

Science and Appropriations: *Determining Funding for Federal Science Agencies with a focus on the National Science Foundation*

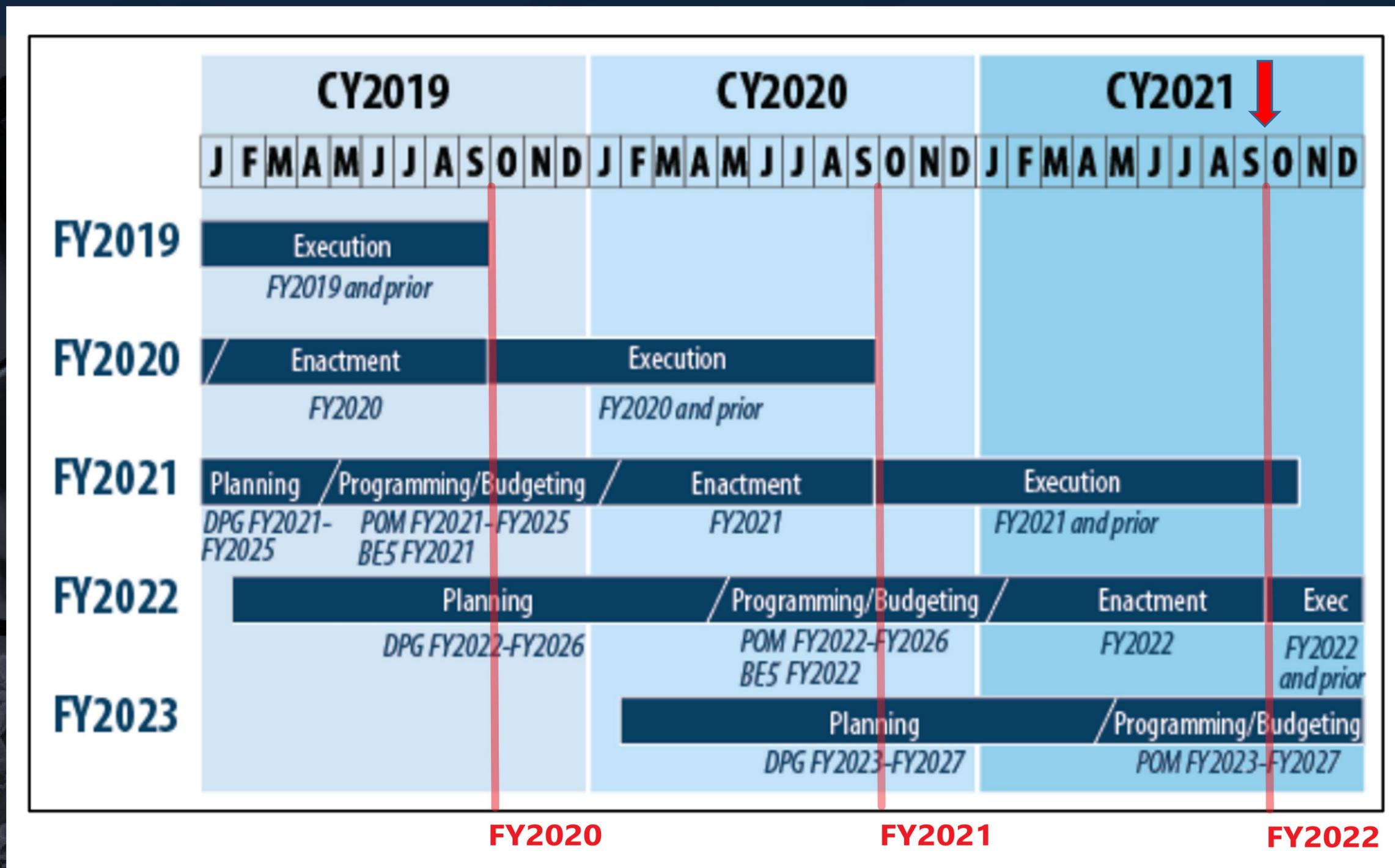
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Appropriations for NSF and Science Spending in the U.S.

Four objectives:

- Provide a brief background of the federal spending process
- Offer insight on where science spending fits in Appropriations
- Outline how spending decisions are made
- Open it up: What questions do you have about Appropriations?

The Federal Budget Flow (How it's supposed to go...)



Who's Involved in Congressional Spending?

Congressional Budget Committees handle the overall top-line caps for revenue and spending with an eye on deficit/surplus control

Congressional Budget Office serve as an independent, non-partisan office within Congress that serves as budgetary referee or scorekeeper

Congressional Authorizing Committees handle the revenue and the *mandatory* (aka “autopilot”) spending

Congressional Appropriation Committees historically deal with *discretionary* (aka “directed”) spending

