PHYSICS, B.S.

The Department of Physics has a long history of providing students with a great educational experience. The department awarded its first Ph.D. in 1899. Since then, physics students have earned degrees in virtually every area of physics, and the department’s faculty has played key roles in a myriad of important research efforts.

Physics is the science of the properties of matter, radiation, and energy in all forms. As such, it is the most fundamental of the sciences. It provides the underlying framework for the other physical sciences and engineering and for understanding physical processes in biological and environmental sciences.

CHOOSE TO BE A PHYSICS MAJOR

WHY STUDY PHYSICS?

- **Intellectual Satisfaction.** First, and foremost, 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 esoteric 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.

YOUR FUTURE IS SO BRIGHT . . .

A degree in physics helps prepare students for employment in industry, research, government, and academia. A bachelor’s degree from the undergraduate physics program will provide an overall view of both classical and modern physics along with problem-solving ability and the flexibility to continue learning.

Your education can:

- Prepare you for employment in industrial or governmental laboratories.
- Prepare you for graduate studies for master’s or doctoral degrees in experimental or theoretical physics.
- 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 liberal 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.

PHYSICS MENTOR PROGRAM

Any student contemplating becoming a physics major is encouraged to obtain a faculty mentor. A mentor is a faculty member with whom students can discuss physics, courses, careers, graduate schools, aspirations, etc. Mentors are not primarily academic advisors. Information is available at the department office.

OTHER PROGRAMS

AMEP

A program in applied mathematics, engineering and physics (AMEP) (http://guide.wisc.edu/undergraduate/letters-science/mathematics/applied-mathematics-engineering-physics-bs-amep) is described in its own section of the Guide.

Astronomy–Physics

Students interested in an astronomy–physics major should contact the astronomy department (http://guide.wisc.edu/undergraduate/letters-science/astronomy).

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 (http://guide.wisc.edu/undergraduate/education). Upon request, the physics department will assign an advisor.

Medical Physics

A suggested curriculum for students interested in graduate study in medical physics is available in the medical physics (https://www.medphysics.wisc.edu) department office.

HOW TO GET IN

TO DECLARE A PHYSICS MAJOR

Students must declare the physics major by filing out a major declaration form (https://www.physics.wisc.edu/sites/default/files/Physics%20Declaration%20Form.pdf), signed by a physics undergraduate advisor. They should talk with one of the undergraduate advisors (http://guide.wisc.edu/undergraduate/letters-science/physics/physics-ba/#advisingandcareers) as soon as they know they might have an interest in the physics major. Students can declare their physics major at any time after completing their first physics course on the UW–Madison campus, and we encourage them to do this as early as possible. They must have a 2.5 GPA in physics and math courses taken at UW–Madison at the time they declare. In all cases, the major must be declared before the semester of graduation. The form can be obtained at the department office in 2320 Chamberlin Hall. Note: Students should bring a copy of their current course history when they talk with the undergraduate advisor.

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/#requirementsforundergraduatestudytext) 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 BREADTH AND DEGREE REQUIREMENTS:**

**BACHELOR OF SCIENCE (B.S.)**

Students pursuing a bachelor of science 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. View a comparison of the degree requirements here. (https://pubs.wisc.edu/home/archives/ug15/images/babs2009.pdf)

**BACHELOR OF SCIENCE DEGREE REQUIREMENTS**

Mathematics
- Two (2) 3+ credits of intermediate/advanced level MATH, COMP SCI, STAT
- Limit one each: COMP SCI, STAT

Foreign Language
- Complete the third unit of a foreign language
- Note: A unit is one year of high school work or one semester/term of college work.

