

TECHVISION21

INSIDE VIEW

Spotlight on President's FY 2024 Budget Technology, Research and Development

In March, President Biden released his proposed FY 2024 budget, which includes \$210 billion for Federal research and technology development, a nearly nine billion—or four percent— increase over FY 2023 enacted levels.

Basic Research

This increased investment would go to the National Science Foundation (15 percent), and the Departments of Commerce (10 percent) and Interior (20 percent).

Applied Research

This increased investment would go to the National Science Foundation (22 percent), and the Departments of Health and Human Services (12 percent), Transportation (14 percent), Interior (17 percent), and Homeland Security (18 percent). Applied research at the Department of Defense would take a 23 percent cut.

Development R&D

This increased investment would go to NASA (12 percent), and the Departments of Agriculture (10 percent), Energy (14 percent), Health and Human Services (23 percent) and Interior (15 percent). Development at the Department of Commerce would take a 26 percent cut.

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FY 2024 Proposed R&D Budget—Federal Department and Agency Highlights...

Department of Agriculture

Electric and Telecommunications Loan Programs. The proposed budget would support \$6.5 billion in loans to construct, acquire, and improve electric infrastructure, including renewable energy, electric transmission, distribution, smart grid technology, energy efficiency, grid resiliency, and security enhancements. The budget would support \$690 million in telecommunications loans for the construction, extension, and improvement of telecommunications facilities that expand broadband and e-connectivity in very low population communities.

Broadband, Distance Learning and Telemedicine Programs: The proposed budget includes \$400 million for Broadband ReConnect Program loans and grants, on top of the \$2 billion provided in the Infrastructure Investment and Jobs Act (IIJA). ReConnect provides financial assistance to deploy broadband to underserved areas. In addition, the budget includes \$35 million for broadband grants to support new or improved broadband access in communities with populations of up to 20,000, and \$65 million for Distance Learning and Telemedicine grants to assist rural communities that would otherwise be without access to learning and medical services over the Internet.

Rural Energy for America Program. The budget requests \$50 million in loans and \$30 million in grants in addition to mandatory funding of \$50 million in grants and \$1 billion in loans for renewable energy systems and energy efficiency improvements.



Product Quality/Value Added. The budget proposes \$194 million for research programs directed toward: improving the efficiency and reducing the cost of converting agricultural products into biobased products and biofuels, developing new and improved products for domestic and foreign markets, and providing higher quality, healthy foods.



NIFA/AFRI. \$1.9 billion would go for National Institute of Food and Agriculture research, extension, and education programs. This includes \$550 million for the Agriculture and Food Research Initiative that funds fundamental and applied sciences in agriculture. AFRI funds projects in areas such as bioenergy, renewable energy, biotechnology, aquaculture, and agriculture systems and technology.

Department of Commerce

NIST. The National Institute of Standards and Technology would receive \$1.6 billion, with a small \$5 million increase over FY 2023. Funding would include new efforts in priority areas such as critical and emerging technologies (\$20 million increase), cyber security (\$20 million increase), and trustworthy and resilient domestic supply chains (\$8 million increase). The budget requests an additional \$60 million for Manufacturing USA, including funds to create and operate test-beds.

