Career Options for Physicists

ATTENTION PHYSICS STUDENTS:

You Have Options

Q: What can you do with a physics degree?
A: Get a PhD and become a physics professor OR ...

What comes after the "or" is not widely known in many physics departments, even though data show that less than a third of physics bachelor's degree recipients enroll in a physics or astronomy graduate program within one year of graduating. People with undergraduate degrees in physics pursue a variety of fascinating, fulfilling, and well-paying careers. This is evidenced by decades of data collected by the Statistical Research Center at the American Institute of Physics. Illustrated below are the common paths of physics bachelor's recipients based on the most recent data. Unless otherwise indicated, all data are for graduates of US physics programs who remain in the United States.

Over 8,400 physics bachelor's degrees were awarded in the class of 2015–16.

A record high! Typically...[1]

- Three-fourths of those who earn physics bachelor's degrees have **research experience**.[2]
- One-third graduate with a **double major**, many in math.[3]
- One-tenth start at **two-year colleges**.[4]

Within one year of earning a physics bachelor's degree...

20% enroll in graduate programs other than physics or astronomy or in professional degree programs.

- About half enter an **engineering** program; the rest enter programs in math, medicine, education, or another field.[5]
- As a group, physics majors score among the highest of all majors on medical school and law school admission tests (the **MCAT** and **LSAT**).[6]
- Students in professional degree programs are more likely to be **self-funded** than students in research-based graduate programs, who usually have teaching assistantships, research assistantships, or fellowships.[5]

~30% attend graduate school in physics or astronomy.[5]

- About 3/4 enroll in a **PhD program**; the remainder choose a master's degree program.[5]
- Most are **fully supported** by teaching assistantships, research assistantships, or fellowships.

Of those who start graduate school in physics or astronomy...

~50% enter the workforce.[5]

Common employment sectors include:

Private sector
- ~2/3 of those who enter the workforce take jobs in the private sector.
- Of those that enter the private sector, the large majority hold science, technology, engineering, and math (STEM) positions.
- Those in private-sector STEM positions are well compensated, with a median starting salary of about $57K.

Colleges or universities
- More than half of the students in these positions were employed at the same institution they graduated from. Many work in research or IT.

Civilian government
- The civilian government sector includes national labs. The vast majority of these positions are in STEM fields, many related to defense or energy.

Active military
- Physics bachelor's work across all branches of the armed forces. Many work in aviation or nuclear power.

High school teaching
- About a quarter of the high school teachers indicated that their undergraduate degree had a high school physics teaching focus.

The Statistical Research Center does not formally follow the career paths of these individuals, but we hear that they go on to successful careers in engineering, management, education, law, medicine, business, and a variety of other areas.

Add to the mix:
Foreign citizens coming to the United States for a graduate degree, students who earned bachelor's degrees in another field but want a graduate degree in physics, and students who earned a physics bachelor's degree in previous academic years.

~1 out of 6 US physics bachelor's receive a physics or astronomy PhD.*

- A doctorate in physics takes an average of **6–7 years**.[7]
- Most PhD students are **fully supported** by teaching or research assistantships or fellowships.[5]

Within one year of earning a physics PhD...

~1 out of 12 US physics bachelor's receive an exiting physics or astronomy master's degree.*

Exiting master's degree recipients are individuals who leave their current department upon receiving a master's degree. Many other students earn an en route master's degree, continuing on to a physics PhD in the same department.

- Over half of those who earn exiting master's degrees do so with a **specific research focus**.[2]
- A master's degree in physics usually takes about **two years**.

For US citizens, within one year of earning an exiting master's degree...

~1/2 enter the workforce.[5]

- About half work in the **private sector**, virtually all in STEM fields.
- The largest portion of exiting master's working in the private sector are employed in the field of engineering.
- Other common employment sectors for exiting master's include **colleges and universities, high schools, and civilian government**.

