

MAJOR MULTI-USER RESEARCH FACILITIES

Major Multi-User Research Facilities Funding (Dollars in Millions)

	FY 2017 Actual	FY 2018 (TBD)	FY 2019 Request	Change over FY 2017 Actual	
				Amount	Percent
Total Research and Related Activities	\$995.01	-	\$1,105.09	\$110.08	11.1%
Operations and Maintenance of Existing Facilities	703.66	-	700.91	-2.75	-0.4%
Federally Funded Research and Development Centers	216.80	-	209.81	-6.99	-3.2%
Operations and Maintenance of Facilities under Construction	63.76	-	84.00	20.24	31.7%
R&RA Planning and Concept Development	10.79	-	6.67	-4.12	-38.2%
R&RA Facilities Construction	-	-	103.70	103.70	N/A
Major Research Equipment and Facilities Construction	\$222.45	-	\$93.65	-\$128.80	-57.9%
Total, Major Multi-User Research Facilities	\$1,217.47	-	\$1,198.74	-\$18.73	-1.5%

NSF investments provide state-of-the-art tools for research and education. These include major multi-user research facilities such as instrumentation networks, observatories, accelerators, detectors, telescopes, research vessels, aircraft, and simulators. In addition, investments in cyber-enabled and geographically distributed user facilities are increasing as a result 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 multi-user facilities are funded through the R&RA account. Most construction is funded through the MREFC account. An exception to this is the Antarctic Infrastructure Modernization for Science (AIMS) construction project, funded through R&RA.

In FY 2018, NSF created the new position of Chief Officer for Research Facilities in the Office of the Director, to enhance oversight of major multi-user research facilities throughout their complete lifecycle. The individual in that position serves as the senior agency official whose responsibility is oversight of the development, construction, and operations of major multi-user research facilities across the Foundation, as required by Section 110 of the American Innovation and Competitiveness Act (P.L. 114-329).

This chapter provides descriptions of each major multi-user research facility supported through the R&RA account and provides funding information by life cycle phase for each facility. The information presented for each facility follows the overall framework established by NSF for major facility projects. Information on projects under construction funded through NSF's MREFC account is provided in the MREFC chapter. Information on the AIMS construction project can be found in the Office of Polar Programs chapter in the R&RA section.

Major Multi-User Research Facilities

Major Multi-User Research Facilities Funding, by Project

(Dollars in Millions)

