DEPARTMENT OF PHYSICS AND ASTRONOMY

Phone: 703-993-1280
Email: physics@gmu.edu
Website: physics.gmu.edu

Administration

- Ernest Barreto, Chair
- Jie Zhang, Associate Chair for Research
- John Cressman, Associate Chair for Laboratory Instruction
- Paul So, Graduate Advisor (Physics)
- Chi Yang, Graduate Advisor (Engineering Physics)
- Joseph Weingartner, Undergraduate Advisor (Physics, Astronomy & Astrophysics)
- Fernando Camelli, Undergraduate Advisor (Computational & Engineering Physics)
- Erhai Zhao, Undergraduate Advisor (Physics)
- Phil Rubin, Undergraduate Advisor (Incoming, First-years, and Transfers)

The Department of Physics and Astronomy is dedicated to the dissemination and advancement of physics and astronomy through instruction, research, and outreach.

The department provides rigorous training for students of physics and astronomy and prepares them to be successful, confident, and versatile in their ability to apply physics and astronomy principles within any chosen field. The department also aims to deliver and instill a broad-based understanding of general physics and astronomy principles and practices to the wider university community through our Mason Core (http://catalog.gmu.edu/mason-core/) (general education) courses. Our student-centric curriculum and instruction use a mixture of traditional and current pedagogical techniques informed by on-going educational research. It is our goal to help students to develop versatility and creativity through analytical practice and problem-solving training in their coursework and faculty-led research projects.

Departmental research focuses on pushing the frontiers of physics and astronomy in a broad range of areas using theoretical, experimental, observational, and computational approaches. The department maintains many active collaborations with scientists across different disciplines within the university community and with other national and international institutions. The department believes strongly in incorporating both graduate as well as undergraduate students in our research programs. It is our goal to see students arrive with enthusiasm and curiosity for physics and astronomy and leave as true scientists ready to conduct their own scientific investigations.

Undergraduate Programs

The department offers the Physics, BS (http://catalog.gmu.edu/colleges-schools/science/physics-astronomy/physics-bs/) and the Astronomy, BS (http://catalog.gmu.edu/colleges-schools/science/physics-astronomy/astronomy-bs/). Also available are the Physics Minor (http://catalog.gmu.edu/colleges-schools/science/physics-astronomy/physics-minor/), the Astronomy Minor (http://catalog.gmu.edu/colleges-schools/science/physics-astronomy/astronomy-minor/), and the Renewable Energy Interdisciplinary Minor (http://catalog.gmu.edu/colleges-schools/science/physics-astronomy/renewable-energy-interdisciplinary-minor/).

Undergraduate Research Opportunities

The department offers many opportunities for undergraduate students to become involved with research. Students should consult faculty working on research topics of interest to them, based on their exploration of the department's website (http://physics.gmu.edu/).

Bachelor's/Accelerated Master's Degree

Information regarding this program can be found in the Physics, BS/Accelerated Masters section of this catalog.

Graduate Programs

This department offers the Applied and Engineering Physics, MS (http://catalog.gmu.edu/colleges-schools/science/physics-astronomy/applied-engineering-physics-ms/). The department also supports the Energy and Sustainability concentration in the Interdisciplinary Studies, MAIS (http://catalog.gmu.edu/colleges-schools/humanities-social-sciences/integrative-studies/interdisciplinary-studies-mais/) program. Additionally, the department offers a Physics, PhD (http://catalog.gmu.edu/colleges-schools/science/physics-astronomy/physics-phd/). These graduate programs are strongly supported by the extensive research activities of the faculty, including many collaborations with scientists and engineers at regional and national government laboratories.

Faculty

Department Faculty

Professors

Barreto, Becker, Dreyfus, Kan, Lohner, Mishin, Oluseyi, Rubin, Satija, Satyapal, Sauer, So, Summers, Trefil, Weigel, Yang, Zhang, Zhao

Associate Professors

Belle, Camelli, Cressman, Djordjevic, Gliozzi, Marzougui, Nikolic, Oerter, Plavchan, Rosenberg, Sheng, Tian, Vora, Weingartner, Yigit

Assistant Professors

Ghahari Kermani, Munshi, Parks

Emeriti

Ceperley, Ehrlich, Ellsworth, Lieb

Research Faculty

Attie, Balmaceda, Bilitza, Braga, Cigan, DeCesar, Deneva, Duxbury, Fischer, Gutarra Leon, Hayashi, Johnson, Kuroda, Mariska, Mazin, Meier, Mosquera Rovira, Nossa Gonzalez, Odstrcil, Poland, Prescott, Purja Pun, Schneider, Sexton, Smith, Wisniewski

Requirements & Policies

Requirements

Writing Intensive Requirement

George Mason requires all undergraduate students to complete at least one course in their major at the 300-level or above that is designated as "writing intensive". Students majoring in physics fulfill this requirement by successfully completing PHYS 407 Senior Laboratory in Modern Physics (Mason Core) (http://catalog.gmu.edu/mason-core/), PHYS 410 Computational Physics Capstone (Mason Core) (http://catalog.gmu.edu/mason-core/), or ASTR 402 RS: Methods of Observational Astronomy (Mason Core) (http://catalog.gmu.edu/mason-core/) depending upon their concentration (see program requirements (https://catalog.gmu.edu/colleges-schools/science/physics-astronomy/physics-bs/)). Astronomy majors fulfill the requirement by completing ASTR 402 RS: Methods of Observational Astronomy (Mason Core) (http://catalog.gmu.edu/mason-core/).