~1/2 continue with graduate studies.[5]

- Most transfer to other institutions to earn a **physics PhD**.
- Others transfer to programs in **related fields** such as materials science, engineering, medical physics, and mathematics.

~1/2 accept a temporary position

(e.g., a postdoc), primarily at a university or with the government.[5]

~40% accept a potentially permanent position.[5]

- ~3/4 of new PhDs accepting potentially permanent positions are employed in the **private sector**.
- The **median starting** salary for new physics PhDs employed in the private sector is **$105K**.

Employment sectors of physics phDs 10-14 years since receiving their degree.[7]

- 45% Private sector
- 43% Academe
- 6% Government
- 6% Other

References and Notes

The following data references published by the Statistical Research Center of the American Institute of Physics are available online at: www.aip.org/statistics.

1. Starr Nicholson and Patrick J. Mulvey, *Roster of Physics Departments with Enrollment and Degree Data, 2016*, September 2017.
2. AIP Statistical Research Center, *AIP Physics Trends: Research Experiences of Physics Undergraduates*, Fall 2009.
3. AIP Statistical Research Center, *AIP Physics Trends: Physics Students Have Broad Interests*, Spring 2011.
4. Susan White and Raymound Chu, *Physics Enrollments in Two-Year Colleges*, April 2013.
5. AIP Statistical Research Center, data from follow-up surveys of physics bachelor's, master's, and PhDs, www.aip.org/statistics/employment.
6. Casey Langer Tesfaye and Patrick Mulvey, *MCAT, LSAT and Physics Bachelor's*, December 2013.
7. Patrick J. Mulvey and Starr Nicholson, *Trends in Physics PhDs*, February 2014.

*Estimate provided by the AIP Statistical Research Center, Summer 2014.

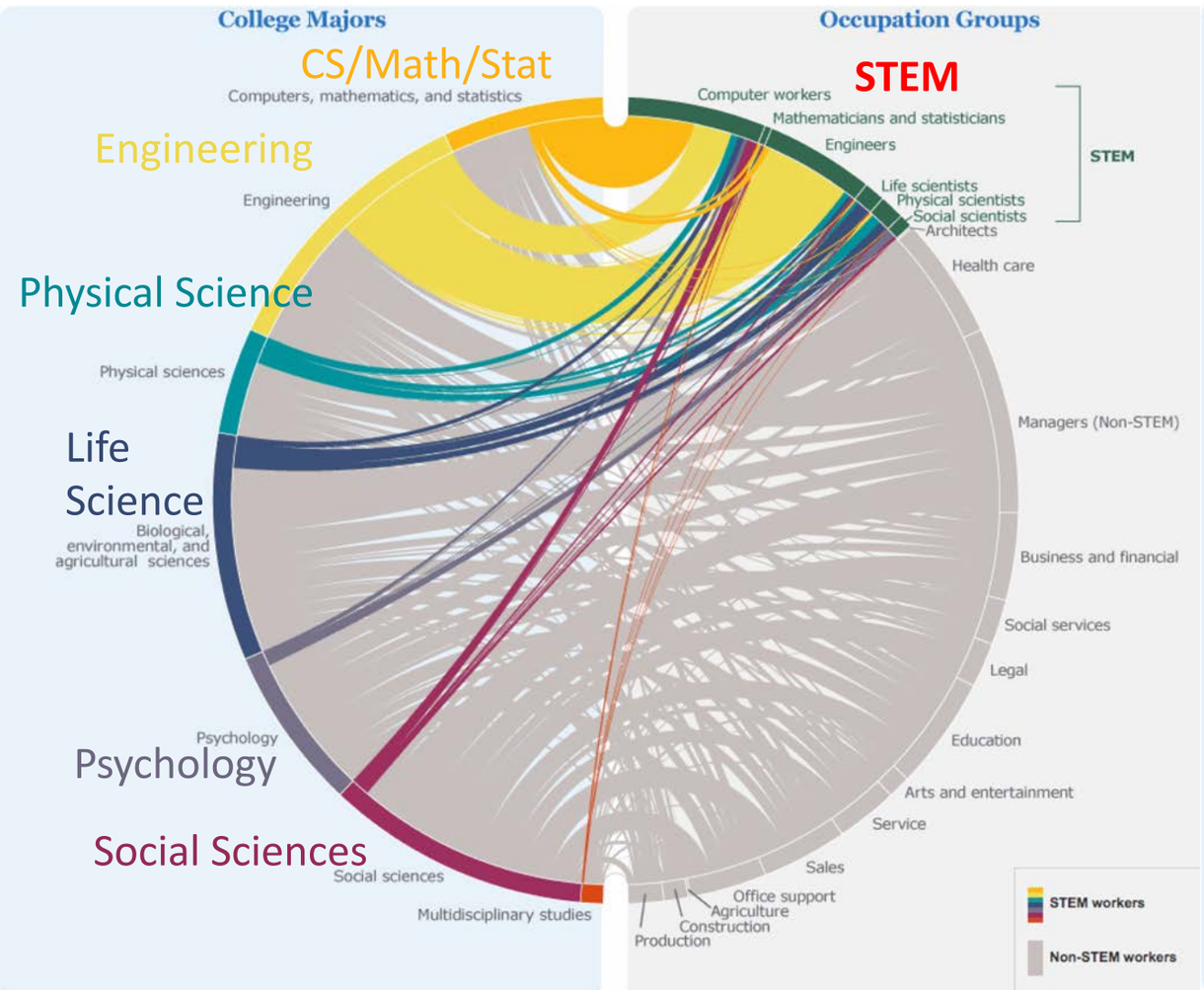
Learn more at the Careers Toolbox website:
www.spsnational.org/careerstoolbox

