

The United States: Leaders in basic science

Maintaining leadership is key to economic competitiveness

Basic science, including biochemistry and molecular biology, is crucial to American innovation. The United States has long been a global leader in research and development, fueling scientific breakthroughs and economic growth. However, China has been rapidly increasing R&D spending, threatening to surpass the United States. Keeping America at the top of the world's innovators for R&D requires sustained federal investment, a robust STEM workforce, and policies that promote scientific advancement.

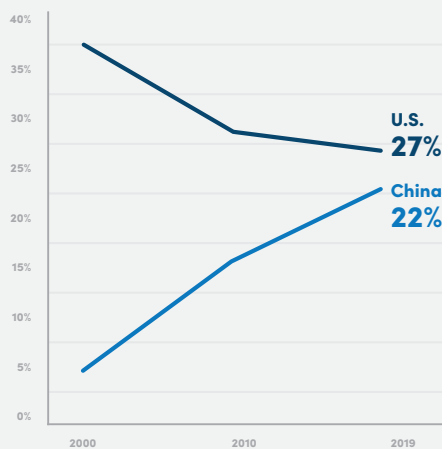
Global competition is growing

Over the past twenty years, China has become even more competitive with the United States by strengthening its STEM workforce and advancing manufacturing capabilities. [From 2000 to 2019, China's contribution to global R&D increased from 5% to 22% while the U.S. decreased from 37% to 27%](#) (see left chart).



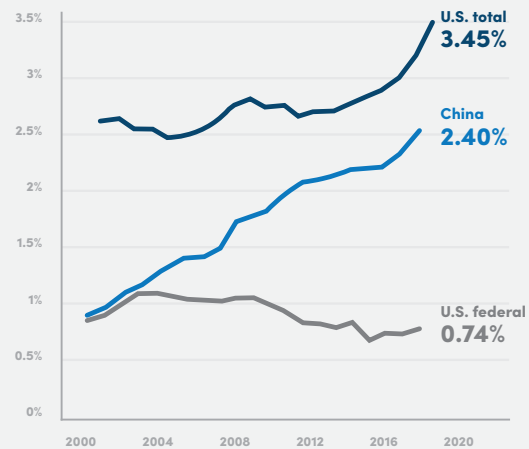
The government of China has [increased the percentage of GDP it spends on R&D from below 1% in 2000 to 2.4% in 2020](#) (see right chart). The United States also has increased overall R&D spending as a percentage of GDP since 2000, but that increase has come from private investment. U.S. federal R&D investments have [stayed at or under 0.8% for the last ten years](#). With the U.S. remaining stagnant in federal funding, it is unsurprising to see China catching up to the U.S. as leaders in global R&D.

China has narrowed the U.S. global lead in R&D (% of global R&D spending)



Source: OECD Data, Gross Domestic Spending on R&D; *AAAS, Historical Trends in Federal R&D

China and U.S. R&D spending (% of GDP)



Source: National Science Board, The State of U.S. Science and Engineering 2022





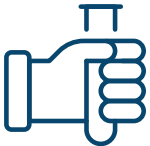
AI and basic science

[Basic science contributed to the development of AI.](#) Scientists continue to utilize AI within data analysis software and for other day to day lab activities. While China is the current leader in AI development, supporting NIH and basic research will allow the U.S. to catch up and reclaim our global advantage in STEM.



Economic impacts

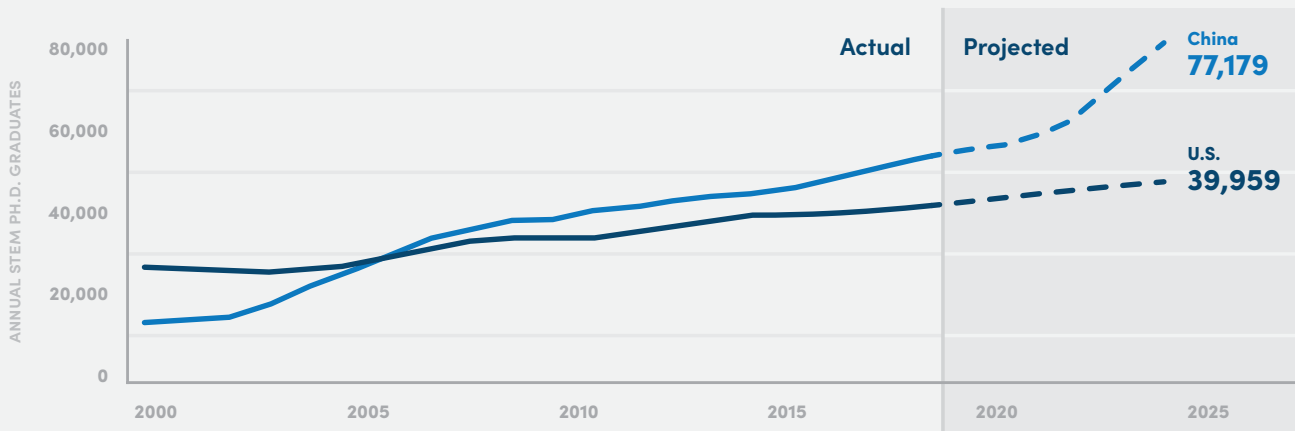
Basic research, supported by National Institutes of Health (NIH), has economic impacts such as [supporting 412,041 jobs and generating \\$92.89 billion in economic activity in FY2023 – or \\$2.46 of economic activity for every \\$1 of research funding.](#) Federal funding for research, including NIH, supports economies in all 50 states. In addition, funding from NIH stimulates local economies through supply purchases, from paper to lab computers.



Robust STEM workforce

A robust STEM enterprise is crucial in keeping the United States at the forefront of scientific innovation. Science and Engineering articles are a [key metric in measuring productivity](#) and research impact of our STEM workforce. As of 2022, [the U.S. is behind China in S&E publications.](#) Additionally, [China is also significantly outpacing the U.S. in STEM PhDs,](#) a key component to driving basic science research (see chart below). To remain as leaders in the scientific community, the U.S. must provide significant and sustained funding to the STEM enterprise.

China and U.S. Ph.D. graduates in stem fields



Source: Center for Security and Emerging Technology, August, 2021. CSET Data Brief, "China is Fast Outpacing U.S. STEM PhD Growth"

