

DIVISION OF MATERIALS RESEARCH (DMR)

\$282,870,000
-\$27,010,000 / -8.7%

DMR Funding
(Dollars in Millions)

	FY 2016 Actual	FY 2017 (TBD)	FY 2018 Request	Change Over	
				FY 2016 Actual Amount	Percent
Total	\$309.88	-	\$282.87	-\$27.01	-8.7%
Research	238.28	-	227.12	-11.16	-4.7%
CAREER	24.06	-	24.03	-0.03	-0.1%
Centers Funding (total)	59.88	-	65.00	5.12	8.6%
Materials Research Science & Engineering Centers	55.54	-	55.00	-0.54	-1.0%
Nanoscale Science & Engineering Centers	0.25	-	-	-0.25	-100.0%
STC: Center for Integrated Quantum Materials	4.09	-	5.00	0.91	22.2%
STC: Science and Technology Center on Real-Time Functional Imaging	-	-	5.00	5.00	N/A
Education	5.79	-	2.00	-3.79	-65.4%
Infrastructure	65.82	-	53.75	-12.07	-18.3%
Cornell High Energy Synchrotron Source (CHESS)	10.03	-	8.00	-2.03	-20.3%
National High Magnetic Field Laboratory (NHMFL)	33.42	-	33.04	-0.38	-1.1%
Nat'l NanotechnologyCoordinated Infrastructure (NNCI)	2.58	-	2.50	-0.08	-3.1%
Mid-scale Research Infrastructure	15.28	-	6.09	-9.19	-60.1%
Research Resources ¹	1.73	-	1.33	-0.40	-23.2%
Center for High Resolution Neutron Scattering (CHRNS)	2.77	-	2.79	0.02	0.7%

¹ Includes investments in materials instrumentation. Higher funding in FY 2016 is attributed to one additional instrumentation award.

DMR invests in the discovery of new materials and the explanation of materials phenomena. Materials are ubiquitous and pervasive, serving as the critical building block to modern technology and innovation. DMR accomplishes its goal by support of basic experimental and theoretical research through a range of programs focused on condensed matter physics, solid-state and materials chemistry, and the science of materials that are ceramic, metallic, polymeric, nano-structured, biological, electronic, photonic, and multifunctional.

The discovery and deployment of new materials have shaped our understanding of our world and enabled significant advances in electronics, communications, transportation, and health-related fields. The health of this enterprise is dependent on investments across scales; from single investigators to teams and centers; to singularly focused discipline research versus that requiring interdisciplinarity; and small instruments to large-scale facilities.

In general, 34 percent of the DMR portfolio is available for new research grants and 66 percent is available for continuing grants.

FY 2018 Summary

All funding decreases/increases represent changes over the FY 2016 Actual.

Research

- CAREER (\$24.03 million, no change): DMR places a high priority on developing the pipeline of new faculty in materials research who will help form the future community. This supports about 180 awards.
- Disciplinary and Interdisciplinary Research (-\$16.53 million to a total of \$133.10 million): Support for fundamental research is the core mission of DMR. Funding changes include:

- CEMMSS (-\$10.88 million to a total of \$14.67 million): DMR participates in CEMMSS through the Advanced Manufacturing and Materials Genome Initiatives. Programs that contribute to these initiatives are DMREF, MIP (see Research Infrastructure below), the Scalable Nanomanufacturing solicitation, and Materials Research Science and Engineering Centers, and core program investments. There will not be a DMREF (-\$8.97 million for a total of \$5.0 million) competition in FY 2018. DMR, along with program partners in ENG, CISE, and other MPS divisions, will invest in community building activities focused on leveraging the data generated by these awards to accelerate the discovery and deployment of materials with a specific function or property through synergistic integration of theory/computation, experiments, and systematic use of materials data.
- Materials Research Science and Engineering Centers (MRSECs) (-\$540,000 to a total of \$55.0 million): MRSECs advance materials research through collaborations of groups of principal investigators and provide students with a rich interdisciplinary education, while addressing fundamental research problems at the forefront of the field. The long-standing, flagship program will complete its triennial competition in FY 2017. In FY 2018, about 20 new and continuing awards are expected.
- Science and Technology Centers (+\$5.91 million to a total \$10.0 million): Funding reflects the prospective renewal of the Center for Integrated Quantum Materials, which explores the fundamental science of quantum materials and quantum devices, and ramp up support for the new STC on Real-Time Functional Imaging, initiated in FY 2016 to integrate different imaging modalities using electron, X-ray, optical, and nano-probe microscopies to tackle major scientific challenges with broader impacts to manufacturing quality control, medical diagnostics, and airport security.
- Nanoscale Science and Engineering Centers (-\$250,000 to zero): This program will sunset as planned in FY 2017.

Education

- Research Experiences for Undergraduates (REU) Sites (-\$3.12 million to a total of \$2.0 million): DMR remains committed to supporting the next generation of scientists and engineers. This reduced level will allow for the renewal of the most productive REU sites. Further, DMR infrastructure programs, such as centers (MRSEC and PREM) and facilities (NHMFL, CHRNS, CHESS, and MIP), provide significant REU opportunities for undergraduates across the U.S.

Infrastructure

- CHESS (-\$2.03 million to a total of \$8.0 million): CHESS, as a high-energy X-ray national user facility, serves researchers in fields of biology, engineering, and materials. The FY Budget 2018 Request is consistent with plans to transition the facility from NSF stewardship to a partnership model, which will begin ahead of schedule in FY 2018.
- NHMFL (-\$380,000 to a total of \$33.04 million): The world leading NHMFL is the only U.S. facility that provides extremely high magnetic fields, enabling transformative research in disciplines ranging from biology and chemistry to materials and condensed matter physics. NHMFL remains a high divisional priority.
- Mid-scale Research Infrastructure program (MIP) (-\$9.19 million to a total of \$6.09 million): DMR awarded the first class of MIPs in FY 2016. MIPs embrace the goals set forth by the Materials Genome Initiative, including a focus on data-driven accelerated research, and the inaugural class is focused on the discovery of new 2D materials for advanced electronics. The planned FY 2018 competition is postponed until the next focus topic is identified; the FY 2018 Request funds the operations costs only for the class of 2016 MIPs.
- Research Resources (-\$400,000 to a total of \$1.33 million): This supports liquid helium and liquid helium recovery systems, the Chemistry and Materials Consortium for Advanced Radiation Sources (ChemMatCARS), and instrumentation for materials research. One additional instrumentation award was made in FY 2016, which is not anticipated in FY 2018.