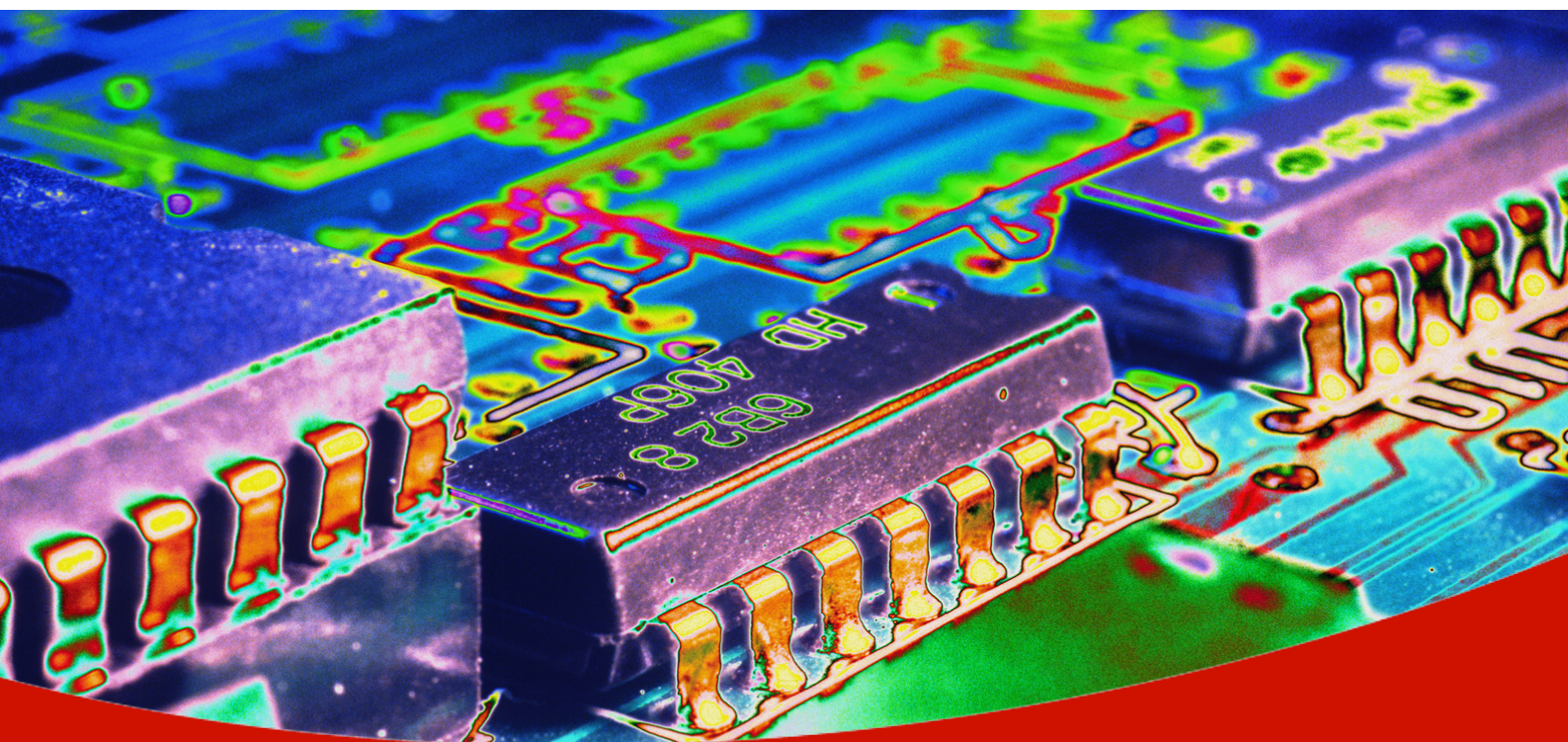
EDA. \$50 million in FY 2024 discretionary funding would go to the Economic Development Administration's Regional Technology and Innovation Hub program. The budget also proposes \$4 billion in no-year mandatory funding for the Hub program (\$1.5 billion in FY 2024 and \$2.5 billion in FY 2026). EDA plans to allocate \$44 million across the Venture Challenge, Capital Challenge, and any Industry Challenges on which it may partner with other agencies.

