MAJOR FACILITIES OVERVIEW

Major Facilities Funding
(Dollars in Millions)

	FY 2024 Current Plan	FY 2025 (TBD)	FY 2026 Request	Change over FY 2024 Current Plan Amount	Change over FY 2024 Current Plan Percent
Total Research and Related Activities	**$1,099.11**		**$763.00**	**-$336.11**	**-30.6%**
Operations and Maintenance of Existing Facilities	736.38		527.00	-209.38	-28.4%
Federally Funded Research and Development Centers	311.64		186.00	-125.64	-40.3%
Operations and Maintenance of Facilities under Construction	17.71		32.00	14.29	80.7%
R&RA Design Stage Activities	33.38		18.00	-15.38	-46.1%
Major Research Equipment and Facilities Construction	**$233.00**		**$250.00**	**$17.00**	**7.3%**
Total, Major Research Facilities	**$1,332.11**		**$1,013.00**	**-$319.11**	**-24.0%**

NSF's investments in major multi-user research facilities (major facilities) enable access to and the operation of large, state-of-the-art tools for research and education. These tools can include instrumentation networks, observatories, accelerators, telescopes, research vessels, aircraft, and simulators. These investments support U.S. leadership in a broad swath of science, engineering and technology, and, in many cases, are the world-leading infrastructure in their discipline. NSF's investments are coordinated with those of other organizations, federal agencies, and international partners to ensure they are complementary and well-integrated. Planning for, and operations and maintenance (O&M) of major facilities are funded through the R&RA account. Most construction is funded through the MREFC account; projects currently supported by the MREFC account are discussed in a separate section.

In FY 2026, NSF will continue to provide O&M funding to all existing major facilities, with a focus on maintaining unique and state-of-the-art capabilities that advance U.S. competitiveness and support national and economic security. NSF will also continue to develop concepts for new potential research infrastructure investments that will keep the U.S. at the forefront of global science and engineering. Funding for logistics and infrastructure in support of the U.S. Antarctic Program and similar activities in the Arctic will enable the U.S. to retain its influential presence through the conduct of scientific research on the Antarctic continent and in Greenland.

At the requested FY 2026 Budget level, NSF will emphasize O&M support for its highest priority infrastructure, including the U.S. Antarctic Program, world-leading optical (Vera C. Rubin Observatory) and radio (Atacama Large Millimeter/submillimeter Array) astronomy facilities, the National Geophysical Facility, the National Ecological Observatory Network, and some ships of the Academic Research Fleet. Each of these facilities is a unique infrastructure that both enables cutting-edge scientific discovery and maintains U.S. scientific and technical leadership in the global research enterprise. A second tier of infrastructure will be supported at a substantially reduced level, which will enable continued delivery of significant scientific outcomes, albeit at a diminished rate. A final group of facilities will be funded at a level that enables only limited FY 2026 activity with the intent to proceed with eventual disposition (closure or divestment) of the infrastructure.

The **Vera C. Rubin Observatory,** operated by NSF's National Optical-Infrared Astronomy Research Laboratory (NOIRLab), comprises an 8.4-meter wide-field optical telescope, equipped with a 3.2-gigapixel camera supplied by the Department of Energy (DOE) and is the only facility of its kind in the world. Located on Cerro Pachón in northern Chile, Rubin Observatory will commence its ten-year in-

depth survey of the night sky in early FY 2026. The culmination of years of investment by NSF and DOE, Rubin Observatory's novel technology, coupled to the world's largest digital camera, will not only advance discovery in astronomical sciences but also contribute to planetary defense by cataloging millions of near-Earth objects such as asteroids.

The **Atacama Large Millimeter/submillimeter Array (ALMA)**, part of NSF's National Radio Astronomy Observatory (NRAO), is the world's most powerful radio telescope. Ongoing support for this 66-antenna array, located on the Chajnantor Plateau in the Atacama Desert of Chile, will ensure that continuous observations of the universe are obtained to enable ground-breaking studies of stars, galaxies and planetary formation, leading to a deeper understanding of the origins of the cosmos. ALMA is an international observatory, collaboratively funded and operated by NSF, the National Institutes of Natural Sciences of Japan, and the European Southern Observatory.

Also operated by NRAO is the **Very Long Baseline Array (VLBA)**, the world's preeminent facility for high-precision astrometric studies and high-resolution imaging. VLBA comprises ten 25-meter diameter telescopes distributed across the U.S., from the U.S. Virgin Islands to Hawaii. The operations of the VLBA are jointly funded by NSF and the U.S. Naval Observatory, which continues to rely on VLBA data for mission-critical measurements of Earth orientation, data necessary for the accurate functioning of GPS. Remaining components of NRAO, including the Very Large Array and Central Development Laboratory, will operate at reduced levels of service at the FY 2026 Budget level.

