

# Physics

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## Degrees Offered

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

## Nature of the Program

The graduate programs in Physics provide a solid foundation in the fundamentals as well as a diverse range of specializations for research (<https://physics.wvu.edu/research/>). The programs' strengths include Astronomy and Astrophysics, Biophysics, Experimental Condensed Matter and Materials Physics, Theoretical and Computational Condensed Matter and Materials Physics, Optical and Laser Physics, Physics Education Research, and Plasma and Space Physics. In addition to working with physics faculty in these research areas, graduate students have worked with faculty in a range of other departments at WVU. The Department is supported by several in-house facilities including a machine shop and electronics shop, high-performance computational facilities for condensed matter and astrophysics and a physics cleanroom. The Department has strong collaboration with other facilities at WVU, such as the engineering fabrication and characterization facility (<http://sharedresearchfacilities.wvu.edu/>) and the bio- and health sciences facilities (<http://www.hsc.wvu.edu/>). Many of the research groups are affiliated with the WVNano Initiative (<https://undergraduateresearch.wvu.edu/research-opportunities/wvu-opportunities/summer-undergraduate-research-experience-sure/>), the Green Bank Observatory (<https://science.nrao.edu/facilities/gbt/>) in Green Bank WV, and the DIII-D Research Program (<https://fusion.gat.com/global/DIII-D/>).

## 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 a more rapid progress toward the degree. Students on visas must comply with the conditions of their visa for financial support.

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## FACULTY

### CHAIR

- Duncan Lorimer - Ph.D. (University of Manchester)  
Astrophysics/Astronomy

### ASSOCIATE CHAIR

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

### PROFESSORS

- Wathiq Abdul-Razzaq - Ph.D. (University of Illinois - Chicago)  
Physics Education
- Alan Bristow - Ph.D. (University of Sheffield)  
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)  
Carroll Professor, Condensed Matter Physics
- Duncan Lorimer - Ph.D. (University of Manchester)  
Astrophysics/Astronomy
- Maura McLaughlin - Ph.D. (Cornell University)  
Eberly Family Professor, Astrophysics/Astronomy
- D.J. Pisano - Ph.D. (University of Wisconsin - Madison)  
Astrophysics/Astronomy
- Paul Miller - Ph.D. (West Virginia University)  
Physics Education Research
- Aldo Humberto Romero - Ph.D. (University of California - San Diego)

#### 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

- Loren Anderson - Ph.D. (Boston University)  
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
- 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
- Jason May - Ph.D. (University of Utah)  
Physics Education Research
- Sarah Burke Spolaor - Ph.D. (Swinburne Institute of Technology)  
Astrophysics/Astronomy
- Jason Ybarra - Ph.D. (University of Florida)  
Astronomy/Astrophysics

### RESEARCH ASSISTANT PROFESSOR

- Christopher Fowler - Ph.D. (University of Colorado - Boulder)  
Space Plasma Physics
- Thomas Steinberger - Ph.D. (West Virginia University)  
Plasma Physics

### PROFESSORS EMERITI

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

## Admissions

The M.S. (<http://catalog.wvu.edu/graduate/eberlycollegeofartsandsciences/physics/#masterstext>) and the Ph.D. (<http://catalog.wvu.edu/graduate/eberlycollegeofartsandsciences/physics/#doctoralstext>) 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. Students who hold an undergraduate degree in a field other than Physics or Astronomy, or who believe that their undergraduate 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/#internationalstext>) 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 15<sup>th</sup>.
- Completed applications for admission may be considered after the January 15<sup>th</sup> 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](mailto:physics@mail.wvu.edu).

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

## ADMISSION REQUIREMENTS 2024-2025

The Admission Requirements above will be the same for the 2024-2025 Academic Year.

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

Typical plans of study for M.S. and Ph.D. students are available in the graduate student handbook. Ph.D. students must complete their oral candidacy exam by the end of their sixth academic semester in the program.

Students are evaluated each year by either the graduate advisor or their Ph.D. committee (after passing their oral exam). To remain in good standing in the program, students must meet minimum GPA requirements as described in the degree program. Each year, Ph.D. students must submit a report to the Ph.D. advisory committee for the evaluation of progress towards completion of the degree. The report must be signed by the committee chair, along with any comments and recommendations, before being submitted to the chair of the graduate studies and advising committee.

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.

More information is available in the physics and astronomy graduate student handbook.