Department of Defense

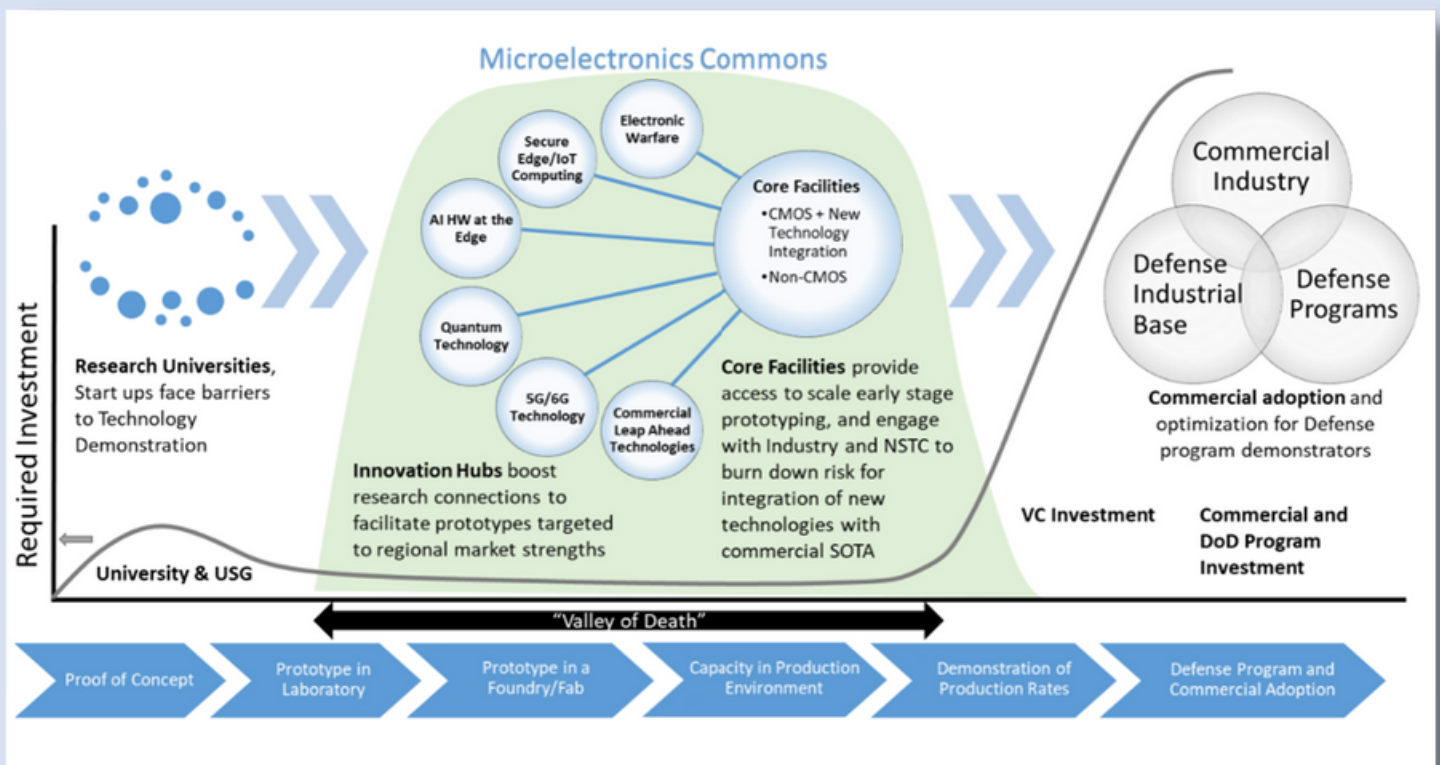
The President's budget proposes \$145 billion for Department of Defense (DOD) research, development, test, and evaluation (RDT&E), an increase of \$5 billion over FY 2023. This includes about \$18 billion for science and technology—basic research (6.1), applied research (6.2), and advanced technology development (6.3)—\$4.6 billion less than FY2023 enacted levels.

Defense-wide Manufacturing Science and Technology Program. Defense-wide manufacturing science and technology would receive \$253 million, a cut of more than \$490 million from the \$747 million enacted in FY 2023, mostly coming from Manufacturing USA which would receive \$113 million. The Manufacturing USA account swelled in FY 2023 with more than \$440 million in Congressional adds, including a \$300 million earmark for Bioindustrial Manufacturing Institutes, for which no funds are requested for FY 2024. Each of the other institutes would take a haircut.

