

# Research in Context

## Bridging Historical Insight with Contemporary Shifts

**Stuart Borrett**

Associate Provost for Research and Innovation



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



# Who am I?



## Stuart Borrett

Associate Provost for Research  
and Innovation

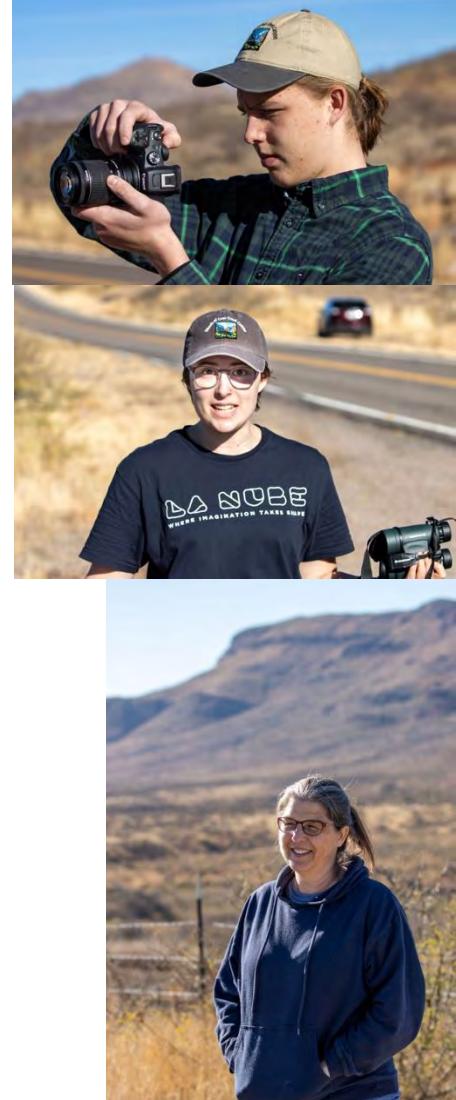
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A few facts ...