L&S Breadth
- Humanities, 12 credits: 6 of the 12 credits must be in literature
- Social Sciences, 12 credits
- Natural Sciences, 12 credits: must include 6 credits in biological science; and must include 6 credits in physical science

Liberal Arts and Science Coursework
- 108 credits

Depth of Intermediate/Advanced work
- 60 intermediate or advanced credits

Major
- Declare and complete at least one (1) major

Total Credits
- 120 credits

UW-Madison Experience
- 30 credits in residence, overall
- 30 credits in residence after the 90th credit

Minimum GPAs
- 2.000 in all coursework at UW–Madison
- 2.000 in intermediate/advanced 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 and do not need to complete the L&S breadth and degree requirements above. Please note that the following special degree programs are not considered majors so are not available to non-L&S-degree-seeking candidates:
- Applied Mathematics, Engineering and Physics (Bachelor of Science–Applied Mathematics, Engineering and Physics)
- Journalism (Bachelor of Arts–Journalism; Bachelor of Science–Journalism)
- Music (Bachelor of Music)
- Social Work (Bachelor of Social Work)

**REQUIREMENTS FOR THE MAJOR**

The physics major requires **35 credits** from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Introductory Physics</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Select one of the following First Introductory Courses:</td>
<td>5</td>
</tr>
<tr>
<td>PHYSICS 247</td>
<td>A Modern Introduction to Physics (recommended)</td>
<td></td>
</tr>
<tr>
<td>PHYSICS 207</td>
<td>General Physics</td>
<td></td>
</tr>
<tr>
<td>PHYSICS 201</td>
<td>General Physics</td>
<td></td>
</tr>
<tr>
<td>E M A 201</td>
<td>Statics</td>
<td>2</td>
</tr>
<tr>
<td>E M A 202</td>
<td>and Dynamics</td>
<td></td>
</tr>
<tr>
<td>E M A 201</td>
<td>Statics</td>
<td>2</td>
</tr>
<tr>
<td>&amp; M E 240</td>
<td>and Dynamics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Select one of the following Second Introductory Courses:</td>
<td>5</td>
</tr>
<tr>
<td>PHYSICS 248</td>
<td>A Modern Introduction to Physics (recommended)</td>
<td></td>
</tr>
<tr>
<td>PHYSICS 208</td>
<td>General Physics</td>
<td></td>
</tr>
<tr>
<td>PHYSICS 202</td>
<td>General Physics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Select one of the following Third Introductory Courses:</td>
<td>3-4</td>
</tr>
<tr>
<td>PHYSICS 249</td>
<td>A Modern Introduction to Physics (recommended)</td>
<td></td>
</tr>
<tr>
<td>PHYSICS 205</td>
<td>Modern Physics for Engineers (not recommended for majors)</td>
<td></td>
</tr>
<tr>
<td>PHYSICS/ E C E 235</td>
<td>Introduction to Solid State Electronics (not recommended for majors)</td>
<td></td>
</tr>
<tr>
<td>PHYSICS 241</td>
<td>Introduction to Modern Physics</td>
<td></td>
</tr>
</tbody>
</table>

1 The introductory course sequence consists of three courses: PHYSICS 247/PHYSICS 248/PHYSICS 249 in the honors sequence recommended for prospective physics majors, PHYSICS 201/PHYSICS 202/PHYSICS 205 in the honors sequence recommended for prospective physics majors, and PHYSICS 207/PHYSICS 208/PHYSICS 241 in the honors sequence recommended for prospective physics majors, and is a suitable alternative for physics majors. Although we recommend following one of these sequences, it is allowed to mix them with the exception that transfers
into the PHYSICS 247/PHYSICS 248/PHYSICS 249 honors sequence are not permitted.

2 The combination of these two courses will count 5 credits toward the 35 required for the major.

### Core Physics

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYSICS 311</td>
<td>Mechanics</td>
<td>3</td>
</tr>
</tbody>
</table>

Select one of the following options:

**Option 1:**

- PHYSICS 322 Electromagnetic Fields

**Option 2:**

- E C E 220 Electrodynamics I
- & E C E 320 and Electrodynamics II
- & E C E 420 and Electromagnetic Wave Transmission

Select one of the following:

- PHYSICS 415 Thermal Physics
- CHEM 561 Physical Chemistry
- CHEM 562 and Physical Chemistry
- M E 361 Thermodynamics

Select one of the following:

- PHYSICS 448 Atomic and Quantum Physics
- & PHYSICS 449 Atomic and Quantum Physics (recommended)
- PHYSICS 531 Introduction to Quantum Mechanics