NSF manages the **U.S. Antarctic Program** (USAP) on behalf of the U.S. government, operating three year-round stations (McMurdo, Amundsen-Scott South Pole, and Palmer) in partnership with the U.S. military, other federal agencies, and private contractors. The USAP maintains an active and influential U.S. presence on the Antarctic continent while enabling cutting-edge scientific research in astronomy, biology and glaciology, among other fields. At the FY 2026 Budget level, NSF will continue to operate all three stations, to support the conduct of long-term research projects, and to carry out recapitalization work that will make the USAP more efficient and effective. To focus support on the stations and associated logistics, NSF intends to terminate the lease of the research vessel *Nathaniel B. Palmer* in FY 2026.

The **National Geophysical Facility (NGF)**, formed in FY 2025 from the consolidation of the former Geodetic and Seismological Facilities for Advancement of Geosciences (GAGE and SAGE), enables the study of Earth processes, such as earthquakes, volcanic eruptions, landslides, and water cycle dynamics. Through continued operation of networks of Global Positioning System (GPS) and Global Navigational Satellite Systems (GNSS) instruments and the Global Seismological Network, in FY 2026, NGF will address national security needs such as improved natural hazards models and earthquake and tsunami early warning systems, in conjunction with USGS and NOAA, respectively, and nuclear test monitoring, in partnership with the National Nuclear Security Administration. Moreover, a robust and growing suite of private sector partnerships supports the use of GPS/GNSS data for automotive navigation, industrial automation, precision agriculture, and wireless network infrastructure.

The **National Ecological Observatory Network (NEON)** is the only continental-scale biological observing system, with infrastructure distributed across the U.S., including Alaska, Hawai'i, and Puerto Rico. Data from NEON enable studies of the complex interactions between living organisms and natural systems, advancing our understanding of wildfires, drought, invasive species, and infectious diseases. In FY 2026, NEON will focus on maintaining the long-term data record generated by the

automated instrumentation deployed at its terrestrial and aquatic sites and gathering samples of key plant and animal species, such as disease-transmitting species of mosquitoes.

The U.S. **Academic Research Fleet (ARF)** currently consists of 17 oceanographic vessels and various submersibles/autonomous vehicles owned by NSF, the Office of Naval Research, and U.S. universities and laboratories. All ARF ships and vehicles are operated by research universities and laboratories. This fleet of technologically advanced ships and submersibles/autonomous underwater vehicles supports research in complex ocean, seafloor and sub-seafloor environments, the Great Lakes, and the polar regions. The FY 2026 Budget Request will enable partial support of some ships in the ARF, with a focus on achieving adequate coverage of both the global oceans and coastal environments and minimizing the loss of qualified crew.

The **National Center for Atmospheric Research (NCAR)** is an NSF-sponsored Federally Funded Research and Development Center (FFRDC) guided by the vision: "a world-class research center leading, promoting and facilitating innovation in the atmospheric and related Earth Systems sciences." NCAR addresses this vision with integrated research and facilities organized around three overlapping areas of activity: cutting-edge airborne and ground-based observational facilities; community weather and climate models with thousands of users worldwide; and petascale high-performance computing. At the FY 2026 Budget level, NCAR will curtail but continue to support research to refine weather and earth system models and to better understand the evolution of wildland fires. Also, continued operation of the NCAR-Wyoming Supercomputer Center will support the integration, analysis, and modeling of large data sets.

NSF supports two large physics experiments – the **Laser Interferometer Gravitational Wave Observatory (LIGO)** and the ATLAS and CMS detectors at the **Large Hadron Collider (LHC)**. **LIGO** is the most sensitive detector of gravitational waves ever built and leads the worldwide effort to study the structure and evolution of the universe through gravitational radiation. LIGO makes use of exquisitely sensitive optical interferometers at two sites – Hanford, Washington and Livingston, Louisiana – to detect gravitational waves and, in collaboration with other, similar experiments in Italy and Japan, to determine the part of the sky from which the radiation originates. Past efforts by LIGO have led to the detection of hundreds of gravitational waves originating from the collisions of black holes, neutron stars, and other celestial objects. In FY 2026 NSF will operate only one of the two sites and will support a reduced level for technology development.

