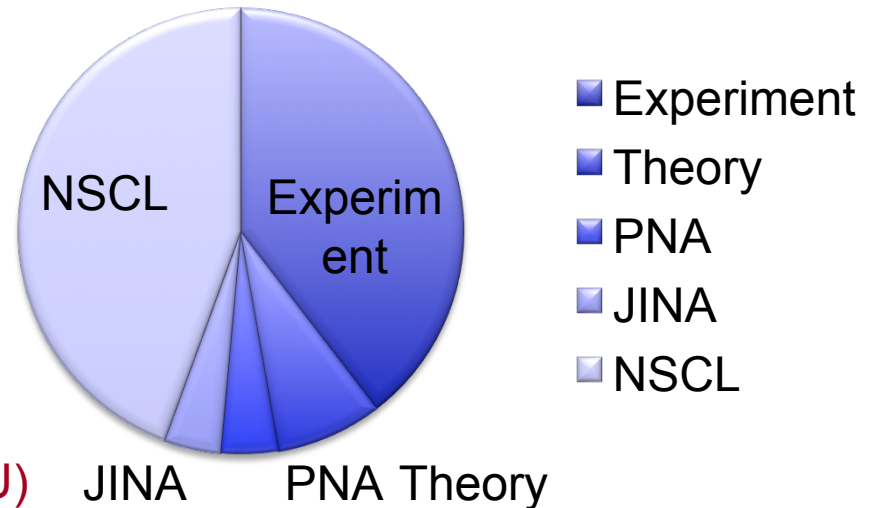
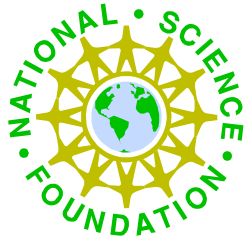


Nuclear Physics at NSF

- NP Experiment
 - Structure
 - Heavy Ions
 - Symmetries
 - Hadrons and QCD
 - Astrophysics (Notre Dame, FSU)
- NP Theory
- Particle Astrophysics and Non-Accelerator Physics (PA)
 - Neutrinos (Borexino, $\beta\beta$, θ_{13})
- Frontier Center (Joint Institute for Nuclear Astrophysics)
- NSCL
- FY2011 total: \$48.5M

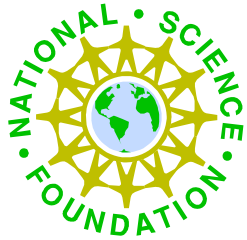




NSF and NSAC

- major projects and facilities
 - NSCL: requires NSB approval
- science areas
 - neutron science
 - theory
- DOE is key partner for much of NSF/NP activities

NSF signs most charges unless they have DOE-only focus (e.g. Committee of Visitors). Most NSAC charges involve issues that will have an impact on NSF support of investigators.

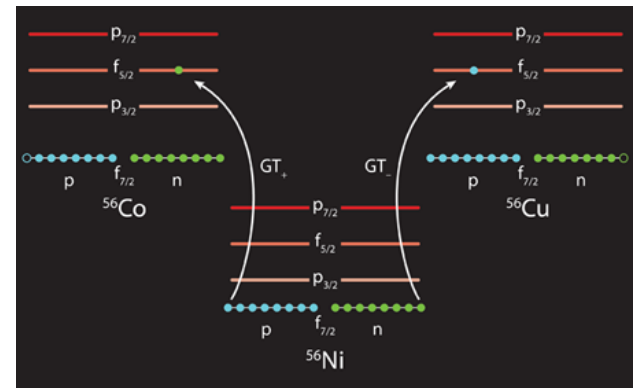


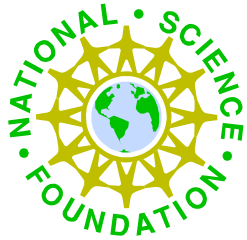
Operation of the NSCL

- Flagship facility for rare isotope research and education at Michigan State U.
 - 310 employees, incl. 120 students, 30 faculty
 - 700 users, 10% US PhDs in nuclear physics
- Experiments in nuclear physics and nuclear astrophysics

