

National Initiatives

CPAD workshop 2026
Seattle

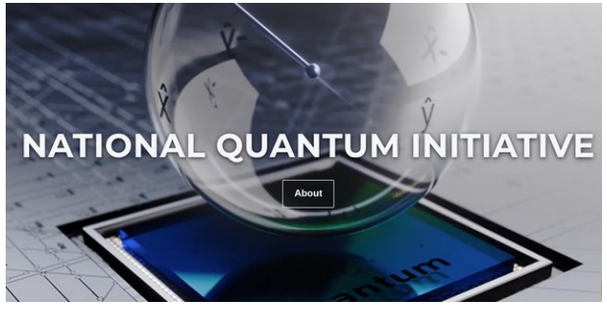
Maurice Garcia-Sciveres, LBNL



2025 Perspective







Get funds for pure HEP instrumentation development

Find a balance. Develop new collaborations not Possible within HEP

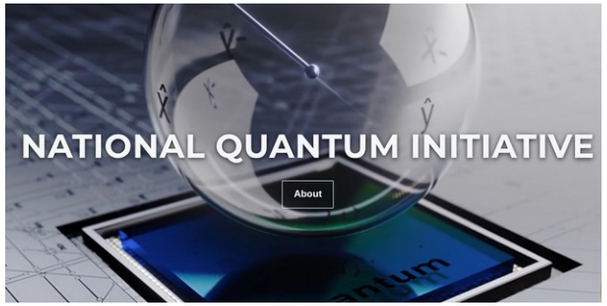
Switch fields to Materials science or EECS



Where are we in 2026 ?



- Authorized 2023-2027
- Projects are still going strong and forward-funded, so will extend into FY28





