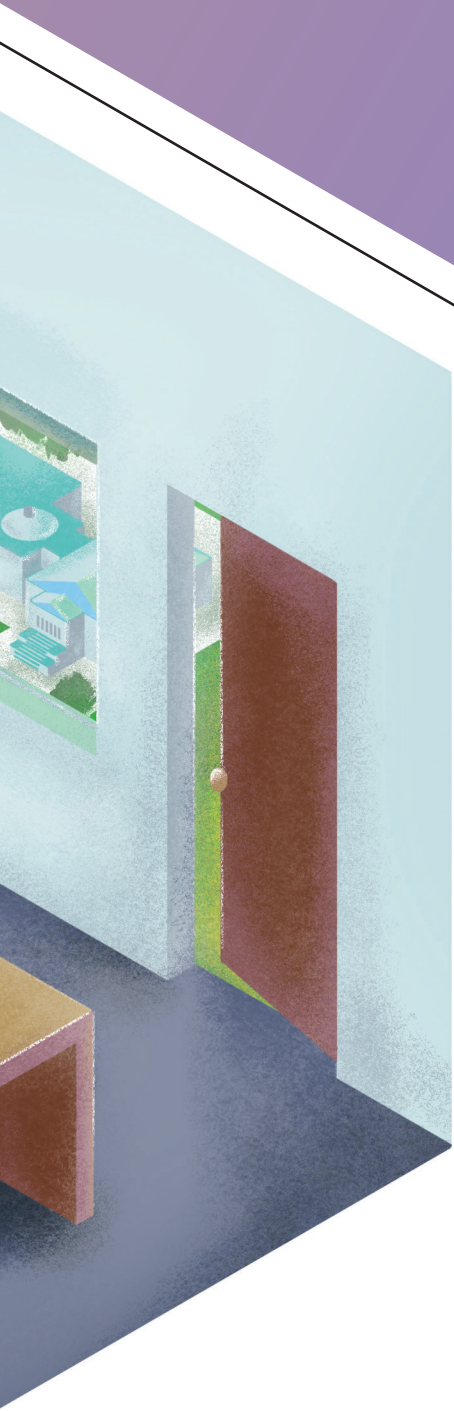


FREDDIE PAGANI





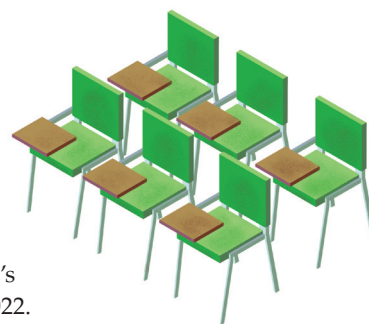
Careers by the numbers

Richard J. Fitzgerald

What's the next career step for new recipients of physics bachelor's degrees? Of physics PhDs? Data give some insights.

Everyone's career follows a different path. Nevertheless, aggregated data can highlight features and trends in the overall career landscape. Here we present a collection of snapshots and trends that paint a picture, albeit an incomplete one, of the career options available to—and taken by—students who have received physics degrees in the US. The data come from surveys by the American Institute of Physics' Research team (AIP also publishes *PHYSICS TODAY*); more information and additional reports, on both astronomy and physics careers, can be found at the team's website, <https://aip.org/statistics>.

