



Report from NSF Particle Physics

USLUO Annual Meeting
November 7, 2013

Saul Gonzalez, Randy Ruchti
Elementary Particle Physics

Jean Cottam, Jim Whitmore
Particle Astrophysics

Marc Sher

Particle Theory, Astrophysics/Cosmology Theory
Program Directors, Physics Division, NSF

Outline



- Organizational and personnel updates
- Budget comments
- New activities in FY14
- Schedule ahead for FY14



Organizational and Personnel Changes



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Celeste M. Rohlfing, Deputy AD

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DIRECTORATE FOR SOCIAL, BEHAVIORAL, & ECONOMIC SCIENCES (SBE)

Myron P. Gutmann, Assistant Director
Joanne Torrow, Deputy AD

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OFFICE OF BUDGET, FINANCE, & AWARD MANAGEMENT (BFA)

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703.292.8210

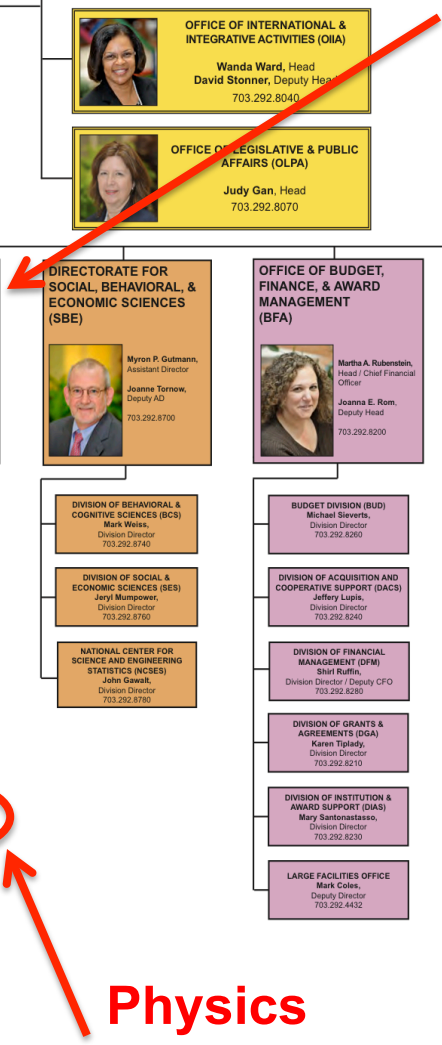
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703.292.8230

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DIVISION OF HUMAN RESOURCE MANAGEMENT (HRM)
Judy Sunley, Division Director
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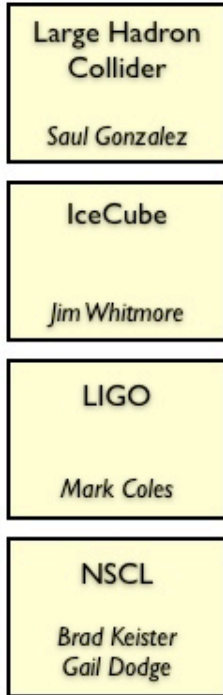


Division of Physics

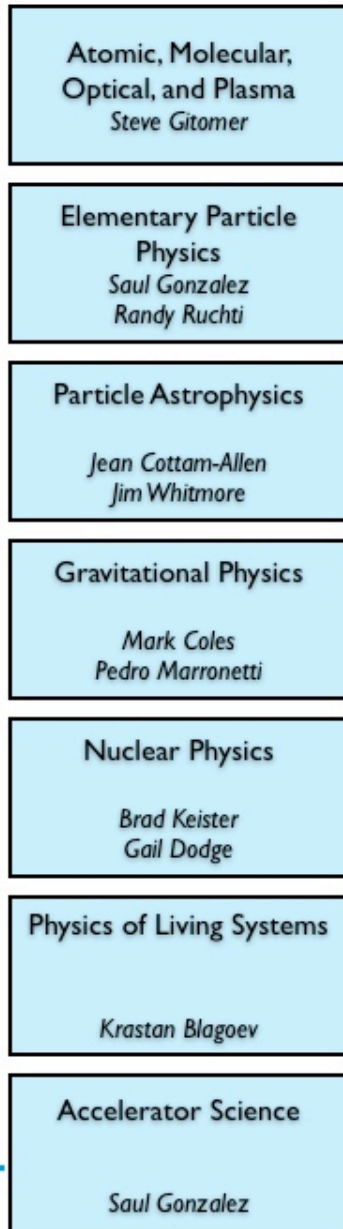
Denise Caldwell
Director

Jim Whitmore
Deputy Director (Acting)