Updated 12/2017

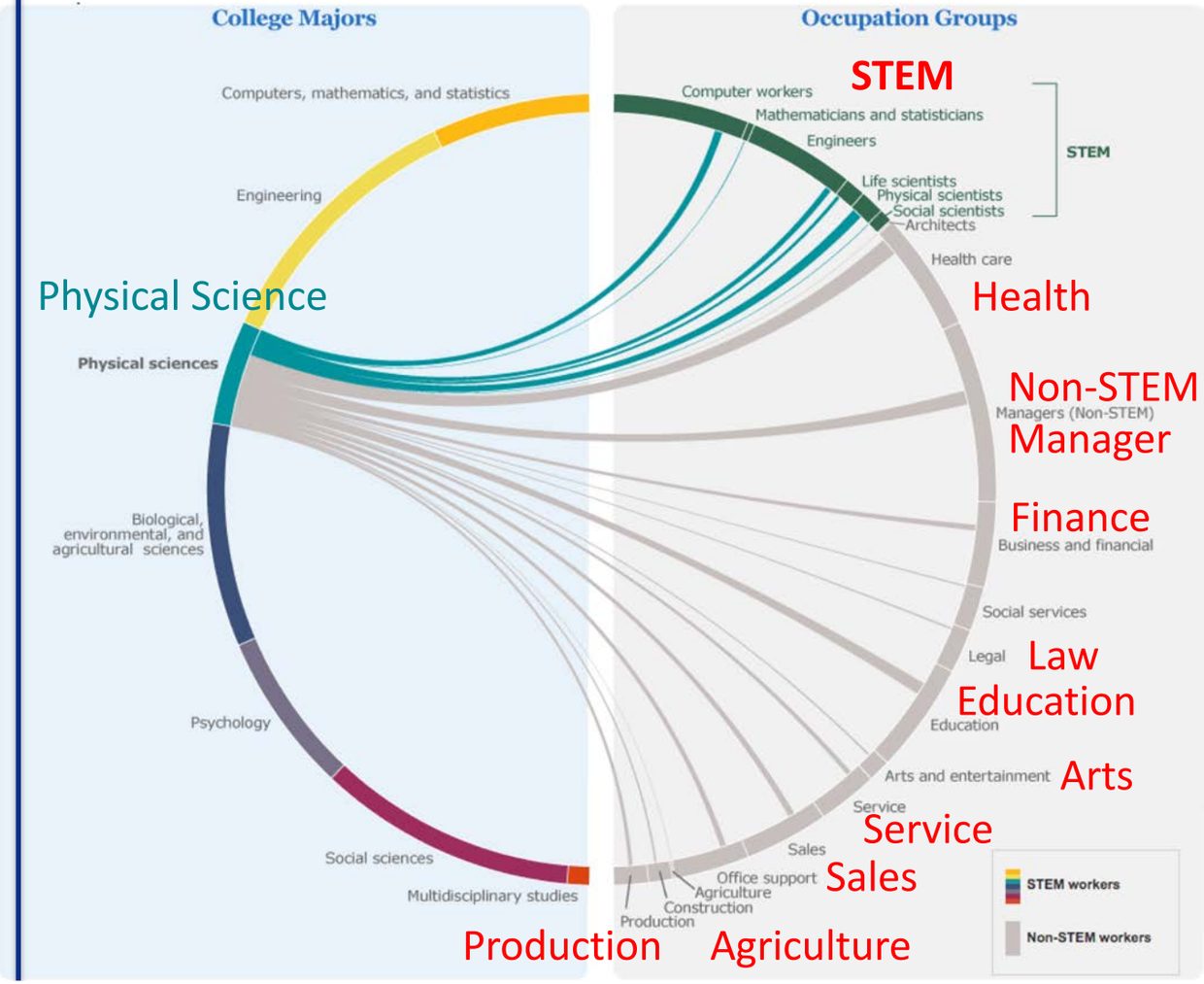
Occupation vs. College Degree

https://www.census.gov/dataviz/visualizations/stem/stem-html/

Which STEM BA/BS end up with STEM job?

