

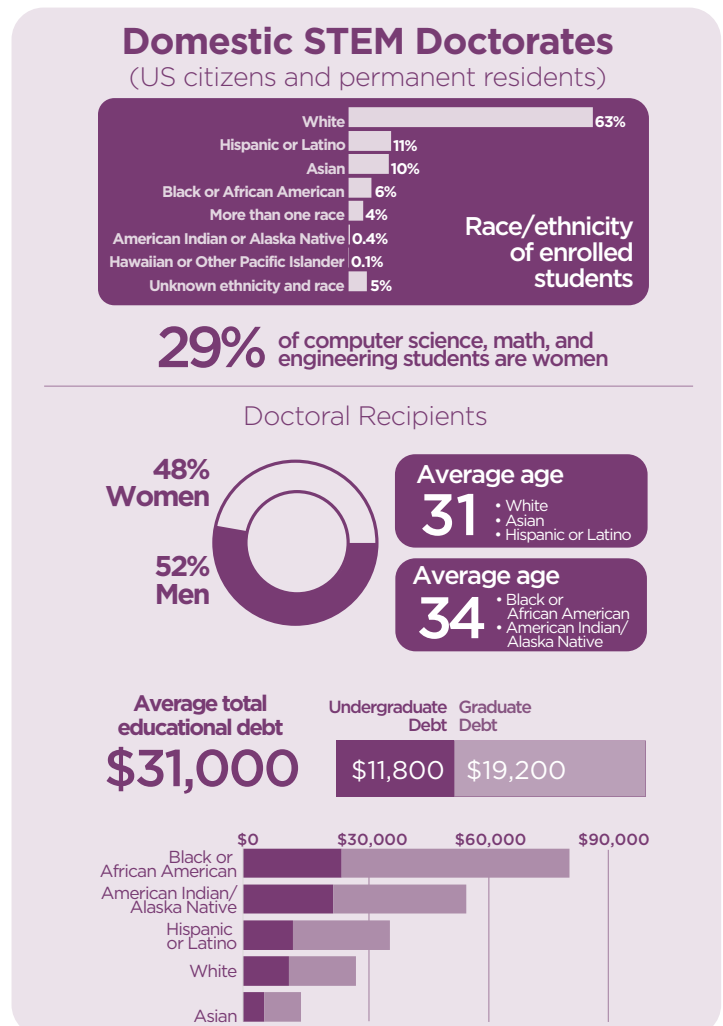
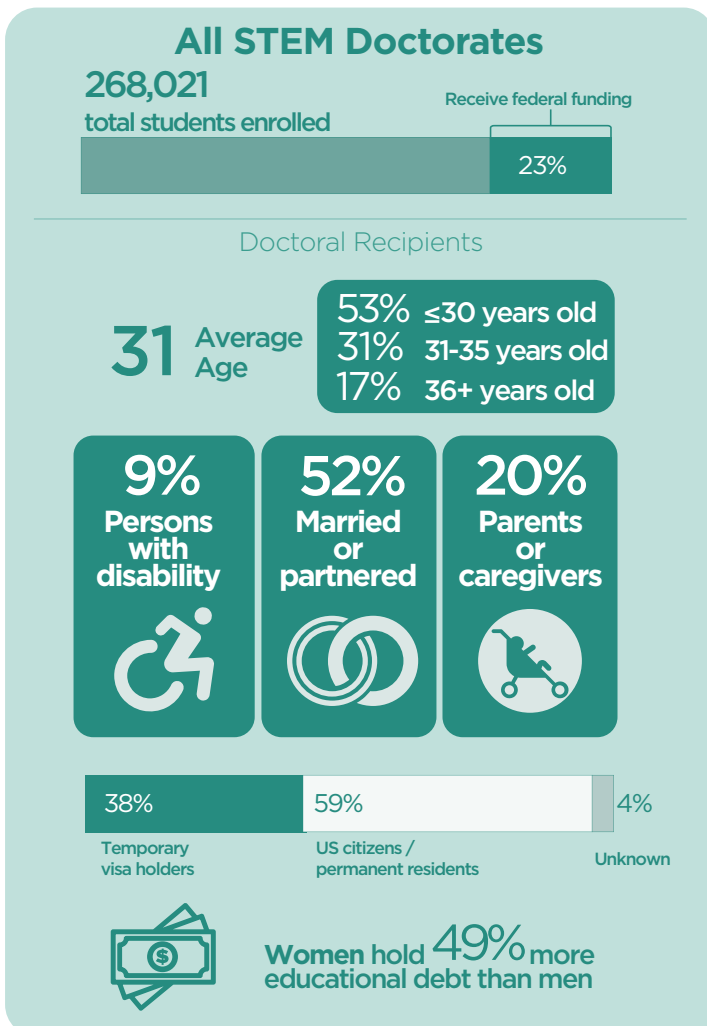
Not Going for Broke: Breaking Down Financial Barriers to Build Up a Diverse Research & Development Workforce

Doctoral students are the lifeblood of academic research and the future of U.S. scientific and technological innovation across academia, industry, and government. To maintain our global competitiveness in science & engineering (S&E), we need to reduce a major barrier for domestic students that discourages many from pursuing a STEM doctorate: money. Students from the [Missing Millions](#) — Blacks, Hispanics, American Indians, Alaska Natives, Native Hawaiians, and women — as well as those from low socio-economic backgrounds, frequently have higher educational debt, greater family obligations, little to no intergenerational wealth, and have been disproportionately impacted by the COVID-19 pandemic. Individuals from these groups often cannot afford to choose the long-term gains of a STEM career that requires an advanced degree over their short-term financial needs. As one part of a comprehensive strategy for diversifying and strengthening the U.S. domestic S&E workforce, policymakers should work to make advanced STEM education an attractive and financially sustainable choice for individuals from all backgrounds.

