MICROELECTRONICS AND SEMICONDUCTORS

Microelectronics and Semiconductor Funding[1]

(Dollars in Millions)

	FY 2024 Current Plan	FY 2025 (TBD)	FY 2026 Request
CISE	$35.99		$12.60
EDU	-		2.00
ENG	38.00		22.60
MPS	33.20		-
TIP	35.38		28.55
Total	**$142.57**		**$65.75**

[1] Funding displayed may have overlap with other topics and programs.

Semiconductors and microelectronics are critical components enabling cell phones, personal computers, cars, appliances, and many other technologies we rely upon every day. They underpin transportation, communications, cybersecurity, healthcare, manufacturing, information technology, and other preeminent U.S. industries. They are also essential to U.S. leadership in areas such as artificial intelligence and quantum computing. NSF investments in Microelectronics and Semiconductor research and education help grow U.S. innovation and keep the nation competitive and secure.

NSF's overarching objectives are to develop new paradigms in semiconductor capabilities and to grow the corresponding national workforce necessary to keep pace with industrial and research needs. Our approach in Microelectronics and Semiconductors will help overcome scientific barriers in essential technologies such as advanced computing; artificial intelligence; distributed mobile processing platforms; internet of things; quantum communication, computing, and sensing; advanced communications; advanced manufacturing; and biological-semiconductor interfaces.

NSF has four goals in Microelectronics and Semiconductors:

- Support research and development of new, secure, high-performance devices and systems that offer improved security, functionality, and energy-efficiency and enable AI, computing, quantum, and other key technologies.
- Investigate and implement methods and techniques to integrate new classes of devices into microelectronic circuits for diverse platforms. Microelectronic devices are fabricated by integrating transistors with numerous other components that work with different physical principles. The need to bring various components—electrical, optical, magnetic, and quantum—into a microelectronic circuit necessitates the investigation of new co-design, packaging, and testing methodologies.
- Create a semiconductor and microelectronics R&D ecosystem. This ecosystem will enable researchers and trainees to fabricate novel transistors and devices and to integrate component technologies into systems using heterogeneous integration techniques. The ecosystem will connect user facilities to fabricate devices in the laboratory, advanced methods for semiconductor manufacturing, and partnerships with industry to translate laboratory-generated ideas into foundry-fabricated prototypes.

- Grow a competitive workforce across the U.S. and provide experiential learning and training opportunities in partnership with industry to support the ecosystem, from researchers to technicians, theorists to experimentalists, and entrepreneurs to practitioners.

In FY 2026, NSF's Microelectronics and Semiconductors investment will support:

- Research in foundational principles: NSF will invest in multidisciplinary research using novel and sustainable materials with specially designed physical properties to create new classes of high-performance semiconductors for microelectronic devices.
- Methods for integrating devices into diverse platforms: NSF will invest in fundamental and use-inspired research, as well as research infrastructure, to investigate and implement new methods for device integration and novel architectures, including the integration of classical computing with quantum computing and other paradigms.
- Microelectronics ecosystem: NSF will invest in semiconductor manufacturing and lifecycle optimization research, lab-to-fab opportunities, and research infrastructure to translate benchtop microelectronics and semiconductors research into fabrication and manufacturing.
- Workforce development*:* Across the U.S. NSF will invest in STEM education at all levels and across settings. These investments include curriculum development and faculty training, infrastructure access, recruitment and retention efforts, expanding pathways to careers in semiconductor manufacturing and design, and coordination and facilitation of partnerships.