



Physics & Astronomy Career Workshop #1

Career Formation:

What Do Physicists Do, and What Should I Do?

11 October 2023

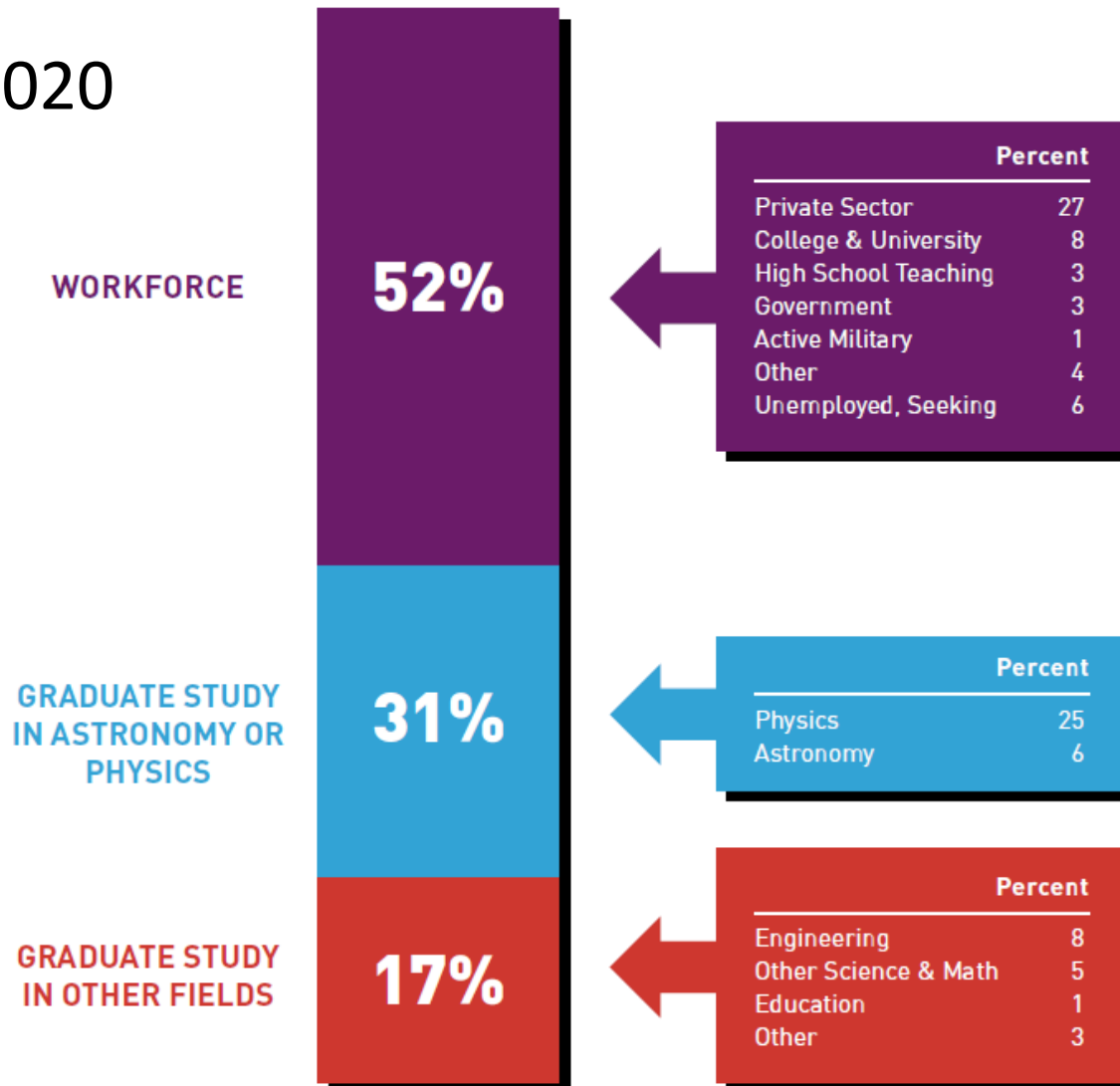
A FEW FACTS: PHYSICS DEGREES IN THE US

- 8618 people graduated with bachelor's degrees in physics in 2021/22
- 2015 people graduated with PhDs in physics in 2021/22
- 434 people were hired as full-time physics faculty members in 2018/19 (~75 of those were already faculty)
- 5% of all physics BS/BA recipients eventually end up as physics professors

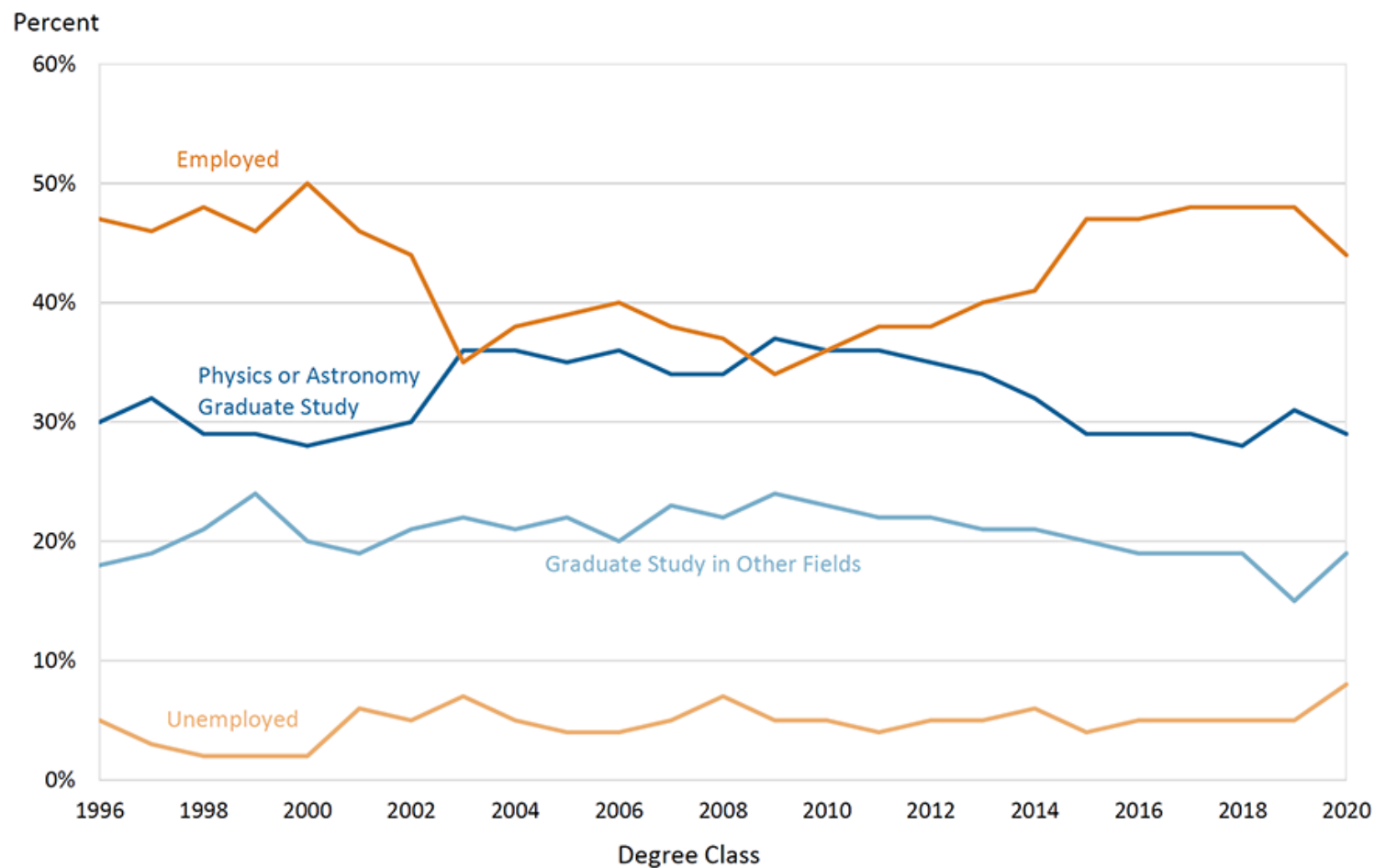
Physics Bachelors 1 Year Later

9,250 Recent Degree Recipients

Classes of 2019 and 2020
combined



Status of Physics Bachelors One Year After Degree, Classes 1996 through 2020



Field of Graduate Study for Physics Bachelors One Year After Degree, Classes of 2019 & 2020 Combined