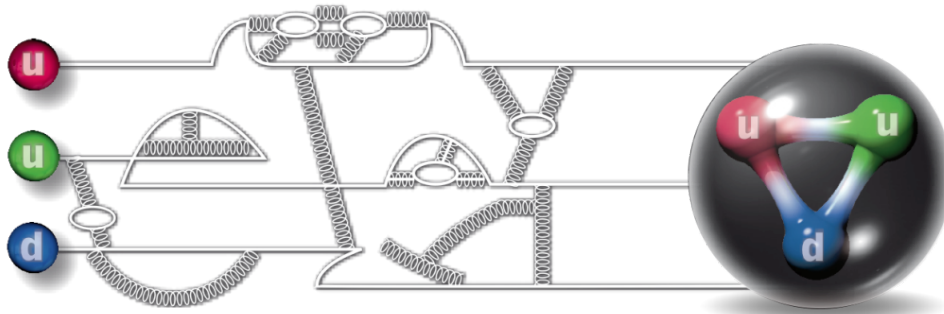


Viewpoint: Recreating a Stellar Electron Catch



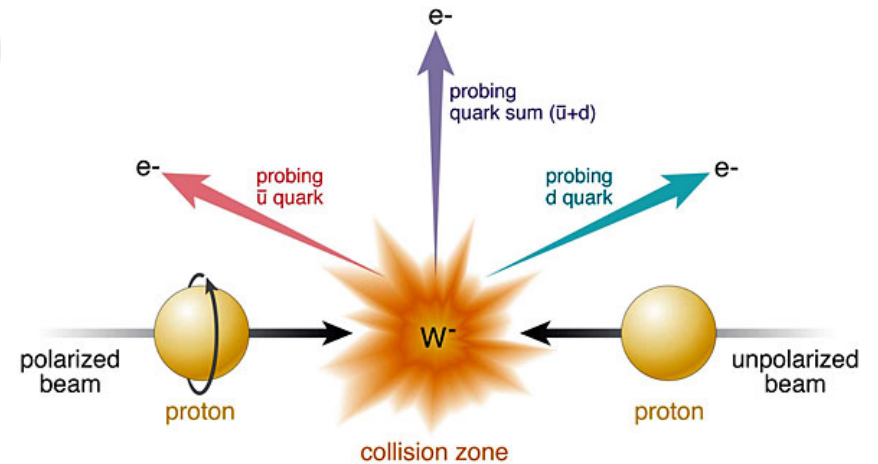


Cold QCD



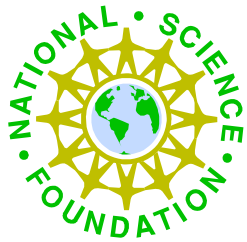
confinement, hadron structure (JLAB)

- investigator awards
- MRI
 - PRIMEX
 - BiBite
 - Preshower Cal (12-GeV)

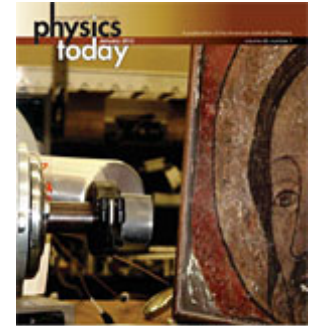


spin (RHIC)

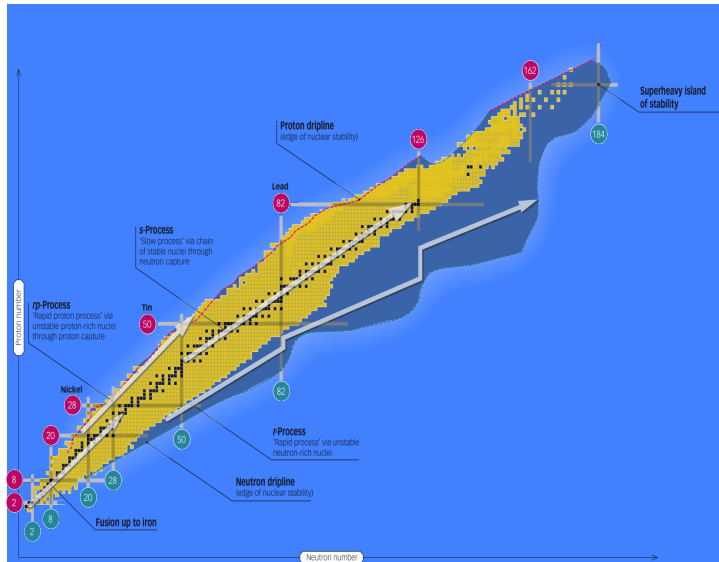
- investigator awards
- MRI
 - STAR End-Cap Cal
 - PHENIX mu Trigger (W)