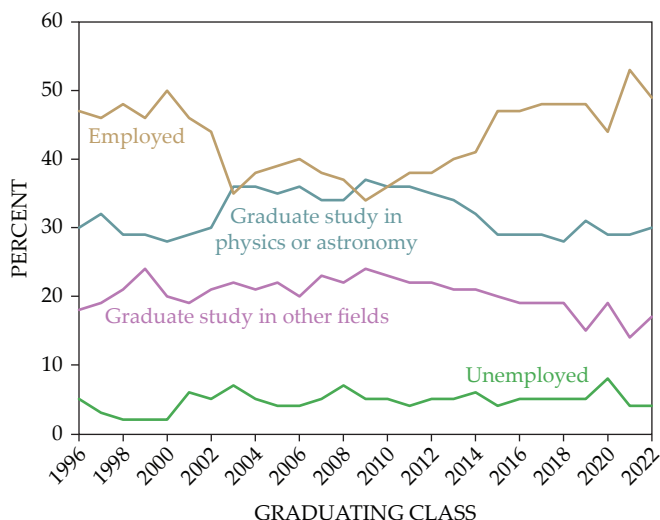
Physics bachelor's degree recipients



Each year, the AIP Research team surveys all US physics departments and bachelor's and PhD recipients in physics. The most recent employment data are from the class of 2022.

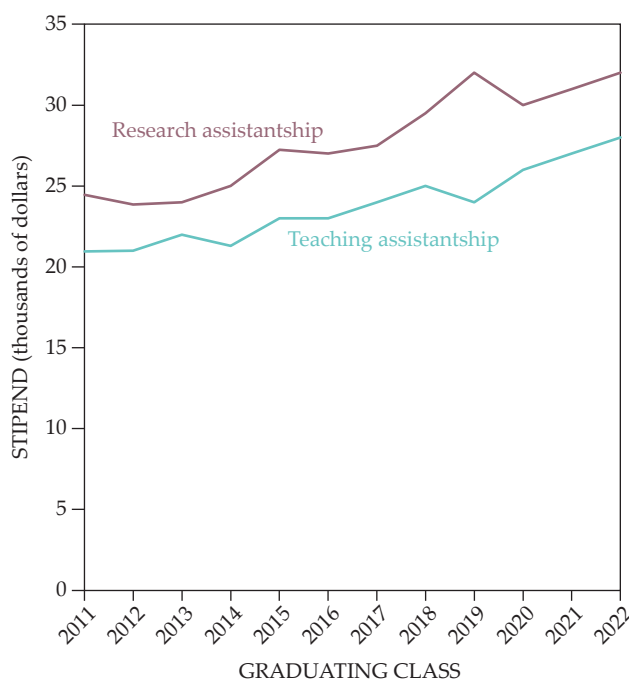
In the US, 8618 undergraduates in the class of 2022 received a bachelor's degree in physics. That marks a 4.5% decline from 2021 and the second straight annual decrease after two decades of increases.¹ Physics enrollments have been falling, so the number of bachelor's degrees awarded will likely continue to fall.

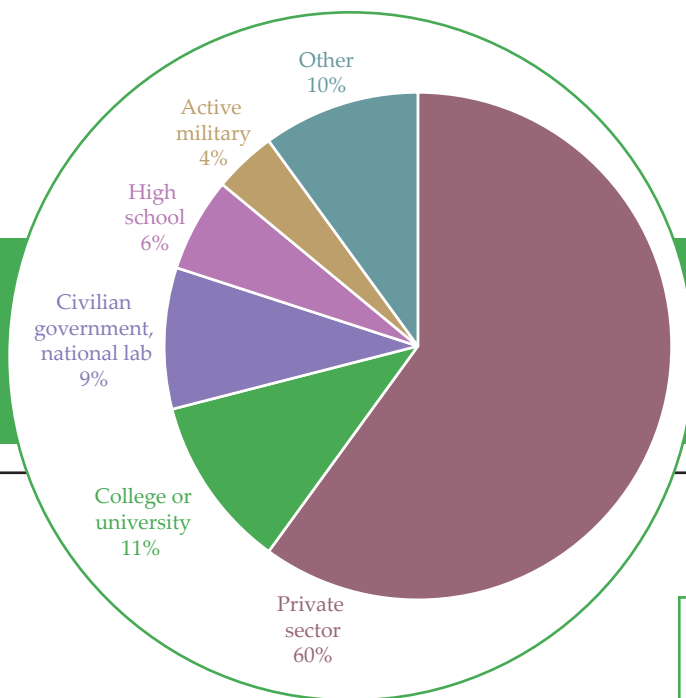
Nearly half of all new physics bachelor's recipients in the classes of 2021 and 2022 reported that they entered the workforce. A majority of the positions in the private and public sectors were in STEM. Of those who continued on to graduate school, roughly two-thirds were in physics or astronomy. Engineering is the next most popular field of study for physics bachelor's recipients; other common areas include math, computer science, education, business, law, and medicine.