3 All three 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.

4 Both courses CHEM 561 and CHEM 562 must be taken and together count 3 credits toward the 35 required for the major.

### Laboratory

Select 6 credits from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYSICS 307</td>
<td>Intermediate Laboratory-Mechanics and Modern Physics</td>
<td>6</td>
</tr>
<tr>
<td>PHYSICS 308</td>
<td>Intermediate Laboratory-Electromagnetic Fields and Optics</td>
<td>6</td>
</tr>
<tr>
<td>PHYSICS 407</td>
<td>Advanced Laboratory</td>
<td>6</td>
</tr>
<tr>
<td>PHYSICS 321</td>
<td>Electric Circuits and Electronics</td>
<td>5</td>
</tr>
<tr>
<td>PHYSICS 325</td>
<td>Optics</td>
<td>5</td>
</tr>
<tr>
<td>PHYSICS 623</td>
<td>Electronic Aids to Measurement</td>
<td>5</td>
</tr>
<tr>
<td>PHYSICS 625</td>
<td>Applied Optics</td>
<td>5</td>
</tr>
<tr>
<td>N E 427</td>
<td>Nuclear Instrumentation Laboratory</td>
<td>6</td>
</tr>
<tr>
<td>N E 428</td>
<td>Nuclear Reactor Laboratory</td>
<td>6</td>
</tr>
<tr>
<td>E C E 305</td>
<td>Semiconductor Properties Laboratory</td>
<td>6</td>
</tr>
<tr>
<td>E C E 313</td>
<td>Optoelectronics Lab</td>
<td>6</td>
</tr>
</tbody>
</table>

5 All four credits for each course count toward 35-credit total.

6 For non-physics courses, students will receive only the credit applied as lab toward the 35-credit requirement.

### Select additional electives to reach 35-credit minimum for the major:

#### Advanced Physics Electives

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYSICS 301</td>
<td>Physics Today</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS 307</td>
<td>Intermediate Laboratory-Mechanics and Modern Physics</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS 311</td>
<td>Mechanics</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS 321</td>
<td>Electric Circuits and Electronics</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS 322</td>
<td>Electromagnetic Fields</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS 323</td>
<td>Electromagnetic Fields</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS 325</td>
<td>Optics</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS 406</td>
<td>Special Topics in Physics</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS 407</td>
<td>Advanced Laboratory</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS 415</td>
<td>Thermal Physics</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS 448</td>
<td>Atomic and Quantum Physics</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS 449</td>
<td>Atomic and Quantum Physics</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS/ENVIR ST 472</td>
<td>Scientific Background to Global Environmental Problems</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS 498</td>
<td>Directed Study</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS 499</td>
<td>Directed Study</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS/B/ H ONCOL/ MED PHYS 501</td>
<td>Radiological Physics and Dosimetry</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS/E C E/ N E 525</td>
<td>Introduction to Plasmas</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS/E C E/ N E 527</td>
<td>Plasma Confinement and Heating</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS 531</td>
<td>Introduction to Quantum Mechanics</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS 535</td>
<td>Introduction to Particle Physics</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS 545</td>
<td>Introduction to Atomic Structure</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS/ E C E 546</td>
<td>Lasers</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS 551</td>
<td>Solid State Physics</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS 623</td>
<td>Electronic Aids to Measurement</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS 625</td>
<td>Applied Optics</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS 681</td>
<td>Senior Honors Thesis</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS 682</td>
<td>Senior Honors Thesis</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS 691</td>
<td>Senior Thesis</td>
<td>7</td>
</tr>
<tr>
<td>PHYSICS 692</td>
<td>Senior Thesis</td>
<td>7</td>
</tr>
</tbody>
</table>

7 It is recommended that the student's program include the seminar PHYSICS 301 Physics Today.

## RESIDENCE AND QUALITY OF WORK IN THE MAJOR

- 2.000 GPA in all PHYSICS and major courses
- 2.000 on at least 15 credits in upper-level work taken in residence: courses in Core, Laboratory, and Advanced Physics Electives
- 15 credits in PHYSICS, taken on campus
HONORS IN THE MAJOR
Students may declare Honors in this Major in Physics in consultation with their major advisor and the Honors Program.

