Physics

Degrees Offered

- Master of Science (M.S.)
- Doctor of Philosophy (Ph.D.)

Nature of the Program

The graduate programs in physics provide a foundation in fundamental and applied research (https://physics.wvu.edu/research/). The program's research strengths include:

- Astronomy and Astrophysics (http://astro.wvu.edu/),
- Biophysics,
- Experimental Condensed Matter and Materials Physics (https://physics.wvu.edu/research/condensed-matter-experiment/),
- Optical and Laser Physics (https://physics.wvu.edu/research/optical-photonics-and-laser-physics/),
- Physics Education Research (https://physics.wvu.edu/research/physics-education-research/),
- Plasma and Space Physics (https://physics.wvu.edu/research/plasma-and-space-physics/), and
- Theoretical and Computational Condensed Matter and Materials Physics (https://physics.wvu.edu/research/condensed-matter-theory-and-computation/).

In addition to research in these areas, graduate students can also work in related areas with faculty in other WVU departments and collaboratively with researchers at other institutions. For example, the department researchers have strong collaborations or affiliations with the WVU Rockefeller Neuroscience Institute (https://rni.wvumedicine.org/), the CHIME (https://chime-experiment.ca/en/), LIGO (https://www.ligo.org/) and NANOgrav (https://nanograv.org/) collaborations, the National Institute for Standards and Technology (https://www.nist.gov/), and the National Energy Technology Laboratory (https://www.netl.doe.gov/). Research programs are routinely supported by the West Virginia Department of Education, the West Virginia Higher Education Policy Commission, the US Departments of Commerce, Defence, Energy, and National Security, the National Science Foundation, the National Aeronautics and Space Administration, the Smithsonian Institution and the American Physical Society. In-house facilities include a machine shop and electronics shop, high-performance computational facilities, and a cleanroom. There is also access to campus-wide facilities including the fabrication (https://innovationhub.wvu.edu/) and characterization facility (http://sharedresearchfacilities.wvu.edu/) and bio- and health sciences facilities (http://www.hsc.wvu.edu/). The department is home Center for Excellence in STEM Education (https://stemcenter.wvu.edu/), the Center for Gravitational Waves and Cosmology (https://gwac.wvu.edu/home/), and the Center for KINETIC Plasma Physics (https://kineticplasma.wvu.edu/).

Financial Aid

With rare exceptions, all doctoral students receive financial support; the department makes every effort to secure funding for eligible master's students as well. Beginning students usually receive teaching assistantships; more advanced students receive research assistantships. Several fellowships are available for outstanding students, allowing full-time concentration on coursework and research and more rapid progress toward the degree. Students on visas must comply with the conditions of their visa for financial support.

Admissions

Please see the admissions requirements (http://catalog.wvu.edu/graduate/eberlycollegeofartsandsciences/physics/#admissionstext) tab and direct questions to physicsadmissions@mail.wvu.edu.

FACULTY

CHAIR

- Maura McLaughlin - Ph.D. (Cornell University)

ASSOCIATE CHAIR FOR GRADUATE STUDIES

- Alan D. Bristow - Ph.D. (University of Sheffield)

ASSOCIATE CHAIR FOR UNDERGRADUATE STUDIES

- Paul Miller - Ph.D. (West Virginia University)

PROFESSORS

- Wathiq Abdul-Razzaq - Ph.D. (University of Illinois - Chicago)
  Physics Education
- Loren Anderson - Ph.D. (Boston University)