WHERE NEW PHYSICS BACHELOR'S RECIPIENTS ARE, one year after getting their degree, for those who received their degree in the US and stayed in the US. The proportion of survey respondents who reported being in graduate school in physics or astronomy has held steady for several years. The results for 2020 were the first to be affected by the COVID-19 pandemic. (Courtesy of Jack Pold and Patrick Mulvey; data from degree-recipient follow-up surveys by AIP Research.)

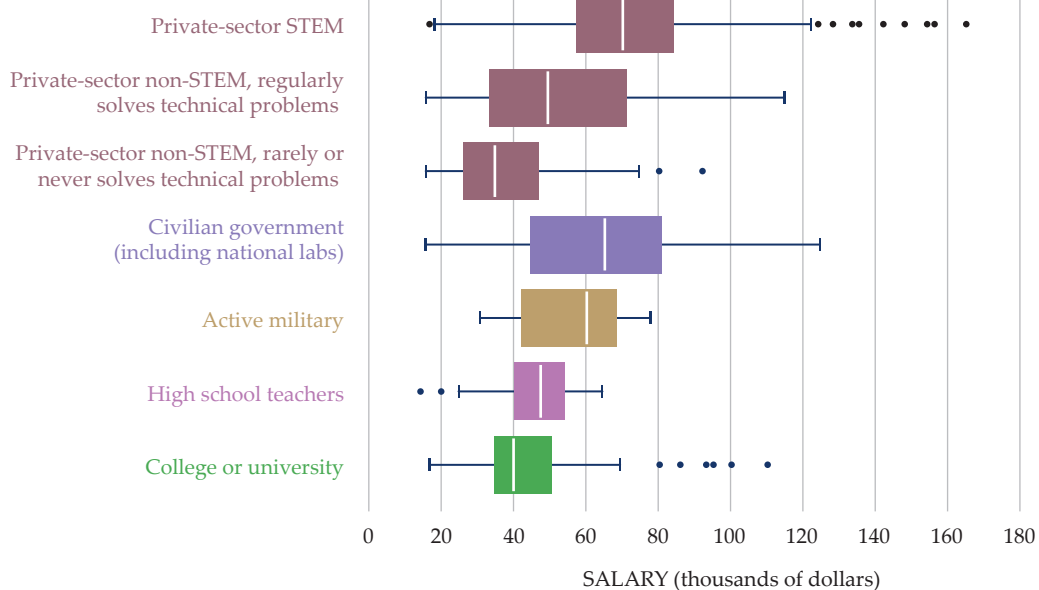
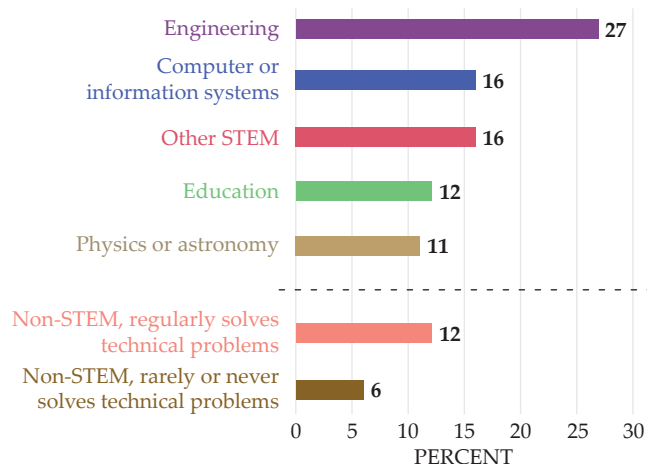
MEDIAN GRADUATE STUDENT STIPENDS. The overall stipend increases from 2011 to 2022 are slightly below the US median earnings increase during that period for all individuals with a bachelor's degree or higher,² and the median stipends are lower than the median starting salaries for physics bachelor's degree recipients who entered the workforce, as seen on page 33. (Courtesy of Jack Pold and Patrick Mulvey; data from degree-recipient follow-up surveys conducted by AIP Research.)





