• Every one of you has the capability to graduate with a bachelor of science in physics.

• Every one of you is welcome, regardless of other identities you hold in addition to that of physics student.

• Every one of you may access campus resources to smooth your path through UW and help you transition to life beyond UW.
Physics explores how the universe works
Learning Physics at UW

• Largest undergraduate program in the country
  • 300-level tutorials and advanced lab sections are <25 people
• Capstone Requirement:
  • 80% of majors do research/project on campus
  • Directed Reading in Physics
  • Pedagogy Course
• Society of Physics Students provides community
UW Physics Degree Options

• Comprehensive
  • Graduate school in physics or astronomy
  • Full range of physics and math

• Applied
  • Technical job at B.S. level or M.S. in engineering
  • More flexibility in electives

• Teaching
  • Communicate science to HS or general audience
  • Physics by Inquiry sequence

• Biological
  • Medical school, grad school in biophysics, biomed industry
  • 7 quarters of biology and chemistry in addition to physics core

https://phys.washington.edu/declaring-major
Why major in physics?

• GOOD reasons
  • Because you REALLY want to know WHY the world works
  • Because the list of courses you REALLY want to take at UW gets you a physics degree (or at least close to one)
  • Because you explored several other options, and you like physics the best

• Reasons that tend not to work out well ...
  • Because you decided to do so in middle school
  • Because engineering turned you down
  • Because mom and dad said to

UW offers over 200 undergraduate degree options, and that is before you start to mix and match
What comes next?

- You can take any job where they want you to solve complex problems.
- You can attend any graduate program that builds on a physics base.
Immediate Plans After Physics B.S. ...

• National Data: 1 year post graduation from aip.org/statistics

Physics Bachelors 1 Year Later
8,800 Recent Degree Recipients

WORKFORCE

52%

GRADUATE STUDY
ASTRONOMY OR PHYSICS

29%

GRADUATE STUDY
OTHER FIELDS

19%

Classes of 2017 and 2018 combined

• UW Data: Pre-graduation 2020 (200 students)

Estimated Probability I will ...

work full time

work part time

Phys GS

Other Sci GS

Engr GS

Prof. School

Teaching

Military service

Peace Corps / TFA / etc.

take time off

Percent

Private Sector 32
College & University 6
High School Teaching 3
Active Military 3
Government 3
Other 2
Unemployed, Seeking 5

Percent

Physics 25
Astronomy 4

Percent

Engineering 9
Other Science & Math 5
Education 2
Other 3

100% 80-99% 60-80% 40-60% 20-40% 1-20% 0%
Which STEM BA/BS end up with STEM job?

CS/Math/Stat
Engineering
Physical Science
Life Science
Psychology
Social Sciences

In which careers do Physical Science BA/BS end up?

Physical Science
Health
Non-STEM Manager
Finance
Law
Education
Arts
Service
Sales
Agriculture

https://www.census.gov/dataviz/visualizations/stem/stem-html/
Typical Job Titles/Salaries 1 yr Post B.S.

Data from American Institute of Physics (aip.org/statistics)
Who hires physics bachelor’s in Washington State?

Washington Employers that recently hired new physics bachelor recipients (2014-2018 data)

AbbVie
AeroTEC
Allen Institute for Brain Science
ALS Global
Amazon
Applied Motion Systems
Areva
Assemble Inc.
Battelle
Bluetooth SIG, Inc.
Boeing
BTownWeb
Carlisle IT - Tri Star
Casey Products
Chiption Ross
Corvus and Columba LLC
Dynetics, Inc.
Eagle Harbor Technologies, Inc.
Electroimpact, Inc.
Factset
Fidelity Investments
Fred Hutch Cancer Res Ctr
G.S. Builders
Google
HopeSource
HP Inc.
Inst. Defense Analyses
Inst. Environmental Health
Inst. Health Metrics & Eval.
Intellectual Ventures
Jacobs
Lease Crutcher Lewis
Leidos
Manufacturing Technology Inc.
Marchex, Inc.
Microsoft
Microvision
Mott MacDonald
Orbital ATK
Ozone International
Pacific Northwest National Laboratory
Pellego
Physio-Control Inc
Professional Credit Service
PSC Biotech
Puget Sound Energy
Radiant Vision Systems
RAFI USA
Raisbeck Engineering
Randstad
Scribe America
Seattle Children’s Research Institute
Silicon Mechanics
Tableau Software
Tecplot Inc.
TigerStop
United States Navy
UT Austin
UW
UtiliQuest
Visiongate
VL Systems
WA State Dept of Transportation
Woodruff Sci. Computing
Questions about Why

(Before we move on to “HOW”)
WHY?

