

Research in Context

Bridging Historical Insight with Contemporary Shifts

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From Insight to Impact: A Seminar Series on Research Communication
September 18, 2025



Who am I?



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A few facts ...

- **Systems Ecologist**
- **Professor @  since 2007**
- **Taught ecology** at BS, MS, and PhD levels
- Editorial Board of **International Journal of Ecological Modelling**
- **Parent** of 2 awesome kids, **married** for 27 yrs
- Began serving as **Senior Research Officer** in 2018
-  **Program Officer 8/2024-8/2025**
- Worked in **research leadership/administration** for as long as I was in graduate school



Road Map

1

**National Research
Enterprise**

2

Recent State

3

Contemporary Shifts

4

How to Respond



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Definition of R&D

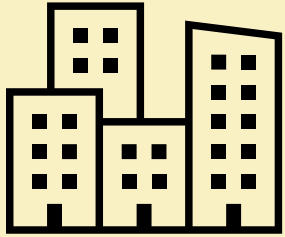


Research and experimental development (R&D) comprise **creative and systematic work** undertaken in order to **increase the stock of knowledge** – including knowledge of humankind, culture and society – and to **devise new applications** of available knowledge.

p.44

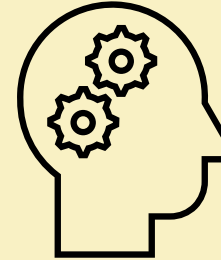
U.S. National Research Enterprise

Institutions and Organizations



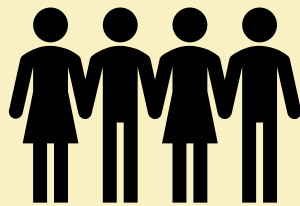
- Facilities
- Equipment
- Resources

Investigators, Trainees, Teams



- Disciplinary knowledge, networks, expertise
- Discovery, technology & innovation pipeline

Research Support and Service Infrastructure



- Staff and administration
- Human capacity and capability
- Policies, practices, and processes
- Partnerships

Government
Industry/Corporate
National Labs
Non-profits
Institutions of Higher-Education



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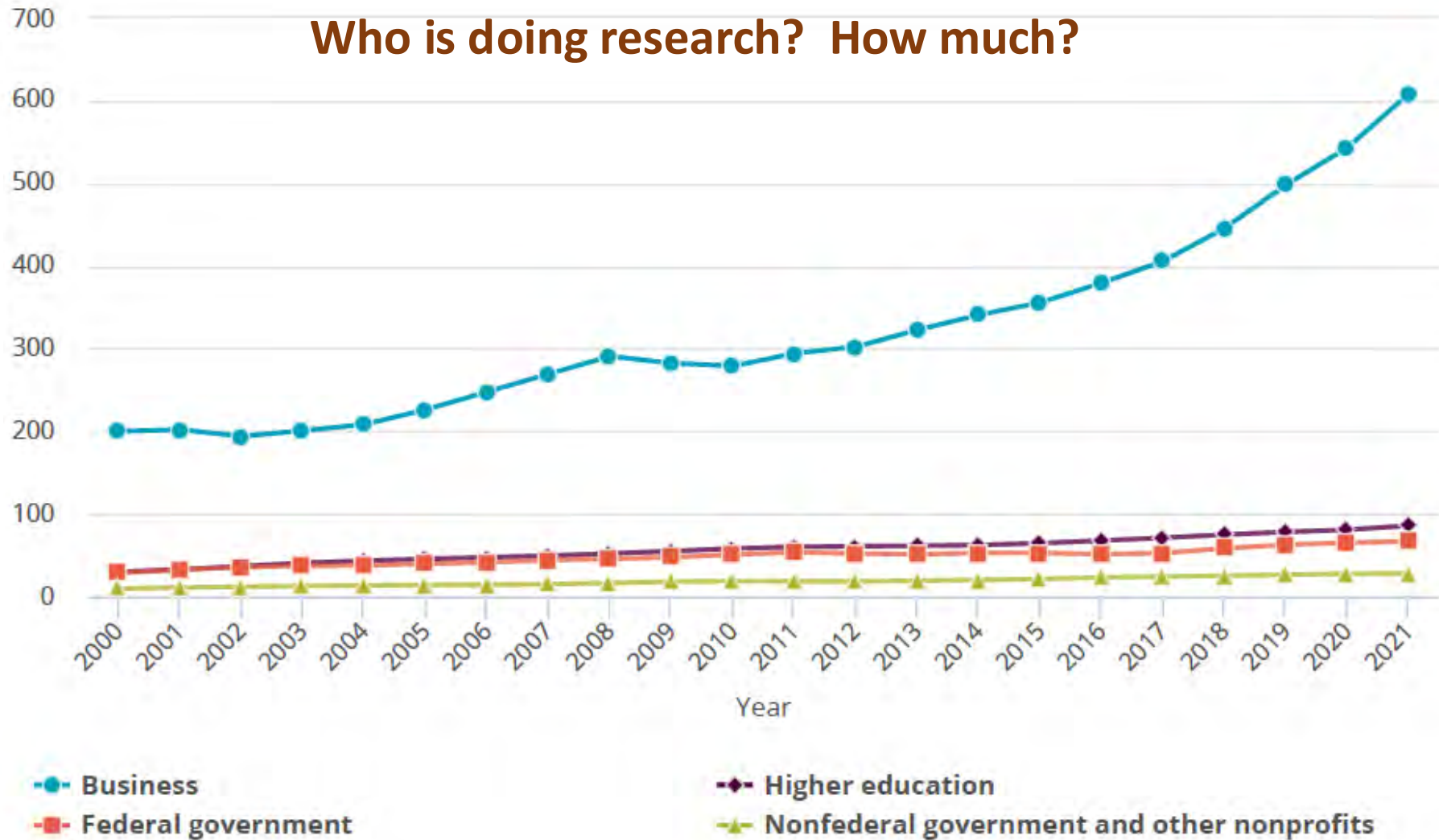


U.S. R&D Expenditures, by performance sector

Using expenditures
as a proxy measure
for activity

Billions of
current
dollars

Who is doing research? How much?