3 DoE Microelectronics Centers

https://www.meercat-center.org/





https://indico.fnal.gov/event/75638

https://sites.google.com/pppl.gov/elmic/





Also mentioned last year the DoD Commons

MICROELECTRONICS COMMONS

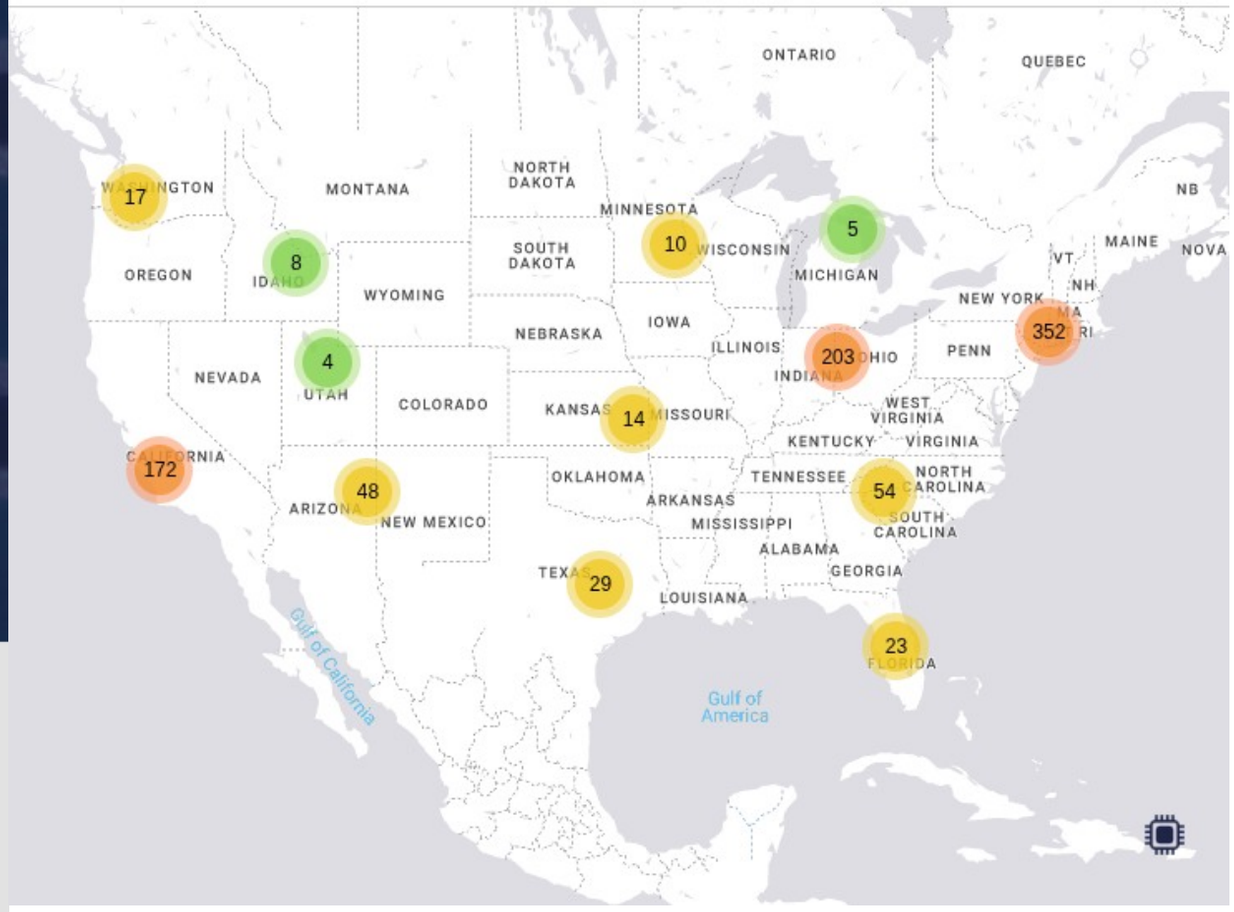
HOME CONNECT WITH A HUB

The Microelectronics Commons: A National Network of Prototyping Innovation Hubs

The Microelectronics Commons is creating a direct pathway to reduce the country's reliance on foreign microelectronics and safeguard the nation from supply chain risks.

Registration Open for the 2025 Microelectronics Commons Annual Meeting

Date: 27-29 October, 2025



https://microelectronicscommons.org/

CMOS+X 2025 40nm chips delivered

40nm CMOS stopped at metal 5.

Stanford University

Northwest HUB | Northwest-AI-Hub

Home About Collaboration Membership CXR Work

Next run, 28nm CMOS, already under design

Upcoming CXR Shuttle

Upcoming CXR Shuttle

Upcoming CXR MPW Shuttle

March 17, 2026

CXR Information Session

Join our webinar to learn more about the program, technology flavor, participation model, and participate in a live Q&A!

March 25, 2026

CXR Shuttle Applications Open

Submit your application to join the CXR Shuttle. Share your +X Project/Innovation and technical needs to be considered.

April 15, 2026

User Selection In-Process

Applications are reviewed based on merit, feasibility, and program fit. Selected users will be notified and onboarded.

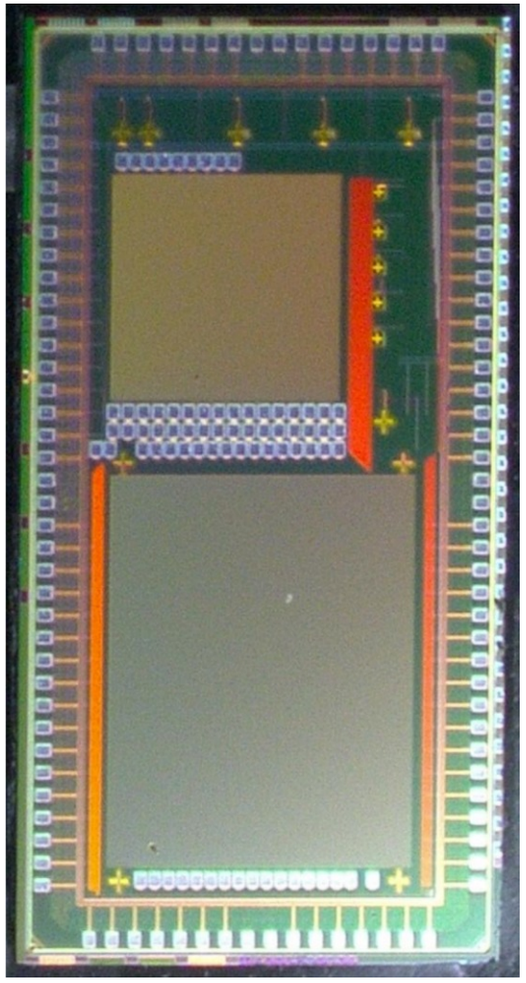
November 10, 2026

Target Tapeout Date

Final designs are submitted for fabrication, marking the transition from design to manufacturing.