• For the past 5 years, we have had the largest undergraduate program in the country
  • >200 undergraduate degrees in 2019-20, a record

• Ten years ago
  • we graduated 57 physics bachelors in a single degree track.
  • we had 4.5 more tenure-track faculty FTE than we do now
  • we could fit our required 300-level courses in an 80-seat lecture hall

• Choice: limit the number of majors or decrease the requirements to graduate
  • Bottlenecks: Advanced Laboratory and Capstone Opportunities

GOING FORWARD

• We hope to admit to the major all students who truly want to be physics majors and who have the skill and knowledge base to succeed in the major.

• Prior to Winter 2020, the requirements were to earn ≥ 2.6 in recent physics and math classes. The median grade in the introductory sequence is typically 2.8.

• How competitive admission will be depends on the level of interest. We admitted 75-80% in winter/spring
What does it take to be a physics major?

• **Interest** –
  - Keen to learn about how and why matter interacts
  - Enjoy “mathematization” of events and processes, and using the results to predict the future
  - Proactive participation in your own learning
  - Desire to pursue a career that uses physics knowledge and skills

• **Skills** –
  - Time management and organization
  - Problem solving
  - Mathematical facility

• **Knowledge base** –
  - Algebra, Trigonometry, Calculus
  - Introductory physics series
    (mechanics, electricity, magnetism, waves, optics, quanta, heat)

*Typically apply Autumn or Spring while taking PHYS 224, 225 and/or 227*
Common Physics Core (55 cr) – taken by all majors

- 5-quarter overview of physics (21 cr)
  - Motion; Electricity & Magnetism; Oscillations & Waves; Thermal Physics; Quantum Physics
- Key tools for doing physics (8 cr)
  - Mathematical tools
  - Electronics lab
  - Overview of physics research
- Common sequence for applying those tools (8 cr)
  - Advanced Electricity and Magnetism
- At least 4 quarters of math (≥ 18 cr)
  - One year of Calculus
  - Selections from Linear Algebra, Differential Equations, Vector Calculus, Partial Diff. Eqn, Complex Analysis

See https://phys.washington.edu/major-requirements
<table>
<thead>
<tr>
<th></th>
<th>Comprehensive (+38-41 cr)</th>
<th>Applied (+33-36 cr)</th>
<th>Teaching (+38-41 cr)</th>
<th>Biological (+51-55 cr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math</td>
<td>Math Phys II + Another adv. math</td>
<td>Matlab or Python + +2 adv. math</td>
<td>Math Phys II + Another adv. math</td>
<td>Math Phys II</td>
</tr>
<tr>
<td>32x</td>
<td>Relativity &amp; Particles, Quantum Mechanics; 3 of E&amp;M, QM, Astro, Classical Mech, Stat Mech</td>
<td>One from “call me a physicist” list</td>
<td>Relativity &amp; Particles, Quantum Mechanics; 1 more “call me a physicist”</td>
<td>Quantum Mechanics Statistical Physics 1 more “call me a physicist”</td>
</tr>
<tr>
<td>Lab</td>
<td>Two advanced labs</td>
<td>Data Analysis lab</td>
<td>One advanced lab</td>
<td>(in bio/chem)</td>
</tr>
<tr>
<td>Capstone</td>
<td>Research or Seminar</td>
<td>Research, internship or Seminar</td>
<td>Teaching practicum</td>
<td>bio-related research</td>
</tr>
<tr>
<td>UD Elect</td>
<td>2 additional Phys/Cognate Class</td>
<td>3 additional Phys/Cognate (may include 1 lab; 1 intro sci)</td>
<td>Sequence for future teachers</td>
<td>Biophysics</td>
</tr>
<tr>
<td>Other Sci</td>
<td></td>
<td></td>
<td></td>
<td>1 year intro chemistry 2 qtrs. Intro biology 2 additional bio/chem</td>
</tr>
</tbody>
</table>
## Physics Minor (30-36 cr, plus math*)

<table>
<thead>
<tr>
<th>Core (21 cr)</th>
<th><a href="https://phys.washington.edu/minor-physics">https://phys.washington.edu/minor-physics</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Motion, Electricity &amp; Magnetism, Oscillations &amp; Waves, Thermal Physics, Quantum Physics</td>
<td></td>
</tr>
</tbody>
</table>