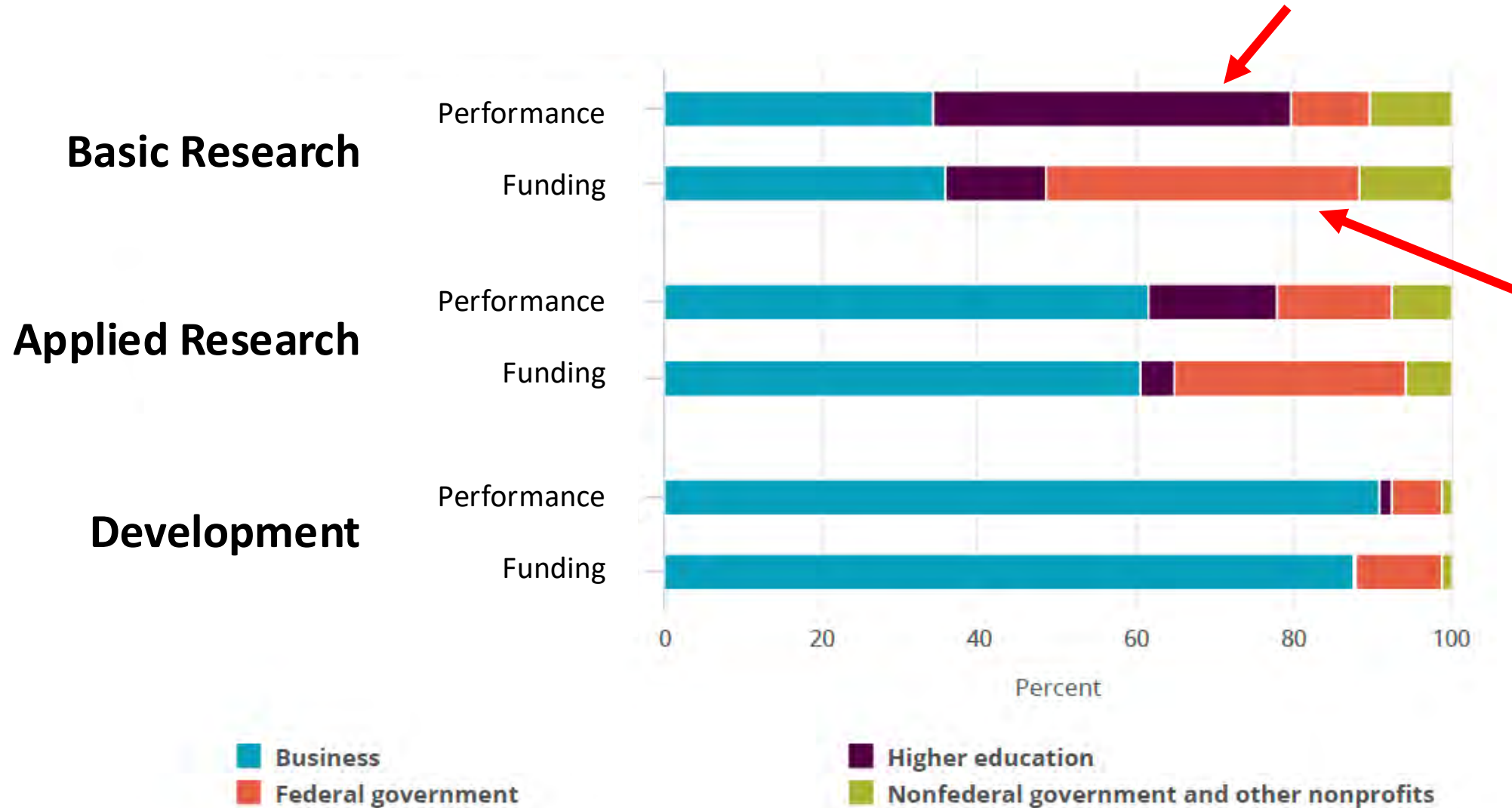


Note(s): Some data for 2021 are preliminary and may be revised later.

Source(s): NCSES, National Patterns of R&D Resources (2021–22 edition). *Indicators 2024: R&D*



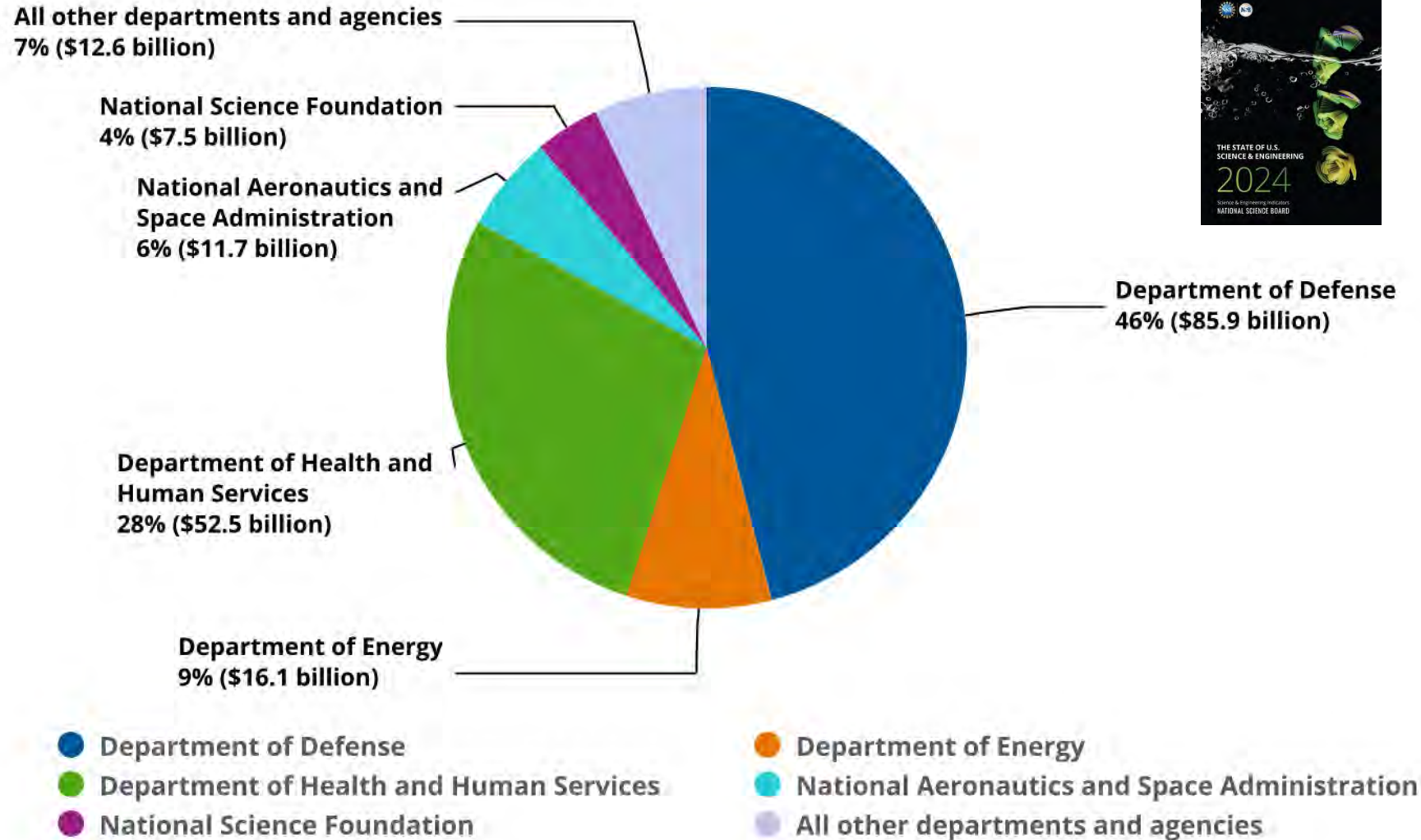
R&D Performance and Funding by Type and Sector: 2021



Note(s): Some data for 2021 are preliminary and may be revised later.

