

# PHYSICS, BA

Physics is the most fundamental of the sciences, interested in the properties of matter, radiation, and energy in all forms. It provides the underlying framework for other physical sciences and engineering and for understanding physical processes in biological and environmental sciences. The major gives you:

- Intellectual satisfaction: physics satisfies our deep desire to understand how the universe works. Physics is interesting.
- Intellectual challenge: by striving for fundamental understanding, the physicist accepts the challenge to move past a merely descriptive approach of our world and probes deeply into how and why it works.
- Physics produces new technology: today's physics research will become tomorrow's technological advances.
- Technical expertise: physicists exploit forefront technologies in their pursuits.
- Flexibility: in a fast-paced and changing world, it is much more important to have a broad substantive education than to be trained in a specific skill. We teach people how to think, and how to apply and extend what they know to new types of problems.
- Physics is analytical and quantitative: people who can reason analytically and quantitatively are essential for the success of almost any pursuit.

The Physics major will provide an overall view of both classical and modern physics with the flexibility to continue learning in fields that interest you. It will also help you develop skills in analysis, problem-solving, and quantitative reasoning that will aid you in whatever careers you choose.

## WHAT YOU LEARN IN THIS MAJOR WILL:

- prepare you for graduate studies for master's or doctoral degrees in experimental or theoretical physics;
- prepare you for employment in industrial or governmental laboratories;
- provide a broad background for further work in other sciences, such as materials sciences, aerospace, astronomy, computer science, geophysics, meteorology, radiology, medicine, biophysics, engineering, and environmental studies;
- provide a science-oriented education. This training can be useful in some areas of business administration, law, or other fields where a basic knowledge of science is useful.
- provide part of the preparation you need to teach physics. To teach physics in high school, you will also take education courses to become certified. You will need a doctoral degree to become a college or university professor.

Interested in the undergraduate physics program? Check out the Physics undergraduate page (<https://www.physics.wisc.edu/academics/undergrads/>).

## RELATED PROGRAMS

L&S Bachelor of Science in Applied Mathematics, Engineering, and Physics (<https://guide.wisc.edu/undergraduate/letters-science/mathematics/applied-mathematics-engineering-physics-bs-amep/>) (BS AMEP) in the Guide

L&S Astronomy-Physics major (<https://guide.wisc.edu/undergraduate/letters-science/astronomy/astronomy-physics-ba/>) in the Guide

## EDUCATION-PHYSICS

A student working toward the Bachelor of Science-Education degree may major or minor in physics. Interested students should contact the School of Education (<https://guide.wisc.edu/undergraduate/education/>).

## MEDICAL PHYSICS

A suggested curriculum for students interested in graduate study in Medical Physics is available on the Department of Medical physics webpage (<https://www.medphysics.wisc.edu/graduate-program/admissions/#requirements>).

## HOW TO GET IN

### HOW TO GET IN DECLARING A PHYSICS MAJOR

Requirements	Details
How to get in	No application required. All students who meet the requirements listed below are eligible to declare. For information on how to declare, visit the Advising and Careers tab.
Courses required to get in	None
GPA requirements to get in	At least a 2.500 GPA on all MATH and PHYSICS courses, computed on all attempts prior to and including the first passed attempt of any course.
Credits required to get in	None
Other	None

Students pursuing the Physics major are not eligible to declare the Physics certificate.

## REQUIREMENTS

### UNIVERSITY GENERAL EDUCATION REQUIREMENTS

All undergraduate students at the University of Wisconsin-Madison are required to fulfill a minimum set of common university general education requirements to ensure that every graduate acquires the essential core of an undergraduate education. This core establishes a foundation for living a productive life, being a citizen of the world, appreciating aesthetic values, and engaging in lifelong learning in a continually changing world. Various schools and colleges will have requirements in addition to the requirements listed below. Consult your advisor for assistance, as needed. For additional information, see the university Undergraduate General Education Requirements (<https://guide.wisc.edu/undergraduate/#requirementsforundergraduatetext>) section of the Guide.

General Education	• Breadth—Humanities/Literature/Arts: 6 credits
	• Breadth—Natural Science: 4 to 6 credits, consisting of one 4- or 5-credit course with a laboratory component; or two courses providing a total of 6 credits
	• Breadth—Social Studies: 3 credits
	• Communication Part A & Part B *
	• Ethnic Studies *
	• Quantitative Reasoning Part A & Part B *

\* The mortarboard symbol appears before the title of any course that fulfills one of the Communication Part A or Part B, Ethnic Studies, or Quantitative Reasoning Part A or Part B requirements.

