

DIVISION OF MATERIALS RESEARCH (DMR)

\$315,800,000
+\$8,810,000 / 2.9%

DMR Funding
(Dollars in Millions)

	FY 2014 Actual	FY 2015 Estimate	FY 2016 Request	Change Over FY 2015 Estimate	
				Amount	Percent
Total, DMR	\$267.09	\$306.99	\$315.80	\$8.81	2.9%
Research	201.60	251.91	248.54	-3.37	-1.3%
CAREER	25.11	21.22	23.03	1.81	8.5%
Centers Funding (total)	32.78	62.89	60.34	-2.55	-4.1%
Materials Centers ¹	24.82	56.00	56.00	-	-
Nanoscale Science & Engineering Centers	0.77	0.25	0.25	-	-
STC1: Center for Layered Polymeric Materials	3.32	2.66	-	-2.66	-100.0%
STC2: Center for Integrated Quantum Materials	3.87	3.98	4.09	0.11	2.8%
Education	6.80	6.30	5.76	-0.54	-8.6%
Infrastructure	58.69	48.78	61.50	12.72	26.1%
National High Magnetic Field Laboratory (NHMFL)	38.68	24.04	32.78	8.74	36.4%
Center for High Resolution Neutron Scattering (CHRNS)	2.66	2.66	2.66	-	-
Cornell High Energy Synchrotron Source (CHESS)	10.00	10.00	10.00	-	-
National Nanotechnology Coordinated Infrastructure (NNCI)	-	2.58	2.58	-	-
National Nanotechnology Infrastructure Network (NNIN)	2.58	-	-	-	N/A
Research Resources	4.77	1.50	1.00	-0.50	-33.3%
Mid-scale Research Infrastructure	-	8.00	12.48	4.48	56.0%

Totals may not add due to rounding.

¹ Due to end-of-fiscal year deadlines, \$29.81 million in funding for new Materials Center awards was carried over from FY 2014 and obligated in early FY 2015.

Research in DMR focuses on advancing materials discovery and characterization. Programs focus on condensed matter physics, solid-state chemistry, and the science of materials that are multifunctional, hybrid, electronic, photonic, metallic, superconducting, ceramic, polymeric, biological, and nano-structured. DMR awards enable materials scientists to advance understanding of the electronic, atomic, and molecular mechanisms and processes that govern macroscale properties. The community seeks to manipulate and control these properties, discover and understand emerging phenomena, and create novel synthesis and processing strategies that lead to new materials with unique characteristics. These discoveries and advancements transcend traditional scientific and engineering disciplines. They enable new technologies that meet societal needs, including those with the goal of sustainability. Research supported by DMR is essential for the development of future technologies and industries including clean energy, advanced optics and electronics, and health. A key and critical enabler to these scientific advances is the investment in development and support of the materials workforce, cyberinfrastructure, and next generation instruments and facilities, including support for mid-scale user facilities called Materials Innovation Platforms (MIP). A MIP, in addition to developing and providing access to new instrumentation, conducts research on a materials challenge by integrating synthesis, characterization, and materials theory or modeling. Finally, conveying the exciting science and the societal benefit enabled by

materials research to students and to the general public remains an important aspect of the division's mission.

In general, 35 percent of the DMR portfolio is available for new research grants and 65 percent goes to continuing grants.

FY 2016 Summary

All funding decreases/increases represent change over the FY 2015 Estimate.

Research

- CAREER (+\$1.81 million to a total of \$23.03 million): DMR places high priority on these grants in order to develop a pipeline of new faculty in materials research who will help form the community of the future. This increase will fund about 14 additional awards.
- DMR participates in the CEMMSS Initiative through investments in Designing Materials to Revolutionize and Engineer our Future (DMREF) (+\$5.25 million to a total of \$12.25 million), a program DMR is leading in response to the national Materials Genome Initiative, and Advanced Manufacturing (+\$6.07 million to a total of \$23.67 million) through individual investigator programs, MRSEC investments, and participation in the Sustainable Nanomanufacturing solicitation. DMREF is a major effort to accelerate the discovery and deployment of new materials with a specific and desired function or property through synergistic integration of theory and computation, experiments, and systematic use of materials data.
- SEES: DMR contributes to this cross-agency initiative (-\$1.0 million to a total of \$6.0 million) through participation in the Sustainable Chemistry, Engineering and Materials (SusChEM) program. DMR focuses this research on the preservation and extension of natural resources aimed at improved material usage and overall lifecycle management. The decrease reflects the planned sunset of SEES in 2017.
- Clean energy (+\$60,000 to a total of \$70.12 million): Additional research in the DMR clean energy portfolio includes hydrogen, fuel cells, biomass, solar energy, hydrocarbon conversion, the capture and use of CO₂, and energy storage.
- BioMaPS (+\$260,000 to a total of \$3.24 million): DMR supports a large and growing amount of research in this area, not only in its Biomaterials program, but throughout the portfolio including the centers and facilities.
- Understanding the Brain (+\$250,000 to a total of \$3.80 million): DMR increases support this agency-wide focus in brain-related research.
- CIF21 (+\$800,00 to a total of \$2.65 million): DMR will accelerate research, especially related to CEMMSS/DMREF, by investing in new functional capabilities in computational methods, algorithms, tools and data core methods, and technologies.
- Materials Research Science and Engineering Centers (MRSECs) (no change at \$56.0 million): MRSEC competitions are usually held triennially, the last in FY 2014 with awards made in early FY 2015. In FY 2016, 21 new and continuing awards are expected to be supported.
- Nanoscale Science and Engineering Centers (NSECs): Support remains unchanged for the NSEC program, which is winding down agency-wide as planned.
- Science and Technology Centers (-\$2.55 million to a total of \$4.09 million): Funding reflects the planned sunset of the Center for Layered Polymeric Systems (-\$2.60 million to zero) and a ramp up in support for the Center on Integrated Quantum Materials (+\$110,000 for a total of \$4.09 million).

Education

- Research Experiences for Undergraduates (-\$300,000 to a total of \$5.17 million): DMR's education portfolio maintains commitments to this program but with a small reduction.
- Integrative Graduate Education and Research Traineeship (-\$240,000 to a total of \$160,000): Support decreases as the program is sunseting as planned.

Infrastructure

- Mid-scale Research Infrastructure (+\$4.48 million to a total of \$12.48 million): Funding supports the Material Innovation Platforms (MIP) program started in FY 2015. The MIP program, which includes a user program, focuses on technical priorities for advancing materials research and is comprised of specialized instrumentation and computation for characterization, modeling, synthesis, and processing for new materials.
- Research Resources (-\$500,000 to a total of \$1.0 million): Funding for helium reclamation decreases due to less demand from the community.
- National Nanotechnology Coordinated Infrastructure (NNCI) (no change at \$300,000): Funds are requested for DMR's contribution to NNCI, the successor to the National Nanotechnology Infrastructure Network (NNIN).
- National High Magnetic Field Laboratory (NHMFL) (+\$8.74 million to a total of \$32.78 million): Funding continues transformational research using high magnetic fields. This facility serves researchers in fields ranging from biology to materials and condensed matter physics. In FY 2014, DMR forward funded NHMFL by \$7.79 million, reducing the amount required in FY 2015. In FY 2016, funding returns to the level committed to in the current cooperative agreement.