2mm

4mm

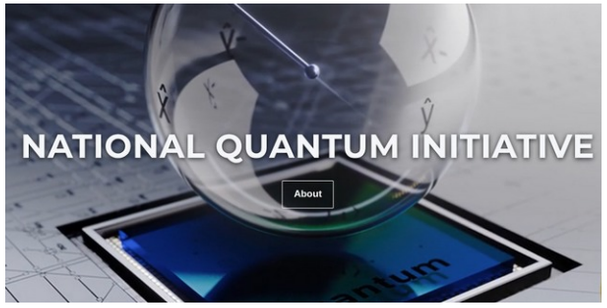




Where are we in 2026 ?



- Authorized 2023-2027
- Projects are still going strong and forward-funded, so will extend into FY28
- No guidance so far on what will happen after that



- Re-authorization act introduced this year
- But has not advanced since April
- Don’t know what will happen with NQI, since Genesis also includes quantum computing



Where are we in 2026 ?

https://www.energy.gov/undersecretaryforscience/genesis-mission/quantum-genesis

Genesis Mission › Quantum Genesis

Quantum Genesis

Quantum Genesis is a U.S. Department of Energy initiative to develop and deploy scientifically relevant, fault-tolerant quantum computing capabilities for research and development.

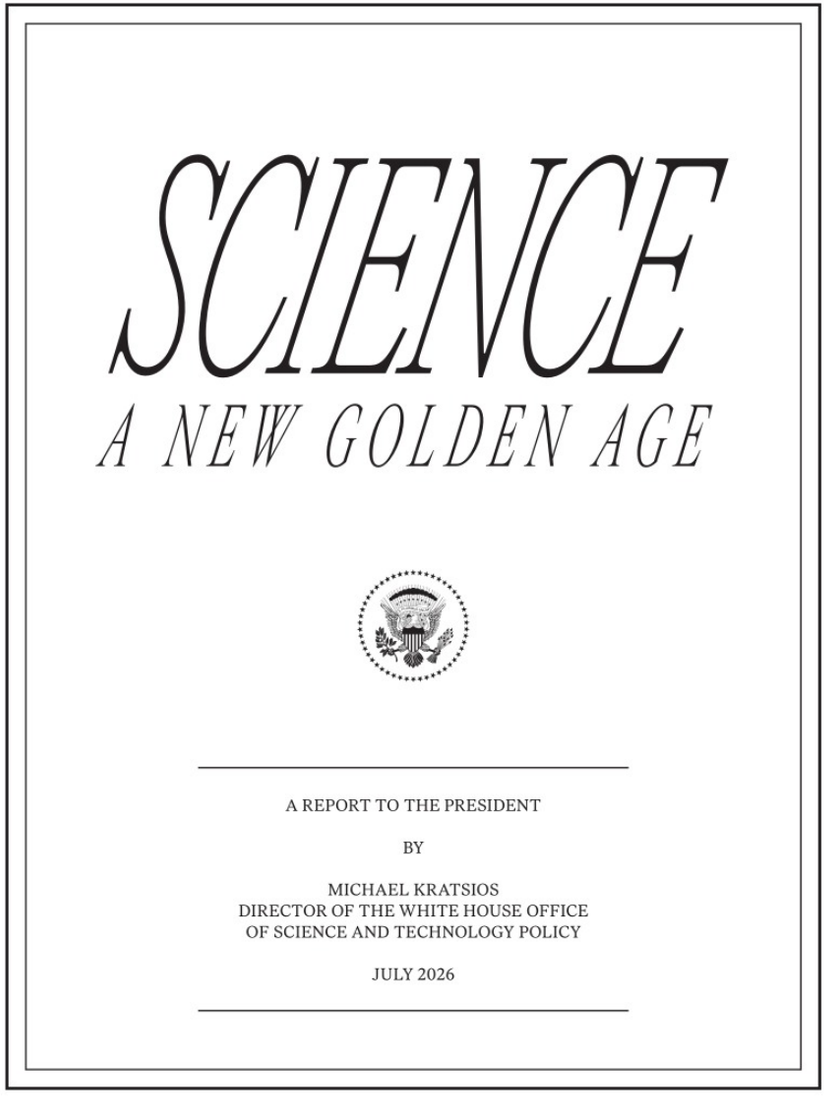
Quantum Genesis Priorities

DOE Q

- **DOE Q Competition**: Accelerating development of fault-tolerant quantum computers, with a goal of demonstrating systems with logical qubits numbering in the low hundreds in 2028. Scientific applications will help guide and evaluate system development.
- **National Quantum Supercomputing User Facility**: Establishing a first-of-its-kind facility where U.S. researchers can access advanced quantum computing systems alongside DOE supercomputing, super intelligence (SI), networking, and scientific resources.
- **Quantum Genesis Priority Applications**: These priorities will provide a concrete basis for judging the "scientific relevance" of quantum computers, coordinating the hardware, software, and domain science R&D needed to achieve the Quantum Genesis Mission's goal of developing fault-tolerant scientifically relevant quantum computers.