- **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**



# Road Map

1

## National Research Enterprise

2

## Recent State

3

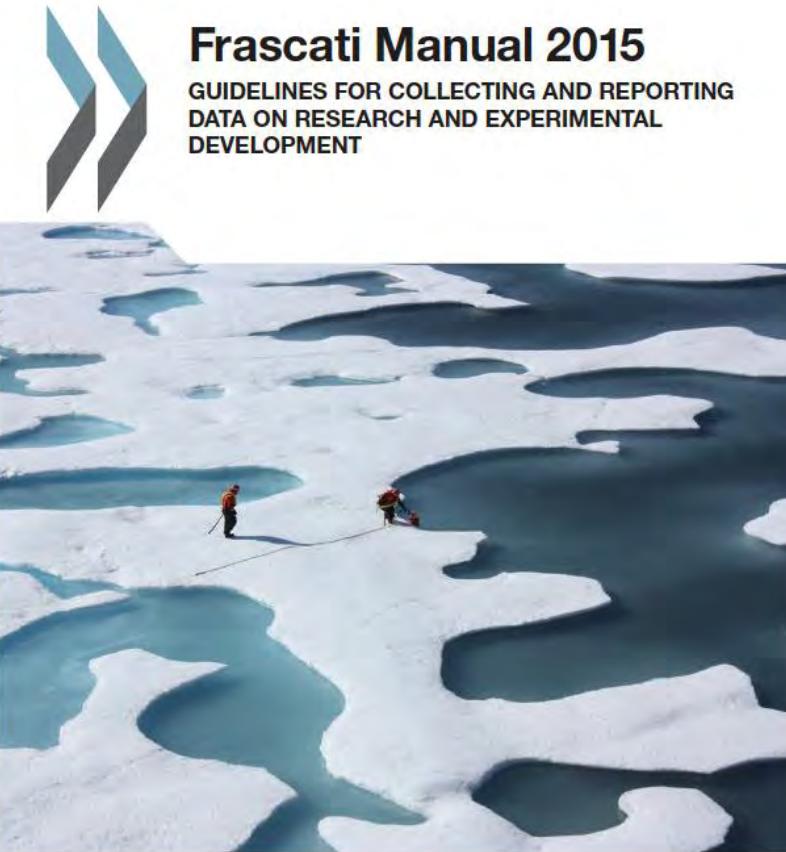
## Contemporary Shifts

4

## How to Respond



# Definition of R&D

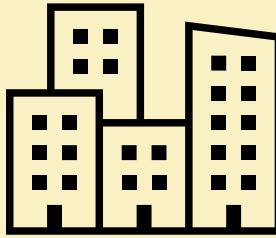


**Research and experimental development (R&D) comprise creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge.**

p.44

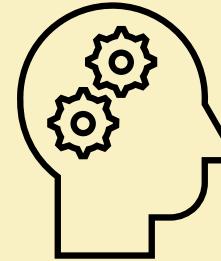
# U.S. National Research Enterprise

## Institutions and Organizations



- Facilities
- Equipment
- Resources

## Investigators, Trainees, Teams



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



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

## Research Support and Service

### Infrastructure



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



# Road Map

1

**National Research Enterprise**

2

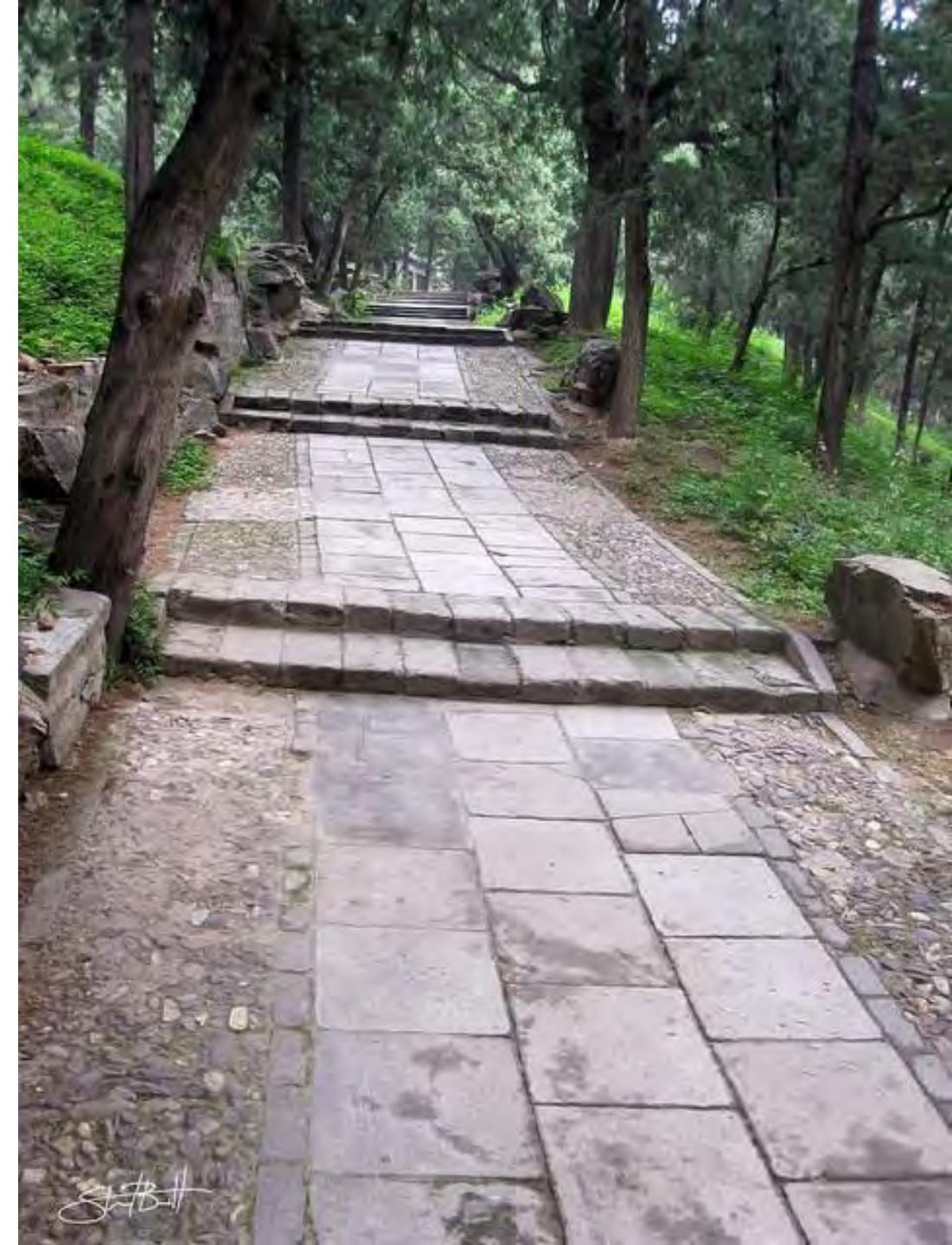
**Recent State**

3

**Contemporary Shifts**

4

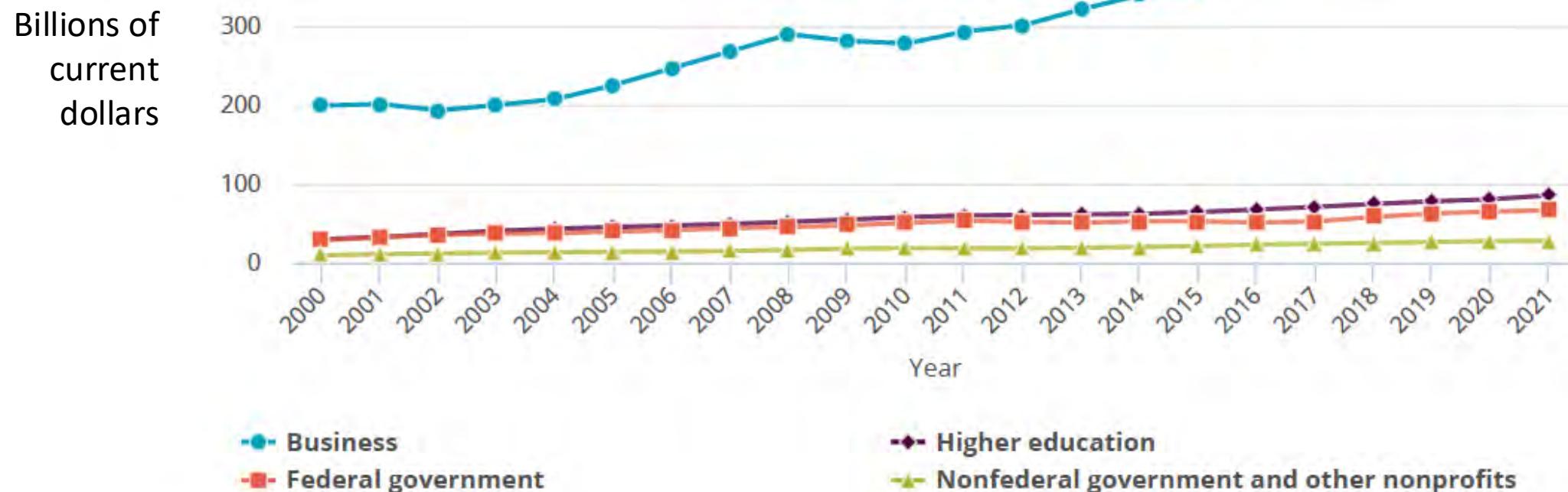
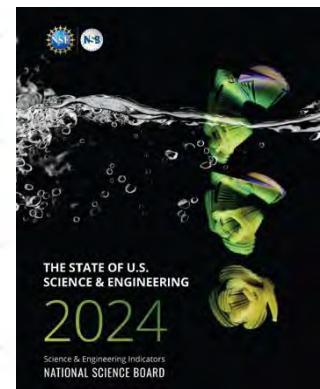
**How to Respond**



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

Using expenditures  
as a proxy measure  
for activity

Who is doing research? How much?