Trusted and Assured Microelectronics. TAM would receive \$1.1 billion (total of 6.4 and 6.5 accounts). In the 6.4 account, funding would increase by \$167 million, with most of the increase—\$100 million—going for radiation hardened microelectronics, which would be funded at \$279 million.



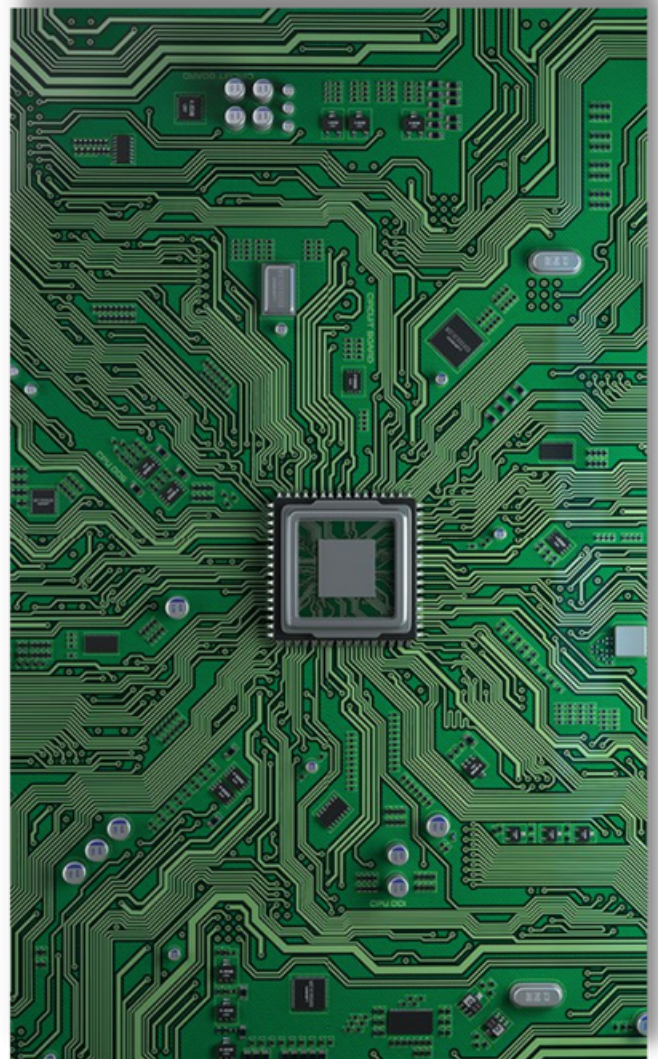
CHIPS Act. In FY 2024, DOD would spend \$400 million on CHIPS Act-mandated efforts, including selecting the remaining microelectronics commons hubs and cores to build out the microelectronics R&D network. \$65 million would go to applied research, \$269 million for advanced technology development, and \$66 million on advanced component development and prototypes. A large portion of funding will be focused on prototyping in a laboratory or foundry/fab. Several million will be devoted to workforce development. In FY 2024, each of the targeted technology areas would receive \$53.3 million: quantum technology, 5G/6G, AI hardware, commercial leap ahead technologies, electromagnetic warfare, and secure edge computing/IOT. Following is a copy of the DOD's illustration of the Microelectronics Commons:



Biomanufacturing. The budget proposes to invest \$200 million to expand the bio-industrial manufacturing base for critical materials.

Office of Strategic Capital. The new OSC would receive \$99 million in FY 2024 to invest in critical technologies, such as advanced materials and semiconductors, which do not traditionally receive investment from DOD procurement and acquisitions, but rely solely on private investment for commercialization, manufacturing and infrastructure. OSC will implement highly targeted partner capital programs to attract private capital investments by lowering their cost of capital. The intent is to increase early-stage investment in the enabling and frontier critical technology areas that require longer duration, lower return “patient capital” required for hardware-based technologies. OSC will also invest via loans, loan guarantees, convertible instruments, and/or purchase commitments in critical technology companies to scale domestic manufacturing and infrastructure.