## COLLEGE OF LETTERS & SCIENCE DEGREE REQUIREMENTS: BACHELOR OF ARTS (BA)

Students pursuing a bachelor of arts degree in the College of Letters & Science must complete all of the requirements below. The College of Letters & Science allows this major to be paired with either a bachelor of arts or a bachelor of science curriculum.

### BACHELOR OF ARTS DEGREE REQUIREMENTS

**Mathematics** Complete the University General Education Requirements for Quantitative Reasoning A (QR-A) and Quantitative Reasoning B (QR-B) coursework.

**Language**

- Complete the fourth unit of a language other than English; OR
- Complete the third unit of a language and the second unit of an additional language other than English.

**L&S Breadth**

- 12 credits of Humanities, which must include 6 credits of literature; and
- 12 credits of Social Science; and
- 12 credits of Natural Science, which must include one 3+ credit Biological Science course and one 3+ credit Physical Science course.

**Liberal Arts and Science Coursework** Complete at least 108 credits.

**Depth of Intermediate/Advanced work** Complete at least 60 credits at the intermediate or advanced level.

**Major** Declare and complete at least one major.

**Total Credits** Complete at least 120 credits.

**UW-Madison Experience**

- 30 credits in residence, overall; and
- 30 credits in residence after the 86th credit.

**Quality of Work**

- 2.000 in all coursework at UW-Madison
- 2.000 in Intermediate/Advanced level coursework at UW-Madison

## NON-L&S STUDENTS PURSUING AN L&S MAJOR

Non-L&S students who have permission from their school/college to pursue an additional major within L&S only need to fulfill the major requirements. They do not need to complete the L&S Degree Requirements above.

## REQUIREMENTS FOR THE MAJOR

The physics major requires 35 credits from the following:

Code	Title	Credits
<b>Introductory Physics<sup>1</sup></b>		
<i>First Introductory Course (complete one):<sup>1</sup></i>		5
PHYSICS 247	A Modern Introduction to Physics (recommended)	
PHYSICS 207	General Physics	
PHYSICS 201	General Physics	
E M A 201 & E M A 202	Statics and Dynamics <sup>2</sup>	
<i>Second Introductory Course (complete one):</i>		5
PHYSICS 248	A Modern Introduction to Physics (recommended)	
PHYSICS 208	General Physics	
PHYSICS 202	General Physics	
<i>Third Introductory Course (complete one):</i>		3-4
PHYSICS 249	A Modern Introduction to Physics (recommended)	
PHYSICS 205	Modern Physics for Engineers (See advising and careers for more information.)	
PHYSICS/ E C E 235	Introduction to Solid State Electronics (See advising and careers for more information.)	
PHYSICS 241	Introduction to Modern Physics	
<b>Intermediate Mechanics</b>		
PHYSICS 311	Mechanics	3
<b>Electromagnetism (complete one):</b>		
PHYSICS 322	Electromagnetic Fields	
E C E 220 & E C E 320 & E C E 420	Electrodynamics I and Electrodynamics II and Electromagnetic Wave Transmission <sup>3</sup>	
<b>Quantum Mechanics (complete one):</b>		
PHYSICS 448	Atomic and Quantum Physics	
PHYSICS 531	Introduction to Quantum Mechanics	
<b>Laboratory</b>		
<i>Full registered credit per course:</i>		
PHYSICS 307	Intermediate Laboratory-Mechanics and Modern Physics	
PHYSICS 407	Advanced Laboratory	
<i>Two credits apply from each of the following:</i>		

PHYSICS 321	Electric Circuits and Electronics <sup>4</sup>	
PHYSICS 325	Optics <sup>4</sup>	
PHYSICS 623	Electronic Aids to Measurement <sup>4</sup>	
PHYSICS 625	Applied Optics <sup>4</sup>	
ASTRON 465	Observational Astronomy and Data Analysis <sup>5</sup>	
N E 427	Nuclear Instrumentation Laboratory <sup>5</sup>	
N E 428	Nuclear Reactor Laboratory <sup>5</sup>	
<i>One credit applies from each of the following:</i>		
E C E 305	Semiconductor Properties Laboratory <sup>5</sup>	
E C E 313	Optoelectronics Lab <sup>5</sup>	
<b>Advanced Physics Electives</b>		<b>4-9</b>
<b>Total Credits</b>		<b>35</b>