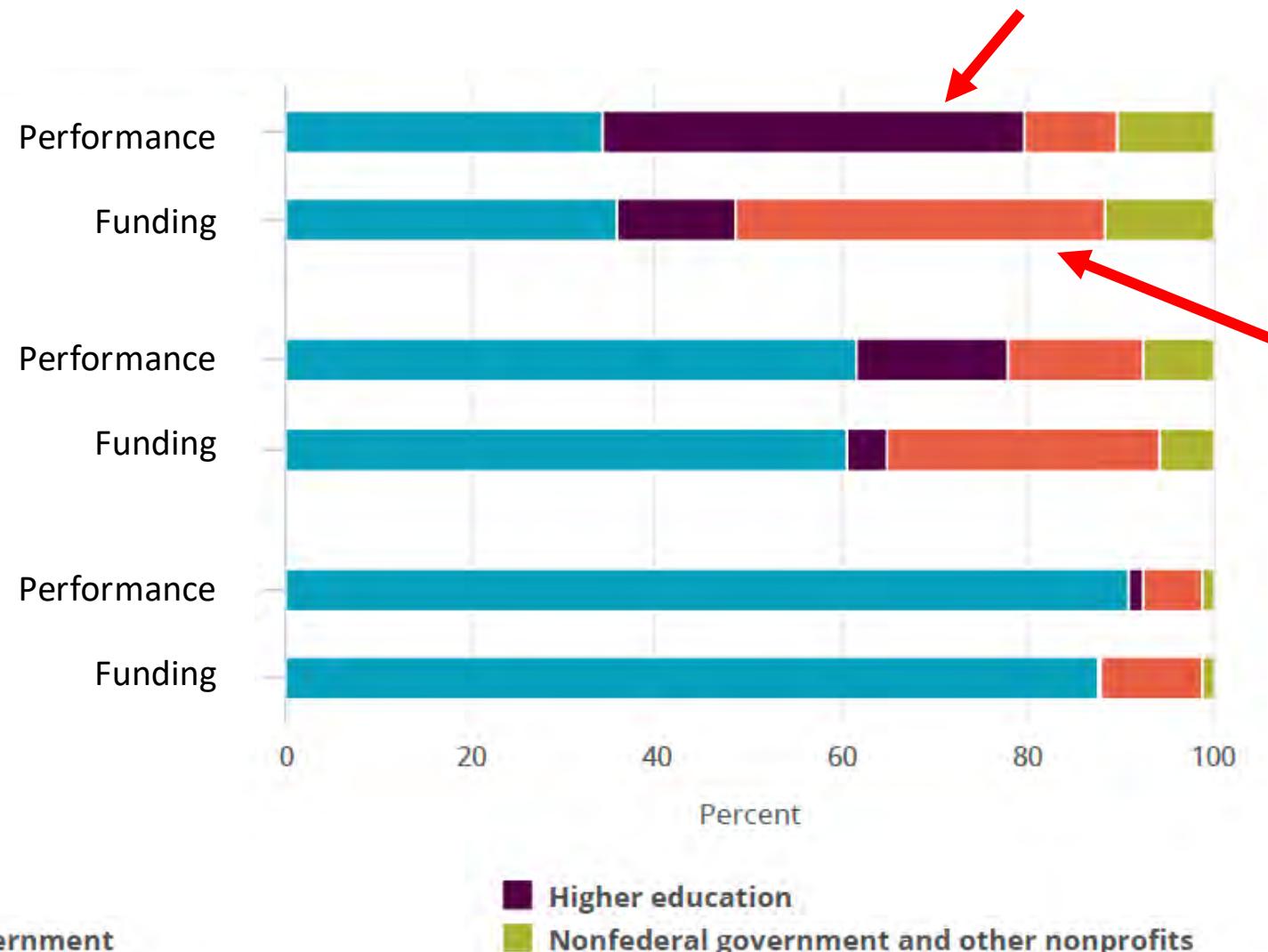


Note(s): Some data for 2021 are preliminary and may be revised later.

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

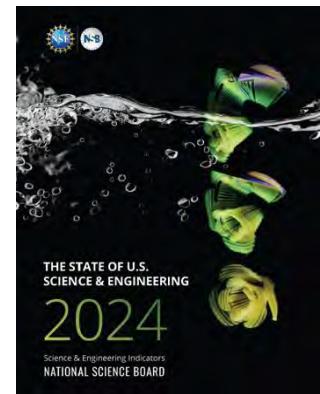
# R&D Performance and Funding by Type and Sector: 2021

## Basic Research



## Applied Research

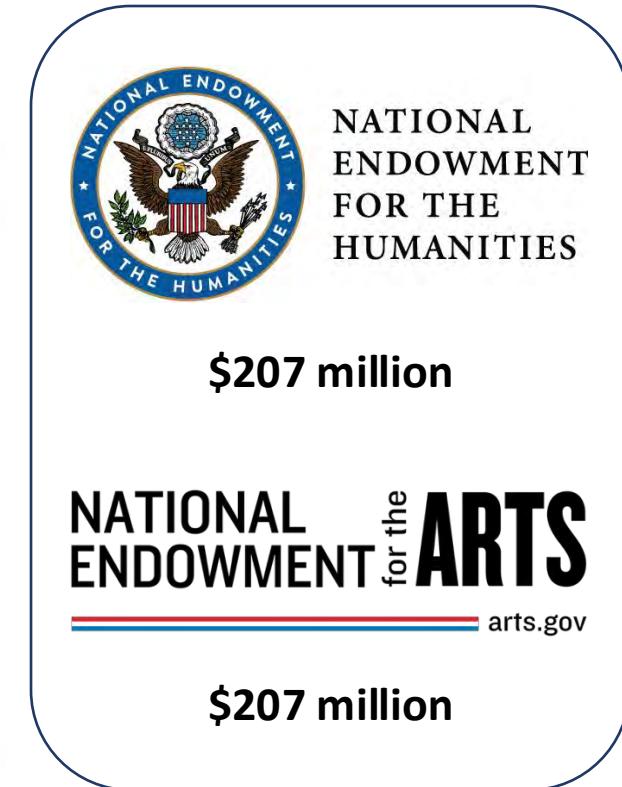
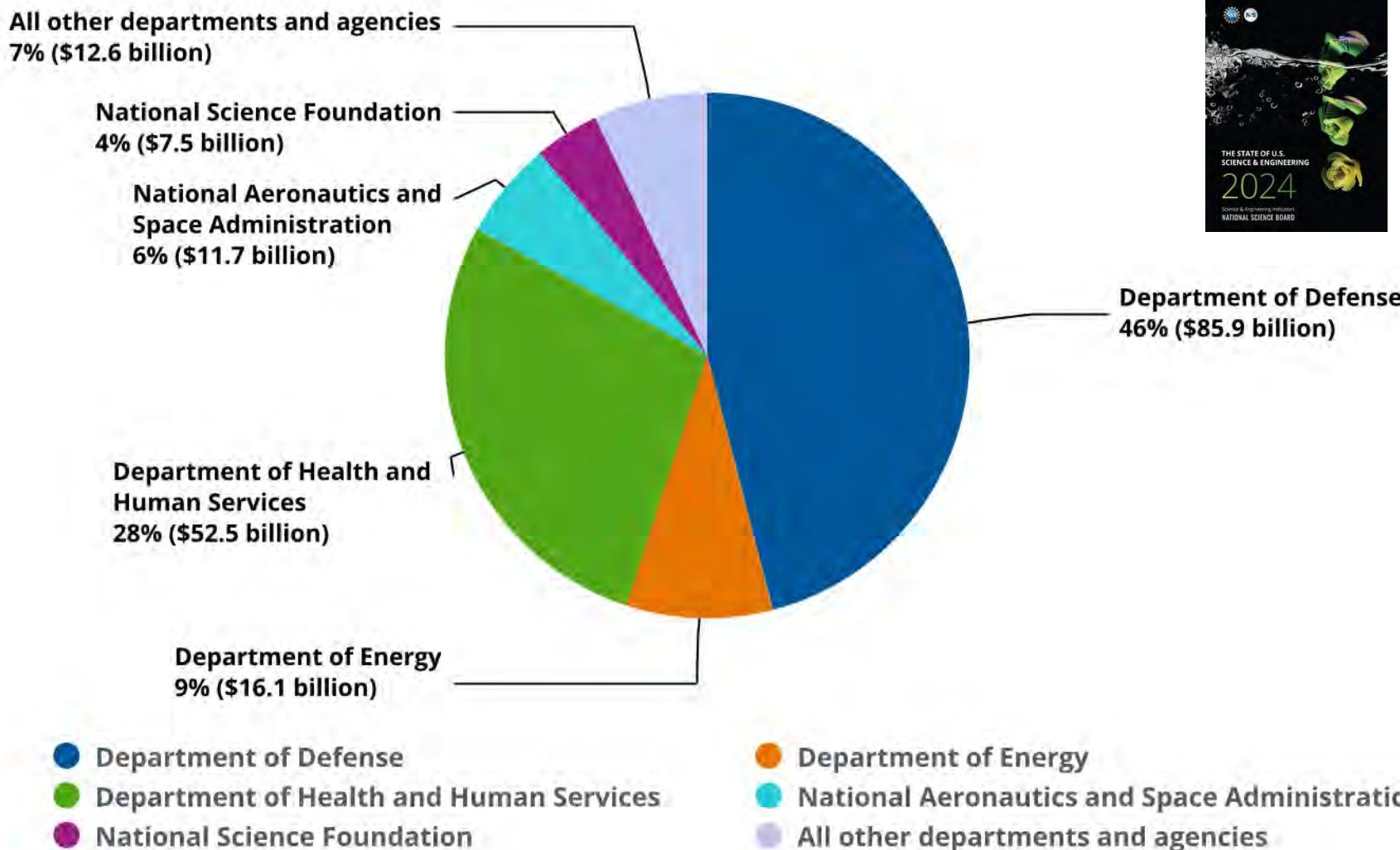
## Development