Source(s): NCSES, National Patterns of R&D Resources (2021–22 edition). *Indicators 2024: R&D*

Federal obligations for R&D by agency, FY2023



NATIONAL
ENDOWMENT
FOR THE
HUMANITIES

\$207 million

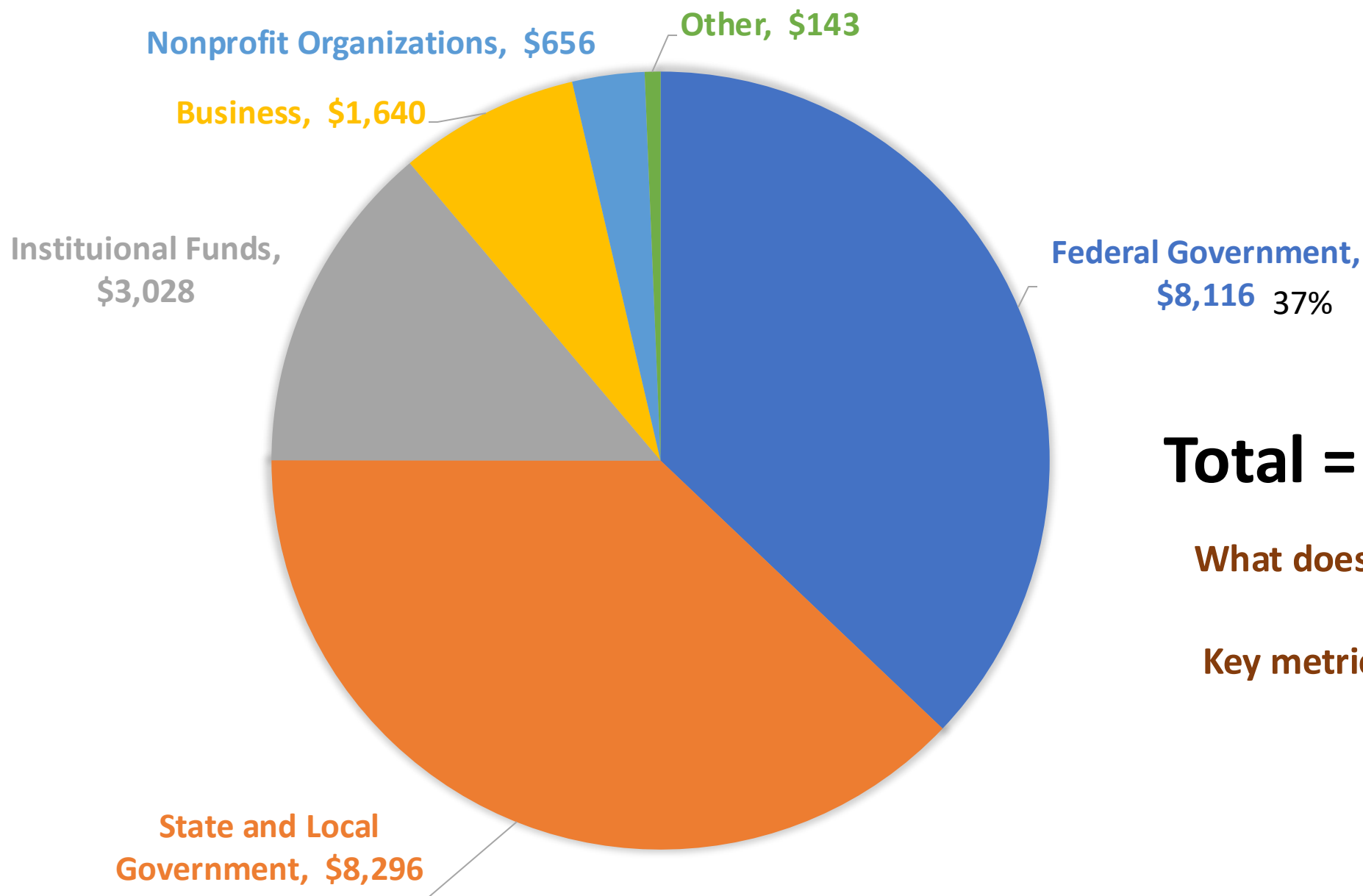
NATIONAL
ENDOWMENT for the **ARTS**
[arts.gov](https://www.arts.gov)

\$207 million

Note(s):
Because of rounding, detail may not add to total.

Source(s):
National Center for Science and Engineering Statistics, Survey of Federal Funds for Research and Development, FYs 2023–24.

FY23 Research Expenditures, by source (in \$1000s)

