PHYSICS, M.S.

DEPARTMENT OVERVIEW

The Department of Physics has a strong tradition of graduate study and research in astrophysics; atomic, molecular, and optical physics; condensed matter physics; high energy and particle physics; plasma physics; quantum computing; and string theory. There are many facilities for carrying out world-class research (https://www.physics.wisc.edu/research/areas/). We have a large professional staff: 45 full-time faculty (https://www.physics.wisc.edu/people/staff/) members, affiliated faculty members holding joint appointments with other departments, scientists, senior scientists, and postdocs. There are over 175 graduate students in the department who come from many countries around the world. More complete information on the graduate program, the faculty, and research groups is available at the department website (http://www.physics.wisc.edu).

Research specialties include:

THEORETICAL PHYSICS

Astrophysics; atomic, molecular, and optical physics; condensed matter physics; cosmology; elementary particle physics; nuclear physics; phenomenology; plasmas and fusion; quantum computing; statistical and thermal physics; string theory.

EXPERIMENTAL PHYSICS

Astrophysics; atomic, molecular, and optical physics; biophysics; condensed matter physics; cosmology; elementary particle physics; neutrino physics; experimental studies of superconductors; medical physics; nuclear physics; plasma physics; quantum computing; spectroscopy.

M.S. DEGREES

The department offers the master science degree in physics, with two named options: Research and Quantum Computing. The M.S. Physics-Research option (http://guide.wisc.edu/graduate/physics/physics-ms/physics-research-ms/) is non-admitting, meaning it is only available to students pursuing their Ph.D. The M.S. Physics-Quantum Computing option (http://guide.wisc.edu/graduate/physics/physics-ms/physics-quantum-computing-ms/) (MSPQC Program) is a professional master's program in an accelerated format designed to be completed in one calendar year.

ADMISSIONS

Students apply to the Master of Science in Physics through the named option or the Ph.D.:

- Quantum Computing (https://guide.wisc.edu/graduate/physics/physics-ms/physics-quantum-computing-ms/)
- The Research (http://guide.wisc.edu/graduate/physics/physics-ms/physics-research-ms/) named option is offered for work leading to the Ph.D. Students may not apply directly for the master's, and should instead see the admissions information for the Ph.D. (http://guide.wisc.edu/graduate/physics/physics-phd/#admissionstext)

FUNDING

GRADUATE SCHOOL RESOURCES

Resources to help you afford graduate study might include assistantships, fellowships, traineeships, and financial aid. Further funding information (https://grad.wisc.edu/funding/) is available from the Graduate School. Be sure to check with your program for individual policies and processes related to funding.

REQUIREMENTS

MINIMUM GRADUATE SCHOOL REQUIREMENTS

Review the Graduate School minimum academic progress and degree requirements (http://guide.wisc.edu/graduate/#policiesandrequirementstext), in addition to the program requirements listed below.

MAJOR REQUIREMENTS

CURRICULAR REQUIREMENTS

Requirement	Detail
Minimum Credit Requirement	30 credits
Minimum Residence Credit Requirement	See Named Options for policy information.
Minimum Graduate Coursework Requirement	15 credits must be graduate-level coursework. Details can be found in the Graduate School's Minimum Graduate Coursework (50%) policy (https://policy.wisc.edu/library/UW-1244 (https://policy.wisc.edu/library/UW-1244/)).
Overall Graduate GPA Requirement	3.00 GPA required. This program follows the Graduate School's GPA Requirement policy (https://policy.wisc.edu/library/UW-1203 (https://policy.wisc.edu/library/UW-1203/)).
Other Grade Requirements	n/a
Assessments and Examinations	See Named Options for policy information.
Language Requirements	n/a

REQUIRED COURSES

Select a Named Option (https://guide.wisc.edu/graduate/physics/physics-ms/#NamedOptions) for courses required.

NAMED OPTIONS

A named option is a formally documented sub-major within an academic major program. Named options appear on the transcript with degree conferral. Students pursuing the Master of Science in Physics must select one of the following named options:

View as listView as grid

- PHYSICS: QUANTUM COMPUTING, M.S. (HTTP://GUIDE.WISC.EDU/GRADUATE/PHYSICS/PHYSICS-MS/PHYSICS-QUANTUM-COMPUTING-MS/)
- PHYSICS: RESEARCH, M.S. (HTTP://GUIDE.WISC.EDU/GRADUATE/PHYSICS/PHYSICS-MS/PHYSICS-RESEARCH-MS/)

POLICIES

Students should refer to one of the named options for policy information:

- Quantum Computing (https://guide.wisc.edu/graduate/physics/physics-ms/physics-quantum-computing-ms/)
- Research (http://guide.wisc.edu/graduate/physics/physics-ms/physics-research-ms/)

PROFESSIONAL DEVELOPMENT

GRADUATE SCHOOL RESOURCES

Take advantage of the Graduate School's professional development resources (https://grad.wisc.edu/pd/) to build skills, thrive academically, and launch your career.

