

Future of Global Collaborative Research in an Age of
National Security Anxieties:
National Science Foundation Perspective



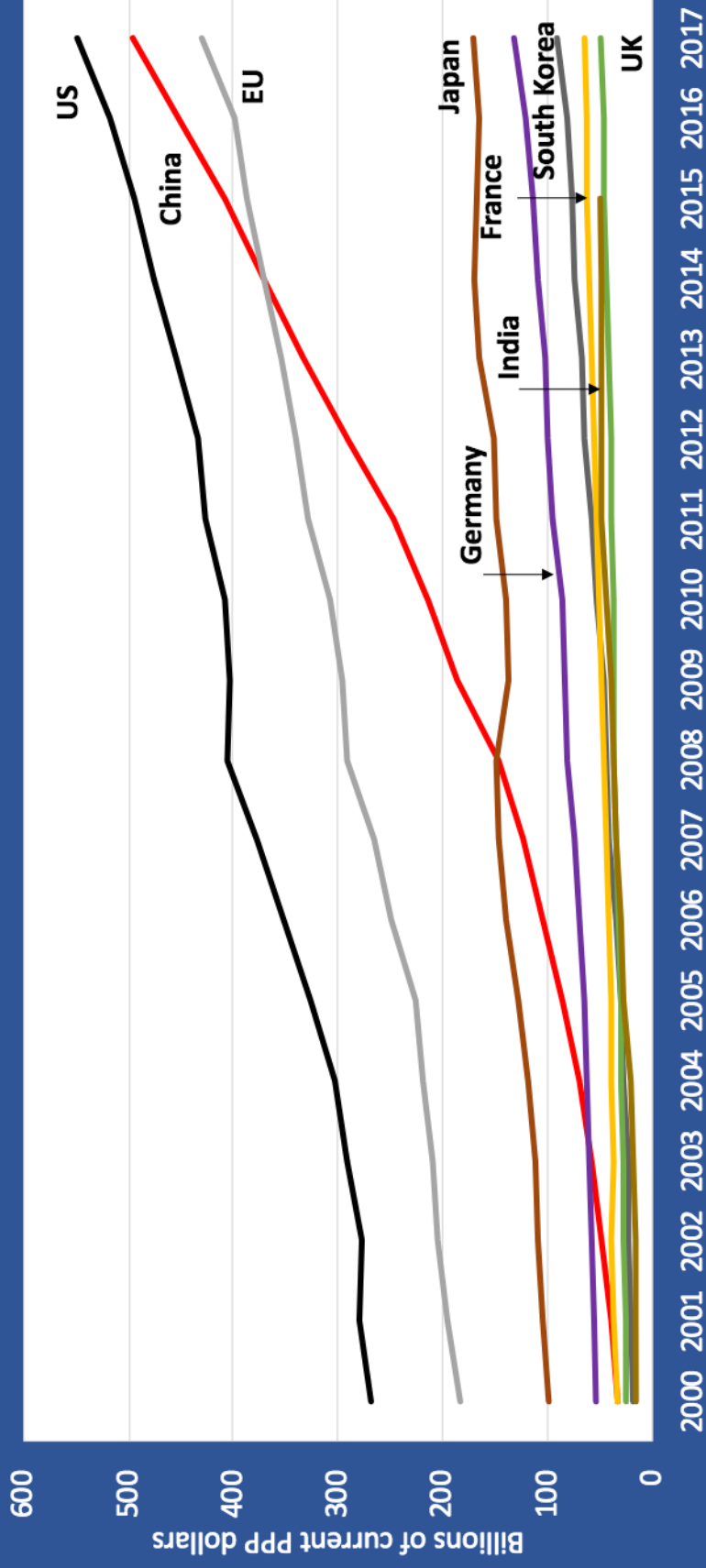
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Outline

- ❖ Importance of continued U.S. engagement in the Global Research Ecosystem: NSF Data
 - Global R&D
 - Research quality
 - Workforce excellence
- ❖ NSF perspective on science and security
 - Openness of U.S. basic research is a fundamental strength
 - Emphasis on disclosure and risk assessment
- ❖ Some NSF opportunities to support U.S. international engagement



Global Expenditure on R&D has increased sharply



Sources: NCSES; OECD; UNESCO.