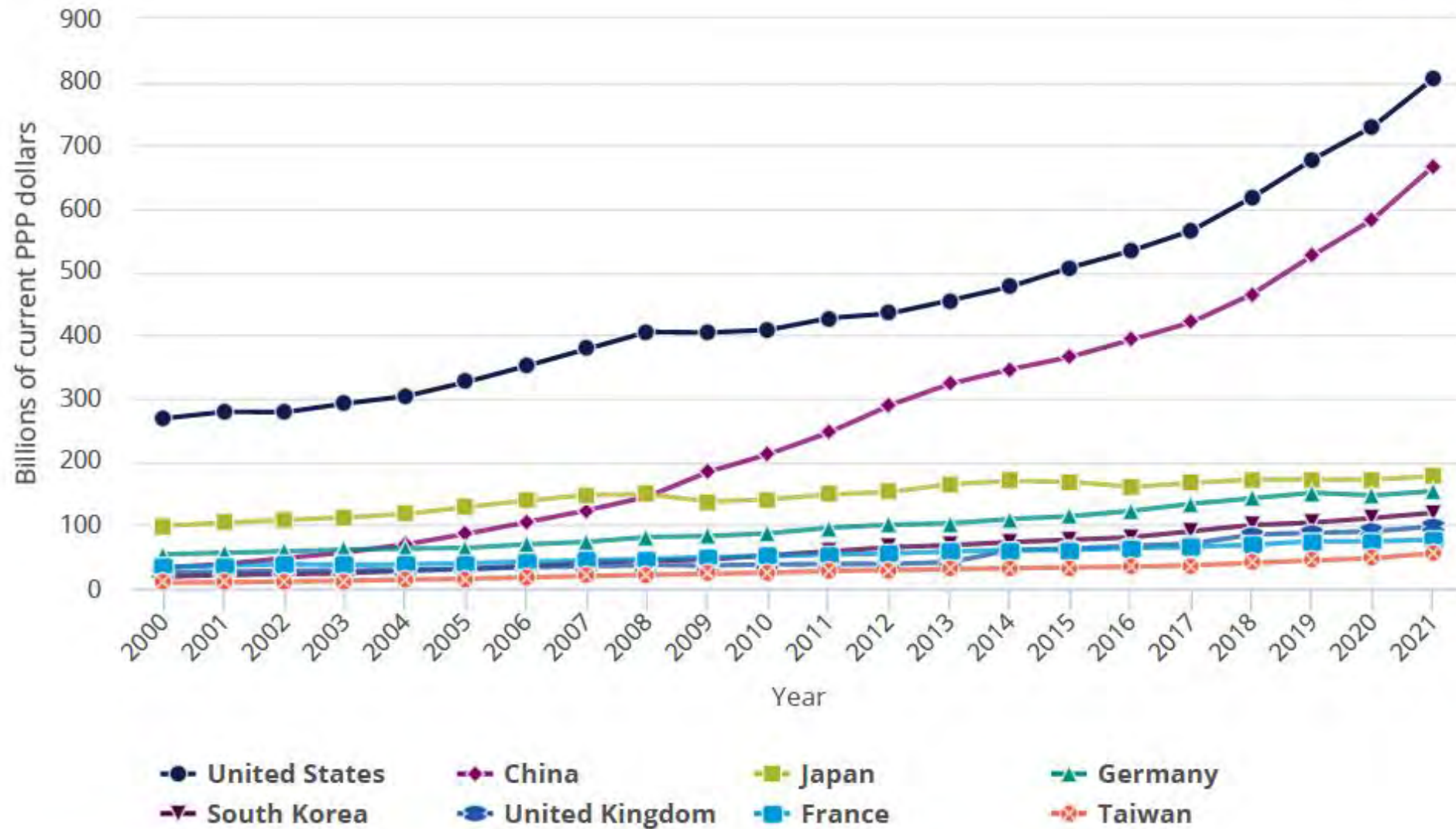


Total = \$21.9 million

What does this include/exclude?

Key metric for R2 classification

International Context: R&D Expenditures 2000-21

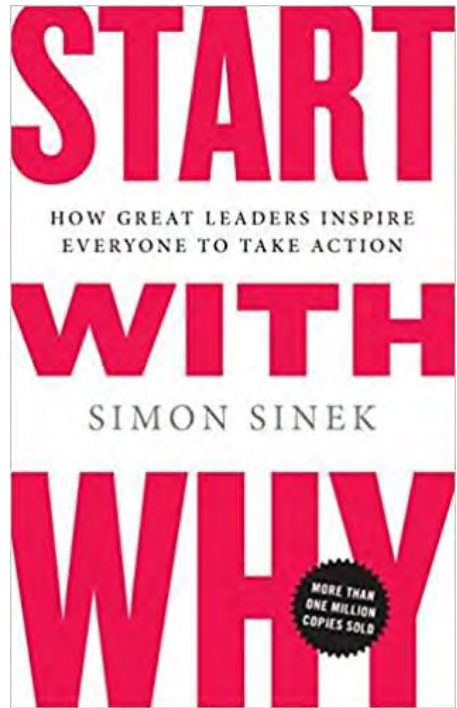


Note(s): PPP is purchasing power parity. Data are for the top eight R&D-performing countries or economies.

Source(s): OECD, MSTI, September 2023 release. *Indicators 2024: R&D*



Consider



Why are US taxpayers investing in R&D?

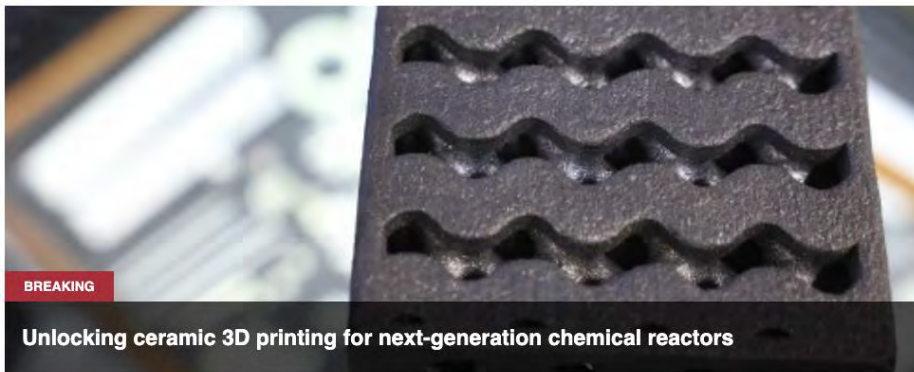
Why does the federal government partner with universities for R&D?

Why does the agency support R&D?

How do your research goals & objectives align with these “whys”?

Answer these questions when you communicate about your research

R&D Outcomes: Recent Headlines



Unlocking ceramic 3D printing for next-generation chemical reactors



New research explores improving coastal high tide flooding outlooks

Increasing lead times will help communities mobilize flood responses.



Treating opioid addiction in jails improves treatment engagement, reduces overdose deaths and reincarceration

September 10, 2025 — NIH-funded study demonstrates life-saving potential of providing medications for opioid use disorder in carceral settings.

16-Sep-2025 8:30 EDT

A New Way to Produce Ammonia More Efficiently

[Princeton Plasma Physics Laboratory](#)

A new approach for making the chemical ammonia using plasma — the fourth state of matter — could revolutionize how hydrogen is stored and transported and drive down the price of various manufacturing processes.



Repeated head impacts cause early neuron loss and inflammation in young athletes

September 17, 2025 — NIH-funded study reveals brain changes long before chronic traumatic encephalopathy (CTE) develops.

NEH in the News

WSU professor's app will help visually impaired read 'rich visual content'

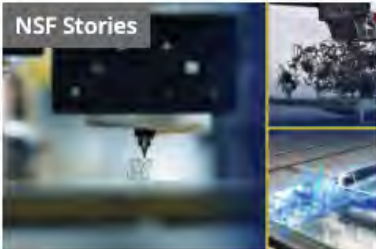
February 25, 2025



Latest News

ARS researchers and their partners discovered a tomato line that is resistant to tomato brown rugose fruit virus. [More ...](#)

[Subscribe](#) | [Archive](#) | [RSS Feeds](#) | [Twitter](#)



New AI model could revolutionize U.S manufacturing

Artificial intelligence has transformed fields like medicine and finance, but it hasn't gained much traction in manufacturing. Factories present a different challenge for AI: They are structured, fast...