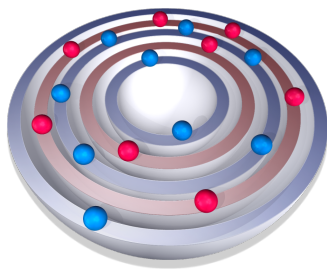
Nuclear Structure



Building off and artifacts
 Scientists used carbon fibers
 to reconstruct paths of
 CERN and performing it



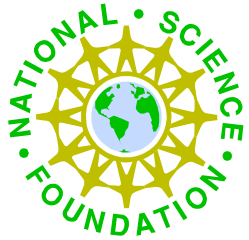
- understanding structure (theory)
- nuclei far from stability
- nuclei in extreme states



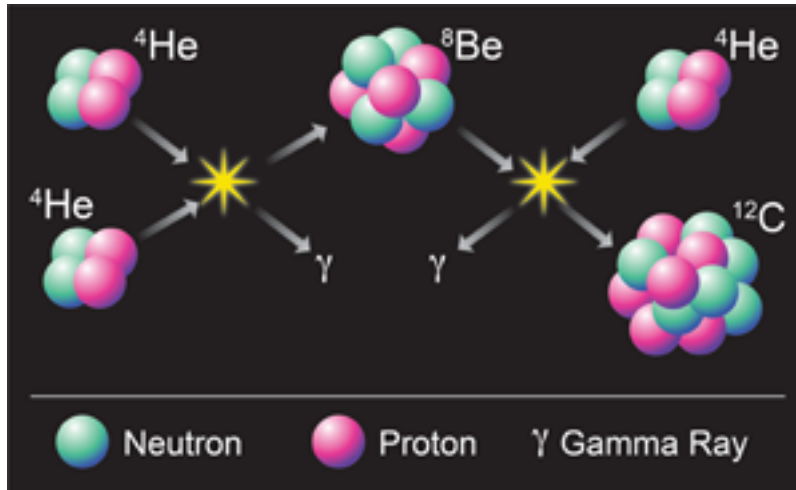
Rutgers, UT: ^{132}Sn



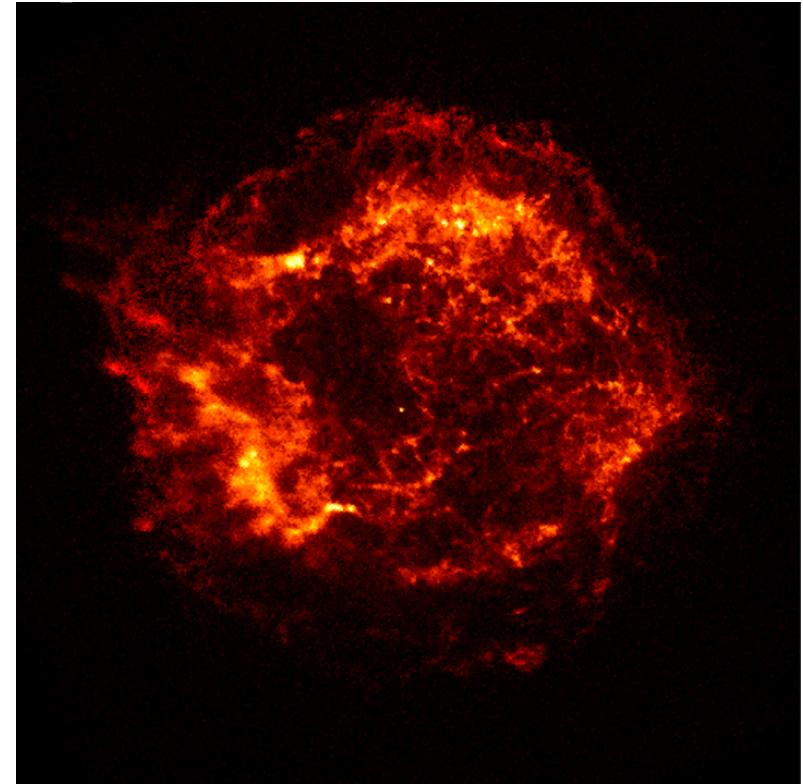