WHERE NEW PHYSICS BACHELOR'S RECIPIENTS WORK, one year after getting their degree, classes of 2021 and 2022 combined. (Data from AIP Research, *Physics Trends: Where New Bachelors Work*, 1 February 2024.)

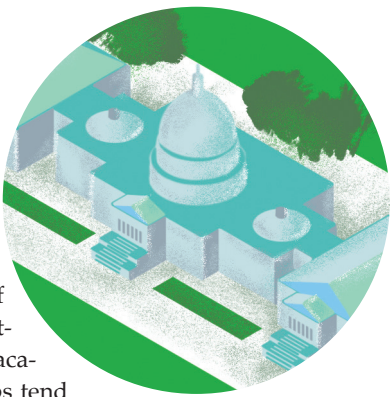
WHAT WORKING PHYSICS BACHELOR'S RECIPIENTS DO, in the winter after getting their degree from a US college or university, classes of 2021 and 2022 combined. The data reflect all employment sectors. "Regularly solves technical problems" includes respondents who selected "Daily," "Weekly," or "Monthly" on a four-point scale that also listed "Rarely or Never." (Data from AIP Research, *Physics Trends: Field of Employment for New Physics Bachelors*, 12 September 2023.)



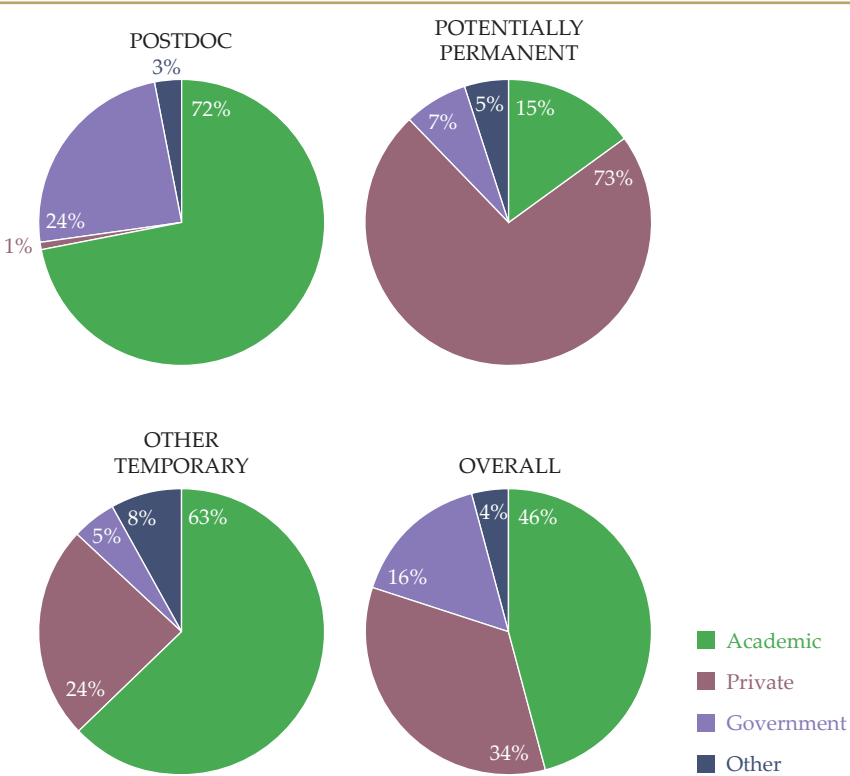
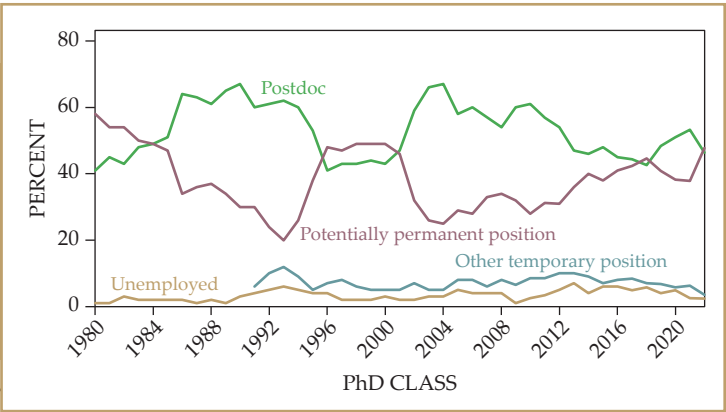
WHAT WORKING BACHELOR'S RECIPIENTS MAKE. Starting salaries are for full-time employed, US-educated physics bachelor's degree recipients from the classes of 2021 and 2022 combined. In this box-and-whisker plot, the boxes represent the middle 50% (25th to 75th percentiles) of salaries, and the vertical line in each box is the median salary. The lines extending to either side of the boxes denote the starting salary ranges excluding outliers, which are indicated by the dots. (Data from AIP Research, *Physics Trends: Starting Salaries for Physics Bachelors*, 12 September 2023.)