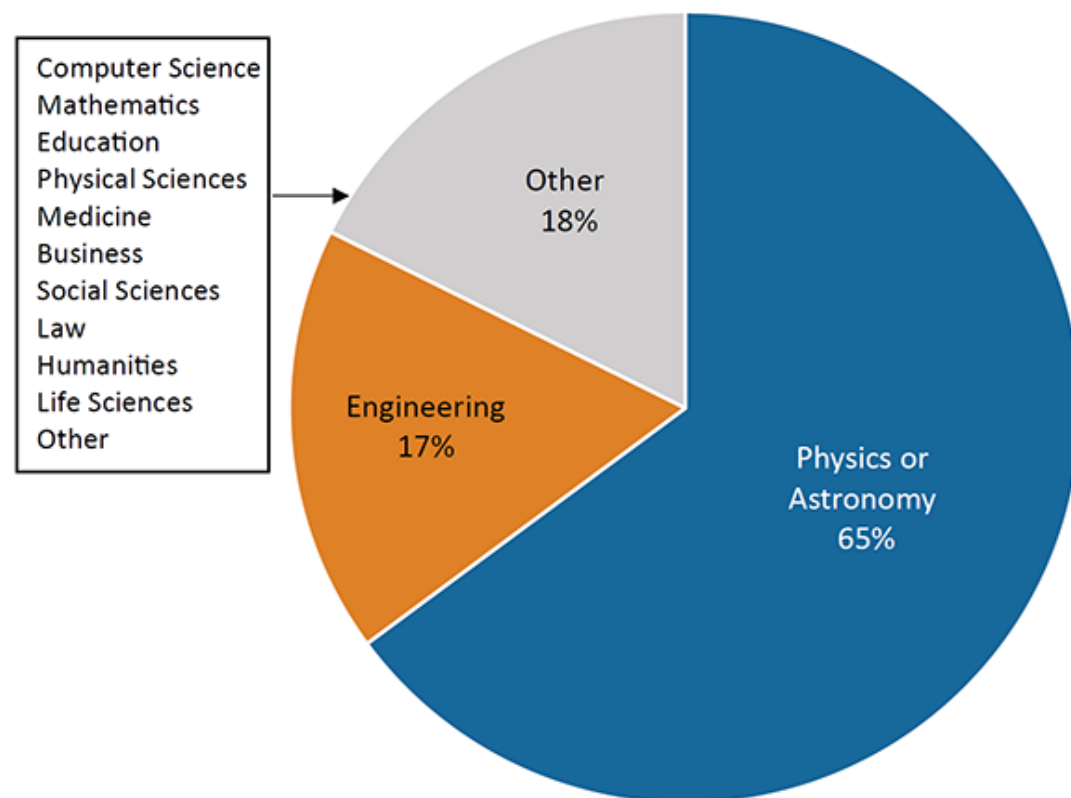
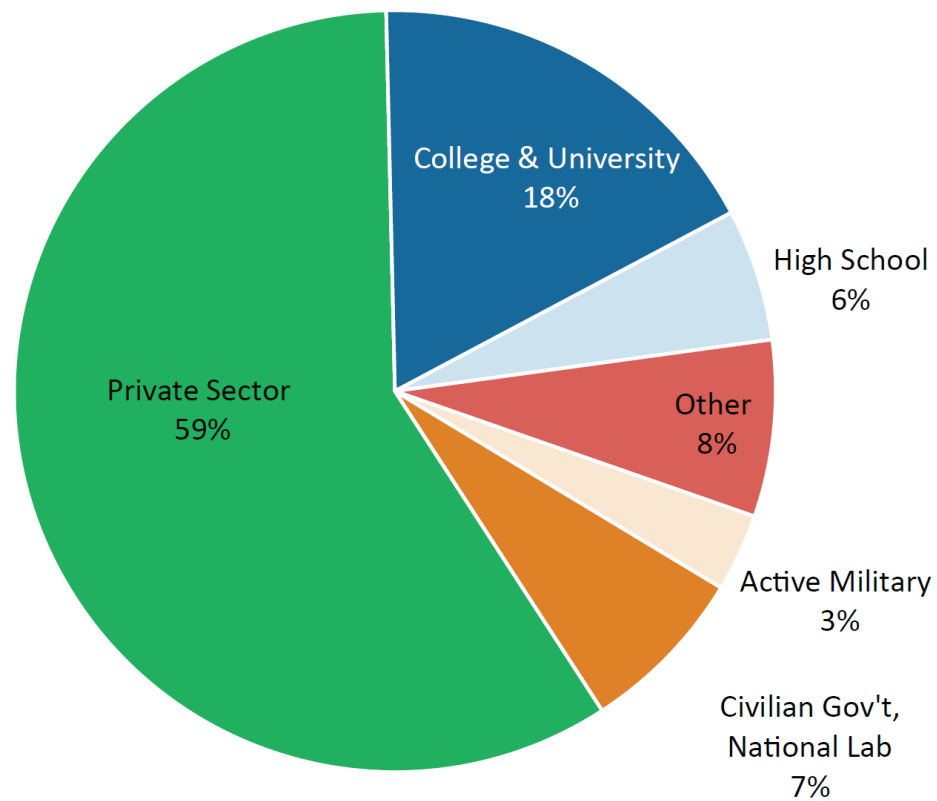
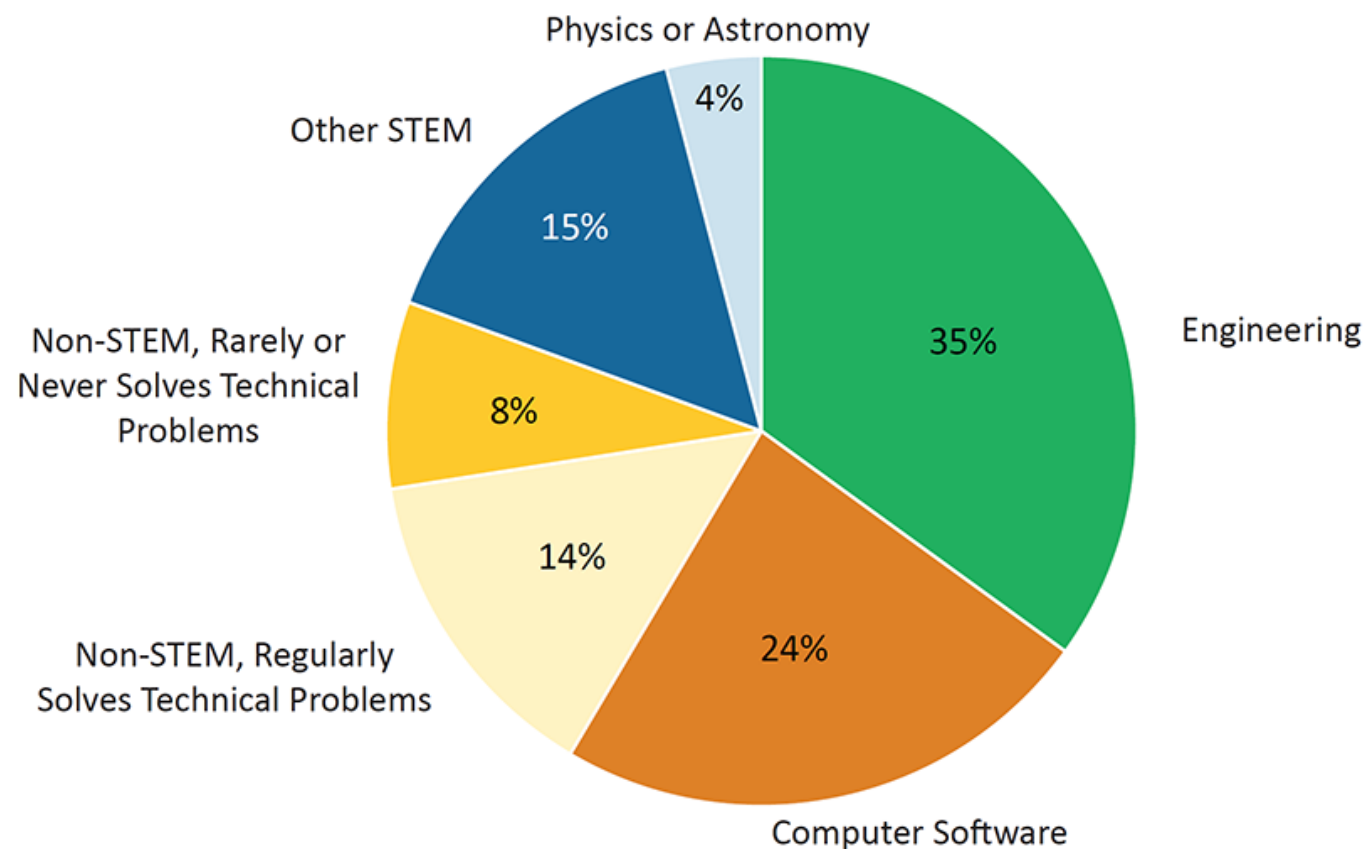