The Appropriations Committee

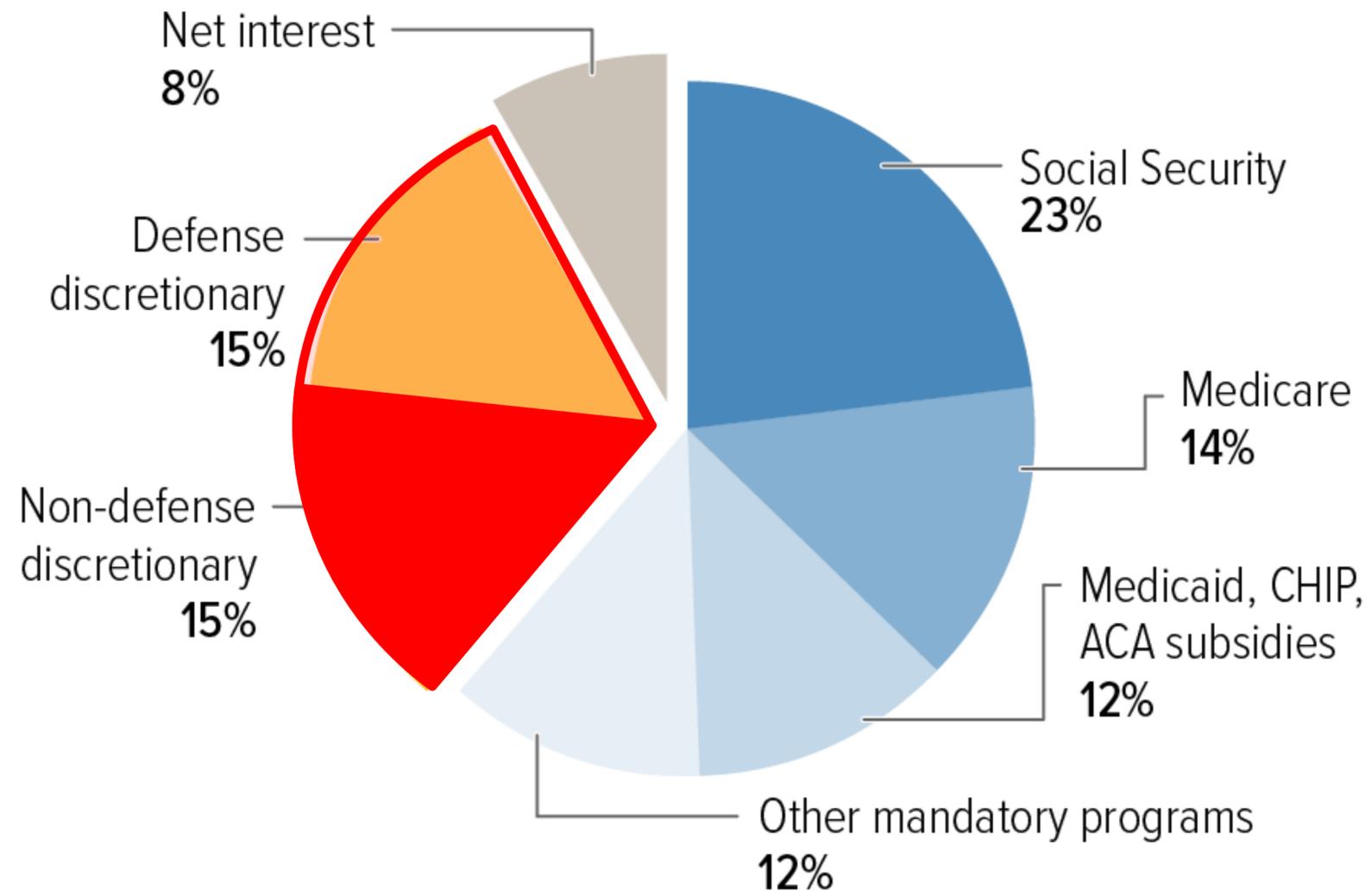
- Broken out by **12 subcommittees**, each responsible for a different grouping of agencies (“different pieces of the discretionary pie”)
- Largest is defense (about \$623B, base) next is Labor-HHS; Transportation-HUD; and **Commerce-Justice-Science (\$71B), which funds NASA and NSF**
- As with all committees, there are “**Four Corners**”: House and Senate, Majority and Minority. Managed by “Clerks” and “Professional Staff”
- Historically has been a very **bi-partisan committee**
- Provides an oversight and accountability function on federal spending
- **The Committee must enact spending bills every year**

Budget Committees v. Appropriation Committees

Deal with Total Budget (discretionary, mandatory/entitlements, and taxes)	Deal with 30% of Budget (only discretionary funds)
Functional (e.g. natural resources, national security)	Organizational (e.g. Dept of Commerce/NOAA, NASA/Science)
Multi-year	Annual
Deficit is major issue – sets overall allocation for spending (“302a’s”)	Deficit is not their problem – staying at allocations is the issue (“302b’s”)
Big Picture guidelines for spending	Actual spending for specific agencies
Concurrent Res. (Congress binding itself)	An Act (President must sign)
Not much lobbying (usually)	Agencies, lobbyists, interest groups, etc
Track all legislation; Enforce the budget resolution	Set spending priorities within allocation; Use creativity to maximize federal dollars

Where Does Science Fit in Federal Spending?

Federal Spending, FY 2019



Note: Figures may not add due to rounding.
Source: Office of Management and Budget

Discretionary spending (\$1.3 trillion in 2019) only accounts for 30% of the annual budget. This is money Congress can control – or appropriate – for funding federal agencies and programs.

And of that portion, only half – or 15% of the federal budget – is available for non-defense related activities. NASA and NSF compete for funding here.

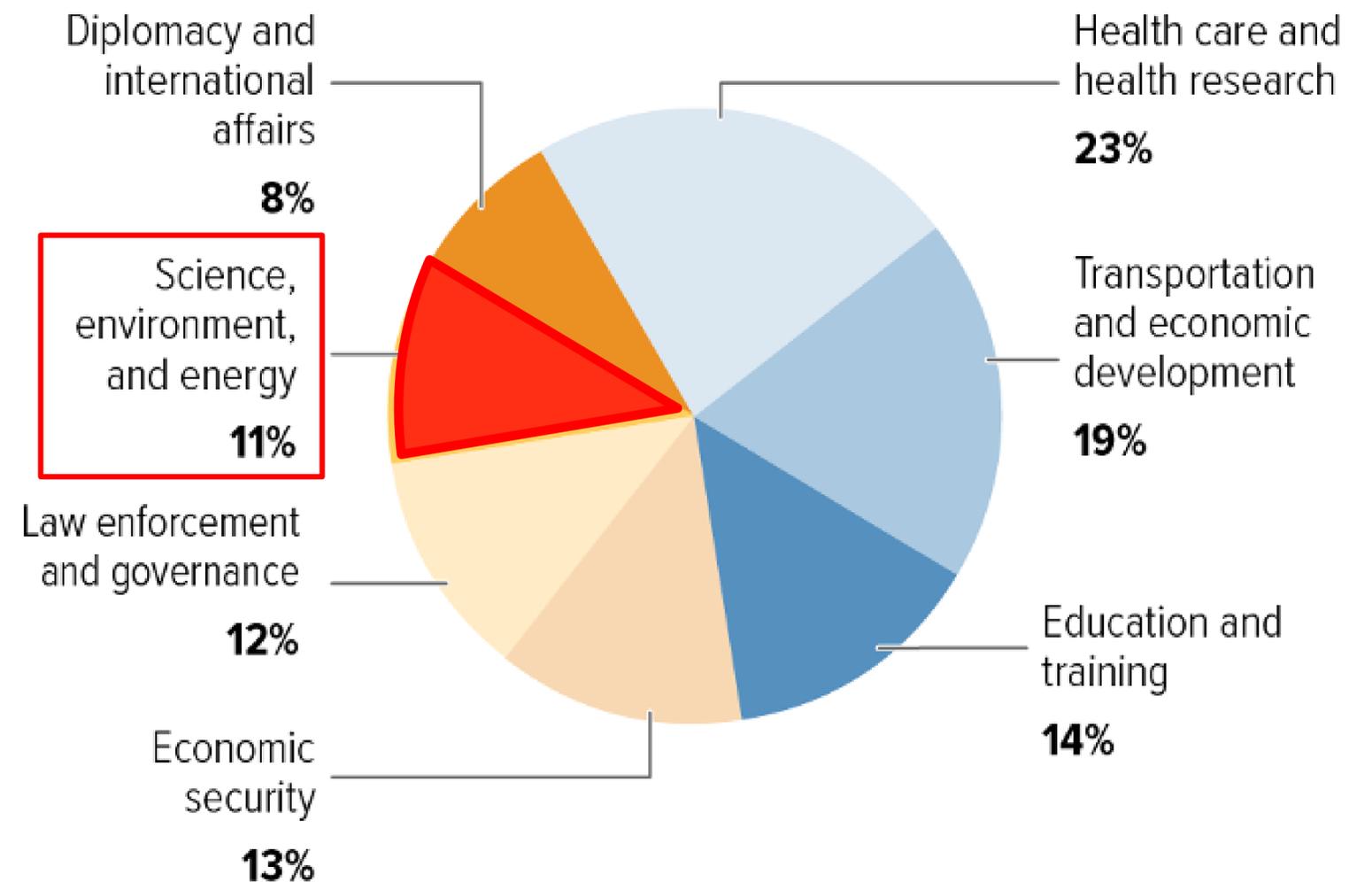
Where Does Science Fit in Federal Spending?