PROGRAM RESOURCES

Students are encouraged to attend Graduate School sponsored Professional Development events and participate in Graduate School Professional Development resources, such as the Individual Development Plan (IDP).

LEARNING OUTCOMES

1. Mastery of the core physical concepts (classical mechanics, electricity and magnetism, quantum mechanics, and statistical mechanics).
2. Articulates, critiques, or elaborates the theories, research methods, and approaches to inquiry or schools of practice in physics.
3. Evaluates or synthesizes information pertaining to questions or challenges in physics.
4. Gains rudimentary awareness of physics research execution.
5. Communicates clearly in ways appropriate to the field of physics.

PEOPLE

FACULTY

More detail about each faculty member (https://www.physics.wisc.edu/people/faculty/) and the research areas (https://www.physics.wisc.edu/research/areas/) can be found on the Physics website.

Yang Bai, Professor
Baha Balantekin, Eugene P. Wigner Professor
Vernon Barger, Van Vleck Professor and Vilas Research Professor
Keith Bechtol, Associate Professor
Kevin Black, Professor
Stanislav Boldyrev, Professor
Uwe Bergmann, Martin L. Pearl Professor in Ultrafast X-Ray Science
Tulika Bose, Professor
Victor Brar, Van Vleck Associate Professor
Duncan Carlsmith, Professor
Daniel Chung, Professor
Susan Coppersmith, Emeriuts Robert E. Fassnacht Professor and Vilas Research Professor
Kyle Cranmer, Professor & Data Science Institute Director
Sridhara Dasu, Professor
Jan Egedal, Professor
Mark Eriksson, John Bardeen Professor and Department Chair
Ilya Esterlis, Assistant Professor
Lisa Everett, Professor
Ke Fang, Assistant Professor
Cary Forest, Prager Professor of Experimental Physics
Pupa Gilbert, Vilas Distinguished Achievement Professor
Francis Halzen, Gregory Breit Professor, Hilldale Professor, & Vilas Research Professor
Kael Hanson, Professor
Aki Hashimoto, Professor
Matthew Herndon, Professor
Robert Joynt, Emeritus Professor
Albrecht Karle, Professor
Roman Kuzmin, Dunson Cheng Assistant Professor
Alex Levchenko, Professor
Lu Lyu (aka Lu Lu), Assistant Professor
Dan McCammon, Professor
Robert McDermott, Professor
Moritz Muenchmeyer, Assistant Professor
Yibin Pan, Associate Professor
Brian Rebel, Professor
Mark Rzchowski, Associate Chair and Professor
Mark Saffman, Professor
John Sarff, Professor
Gary Shiu, Professor
Paul Terry, Professor
Peter Timbie, Professor
Justin Vandenbroucke, Associate Professor
Maxim Vavilov, Professor
Thad Walker, Vilas Distinguished Achievement Professor
Sau Lan Wu, Enrico Fermi Professor, Hilldale Professor, and Vilas Research Professor
Deniz Yavuz, Professor
Ellen Zweibel, William L Kraushaar Professor of Astronomy & Physics

AFFILIATED FACULTY

David Anderson, Professor, Electrical & Computer Engineering
Paul Campagnola, Professor, Biomedical Engineering
Jennifer Choy, Assistant Professor, Engineering Physics
Elena D'Onghia, Professor, Astronomy
Chang-Beom Eom, Professor, Materials Science & Engineering
Chris Hegna, Professor, Engineering Physics
Sebastian Heinz, Professor, Astronomy
Mikhail Kats, Associate Professor, Electrical & Computer Engineering
Jason Kawasaki, Associate Professor, Materials Science & Engineering
Irena Knezevic, Professor, Electrical & Computer Engineering
Alexandre Lazarian, Professor, Astronomy
Daniel Rhodes, Assistant Professor, Materials Science & Engineering
Oliver Schmitz, Professor, Engineering Physics
Micheline Soley, Assistant Professor, Chemistry

Carl Sovinec, Professor, Engineering Physics
Richard Townsend, Professor, Astronomy
Ying Wang, Assistant Professor, Materials Science & Engineering
Jun Xiao, Assistant Professor, Materials Science & Engineering