July 17, 2025



New axolotl study gives researchers a leg up in work towards limb regeneration

Researchers supported by the U.S. National Science Foundation have discovered that it is not how much of a key molecule that allows axolotls to regenerate limbs properly, it is how little. This new...

July 18, 2025

USDA and DOI Announce Bold Federal Reforms to Improve Nation's Wildfire Response System

September 15, 2025

(Washington, D.C., September 15, 2025) — U.S. Secretary of Agriculture Brooke L. Rollins today issued a new memorandum to modernize and strengthen America's wildfire prevention and response system. This policy direction enacts common-sense reforms that modernize and streamline federal wildfire...

R&D Outcomes: IT

“Tire Track Plot”

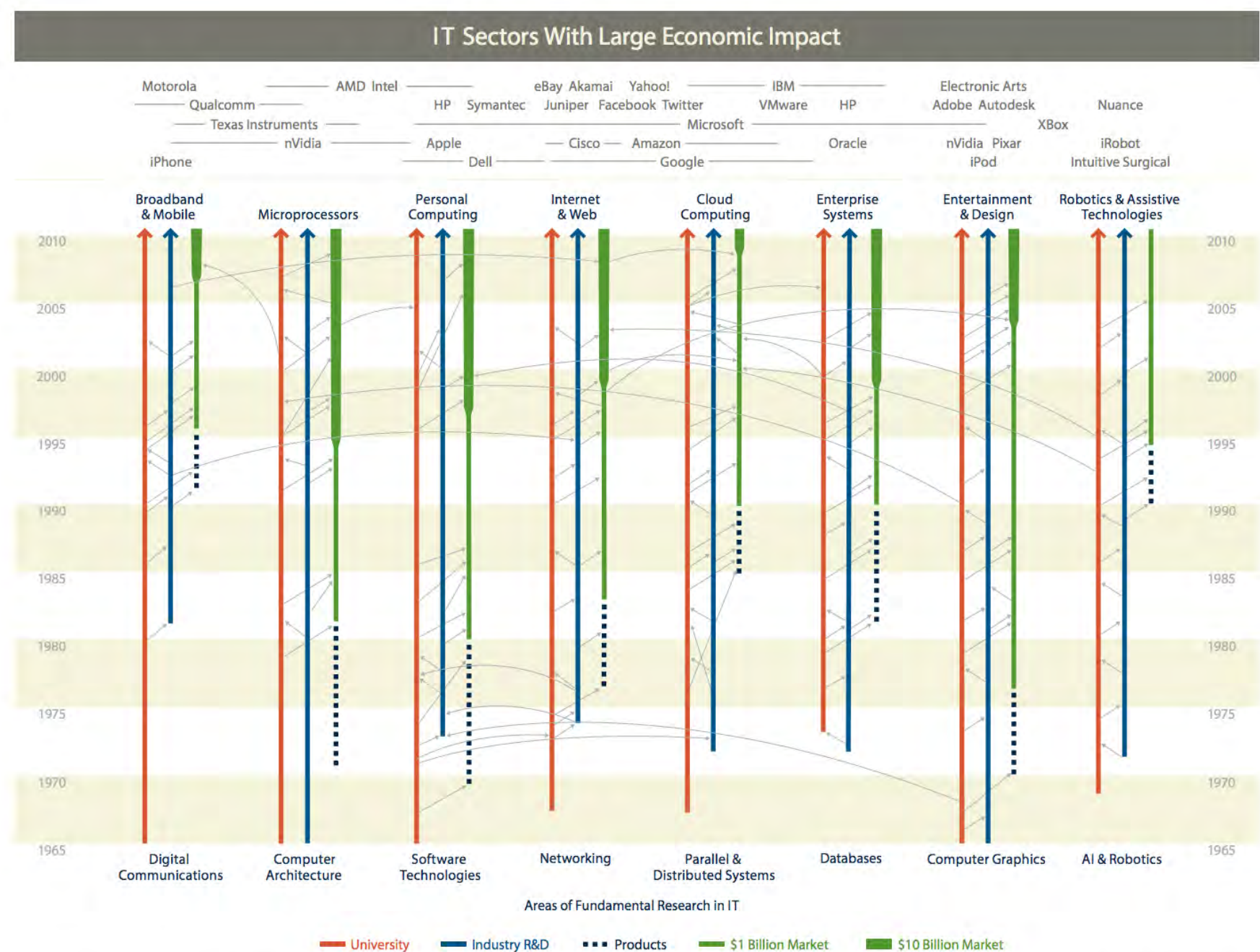


FIGURE I.1 Examples of the contributions of federally supported fundamental research to the creation of IT sectors, firms, and products with large economic impact. SOURCE: Reprinted from National Research Council, 2012, *Continuing Innovation in Information Technology*, The National Academies Press, Washington, D.C.

R&D Outcomes: Economic Prosperity



The Returns to Government R&D: Evidence from U.S. Appropriations Shocks

Andrew J. Fieldhouse and Karel Mertens

Working Paper 2305 May 2023 (Updated December 2023)

Research Department
<https://doi.org/10.24149/wp2305r1>

Working papers from the Federal Reserve Bank of Dallas are preliminary drafts circulated for professional comment. The views in this paper are those of the authors and do not necessarily reflect the views of the Federal Reserve Bank of Dallas or the Federal Reserve System. Any errors or omissions are the responsibility of the authors.

1/4 or 25%

**of business sector economic growth (TFP)
since WWII**
is due government funded non-defense R&D

...workforce development too!

