

MAJOR FACILITIES OVERVIEW

Major Facilities Funding

(Dollars in Millions)

	FY 2023			Change over	
	Base Plan	FY 2024 (TBD)	FY 2025 Request	FY 2023 Base Plan Amount	Percent
Total Research and Related Activities	\$1,027.17	-	\$1,166.33	\$139.16	13.5%
Operations and Maintenance of Existing Facilities	675.92	-	768.71	92.79	13.7%
Federally Funded Research and Development Centers	298.72	-	351.62	52.90	17.7%
Operations and Maintenance of Facilities under Construction	22.10	-	-	-22.10	-100.0%
R&RA Design Stage Activities	30.43	-	46.00	15.57	51.2%
Major Research Equipment and Facilities Construction	\$186.23	-	\$299.00	\$112.77	60.6%
Total, Major Research Facilities	\$1,213.40	-	\$1,465.33	\$251.93	20.8%

NSF investments in major multi-user research facilities (major facilities) provide large, state-of-the-art tools for research and education. These can include instrumentation networks, observatories, accelerators, telescopes, research vessels, aircraft, and simulators. In addition, scientific use of cyber-enabled and geographically distributed facilities continues to increase because of rapid advances in computer, information, and communication technologies. NSF's investments are coordinated with those of other organizations, federal agencies, and international partners to ensure they are complementary and well-integrated. Planning, operations, and maintenance of major facilities are funded through the R&RA account. Most construction is funded through the MREFC account.

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, and operations of major facilities across the Foundation, as required by Section 110 of the American Innovation and Competitiveness Act (P.L. 114-329). In FY 2022, a Deputy Chief Officer for Research Facilities position was created to provide oversight for NSF's Mid-scale Research Infrastructure portfolio.

The Program Management Improvement and Accountability Act requires an annual NSF portfolio review integrated with an agency Strategic Review. NSF began considering major facilities as part of the Strategic Review starting in FY 2019 and has addressed such topics as improving resilience to lapses in appropriations and improving NSF internal processes for the Development and Design Stages. In FY 2022, the Strategic Review considered NSF's processes for the final lifecycle stage of facilities, termed Disposition. The Office of the Director and RIO are implementing recommendations from this review, including refining, and consistently applying, language related to disposition, developing processes for estimating the likely cost of the final lifecycle stage, and clarifying expectations for how disposition will be funded and managed. The FY 2023 Strategic Review evaluated NSF's processes for designation of FFRDCs and recommended development of formal guidance that documents the policies and procedures for that designation process. Going forward, NSF will assess annually what, if any, major facilities portfolio topics are appropriate for the inclusion in the Strategic Review.

The Facility Operation Transition activity proposed in IA reflects NSF's strategic commitment to successful O&M of new major facilities as well as balancing portfolio funding between facilities and individual investigator research, both of which were emphasized in the NSB's Congressionally

Major Facilities

requested 2018 report entitled “Study of Operations and Maintenance Costs for NSF Facilities” (NSB-2018-17).¹ The funds in this activity will be used to (1) partially support initial O&M of new facilities so that the full O&M costs can be gradually absorbed into the budget of the managing division or directorate, and (2) partially support divestment of lower-priority facilities, the full cost of which may significantly impact individual divisions’ or directorates’ funding. In FY 2023, these funds supported operations and maintenance costs in MPS (\$12.0 million).

This chapter provides descriptions of each major facility supported through the R&RA account and includes funding by lifecycle phase for each facility. The information presented for each facility follows the overall framework established by NSF for major facility projects. Descriptions of projects under construction that are funded through NSF’s MREFC account are provided in the MREFC narratives. The following pages contain information on the budget requests for NSF’s major facilities in FY 2025.

¹ National Science Board, *Study of Operations and Maintenance Costs for NSF Facilities* (NSB-2018-17), May 2018, www.nsf.gov/pubs/2018/nsb201817/nsb201817.pdf. *FY 2021 Budget Request to Congress*.