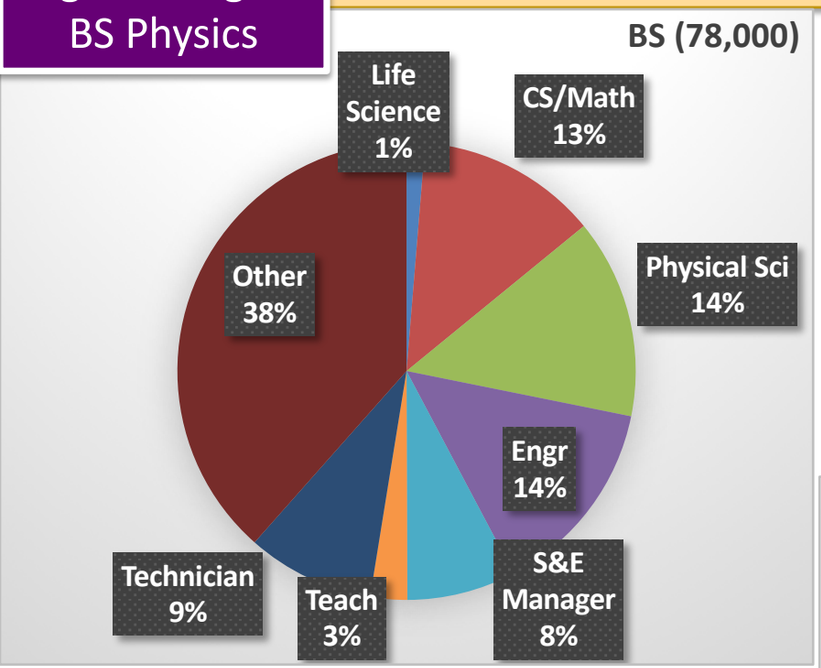


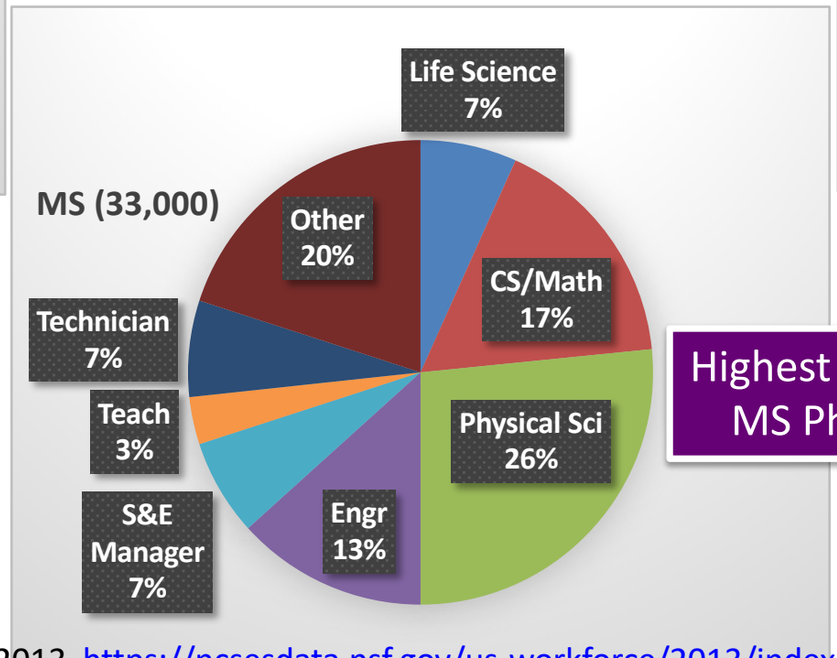
In which careers do Physical Science BA/BS end up?



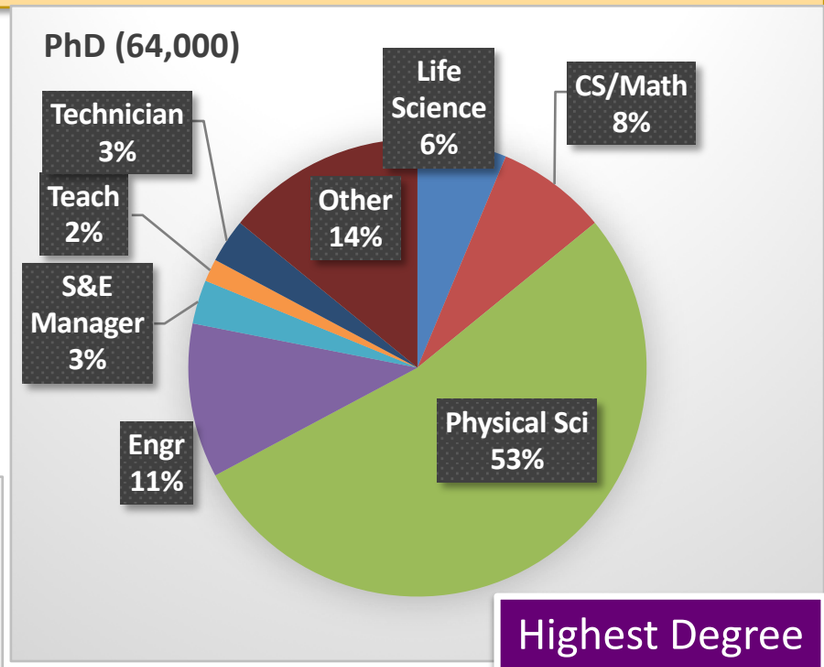
What do Career Physicists Do?

Highest Degree
BS Physics





Highest Degree
MS Physics



Highest Degree
PhD Physics

NSF Survey of College Graduates 2013 https://ncsesdata.nsf.gov/us-workforce/2013/index.html Tables 3.2, 3.3, 3.4

Typical Job Titles 1 yr Post B.S.