HONORS IN THE PHYSICS MAJOR: REQUIREMENTS
To earn Honors in the Major in Physics, 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 courses, and all courses accepted in the major
• Complete 12 credits for Honors in courses counting in the major, with a grade of B or better, to include:
  • 9 credits at the advanced level
• A two-semester Senior Honors Thesis in PHYSICS 681 Senior Honors Thesis and PHYSICS 682 Senior Honors Thesis for a total of 6 credits

DISTINCTION IN THE MAJOR
Distinction in the Major requires no declaration, and is awarded at the time of graduation. Students may not receive Distinction and Honors in the same major. To receive Distinction in the Major, students must have met the following requirements and notify a departmental advisor:

• 3.300 university GPA
• 3.300 GPA in all major and major subject (physics) courses
• 6 additional credits in advanced-level physics beyond the minimum required for the major.

THESIS OF DISTINCTION
An exceptional original thesis will be designated as a Thesis of Distinction upon recommendation by the department.

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.

LEARNING OUTCOMES
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.

ADVISING AND CAREERS
PHYSICS UNDERGRADUATE ADVISORS
Professor Dan McCammon
6207 Chamberlin Hall
608-262-5916

Professor Jan Egedal
3275 Chamberlin Hall
608-262-3628

Professor Deniz Yavuz
5320 Chamberlin Hall
608-263-9399

AMEP Advisor
Professor Cary Forest
3277 Chamberlin Hall
608-263-0486

Professor Robert McDermott
5112 Chamberlin Hall
608-263-4476

The Department of Physics encourages our majors to begin working on their career exploration and preparation soon after arriving on campus. We partner with SuccessWorks at the College of Letters & Science. L&S graduates are in high demand by employers and graduate programs. It is important to us that our students are career ready at the time of graduation, and we are committed to your success.

Additional Resources:
• Link to physics department student jobs and research opportunities (https://www.physics.wisc.edu/academics/undergrads/news)

L&S CAREER RESOURCES
SuccessWorks at the College of Letters & Science helps students leverage the academic skills learned in their major, certificates, and liberal arts degree, explore and try out different career paths; participate in internships; prepare for the job search and/or graduate school applications; and network with professionals in the field (alumni and employers).
SuccessWorks can also assist students in career advising, résumé and cover letter writing, networking opportunities, and interview skills, as well as course offerings for undergraduates to begin their career exploration early in their undergraduate career.

- SuccessWorks (https://careers.ls.wisc.edu)
- Set up a career advising appointment (https://careers.ls.wisc.edu/make-an-appointment)
- INTER-LS 210 L&S Career Development: Taking Initiative (1 credit, targeted to first- and second-year students)—for more information, see Inter-LS 210: Career Development, Taking Initiative (https://careers.ls.wisc.edu/inter-ls-210-career-development-taking-initiative)
- Learn how we’re transforming career preparation: L&S Career Initiative (http://ls.wisc.edu/lsci)