Figure based on responses from 2,593 physics bachelors degree recipients who indicated that they continued into graduate study.

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

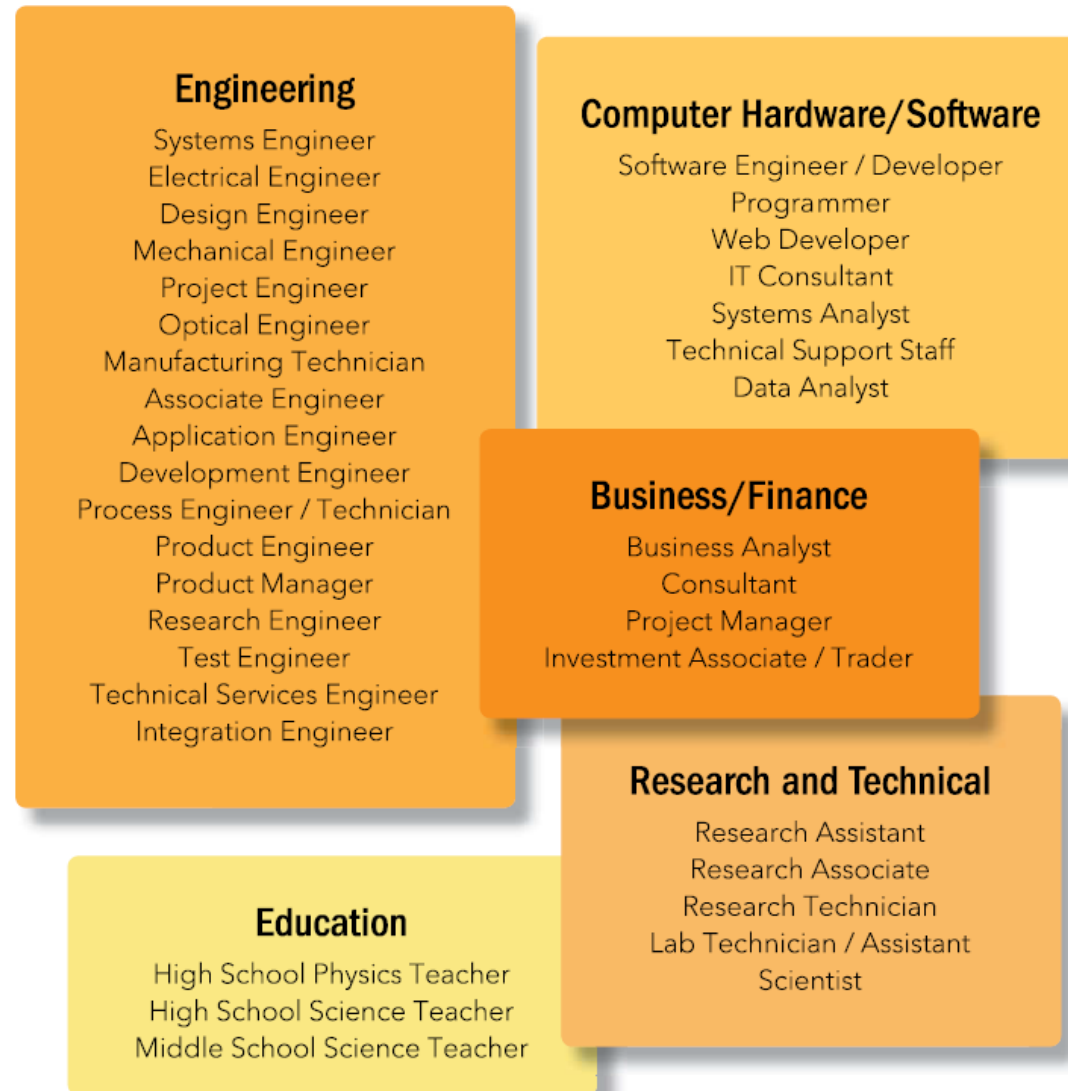


Field of Employment for New Physics Bachelors in the Private Sector, Classes of 2019 & 2020 Combined



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".