Common Critiques

- High Bureaucracy and Administrative Burden
 - slow
 - expensive
- Funding priorities – who determines?
- Difficult to fund high-risk, high reward research
- Inequities in funding distribution
- Reproducibility & research integrity
- Intellectual Property and commercialization
- Limited public engagement

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Contemporary Shifts: Presidential Executive Orders



These and others required federal agencies sponsoring research to change their practices



New Guidelines

Terminated awards that were not compliant

Asked PIs to renovate active awards

Eliminated programs

Revising program descriptions

Broader Impacts

1,752 Awards
\$1.4 B



~7 awards terminated (of ~250)

Others may still be impacted

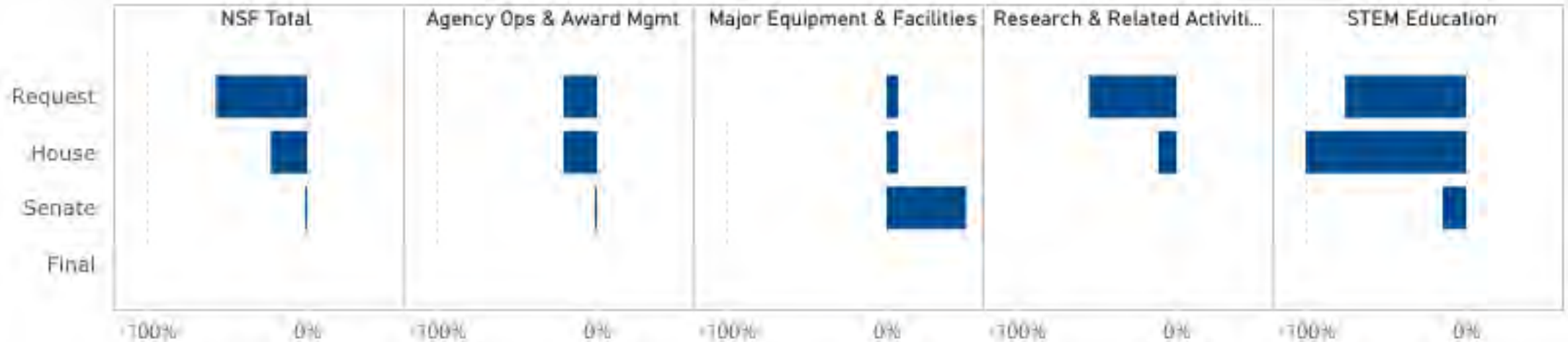
Slow NCX

Slow new fed. awards



Contemporary Shifts: Federal Budget – not done yet

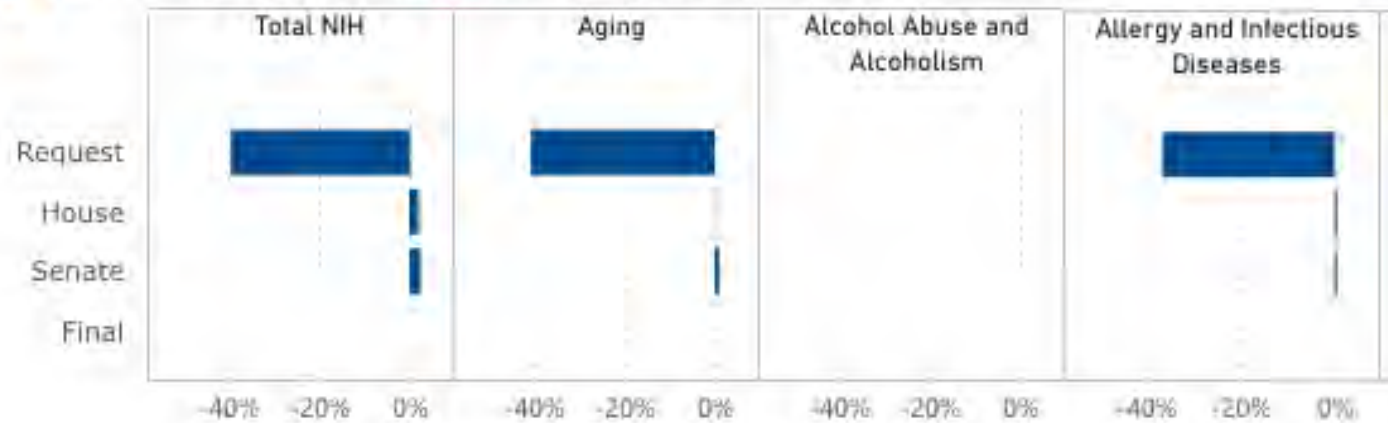
National Science Foundation



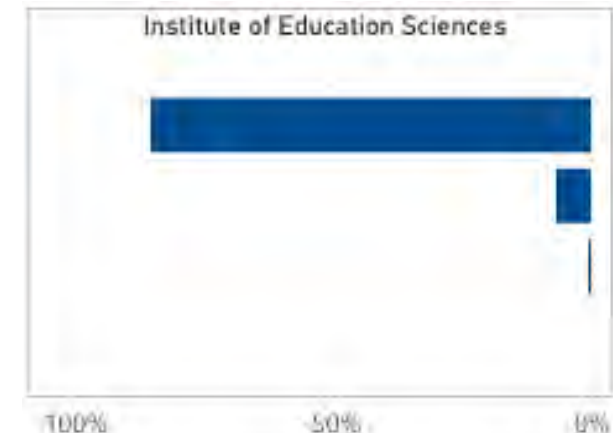
Percent different from previous fiscal year

NIH

● Percent Change from Prior Year ● Additional Funding



Dept. of Education



Contemporary Shifts: Other Items

- Changing federal workforce
 - Reduction of force
 - “Fork” approach
- Changing rules for federally sponsored research
 - 2 CFR 200 update expected soon
 - Recover of facilities and administration costs
 - Award Terms and Conditions

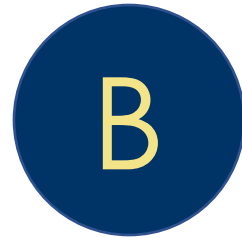


Contemporary Shifts: Federal R&D Strategy

To what degree should the US Federal Government ...



Invest in R&D?



Partner with IHE for R&D?



What R&D to prioritize?

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Disruption to the National Research Enterprise (+)

change

Dynamic

Uncertain

That may leave you feeling



Suggested Responses

, ?

Acknowledge & Grace

Seek emergent opportunities

Federal priorities seem to be:

- Emerging technology: **Artificial Intelligence, Quantum Computing**
- **Biotechnology** and biosecurity
- **Advanced manufacturing**
- **Nuclear energy**

Discere Aude

Continue **research, scholarship**, and **creative work** with the resources we have at UNCW.

Your research matters!

Consider **other partnerships**

- State & local government
- Foundations
- Corporate & Industry
- Other universities



Lessons from a Program Officer:

Keep submitting proposals

- **Writing a proposal** is never wasted time & effort. It is a creative act that advances a researcher's ideas and insights.
- **Merit Review**: constructive reviews further improve research.
- When the funding arrived, I could only **recommend awards** to proposals that were in hand and reviewed.
- A **drop in proposal submissions** could be used as evidence that continuing funding of the agency/sponsor is unnecessary.
- **Patience. Federal agencies must comply** with executive orders and new legislation, and it takes time to do this.

Research and Innovation Service Team (RIST)



- **Here to support you!** Please let us know when you have a question, concern, or suggestion.
- Actively **monitoring the changing research support and regulatory landscape**, and we will actively share with you what we know (and don't).
- Happy to meet individually or visit **department or committee meetings**.



Connect with RIST!