The Large Hadron Collider (LHC), operated by the European Organization for Nuclear Research (CERN) in Geneva, Switzerland, is the world's most powerful particle accelerator. It produces the highest energy particle beams ever created in a laboratory, making it the premier facility in the world for research in elementary particle physics. NSF supports the participation of U.S. researchers in experiments at CERN through the operation of two of LHC's detectors: A Toroidal LHC ApparatuS (ATLAS) and the Compact Muon Solenoid (CMS). At the FY 2026 Budget level, NSF will provide about 60% of the prior share of support for these detectors. Participation of U.S. researchers in LHC research will be commensurately reduced, and NSF expects similar reductions for software and computing capability for analysis.

The **National High Magnetic Field Laboratory (NHMFL)**, operated by a consortium of Florida State University, University of Florida, and Los Alamos National Laboratory, is the world's premier facility for studies requiring high magnetic field environments. NHMFL has an extensive collection of unique

magnet systems that enable research across a broad range of topics, including quantum phenomena in many types of materials, structure of macromolecular components of life, and properties of materials essential to energy production, storage, and use. At the FY 2026 Budget Request level, NHMFL will support a subset of its cutting-edge facilities that includes research on the spin dynamics of quantum particles, which informs the development of room-temperature quantum computing devices, and access to Nuclear Magnetic Resonance technology that enables study of drug development with microorganisms.

The **National Solar Observatory (NSO)**, an NSF-sponsored FFRDC, provides leadership to the solar astronomy community through operations of the Daniel K. Inouye Solar Telescope (Inouye) and the NSO Integrated Synoptic Program, which includes the Global Oscillations Network Group (GONG). Located at the summit of Haleakala on the island of Maui, Hawai'i, Inouye is the world's largest and most advanced solar telescope. Once its commissioning phase is complete, Inouye will enable detailed study of the Sun, including phenomena, such as solar flares and coronal mass ejections, that impact space weather, satellite operations, and terrestrial electrical systems. Observations from GONG, a global network of six telescopes, are essential to predictions of space weather. At the FY 2026 Budget request level, NSF will continue the commissioning of Inouye and its data center.

In addition to Rubin Observatory, **NSF's National Optical-Infrared Astronomy Research Laboratory (NOIRLab)** operates the International Gemini Observatory (Gemini), optical and infrared telescopes at Kitt Peak National Observatory (Arizona) and Cerro Tololo Inter-American Observatory (northern Chile), and the Community Science and Data Center. Gemini comprises two 8-meter telescopes: Gemini-North on Maunakea in Hawaii and Gemini-South on Cerro Pachón in northern Chile. NOIRLab's facilities are open to all astronomers regardless of institutional affiliation, with services provided to over 1000 graduate and undergraduate students annually. At the FY 2026 Budget Request level, the Gemini telescopes will operate at approximately 50% capacity and access to the telescopes at Kitt Peak and Cerro Tololo will be phased out. NSF will begin transferring ownership and operations of these telescopes to other agencies or academic institutions.

Located beneath the ice at the U.S. Amundsen-Scott South Pole station, the **IceCube Neutrino Observatory (ICNO)** is the world's largest high-energy neutrino detector. Over 5000 detectors are distributed throughout a cubic kilometer of ice to observe neutrinos originating from a range of astrophysical processes occurring in the universe. ICNO operates continuously, with data transmitted daily to a data center at the University of Wisconsin-Madison. In FY 2026, operations will continue with a reduction in staff deploying to Antarctica and minimal maintenance activities.

The FY 2026 Budget Request also provides funding for the **Ocean Observatories Initiative (OOI), Sub-seafloor Sampling program (S3P),** and **Green Bank Observatory** major facilities. The FY 2026 request will support only basic services, such as minimal routine maintenance and continued provision of data to the research community. NSF intends to pursue decommissioning and disposition of these facilities to focus on higher priority investments as described above

<u>Oversight</u>

The Chief Officer for Research Facilities in the Office of the Director is the senior agency official responsible for oversight of major facilities throughout their complete lifecycle. This individual works cooperatively with the Research Infrastructure Office (RIO, formerly the Large Facilities Office), Program Offices, and others across NSF to ensure appropriate oversight of the development,

construction, operations, and disposition of major facilities, as required by Section 110 of the American Innovation and Competitiveness Act (P.L. 114-329). A Deputy Chief Officer for Research Facilities assists in these efforts and provides oversight for NSF's Mid-scale Research Infrastructure portfolio.