Of the 15% non-defense discretionary spending:

“Science, environment, and energy” combined are only 11%. Or 1.4% of total federal spending.

Out of this \$661 billion non-defense discretionary spending pie, NASA received \$21.5 billion (3%) and NSF received \$8.1 billion (1%) in 2019

Non-Defense Discretionary Spending, Fiscal Year 2019



Note: Does not add to 100% due to rounding.

Source: CBPP calculations using Office of Management and Budget data

Science Funding – Two Categories

“Grants by the Pound”

- **Means:** The total spending for the agency/account drives the metrics for what can be accomplished
- **Examples:** NSF Research and Related Activities (R&RA) grants, NSF Mid-Scale Research Projects
- **Point:** Backbone of science funding, but faceless, scalable accounts are difficult to grow

“Rack and Stack”

- **Means:** The sum of each project’s funding drives the overall agency/account funding level
- **Examples:** NASA Science directorate funding (i.e., Planetary, Astro); NSF Major Construction (MREFC)
- **Point:** Procurement-dependent and fluctuates, but **Big projects drive big budgets, not the other way around**

NSF Funding – General Appropriations Perspective

The Administration proposes, Congress disposes

The Appropriations Committee has the final say

Appropriators don't support reducing NSF

Both the House and Senate are willing to push back on proposed cuts to NSF grants & construction

Appropriators care about scientific integrity

Funding is not broken out by directorates and science disciplines are defended against attacks