**Signup for R&I
News & Funding
Opportunities email**



Opt in!

**Join SPARC
Virtual Office Hours**



<https://uncw.edu/myuncw/research/toolbox/news-updates>

**Tuesday & Thursdays
1-2 pm**

**Join RIO
Virtual Office Hours**

Virtual Office Hours



IRB: T, 11-12:30 pm
TH, 2-3:30 pm

IACUC: F, 11 – noon

Export Controls: TH, 10-11:30 am

Contact Us!



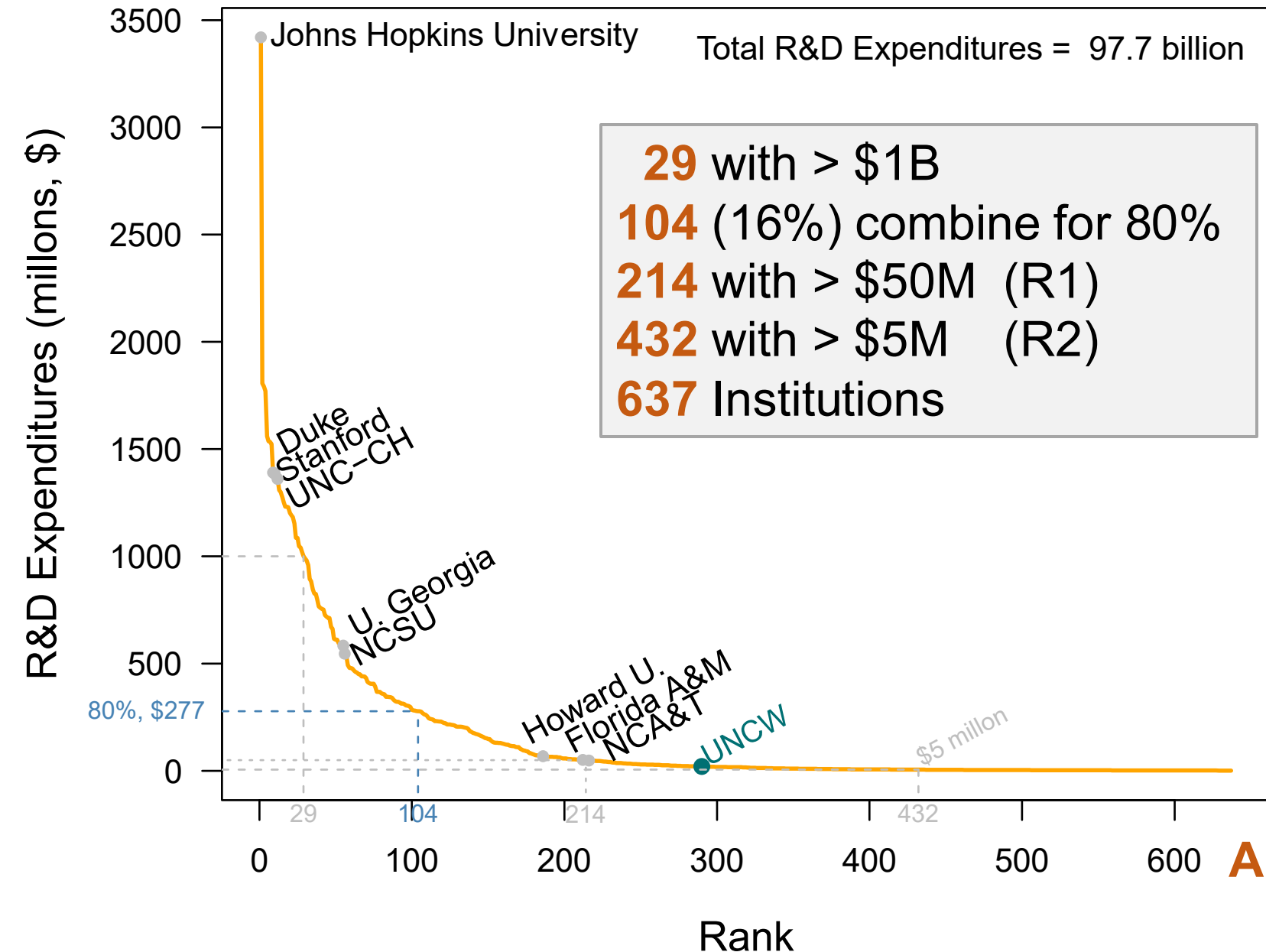
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RESEARCH AND INNOVATION

NSF HERD 2022 Research Expenditures

State of the R&D System



637 of ~ 4,000

Colleges and Universities

Variability in institution
research activity, type,
expertise population served,
geographic location