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



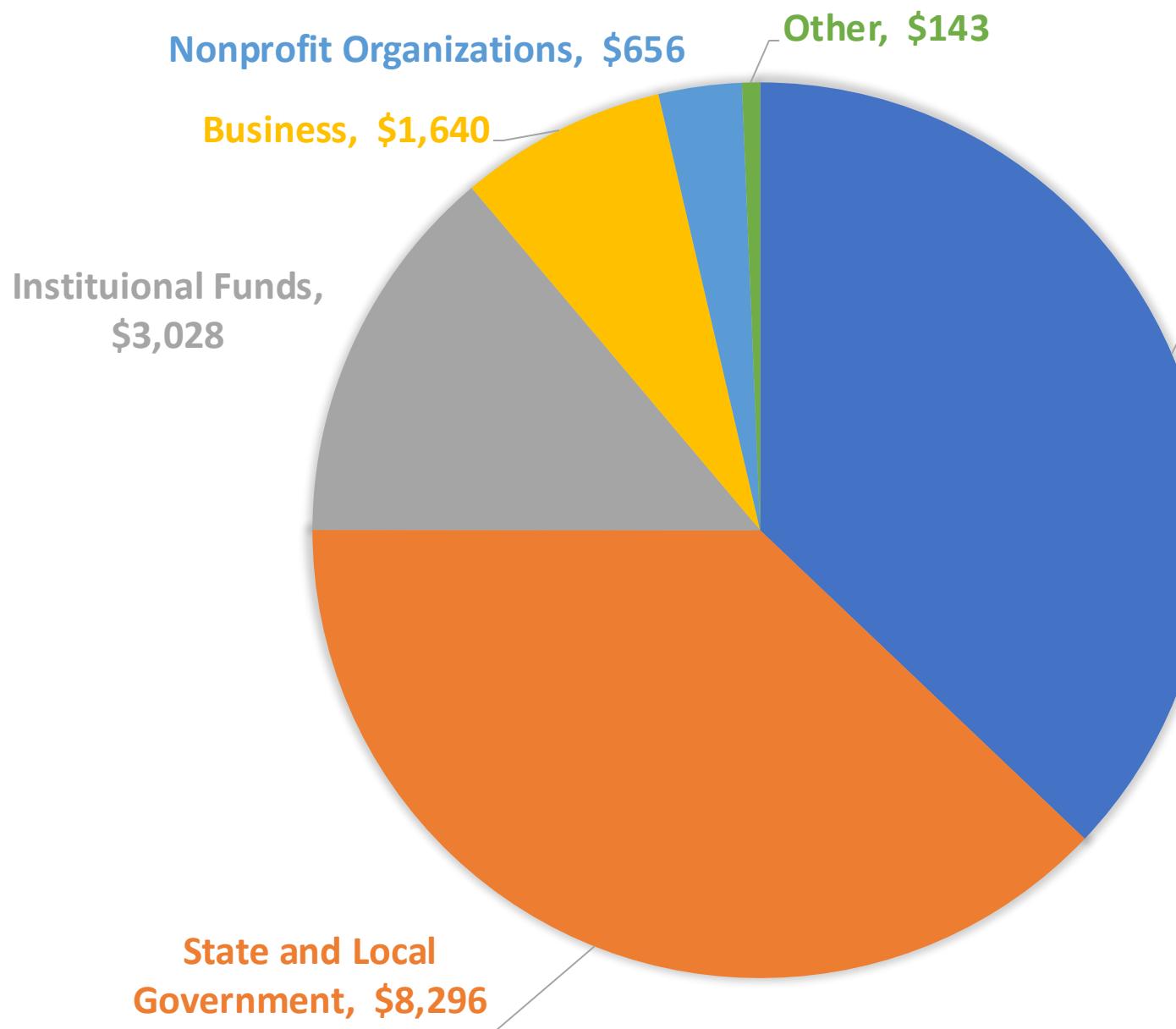
## Note(s):

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)