Regional shift in share of worldwide R&D expenditures



Sources: OECD; UNESCO.



International co-authorship rates of S&E articles



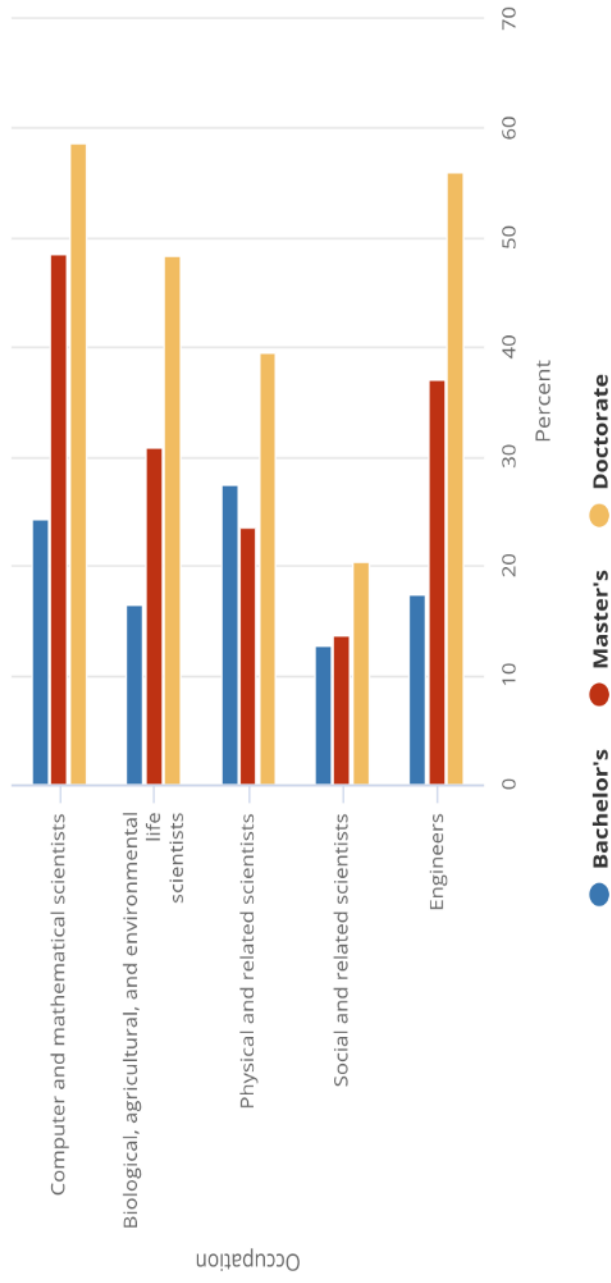
Source: Elsevier, Scopus database.



Foreign-born workers are a large share of the S&E labor force: 2017

FIGURE 3-24

Foreign-born scientists and engineers employed in S&E occupations, by highest degree level and broad S&E occupational category: 2017