Astrophysics/Astronomy

- Alan D. Bristow - Ph.D. (University of Sheffield)
  Optical/Condensed Matter Physics
- Paul Cassak - Ph.D. (University of Maryland)
  Plasma Physics
- Matthew B. Johnson - Ph.D. (California Institute of Technology)
  Condensed Matter Physics
- Mark E. Koepke - Ph.D. (University of Maryland)
  Plasma Physics
- Lian Li - PhD (University of Arizona)
  Robert L. Carroll Professor, Condensed Mater Physics
- Duncan Lorimer - Ph.D. (University of Manchester)
  Astrophysics/Astronomy
- Maura McLaughlin - Ph.D. (Cornell University)
  Eberly Family Professor, Astrophysics/Astronomy
- Paul Miller - Ph.D. (West Virginia University)
  Physics Education Research
- Sheena Murphy - Ph.D.(Cornell University)
  Regular Graduate Faculty, Associate VP for Research Development
- D.J. Pisano - Ph.D. (University of Wisconsin - Madison)
  Astrophysics/Astronomy
- Aldo Humberto Romero - Ph.D. (University of California - San Diego)
  Eberly Distinguished Professor, Condensed Matter Physics
- Earl E. Scime - Ph.D. (University of Wisconsin - Madison)
  Oleg D. Jefimenko Professor, Plasma Physics
- Tudor Stanescu - Ph.D. (University of Illinois)
  Theoretical Condensed Matter Physics
- Gay Stewart - Ph.D. (University of Illinois-Urbana Champaign)
  Eberly Professor of STEM Education
- John Stewart - Ph.D. (University of Illinois-Urbana Champaign)
  Physics Education Research

ASSOCIATE PROFESSORS

- Sarah Burke-Spolaor - Ph.D. (Swinburne Institute of Technology)
  Astrophysics/Astronomy
- Edward Flagg - Ph.D. (University of Texas - Austin)
  Condensed Matter Physics
- Mikel Holcomb - Ph.D. (University of California - Berkeley)
  Condensed Matter Physics
- Sean McWilliams - Ph.D. (University of Maryland)
  Astrophysics/Astronomy
- Weichao Tu - Ph.D. (University of Colorado-Boulder)
  Space Plasma Physics

ASSISTANT PROFESSORS

- Emmanuel Fonseca - Ph.D. (University of British Columbia)
  Astrophysics/Astronomy
- Chris Fowler - Ph.D. (University of Colorado - Boulder)
  Regular Graduate Faculty, Plasma Physics, Space Plasmas
- Katherine Goodrich - Ph.D. (University of Colorado - Boulder)
  Space Plasma Physics
- Joonhee Lee - Ph.D. (Seoul National University)
  Biophysics
- Subhasish Mandal - Ph.D. (Michigan Technological University)
  Condensed Matter Physics
- Thomas Steinberger - Ph.D. (West Virginia University)
  Regular Graduate Faculty, Plasma and Space Physics

- Jason Ybarra - Ph.D. (University of Florida)
  Astronomy/Astrophysics

PROFESSORS EMERITI

- Larry Halliburton - Ph.D. (University of Missouri - Columbia)
- Arthur S. Pavlovic - Ph.D. (Columbia University)
- Mohindar S. Seehra - Ph.D. (University of Rochester)
- Richard Treat - Ph.D. (University of California - Riverside)
- H. Arthur Weldon - Ph.D. (Massachusetts Institute of Technology)

Admissions for 2025-2026

The M.S. (http://catalog.wvu.edu/graduate/eberlycollegeofartsandsciences/physics/#masterstext) and the Ph.D. (http://catalog.wvu.edu/graduate/eberlycollegeofartsandsciences/physics/#doctoraltext) in Physics are separate degree programs, and students should consider which is the most appropriate for their career goals. Students who are admitted to the Ph.D. may earn the M.S. as part of their plan of study. Students will need to indicate their intended degree program in the application portal.

M.S. AND PH.D. IN PHYSICS

In addition to WVU's general admission requirements (http://catalog.wvu.edu/graduate/graduateeducationatwestvirginiauniversity/#classificationstext), applicants are expected to have a bachelor's degree in Physics, Astronomy, or a related field, with upper-division courses in electricity and magnetism, mechanics, quantum mechanics, thermodynamics, and mathematical methods. Applicants lacking some of these courses may be asked to remedy the deficiencies by enrolling in additional courses. Typically, competitive applicants have a cumulative GPA of at least 3.0 at the undergraduate and graduate level (if applicable). Students who hold an undergraduate degree in a field other than Physics or Astronomy, or who believe that their undergraduate and/or subsequent graduate GPA does not reflect their Physics knowledge, are strongly encouraged to submit the subject GRE. Prospective students should expect a brief phone interview prior to being offered admission to the program.