**PEOPLE**

**FACULTY**

Yang Bai (https://www.physics.wisc.edu/people/yangbai), Associate Professor
Baha Balantekin (https://www.physics.wisc.edu/people/bahabaltantekin), Professor
Vernon Barger (https://www.physics.wisc.edu/people/vernon-dbarger), Professor
Keith Bechtol (https://www.physics.wisc.edu/people/keithbechtol), Assistant Professor
Kevin Black (https://www.physics.wisc.edu/people/kevinblack), Professor
Stas Boldyrev (https://www.physics.wisc.edu/people/StanislavBoldyrev), Professor
Tulika Bose (https://www.physics.wisc.edu/people/tulikabose), Professor
Victor Brar (https://www.physics.wisc.edu/people/victorbrar), Assistant Professor
Duncan Carlsmith (https://www.physics.wisc.edu/people/duncancarlsmith), Professor
Daniel Chung (https://www.physics.wisc.edu/people/daniel-jchung), Professor
Susan Coppersmith (https://www.physics.wisc.edu/people/susan-coppersmith), Professor
Sridhara Dasu (https://www.physics.wisc.edu/people/sridharadasu), Department Chair and Professor
Jan Egedal (https://www.physics.wisc.edu/people/janegedal), Professor
Mark Eriksson (https://www.physics.wisc.edu/people/markeriksson), Professor
Lisa Everett (https://www.physics.wisc.edu/people/lisa-leverett), Professor
Cary Forest (https://www.physics.wisc.edu/people/cary-bforest), Professor
Pupa Gilbert (https://www.physics.wisc.edu/people/pupagilbert), Professor
Francis Halzen (https://www.physics.wisc.edu/people/francis-iphalzen), Professor
Kael Hanson (https://www.physics.wisc.edu/people/kael-dhanson), Professor
Aki Hashimoto (https://www.physics.wisc.edu/people/akihashimoto), Professor
Matthew Herndon (https://www.physics.wisc.edu/people/matthew-herndon), Professor
Lev Ioffe (https://www.physics.wisc.edu/people/levioffe), Professor
Robert Joynt (https://www.physics.wisc.edu/people/robert-joynt), Professor
Albrecht Karle (https://www.physics.wisc.edu/people/albrechtkarle), Professor
Shimon Kolkowitz (https://www.physics.wisc.edu/people/shimonkolkowitz), Assistant Professor
James Lawler (https://www.physics.wisc.edu/people/james-elawler), Professor
Alex Levchenko (https://www.physics.wisc.edu/people/alexlevchenko), Associate Professor
Dan McCammon (https://www.physics.wisc.edu/people/dannccammon), Professor
Robert McDermott (https://www.physics.wisc.edu/people/robert-fmcdermott), Professor
Marshall Onellion (https://www.physics.wisc.edu/people/marshallfonellion), Assistant Professor
Kimberly Palladino (https://www.physics.wisc.edu/people/kimberly-jpalladino), Associate Professor
Yibin Pan (https://www.physics.wisc.edu/people/yibinpan), Associate Professor
Brian Rebel (https://www.physics.wisc.edu/people/brianrebel), Associate Professor
Mark Rzchowski (https://www.physics.wisc.edu/people/markrzchowski), Professor
Mark Saffman (https://www.physics.wisc.edu/people/markssaffman), Professor
John Sarff (https://www.physics.wisc.edu/people/john-ssarff), Professor
Gary Shiu (https://www.physics.wisc.edu/people/garyshiu), Professor
Wesley Smith (https://www.physics.wisc.edu/people/wesley-hsmith), Professor
Paul Terry (https://www.physics.wisc.edu/people/paul-wterry), Professor
Peter Timbie (https://www.physics.wisc.edu/people/peter-ttimbie), Professor
Justin Vandenbroucke (https://www.physics.wisc.edu/people/justinvandenbroucke), Assistant Professor
Maxim Vavilov (https://www.physics.wisc.edu/people/maxim-gvavilov), Professor
Thad Walker (https://www.physics.wisc.edu/people/thad-gwalker), Professor
Sau Lan Wu (https://www.physics.wisc.edu/people/sau-lanwu), Professor
Deniz Yavuz (https://www.physics.wisc.edu/people/denizyavuz), Professor
Ellen Zweibel (https://www.physics.wisc.edu/people/ellen-gzweibel), Professor

**WISCONSIN EXPERIENCE**

**PHYSICS UNDERGRADUATE COLLOQUIUM**

There is a weekly series of talks in the spring semester called "Physics Today," at which a topic of local research is described by one of the physics faculty. These are open and may be attended by anyone. They can also be taken as a course, PHYSICS 301 Physics Today. See the Course Guide for location and time.
THE PHYSICS CLUB
The University Physical Society (UPS)—also known as the Physics Club—is a student organization for people interested in physics and related fields.

WHAT DOES THE PHYSICS CLUB DO?
The Physics Club organizes events such as seminars, tours, trips, and socials for its members. 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. Every Friday afternoon, we meet with the physics colloquium speaker to learn about the process of becoming a scientist. In addition, UPS sponsors a variety of other events. For example, in the past, we have taken a field trip to Fermilab, sponsored a racquetball tournament, and have frequently gathered for social events such as ice skating, movie night, and bowling.

WHY SHOULD YOU JOIN THE PHYSICS CLUB?
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, 2328 Chamberlin Hall. Joining also adds you to the club email list, so you can be notified about club sponsored events.

PERKS OF BEING A PHYSICS CLUB MEMBER
When you join the Physics Club, you get access to an excellent room, 2328 Chamberlin Hall. This room contains a refrigerator, reference shelves of textbooks, couch, tables, and chairs, a phone, blackboards, and a microwave. We have a several computers in the room. You can get your own key to the room and visit at your leisure, and stay as long as you like. Plus, you get the added bonus of knowing people who are in your classes.

