MID-SCALE RESEARCH INFRASTRUCTURE (MID-SCALE RI)

Mid-scale RI Funding
(Dollars in Millions)

	FY 2019 Actual	FY 2020 (TBD)	FY 2021 Request
R&RA (IA/Mid-scale RI-1)[1]	$60.04	-	$32.67
MREFC	-	-	65.00
Total	**$60.04**	**-**	**$97.67**

[1] In FY 2021, The EPSCoR program will invest no less than an additional $20.0 million in Mid-scale RI within EPSCoR jurisdictions

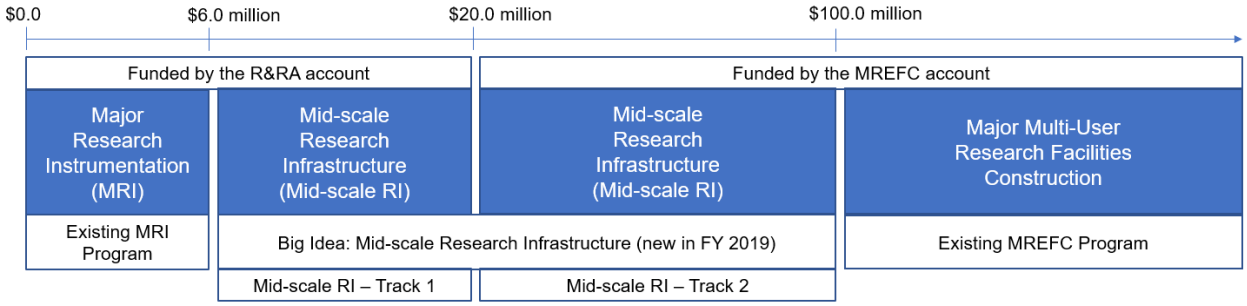
Overview

The Mid-scale RI program is an NSF-wide effort to meet the research community's needs for modern research infrastructure to support priority science and engineering research. Mid-scale RI is an "enabling" Big Idea that implements agile mechanisms for funding experimental research capabilities costing between $6.0 million and $100.0 million.[1] The objective is to transform scientific and engineering research fields with new infrastructure, while simultaneously training early-career researchers in the development, design, construction, and use of cutting-edge infrastructure.

The scientific importance of mid-scale research infrastructure is reflected in the 2017 American Innovation and Competitiveness Act (AICA), which directed NSF to "evaluate the existing and future needs, across all disciplines supported by the Foundation, for mid-scale projects." NSF issued a Request for Information in late 2017 that resulted in nearly 200 ideas for research infrastructure within a project cost range of $20 million to $100 million. Subsequently, FY 2018 appropriations report language directed the NSB to "consider steps to bridge the gap between the NSF's Major Research Instrumentation (MRI) program and the agency's Major Research Equipment and Facility Construction (MREFC) account." Responding to this direction, the NSB report, "Bridging the Gap: Building a Sustained Approach to Mid-scale Research Infrastructure and Cyberinfrastructure at NSF",[2] highlights that:

> "The research community has identified mid-scale research infrastructure as a key enabler of scientific advances on shorter timescales than required for the larger projects funded within the MREFC account. ... Infrastructure investments at the required mid-level can also help maintain the United States' standing among global partners and competitors."

NSF Portfolio of Central Instrumentation and Infrastructure Implementation Programs



[1] The NSF-established thresholds for Mid-scale Track-2 projects have been updated from prior presentations to align with the definitions in AICA.
[2] www.nsf.gov/nsb/publications/2018/NSB-2018-40-Midscale-Research-Infrastructure-Report-to-Congress-Oct2018.pdf

The graphic above shows NSF-wide instrumentation and infrastructure programs. Information presented in this narrative focuses on the Mid-scale RI components, Mid-scale RI - Track 1 (Mid-scale RI-1) and Mid-scale RI - Track 2 (Mid-scale RI-2), which constitute the Mid-scale RI Big Idea. Information on the complementary MRI program may be found in the IA narrative, while information on major multi-user research facility construction projects may be found in the MREFC chapter. The Mid-scale RI program supports the implementation of research infrastructure at scales that are above what is possible through the MRI program and below what has previously been funded through the MREFC account. Mid-scale RI-2 awards will be funded by the MREFC account and are distinguished from Mid-scale RI-1 awards by their scale, potential risks, and the resulting NSF oversight.

In FY 2019, NSF received proposals in response to two Mid-scale RI funding opportunities. One (Mid-scale RI-1, NSF-19-537[3]) included an opportunity to propose Mid-scale RI implementation projects with a total NSF project cost between $6.0 million[4] and $20.0 million, as well as infrastructure design projects with costs between $600,000 and $20.0 million, while a second (Mid-scale RI-2, NSF-19-542[5]) included an opportunity to implement projects with a total NSF cost between $20.0 million and $70.0 million. NSF made ten Mid-scale RI-1 awards, including the development of the first 1.2GHz nuclear magnetic resonance (NMR) facility in the U.S., extremely fast and powerful lasers, a neutron spin echo spectrometer to be deployed at National Institute of Standards and Technology, and a testbed for experiments for future internet designs, as well as support for the design of a future experiment to study the cosmic microwave background. The first awards for Mid-scale RI-2 will be made in FY 2020. The anticipated total number of Mid-scale RI-2 awards made as a result of the first competition is three to six.

Goals

1. Provide access to cutting-edge mid-scale research infrastructure, including instrumentation.
2. Enable agile development and implementation of frontier scientific and engineering research infrastructure with a high potential to significantly advance the Nation's research capabilities.
3. Train early-career scientists and engineers in the development and use of advanced research infrastructure.

FY 2021 Investments

In FY 2021, NSF will invest a total of $117.67 million in Mid-scale RI, split between two separate tracks, Mid-scale RI-1 ($52.67 million) and Mid-scale RI-2 ($65.0 million). Track 1 will be funded through the R&RA account, and Track 2 will be funded through the MREFC account. For Track 1, $32.67 million will be available for investment in projects in any jurisdiction, while no less than $20.0 million will be invested in EPSCoR jurisdictions. Subject to availability of funding in FY 2022, Mid-scale RI-1 funding will support an estimated seven to nine new awards in a funding cycle that will span FY 2021 and FY 2022. It is anticipated that Mid-scale RI-2 funding will provide support for projects funded as a result of the first Mid-scale RI-2 competition that will conclude during FY 2020.

[3] www.nsf.gov/pubs/2019/nsf19537/nsf19537.htm
[4] Design activities to bring Mid-scale or larger projects to readiness for implementation may request a minimum of $600,000.
[5] www.nsf.gov/pubs/2019/nsf19542/nsf19542.htm