NSF MRI:
 new accelerator at Notre Dame

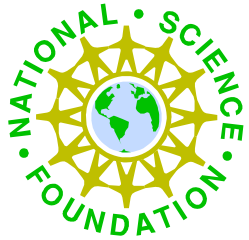


Nuclear Astrophysics

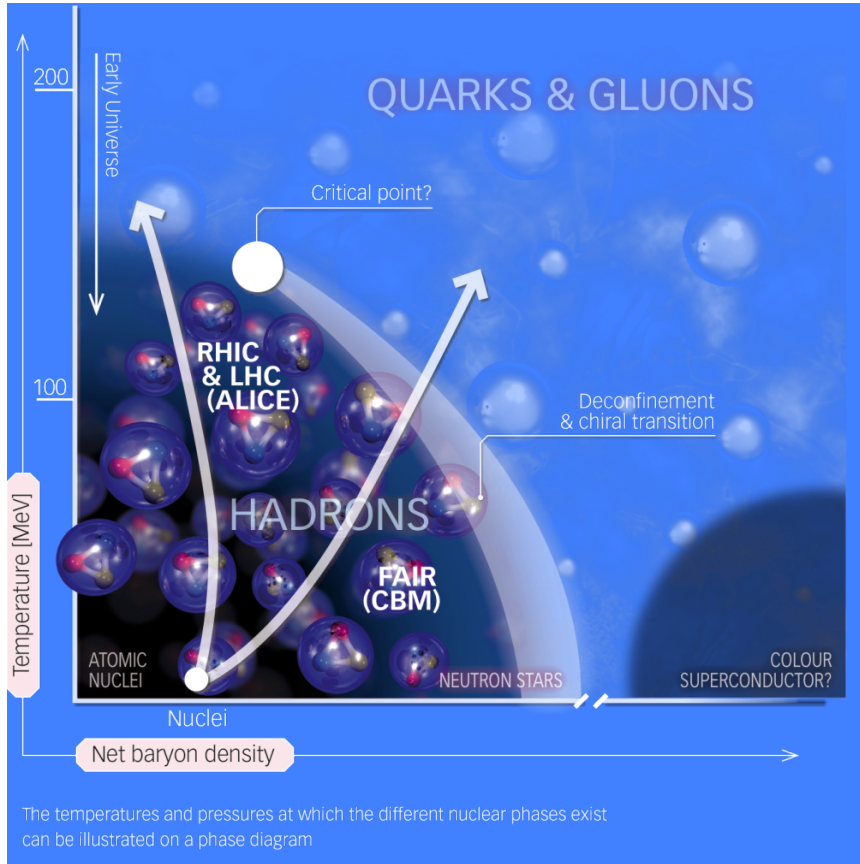


nuclear processes in stellar formation,
energy generation, novae, supernovae

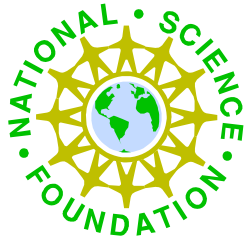




Hot QCD



- investigator awards at RHIC, LHC
- several new investigators
- summer student experience
- MRI: PHENIX Hadron-Blind Cal