University Physical Society
2328 Chamberlin Hall
ups.physics.wisc.edu
ups-officers@googlegroups.com
To Join:
Drop by Room 2328 Chamberlin Hall and pick up a membership form. Turn in a completed form with your $5 annual dues to a UPS club officer.

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 (PLC) matches upper-level undergraduate students as tutor/mentors in small study groups with students studying introductory physics (algebra-based PHYSICS 103–PHYSICS 104 and calculus-based PHYSICS 207–PHYSICS 208). Physics Peer Mentor Tutors meet twice a week with the same small group of students to overview key concepts, choose and supervise practice problems, answer questions, and serve as a mentor. We strive 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 PLC staff member each week to discuss strategies for teaching course content, including how to use teaching materials that stress conceptual understanding. In addition, 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, and so on.

Our peer mentor tutors report that they greatly enjoy working with their students and in the process 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 postgraduate teaching in middle/high school or as a university teaching assistant. Most tutors are upper-class students majoring in physics, astrophysics, secondary science education, and engineering. We also welcome students from other fields if they have a strong physics background. Students receive either independent study credit or a stipend for participation in the Physics Peer Mentor Tutor program. To apply, please submit a resume, your transcript (unofficial copy is fine), and a short statement about why you would like to be a physics peer mentor tutor (½–1 page).

Physics Learning Center
2337/2338 Chamberlin Hall
Contact: Susan Nossal
2328 Chamberlin Hall
nossal@physics.wisc.edu
608-262-9107

PHYSICS MENTOR PROGRAM
Any student contemplating becoming a physics major is encouraged to obtain a faculty mentor. A mentor is a faculty member with whom students can discuss physics, courses, careers, graduate schools, aspirations, and so on. Mentors are not primarily academic advisors.

RESOURCES AND SCHOLARSHIPS

STUDENT AWARDS
The Fay Ajzenberg-Selove Award is presented to undergraduate women majoring in physics, astronomy, or physics/astronomy for the purpose of encouraging women to continue their careers in science. Dr. Ajzenberg-Selove, who received her Ph.D. in physics in 1952, is currently a professor emerita the University of Pennsylvania.

The Dr. Maritza Irene Stapanian Crabtree Award in physics was established by William Crabtree to honor his wife, Dr. Maritza Crabtree, who graduated with a physics degree in 1971. This annual award benefits undergraduate students in physics based equally on merit and need. The Bernice Durand Undergraduate Research Scholarship was established by Vice Provost/Physics Professor Bernice Durand to promote meaningful undergraduate research opportunities and to
support and encourage women and ethnic minorities as undergraduate majors in the departments of physics and astronomy.

**The Henry and Eleanor Firminhac Physics Undergraduate Scholarship** is given to undergraduates in physics with financial need as the primary consideration. Funding provided by Ralph Firminhac in honor of his parents.

**The L. R. Ingersoll Prize** is given for distinguished achievement in introductory physics. This prize is underwritten by a fund established by the family and friends of the late Professor Ingersoll, a distinguished physicist and teacher at the university who served as department chair for many years.

**The Liebenberg Family Research Scholarship** is for physics, AMEP (applied mathematics, engineering, and physics) or astronomy/physics majors. This scholarship opportunity was initiated by the Liebenberg family for the purpose of promoting undergraduate summer research opportunities.

**The Albert Augustus Radtke Scholarship Award** is given to outstanding junior or senior students majoring in physics or AMEP. This award was made possible by a bequest of the late Mrs. Elizabeth S. Radtke in honor of her husband, a 1900 degree recipient from UW–Madison.

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**For more information.** Go to www.physics.wisc.edu/awards (https://www.physics.wisc.edu/awards) or contact info@physics.wisc.edu.

**Application Process.** The deadline for student application materials is March 15th. No late applications will be accepted.

**To Apply.** Please submit a statement of interest and how this award would help your education. If it is an award that is for financial need (Crabtree and Firminhac) you need to emphasize what the need is. If the award you are applying for also has a merit requirement, the department will run your transcript.