MAJOR FACILITIES FUNDING, BY PROJECT
(Dollars in Millions)

	FY 2023			Change over	
	Base Plan	FY 2024 (TBD)	FY 2025 Request	FY 2023 Base Plan Amount	Percent
Operations and Maintenance of Major Facilities	\$996.74	-	\$1,120.33	\$123.59	12.4%
National Ecological Observatory Network (NEON)	71.71	-	82.02	10.31	14.4%
Biological Sciences	\$71.71	-	\$82.02	\$10.31	14.4%
Academic Research Fleet ¹	136.09	-	151.33	15.24	11.2%
National Center for Atmospheric Research (NCAR) FFRDC	116.20	-	124.59	8.39	7.2%
National Geophysical Facility (NGF) ²	37.92	-	45.29	7.37	19.4%
<i>Geodetic Facility for the Advancement of GEoscience (GAGE)</i> ²	14.55	-	8.55	-6.00	-41.2%
<i>Seismological Facility for the Advancement of GEoscience (SAGE)</i> ²	23.37	-	13.25	-10.12	-43.3%
<i>NGF O&M</i> ²	-	-	23.49	23.49	N/A
Ocean Observatories Initiative (OOI) ¹	42.02	-	47.76	5.74	13.7%
U.S. Sub-seafloor Sampling (S3P) (Formerly IODP)	50.40	-	55.51	5.11	10.1%
Geosciences	\$382.63	-	\$424.48	\$41.85	10.9%
Green Bank Observatory (GBO) FFRDC ³	10.83	-	9.68	-1.15	-10.6%
Large Hadron Collider (LHC) - ATLAS and CMS	20.50	-	20.50	-	-
Laser Interferometer Gravitational Wave Observatory (LIGO)	45.00	-	49.00	4.00	8.9%
National High Magnetic Field Laboratory (NHMFL) ³	39.91	-	39.13	-0.78	-2.0%
National Radio Astronomy Observatory (NRAO) FFRDC ³	93.66	-	96.71	3.05	3.3%
<i>NRAO O&M</i> ^{3,4}	43.03	-	43.00	-0.03	-0.1%
<i>Atacama Large Millimeter Array (ALMA) O&M</i>	50.63	-	53.71	3.08	6.1%
National Solar Observatory (NSO) FFRDC ³	26.56	-	34.24	7.68	28.9%
<i>NSO O&M</i>	5.88	-	6.24	0.36	6.1%
<i>Daniel K. Inouye Solar Telescope (DKIST)</i> ³	20.68	-	28.00	7.32	35.4%
NSF's National Optical-Infrared Astronomy Research Laboratory FFRDC ³	73.57	-	86.40	12.83	17.4%
<i>NOIRLab O&M (Mid-Scale Observatories & Community Science and Data Center)</i> ^{3,5}	28.49	-	24.82	-3.67	-12.9%
<i>GEMINI Observatory O&M</i>	22.98	-	25.49	2.51	10.9%
<i>Vera C. Rubin Observatory O&M</i>	22.10	-	36.09	13.99	63.3%
Mathematical and Physical Sciences	\$310.03	-	\$335.66	\$25.63	8.3%
Antarctic Facilities and Operations (AFO)	224.71	-	269.94	45.23	20.1%
IceCube Neutrino Observatory (ICNO)	7.66	-	8.23	0.57	7.4%
Office of Polar Programs	\$232.37	-	\$278.17	\$45.80	19.7%
Major Research Facilities Construction Investments	\$216.66	-	\$345.00	\$128.34	59.2%
R&RA Design Stage Activities ⁶	\$30.43	-	\$46.00	\$15.57	51.2%
Major Research Equipment and Facilities Construction (MREFC)	\$186.23	-	\$299.00	\$112.77	60.6%
Total, Major Research Facilities	\$1,213.40	-	\$1,465.33	\$251.93	20.8%

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

¹ FY 2023 reflects the transfer of ship-time costs, estimated at \$8.98 million, from the Ocean Observatories Initiative (OOI) to the Academic Research Fleet (ARF). These costs are reflected within ARF for the FY 2025 Request.

² GAGE and SAGE will be consolidated into a single facility during FY 2025. Budget Year and outyear estimates for the consolidated facility are shown under a new line represented as the "National Geophysical Facility (NGF)".

³ FY 2023 includes funding for repairs and maintenance beyond regular O&M.

⁴ Includes funding for VLBA (\$3.43 million per year), as well as funding for the ngVLA program office.

⁵ Includes support for the Windows on the Universe Center for Astronomy Outreach, ongoing activities at the WIYN telescope, and potential future participation in the U.S. Extremely Large Telescope program.

⁶ Design Stage Activities include support for potential next generation major facilities. This line reflects FY 2023 funding amounts of \$12.43 million for the Antarctic Research Vessel (ARV), \$3.0 million for the Next Generation Very Large Array (ngVLA), and \$15.0 million for Extremely Large Telescopes (ELT), and FY 2025 funding amounts of \$22.0 million for the ARV, \$7.0 million for the ngVLA, and \$17.0 million for ELT.