Common Job Titles of New Physics Bachelors



Starting Salaries for New Physics Bachelors, Classes of 2019 & 2020 Combined

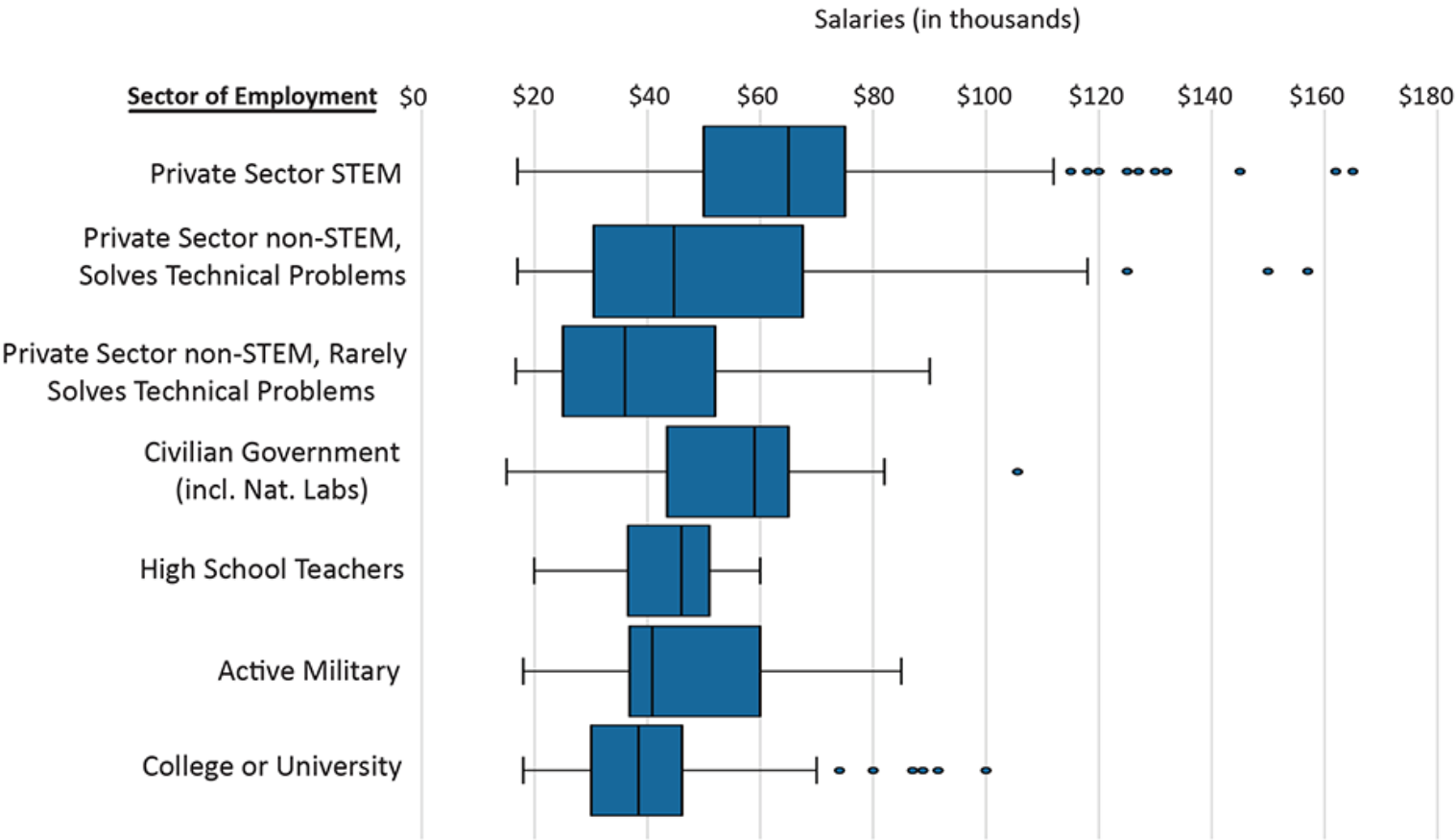
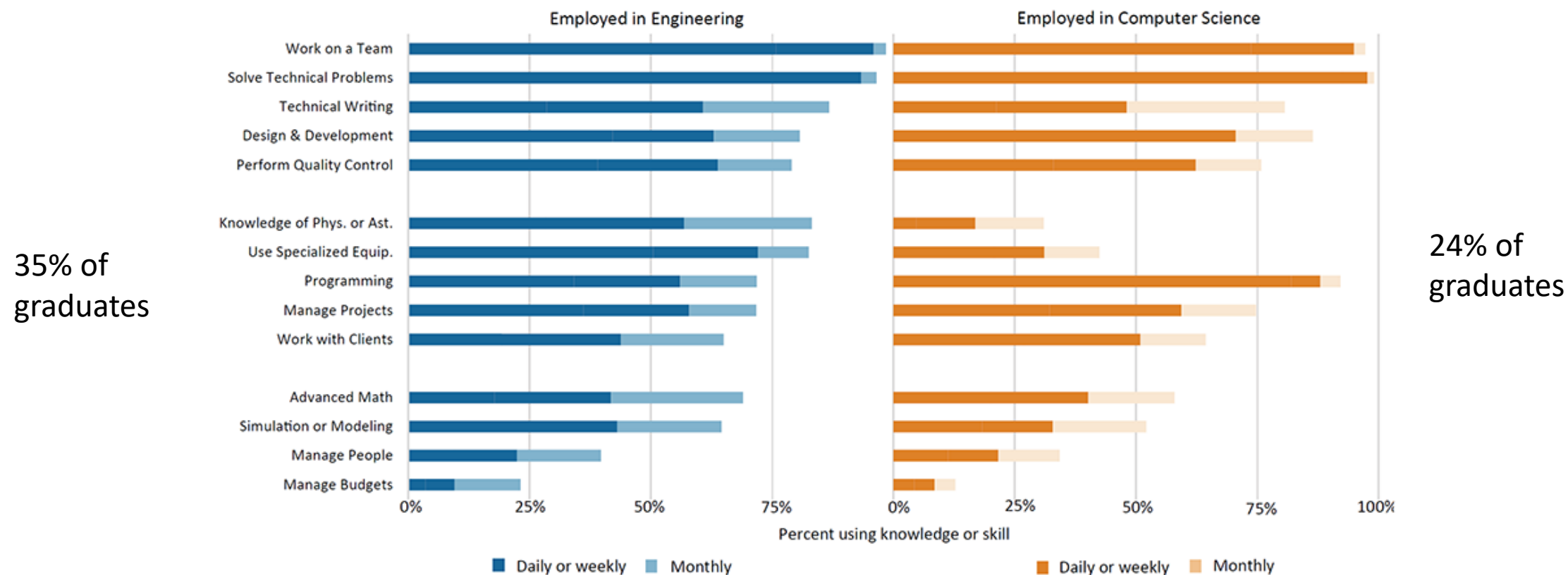