DARPA. The budget proposes \$4.4 billion for the Defense Advanced Projects Research Agency, an increase of about \$300 million over FY 2023. This includes \$710 million (across 6.1, 6.2, and 6.3 accounts) for Beyond Scaling/Electronics Resurgence Initiative 2.0, DARPA’s post-Moore microelectronics program. In the 6.2 account, \$50 million would go for next generation advanced manufacturing tools, \$40 million for 3-D heterogeneous integration, \$43 million for extreme environment electronics, and \$25 million for next generation manufacturing prototyping. In the 6.3 account, \$175 million would go for next generation manufacturing prototyping (public-private partnerships).



Department of Energy

EERE. The Office of Energy Efficiency and Renewable Energy would receive \$3.8 billion, \$366 million or 11 percent more than FY 2023. Big increases would go to renewable energy grid integration, wind energy, geothermal technologies, advanced materials and manufacturing, and industrial efficiency and decarbonization. DOE would establish its 18th national laboratory. In addition, EERE has \$1.9 billion in FY 2024 funding from the IIJA.

Office of Energy Efficiency and Renewable Energy Proposed FY 2024 Budget (<i>millions</i>)			
	FY 2024 Budget Proposal	\$ Increase/ Decrease	% Increase/ Decrease
Vehicle Technologies	527	72	16%
Bioenergy Technologies	323	43	15%
Hydrogen/Fuel Cells	163	(7)	-4%
Renewable Energy Grid Integration	59	14	31%
Solar Energy	379	61	19%
Wind Energy	385	253	192%
Water Power	230	51	28%
Geothermal Technologies	216	98	83%
Advanced Materials/Manufacturing	241	58	32%
Industrial Efficiency/Decarbonization	394	128	48%
Building Technologies	348	16	5%

Expect to see competitive funding opportunities in areas such as: batteries, electric drive system performance, renewable fuels, reducing embodied energy in vehicle manufacturing, distributed energy, thermal storage and heat exchangers for concentrating solar power, autonomous heliostat fields, solar-thermal driven industrial processes, PV research, high efficiency PV cells/modules and their durability, solar grid integration, power electronics, wind testing facilities, floating off-shore wind, nascent wind designs, regional energy-water demonstration facilities, geothermal well construction, Connected Communities 2.0, American-made Solar Prize, Community Energy Coalition Prize, Citizen Science Prize, and Clean Energy Careers for All Prize.

OTT. The budget requests \$56 million for the Office of Technology Transition, including \$31 million to establish a new Foundation for Energy Security and Innovation to raise philanthropic funds to make targeted investments that enhance the DOE mission.

FY IJJA Funding (<i>millions</i>)	
EV Vehicle Battery Recycling/2 nd Applications	40
Clean Hydrogen Manufacturing Recycling	100
Clean Hydrogen Electrolysis	200
Efficiency/Resilience Codes Implementation	45
Advanced Energy Manufacturing/Recycling	150
Battery Manufacturing/Recycling	600
Battery Material Processing	600
Industrial Research/Assessment Centers	110
Energy Efficiency/Renewables Public Schools	100

Energy Supply Chains. The budget requests \$75 million to establish the Global Clean Energy Manufacturing Initiative to support collaborations with international partners on energy supply chains, including mineral and material resources, material processing, and scaleup, as well as other components of the energy supply chains. Also, the budget requests \$65 million for the Energy Sector Industrial Base including funds for grants to establish new domestic, commercial-scale component, device, or system manufacturing in critical energy sector segments of the supply chain.

ARPA-E. \$650 million would go to the Advanced Research Projects Agency-Energy, an increase of \$180 million or 38 percent over FY 2023. In FY 2024, ARPA-E plans to release solicitations for its OPEN 2024 and Seeding Critical Advances for Leading Energy and Technologies with Untapped Potential (SCALEUP) programs, and upto 12 new funding opportunities.