NSF has tremendous discretionary authority compared to other agencies



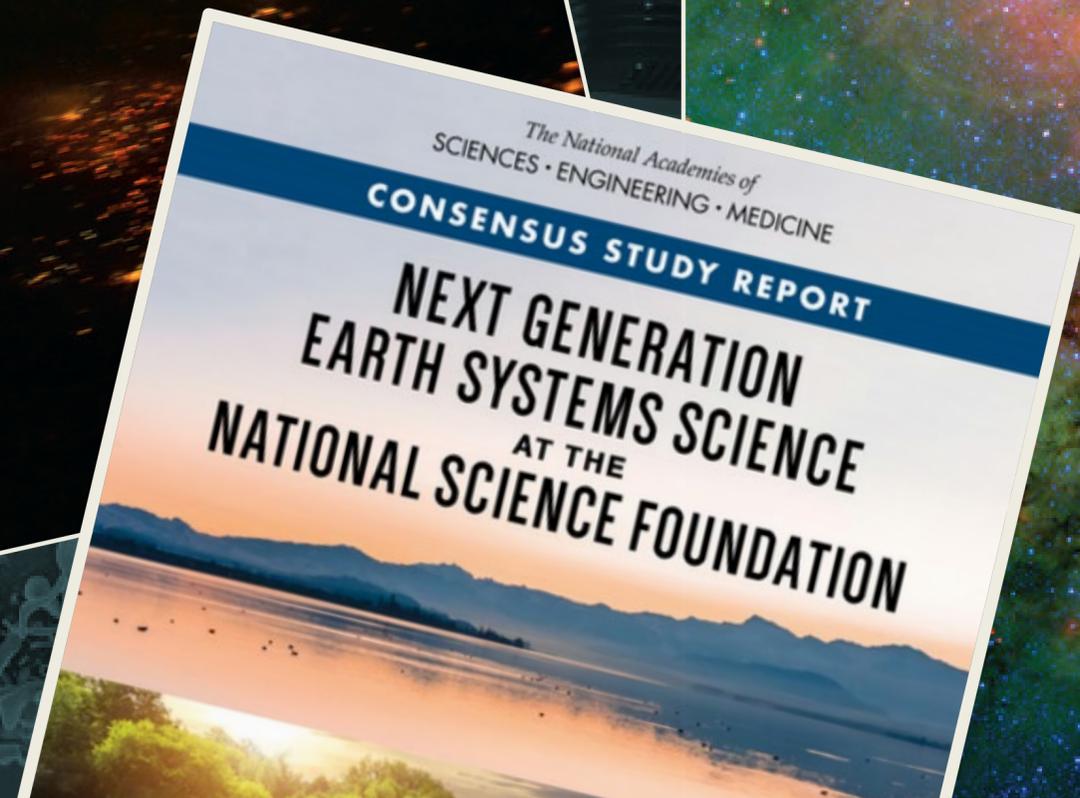
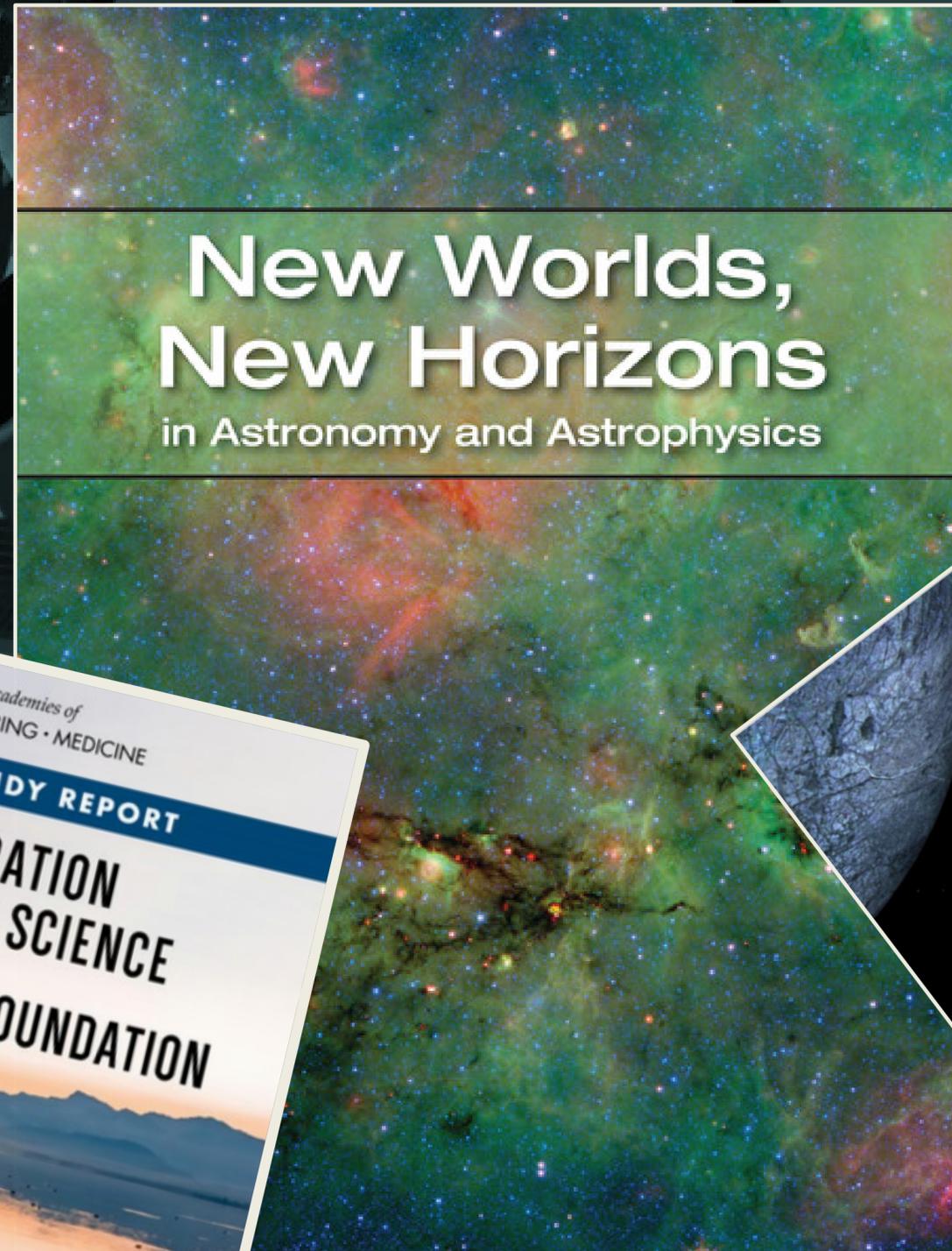
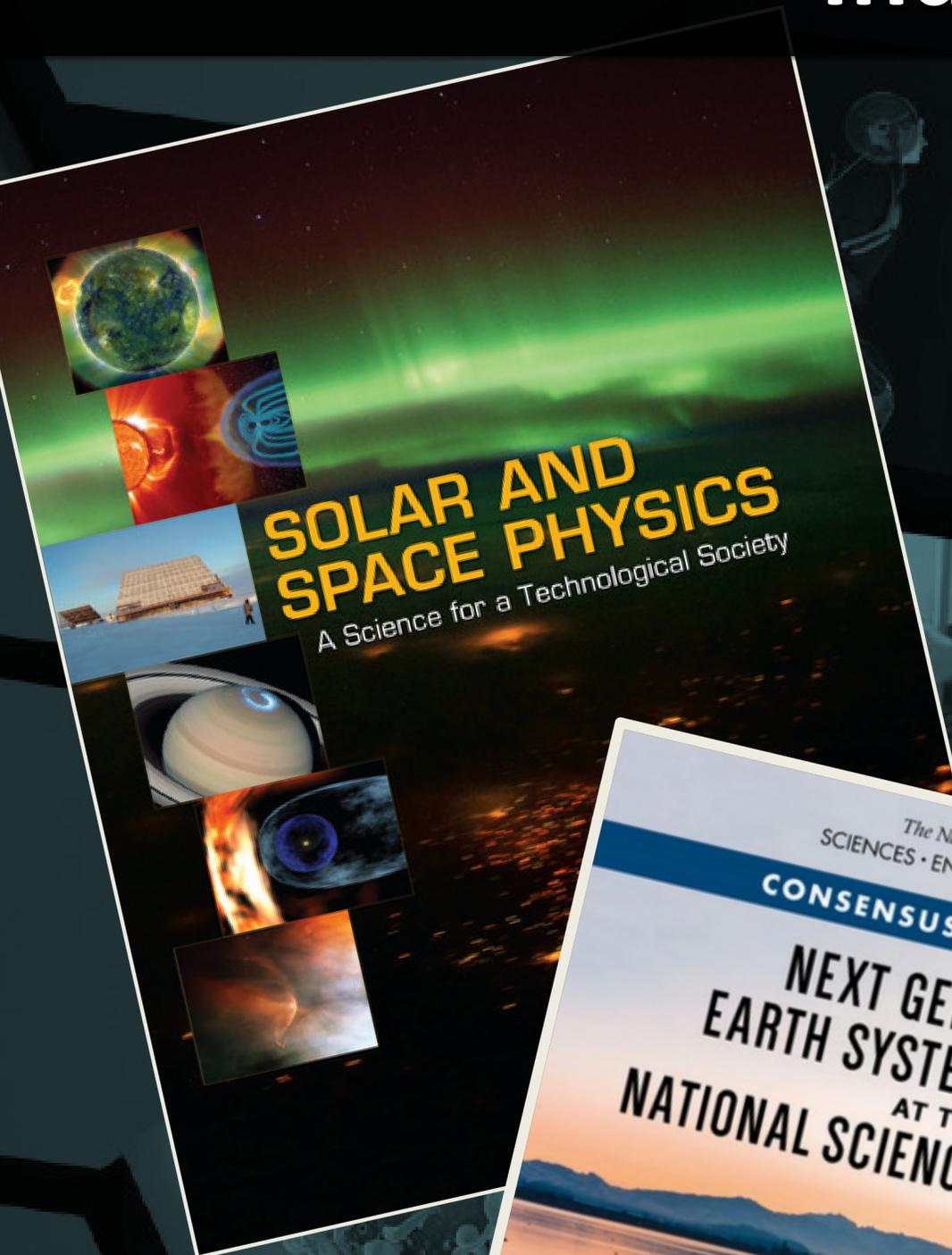
What is an earmark?



