

PHYSICS, M.A.

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, 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.A. DEGREE DETAILS

The master of arts degree is a purely academic degree, requiring graduate course work and passage of the qualifying examination at the master's level. It is designed to strengthen the student's physics background and enhance the opportunities for employment as a physicist or in physics education.

ADMISSIONS

This master's program 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/>)

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/#policiesandrequirements>), in addition to the program requirements listed below.

MAJOR REQUIREMENTS

MODE OF INSTRUCTION

Face to Face	Evening/ Weekend	Online	Hybrid	Accelerated
Yes	No	No	No	No

Mode of Instruction Definitions

Accelerated: Accelerated programs are offered at a fast pace that condenses the time to completion. Students typically take enough credits aimed at completing the program in a year or two.

Evening/Weekend: Courses meet on the UW-Madison campus only in evenings and/or on weekends to accommodate typical business schedules. Students have the advantages of face-to-face courses with the flexibility to keep work and other life commitments.

Face-to-Face: Courses typically meet during weekdays on the UW-Madison Campus.

Hybrid: These programs combine face-to-face and online learning formats. Contact the program for more specific information.

Online: These programs are offered 100% online. Some programs may require an on-campus orientation or residency experience, but the courses will be facilitated in an online format.

CURRICULAR REQUIREMENTS

Requirement Detail	
Minimum Credit Requirement	30 credits
Minimum Residence Credit Requirement	30 credits
Minimum Graduate Coursework Requirement	Half of degree coursework (15 credits out of 30 total credits) must be completed graduate-level coursework; courses with the Graduate Level Coursework attribute are identified and searchable in the university's Course Guide (https://registrar.wisc.edu/course-guide (https://registrar.wisc.edu/course-guide/)). No 300-level courses will be counted toward the 30 credit minimum.
Overall Graduate GPA Requirement	3.00 GPA required.

Other Grade Requirements The Graduate School requires an average grade of B or better in all coursework (300 or above, not including research credits) taken as a graduate student unless conditions for probationary status require higher grades. Grades of Incomplete are considered to be unsatisfactory if they are not removed during the next enrolled semester.

Assessments and Examinations All master of arts degree candidates must pass the qualifying examination at the master's level.

Language Requirements Contact the program for information on any language requirements.

REQUIRED COURSES

All graduate degree candidates are required to take five core courses:

Code	Title	Credits
Required Core		
PHYSICS 711	Theoretical Physics-Dynamics	3
PHYSICS 715	Statistical Mechanics	3
PHYSICS 721	Theoretical Physics-Electrodynamics	3
PHYSICS 731	Quantum Mechanics	3
PHYSICS 732	Quantum Mechanics	3

The remaining 15 credits may be earned through a combination of coursework, directed study, and research, to be determined by the advisor in consultation with the student.

POLICIES

GRADUATE SCHOOL POLICIES

The Graduate School's Academic Policies and Procedures (<https://grad.wisc.edu/acadpolicy/>) provide essential information regarding general university policies. Program authority to set degree policies beyond the minimum required by the Graduate School lies with the degree program faculty. Policies set by the academic degree program can be found below.

MAJOR-SPECIFIC POLICIES

PRIOR COURSEWORK

Graduate Work from Other Institutions

Prior coursework from other institutions may count toward any graduate degree in physics as allowed by the Graduate School policy on prior coursework.

UW-Madison Undergraduate

Up to 7 credits in courses numbered 500 or above may be used to satisfy minimum degree requirements.

UW-Madison University Special

With program approval and payment of difference in tuition (between Special and graduate tuition), students are allowed to count no more than 15 credits of coursework numbered 500 or above taken as a UW-Madison University Special student. Coursework earned five or more years prior to admission to a master's degree is not allowed to satisfy requirements.

PROBATION

Grade of B or better in all coursework and a minimum cumulative graduate GPA of 3.0 are required.

ADVISOR / COMMITTEE

The director of graduate studies (DGS) serves as the academic advisor to all master of arts degree candidates. The DGS will meet regularly with the Master's candidate to monitor progress toward the degree.

CREDITS PER TERM ALLOWED

15 credits

TIME CONSTRAINTS

n/a

GRIEVANCES AND APPEALS

These resources may be helpful in addressing your concerns:

- Bias or Hate Reporting (<https://doso.students.wisc.edu/bias-or-hate-reporting/>)
- Graduate Assistantship Policies and Procedures (<https://hr.wisc.edu/policies/gapp/#grievance-procedure>)
- Hostile and Intimidating Behavior Policies and Procedures (<https://hr.wisc.edu/hib/>)
 - Office of the Provost for Faculty and Staff Affairs (<https://facstaff.provost.wisc.edu/>)
- Dean of Students Office (<https://doso.students.wisc.edu/>) (for all students to seek grievance assistance and support)
- Employee Assistance (<http://www.eao.wisc.edu/>) (for personal counseling and workplace consultation around communication and conflict involving graduate assistants and other employees, post-doctoral students, faculty and staff)
- Employee Disability Resource Office (<https://employee disabilities.wisc.edu/>) (for qualified employees or applicants with disabilities to have equal employment opportunities)
- Graduate School (<https://grad.wisc.edu/>) (for informal advice at any level of review and for official appeals of program/departmental or school/college grievance decisions)
- Office of Compliance (<https://compliance.wisc.edu/>) (for class harassment and discrimination, including sexual harassment and sexual violence)
- Office of Student Conduct and Community Standards (<https://conduct.students.wisc.edu/>) (for conflicts involving students)
- Ombuds Office for Faculty and Staff (<http://www.ombuds.wisc.edu/>) (for employed graduate students and post-docs, as well as faculty and staff)
- Title IX (<https://compliance.wisc.edu/titleix/>) (for concerns about discrimination)

Students should contact the department chair or program director with questions about grievances. They may also contact the L&S Academic Divisional Associate Deans, the L&S Associate Dean for Teaching and Learning Administration, or the L&S Director of Human Resources.

OTHER

n/a

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, Emeritus Robert E. Fasnacht 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'Ongnia, 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