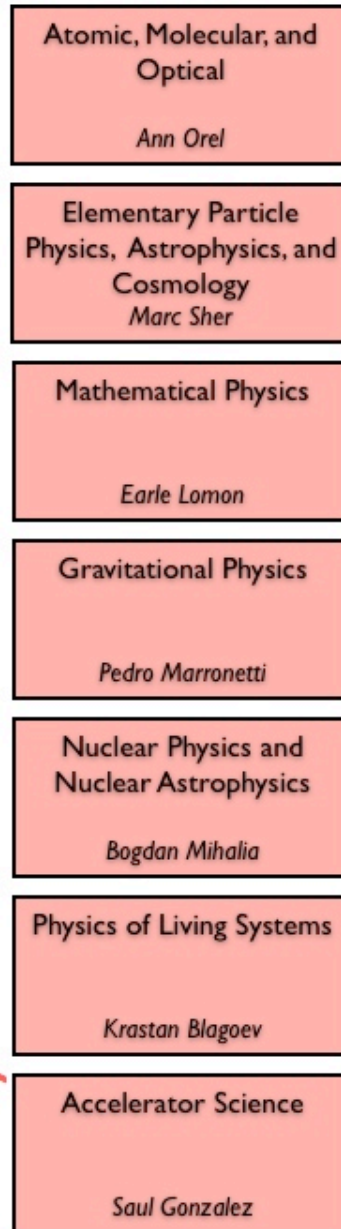
Facilities



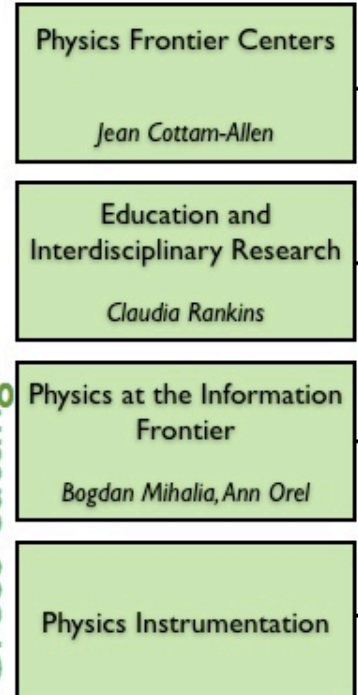
Experiment



Theory



Cross-cutting



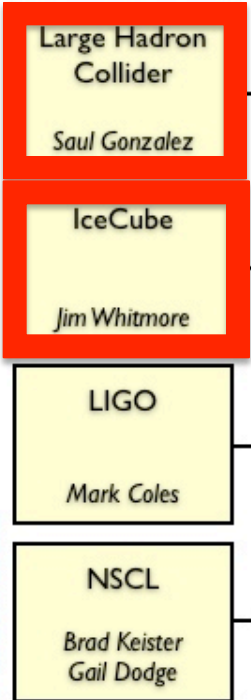


Division of Physics

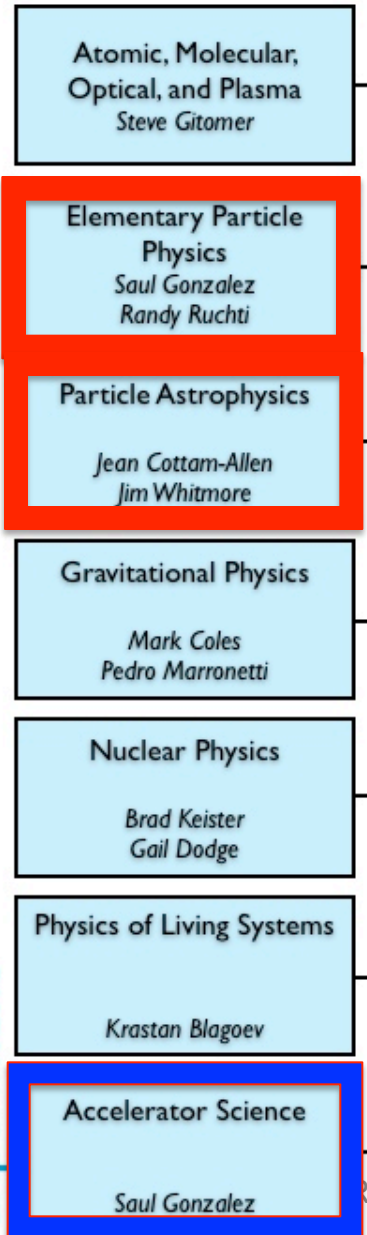
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Director

