So... What *can* you do with a physics degree?

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Goals for this talk:
- Overview of which job sectors physics graduates work in
- A few specific examples of successful physics career profiles
- Provide some resources for further exploration
But first...  

thank you
What do physicists do?

Definition: Physicist

noun

an expert in or student of physics.
What do physicists do?
What are they doing (Bachelor’s)?

Largely finding employment in the private sector

> 8500 Physics Bachelor’s degrees are awarded annually in the U.S.

About half go straight into the workforce

Table: Initial Employment Sectors of New Physics Bachelors, Classes of 2019 & 2020 Combined

<table>
<thead>
<tr>
<th>Employment Sector</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Sector</td>
<td>59%</td>
</tr>
<tr>
<td>College &amp; University</td>
<td>18%</td>
</tr>
<tr>
<td>High School</td>
<td>6%</td>
</tr>
<tr>
<td>Civilian, Gov’t, National Lab</td>
<td>7%</td>
</tr>
<tr>
<td>Active Military</td>
<td>3%</td>
</tr>
<tr>
<td>Other</td>
<td>7%</td>
</tr>
</tbody>
</table>

Figure based on 5764 individuals
What are they doing (Bachelor’s)?

Majority working in STEM jobs

These physicists often have a job title that is not “physicist!”

Field of Employment for New Physics Bachelors in the Private Sector, Classes of 2019 & 2020 Combined

- Engineering: 35%
- Computer Software: 24%
- Non-STEM, Regularly Solves Technical Problems: 14%
- Non-STEM, Rarely or Never Solves Technical Problems: 8%
- Other STEM: 4%
- Physics or Astronomy: 15%

STEM refers to natural science, technology, engineering and mathematics. Regularly solving technical problems refers to respondents who selected “Daily”, “Weekly”, or “Monthly” on a four-point scale that also included “Rarely or Never”.

aip.org/statistics
Common Job Titles of Physics Bachelors

Engineering
- Systems Engineer
- Electrical Engineer
- Design Engineer
- Mechanical Engineer
- Project Engineer
- Optical Engineer
- Manufacturing Technician
- Associate Engineer
- Application Engineer
- Development Engineer
- Process Engineer / Technician
- Product Engineer
- Product Manager
- Research Engineer
- Quality / Test Engineer
- Technical Services Engineer
- Integration Engineer
- Accelerator Operator

Computer Hardware/Software
- Software Engineer / Developer
- Programmer
- IT Consultant
- Systems Analyst
- Technical Support Staff
- Data Analyst / Scientist

Business/Finance
- Business Analyst
- Consultant
- Project Manager
- Investment Associate / Trader

Research and Technical
- Research Assistant
- Research Associate
- Research Technician
- Lab Technician / Assistant Scientist

Education
- High School Physics Teacher
- High School Science Teacher
- Middle School Science Teacher
- Instructor
- Tutor

What are they doing (PhDs)?

2015-2016 graduates: 1 year after PhD

About **half** of Physics PhDs are initially employed in academic sector.

However, ~**73%** of the potentially permanent jobs were in the private sector.

- **47%** Postdoc Positions
  - University: 560
  - Government*: 150
  - Other: 40

- **39%** Potentially Permanent Positions
  - Private Sector: 455
  - Academe: 100
  - Government*: 45
  - Other: 25

- **8%** Other Temporary Positions
  - Academe: 90
  - Private Sector: 30
  - Other: 10

6% of those in the U.S. were unemployed the winter after receiving their degrees. <1% of those in the U.S. were not employed and not seeking employment.
Industry demand

Percentage of Physics PhDs* Employed in the Private Sector

Source: NSF Survey of Doctoral Recipients, 2001 - 2013

*Data includes PhDs employed in potentially permanent positions only. Data excludes PhDs not in the labor force. Average unemployment is 3%.
Examples of Successful Physicists’ Careers

aps.org/careers/physicists/profiles
Learn about faculty and lecturers teaching and doing research at universities and colleges

Academia & Research Universities

Learn about teaching physics with elementary, middle, high school, and college students

K-12 and Four-Year College Teaching

Explore the career paths of physicists in industry jobs working in R&D, consulting and more

Private Sector

Gain some insight into the role of scientists working at national labs

Government/National Lab
Physicist Profile

Zahra Hussaini, BS, Site Reliability Engineer

Zahra switched her major to physics to seek a deeper understanding of materials science. As she worked at NIST to get a taste of research, she instead discovered her passion for computer science.