From Slate.com:

“No one can agree on the precise definition. In general, the word "earmark" refers to any element of a spending bill that allocates money for a very specific thing—a given project, say, or location, or institution. For example, if Congress passed a budget that gave a certain amount of money to the National Park Service as a whole, no one would consider it an earmark. But if Congress added a line to the budget specifying that some of that money must go toward the preservation of a single building—definitely an earmark.”

Reports from the National Academies' and other Independent Entities Matter



Why Does Congress Pay Attention?

- 1) An independent report that provides a new benchmark
- 2) Sorted and prioritized list of projects
- 3) Recommendations reflect consensus within the community
- 4) Top projects tackling the most compelling science questions
- 5) Considerations on the U.S.'s global role in a particular science discipline



Decisions about Science Funding

Receiving a top recommendation from the National Academies or other top science committee does not guarantee a project's funding....

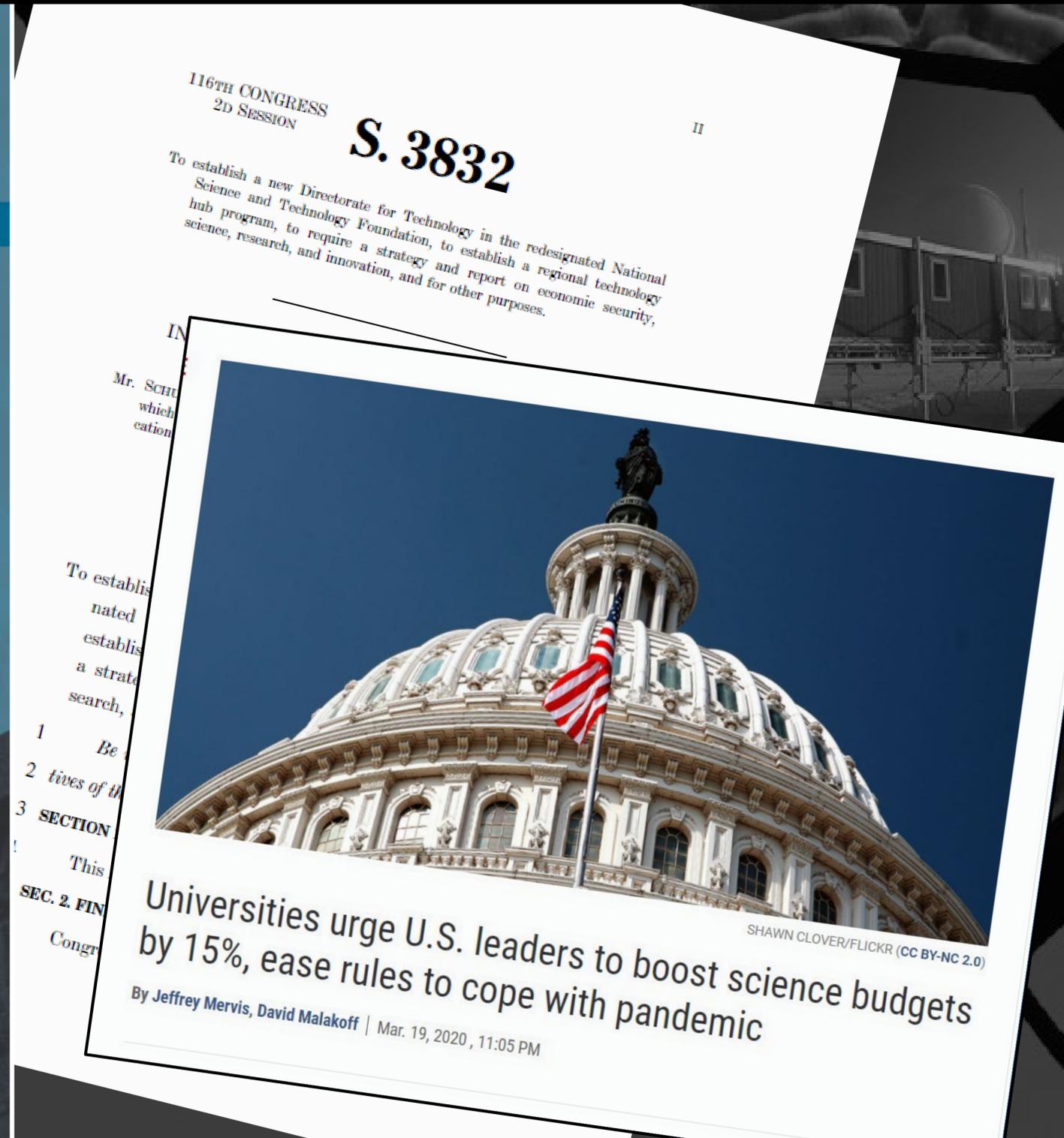
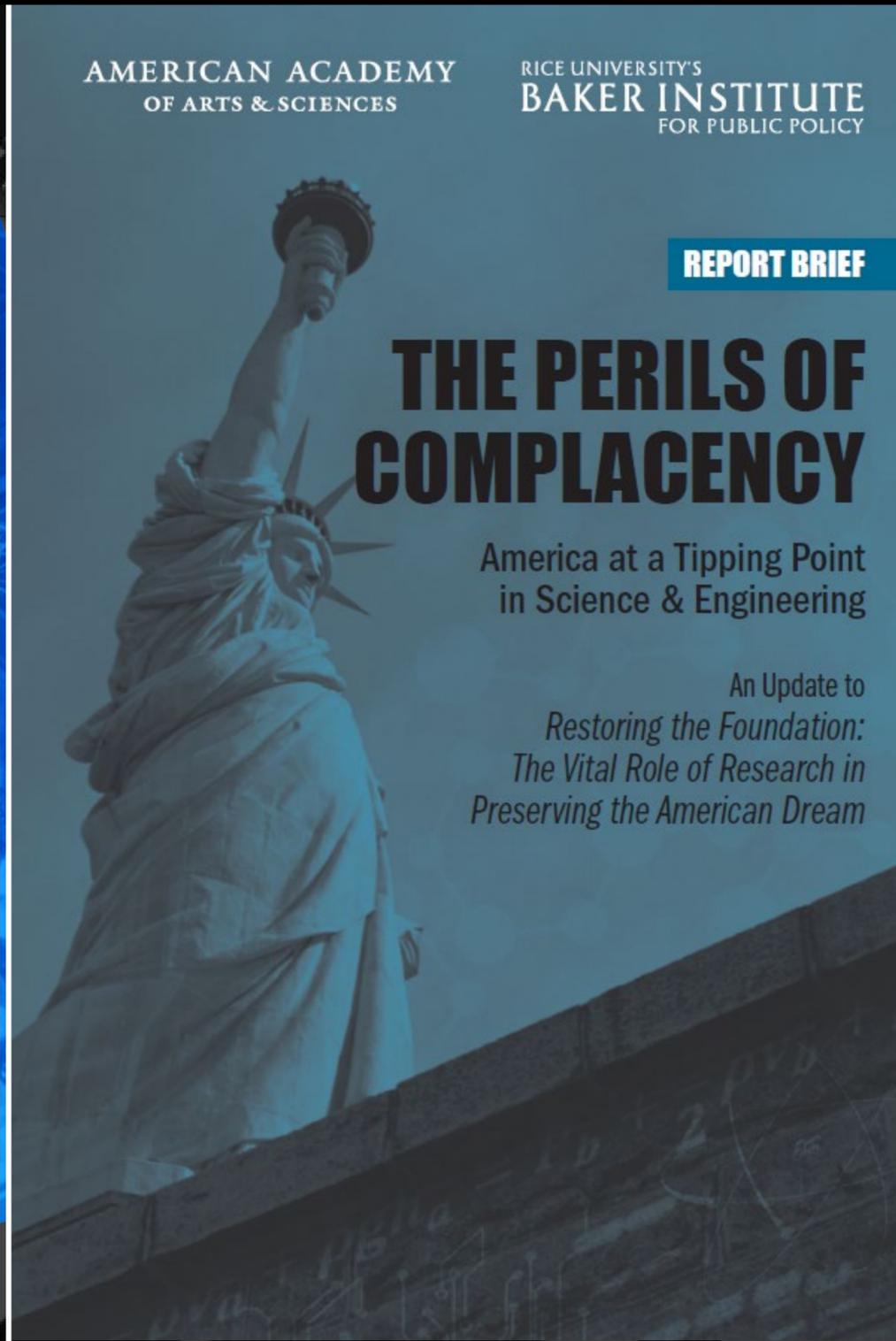
...it only helps to gain a seat at the negotiating table.