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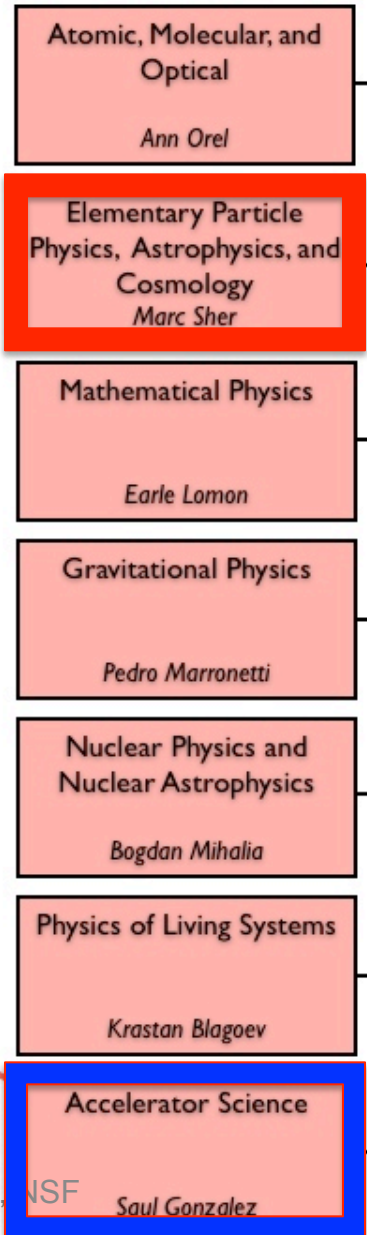
Facilities



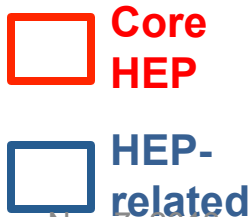
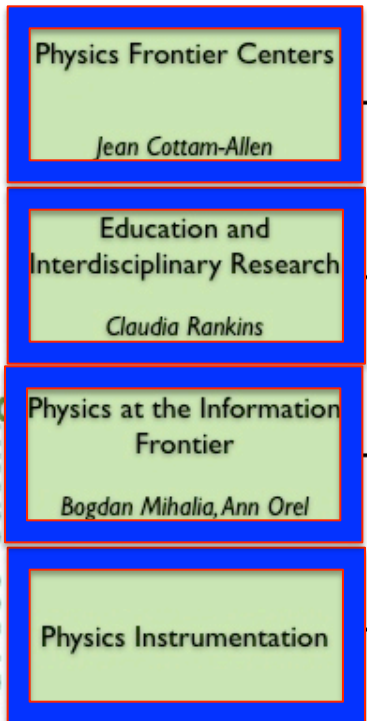
Experiment



Theory



Cross-cutting



Personnel Changes



- **Fleming Crim** is Assistant Director for Mathematical and Physical Sciences, January 2013. Crim is from the University of Wisconsin faculty in Chemistry.
- **Marv Goldberg** retired at the end of March 2013. Marv's vision and contributions to the field are many, ranging from support for LHC to Tier 2 and Grids to QuarkNet...
- **Denise Caldwell** was appointed as Director of the Division of Physics, April 2013.
- **Jim Whitmore** is serving as Acting Deputy Division Director while a search is underway for a new Deputy Division Director.
- **Marc Sher**, is Program Director for HEP Theory and Theoretical Astrophysics/Cosmology, replacing Keith Dienes for the current year. Sher is from the College of William and Mary faculty in Physics.