For federally-supported STEM doctoral students, we recommend:

1. Raising stipends
2. Providing benefits, including supplemental funds for health insurance, parental leave, childcare, and professional development

Young, Unencumbered Doctoral Students? Shattering a Misconception



Data compiled from the [Women, Minorities, and Persons with Disabilities in Science and Engineering](#) report (2021), [Survey of Earned Doctorates](#) (2020) and [Survey of Graduate Students and Postdoctorates in Science and Engineering](#) (2020). Percentages are rounded.

Financial Hurdles Can Discourage Entry into STEM Doctoral Programs for the Missing Millions

Some students can absorb low earnings for the 5+ years it takes to earn a doctorate. The NSB concludes that students who have dependents, high debt, and/or little to no existing financial resources — as is too often the case for students from the Missing Millions — may find that **pursuing and persisting in STEM doctoral programs presents too high a hurdle, compared to the financial independence and security offered by employment.**



Will there be a return on my investment?

- Future employment
- Future lifetime earnings
- Delayed retirement savings

Can I afford graduate school?

- Debt prior to graduate school
- Debt incurred during graduate school (for tuition, housing, etc.)
- Access to savings and intergenerational wealth
- Duration of program (how long can I sustain this income level?)
- Lack of information about costs and available resources

Will there be a return on my investment?

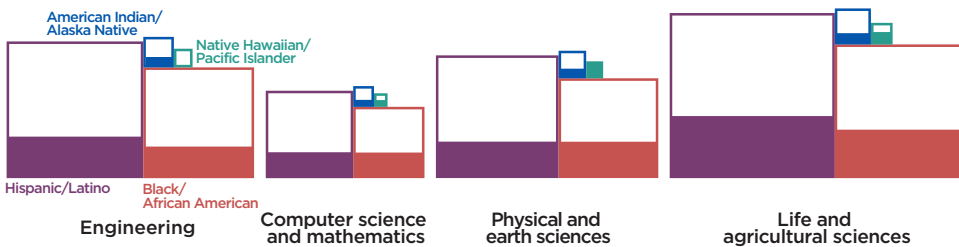
Can I support myself and dependents while in graduate school?

- Healthcare
- Childcare / eldercare
- Cost of living
- Access to additional funding / income
- Funding security

Can I afford graduate school?

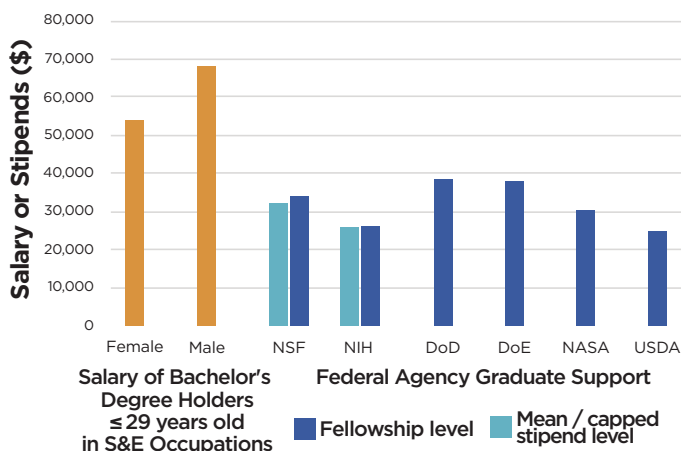
Will there be a return on my investment?

Give Doctoral Students What They Need to Thrive, Not Just Survive



Missing Millions Doctorates by Field of Degree: Within each field, the boxes for race / ethnicity are sized to their relative proportion in the overall U.S. population. The solid color area within each box represents the number of doctorates awarded (2018) in the given demographic for that research field; unfilled area represents the number of additional doctorates from that demographic needed for the field to be representative of the group's proportion in the U.S. population. The box sets are scaled to illustrate the relative number of doctorates awarded in the U.S. across these degree fields.

S&E Bachelor's Degree Holders Earn More on Average than STEM Doctoral Students, Irrespective of Funding Agency



Individuals with in-demand STEM bachelor's degrees must weigh the return on their educational investment in the face of the yawning gap between job compensation packages and doctoral student support. Recent graduates with STEM bachelor's degrees can earn up to \$36,000 more per year of employment than STEM doctoral students, not including benefits such as healthcare. **This disparity in earnings is even greater in mathematics, computer science, engineering, and other subjects needed for critical and emerging technology areas that are vital to our future economic and national security.** As such, the short-term financial needs of prospective doctoral students from underrepresented groups often outweigh the prospect of future lifetime earnings. In addition, students are not only forgoing wages to pursue a doctorate — in most STEM fields, graduate educational debt accounts for **more than half** of doctoral recipients' cumulative educational debt.

Increasing federal support for STEM doctoral students would help reduce this gap, which in turn will help increase recruitment and persistence in STEM doctoral programs, opening this pathway to more of the diverse domestic talent currently missing in our S&E enterprise. **Lowering financial barriers would strengthen individual futures and our nation's future competitiveness.**

Data sources: **Salary information (yellow):** [Women, Minorities, and Persons with Disabilities in Science and Engineering report 2021](#) (Table 9-16); **NSF:** Mean annual graduate student support requested per research grant, published [2019 Merit Review Digest \(Table 2.2\)](#) – includes both master's and doctoral support; **GRFP, 2021; NIH:** Capped doctoral stipend and NRSA levels set in 2021 [FOA](#); **DOD:** [NDSEG, 2020](#); **DOE:** [CSGF](#); **NASA:** [NASA fellowship, 2022](#); **USDA:** [NIFA](#)