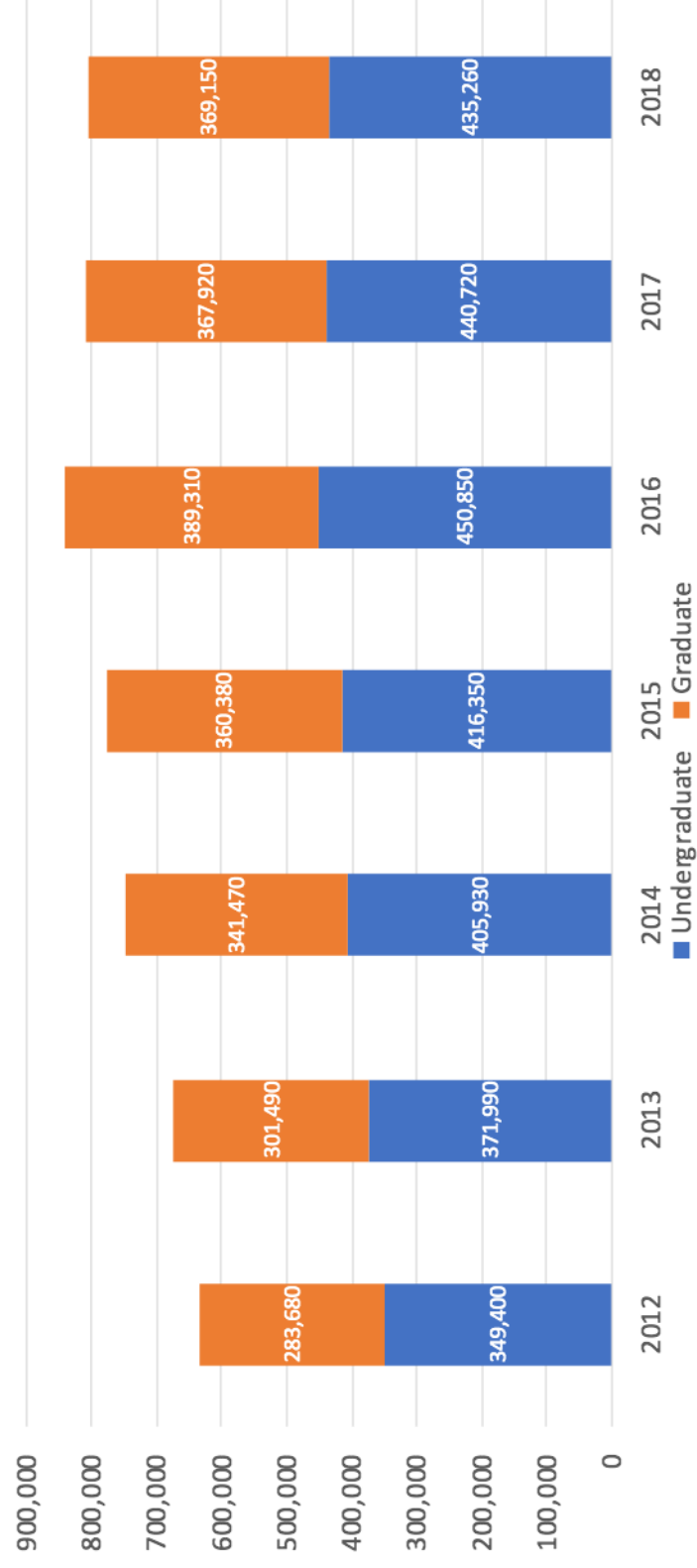


Source(s)
National Center for Science and Engineering Statistics, National Science Foundation, National Survey of College Graduates (NSCG), 2017.
Science and Engineering Indicators