Budget Comments

National Science Foundation Budget



(Dollars in Millions)

NSF by Account	FY 2012 Actual	Δ	FY 2013 Enacted	Δ	FY 2014 Request
BIO	\$712.28	-4.7%	\$678.93	12.0%	\$760.58
CISE	937.16	-8.4%	858.53	10.7%	950.25
ENG	824.55	-1.3%	813.54	12.0%	911.10
GEO	1,321.37	-4.2%	1,265.84	10.1%	1,393.86
MPS	1,308.70	-4.5%	1,249.50	10.9%	1,386.12
SBE	254.19	-4.6%	242.51	12.3%	272.35
IIA	398.60	8.7%	433.47	23.8%	536.62
US ARCTIC RESEARCH COMMISSION	1.45	-4.1%	1.39	0.4%	1.40
Research & Related Activities	\$5,758.30	-3.7%	\$5,543.71	12.1%	\$6,212.27
Education & Human Resources	\$830.54	0.3%	\$833.31	5.6%	\$880.29
Major Research Equipment & Facilities Construction	\$198.08	-1.0%	\$196.17	7.1%	\$210.12
Agency Operations & Award Management	\$299.30	-1.9%	\$293.60	3.6%	\$304.29
National Science Board	\$4.37	-5.7%	\$4.12	8.5%	\$4.47
Office of Inspector General	\$14.82	-11.0%	\$13.19	8.6%	\$14.32
Total, NSF	\$7,105.41	-3.1%	\$6,884.10	10.8%	\$7,625.76

Totals may not add due to rounding.

NSF FY 2013 Sequestration Guiding Principles: “We intend to make the necessary FY2013 reductions with as little disruption as possible to established commitments, and are using the following set of core principles to guide our sequestration planned activities:

- Protect commitments to NSF’s core mission and maintain existing awards
- Protect the NSF workforce; and
- Protect STEM human capital development programs.”

➔ **Reduced funds for new awards**

MPS/PHY Budget



Mathematical and Physical Sciences (MPS) Funding

(Dollars in Millions)

	FY 2012 Actual	Δ	FY 2013 Enacted	Δ	FY 2014 Request
Division of Astronomical Sciences (AST)	\$234.72	-0.9%	\$232.52	4.8%	\$243.64
Division of Chemistry (CHE)	234.03	-2.2%	228.97	10.8%	253.65
Division of Materials Research (DMR)	294.40	-1.2%	290.74	8.2%	314.63
Division of Mathematical Sciences (DMS)	237.72	-7.8%	219.19	11.6%	244.54
Division of Physics (PHY)	277.44	-9.6%	250.72	15.3%	289.02
Office of Multidisciplinary Activities (OMA)	30.37	-9.9%	27.36	48.5%	40.64
Total, MPS	\$1,308.70	-4.5%	\$1,249.50	10.9%	\$1,386.12

Totals may not add due to rounding.

Following the NSF Sequestration Guidelines that protect existing commitments including facilities