New physics PhDs

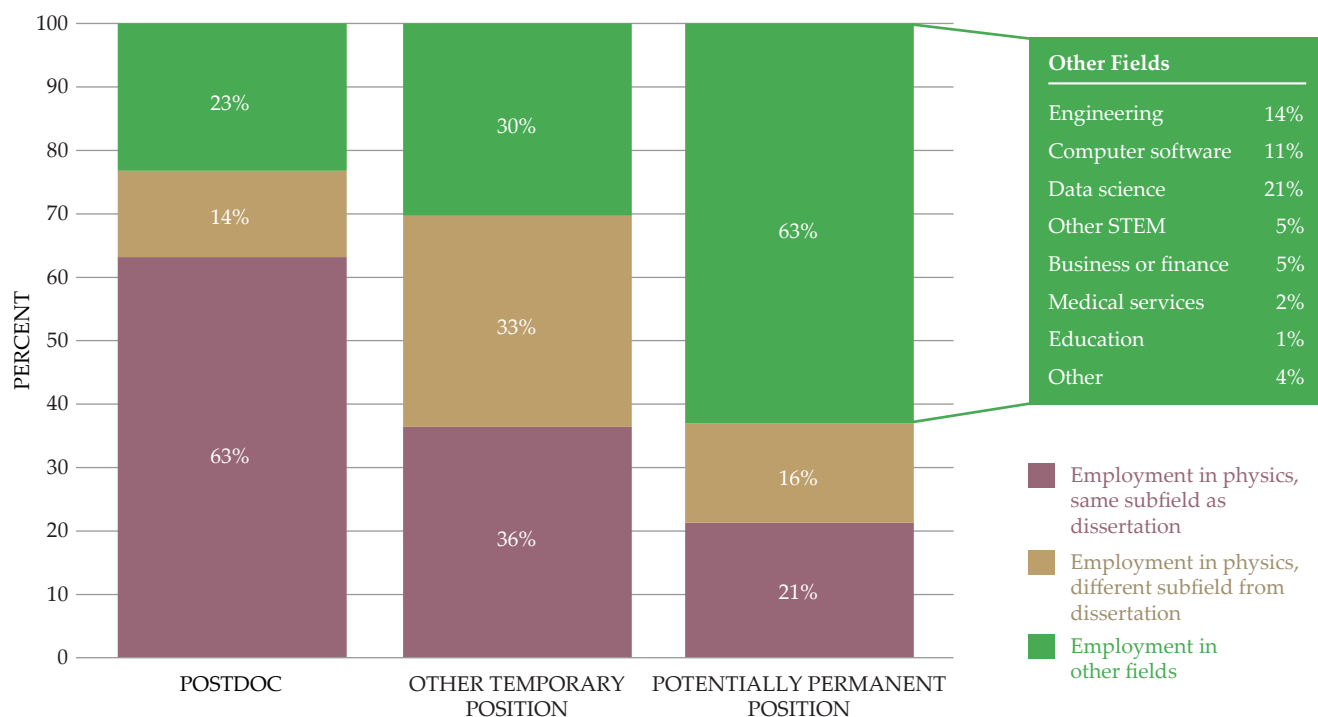
The classes of 2021 and 2022 produced an average of 1900 physics PhDs in the US. Of those, 14% left the country. The others are roughly evenly split between accepting post-docs and potentially permanent positions.³ Postdoctoral researchers primarily go into academia or government, and they generally stay in the same subfield. Private-sector jobs tend to pay the most and temporary positions the least.