List of Admission Requirements for M.S. and Ph.D. Applications:

- See the steps to apply for admissions and access the application here (https://graduateadmissions.wvu.edu/how-to-apply/).
- Transcripts from all institutions attended.
- Three letters of recommendation from professional or academic references.
- A statement of purpose that explains the applicant's previous academic experience and highlights their interest in pursuing graduate school in Physics and Astronomy at WVU. While there is no specific length requirement, the essay should demonstrate clear and concise scientific writing.
- The applicant's ranked areas of research interest and the faculty with whom the applicant would want to work.
- Curriculum Vitae or Resume.

International Applications:

- See the steps to apply for admissions and access the application here (https://graduateadmissions.wvu.edu/how-to-apply/).
- International applicants should view additional requirements here (http://catalog.wvu.edu/graduate/graduateeducationatwestvirginiauniversity/#internationaltext) and here (https://graduateadmissions.wvu.edu/information-for/international-students/).
- Language proficiency is required in order to hold a graduate teaching assistantship. See here (https://elli.wvu.edu/testing-resources/english-proficiency-gtas/).

Application Deadlines:

- The Physics program admits students for the Fall semester only.
- The priority application deadline is January 15th.
- Completed applications for admission may be considered after the January 15th deadline on a space-available basis.
- Exceptional applicants may be nominated by the Physics program for competitive University Fellowships. Qualified applicants will be notified if they are nominated. More information on WVU fellowships can be found here (https://graduateeducation.wvu.edu/finances/fellowships/).

More information can be found on the department's website (https://physics.wvu.edu/students/graduate-students/). Applicants needing additional information may contact the department: physics@mail.wvu.edu.

Certain application requirements may be waived based on a preliminary review of an application by the program.

M.S. and Ph.D. Major Code: 1463

For specific information on the following program, please see the link to the right:

- Physics, M.S.

For specific information on the following program, please see the link to the right:

- Physics, Ph.D.

Degree Progress

All graduate students enrolled in at least one credit hour during the academic year must be provided with a written evaluation from their program following the end of each spring term. This requirement may be waived for students in good standing who are expected to graduate in spring or summer. Specific processes and timelines for each program's evaluation can be found in the graduate handbook. Annual evaluation may result in probation for students either not making adequate degree progress or failing to uphold professional standards. Typical plans of study for M.S. and Ph.D. students are available on the department's website (https://physics.wvu.edu/students/graduate-students/). Students are evaluated each year by either the graduate advisor or their doctoral committee after passing their oral qualifier/candidacy exam.

M.S. BENCHMARKS AND DEADLINES

- Year 1: Provide a plan of study - examples are available in the graduate student handbook.
- Year 2+: Complete the coursework for the degree. For a thesis option, submit a written dissertation and present an oral dissertation defense.

PH.D. BENCHMARKS AND DEADLINES

- Year 1: Provide a plan of study - examples are available in the graduate student handbook.
- Year 3: Form a doctoral committee and pass an oral qualifier/candidacy exam by the end of their sixth academic semester in the program.
- Year 3+: Complete the coursework for the degree. Submit a progress report annually (by the end of March) to the graduate advisor with approval from the doctoral committee chair. Present a degree progress update in a meeting with a quorum of the doctoral committee (chair + two members) before submitting annual report, unless expected to graduate within six months of the annual progress report deadline.

GOOD STANDING / PROBATION

To remain in good standing in the program, students must meet minimum GPA requirements as described by the degree program. Students who are not in good standing at the end of any semester will be placed on academic probation and must submit a plan to return to good standing to the chair of the graduate studies and advising committee. Students on academic probation may not take the oral candidacy exam. The progress of students who are not in good standing for one full year will be reviewed by the graduate studies and advising committee. Students who are not in good standing for two full years will not be allowed to continue in the program.