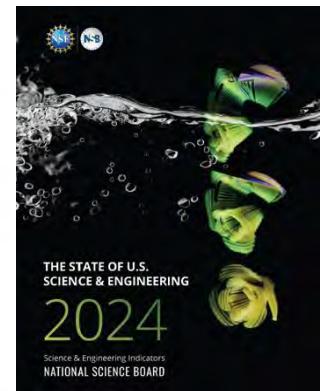
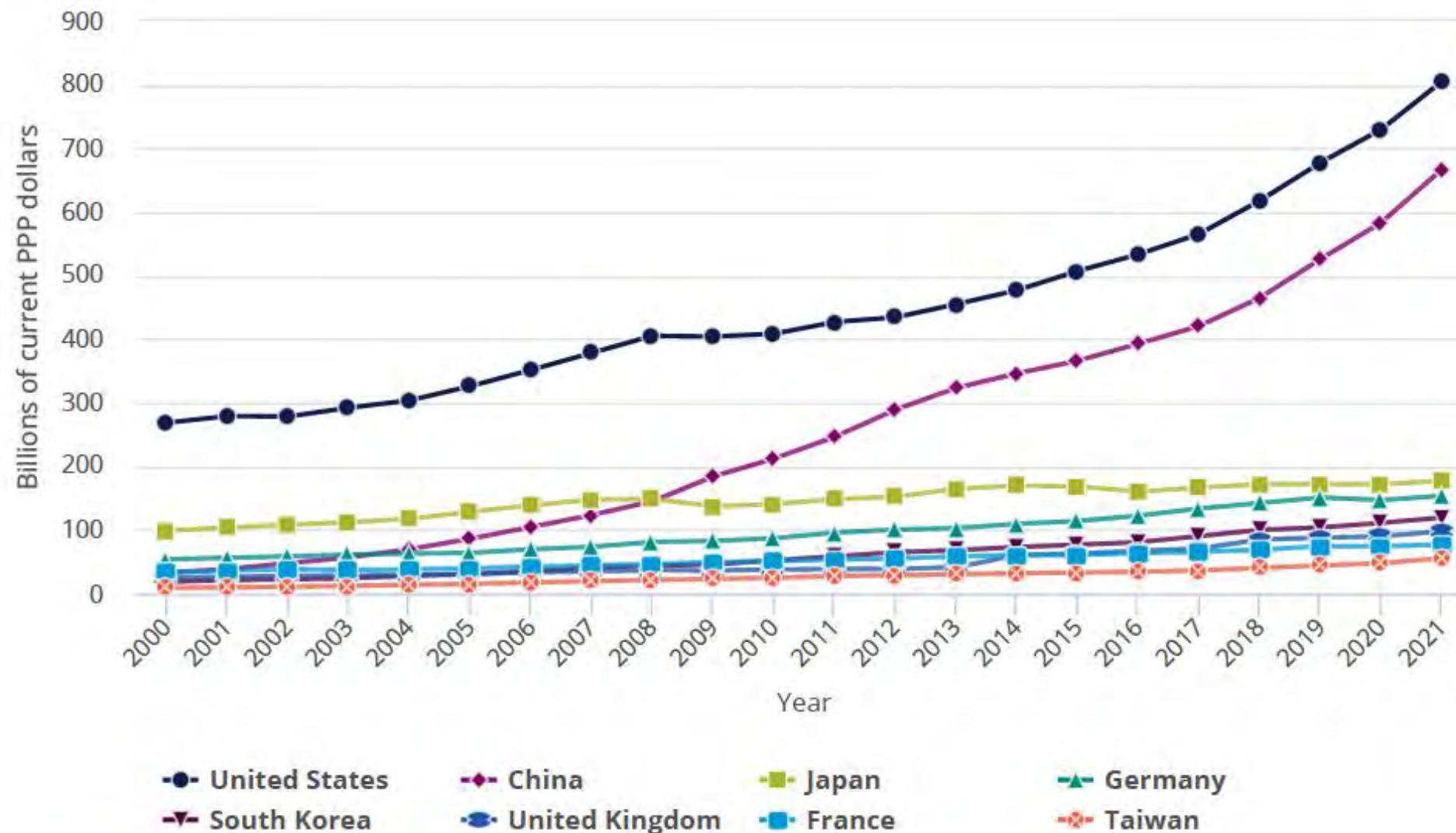
Federal Government,  
\$8,116 37%

**Total = \$21.9 million**

What does this include/exclude?

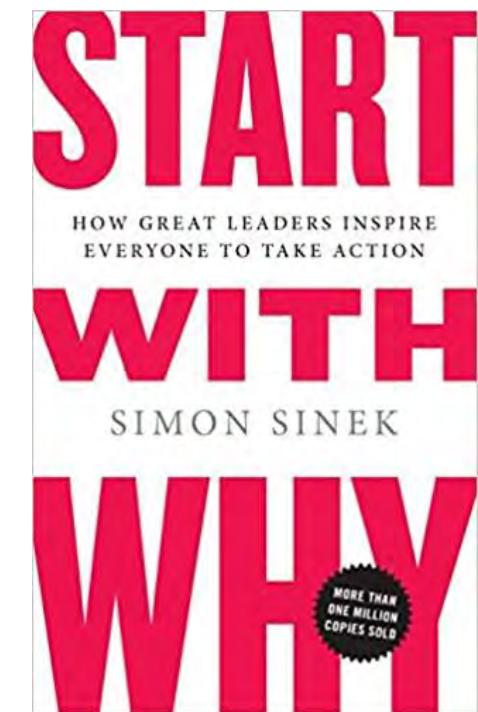
Key metric for R2 classification

# 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*



**Why are US taxpayers investing in R&D?**

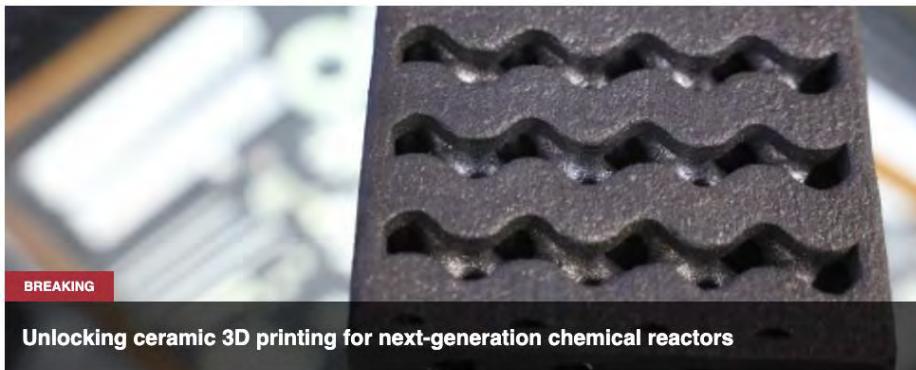
**Why does the federal government partner with universities for R&D?**

**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



BREAKING

Unlocking ceramic 3D printing for next-generation chemical reactors



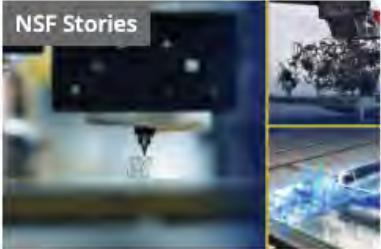
New research explores improving coastal high tide flooding outlooks

Increasing lead times will help communities mobilize flood responses.



## 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.



## **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



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.



