DOCTOR OF PHILOSOPHY IN THE FIELD OF PHYSICS

OVERVIEW

The Department of Physics is part of the natural, mathematical and biomedical sciences discipline in the Columbian College of Arts and Sciences.

Graduate students in physics gain knowledge of advanced physics concepts, including advanced mechanics, electromagnetic theory, advanced quantum mechanics and statistical mechanics, along with mathematical methods in physics and computational physics. Additional courses in quantum field theory, solid-state physics, nuclear physics, astrophysics and biophysics are offered. An integral part of the program involves students in active and frontier research.

For students interested in experimental, observational, and applied physics, the department's association with national and international laboratories allows hands-on training and original research. The department maintains research affiliations and collaborations with researchers at the Jefferson Lab National Accelerator Facility, the Naval Research Laboratories, the National Institute of Standards and Technology and the National Aeronautics and Space Administration. The department also has ties with international research institutions.

Concentrations include nuclear physics, astrophysics, and condensed-matter physics as well as interdisciplinary studies in materials science and biophysics.

The PhD in physics is a STEM-designated degree program.

ADMISSIONS

Admission deadlines: Fall – January 15
Spring – October 1*

Standardized test scores: GRE general test required; GRE subject test recommended (institutional code 5246). GRE general test waived for applicants who hold a JD, MD, or PhD. The Test of English as a Foreign Language (TOEFL), the academic International English Language Testing System (IELTS), or the PTE Academic is required of all applicants except those who hold a bachelor’s, master’s, or doctoral degree from a college or university in the United States or from an institution located in a country in which English is the official language, provided English was the language of instruction. Minimum scores for the program are:

- Academic IELTS: an overall band score of 6.0 with no individual score below 5.0; or
- TOEFL: 550 on paper-based or 80 on Internet-based; or
- PTE Academic: 53

Applicants to the Master’s program who do not meet minimum English language requirements may be eligible for our full-time Applied English Language program (https://nondegree.gwu.edu/aes-gw/).

Recommendations required: Three (3) recommendations
Prior academic records: Transcripts are required from all colleges and universities attended, whether or not credit was earned, the program was completed, or the credit appears as transfer credit on another transcript. Unofficial transcripts from all colleges and universities attended must be uploaded to your online application. Official transcripts are required only of applicants who are offered admission. If transcripts are in a language other than English, English language translations must be provided. The English translation alone should be uploaded into your application.

Statement of purpose: In an essay of 250 – 500 words, state your purpose in undertaking graduate study in your chosen field. Include your academic objectives, research interests, and career plans. Also discuss your related qualifications, including collegiate, professional, and community activities, and any other substantial accomplishments not already mentioned on the application. If you are applying for an assistantship or fellowship, you should also describe any teaching experience you have had.

International applicants only: Please review International Applicant Information (http://graduate.admissions.gwu.edu/international-applicants/) carefully for details on required documents, earlier deadlines for applicants requiring an I-20 or DS-2019 from GW, and English language requirements.

* Spring admission to Ph.D. program is not always offered. Check with department for availability.

For more information on the admission process, please visit the Columbian College of Arts and Sciences Frequently Asked Questions (http://columbian.gwu.edu/graduate/admissions/faqs/) page.

Supporting documents not submitted online should be mailed to:
Columbian College of Arts and Sciences - Graduate Admissions Office
The George Washington University
801 22nd Street NW, Phillips Hall 215
Washington DC 20052

Contact for questions:
askccas@gwu.edu ~ 202-994-6210 (phone) ~ 202-994-6213 (fax)
8:30 am - 5:30 pm, Monday through Friday

REQUIREMENTS

The following requirements must be fulfilled:
The general requirements stated under Columbian College of Arts and Sciences, Graduate Programs (http://bulletin.gwu.edu/arts-sciences/#degree regulatestext).
The requirements for the Doctor of Philosophy Program (http://bulletin.gwu.edu/arts-sciences/#doctoraldtext).

Students must pass a general examination and an oral defense of the doctoral research program.

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<tbody>
<tr>
<td>PHYS 6110</td>
<td>Mathematical Methods of Theoretical Physics</td>
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<td>PHYS 6120</td>
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<td>PHYS 6210</td>
<td>Electrodynamics and Classical Field Theory</td>
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<td>PHYS 6510</td>
<td>Communications in Physics</td>
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One of the following options:

Option A

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<tr>
<td>PHYS 6610</td>
<td>Nuclear and Particle Physics I</td>
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<tr>
<td>PHYS 6710</td>
<td>Nuclear and Particle Physics II</td>
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Option B
Specific course requirements can be waived on a case-by-case basis upon approval of the department's graduate advisor.

**Research fields**

- Nuclear physics—experimental and theoretical studies on the structure, electromagnetic, weak and strong interactions, and scattering of few-body systems at low and intermediate energies;
- Biophysics and condensed-matter physics—experimental, theoretical, and computational studies of structures and functions of cells, biological networks and biomolecules, deciphering information encoded in genome;
- Theoretical and observational astrophysics—high-energy astrophysics, multi-wavelength studies of extreme energy-density environments and huge energy releases in astrophysical objects;
- Interdisciplinary physics, including energy research and physics education research.