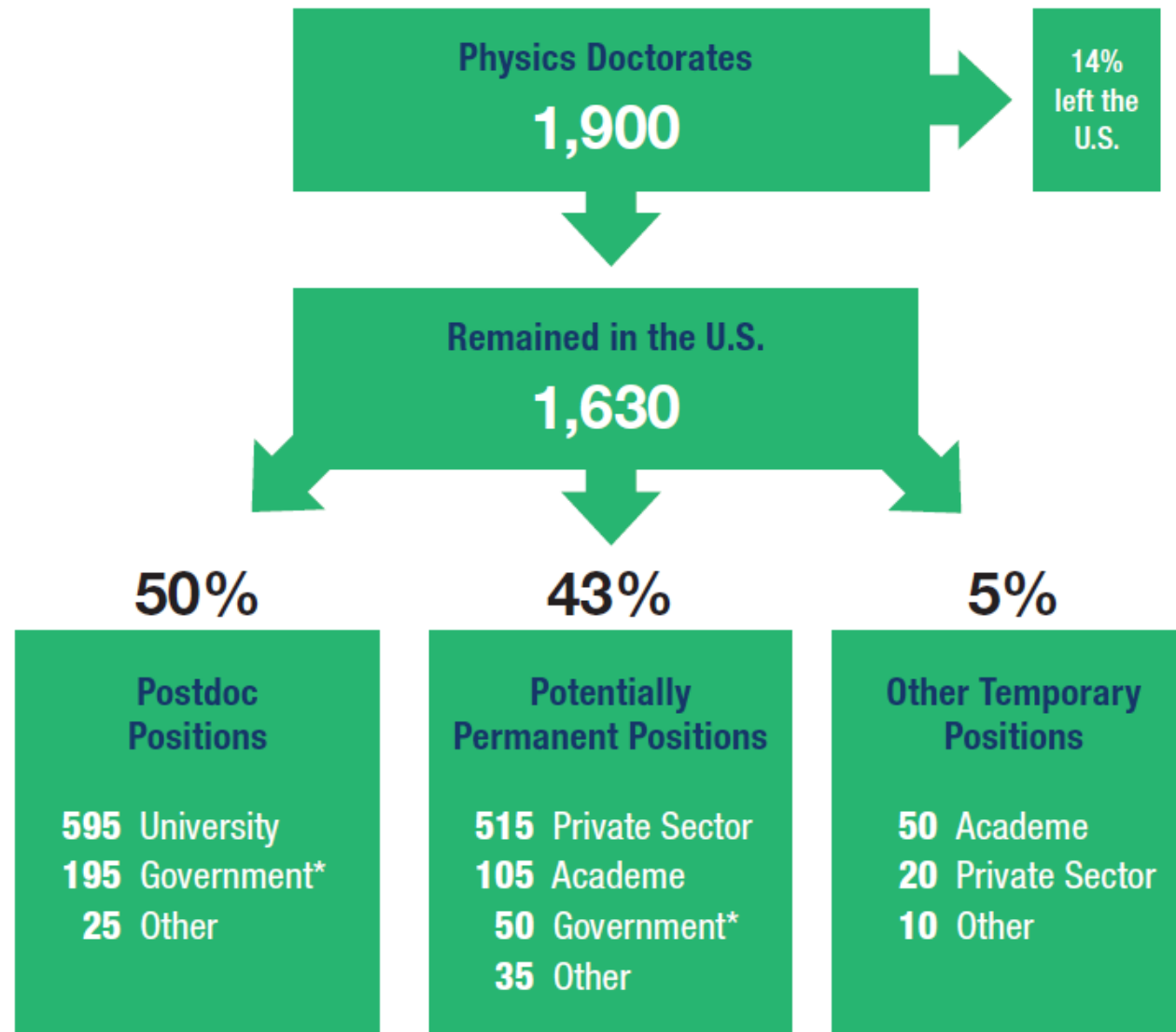
Figure only includes bachelors in full-time, newly accepted positions. The full starting salary range is represented by the lines extending to each side of the box. The box represents the middle 50% (25th to 75th percentile) of the salaries. The vertical line within the box represents the median starting salary for the sector. The dots outside of the lines are statistical outliers. Solves 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 position.

Knowledge and Skills Used by New Physics Bachelors Employed in the Private Sector, Classes of 2019 & 2020 Combined



Percentages represent the physics bachelors who choose "daily", "weekly", or "monthly" on a four point scale that also included "never or rarely".

Physics PhDs 1 Year Later



Classes of 2021 &
2022 combined

Initial Employment of Physics PhDs, 1980 through 2020

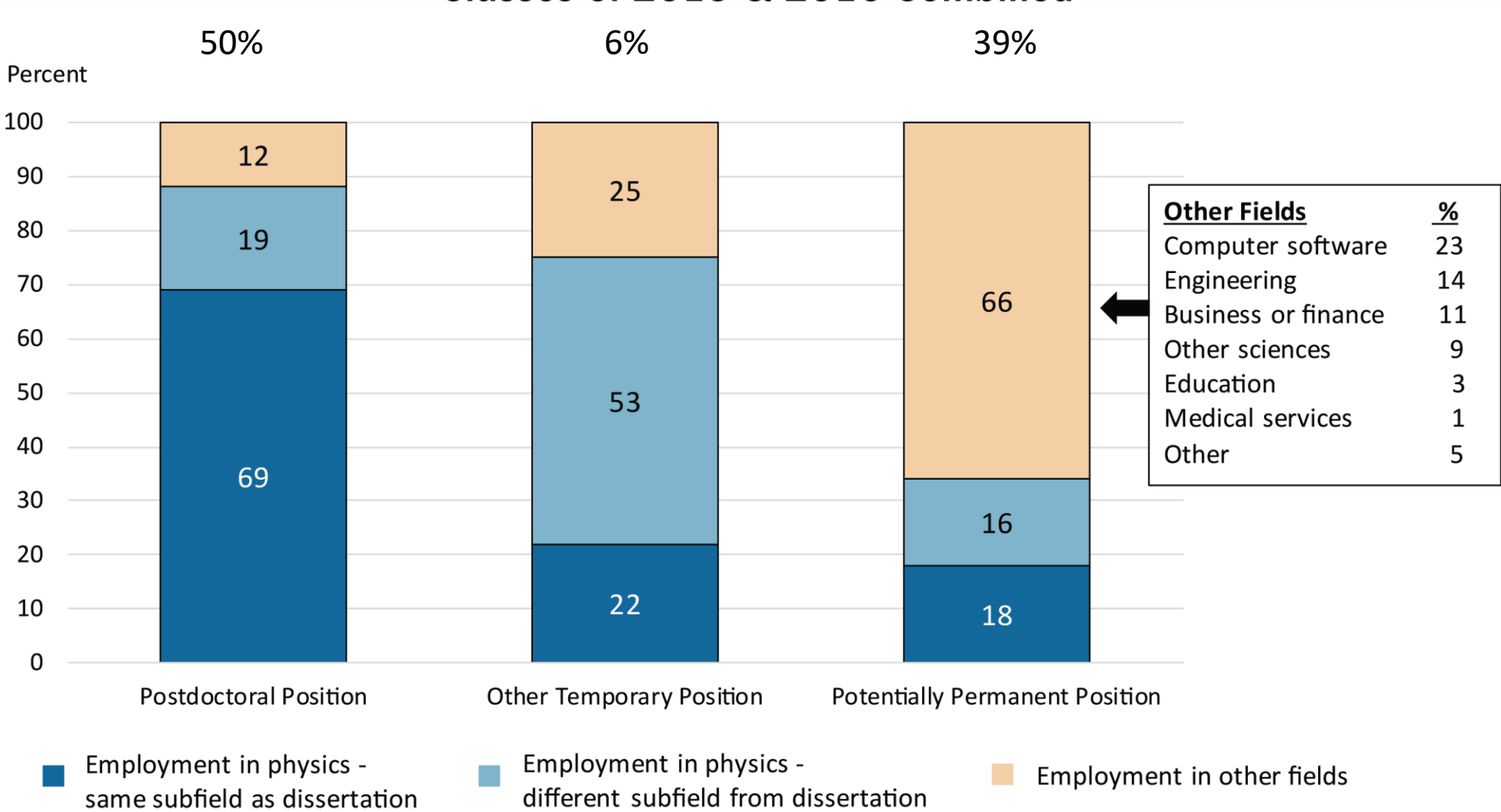


In 1991, the survey questionnaire was changed to measure “other temporary” employment as a separate category. Data are limited to PhDs who earned their degrees from a US university and remained in the US.