<sup>1</sup> PHYSICS 247/PHYSICS 248/PHYSICS 249 is the introductory course sequence recommended for prospective physics majors, PHYSICS 201/PHYSICS 202/PHYSICS 241 is recommended for engineers, and PHYSICS 207/PHYSICS 208/PHYSICS 241 is intended for life sciences and chemistry majors. Both PHYSICS 201 General Physics/PHYSICS 202 General Physics/PHYSICS 241 Introduction to Modern Physics and PHYSICS 207 General Physics/PHYSICS 208 General Physics/PHYSICS 241 Introduction to Modern Physics are suitable alternatives for physics majors. Although the department recommends following one of these sequences, students are allowed to mix them, with the exception that transfers into the PHYSICS 247/PHYSICS 248/PHYSICS 249 sequence are not permitted.

<sup>2</sup> Both courses must be taken and together count 5 credits toward the 35 required for the major. These credits can be counted toward the 35 required for the major only if these courses are used to satisfy this requirement.

<sup>3</sup> All three of E C E 220 and E C E 320 and E C E 420 must be taken, and together count 3 credits toward the 35 required for the major. These credits can be counted toward the 35 required for the major only if these courses are used to satisfy this requirement.

<sup>4</sup> All four credits for each course count toward 35-credit total.

<sup>5</sup> For non-PHYSICS courses, students will receive only the credit applied as lab toward the 35-credit requirement.

## ADVANCED PHYSICS ELECTIVE COURSES

Code	Title	Credits
PHYSICS 301	Physics Today (recommended) <sup>6</sup>	1
PHYSICS 307	Intermediate Laboratory-Mechanics and Modern Physics	2
PHYSICS 311	Mechanics	3
PHYSICS 321	Electric Circuits and Electronics	4
PHYSICS 322	Electromagnetic Fields	3
PHYSICS 323	Electromagnetic Fields	3
PHYSICS 325	Optics	4
PHYSICS 361	Machine Learning in Physics	3
PHYSICS 406	Special Topics in Physics	1-4
PHYSICS 407	Advanced Laboratory	2-4
PHYSICS 415	Thermal Physics	3
PHYSICS 448	Atomic and Quantum Physics	3

PHYSICS 449	Atomic and Quantum Physics	3
PHYSICS 498	Directed Study	1-3
PHYSICS 499	Directed Study	1-3
PHYSICS/B M E/ H ONCOL/ MED PHYS 501	Radiation Physics and Dosimetry	3
PHYSICS/E C E/ N E 525	Introduction to Plasmas	3
PHYSICS/E C E/ N E 527	Plasma Confinement and Heating	3
PHYSICS 531	Introduction to Quantum Mechanics	3
PHYSICS 535	Introduction to Particle Physics	3
PHYSICS 545	Introduction to Atomic Structure	3
PHYSICS 551	Solid State Physics	3
PHYSICS 603	Workshop in College Physics Teaching	1-2
PHYSICS 623	Electronic Aids to Measurement	4
PHYSICS 625	Applied Optics	4
PHYSICS 681	Senior Honors Thesis	3
PHYSICS 682	Senior Honors Thesis	3
PHYSICS/ MED PHYS 688	Radiation Production and Detection	4
PHYSICS 691	Senior Thesis	2-3
PHYSICS 692	Senior Thesis	2-3

<sup>6</sup> It is recommended that the student's program include the seminar PHYSICS 301 Physics Today.

## RESIDENCE AND QUALITY OF WORK

- 2.000 GPA in all PHYSICS and all major courses
- 2.000 on at least 15 credits in Upper Level work, taken in residence<sup>7</sup>
- 15 credits in PHYSICS, taken on campus

<sup>7</sup> Courses that meet the Core and Laboratory requirements, and Advanced level PHYSICS courses, count as upper-level in the major.

## HONORS IN THE MAJOR

Students may declare Honors in the Major in consultation with their major advisor and the Honors Program.