Currently, Zahra works on Google Search, debugging and fixing issues before they become visible to users.

“I think physics is an awesome degree because it teaches you a niche and a way of problem solving that is applicable to so many different fields.”

Learn more: aps.org/careers/physicists/profiles/hussaini.cfm
December found a job at a biotech startup straight out of college. She traveled to several countries to teach science and English and to support humanitarian work. This fueled her passion for a career in global development with strong social responsibility.

Now, December is a project manager working on a device to treat brain aneurysms and strokes!

Learn more: aps.org/careers/physicists/profiles/martin.cfm
Paul Markoff-Johnson, MS
Director of Product Development

Paul gained an appreciation for physics when he saw its connection with math.

He switched majors from engineering to physics due to the broader scope, variety of career options, and the invaluable skill of using basic principles to solve problems.

Currently, Paul is the Director of Product Development at a company specializing in thin film technology.

“You get that ability to walk into strange situations, unfamiliar situations, and think from what I call basic principles.”

Learn more: aps.org/careers/physicists/profiles/markoff.cfm
Neha Pachauri, PhD, Process Engineer

Neha first pursued science due to her natural inquisitiveness. After a Master’s degree, teaching physics made her want to dig deeper and get a PhD.

Looking to apply her training to real-world applications, Neha joined Intel’s fabrication facility. She found working on cutting edge technology to be intellectually stimulating.

Advice for students: Try new things and make time for a hobby.

Learn more: aps.org/careers/physicists/profiles/pachauri.cfm
Who can do physics? Who does physics?

Bachelor's Degrees Earned by Women

--- All Bachelor's
- Biology
- Chemistry
- Math & Stats
- Earth Sciences
- Engineering
- Physics
- Computer Science

Source: IPEDS and APS

Most female physics majors/physicists report becoming interested in physics as a potential career when they were in high school.


STEP UP: https://engage.aps.org/stepup/home

Who can do physics? Who does physics?

Who can do physics? Who does physics?

Resources (learn more)

APS Careers 2023 Guide

• Breadth of opportunities for physics graduates
• Advice from professionals
• List of companies hiring physicists

[go.aps.org/careersguide]

SPS Careers Toolbox

• Lists common job titles
• Effective job searching tips
• Resume, cover letter help
• Tips for interviewing

[spsnational.org/sites/all/careerstoolbox]

APS Careers Website

• APS Job Board
• Professional Guidebook
• Physicist Profiles
• Common Careers Paths

[aps.org/careers]
Resources (for the classroom)

Careers in Physics Lesson Plan
https://engage.aps.org/stepup/curriculum/careers

1. Students brainstorm careers that one can have with a physics degree.
Resources (for the classroom)

Careers in Physics Lesson Plan
https://engage.aps.org/stepup/curriculum/careers

2. Students complete a brief survey to determine areas of interest for their future careers.
Resources (for the classroom)

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https://engage.aps.org/stepup/curriculum/careers

3. Using data from their surveys and a matrix, students are matched to relevant physicist profiles to research and discuss.
Resources (for the classroom)

Careers in Physics Lesson Plan
https://engage.aps.org/stepup/curriculum/careers

4. Students discuss new careers in physics they learned about, and reflect on how their perceptions of careers in physics have changed.
Resources (for the classroom)

Careers in Physics Lesson Plan
https://engage.aps.org/stepup/curriculum/careers

5. CRITICAL COMPONENT:
Students complete a personal career profile in which they envision themselves as a future physicist.
Resources (for the classroom)

Careers in Physics Lesson Plan
https://engage.aps.org/stepup/curriculum/careers

6. Students discuss data presented by the teacher on careers and salaries in physics.
Summary

- The careers accessible to physics graduates are very broad.
- Most physics graduates work in the private sector (at all degree levels, Bachelor’s to PhD), applying their physics knowledge and training in intellectually stimulating and rewarding jobs.
- High school is a critical time to inspire the next generation of physicists.

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Questions? Comments? Discussion?

What do you do in your classroom to help your students understand what is like to do physics/be a physicist?

Success stories of past students who have gone on to study physics in college, and/or pursue a physics career?

What challenges, if any, have you encountered related to the ideas and topics we’ve discussed?

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