

**NATIONAL NANOTECHNOLOGY COORDINATED
INFRASTRUCTURE (NNCI)**

\$14,780,000
-\$770,000 / -5.0%

National Nanotechnology Coordinated Infrastructure Funding
(Dollars in Millions)

FY 2017	FY 2018	FY 2019	Change over	
			FY 2017 Actual	Percent
Actual	(TBD)	Request	Amount	Percent
\$15.55	-	\$14.78	-\$0.77	-5.0%

The NNCI program was established in FY 2015 as the successor to the National Nanotechnology Infrastructure Network (NNIN). NNCI comprises 16 independent awards to universities around the Nation as user facility sites in nanotechnology. NNCI represents a model in which NSF selects and manages each university site in the network rather than a single lead institution with collaborating partners as in the previous NNIN, thus providing more flexibility in awardee selection and management, and more agility in addressing emerging user facility needs in nanoscale research and education. The 16 NNCI sites involve 29 universities and other partner organizations located in 17 states. The NNCI sites provide researchers in academia, small and large companies, and government with access to university user facilities with leading-edge fabrication and characterization tools, instrumentation, and expertise within all disciplines of nanoscale science, engineering and technology, thus helping to catalyze new discoveries in science and engineering and to stimulate technological innovation.

A Coordinating Office at the Georgia Institute of Technology was selected in FY 2016 through externally reviewed proposals from among the awarded sites to enhance the impact of NNCI as a national infrastructure network of user facility sites. The director of the Coordinating Office is a key individual for developing management strategies and operational plans in concert with the site directors of the individual user facilities, and serves as the principal contact person with NSF. The individual NNCI sites have autonomy in their operation and management but are required to act in concert with the Coordinating Office. The Coordinating Office has established a comprehensive web portal to ensure close linkage among the individual facility websites to present a unified face to the user community of overall tools, instruments, and capabilities.¹⁸ It is harmonizing capabilities for modeling and simulation across sites and interaction with NanoHUB of the NSF-supported Network for Computational Nanotechnology (NCN). It is coordinating and disseminating best practices for national-level education and outreach programs, as well as instruction across sites in social and ethical implications of nanotechnology. It is establishing uniform methods for assessment and quantifiable metrics of site performance and impact; and is also engaging all sites in a planning process to explore emerging areas of nanoscale science, engineering, and technology that can lead to new research opportunities and future growth of the external user base.

The broad scope of NNCI sites coverage includes materials, structures, devices, and systems in areas of physics, chemistry, materials sciences, mechanical systems, geosciences, geophysical, geochemical, environmental sciences, biology, life sciences, synthetic biology, fabrication in soft matter including biological interfaces, biomedicine, electronics, optics, magnetism, molecular synthesis, molecular scale devices, manufacturing concepts, modeling and simulation, social and ethical implications of nanotechnology, and education and outreach. The individual award sites are intended to support a rich user base with broad accessibility and affordable user fee structure. NSF funds leverage those of university and other resources to grow the numbers of external users, including those from companies and academia. Sites embrace a culture of open access to researchers for any research project of merit, with protection of intellectual property, and mechanisms for encouraging non-traditional users from diverse disciplines. They also have an organizational structure that facilitates coordination of complex process steps and tools for

¹⁸ NNCI Coordinating Office web portal, www.NNCI.net

Major Multi-User Research Facilities

integrated tasks and acceptance of experimental risks associated with non-standard processes and materials.

Nanotechnology facilities provide unique opportunities to infuse innovative education with research at the frontiers of the field. Award sites are providing focused strategies for integrating pioneering science and engineering with education, including plans for assessing effectiveness and spreading promising practices. Sites having particular expertise in the social and ethical implications of nanotechnology have integrated study and dissemination of those aspects into their activities that can leverage their user community base, which relate to the capabilities of their respective user facilities.

NNCI collects annual user data from October 1 to September 30 each year. In Year 1, the total number of unique users (internal and external) was 60,675, with 2,561 external users (23.9 percent). External users were composed of 1,151 academic users and 1,410 industry users (65 percent from small companies). There has been steady growth in these numbers. In Year 2, there were 12,447 total users, with 3,171 external users (25.5 percent). Year 2 external users include 1,504 academic and 1,667 industry users (61 percent from small companies). New (first time) users trained were 4,116 in Year 1 and 4,946 in Year 2.

Total Obligations for NNCI

(Dollars in Millions)

	FY 2017	FY 2018	FY 2019	ESTIMATES ¹				
	Actual	(TBD)	Request	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Operations & Maintenance	\$15.55	-	\$14.78	\$15.46	\$15.46	\$15.46	\$15.46	\$15.46

¹ Outyear funding estimates are for planning purposes only. The current cooperative agreement ends in FY 2019.

Management and Oversight

- **NSF Structure:** Post-award oversight is performed under the guidance of the NSF lead program officer and directorate working group members to monitor progress of the award and award accomplishments.
- **External Structure:** The NNCI Coordinating Office is led by a director, deputy director, and three associate directors who manage the network in specific areas: education and outreach programs, societal and ethical implications (SEI) activities, and computational activities and facilitates interactions with nanoHUB/NCN at Purdue University. The core staff is guided by an executive committee, which includes the 16 NNCI site directors. The NNCI Executive Committee meets monthly via teleconference/WebEx and annually in person at the NNCI Conference. The NNCI Executive Committee and Coordinating Office are advised by an external advisory board comprised of members representing industry, academia, government, education and outreach, SEI, computation and non-traditional disciplines in nanoscience and nanoengineering. Several subcommittees of the NNCI Executive Committee work to address high-level issues related to the NNCI network, such as new equipment and research opportunities, workforce development, diversity, and building the user base. An annual NNCI Conference organized by the NNCI Coordinating Office is held at different network sites to highlight the research supported by the NNCI facilities and to provide a venue to share best practices. The first of two annual NNCI Conferences was held at Georgia Tech in January 2017 covering FY 2016 activities and the second, covering FY 2017 activities, at the University of Pennsylvania in October 2017.
- **Reviews:** Reviews are being conducted through annual reverse site reviews at NSF. The awardees submit comprehensive annual project reports to NSF in advance of each annual review. The annual project reports contain a program plan and budget for the next year's funding increment. Each annual review of a site focuses on the quality of performance and management under the cooperative agreement. Data collection is consistent with NSF policies for information collection.

Renewal/Competition/Termination

The initial NNCI award is for five years and may be renewed once for an additional five years, subject to external merit review. Limited new competitions may be held, based on availability of funds, to address critical needs in nanotechnology or to replace non-performing sites or the Coordinating Office.