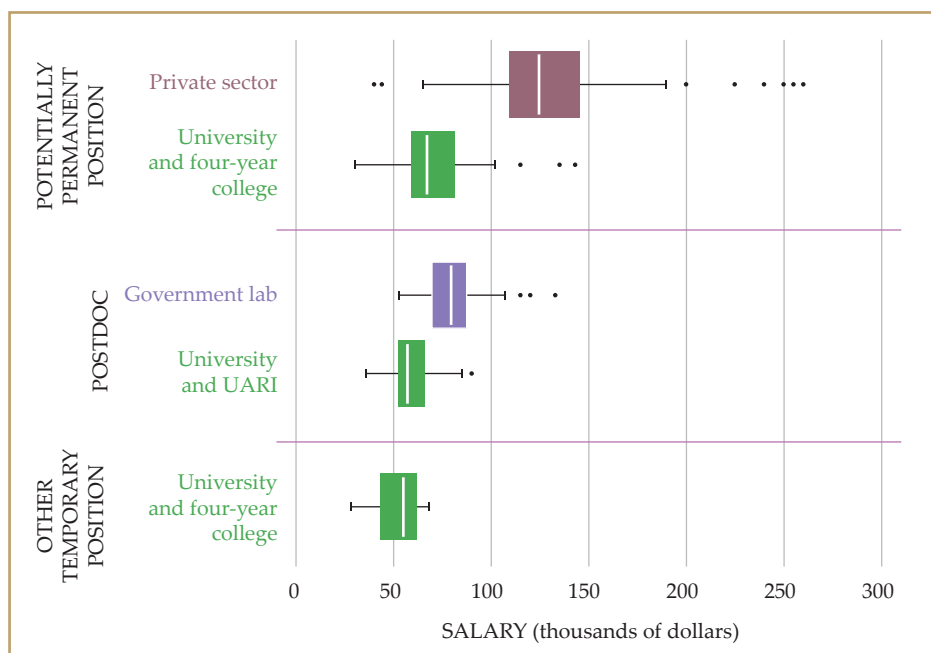
EMPLOYMENT STATUS OF NEW PHYSICS PhDs, in the winter after receiving their degree. The data are for those who received their PhD degree from a US institution and remained in the US. The 1991 survey was the first to include “other temporary” employment as a separate category. (Courtesy of Jack Pold and Patrick Mulvey; data from degree-recipient follow-up surveys conducted by AIP Research.)



EMPLOYMENT SECTOR FOR NEW PHYSICS PhDs, classes of 2021 and 2022, broken down by job status. Data are for those who received their PhD degrees in the US and remained in the country. (Courtesy of Jack Pold and Patrick Mulvey; data from degree-recipient follow-up surveys conducted by AIP Research.)