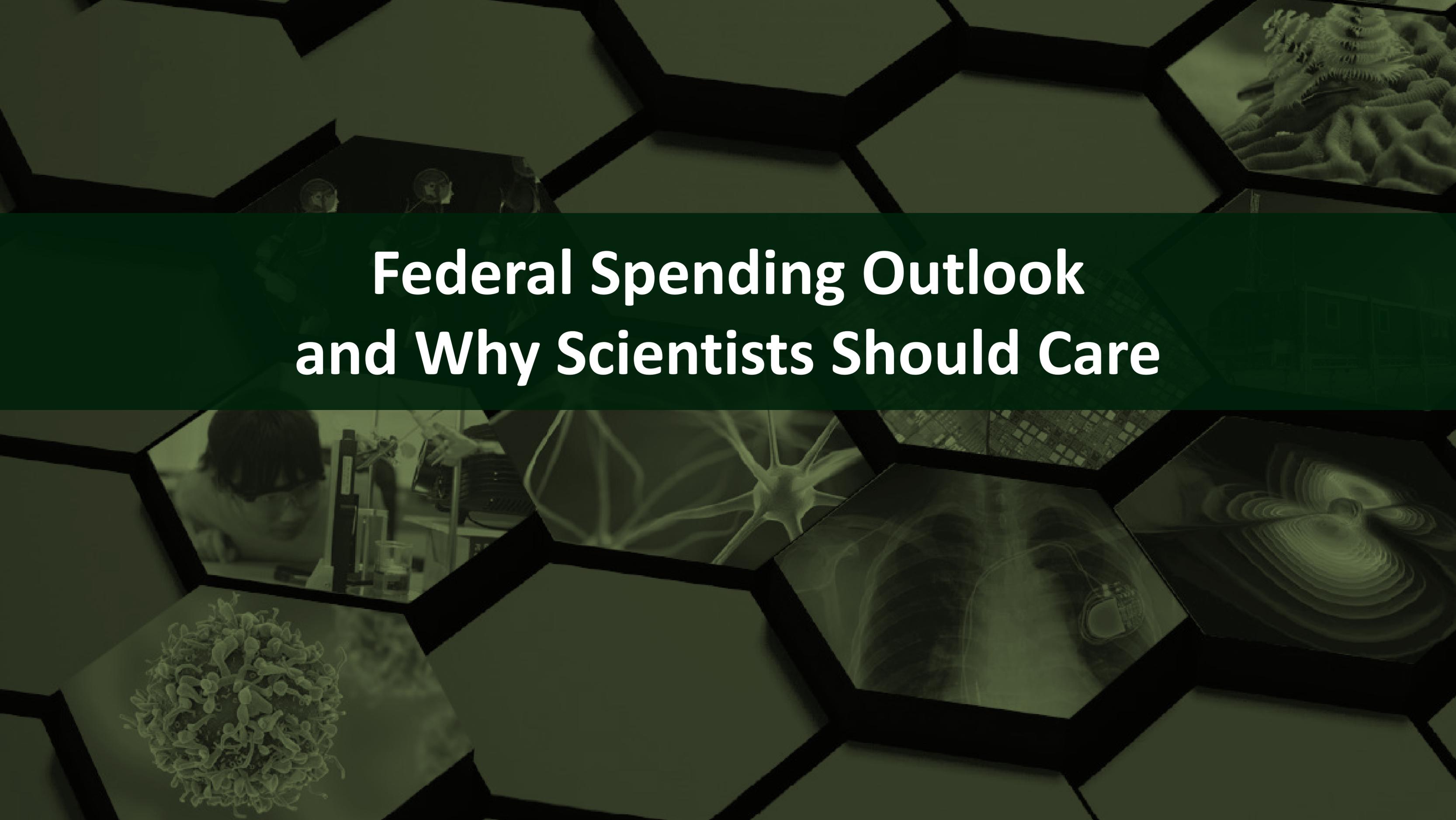
During appropriations negotiations, the discussions shift