Teacher Licensure

Students who wish to become teachers should consult the College of Education and Human Development (http://catalog.gmu.edu/colleges-schools/education-human-development/) section of this catalog and attend an information session early in their undergraduate career. For more information, visit the Graduate School of Education's website (https://gse.gmu.edu/).

Physics for Non-majors

Recommended for biology, geology, premedical, and mathematics students who seek a BA degree:

Code	Title	Credits
PHYS 243	College Physics I (Mason Core) (http://catalog.gmu.edu/mason-core/)	
PHYS 244	College Physics I Lab (Mason Core) (http://catalog.gmu.edu/mason-core/)	
PHYS 245	College Physics II (Mason Core) (http://catalog.gmu.edu/mason-core/)	
PHYS 246	College Physics II Lab (Mason Core) (http://catalog.gmu.edu/mason-core/)	

Recommended for non-science majors:

Code	Title	Credits
PHYS 103	Physics and Everyday Phenomena I (Mason Core) (http://catalog.gmu.edu/mason-core/)	
PHYS 104	Physics and Everyday Phenomena II (Mason Core) (http://catalog.gmu.edu/mason-core/)	
PHYS 106	The Quantum World: A Continuous Revolution in What We Know and How We Live (Mason Core) (http://catalog.gmu.edu/mason-core/)	
PHYS 111	Introduction to the Fundamentals of Atmospheric Science (Mason Core) (http://catalog.gmu.edu/mason-core/)	
PHYS 112	Introduction to the Fundamentals of Atmospheric Science Lab (Mason Core) (http://catalog.gmu.edu/mason-core/)	

The following courses constitute a calculus-based sequence in general physics to be taken by physics and engineering majors, chemistry, computer science, and mathematics students who are pursuing a BS degree:

Code	Title	Credits
PHYS 160 & PHYS 161 & PHYS 260 & PHYS 261	University Physics I (Mason Core) (http://catalog.gmu.edu/mason-core/) and University Physics I Laboratory (Mason Core) (http://catalog.gmu.edu/mason-core/) and University Physics II (Mason Core) (http://catalog.gmu.edu/mason-core/) and University Physics II Laboratory (Mason Core) (http://catalog.gmu.edu/mason-core/)	
or		
PHYS 170 & PHYS 161 & PHYS 270 & PHYS 261	Introductory and Modern Physics I (Mason Core) (http://catalog.gmu.edu/mason-core/) and University Physics I Laboratory (Mason Core) (http://catalog.gmu.edu/mason-core/) and Introductory and Modern Physics II (Mason Core) (http://catalog.gmu.edu/mason-core/) and University Physics II Laboratory (Mason Core) (http://catalog.gmu.edu/mason-core/)	

Students may receive credit for only one of the following three sequences:

Code	Title	Credits
PHYS 103 & PHYS 104	Physics and Everyday Phenomena I (Mason Core) (http://catalog.gmu.edu/mason-core/) and Physics and Everyday Phenomena II (Mason Core) (http://catalog.gmu.edu/mason-core/)	
PHYS 243 & PHYS 244 & PHYS 245 & PHYS 246	College Physics I (Mason Core) (http://catalog.gmu.edu/mason-core/) and College Physics I Lab (Mason Core) (http://catalog.gmu.edu/mason-core/) and College Physics II (Mason Core) (http://catalog.gmu.edu/mason-core/) and College Physics II Lab (Mason Core) (http://catalog.gmu.edu/mason-core/)	
PHYS 160 & PHYS 161 & PHYS 260 & PHYS 261 & PHYS 262 & PHYS 263	University Physics I (Mason Core) (http://catalog.gmu.edu/mason-core/) and University Physics I Laboratory (Mason Core) (http://catalog.gmu.edu/mason-core/) and University Physics II (Mason Core) (http://catalog.gmu.edu/mason-core/) and University Physics II Laboratory (Mason Core) (http://catalog.gmu.edu/mason-core/) and University Physics III (Mason Core) (http://catalog.gmu.edu/mason-core/) and University Physics III Laboratory (Mason Core) (http://catalog.gmu.edu/mason-core/)	

PHYS 170 & PHYS 161 & PHYS 270 & PHYS 261 & PHYS 262 & PHYS 263	Introductory and Modern Physics I (Mason Core) (http://catalog.gmu.edu/mason-core/) and University Physics I Laboratory (Mason Core) (http://catalog.gmu.edu/mason-core/) and Introductory and Modern Physics II (Mason Core) (http://catalog.gmu.edu/mason-core/) and University Physics II Laboratory (Mason Core) (http://catalog.gmu.edu/mason-core/) and University Physics III (Mason Core) (http://catalog.gmu.edu/mason-core/) and University Physics III Laboratory (Mason Core) (http://catalog.gmu.edu/mason-core/)

Programs

- Applied and Engineering Physics, MS
- Astronomy Minor
- Astronomy, BS
- Astrophysics Minor
- Physics Minor
- Physics, BS
- Physics, PhD
- Renewable Energy Interdisciplinary Minor