U.S. international student enrollment has declined since 2016

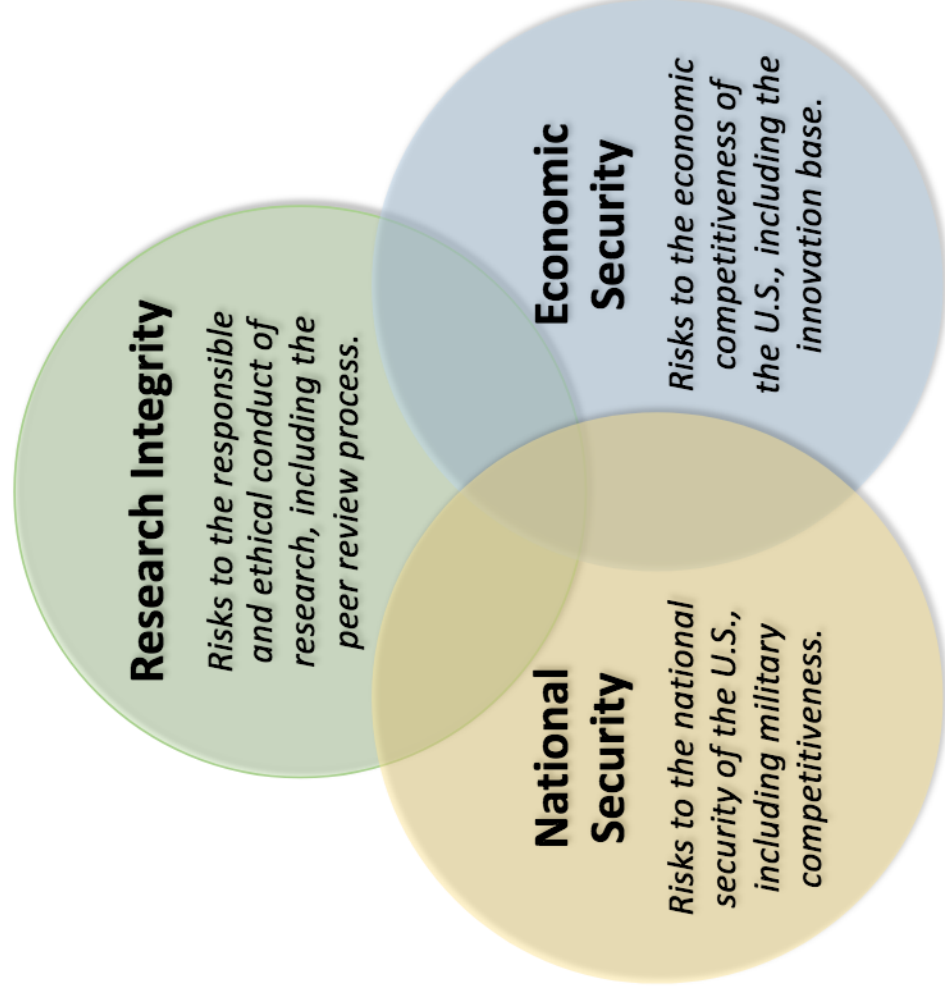
International students enrolled in U.S. higher education institutions: 2012-18



Source: U.S. Department of Homeland Security, U.S. Immigration and Customs Enforcement, special tabulations (2018) of the Student and Exchange Visitor Information System (SEVIS) database.



Risks to U.S. Science and Security in a Global Research Ecosystem



Risks to U.S. Science and Security in a Global Research Ecosystem

Research Integrity:

- Conflicts of interest / commitment
- Confidentiality of merit review process
- Protection of pre-publication data

Risks to U.S. Science and Security in a Global Research Ecosystem

**NSF's approach
emphasizes
disclosure and risk
assessment.**

JASON Independent Science Advisory Group Report *Fundamental Research Security*

December 2019
Commissioned by NSF

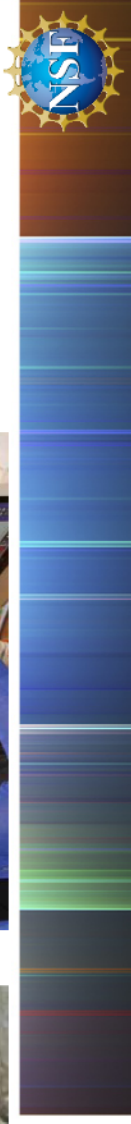
Conclusion

...a reinvigorated commitment to U.S. standards of research integrity and the tradition of open science by all stakeholders will drive continued preeminence of the United States in science, engineering, and technology.



Selection of NSF Programs Supporting U.S. International Engagement in Research, Education

- ❖ International Research Experience for Students (IRES; NSF 19-585)
- ❖ Accelerating Research through International Network-to-Network Collaboration (AccelNet; NSF 19-501)
- ❖ Partnerships for International Research and Education (PIRE; under revision)



Science Thrives in an Atmosphere of Openness and Transparency

“...the open and internationally collaborative nature of the United States research enterprise has been critical to our success in research, and...this success has underpinned our Nation’s prosperity and security.”

Dr. Kelvin Droegemeier

White House Office of Science and Technology Policy (OSTP) Director

Letter to the U.S. Research Community, September 16, 2019.



Resources

- Science and Engineering Indicators 2020
<https://nces.nsf.gov/indicators>
- OSTP Director Letter to Research Community
<https://www.whitehouse.gov/wp-content/uploads/2019/09/OSTP-letter-to-the-US-research-community-september-2019.pdf>
- Report by the independent science advisory group JASON, “Fundamental Research Security”
https://www.nsf.gov/news/news_summ.jsp?cntn_id=299700
- International Research Experiences for Students program
https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505656
- AccelNet program
https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505584



Thank you

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