Administration effort to re-think funding



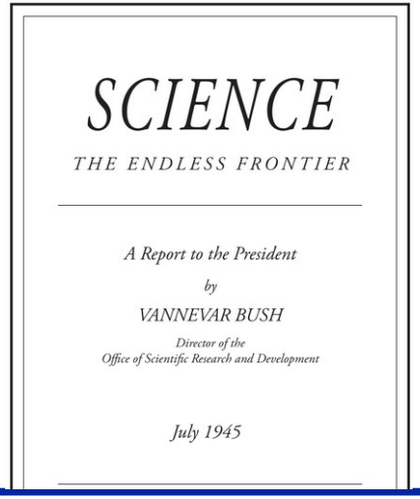
https://www.whitehouse.gov/science/

This report lays out the direction that federal federal funding is going

Good to read both reports: easy to see clear similarities and differences

The most significant difference to me, is the the 1945 report was used to **ESTABLISH** federal basic science funding
While the 2026 report aims to evolve the funding model,
but it's using 1945 as a template,
rather than starting from BRN's and other existing reports

For a summary of detailed comparisons I used Claude Sonnet 5.5
It's useful to look at some of the points Claude makes





Administration effort to re-think funding

>> Claude Sonnet:
I read both texts side by side. That was a close reading, not a software diff, so I may have missed phrase-level echoes.

How was the 1945 text reused?

>> Claude Sonnet:
The reuse is overt and sits at three levels:
- A copied skeleton: title format, front-matter order, and the president's-letter-with-numbered-questions device.
- Verbatim Bush quotations used as anchors. I checked them against your text and the wording matches. The "essential key" quote drops Bush's "one" before it, and "coordinated attack on special problems" is a Bush section heading presented as a phrase.
- Unquoted conceptual echoes, some preserved and some flipped.

Was the 2026 report written by AI?

>> Claude Sonnet:
This comparison doesn't point toward mechanical rewriting… etc. etc.

Most significant shifts from 1945 to 2026

>> My summary of Claude's replies:

Curiosity driven science → applied science towards strategic goals
(Permissionless innovation "must be married to strategic purpose.")

Open science → closed science
(Accountability. Control of collaboration and publication)

Universities as basic science funding recipients → Hubs and industry partners for access by individuals
(Bush said industrial labs seldom do satisfactory basic science, apart from "notable exceptions," while the 2026 text builds on those exceptions (Bell Labs, transformers, corporate Nobel winners)