### Specialization (Pick 1)

<table>
<thead>
<tr>
<th>Physics Education (15 cr)</th>
<th>Physics by Inquiry Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Physics (9 cr)</td>
<td>Intro Laboratory Analysis</td>
</tr>
<tr>
<td></td>
<td>Electronics Lab</td>
</tr>
<tr>
<td></td>
<td>Additional Advanced Lab</td>
</tr>
<tr>
<td>Mathematical Physics (12 cr)</td>
<td>Math Physics I and II: Phys 227, 228</td>
</tr>
<tr>
<td></td>
<td>Either Electricity &amp; Magnetism (321) or Quantum Mechanics (324)</td>
</tr>
</tbody>
</table>

*Note: Prerequisites for these classes includes 15 credits of calculus sequence, plus 6-7 credits of advanced math
Declaring a Physics Major

1. Complete PHYS 123 and MATH 126.
2. Take a physics course within the previous two quarters and be enrolled in a physics course with number > 220.
3. Develop a graduation plan and enter into UW MyPlan.
   - Apply online during first three weeks of Spring or Autumn quarter.*
   - Meeting minimum requirements does not guarantee admission. Admission is capacity constrained, based on holistic review of a student’s record.
   - New majors must agree to the department Code of Conduct and have their graduation plan approved by Physics Student Services.

* Winter quarter for transfer students or extended premajors only

See https://phys.washington.edu/declaring-major
DUE 5 pm OCT 16
1. Make a list of courses you want to take while an undergraduate.
2. Check their prerequisites, and add those to your list.
3. Compare to your list degree requirements
   - https://phys.washington.edu/major-requirements
4. Pick the degree track closest to your list.
5. Add in courses not on your list needed to meet degree requirements.
6. Put together a rough draft of a plan
   - Check that courses are offered in the quarter you hope to take them.
   - Check that you don’t have too many problem sets due each week
   - Don’t forget your language, diversity, VLPA and I&S requirements
7. Enter your plan into MyPlan
8. Discuss your plan with Physics Student Services, and edit as appropriate
   - Needs to be approved by the end of Autumn Quarter.
Personal Statement

1. Reason(s) you want to major in physics, and how your graduation plan fits your career goals

2. Personal strategies for success in and out of the classroom

3. Discuss any flags* in your transcript, and how you have addressed issues that might otherwise impact your ability to thrive in the major.
   
   *e.g., low grades in one or more quarters, “S” grades, multiple quarters without physics and/or math courses
   
   NOTE: These flags will NOT stop you from being admitted if it is clear you are ready to succeed going forward. We do, however, need to see you are aware of issues and how to deal with them.

4. If you have not completed PHYS 121-2-3, MATH 124-5-6, and/or are not currently enrolled in PHYS 224, 225 or 227, you will most likely have your application postponed to a future quarter. If you believe you should be considered in Aut20, this must be well justified in your statement.

5. EDIT until it fits into 3000 characters or less.
Criteria for Satisfactory Progress

• Students must take physics courses, courses from the menu of math classes, or electives in other departments that meet a requirement for the physics major. Exceptions (e.g. for double major, study abroad) should be pre-approved.

• Maintain a cumulative average GPA of at least 2.0 in all physics classes.

• Students must earn a numerical grade of at least a 2.0 in each course used to satisfy the requirements of the physics major.

See https://phys.washington.edu/uw-physics-major-continuation-policy
Physics Student Services

- Director of Student Services
  - Catherine Provost (cuala@uw.edu)
    - All graduate issues
    - Grad school-related UG issues

- Staff Advisors
  - Margot Nims (sassy2@uw.edu) and Paula Newcomer (newcomer@uw.edu)
    - All undergraduate issues

- Faculty Advisor
  - Prof. Marjorie Olmstead (ufaphys@uw.edu)
    - advice from a faculty member; waivers and substitutions

- Program Assistant
  - Amy Glenz (amyglenz@uw.edu)

To reach us during the COVID-19 shut-down:
https://phys.washington.edu/advising-student-services-0

If you aren’t sure who should answer your email:
physadvs@uw.edu

To get on our mailing list, go to
http://mailman11.u.washington.edu/mailman/listinfo/announcements-physics-majors
We look forward to your joining us!!

Applications
Due 5 pm
Friday OCT 16

To talk with us or get your questions answered during the COVID-19 shut-down: https://phys.washington.edu/advising-student-services-0. physadvs@uw.edu