## **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 ...](#)

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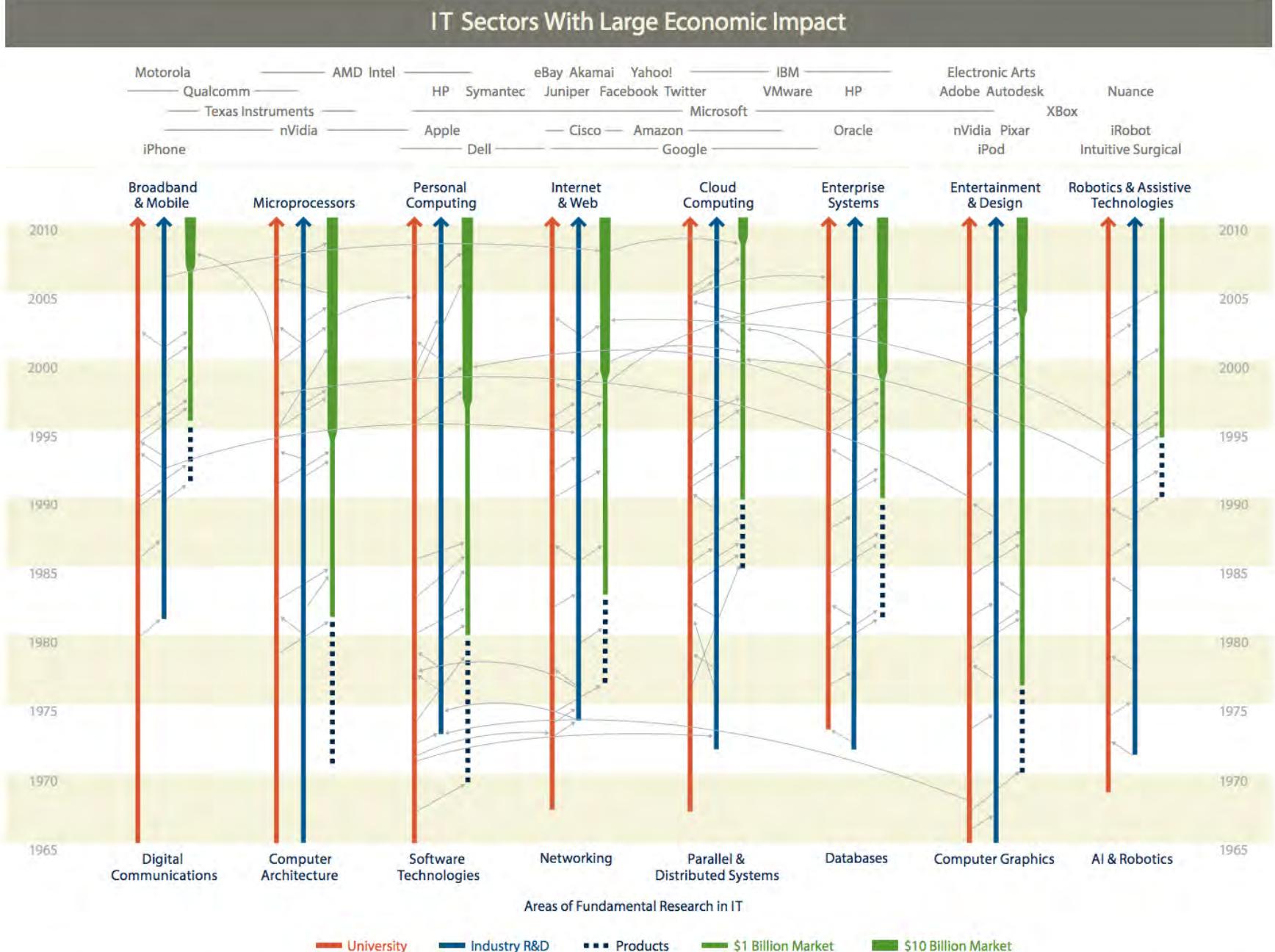
## USDA and DOI Announce Bold Federal Reforms to Improve Nation's Wildfire Response System

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/10.2449/wp2305r>

Working papers from the Federal Reserve Bank of Dallas are preliminary, often 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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**How to Respond**



# Contemporary Shifts: Presidential Executive Orders



The WHITE HOUSE

45 47

PRESIDENTIAL ACTIONS

## Ending Radical And Wasteful Government DEI Programs And Preferencing

The White House | January 20, 2025



The WHITE HOUSE

45 47

PRESIDENTIAL ACTIONS

## DEFENDING WOMEN FROM GENDER IDEOLOGY EXTREMISM AND RESTORING BIOLOGICAL TRUTH TO THE FEDERAL GOVERNMENT

The White House | January 20, 2025

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

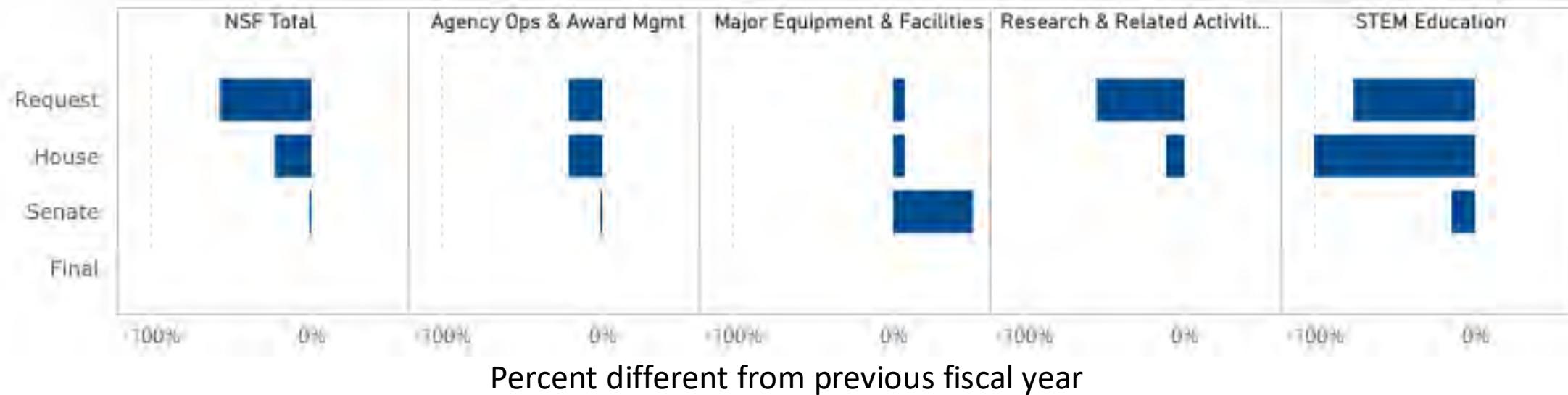


1,752 Awards  
\$1.4 B

~7 awards terminated (of ~250)  
Others may still be impacted  
Slow NCX  
Slow new fed. awards

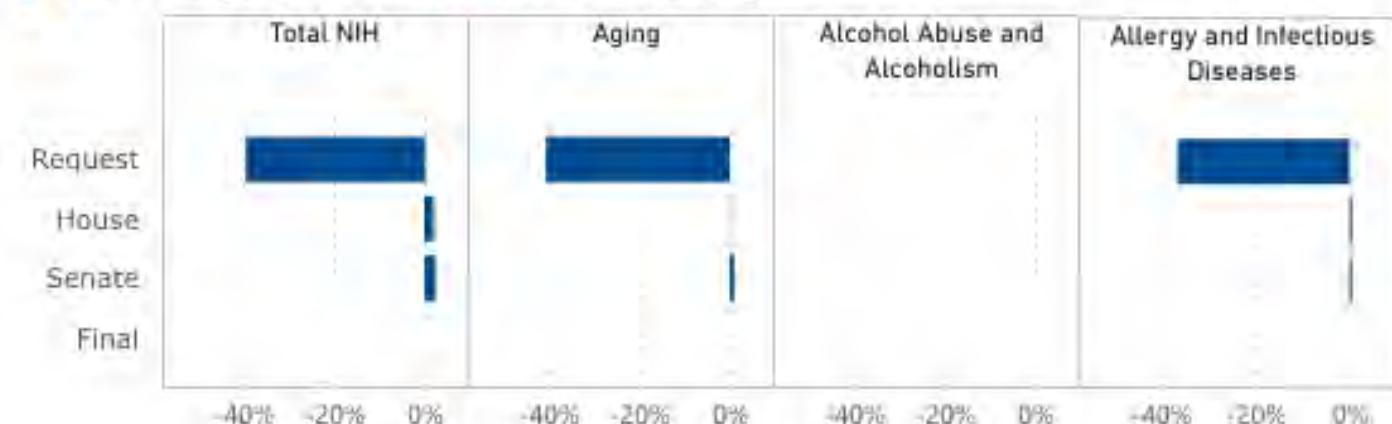
# Contemporary Shifts: Federal Budget – not done yet