Significant “conceptual flips” table

Bush 1945	Kratsios 2026	What changed
Title page "A Report to the President by Vannevar Bush," then FDR epigraph on "new frontiers of the mind." Front matter runs transmittal letter, president's letter, summary, chapters, appendices	Same title format and epigraph-page device (Trump quote). Same order, then endnotes and an annex	Bush's appendices are advisory committee reports. The 2026 annex is a joint OSTP/OMB memo instructing agencies, so the report doubles as a directive.
FDR's four "First/Second/Third/Fourth" questions, each with a gloss	Trump's three "First/Second/Third" questions with glosses. Chapter II–IV titles reuse their wording	Disease, release of wartime knowledge, and talent are dropped. Dominance over rivals becomes first. Both reports reorder the questions across their chapters.
FDR's aims: health, new jobs, standard of living	Trump's letter says FDR charged Bush to explore "new frontiers of the mind for the sake of national greatness"	FDR's letter never mentions greatness. The paraphrase adds it.
"Scientific Progress Is Essential" (summary and Ch. 1). The "essential key to our security…" line	"Scientific Progress Remains Essential," quoting the same line	One word changes, and the section argues Bush's principles survive while his processes don't.
Ch. 3: nation dependent on others for basic knowledge is "weak… regardless of its mechanical skill"	Quoted as Ch. II's epigraph. Ch. I and IV then warn about dependence on foreign manufacturing	The dependence logic is kept, but the dependency shifts from basic knowledge to production. Ch. IV calls process knowledge the "keystone."
Ch. 3: trend data show applied work dwarfing university research, so strengthen universities with public funds	Ch. I: industry spends $700B and its basic-research share is rising, which "demands a corresponding adjustment" in the federal role	Same trend-then-recommendation structure, with the opposite finding and a different conclusion.
Ch. 2: medical schools' duty to foster free inquiry "cannot be shifted to government agencies, industrial organizations, or to any other institutions"	FROs and X-Labs, because "academic incentives filter out team-based execution." The university is "no longer the only home"	Bush's non-transferable duty becomes a reason to build alternatives.
A National Research Foundation as the central new institution	Metascience units, X-Labs, ARPAs, Genesis Mission, prizes, golden tickets	One new body becomes a portfolio of experiments.
Fundamental 1: stable funding, "programs of five years duration or longer"; basic research "ceases to be basic" on short-term support	Memo: long-duration grants "ideally lasting five years or more," fully funded in year one	Closest to straight reuse. The memo adds up-front funding and revocability.
Fundamentals 4–5: institutions keep internal control; the Foundation allocates funds and answers to the President and Congress	"Accountability does not mean dictating how a research agenda is to be executed." Only politically responsive parts can set priorities. Prioritize "the individual scientist over legacy institutions"	Fundamental 5 is kept. Fundamental 4 (institutional control, "of the utmost importance") is replaced by funding individuals directly.
Ch. 4: talent selected by ability, "not the circumstance of family fortune." Scholarship holders join a National Science Reserve	Memo: talent defined by ability, "not background or identity." Fellowship programs may require broad service, including defense industrial base or military	"Family fortune" becomes "background or identity." The emergency-call-up reserve becomes a service requirement.
Ch. 5: no reason to think others won't rediscover secrets, so broad dissemination is the sounder basis for security	Ch. I "Regaining Leadership": "unguarded openness," research security, sharing "on one's own terms" versus being "exploited"	Same topic, opposite lean. The 2026 text never engages Bush's argument.
"Publication Should Be Encouraged"; Division of Publications and Scientific Collaboration	"Rethinking Scientific Publication"; "New Forms of Collaboration and Credit"	Near-identical headings. The content moves from releasing wartime reports cheaply to replacing journals with blockchain credit and agent markets.
Basic research as "scientific capital"	"Foundational research" (basic and use-inspired), funded by "capital allocators" with "portfolios"	The vocabulary shifts from public capital to venture-style investing.



Resulting Federal Initiatives

Genesis mission and Super Intelligence (SI) tools credits and computing infrastructure

$310 million in industry and philanthropic commitments to support Federally-funded X-Labs teams with advanced scientific instrumentation and facility space. This builds on the $1.5 billion NSF X-Labs initiative announced in May

Can CPAD DRC structure fit the X-Lab model?

NSF X-LABS https://www.nsf.gov/funding/initiatives/nsf-x-labs

RFI Responses (Future Topics): October 30, 2026

Written Proposal Deadline: January 7, 2027

From Sequence to Function webinar: November 18, 2026

DOE Quantum Genesis Q Competition mentioned earlier

NSF 2x$33 million Grand Research Challenge (GRC) prize competitions in Quantum+X applications and synthetic multicellularity (deadline was Oct 15)

NSF, DOE, NASA, and DOW launched new metascience initiatives to inform how they fund and conduct science… to better identify exceptional ideas and empower talented researchers.



Non-Federal Initiatives

State Initiatives (examples)

PRESS RELEASE

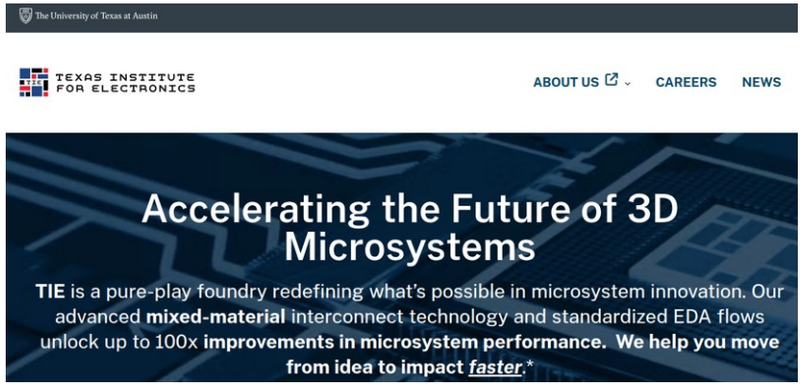
Governor Healey Announces $25 Million for New MIT Quantum Systems Lab, Strengthening MA's Global Leadership in Quantum Computing Research

State matching funds will keep Massachusetts, MIT and UMass Boston at the forefront of quantum computing research, create hundreds of new jobs, and provide opportunities for students

FOR IMMEDIATE RELEASE:
5/28/2026

Governor Maura Healey and Lt. Governor Kim Driscoll

MEDIA CONTACT
Jacqueline Manni
Press Secretary



Private foundations

Kavli, Keck, Moore, Simons,…
No current instrumentation initiatives, but they may come. They may also start to follow metascience initiatives



Beyond Initiatives

There are still opportunities for detector R&D funding outside of direct DOE and NSF independent of initiatives.