All NSF major facilities are managed by Integrated Project Teams (IPT) comprising one or more program officers and staff from the Research Infrastructure Office and the Division of Acquisition and Cooperative Support. Within each Directorate, a Senior Advisor for Facilities or Directorate Representative also provides high-level guidance, support, and oversight. Each IPT meets at least once annually with the Chief Officer for Research Facilities and more regular updates are provided through the Directorate representatives and bimonthly written reports.

MAJOR FACILITIES FUNDING, BY PROJECT

(Dollars in Millions)

	FY 2024 Current Plan	FY 2025 (TBD)	FY 2026 Request	Change over FY 2024 Current Plan Amount	Change over FY 2024 Current Plan Percent
Operations and Maintenance of Major Facilities	**$1,065.73**		**$745.00**	**-$320.73**	-30.1%
National Ecological Observatory Network (NEON)	78.05		47.00	-31.05	-39.8%
Biological Sciences	***$78.05***		***$47.00***	***-$31.05***	***-39.8%***
Academic Research Fleet	153.06		92.00	-61.06	-39.9%
National Center for Atmospheric Research (NCAR) FFRDC	127.66		77.00	-50.66	-39.7%
National Geophysical Facility[1]	39.48		39.00	-0.48	-1.2%
Ocean Observatories Initiative (OOI)	39.34		8.00	-31.34	-79.7%
U.S. Sub-seafloor Sampling (S3P)[2]	48.51		10.00	-38.51	-79.4%
Geosciences	***$408.05***		***$226.00***	***-$182.05***	***-44.6%***
Large Hadron Collider (LHC) - ATLAS and CMS	20.50		12.00	-8.50	-41.5%
Laser Interferometer Gravitational Wave Observatory (LIGO)	48.00		29.00	-19.00	-39.6%
National High Magnetic Field Laboratory (NHMFL)	38.57		23.00	-15.57	-40.4%
National Radio Astronomy Observatory (NRAO) FFRDC	107.90		71.00	-36.90	-34.2%
NRAO O&M	*43.59*		*24.00*	*-19.59*	*-44.9%*
Atacama Large Millimeter Array (ALMA) O&M	*54.76*		*44.00*	*-10.76*	*-19.6%*
Green Bank Observatory	*9.55*		*3.00*	*-6.55*	*-68.6%*
National Solar Observatory (NSO) FFRDC	27.67		17.00	-10.67	-38.6%
NSO O&M	*6.24*		*4.00*	*-2.24*	*-35.9%*
Daniel K. Inouye Solar Telescope (DKIST)	*21.43*		*13.00*	*-8.43*	*-39.3%*
NSF's National Optical-Infrared Astronomy Research Laboratory FFRDC	66.12		53.00	-13.12	-19.8%
NOIRLab O&M (Mid-Scale Observatories & Community Science and Data Center)	*23.68*		*6.00*	*-17.68*	*-74.7%*
GEMINI Observatory O&M	*24.73*		*15.00*	*-9.73*	*-39.3%*
Vera C. Rubin Observatory O&M	*17.71*		*32.00*	*14.29*	*80.7%*
Mathematical and Physical Sciences	***$308.76***		***$205.00***	***-$103.76***	***-33.6%***
Antarctic Facilities and Operations (AFO)	262.93		263.00	0.07	0.0%
IceCube Neutrino Observatory (ICNO)	7.94		4.00	-3.94	-49.6%
Office of Polar Programs	***$270.87***		***$267.00***	***-$3.87***	***-1.4%***
Major Research Facilities Construction Investments	**$266.38**		**$268.00**	**$1.62**	**0.6%**
R&RA Design Stage Activities[3]	**$33.38**		**$18.00**	**-$15.38**	**-46.1%**
Major Research Equipment and Facilities Construction (MREFC)	**$233.00**		**$250.00**	**$17.00**	**7.3%**
Total, Major Research Facilities	**$1,332.11**		**$1,013.00**	**-$319.11**	**-24.0%**

FFRDC is an acronym for Federally-Funded Research and Development Center.

[1] FY 2024 column restated to include GAGE and SAGE, which were subsequently consolidated into a single facility, the National Geophysical Facility (NGF).

[2] Formerly the Integrated Ocean Drilling Program (IODP).

[3] Design Stage Activities include support for potential next generation major facilities. This line reflects FY 2024 funding amounts of $3.88 million for the Antarctic Research Vessel (ARV), $9.5 million for Summit Station, $7.0 million for the Next Generation Very Large Array (ngVLA), and $13.0 million for Extremely Large Telescopes (ELT), and FY 2026 funding amounts of $12.0 million for Summit Station, and $6.0 million for ngVLA.