## National Science Foundation

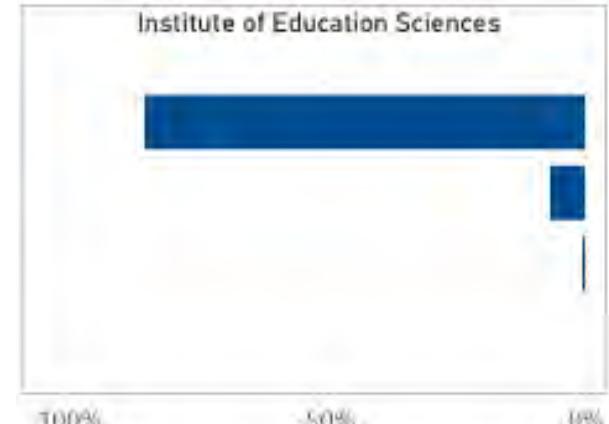


## NIH

● Percent Change from Prior Year ● Additional Funding



## Dept. of Education

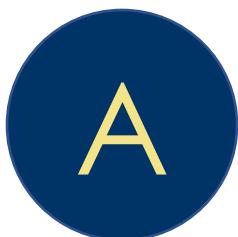


# Contemporary Shifts: Other Items

- 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



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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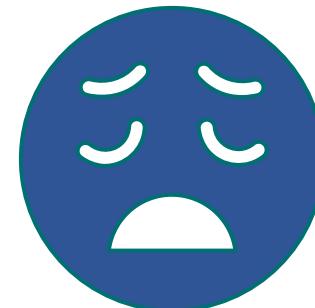
# Disruption to the National Research Enterprise (+)

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



RESEARCH AND INNOVATION

For those whose research depends upon external funding ...

## 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

# 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!**



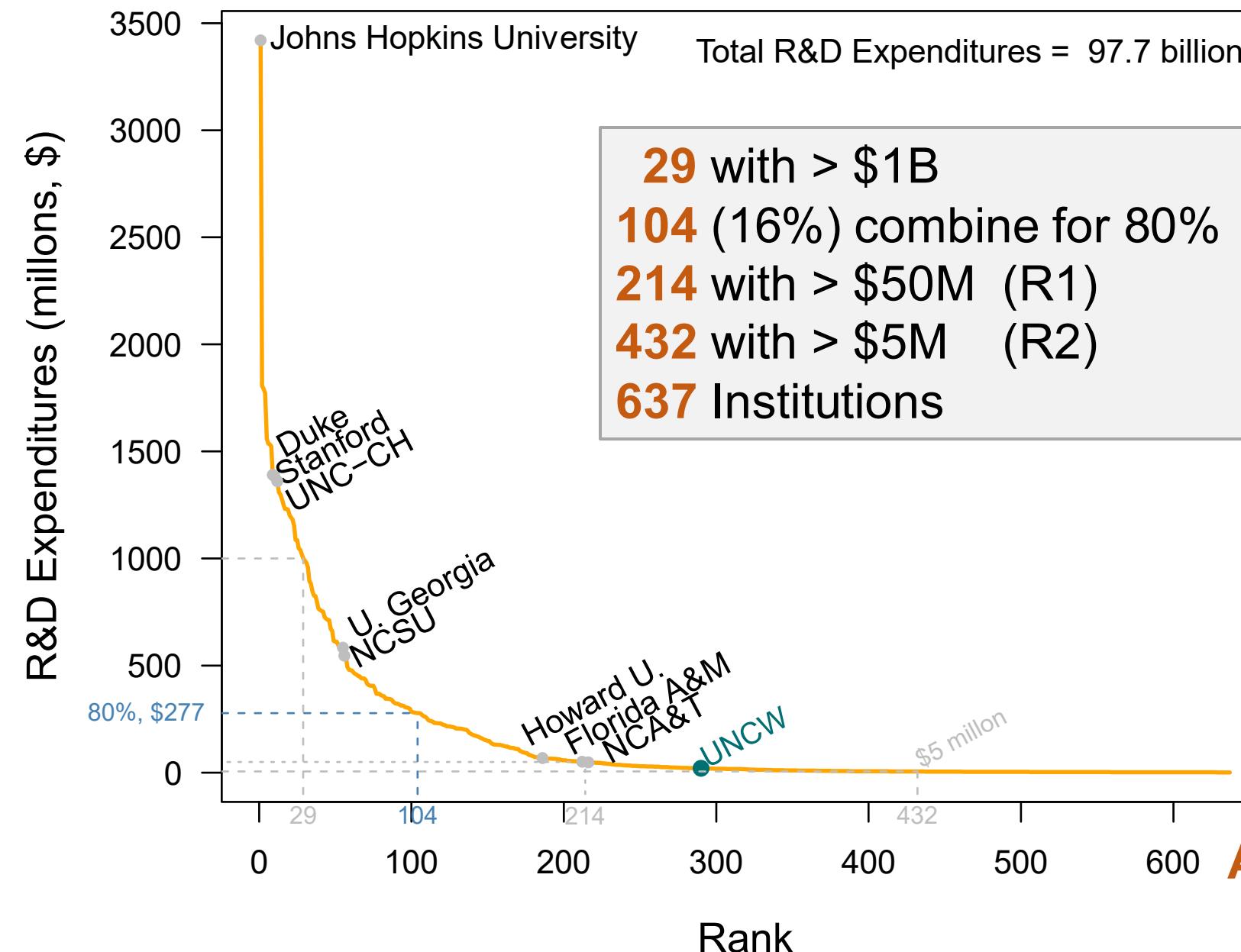
**Stuart Borrett**  
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910.962.7430