## HONORS IN THE MAJOR REQUIREMENTS

To earn Honors in the Major, students must satisfy both the requirements for the major (above) and the following additional requirements:

- Earn a 3.300 University GPA
- Earn a 3.300 GPA in all PHYSICS and all major courses
- 12 credits of Honors PHYSICS courses with grades of B or better, to include:
  - PHYSICS 681 - PHYSICS 682, for a total of 6 credits
  - 3 additional credits of Advanced level PHYSICS for Honors, with a grade of B or better

- 3 credits at any level in PHYSICS for Honors, with a grade of B or better<sup>8</sup>

<sup>8</sup> Note that enrolling in PHYSICS 247/PHYSICS 248/PHYSICS 249 provides honors credit towards Honors in the Major (not at the Advanced level, however).

## UNIVERSITY DEGREE REQUIREMENTS

**Total Degree** To receive a bachelor's degree from UW–Madison, students must earn a minimum of 120 degree credits. The requirements for some programs may exceed 120 degree credits. Students should consult with their college or department advisor for information on specific credit requirements.

**Residency** Degree candidates are required to earn a minimum of 30 credits in residence at UW–Madison. "In residence" means on the UW–Madison campus with an undergraduate degree classification. "In residence" credit also includes UW–Madison courses offered in distance or online formats and credits earned in UW–Madison Study Abroad/Study Away programs.

**Quality of Work** Undergraduate students must maintain the minimum grade point average specified by the school, college, or academic program to remain in good academic standing. Students whose academic performance drops below these minimum thresholds will be placed on academic probation.

advisors, Guide, DARS, and Course Search & Enroll for assistance making and adjusting their plan.

### Departmental Expectations

Students should arrange a meeting with a departmental advisor as soon as they are even thinking about a physics major. It is important to get major advising as early as possible.

This is one of many paths through the physics major. For other possibilities and details on math preparation and sequence of courses, see the Advising and Careers page (<https://guide.wisc.edu/undergraduate/letters-science/physics/physics-bs/#advisingandcareerstext>).

#### First Year

Fall	Credits Spring	Credits
MATH 222	4 PHYSICS 247	5
COMP SCI 220	4 MATH 234	4
Communication A	3 Ethnic Studies	3
Foreign Language (if needed)	4 Foreign Language (if needed)	4
<b>15</b>		<b>16</b>

#### Second Year

Fall	Credits Spring	Credits
PHYSICS 248	5 PHYSICS 249	4
MATH 319	3 PHYSICS 311	3
MATH 340	3 PHYSICS 301	1
INTER-LS 210	1 MATH 321	3
Humanities Breadth	3 Literature Breadth	3
<b>15</b>		<b>14</b>

#### Third Year

Fall	Credits Spring	Credits
PHYSICS 307	2 Physics Lab Course	4
PHYSICS 322	3 Physics Elective	3
MATH 322	3 Humanities Breadth	3
Social Science Breadth	3 Social Science Breadth	3
Communication B	3-4 Biological Science Breadth	3
<b>14</b>		<b>16</b>

#### Fourth Year

Fall	Credits Spring	Credits
PHYSICS 448	3 PHYSICS 449	3
Physics Elective	3 PHYSICS 415	3
Social Science Breadth	3 Literature Breadth	3
Humanities Breadth	3 Humanities Breadth	3
Biological Science Breadth	3 Social Science Breadth	3
<b>15</b>		<b>15</b>

**Total Credits 120**

## THREE-YEAR PLAN

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This Sample Three-Year Plan is a tool to assist students and their advisor(s). Students should use it –along with their DARS report, the Degree Planner, and Course Search & Enroll tools – to make their own

## LEARNING OUTCOMES

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1. Understand basic physical principles.
2. Solve problems proficiently using both quantitative and qualitative applications of these physical principles.
3. Appreciate the excitement of physics and be acquainted with a wide range of research areas in physics.
4. Know how to perform quantitative measurements of physical phenomena and understand the statistical significance of observations made in the presence of statistical and systematic uncertainties.
5. Be prepared for graduate study and/or careers in STEM fields.
6. Communicate effectively with scientific peers and the public, both orally and in writing.
7. Understand their own learning processes and be able to continue to educate themselves after graduation.

## FOUR-YEAR PLAN

### FOUR-YEAR PLAN

This Four-Year Plan is only one way a student may complete an L&S degree with this major. Many factors can affect student degree planning, including placement scores, credit for transferred courses, credits earned by examination, and individual scholarly interests. In addition, many students have commitments (e.g., athletics, honors, research, student organizations, study abroad, work and volunteer experiences) that necessitate they adjust their plans accordingly. Informed students engage in their own unique Wisconsin Experience by consulting their academic

three-year plan based on their placement scores, credit for transferred courses and approved examinations, and individual interests.