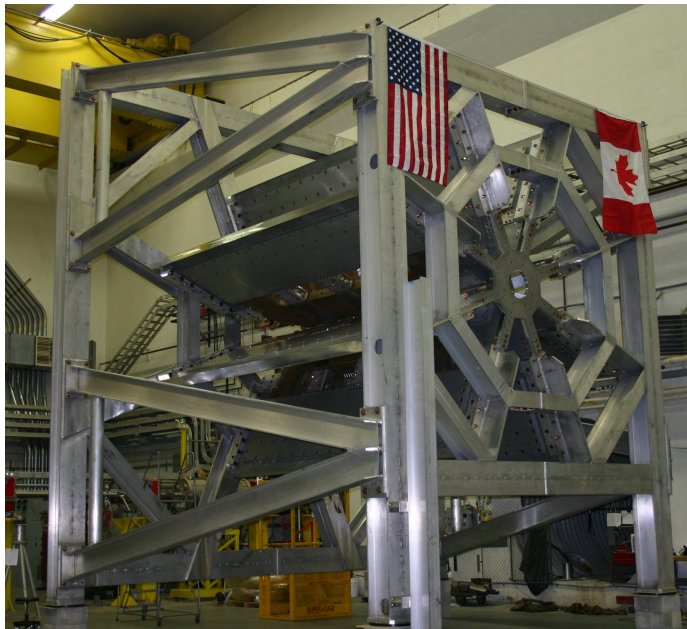


Nuclear Precision Measurements

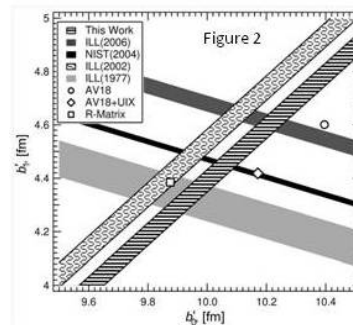


Qweak at JLAB

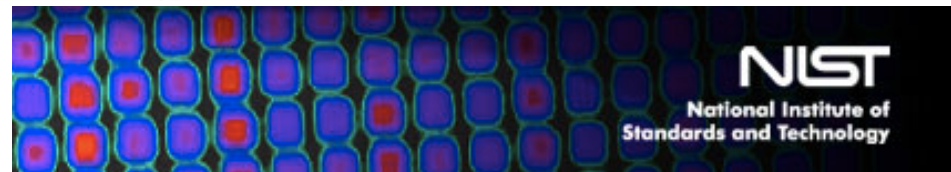
- proton weak charge
- NSF (MRI), DOE, NSERC, VA



March 9, 2012



- neutron interferometry
- n-A scattering lengths
- tests of EFT

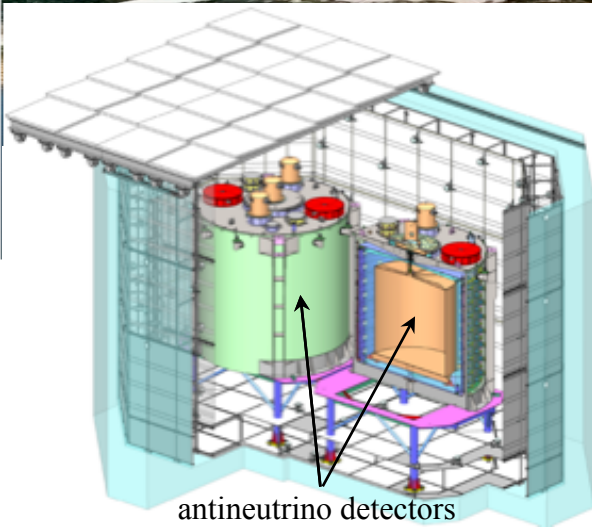


NSAC Meeting

Daya Bay θ_{13} Results



China, DOE [+NSF/NP: Caltech, IUIUC]