from: *"Who cares about this project, and how much funding does it need?"*

to: *"Who's going to complain if we don't fund this project, and do we care?"*

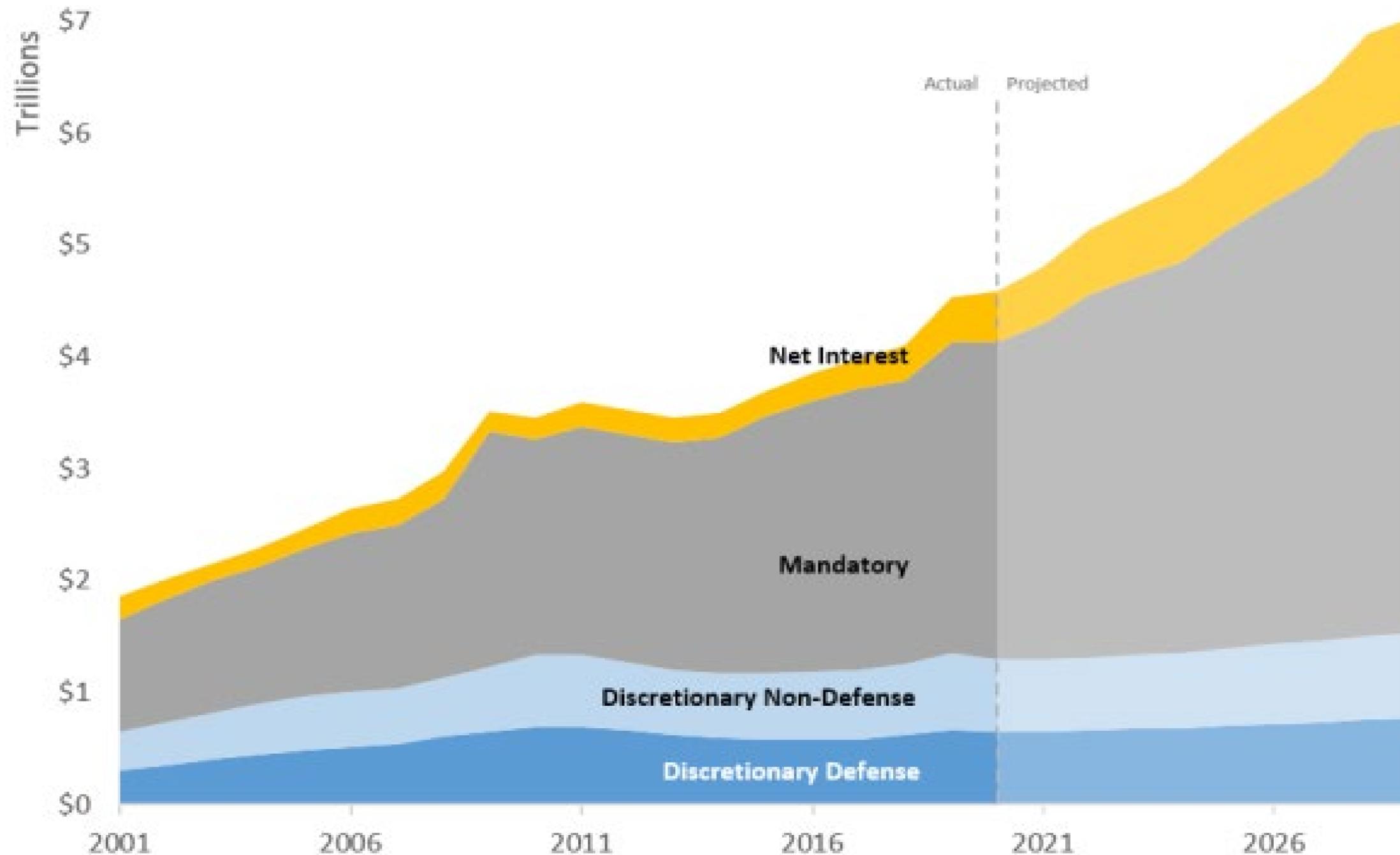
OK, but what about all those calls to boost U.S. R&D?





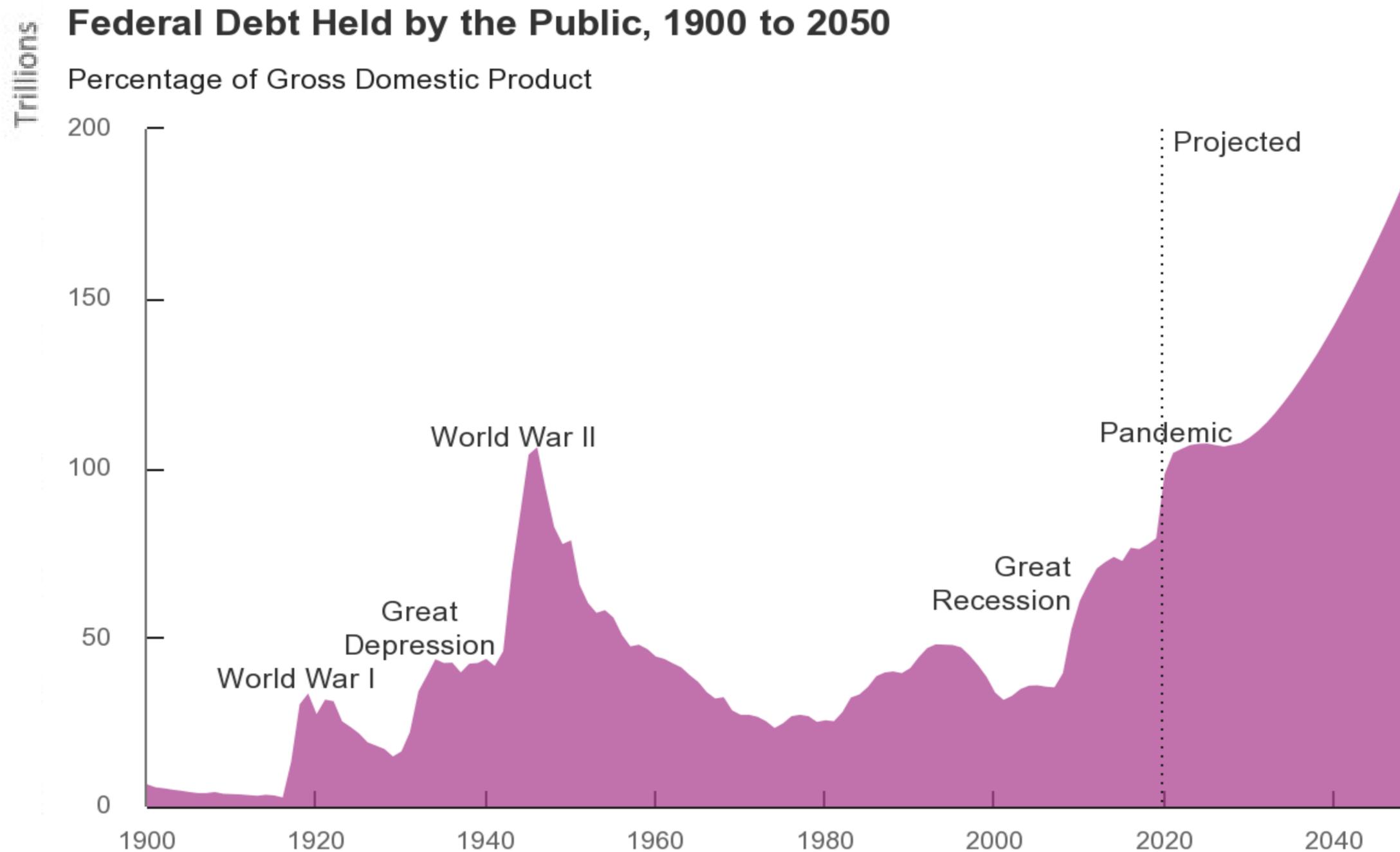
Federal Spending Outlook and Why Scientists Should Care