**Potential Areas for
FY 2024 ARPA-E Funding Opportunities**

- Net-zero low GHG building heating and cooling
- Net-zero aviation
- Net-zero power grid and electrification
- Industrial products and fuels for a net-zero, circular economy
- Fusion energy at scale
- Climate sensors/monitoring for improved GHG detection for potential capture/sequestration
- Carbon neutral/negative agricultural production
- Innovative carbon capture technologies, including those utilizing land and water bodies
- Prevention of GHG emissions from land sources
- Carbon neutral waste and recycling
- Resilient energy infrastructure to facilitate protection against climate-related severe events
- Resiliency via wireless power transfer
- Methane abatement

Clean Energy Demonstrations. The budget proposes \$215 million for the Office of Clean Energy Demonstrations (OCED), an increase of \$126 million or 142 percent. OCED plans to fund up to five demonstration projects that enable significant decarbonization of industrial facilities or processes and/or enable the production of low-carbon products and products such as steel, cement, glass, and fuels.

Science. The Office of Science would receive \$15 billion, an increase of \$270 million over FY2023. A huge increase of \$276 million would go to U.S. fusion program acceleration, while exascale computing would be reduced by \$254 million. DOE intend to establish new Microelectronics Science Research Centers authorized under the CHIPS Act, and will recompute the Energy Frontier Research Centers with an emphasis on quantum, microelectronics, and transformative manufacturing.

Department of Health and Human Services

- **ARPA-H.** The Advanced Research Projects Agency-Health would receive an increase of \$1 billion, for a proposed total of \$2.5 billion.
- **BARDA.** \$1 billion would go to the Biomedical Advanced Research and Development Authority.

Department of Transportation

ARPA-I. The Advanced Research Project Agency-Infrastructure would receive \$19 million to ramp-up its operations. Other areas of research focused on emerging technologies include integration of drones into the airspace, and research to advance, as well as support, the Department's rulemaking in automated systems across all modes of transportation.