	FY 2017 Actual	FY 2018 (TBD)	FY 2019 Request	Change over FY 2017 Actual	
				Amount	Percent
Operations and Maintenance of Existing Facilities	\$703.66	-	\$700.91	-\$2.75	-0.4%
Engineering					
National Nanotechnology Coordinated Infrastructure (NNCI)	15.55	-	14.78	-0.77	-5.0%
Natural Hazards Engineering Research Infrastructure (NHERI)	14.99	-	11.75	-3.24	-21.6%
Geosciences					
Academic Research Fleet ¹	82.03	-	77.80	-4.23	-5.2%
Geodesy Advancing Geosciences and EarthScope (GAGE)	13.10	-	12.19	-0.91	-6.9%
International Ocean Discovery Program (IODP)	48.00	-	48.00	-	0.0%
Ocean Observatories Initiative (OOI) ²	0.34	-	40.00	39.66	11638.8%
Polar Facilities and Logistics	330.30	-	303.94	-26.36	-8.0%
Seismological Facilities for the Advancement of Geoscience & EarthScope (SAGE)	26.05	-	24.16	-1.89	-7.3%
Mathematical and Physical Sciences					
Arecibo Observatory	8.00	-	6.08	-1.92	-24.0%
Cornell High Energy Synchrotron Source (CHESS)	26.20	-	10.00	-16.20	-61.8%
Gemini Observatory	24.24	-	21.66	-2.58	-10.6%
IceCube Neutrino Observatory	7.00	-	7.00	-0.00	0.0%
Large Hadron Collider (LHC) ³	16.00	-	16.00	0.00	0.0%
Laser Interferometer Gravitational Wave Observatory (LIGO)	41.93	-	45.00	3.07	7.3%
National High Magnetic Field Laboratory (NHMFL)	23.15	-	35.76	12.61	54.5%
National Superconducting Cyclotron Laboratory (NSCL)	24.00	-	24.00	-	0.0%
Other Facilities ⁴	2.79	-	2.79	0.00	0.1%
Federally Funded Research and Development Centers⁵	\$216.80	-	\$209.81	-\$6.99	-3.2%
National Center for Atmospheric Research (NCAR)	99.70	-	94.70	-5.00	-5.0%
National Optical Astronomy Observatory (NOAO)	22.99	-	20.13	-2.86	-12.4%
National Radio Astronomy Observatory (NRAO) ⁶	76.66	-	79.13	2.47	3.2%
Other Astronomical Facilities ⁷	11.45	-	11.85	0.40	3.5%
National Solar Observatory (NSO) ⁸	6.00	-	4.00	-2.00	-33.3%
Operations and Maintenance of Facilities under Construction	\$63.76	-	\$84.00	\$20.24	31.7%
Daniel K. Inouye Solar Telescope (DKIST) ⁹	13.50	-	18.50	5.00	37.0%
Large Synoptic Survey Telescope (LSST)	-	-	0.50	0.50	N/A
National Ecological Observatory Network (NEON)	50.26	-	65.00	14.74	29.3%
R&RA Planning and Concept Development	\$10.79	-	\$6.67	-\$4.12	-38.2%
Pre-construction Planning ¹⁰	10.79	-	6.67	-4.12	-38.2%
R&RA Facilities Construction¹¹	-	-	103.70	103.70	N/A
Major Research Equipment and Facilities Construction	\$222.45	-	\$93.65	-\$128.80	-57.9%
Total, Major Multi-User Research Facilities	\$1,217.47	-	\$1,198.74	-\$18.73	-1.5%

¹ Includes ship operations and upgrade support. Regional Class Research Vessels (RCRV) funding is no longer included on this line as it began MREFC construction in FY 2017.

² The FY 2017 budget of \$340,000 reflects only the incremental support necessary to enable the potential transition of managing institutions associated with the competition for a new operation and management award of the OOI. FY 2017 operations and maintenance were funded in a prior year.

³ Excludes \$5.71 million in FY 2017 and \$6.30 million in FY 2019 for planning for a potential High-Lumosity LHC upgrade. That funding is captured on the R&RA Planning and Concept Development line.

⁴ Includes support for the Center for High Resolution Neutron Scattering (CHRNS).

⁵ Excludes support for the Office of Science and Technology Policy Institute, which is a Federally Funded Research and Development Center but not a multi-user research facility.

⁶ Includes operations and maintenance support for the Atacama Large Millimeter/submillimeter Array (ALMA).

⁷ Includes support for the Green Bank Observatory and the Long Baseline Observatory.

⁸ Excludes \$11.50 million in FY 2017 and \$16.50 million in FY 2019 for operations and maintenance support for the DKIST facility construction project. That funding is captured within the totals presented on the DKIST line.

⁹ Of total DKIST funding presented, \$11.50 million in FY 2017 and \$16.50 million in FY 2019 are for operations and maintenance support provided through NSO and \$2.0 million is for cultural mitigation activities as agreed to during the environmental compliance process.

¹⁰ Pre-construction planning includes funding for potential next generation multi-user facilities. This line reflects funding for Antarctic Infrastructure Modernization for Science (AIMS) and a potential High-Lumosity LHC upgrade in FY 2017 and FY 2019. AIMS begins construction in FY 2019.

¹¹ Funding for R&RA Projects under construction in this table reflects support for the AIMS project.

NSF Facilities Investments in FY 2019

The following pages contain information on NSF’s ongoing facilities in FY 2019.

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