Three-year plans may vary considerably from student to student, depending on their individual preparation and circumstances. Students interested in graduating in three years should meet with an advisor as early as possible to discuss feasibility, appropriate course sequencing, post-graduation plans (careers, graduate school, etc.), and opportunities they might forgo in pursuit of a three-year graduation plan.

### Departmental Expectations

This three-year degree plan is feasible for students with a minimum of 30 advanced standing credits and who have satisfied the following requirements with course credit or via placement examination:

- MATH 221 Calculus and Analytic Geometry 1
- MATH 222 Calculus and Analytic Geometry 2
- 3-4 units of foreign language

Therefore, this three-year plan can either be for those who completed these requirements in their first year or for students immediately starting with those requirements and who wish to take more advanced electives in their final year.

#### First Year

Fall	Credits Spring	Credits
PHYSICS 247	5 PHYSICS 248	5
MATH 234	4 MATH 319	3
Communication A	3 MATH 340	3
Social Science Breadth	4 INTER-LS 210	1
	Humanities Breadth w/ Ethnic Studies	3
	<b>16</b>	<b>15</b>

#### Second Year

Fall	Credits Spring	Credits
PHYSICS 249	4 PHYSICS 322	3
PHYSICS 311	3 PHYSICS 307	2
MATH 321	3 MATH 322	3
Humanities Breadth	3 PHYSICS 301	1
Literature Breadth	3 Social Science Breadth	4
	Biological Science Breadth	3
	<b>16</b>	<b>16</b>

#### Third Year

Fall	Credits Spring	Credits
PHYSICS 448	3 PHYSICS 449	3
PHYSICS 415	3 Physics Lab Course	4
Communication B	3-4 Social Science Breadth	4
Literature Breadth	3 Elective	1
Biological Science Breadth	3	
	<b>15</b>	<b>12</b>

**Total Credits 90**

## ADVISING AND CAREERS

### ADVISING AND CAREERS DECLARE OR CANCEL THE MAJOR

Follow the process described in the Department of Physics website (<https://physics.wisc.edu/undergraduate/>).

Talk with a Physics advisor: send an email to [physics-advisors@wisc.edu](mailto:physics-advisors@wisc.edu) or schedule an appointment with Evan Heintz (MyUW Starfish (<https://wisc.starfishsolutions.com/starfish-ops/dl/instructor/serviceCatalog.html?bookmark=connection/38989/schedule>)).

### ADVISING FOR ADMITTED STUDENTS

Assistance choosing courses is available for students enrolling during Student Orientation, Advising, and Registration (SOAR (<https://soar.wisc.edu/>)): contact Evan Heintz, [eheintz@wisc.edu](mailto:eheintz@wisc.edu) or Starfish (<https://wisc.starfishsolutions.com/starfish-ops/dl/instructor/serviceCatalog.html?bookmark=connection/38989/schedule>).

### CAREER EXPLORATION

A good starting point for exploring careers is PHYSICS 301 Physics Today. This course, offered in Spring semesters, includes a weekly talk where a research topic is discussed by one of the Physics or Astronomy faculty.

SuccessWorks has also created the extremely helpful Physics-specific "What Can You Do with Your Major" (<https://successworks.wisc.edu/what-you-can-do-with-your-major/>) Skills & Outcomes Sheet. Explore the major's transferable skills, alumni job titles, frequent employers of the major, and words of advice from alumni who have found success following their passions.

The Department of Physics website has a current list of research opportunities (<https://www.physics.wisc.edu/undergraduate/student-resources/#research-opportunities>) with our faculty, and other physics-related student jobs (<https://www.physics.wisc.edu/undergraduate/student-resources/#other-job-opportunities>) on campus.

## RECOMMENDED ADDITIONAL COURSES

### MATHEMATICS

Please consult with a Physics advisor before choosing your Mathematics courses.

Specific Mathematics courses are prerequisites for the major's Physics courses. A typical math sequence is: MATH 221 Calculus and Analytic Geometry 1, MATH 222 Calculus and Analytic Geometry 2, MATH 234 Calculus--Functions of Several Variables, MATH 319 Techniques in Ordinary Differential Equations, MATH 340 Elementary Matrix and Linear Algebra, MATH 321 Applied Mathematical Analysis 1: Vector and Complex Calculus, and MATH 322 Applied Mathematical Analysis 2: Partial Differential Equations. MATH 320 Linear Algebra and Differential Equations is an alternative course that Physics students may choose instead of taking both MATH 319 Techniques in Ordinary Differential Equations and MATH 340 Elementary Matrix and Linear Algebra.