There are many of these- SBIR, DARPA, NNSA, NIH, Commerce, Industry, etc.

Beyond scope of this talk



Conclusion

- Initiatives we were adapting to until last year now have uncertain future
  - Still in effect and funding may extend till FY28
- Administration changing science funding model, resulting in new initiatives
  - Genesis
  - X-Labs
  - DOE Q and NSF Quantum + X
  - Metascience (agency level, TBD what comes of this one)
- Shifting focus from funding basic open science to more closed applied science
- For instrumentation development best bet may be on X-Labs. RFI input due end of October



BACKUP

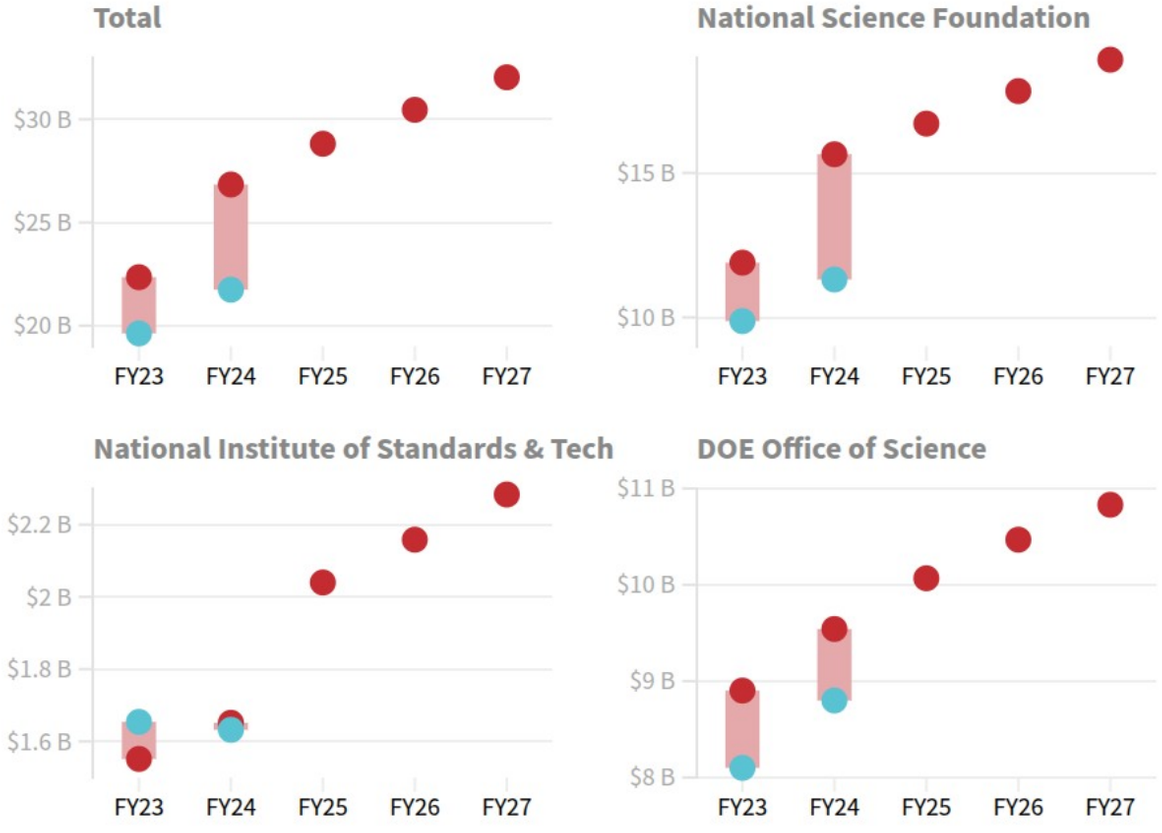


CHIPS Act of 2022

CHIPS and Science Act Funding Appropriations vs. Authorizations

R&D

CHIPS (Authorization) Omnibus (Appropriation)



Source: Federation of American Scientists, H.R.4346 - Chips and Science Act

CSIS | RENEWING AMERICAN INNOVATION PROJECT

US Manufacturing

Industry