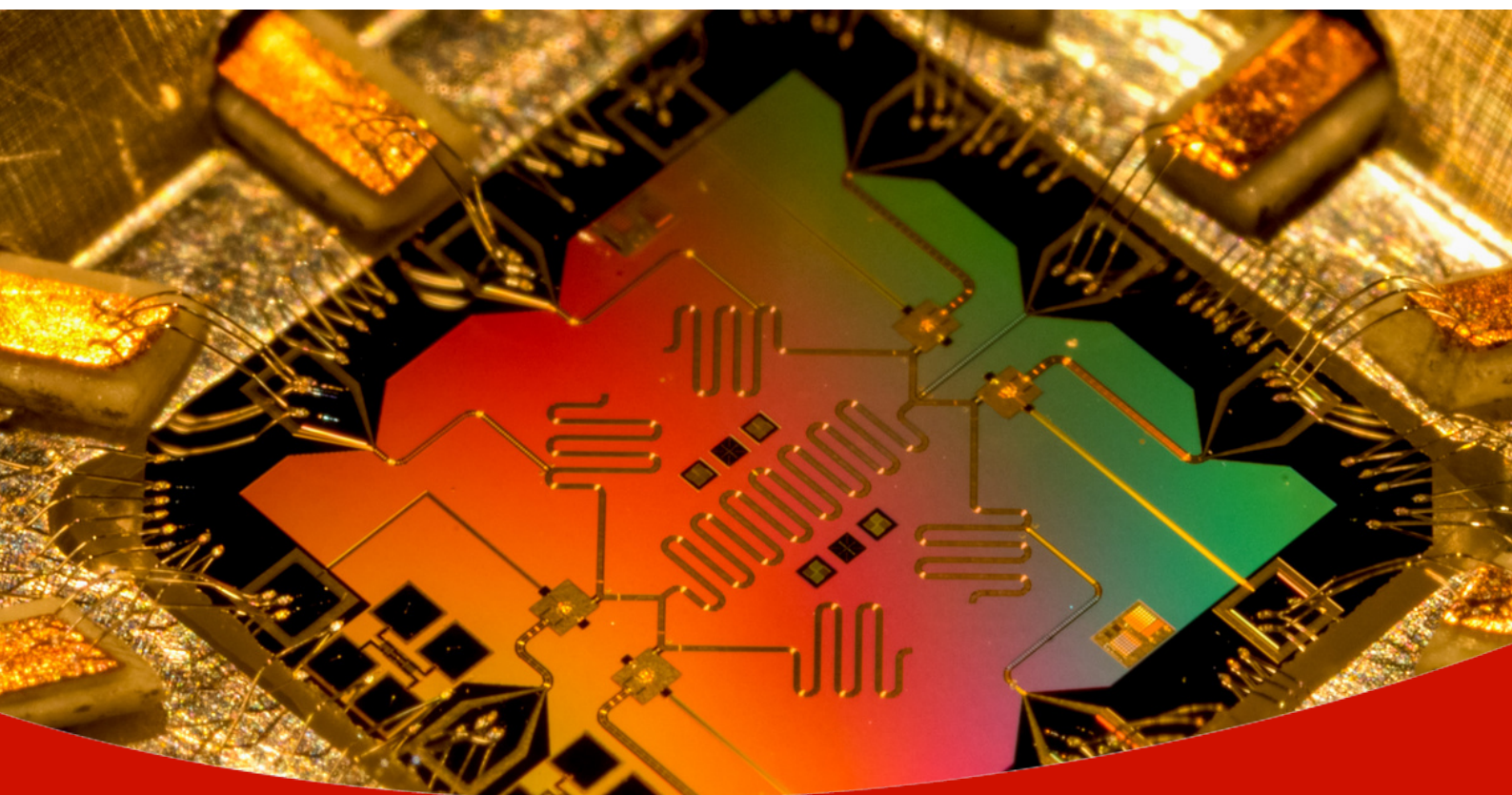
National Science Foundation

The budget proposes \$9.3 billion for the National Science Foundation (NSF), an increase of \$1.3 billion, or 17 percent. In FY 2024, NSF plans to establish up to two additional Artificial Intelligence Institutes and five new Biology Integration Institutes, and make two or three new BioFoundry awards.

Proposed FY 2024 National Science Foundation Investments to Advance Key Technologies (<i>millions</i>)	
Advanced Manufacturing	454
Advanced Wireless	179
Artificial Intelligence	796
Biotechnology	470
Microelectronics/Semiconductors	210
Quantum Information Science	333
Clean Energy Technology	550

TIP. The Directorate for Technology, Innovation, and Partnerships would receive \$1.2 billion. Innovation and Technology Ecosystems would receive \$490 million, an increase of \$341 million or 229 percent over FY 2023. This includes \$300 million for the Regional Innovation Engines program, and \$100 million for the Convergence Accelerator program for investments in regional anchors and teams pursuing location-specific challenges, for example, in food and agriculture, disaster response, water resources, and transportation. Translational Impacts (TI) would receive \$489 million, an increase of \$98 million or 25 percent over FY 2023. TI involves a portfolio of lab-to-market programs including Partnerships for Innovation, I-Corps, SBIR, Pathways to Enable Open-Source Ecosystems, Entrepreneurial Fellowships, and Accelerating Research Translation.

Also, TIP would invest \$106 million for testbeds (prototyping platforms across key technology areas). Within its funding, TIP would devote \$197 million to accelerate breakthroughs in advanced materials, artificial intelligence, biotechnology, clean energy technology, future manufacturing, next generation networks, microelectronics/semiconductors, and quantum information science.



OUTLOOK

It is very unlikely that the President will receive everything on his science, technology, and innovation wish list. However, in the face of a technologically strengthening China, and U.S. dependency on certain critical materials and products sourced from China, there is growing bi-partisan recognition that the United State must invest to stay ahead in the technology race, or our national and economy security will be at great risk.

TechVision21 believes that there will be numerous funding opportunities across the fields of science, technology, and innovation in FY 2024.

We are ready to help you pinpoint Federal funding and connect with funders, build out your concepts, find partners, and develop competitive proposals. **Contact TechVision21 at (202) 966-6610, kcarnes@techvision21.com, techvision21.com**



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