

# U.S. Fusion Energy Sciences Program

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## FY 2010 Budget Presentation to the Fusion Program Leaders

May 7, 2009



U.S. DEPARTMENT OF  
**ENERGY**

Office of  
Science

# FY 2010: Overview

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- U.S. ITER Project is funded at \$135M
- Facilities
  - Increases are provided for DIII-D and C-Mod operations and research
  - NSTX Upgrade MIE continues for second year
  - NCSX MIE cancelled in May 2008; funding was reallocated in FY 2009
- Modest new initiatives
  - Strategic Planning still underway--awaiting arrival of the new Associate Director to further formalize and implement the process (June 2009)
  - Modest new initiative in Materials Under Extreme Conditions with ASCR and BES
- Other issues
  - Fusion Simulation Program funding continues for second year and increases to \$4M
  - Plasma Science Centers are fully supported
  - HEDLP funding remains flat at \$24.5M level
  - \$600K increase for SBIR/STTR

# Fusion Energy Sciences FY 2010 Budget

*Dollars in Millions*

	<u>FY 2008</u> <u>Actual</u>	<u>FY 2009</u> <u>Appropriation</u>	<u>FY 2010</u> <u>Request</u>
<b><u>Funding by Subcategory</u></b>			
Science	155.0	172.4	176.1
Facility Operations	117.0	207.3	221.7
<u>Enabling Research and Development</u>	<u>22.9</u>	<u>22.9</u>	<u>23.2</u>
<b>TOTAL</b>	<b>294.9</b>	<b>402.6</b>	<b>421.0</b>
<b><u>Funding by Facility</u></b>			
DIII-D	61.9	62.6	64.9
C-Mod	25.2	25.0	26.5
NSTX	38.6	45.9*	45.8*
NCSX	16.6	0	0
<b><u>Funding of Base and ITER</u></b>			
Non-ITER	268.8	278.6	286.0
ITER	26.1	124.0	135.0

\*Includes NSTX MIE for upgrades.

# FY 2010: ITER Recovery Underway

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- FY 2009: Funding received enables resumption of full participation
  - Paid cash contributions for CY 2008 and CY 2009
  - Re-establishing full U.S. project team
- FY 2010: Funding will maintain fulfillment of commitments
  - Pay cash contributions for CY 2010
  - Continue design, R&D, and procurement activities to establish baseline
- ITER cost and schedule under assessment
  - CD-1 cost range (\$1.4 – 2.2B) approved January 2008 (CD-1 memo dated 1/25/08)
  - CD-2 (Performance Baseline) anticipated in FY 2010–FY 2011
- Test Blanket Module discussions continue

# US ITER Funding for FY 2010

## Distribution of Funding

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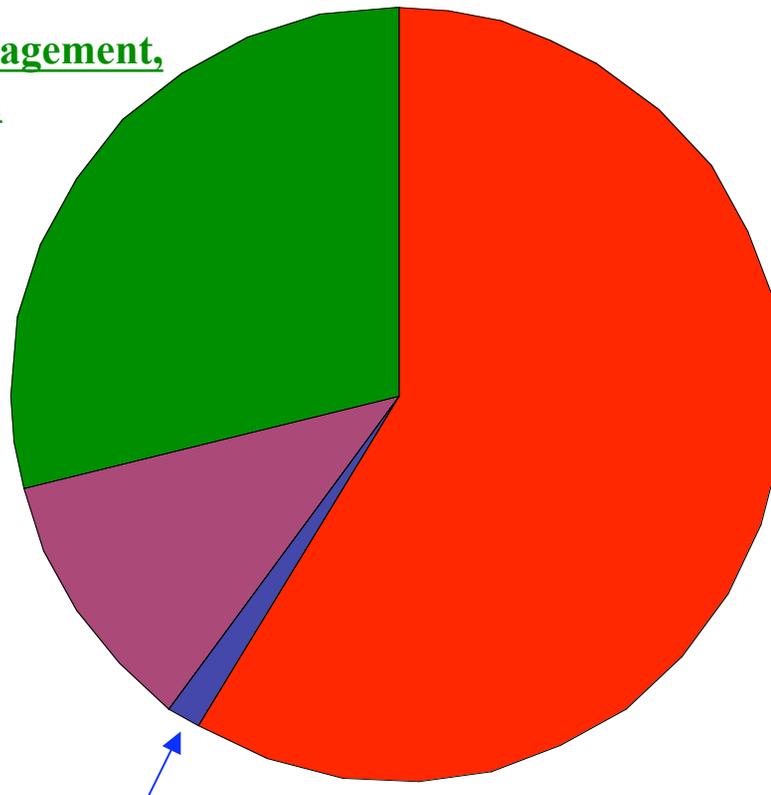
Total of \$135M