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

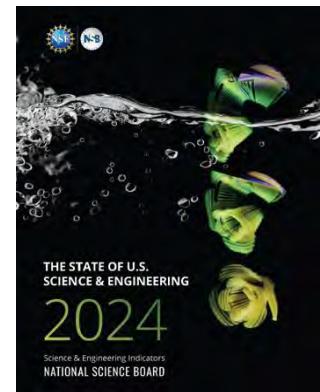
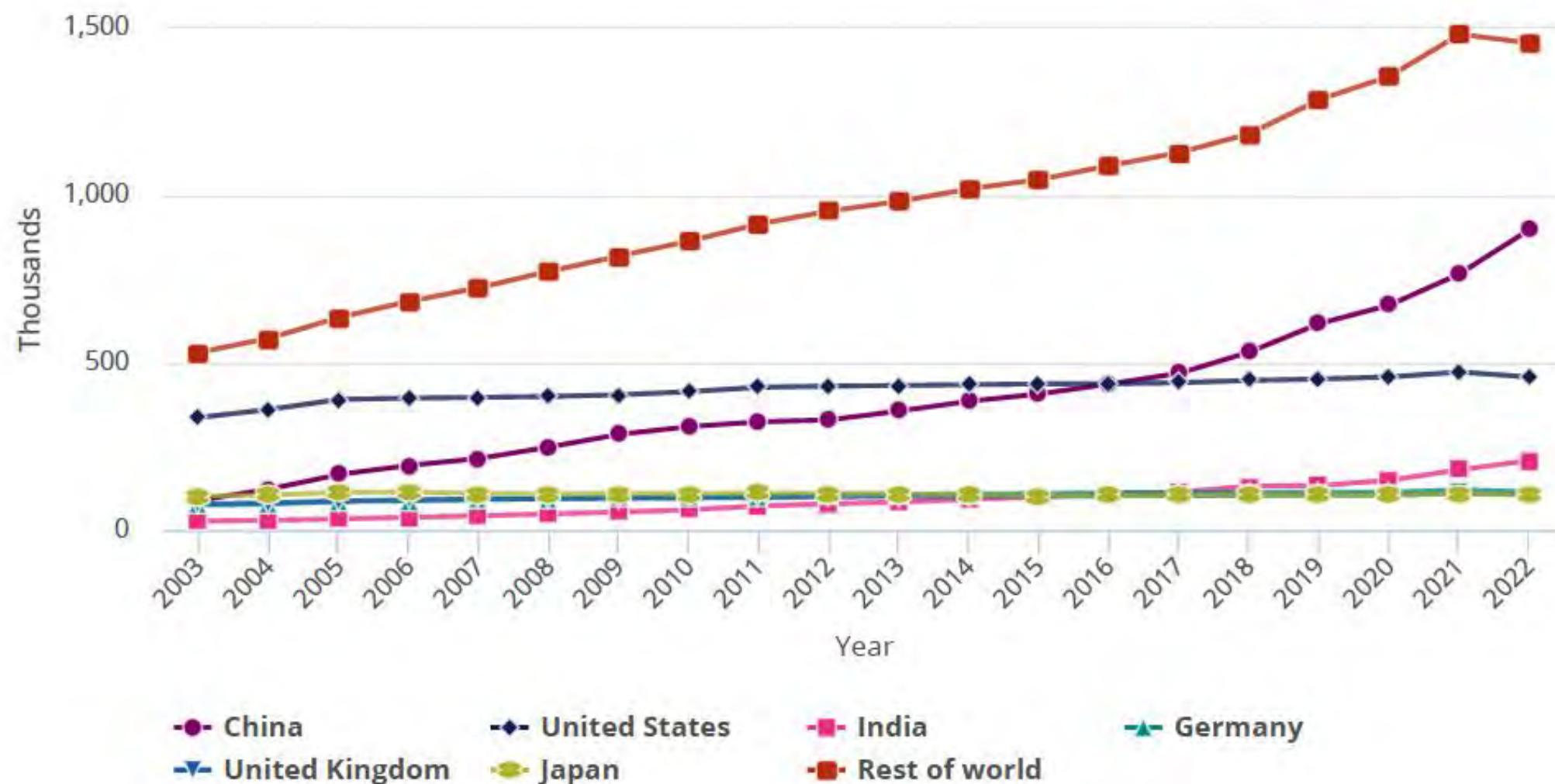
$$(1 - E_h) = 0.20$$

→ Not Diverse

→ Centralized

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

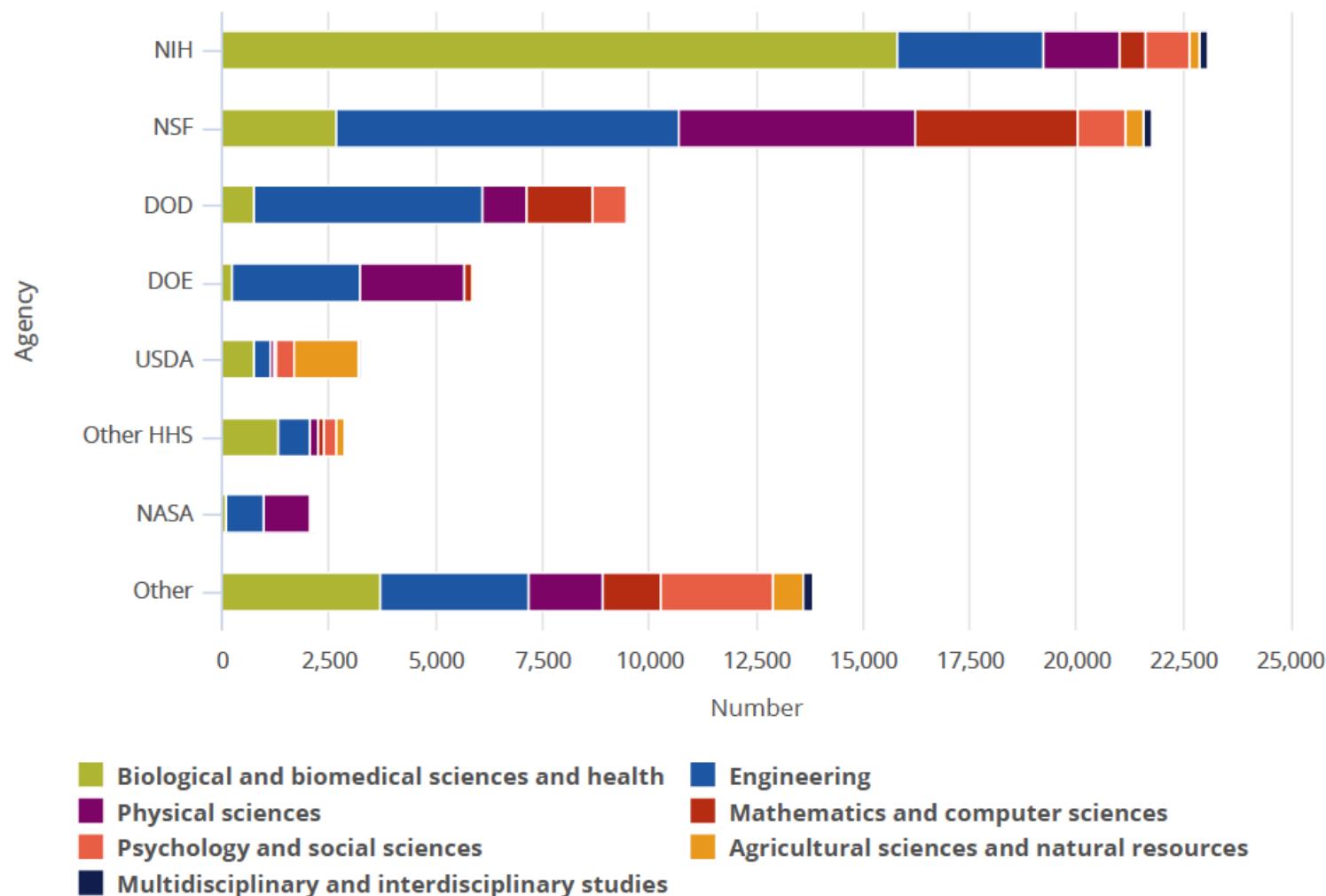
# International Context: S&E Articles, 2003-22



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*