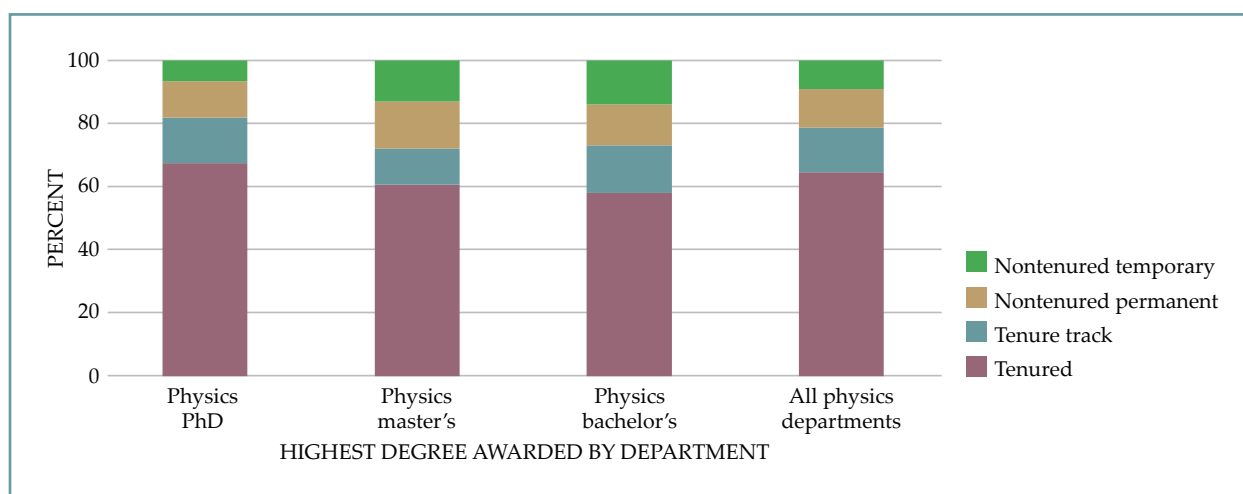
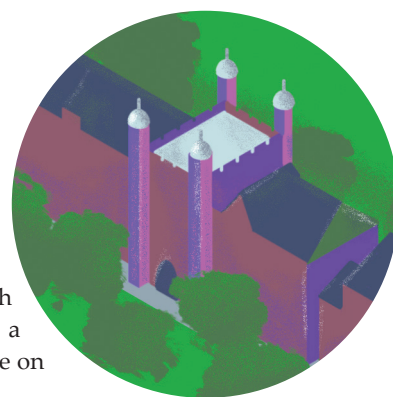
EMPLOYMENT FIELD FOR NEW PHYSICS PhDs, classes of 2021 and 2022 combined. “Physics” includes respondents who said that either their primary or secondary employment field was in physics or astronomy. Data are for PhDs who received their degrees in the US and remained in the country. The inset lists the other fields for the potentially permanent positions; the components of the other temporary positions do not add up to 100% because of rounding. (Courtesy of Jack Pold and Patrick Mulvey; data from degree-recipient follow-up surveys conducted by AIP Research.)