Core Staff for Project Management,  
R&D and Design  
\$39M

Engaging Industry and other  
Labs in R&D,  
Prototyping and Design  
Activities  
\$79M

Funds to IO  
\$15M

Secondees to ITER  
Organization (IO)  
\$2.0M



## Fusion Energy Sciences Budget by Institution

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<u>Institution</u>	(\$ Millions)		
	<u>FY 2008</u> <u>Actual</u>	<u>FY 2009</u> <u>CONG</u>	<u>FY 2010</u> <u>CONG</u>
General Atomics	55.1	54.5	56.2
Lawrence Berkeley National Laboratory	4.8	4.9	4.9
Lawrence Livermore National Laboratory	13.1	12.5	12.5
Los Alamos National Laboratory	3.6	3.0	3.4
Oak Ridge National Laboratory	19.9	17.2	17.1
ORNL/PPPL-ITER	26.1	124.0	135.0
Princeton Plasma Physics Laboratory	72.4	70.3	70.2
Massachusetts Institute of Technology	27.9	26.5	27.4
Other Universities	57.0	57.5	57.3
All Other	<u>15.0</u>	<u>32.2</u>	<u>37.0</u>
<b>Total</b>	<b>294.9</b>	<b>402.6</b>	<b>421.0</b>

# FY 2010: Fusion Program Summary

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- ITER funding back on track; however, a complete baseline funding profile, including out-years, will be established at CD-2, anticipated in late FY 2010 or FY 2011
- Increases are provided for DIII-D and C-Mod operations and research
- Continuation of modest starts and initiatives
  - Fusion Simulation Program; HEDLP, NSTX Upgrades, Materials
  - Planning activities
- Strategic planning developments will continue

**Fusion Energy Sciences**  
**FY 2010 Congressional Budget**  
(Budget Authority in thousands)

	FY 2008	FY 2009	FY 2010
	Actuals	Approp for Narrative	Cong
<b>Science</b>			
DIII-D Research	27,451	26,488	26,604
C-Mod Research	9,502	9,027	9,030
International Research	5,014	4,897	4,900
Diagnostics	4,141	3,962	3,912
HBCU, Education, Outreach, Reserves, Otl	5,514	6,148	6,995
SBIR/STTR	0	8,066	8,667
<b>Subtotal Tokamak Research</b>	<b>51,622</b>	<b>58,588</b>	<b>60,108</b>
NSTX Research	16,293	17,387	17,399
Experimental Plasma Research	17,026	16,780	16,745
High Energy Density Lab Plasmas	16,021	24,534	24,536
MST Research	6,910	6,865	6,915
NCSX Research	753	0	0
<b>Subtotal Alternates Research</b>	<b>57,003</b>	<b>65,566</b>	<b>65,595</b>
<b>Theory and Modeling</b>	<b>24,505</b>	<b>24,176</b>	<b>24,283</b>
<b>SciDAC</b>	<b>7,081</b>	<b>7,212</b>	<b>7,212</b>
<b>Fusion Simulation Program</b>	<b>0</b>	<b>1,976</b>	<b>4,000</b>
<b>General Plasma Science Research</b>	<b>14,821</b>	<b>14,869</b>	<b>14,869</b>
<b>Total, Science Research</b>	<b>155,032</b>	<b>172,387</b>	<b>176,067</b>
<b>Facilities Operations</b>			
DIII-D Operations	34,452	36,141	38,330
C-Mod Operations	15,695	15,934	17,434
NSTX Operations	22,274	22,975	23,400
NSTX Upgrade	0	5,575	5,000
NCSX MIE	15,900	0	0
OTHER-Infrastructure	425	500	500
GPE	275	160	110
GPP	1,877	1,968	1,968
ITER MIE OPC	3,570	15,000	30,000
ITER MIE TEC	22,500	109,000	105,000
<b>Total, Facility Operations</b>	<b>116,968</b>	<b>207,253</b>	<b>221,742</b>
<b>Enabling R&amp;D</b>			
Plasma Technology	14,540	13,851	13,651
Advanced Design Studies	2,643	4,268	4,323
Materials Research	5,750	4,791	5,217
<b>Total, Enabling R&amp;D</b>	<b>22,933</b>	<b>22,910</b>	<b>23,191</b>
<b>Total, Fusion Energy Sciences</b>	<b>294,933</b>	<b>402,550</b>	<b>421,000</b>