antineutrino detectors

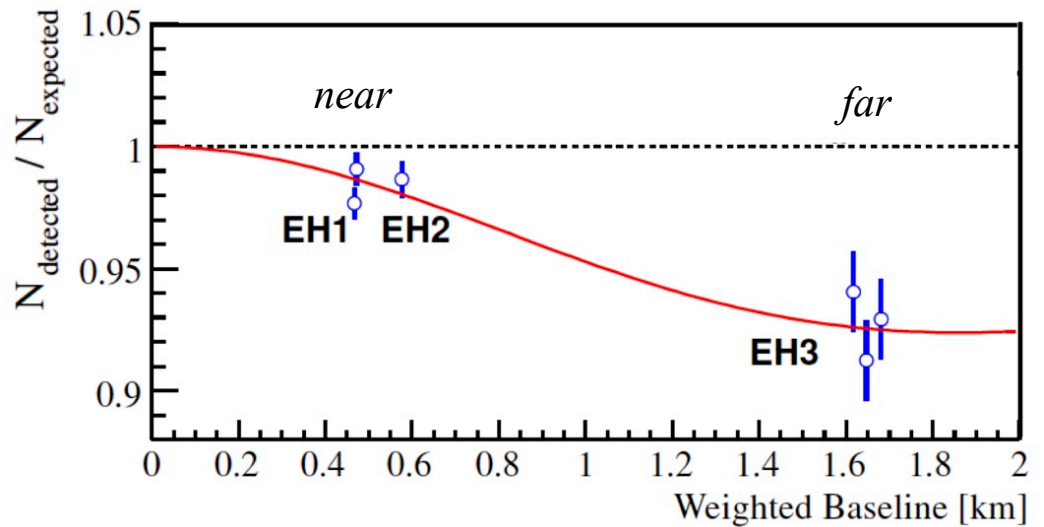
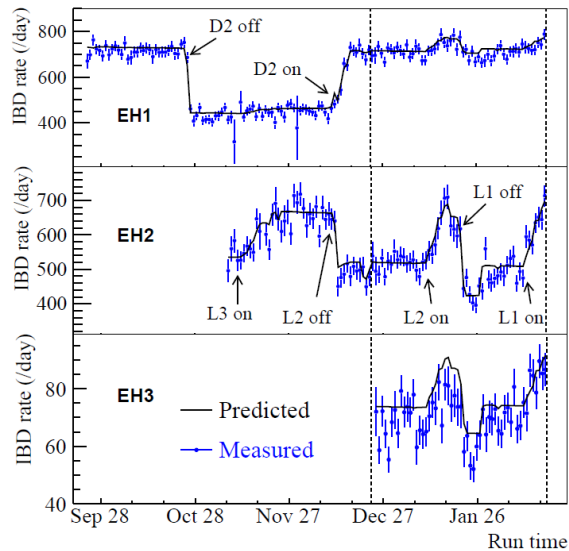
Observe electron-antineutrino disappearance

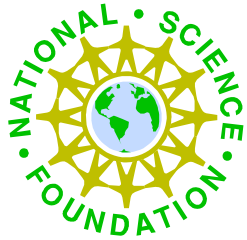
six 2.9 GWth reactors

six 20-ton detectors: 3 near (~500m), 3 far (~1650m)

55 days of running

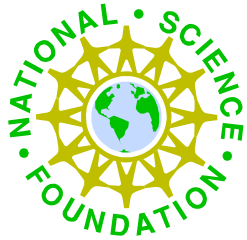
$$\sin^2 2\theta_{13} = 0.092 \pm 0.016(\text{stat}) \pm 0.005(\text{syst})$$





FY2012 Status

- NSF appropriation: R&RA up 2.8%
- NP and most other programs down 3.5% from FY2011 (down 3% from FY2010)
- NSCL flat from FY2011 level
- continue managing ARRA funding impact from FY2009



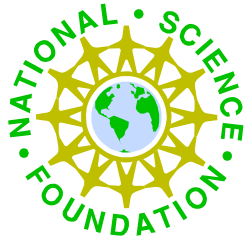
FY2013 R&RA Budget Request

R&RA Funding

(Dollars in Millions)

	FY 2011	FY 2012	FY 2013	Change over	
				FY 2012 Estimate	
				Actual	Estimate
Biological Sciences	\$712.27	\$712.38	\$733.86	\$21.48	3.0%
Computer & Information Science & Engineering	636.06	653.59	709.72	56.13	8.6%
Engineering	763.33	826.17	876.33	50.16	6.1%
Geosciences	885.32	885.27	906.44	21.17	2.4%
Mathematical & Physical Sciences	1,312.42	1,308.94	1,345.18	36.24	2.8%
Social, Behavioral & Economic Sciences	247.33	254.25	259.55	5.30	2.1%
Office of Cyberinfrastructure	300.75	211.64	218.27	6.63	3.1%
Office of International Science & Engineering	49.03	49.85	51.28	1.43	2.9%
Office of Polar Programs ¹	440.70	435.87	449.74	13.87	3.2%
Integrative Activities	259.60	349.59	431.52	81.93	23.4%
U.S. Arctic Research Commission	1.58	1.45	1.39	-0.06	-4.1%
Total, R&RA	\$5,608.38	\$5,689.00	\$5,983.28	\$294.28	5.2%

Totals may not add due to rounding.