Engineering

- Systems Engineer
- Application Engineer
- Electrical Engineer
- Development Engineer
- Design Engineer
- Engineering Technician
- Mechanical Engineer
- Field Engineer
- Project Engineer
- Process Engineer
- Optical Engineer
- Process Technician
- Manufacturing Engineer
- Product Engineer
- Manufacturing Technician
- Product Manager
- Laser Engineer
- Research Engineer
- Associate Engineer
- Test Engineer
- Technical Services Engineer
- General Engineer

Education

- High School Physics Teacher
- High School Science Teacher
- Middle School Science Teacher
- Substitute Science Teacher

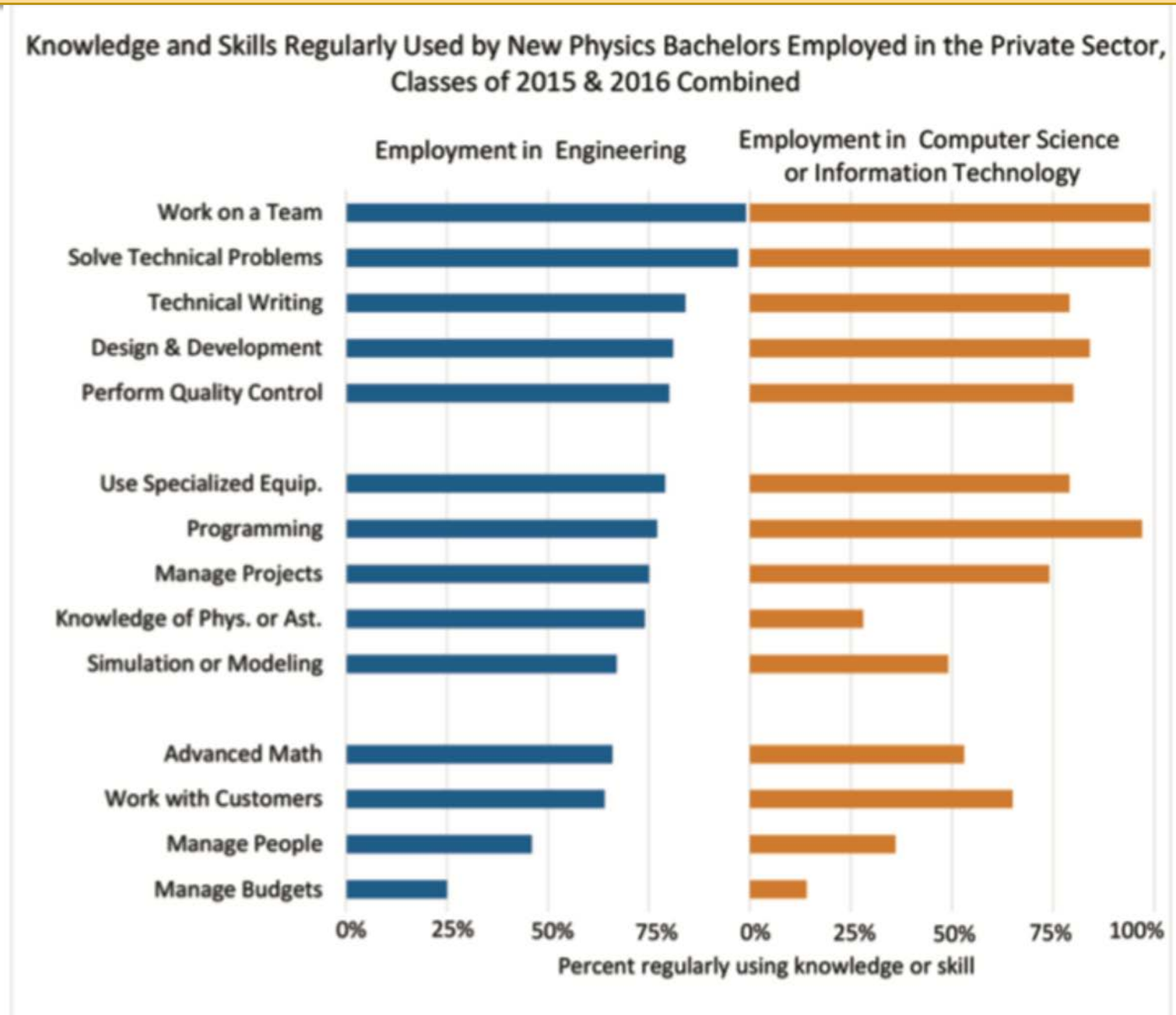
Research & Technical

- Research Assistant
- Research Associate
- Research Technician
- Lab Technician
- Lab Assistant
- Accelerator Operator
- Physical Sciences Technician

Computer Hardware / Software

- Software Engineer
- Programmer
- Web Developer
- IT Consultant
- Systems Analyst
- Technical Support Staff
- Analyst

Typical Job Skills Utilized



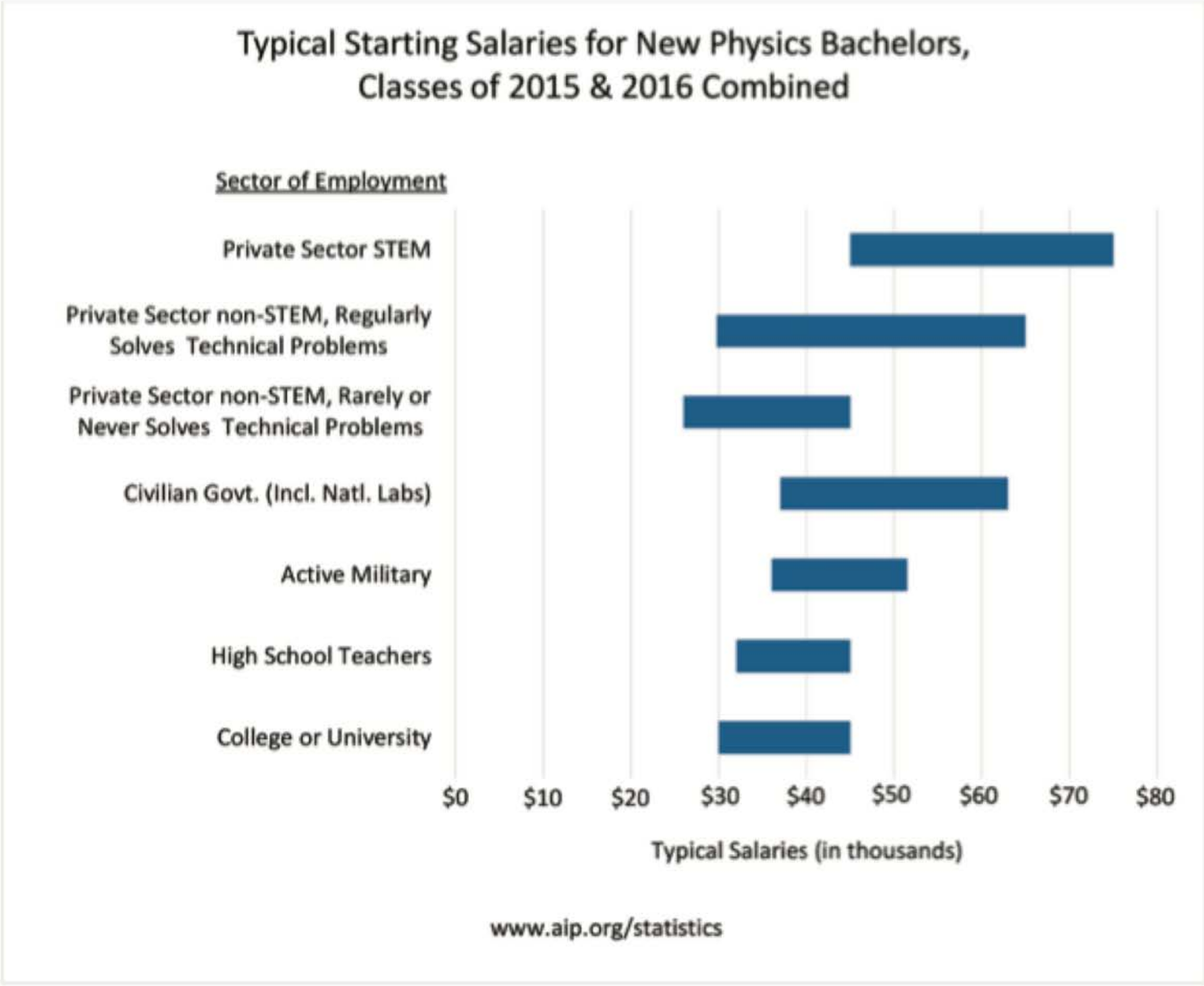
What resources are available for my job search?