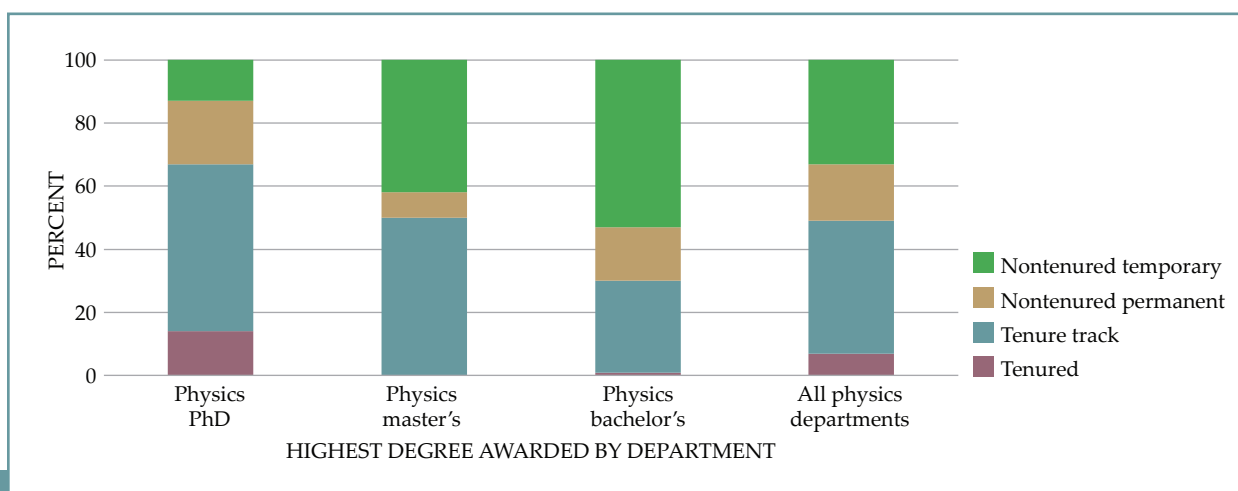
STARTING SALARIES FOR NEW PHYSICS PhDs, classes of 2021 and 2022 combined. Government labs include federally funded R&D centers, such as Los Alamos National Laboratory. UARIs are university-affiliated research institutes. For how to read the box-and-whisker plot, see the bachelor’s salary graph on page 33. (Courtesy of Jack Pold and Patrick Mulvey; data from degree-recipient follow-up surveys conducted by AIP Research.)

The academic workforce

In addition to collecting information about and from degree recipients, the AIP Research team also gathers data every two years about the US academic physics workforce as a whole. The tenure status of faculty members in a department has a strong dependence on the highest degree (bachelor's, master's, or PhD) that it awards.⁴



TENURE STATUS OF CURRENT PHYSICS FACULTY MEMBERS, according to the highest degree that the department awards. Here the data include anyone engaged in teaching or research in the 2021–22 academic year. (Courtesy of Anne Marie Porter; data from the 2022 AIP Academic Workforce Survey.)



TENURE STATUS FOR NEW PHYSICS FACULTY HIRES, according to the highest degree that the department awards, for the 2021–22 academic year. (Courtesy of Anne Marie Porter; data from the 2022 AIP Academic Workforce Survey.)

Additional resources

- ▶ “You have options: Career paths for physicists,” *SPS Observer*, Fall 2024, p. 22.
- ▶ AIP Research, <https://aip.org/statistics>.
- ▶ National Center for Science and Engineering Statistics, <https://nces.nsf.gov>.
- ▶ National Center for Education Statistics, <https://nces.ed.gov>.
- ▶ National Science Board, National Science Foundation, *Science and Engineering Indicators 2024: The State of U.S. Science & Engineering*, NSB-2024-3 (March 2024), <https://nces.nsf.gov/pubs/nsb20243>.

I thank Patrick Mulvey, Jack Pold, Anne Marie Porter, Susan White, and Freddie Pagani for their assistance with the data and graphs.

REFERENCES

1. S. Nicholson, P. J. Mulvey, *Roster of Physics Departments with Enrollment and Degree Data*, 2022, AIP Research (September 2023).
2. US Bureau of Labor Statistics, “Median usual weekly earnings of full-time wage and salary workers by educational attainment” (July 2024), <https://www.bls.gov/charts/usual-weekly-earnings/usual-weekly-earnings-over-time-by-education.htm>.
3. *AIP Physics Trends: Physics PhDs 1 Year Later*, AIP Research (12 September 2023), <https://www2.aip.org/statistics/physics-phds-1-year-later>.
4. A. M. Porter, J. Taylor, *The State of the Academic Workforce in Physics and Astronomy Departments, 2000–2022*, AIP Research (3 May 2024). PT

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