Students also majoring in Mathematics may have a different recommended set. We do not recommend the MATH honors sequences

for Physics students unless you are considering a second major in Mathematics.

- MATH 221 Calculus and Analytic Geometry 1: A prerequisite for PHYSICS 247 A Modern Introduction to Physics, PHYSICS 207 General Physics, and PHYSICS 201 General Physics.
- MATH 222 Calculus and Analytic Geometry 2: A prerequisite for PHYSICS 247 A Modern Introduction to Physics but can be taken concurrently.
- MATH 234 Calculus--Functions of Several Variables: MATH 234 Calculus--Functions of Several Variables is a prerequisite for PHYSICS 248 A Modern Introduction to Physics but can be taken concurrently. If you are not taking the PHYSICS 247 A Modern Introduction to Physics + PHYSICS 248 A Modern Introduction to Physics + PHYSICS 249 A Modern Introduction to Physics introductory sequence, you will still need this course for PHYSICS 311 Mechanics and PHYSICS 322 Electromagnetic Fields.
- MATH 319 Techniques in Ordinary Differential Equations and MATH 340 Elementary Matrix and Linear Algebra: You are strongly advised to take these courses before you take PHYSICS 311 Mechanics and PHYSICS 322 Electromagnetic Fields .
- MATH 320 Linear Algebra and Differential Equations: This course combines topics from MATH 319 and MATH 340. It is adequate for the rest of our undergraduate physics curriculum but is not recommended for those planning for graduate school. There is an accelerated honors section that thoroughly covers all of the material in MATH 319 and MATH 340. It is more challenging but is a good way to fit in both topics if you are unable to take MATH 319 + MATH 340 before you take PHYSICS 311 or PHYSICS 322.
- MATH 321 Applied Mathematical Analysis 1: Vector and Complex Calculus: For students interested in more abstract math, taking MATH 521 Analysis I would be equivalent. It is recommended that MATH 321 be taken before PHYSICS 322 Electromagnetic Fields but especially before you take either PHYSICS 448 Atomic and Quantum Physics or PHYSICS 531 Introduction to Quantum Mechanics. Students may want to check with the academic advisor before enrolling in this course to confirm they have enough time and attention in a specific term.
- MATH 322 Applied Mathematical Analysis 2: Partial Differential Equations: MATH 321 and MATH 322 are recommended for those planning for graduate school in Physics.

### Computer and Data Science

Computers are fundamental to astronomical research. The most useful language is Python, followed by C or C++. COMP SCI 220 Data Science Programming I is a good starting point for learning Python.

Students interested in data science and machine learning are also recommended to take PHYSICS 361 Machine Learning in Physics.

### Chemistry

A college course in chemistry is useful for all Physics students, but not required.

## SUCCESSWORKS

SuccessWorks (<https://successworks.wisc.edu/>) at the College of Letters & Science helps you turn the academic skills learned in your classes into a fulfilling life, guiding you every step of the way to securing jobs, internships, or admission to graduate school.

Through one-on-one career advising, events, and resources, you can explore career options, build valuable internship and research experience, and connect with supportive alumni and employers who open doors of opportunity.

- What you can do with your major (<https://successworks.wisc.edu/what-you-can-do-with-your-major/>) (Major Skills & Outcomes Sheets)
- Make a career advising appointment (<https://successworks.wisc.edu/make-an-appointment/>)
- Learn about internships and internship funding (<https://successworks.wisc.edu/finding-a-job-or-internship/>)
- Try "Jobs, Internships, & How to Get Them," (<https://successworks.wisc.edu/canvas/>) an interactive guide in Canvas for enrolled UW–Madison students

## WISCONSIN EXPERIENCE

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#### PHYSICS CLUB

The Society of Physics Students (<https://win.wisc.edu/organization/physicsclub/>), the Physics Club, is a student organization for people interested in physics and related fields.

The Physics Club organizes events such as seminars, tours, trips, and socials for its members. In the the past, we have taken a field trip to Fermilab and have frequently gathered for social events such as ice skating, movie night, and bowling. Physics Club volunteers also offer free drop-in tutoring to students in introductory physics and astronomy classes. In addition, we maintain subscriptions to science-related magazines such as *Scientific American*, *Astronomy*, and *Physics Today*, which are kept in the club's room located at 2328 Chamberlin Hall.

