

**DIVISION OF MATERIALS RESEARCH (DMR)**

**\$302,630,000**  
**+\$8,080,000/ 2.7%**

**DMR Funding**  
(Dollars in Millions)

	FY 2011 Actual	FY 2012 Estimate	FY 2013 Request	Change Over FY 2012 Estimate	
				Amount	Percent
<b>Total, DMR</b>	<b>\$294.91</b>	<b>\$294.55</b>	<b>\$302.63</b>	<b>\$8.08</b>	<b>2.7%</b>
<b>Research</b>	<b>227.15</b>	<b>231.84</b>	<b>233.13</b>	<b>1.29</b>	<b>0.6%</b>
<i>CAREER</i>	21.78	18.00	18.75	0.75	4.2%
<i>Centers Funding (total)</i>	72.65	53.23	59.83	6.60	12.4%
<i>Materials Centers</i>	61.33	44.35	51.20	6.85	15.4%
<i>Nanoscale Science &amp; Engineering Centers</i>	4.66	4.88	4.63	-0.25	-5.1%
<i>STC: Ctr for Layered Polymeric Systems</i>	4.00	4.00	4.00	-	-
<i>STC: Materials &amp; Devices for InfoTech</i>	2.66	-	-	-	N/A
<b>Education</b>	<b>10.54</b>	<b>9.06</b>	<b>9.06</b>	<b>-</b>	<b>-</b>
<b>Infrastructure</b>	<b>57.22</b>	<b>53.65</b>	<b>60.44</b>	<b>6.79</b>	<b>12.7%</b>
<i>Nat'l Nanotechnology Infrastructure Network</i>	2.98	2.58	2.58	-	-
<i>CHES</i>	14.12	19.67	20.00	0.33	1.7%
<i>NHMFL</i>	31.18	24.30	30.00	5.70	23.5%
<i>Other MPS facilities</i>	4.86	2.52	2.66	0.14	5.6%
<i>Research Resources</i>	4.11	4.58	5.20	0.62	13.5%

Totals may not add due to rounding.

<sup>1</sup> Other MPS Facilities are the Center for High Resolution Neutron Scattering (CHRNS) and the Chemistry and Materials Consortium for Advanced Radiation Sources (ChemMatCARS) for all years, and the Synchrotron Radiation Center (SRC) for FY 2011 only.

DMR focuses on research aimed at advancing materials discovery and characterization, including condensed matter physics, solid-state chemistry, and the science of materials that are multifunctional, hybrid, electronic, photonic, metallic, superconducting, ceramic, polymeric, biological and nanostructured. DMR awards enable the community to advance understanding of electronic, atomic, and molecular mechanisms and processes that govern macroscale properties so that we can learn how to manipulate and control them, to discover new synthesis and processing strategies that lead to new materials with unique and novel properties, and to discover and to understand new phenomena. The discoveries and advancements transcend traditional scientific and engineering disciplines, and can result in elimination of roadblocks to enabling new technology including those with the goal of sustainability. A key and critical enabler to these scientific advances is the investment in development and support of the materials workforce, and in next-generation instruments and facilities. DMR will continue to educate the public about the benefits enabled by materials research.

In general, 22 percent of the DMR grant portfolio is available for new research grants and 78 percent for continuing grants.

**FY 2013 Summary**

All funding decreases/increases represent change over the FY 2012 Estimate.

### Research

- DMR leads the NSF investment in Designing Materials to Revolutionize and Engineer our Future (DMREF), which is in response to the national Materials Genome Initiative. DMREF, which is part of CEMMSS, is a major effort to accelerate the design and synthesis 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. DMREF was run as a pilot in FY 2012 with the Directorate for Engineering (ENG) divisions of Civil, Mechanical and Manufacturing Innovation (CMMI), Chemical, Bioengineering, Environmental, and Transport Systems (CBET), CHE, and DMS. In FY 2013 DMR's request is +\$10.50 million for a total of \$10.50 million.
- DMR will participate in the new Sustainable Chemistry, Engineering and Materials (SusChEM), which is part of SEES. DMR's fundamental research in sustainability includes work to enable the capture and utilization of carbon dioxide (for new materials, for example), discovery of new materials withstanding extreme conditions, use of new (non-petroleum based) raw materials as feedstocks for society's materials, and materials synthesis and processing to optimize the use of raw materials, water, chemicals, and energy in an environmentally benign way. In lieu of Sustainable Energy Pathways in FY 2013, DMR will direct \$5.0 million and request an additional \$2.40 million for a total of \$7.40 million for SusChEM.
- In CIF21, DMR will accelerate research, especially related to DMREF, by investing in new functional capabilities in computational methods, algorithms, tools, and data methods and technologies. Through partnership with the Office of Cyberinfrastructure and other NSF divisions, DMR will support these tools at individual investigator to focused research group levels of support, including EAGERs and CREATIVs. DMR requests an increase of \$1.48 million for a total of \$3.23 million.
- In FY 2013, DMR requests \$51.20 million (+\$6.85 million) for Materials Centers, an interdisciplinary vehicle for supporting materials research and educating students. No new awards will be made in FY 2013, as the program is competed triennially with the next competition planned for FY 2014. FY 2013 support is for continuing grant increments supporting 23 centers. (For more information, see the Centers narrative in the NSF-Wide Investments tab).

### Education

- DMR will maintain its investments in REU Sites and Supplements, IGERT, and RET supplements at the FY 2012 Current Plan levels in the FY 2013 Request.
- DMR's focus on Expeditions in Education (E<sup>2</sup>) will introduce Materials Genome Initiative concepts into student learning.

### Infrastructure

- Increased funding of +\$330,000 (for a total of \$20.0 million) is requested for the synchrotron light source, CHESS. This will allow continued operation as a national user facility. The CHESS user program supports work in cancer research, new materials for electronics, aircraft, biotechnology, batteries, fuel cells, solar cells and other energy applications.
- The FY 2013 Request for NHMFL (\$30.0 million) will allow the facility to continue operations, focus on magnet development, and strengthen education, training, user support, and in-house research. The FY 2012 Estimate appears lower as it reflects forward funding of activities in prior years. As noted in the Facilities chapter, a 5-year renewal proposal for the operation of the NHMFL beginning in FY 2013 was submitted to NSF in summer 2011 and is currently under review with results expected in summer 2012.
- An increase in DMR support for the Coherent Light Source (CLS) research project (+\$620,000 for a total of \$5.20 million) is requested as scheduled in the cooperative agreement. Additional funding in FY 2013 is provided by CHE (\$400,000) and OMA (\$2.0 million) for a total of \$7.60 million.