Shannon Equitability Index

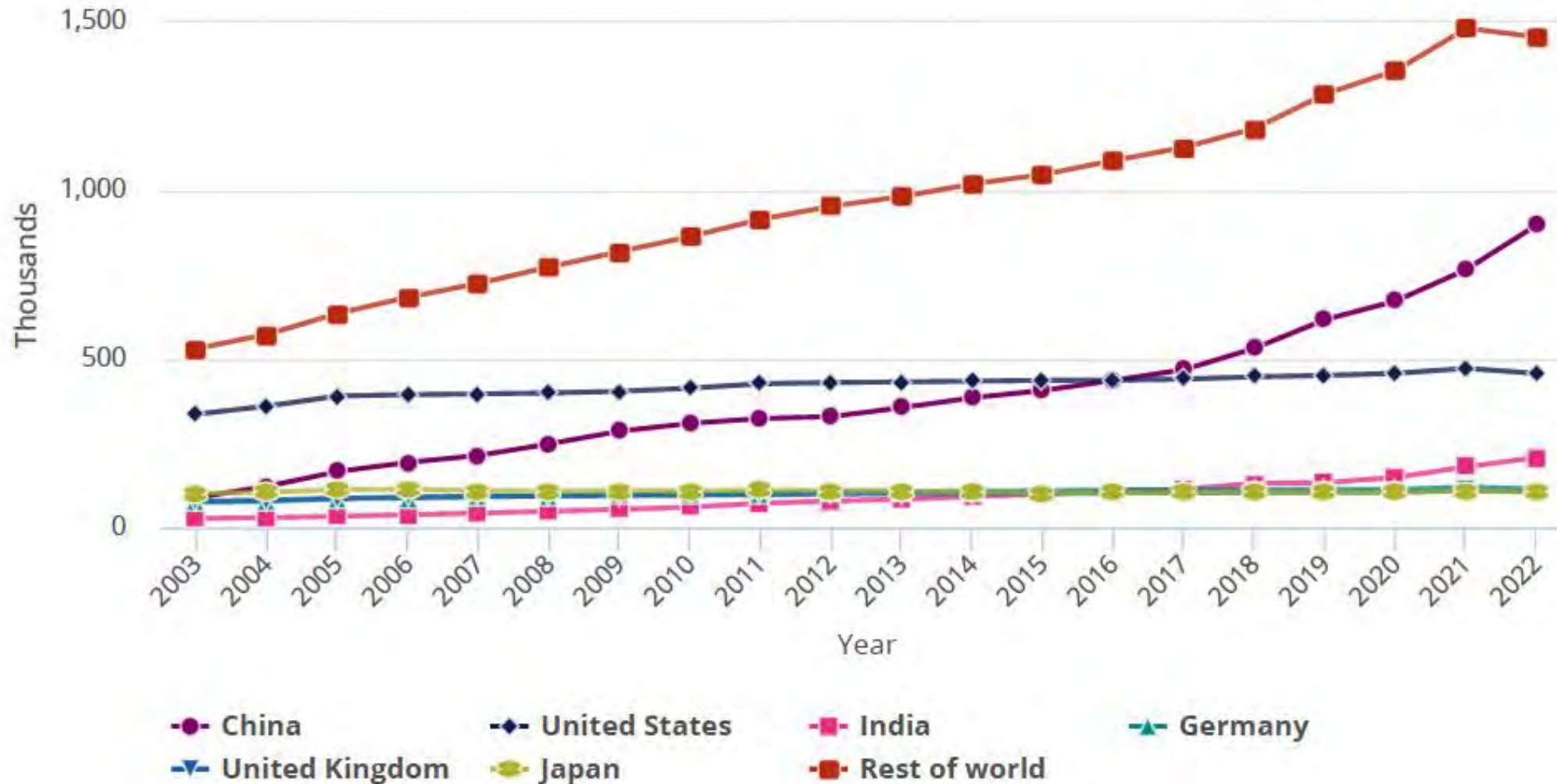
$$(1 - E_h) = 0.20$$

→ Not Diverse

→ Centralized

**Are we getting all we can from
the IHE R&D ecosystem?**

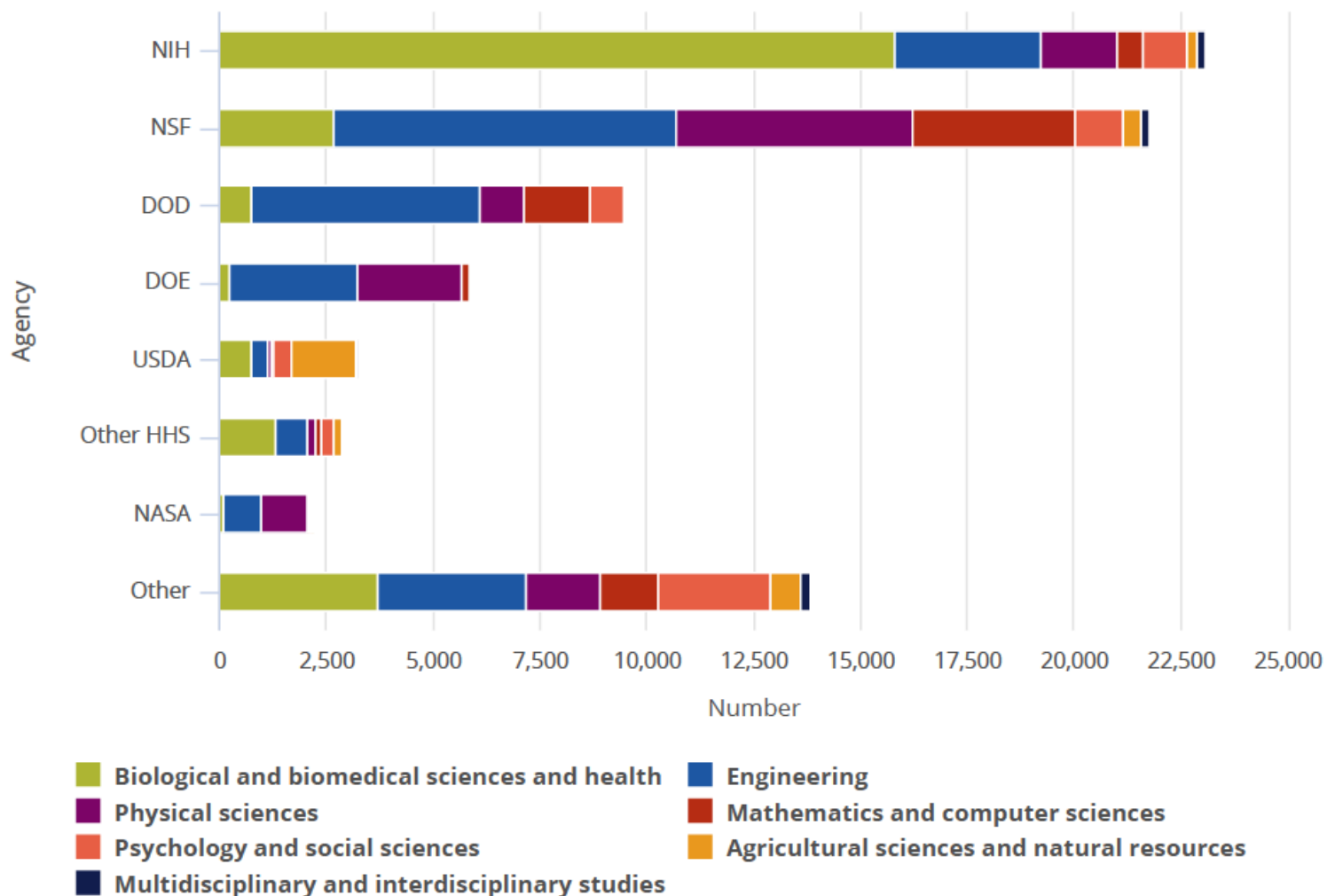
International Context: S&E Articles, 2003-22



Note(s): Articles are fractionally counted and classified by publication year and assigned to a region, country, or economy by author's institutional address.

Source(s): NCSES, special tabulations (2023) by Science-Metrix of Elsevier's Scopus abstract and citation database. *Indicators 2024: Publications Output*

Support for Graduate Students



Note(s): DOD is Department of Defense. DOE is Department of Energy. HHS is Department of Health and Human Services, excluding NIH. NASA is National Aeronautics and Space Administration. NIH is National Institutes of Health. NSF is National Science Foundation. USDA is Department of Agriculture. S&E includes health fields. Physical sciences includes geosciences, atmospheric sciences, and ocean sciences. Agricultural sciences includes veterinary sciences; natural resources includes conservation. Mathematics includes statistics; computer sciences includes information sciences.

Source(s): NCSES, GSS, 2021. *Indicators 2024: Academic R&D*