By joining the Physics Club you'll be meeting many physics majors, who are, in general, really cool people to hang out with. If you are thinking about declaring a Physics major, this is the place to come for helpful advice about taking classes and finding an undergraduate job in the physics department. If you join, you can get access to the Physics Club room. Joining also adds you to the club email list, so you can be notified about club-sponsored events.

To join, email [physics.society.wisc@gmail.com](mailto:physics.society.wisc@gmail.com) or drop by Room 2328 Chamberlin Hall and pick up a membership form. Turn in a completed form with your annual dues to a Physics Club officer.

### GENDER MINORITIES AND WOMEN IN PHYSICS

Gender Minorities and Women in Physics (<https://gmawip.physics.wisc.edu/>) (GMAWiP) is a student organization open to undergraduates for the support and promotion of gender minorities and women in physics at UW–Madison. We provide both professional development and support for women and gender minorities in physics

at every step in their careers by taking concrete actions through career development, mentorship, fellowship, and outreach.

We also advocate for other minorities in physics, including, but not limited to students of color, students with disability status, low-income students, and LGBT+ students. The group hosts social events aimed at building a sense of community among the members.

### Undergraduate Mentorship Program

GMaWiP provides a mentorship program for undergraduate students. This program connects the undergraduate with a graduate student who will advise and mentor the undergraduate as they work to obtain their degree. If you are interested in this mentorship program or are interested in getting involved with GMaWiP, please contact the undergraduate advisor.

### BLACK AND BROWN IN PHYSICS

Black and Brown in Physics (<https://bbip.physics.wisc.edu/>) (BBiP) is a student organization that creates a safe and welcoming community for the Black and Brown people within physics and physics-adjacent! BBiP hosts general meetings, heritage-based events, and by inviting Black and Brown physicists, educators, and historians to provide talks for both the organization and the Physics department. To get involved, please email [bbipuw@gmail.com](mailto:bbipuw@gmail.com).

### PHYSICS LEARNING CENTER

The Physics Learning Center: Striving to help all students succeed in Physics.

- Do you enjoy Physics?
- Are you patient?
- Do you like to teach?
- Would you like to help other undergraduate students?

The Physics Learning Center has job opportunities for Physics undergraduates as peer mentor tutors, to help others learn physics and new ways to solve physics problems.

The Physics Learning Center provides supplemental instruction and a supportive learning environment to students in large challenging introductory physics courses. They include algebra-based PHYSICS 103 General Physics + PHYSICS 104 General Physics and calculus-based PHYSICS 207 General Physics + PHYSICS 208 General Physics, which are requisites for many STEM majors and pre-health professional pathways. The majority of students in these classes are not majoring in Physics.

Peer mentor tutors lead a learning team twice a week helping students build a conceptual framework to solve a variety of physics problems. The Physics Learning Center strives to create a supportive learning environment to help students gain skills, increase confidence, and meet potential study partners.

Peer mentor tutors receive extensive training in teaching physics and in general pedagogy. Tutors meet with a Physics Learning Center staff member each week to discuss strategies for teaching course content, including how to use teaching materials that stress conceptual understanding. In addition, peer mentor tutors from all courses meet as a group for a weekly teaching seminar to discuss issues such as group dynamics, techniques for actively involving students in learning, helping students to prepare for exams, raising awareness of diversity in student experiences, resources on campus, etc.

Our peer mentor tutors report that they greatly enjoy working with their students. In the process, they strengthen their own foundation in physics and presentation skills. They also tell us that teaching physics helps to

review for the Graduate Record Exam and to prepare for post-graduate teaching in middle/high school or as a university teaching assistant.

Peer mentor tutors are a mix of students majoring in Physics, Astronomy–Physics, secondary science education, and engineering, as well as from other majors. This is a paid position taking about eight hours per week that includes learning team time, content and pedagogy meetings, reviews before exams, and time to prepare for teaching.

To find out more about the PLC Peer Mentor Tutor Program, please contact us.

### Physics Learning Center

2337/2338 Chamberlin Hall  
Susan Nossal | [nossal@physics.wisc.edu](mailto:nossal@physics.wisc.edu) |  
608-262-9107

## RESOURCES AND SCHOLARSHIPS

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Students majoring in Physics may be eligible for department scholarships (<https://www.physics.wisc.edu/department/awards/apply/>).