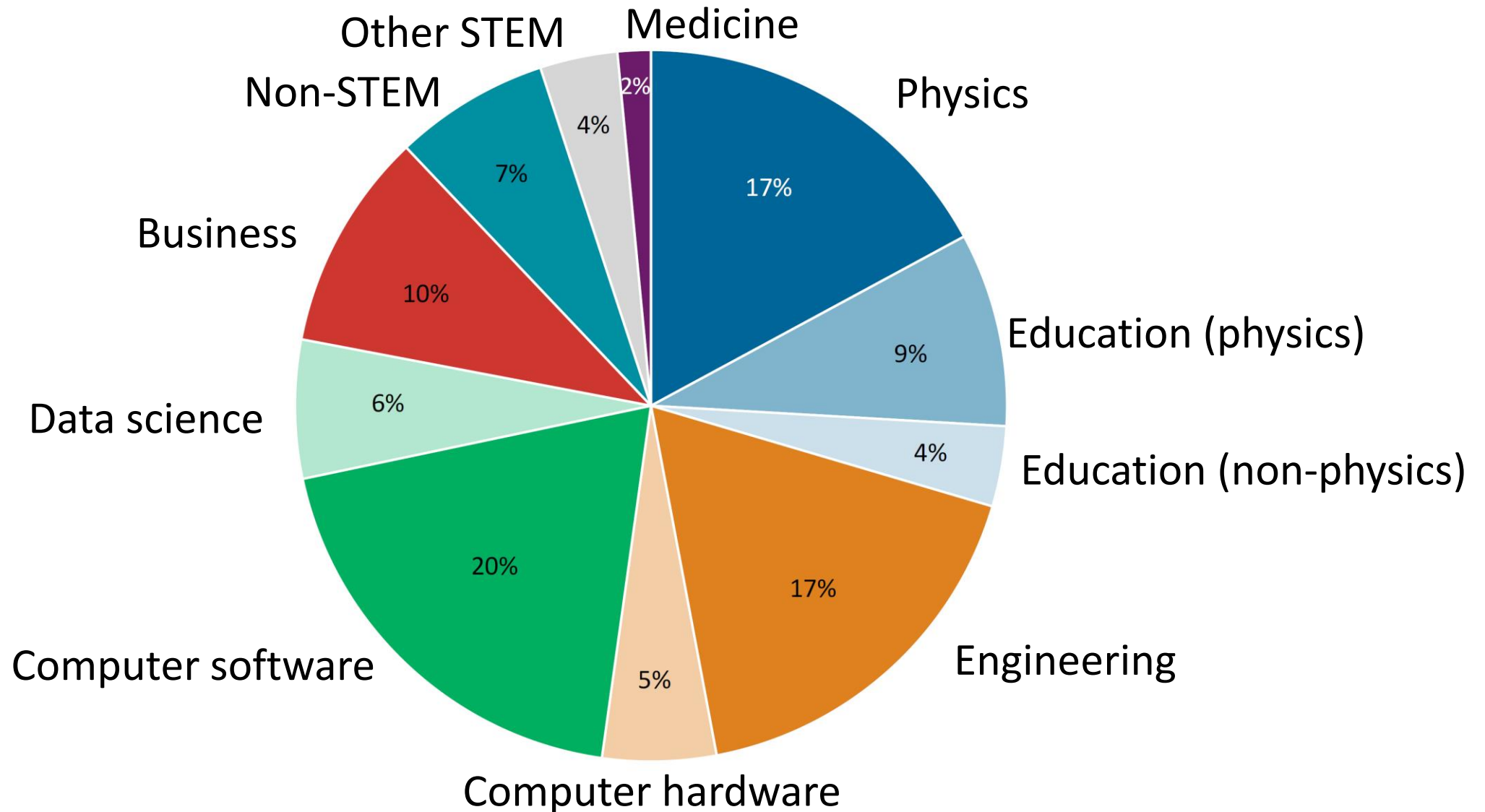
Reasons for Accepting a Postdoctoral Fellowship, Classes of 2015 & 2016 Combined



Employment Field of New Physics PhDs, Classes of 2015 & 2016 Combined



Field of employment for new physics PhDs (potentially-permanent positions)



Common job titles for new physics PhDs

Engineering

Aeronautical Engineer
Applications Engineer
Battery Test Engineer
Characterization Engineer
Development Engineer
Device Modeling and Testing Engineer
Laser and Optics Engineer
Process Technology Development Engineer
R&D Engineer
Systems Analyst
Systems Engineer
Technical Specialist
Senior Design Engineer
Sensor System Engineer

Computer software

Analyst / Programmer
Application Developer
Associate Software Engineer
Autonomy Engineer
Flight Software Engineer II
Mathematical Analyst and Developer
Scientific Programmer

Data science

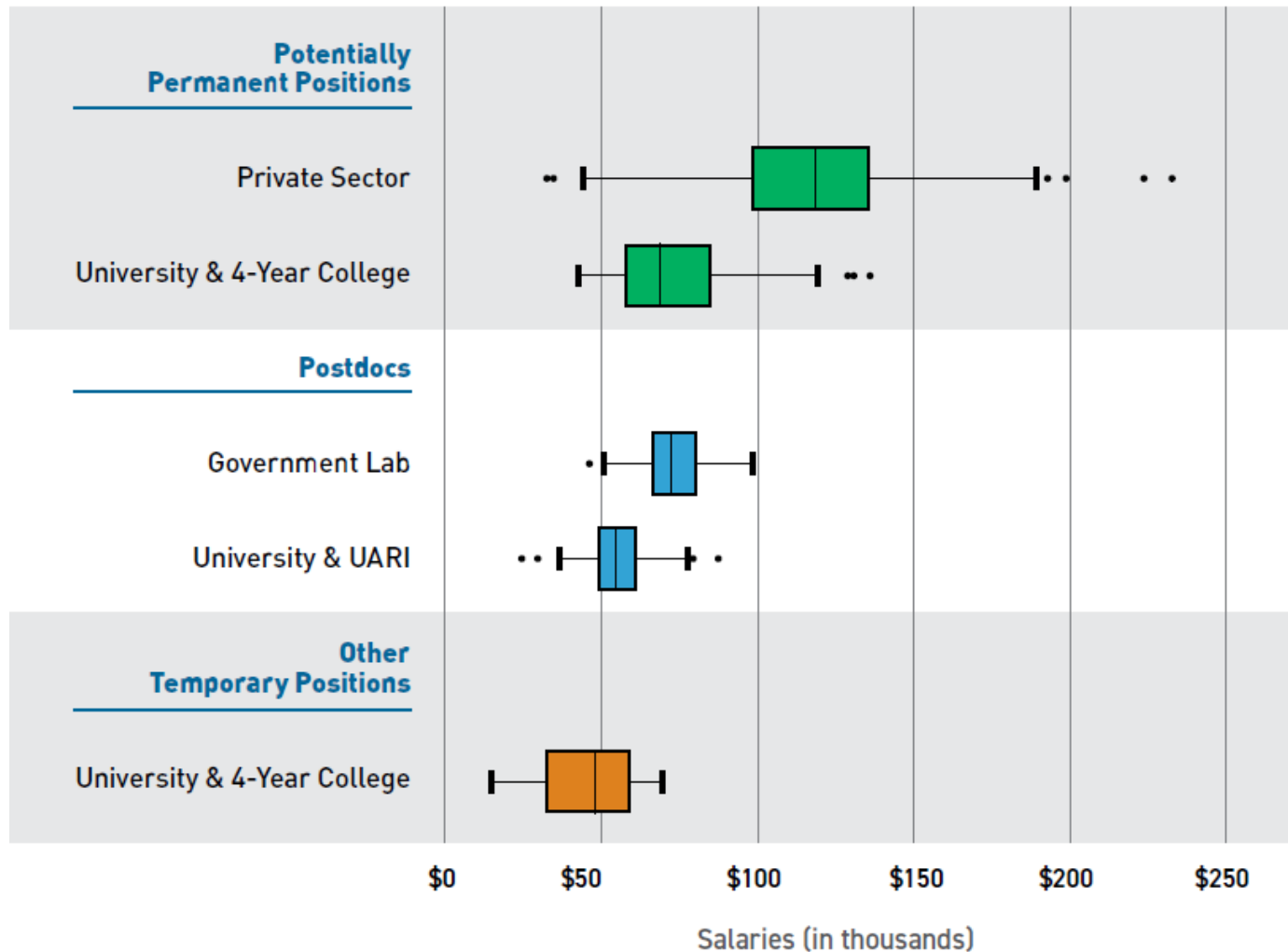
Data Analyst
Machine Learning Engineer
Research Analytics Consultant
Tech Data Scientist II

