

New NSF Research Infrastructure Program Issues First Grants

BY MITCH AMBROSE

In September, the National Science Foundation (NSF) announced the first 10 grant awards from a new agency-wide program dedicated to funding “mid-scale” research infrastructure (RI) projects costing between \$6 million and \$20 million. The awards total \$121 million and will support a variety of instrument acquisition and upgrade efforts. NSF received \$2.6 billion in project proposals through the first competition and it anticipates issuing awards every other year.

A majority of the first 10 awards will support research in the physical sciences. Among them are a \$16 million grant to the University of Michigan that will enable it to boost the peak power of an existing laser to 3 petawatts, which will make the laser the most powerful of its kind in the United States. A \$12 million grant to the University of Delaware will support development of a state-of-the-art neutron spectrometer to be installed at the National Institute of Standards and Technology.

Recent reports have urged federal agencies to increase investments in such instrumentation. A National Academies study released in 2017 noted the US now trails other parts of the world in building ultrafast, high-intensity lasers. And an APS study released last year documented that the US hosts fewer instruments for neutron scattering research than facilities in Europe and in the Asia-Pacific region.

Three of the 10 grants will support design studies. One will go to a team at Arizona State University

to develop a concept for an x-ray free-electron laser (XFEL) that is far more compact than conventional XFELs, such as the Linac Coherent Light Source at SLAC National Accelerator Laboratory. Another design grant will go to the Event Horizon Telescope team that recently produced the first image of a black hole, supporting their plans for expanding the global telescope network so as to capture “movies” of black holes. The third will advance planning for CMB-S4, a major cosmic microwave background detection experiment.

The new grant program, known as Mid-scale RI-1, is one of two new mechanisms designed to fill a gap between existing agency-wide infrastructure accounts. Toward the end of fiscal year 2020, NSF plans to issue awards from a second program called Mid-scale RI-2 that it is setting up to fund projects costing between \$20 million and \$70 million. The programs complement NSF’s Major Research Instrumentation program, which funds projects at levels up to about \$6 million, and its Major Research Equipment and Facilities Construction (MREFC) account, which currently funds projects costing more than \$70 million.

Better supporting mid-scale RI is one of the 10 “Big Idea” priority areas that NSF first announced in 2016. NSF created the mid-scale programs after securing support from Congress and the National Science Board, which oversees the agency. In a congressionally mandated report, the board concluded that mid-scale RI



is “underrepresented” in NSF’s portfolio of facilities investments, which it attributed to “an artifact of budget constraints and the natural limits of what division budgets can sustain.”

Through its latest budget request, NSF has proposed using the MREFC account to provide the Mid-scale RI-2 with \$45 million for fiscal year 2020. Both the House and Senate have accepted this request in their respective NSF spending bills, with the Senate proposing an extra \$30 million.

In justifying the additional resources, the Senate Appropriations Committee wrote that it “commends NSF for its planned investments in mid-scale research infrastructure, including the provision of larger mid-scale instrumentation under the MREFC account after the committee repeatedly directed the foundation to determine how best to support projects of this scale.”

The author is Acting Director of FYI.

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