravity Group studies extreme astrophysical phenomena, such as the inspiral and merger of black holes and neutron stars, to further our understanding of astrophysics and fundamental physics. Our programs in astrophysics and relativity are directed toward a fundamental understanding of the behavior of matter and energy on the astrophysical scale. Our solar physics group studies phenomena such as solar flares and prominences associated with the star nearest us, the sun. Our research in the physics of lasers and condensed matter systems - such as magnetic and dielectric materials, semiconductor and metal surfaces and thin films, microwave photonic devices, laser materials and superconducting solids - enlarges the knowledge base on which future advances in technology are founded. Our research in science education aims to improve the understanding of how students can best learn science in the schools, colleges, and universities. Faculty working with the most advanced techniques on current topics carry their research experience into the classrooms at all levels.

Our research groups foster interactions among the faculty, undergraduate and graduate students, research scientists, visiting scientists, and other departments and centers. Our research facilities at the Engineering and Physical Science (EPS) Building include state-of-the-art laboratories and equipment. External collaborations bring national and international experts to the department and open opportunities for research to be conducted at other world-class laboratories around the globe. On-campus, interdisciplinary research include collaborations with the departments of Chemistry and Biochemistry, Electrical and Computer Engineering, Mechanical Engineering, and several research centers and institutes on campus including the Space Science and Engineering Laboratory (SSEL), the Imaging and Chemical Analysis Laboratory (ICAL), Montana Space Grant Consortium (MSGC), the Optical Technology Center (OpTeC), and the Spectrum Lab and interdisciplinary academic programs, such as Material Science and Optics and Photonics undergraduate and graduate degree programs. Research collaborations with local industries are numerous and actively pursued. For more information on each research program, look at the departmental Research and Programs (http://www.physics.montana.edu/research/) page.

Application Deadline & Financial Assistance Information

Fall admission: New graduates are accepted for Fall term only. Applications received by the January 10th deadline will be acted upon and notification of admission status given by April 15th. Applications received after January 10th will be treated individually on a "space-available" basis. There will be no admits for Fall term after May 1st.

Most physics graduate students demonstrating continual satisfactory progress, both academically and in English proficiency, are awarded financial aid throughout their graduate studies in the form of research & teaching assistantships, aa well as tuition waivers.

Masters in Optics and Photonics

The M.S. Degree in Optics and Photonics is an interdisciplinary, cooperative program managed by the Optics Program Committee on behalf of the three participating departments: Physics, Electrical and Computer Engineering, and Chemistry and Biochemistry. Students apply directly to the Optics and Photonics Graduate Program and are admitted through one of the participating departments, selected based on advisor affiliation and student interest. The Optics and Photonics degree is distinct from the other graduate degrees offered by the participating departments because it requires interdisciplinary coursework involving at least two of the departments. The interdisciplinary program of study allows students to emphasize optics theory and applications in more depth than is possible through degrees in the traditional disciplines. Each optics student will be mentored by a graduate advisor from the faculty of one of the three participating departments, and a graduate supervisory committee made up of faculty from at least two of the three departments in the cooperative program. Optics and Photonics graduate students will defend their thesis or professional paper in an oral examination, depending on whether they are doing Option A (thesis) or Option B (professional paper). More information on the M.S. Degree in Optics and Photonics program can be found at: M. S. Degree in Optics and Photonics (https://optics.montana.edu/Optics_photonics_MS.html) .

The Accelerated MS in Optics and Photonics allows MSU undergraduates to earn reserved graduate credits towards a masters degree before they graduate. More information can be found at: Accelerated MS in Optics and Photonics (https://optics.montana.edu/Optics_photonics_MS_accelerated.html).

Ph.D. in Material Science

MSU is part of a collaborative Ph.D. program with UMT and MTech in materials science (MatSci). At MSU, the Ph.D program involves multiple departments, faculty, courses, and research infrastructure. Research

specialties are focused in biomaterials; electronic, photonic, and magnetic materials; materials for energy storage, conversion, and conservation; and materials synthesis, processing, and fabrication. The curriculum integrates a broad range of physical science and engineering disciplines with an even broader range of applications: from health and medicine to nanotechnology to energy, environment, and natural resources. Each student will complete original, independent research culminating in a dissertation. More information on the Ph.D. program in Material Science can be found at: Ph.D. in Materials-science (http://www.montana.edu/materials/)

Degrees Offered

- M.S. in Physics (http://catalog.montana.edu/graduate/letters-science/physics/ms-physics/)
- Ph.D. in Materials and Science (http://catalog.montana.edu/graduate/letters-science/chemistry-biochemistry/phd-materials-science/)
- Ph.D. in Physics (http://catalog.montana.edu/graduate/letters-science/physics/phd-physics/)

Interdisciplinary Degrees Offered

- M.S. in Optics & Photonics Plan A (thesis) (http://catalog.montana.edu/graduate/engineering/electrical-computer-engineering/ms-optics-plan-a/)
- M.S. in Optics & Photonics Plan B (professional paper) (http://catalog.montana.edu/graduate/engineering/electrical-computer-engineering/ms-optics-plan-b/)