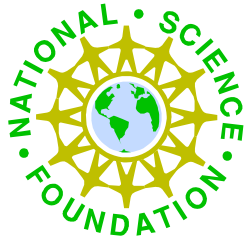


FY2013 MPS Budget Request

MPS Funding

(Dollars in Millions)

	FY 2011 Actual	FY 2012 Estimate	FY 2013 Request	Change Over FY 2012 Estimate	
				Amount	Percent
Division of Astronomical Sciences (AST)	\$236.78	\$234.55	\$244.55	\$10.00	4.3%
Division of Chemistry (CHE)	233.55	234.06	243.85	9.79	4.2%
Division of Materials Research (DMR)	294.91	294.55	302.63	8.08	2.7%
Division of Mathematical Sciences (DMS)	239.79	237.77	245.00	7.23	3.0%
Division of Physics (PHY)	280.34	277.37	280.08	2.71	1.0%
Office of Multidisciplinary Activities (OMA)	27.06	30.64	29.07	-1.57	-5.1%
Total, MPS	\$1,312.42	\$1,308.94	\$1,345.18	\$36.24	2.8%



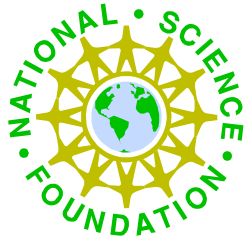
FY2013 Physics Division Budget Request

PHY Funding

(Dollars in Millions)

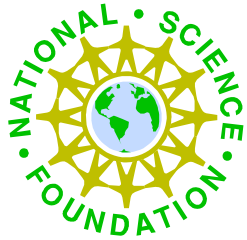
	FY 2011 Actual	FY 2012 Estimate	FY 2013 Request	Change Over FY 2012 Estimate	
				Amount	Percent
Total, PHY	\$280.34	\$277.37	\$280.08	\$2.71	1.0%
Research	179.03	193.68	196.29	2.61	1.3%
<i>CAREER</i>	7.42	7.01	7.11	0.10	1.4%
<i>Centers Funding (total)</i>	3.58	1.14	1.14	-	-
<i>Nanoscale Science & Engineering Centers</i>	0.96	1.14	1.14	-	-
<i>STC: Cntr. for Bio. Sci. & Tech.</i>	2.62	-	-	-	N/A
Education	9.62	5.34	5.34	-	-
Infrastructure	91.69	78.35	78.45	0.10	0.1%
<i>Large Hadron Collider (LHC)</i>	18.00	18.00	18.00	-	-
<i>Laser Interferometer Grav. Wave Obs. (LIGO)</i>	30.30	30.40	30.50	0.10	0.3%
<i>Nat'l Superconducting Cyclotron Lab. (NSCL)</i>	21.50	21.50	21.50	-	-
<i>IceCube</i>	3.45	3.45	3.45	-	-
<i>DUSEL</i>	10.19	-	-	-	N/A
<i>Research Resources</i>	8.25	5.00	5.00	-	-

Totals may not add due to rounding.



Additional Funding

- Domestic Nuclear Detection Office (DNDO)
 - FY2012 process canceled (no DHS funds)
- Major Research Instrumentation (MRI)
 - deadline passed
 - proposals under review
- Petascale Computing Resource Allocations (PRA)
 - testbed access to petascale code development
 - proposals under review
 - *FY2012 deadline: June 30, 2012*



People

- NSF Director: Subra Suresh
- NSF Deputy Director: Cora Marrett
- MPS Assistant Director: Ed Seidel
- Physics Division Director: Joe Dehmer
- Nuclear Physics:
 - BDK (expt and theory)
 - Kyungseon Joo (and astro, underground)