Business

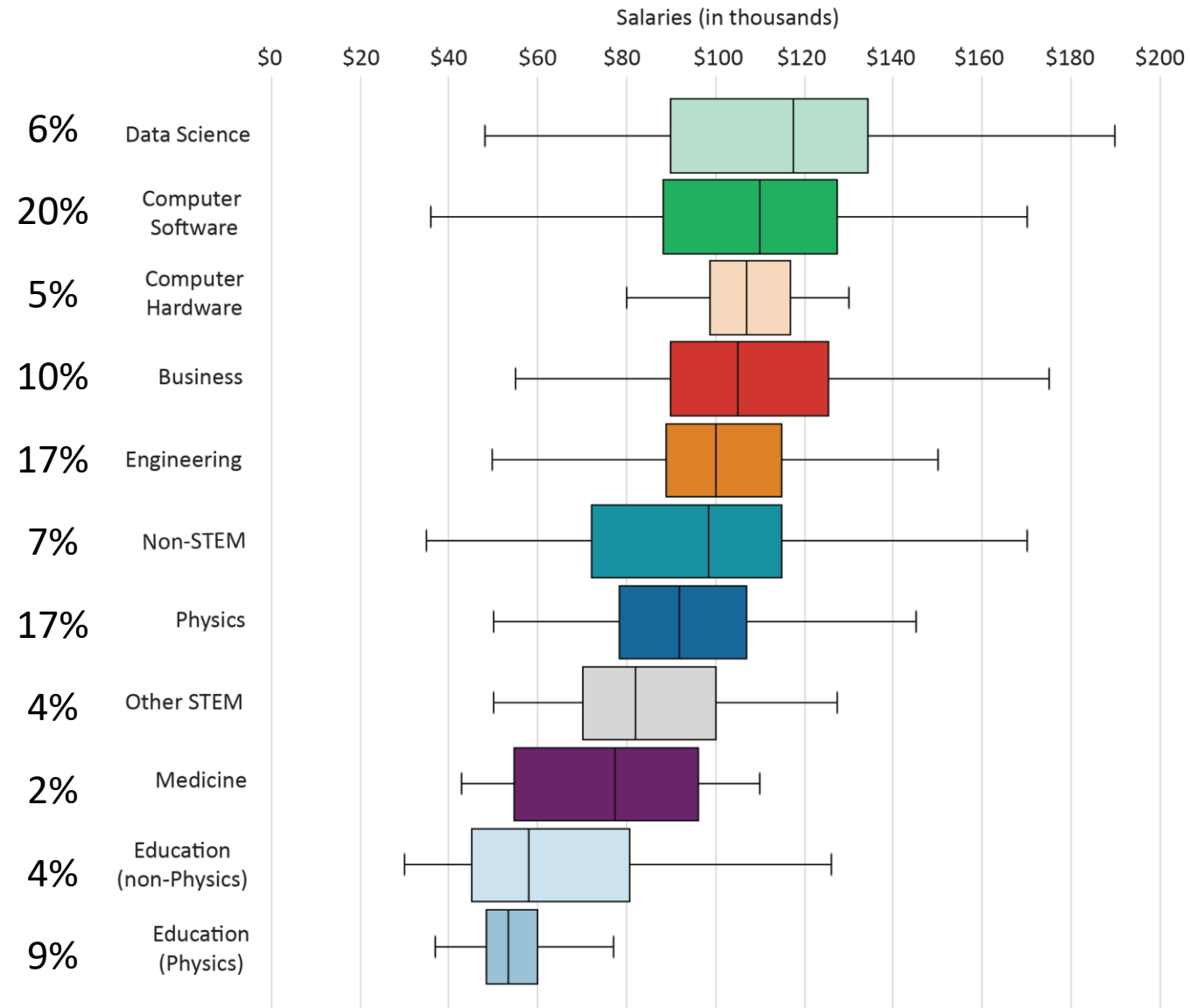
Algorithm Developer
Credit Research Associate
Data Analyst
Quantitative Financial Analyst
Risk Insights Analyst
Senior Analytics Consultant

Starting Salaries for New Physics Doctorates

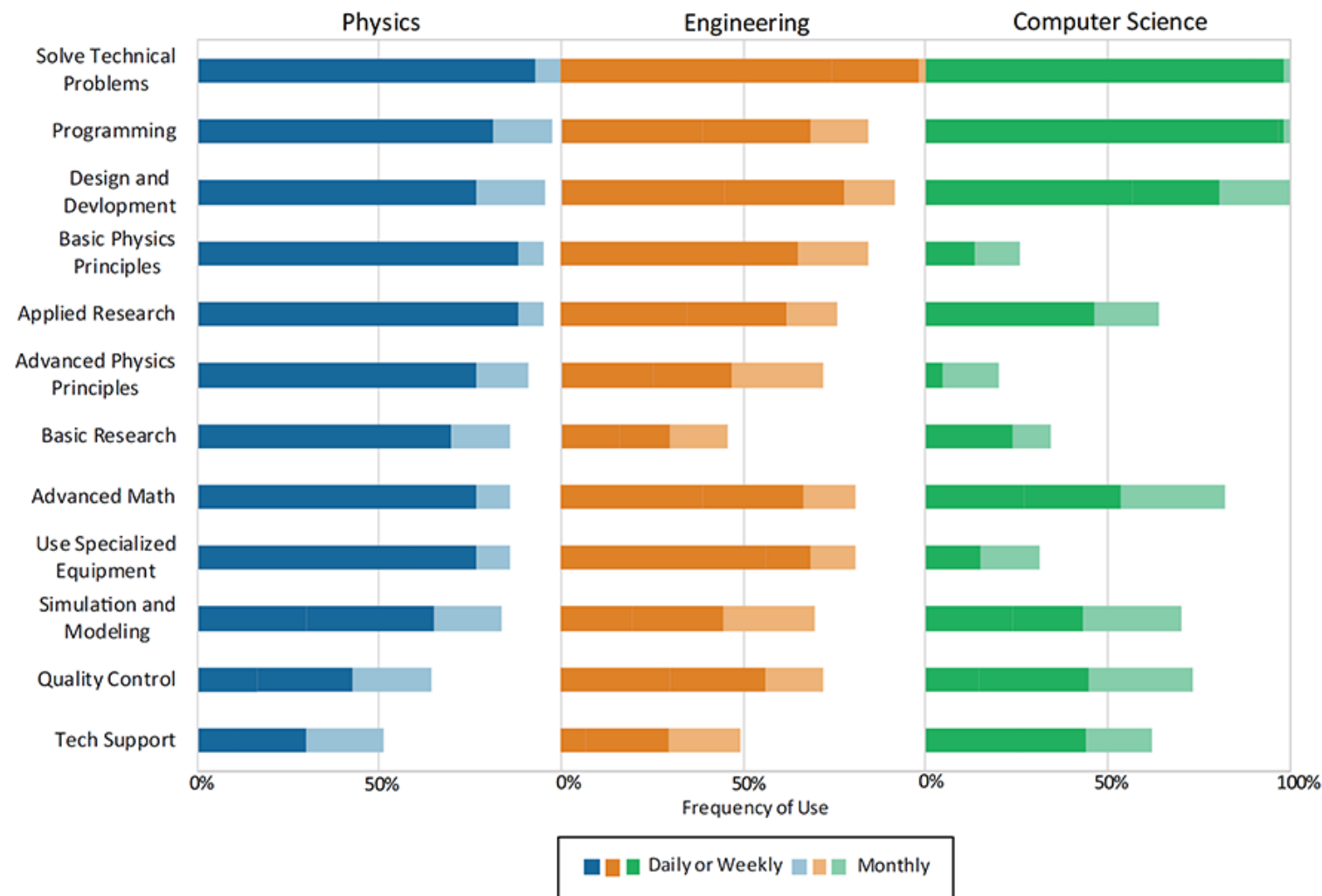
Classes of 2019 and 2020 combined



Starting Salary Ranges for New Physics PhDs in Potentially Permanent Positions, Classes of 2014 through 2018