- American Physical Society Careers Page
  - http://www.aps.org/careers/
- Society of Physics Students Careers Page
  - https://www.spsnational.org/career-resources
- AAAS (Science Magazine) Career Resources
  - http://www.sciencemag.org/careers/career-resources
- UW Career and Internship Center
  - http://careers.uw.edu/
- Faculty, Alumni, others in area
  - Today's Career Panel

Career Panel

- **Cliff Slaughterbeck**, Senior Manager, System Design Engineering at the Allen Institute for Brain Science (employer)
- **Marie Scott**, Assistant Project Manager at Arcadis, leading global natural and built asset design and consultancy firm.
- **Arielle Leon**, B.S Physics/Astronomy UW 2012: System Design Engineer at the Paul Allen Institute for Brain Science
- **Patrick Chidsey**: Associate Director at the UW's Career Center

Typical Starting Salaries



Private sector job tend to pay more upfront but other jobs, such a teaching, have other benefits.

Figure 6. Typical Starting Salaries for New Physics Bachelors

Figure includes only bachelors in full-time, newly accepted positions. Typical salaries are in the middle 50% i.e, between the 25th and 75th percentiles. STEM refers to positions in natural science, technology, engineering and math. Regularly solving technical problems refers to respondents who selected "Daily", "Weekly", or "Monthly" on a four-point scale that also included "Rarely or Never" when asked how frequently they solved technical problems in their positions.

National Resources - SPS

SPS Jobs | jobs.spsnational.org
SPS Jobs has job listings appropriate for students seeking employment with a bachelor's degree in physics.
Physics Today Job Resources | www.physicstoday.org/jobs/career_resources SPS Career Resources | www.spsnational.org/career-resources
Visit this Society of Physics Students site for career-related information, including profiles of people working in different careers, advice, and links to related resources.
Who's Hiring Physics Bachelor's? | www.aip.org/statistics/whos-hiring-physics-bachelors
Click on a state to see a list of some of the employers that hired physics bachelor's recipients recently in that state.
AIP Statistics: Skills Physics Bachelor's Use | www.aip.org/ statistics /reports/physics-bachelors-initial-employment2014
This link will take you to a report titled, "Physics Bachelor's Initial Employment." Figure 4 in this report shows the skills used by physics bachelor's recipients in their first job. Use these lists when you are thinking about the knowledge and skills you have. Make sure these are highlighted in your resume.
APS Careers Website | www.aps.org/careers
Access a host of career resources at the APS Careers website, including links to the APS Webinar Archive, Career Workshops from annual meetings, links to a professional development guide, and informa on on Student Travel Awards and Future of Physics Days events at APS national meetings, specifically geared toward undergraduates.