Racking up the Spending (Pre-COVID)



Credit: Congressional Research Service

Racking up the Spending (Post-COVID)



Credit: Congressional Budget Office

So what does this mean for science funding?

The U.S. cannot balance the budget on the backs of non-defense, discretionary funding

...but that won't prevent some members of Congress from trying.

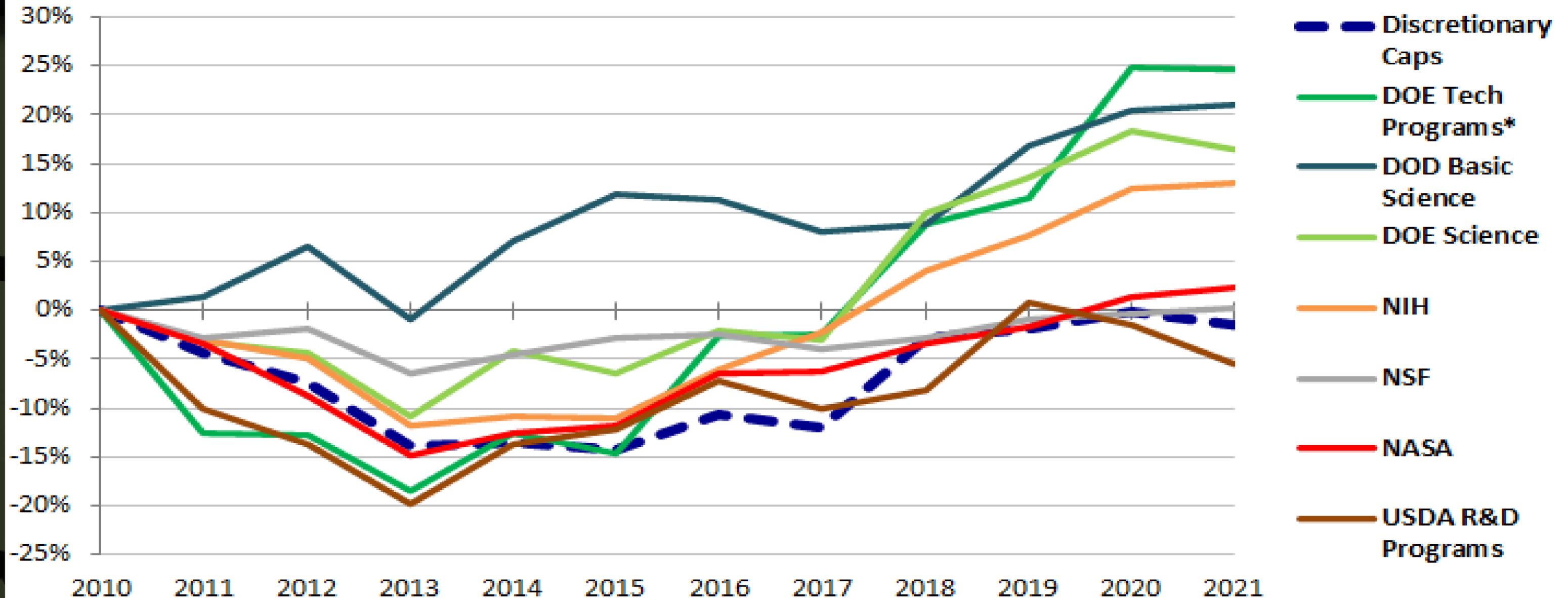
Cost caps will need to be developed in Congress before Appropriations can move, which will be an ordeal

...but even with new cost caps, funding for NASA and NSF will likely be constrained.

Not getting cut is the new up

And beware of intra-agency budget obstacles:

Figure 2: Select Science & Tech Agency Budgets Since FY 2010
Relative changes above or below FY 2010, inflation-adjusted



*Including nuclear, fossil, grid, renewables, efficiency, ARPA-E, grid security and infrastructure. Excludes COVID-19 emergency spending. Based on analysis of OMB, agency and appropriations data. © 2021 AAAS

Bottom Line:

The budget outlook is ripe for fiscal conservativeness and more constrained spending. Competition will continue to be high, and nothing will be handed to anyone.

However, U.S. science agencies can still thrive in this environment, if science communities makes justifiable, defensible requests.

After all, federal dollars will still be spent on non-defense discretionary programs. If not on science, then they will spend it on something else.

If scientists fail to compete and don't request (reasonable) funding for next-generation projects, then federal funding will never materialize.

Questions and Open Discussion

What do you want to know more about?