Scientific and Technical Knowledge Used by New Physics PhDs Employed in Potentially Permanent Positions, Classes of 2015 & 2016 Combined

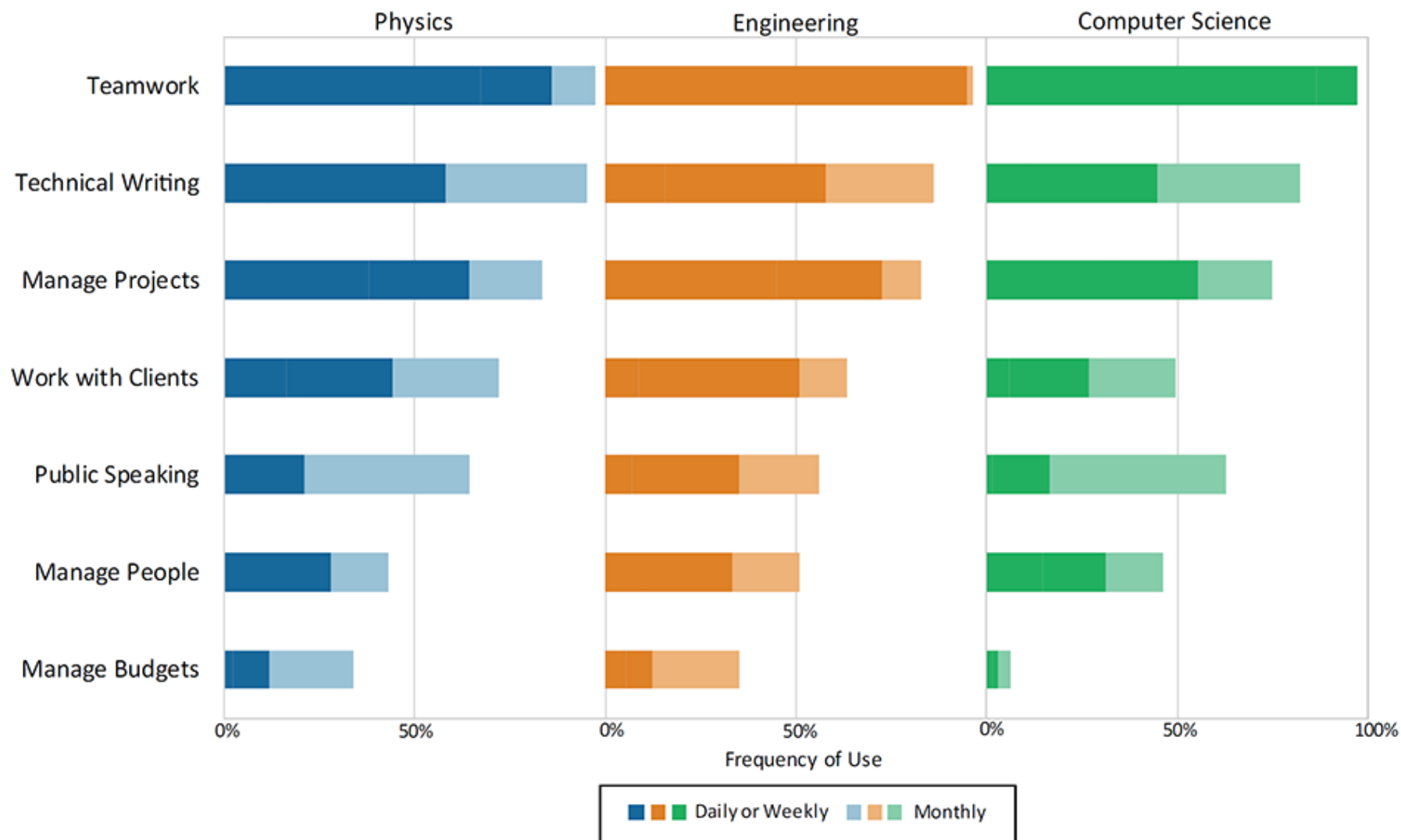


17%

17%

25%

Interpersonal and Management Skills Used by New Physics PhDs Employed in Potentially Permanent Positions, Classes of 2015 & 2016 Combined



Career Planning Process

Foundational activities: before you need a job

- Self-knowledge: what are my goals, interests, and values?
- Self-assessment: what are my skills and knowledge?
- Exploration: what kinds of careers are out there and whom can I talk to about them?

Workshops #1 and #2 concentrate on these

Focused activities: when you need a job

- Finding available positions
- Writing a résumé to respond to a job ad
- Interviewing

Workshops #3 and #4 concentrate on these

Foundational activities: Self-knowledge

Keep a career journal

Goals: what is important to me?

- Make the world better
- Make a lot of money
- Live in Colorado
- Work-life balance/time for family or hobbies
- Traveling



Interests: how do I like to spend my time?

- Tinkering with equipment
- Coding
- Analyzing data/figuring out the Universe
- Writing
- Working with other people

Strengths: what am I really good at?

- Keeping track of details
- Seeing the big picture
- Writing
- Working with diverse teams
- Writing code
- Making equipment work

Foundational activities: Self-assessment

Skills inventory: what can I do, and when have I done it?

Identify skills and an example of where you have used them

Technical skills

- Solving complex technical problems
- Teaching: conceptualizing & explaining
- Programming
- Documentation
- Data and error analysis
- Advanced mathematics
- Simulation and modeling
- Using (and repairing) specialized equipment
- Quality control
- Machining

Non-technical skills

- Functioning in a variety of environments and roles
- Writing concisely and accurately
- Presenting information orally
- Tailoring your message to an audience
- Supporting a position with argumentation, logic, data
- Conceiving/designing complex projects
- Implementing and managing to completion
- Managing/leading groups of people
- Managing projects (creating task lists, developing timelines, setting goals, etc.)
- Planning for and obtaining necessary resources (e.g. funding)
- Developing and managing budgets
- Working on a team

You will use this when you write a résumé in workshop #3

Foundational activities: Exploration

What careers am I interested in and whom can I talk to about them?

What careers?

Many resources on the UNC P&A

Career Info webpage:

<https://physics.unc.edu/career-info/>

From APS:

Profiles of physicists

<https://www.aps.org/careers/physicists/profiles/index.cfm>

Common career paths

<https://www.aps.org/careers/physicists/prospects.cfm>

Whom to talk to?

Many physicists can be found on LinkedIn—you need to be there too!

<https://www.linkedin.com/>

For info on how to join, see

<https://careers.unc.edu/students/networking-and-social-media/how-build-your-linkedin-presence>

More on this in workshop #2

Foundational activities homework

Self-knowledge

Revisit your list of goals, interests, and strengths; discuss with friends, co-workers and family

Self-assessment

Keep working on your skills inventory—what else have you done? (Add to it as you learn new skills)



Exploration

Watch an APS webinar on a career sector that interests you: <https://www.aps.org/webinars/> (OK to do at 2X speed!)

Exploration

Look through profiles and career paths (including on LinkedIn—join now!) and use your self-knowledge to identify at least one career path that sounds appealing

You will report on these and use them in workshop #2