3.1% reduction to NSF

→ **4.5%** reduction to MPS

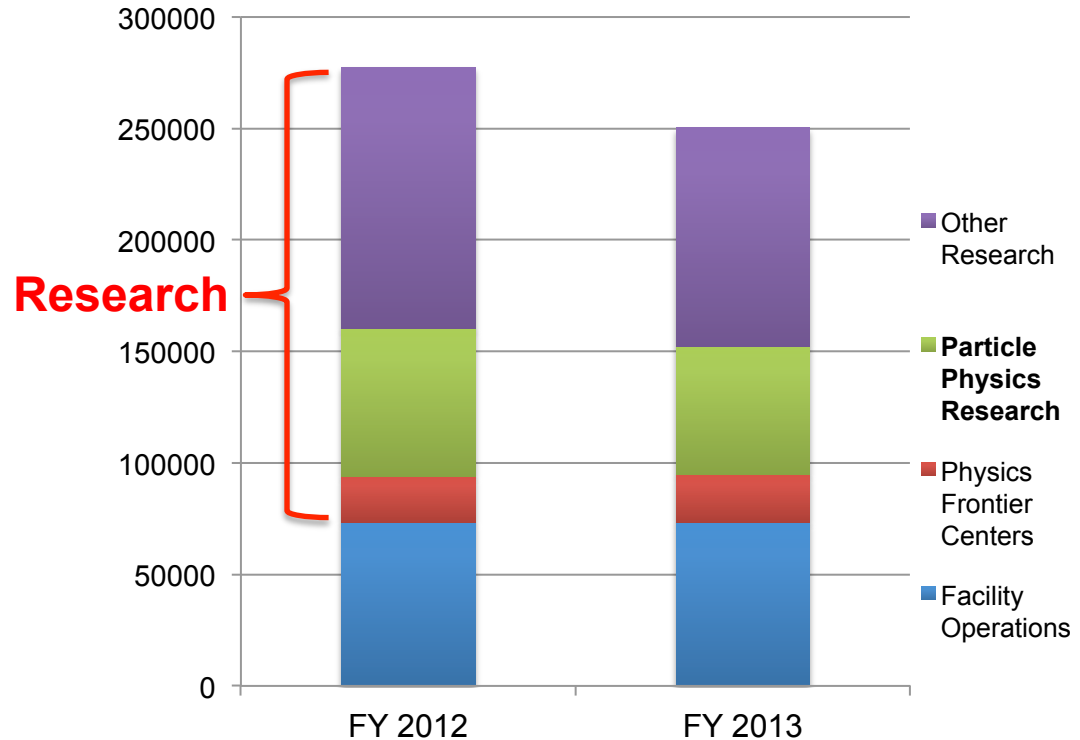
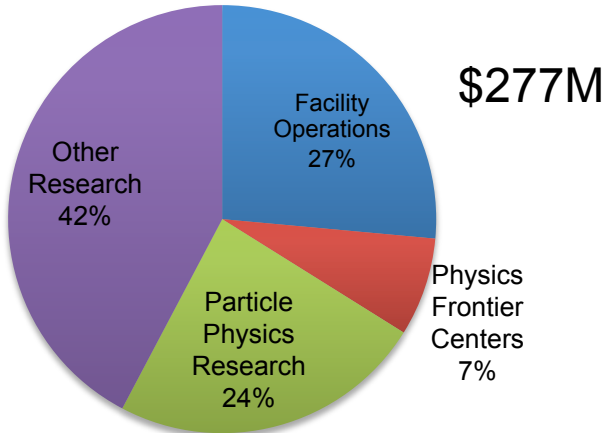
→ **9.6%** reduction to PHY

→ **Major impacts!**

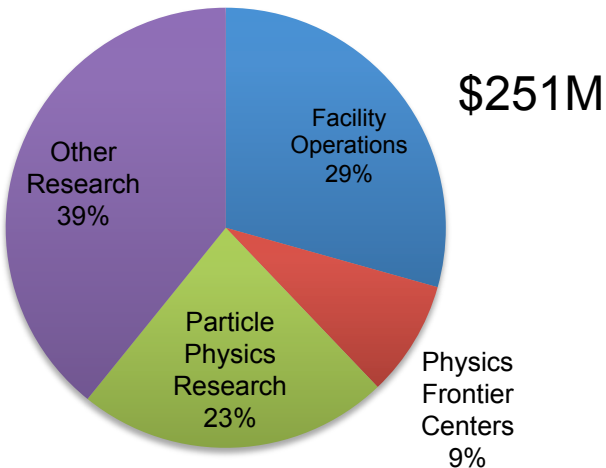
FY2013 Budget Impacts



FY 2012 (by activity)



FY 2013 (by activity)



Approximately **12%** reduction in funds to research programs. Effective **36%** cut in funding for new awards

➔ Fewer awards, less support for faculty, postdocs, and students

Particle Physics Funding Details



(in M\$)		FY 2008	FY 2009	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
		Actuals	Omnibus	ARRA	Actual	Actual	Actual	Estimate
Experimental EPP	EPP Research	20.5	18.8	14.0	25.8	25.0	24.7	21.7
	LHC Ops	18.0	18.0		18.0	18.0	18.0	18.0
	CESR	13.7	8.5	1.3				
	Accel/Instrumentation	4.0	2.2		3.0	4.1	11.9	4.5
Experimental Particle Astro	Particle Astrophysics	15.8	15.9	15.3	17.9	9.7	11.5	10.4
	IceCube Ops	1.5	2.2		2.2	3.5	3.5	3.5
	DUSEL Planning	2.0	22.0		28.9	10.2		3.2
	Underground R&D	5.0	4.0	5.6	4.6	6.0	11.0	3.4
	Underground Physics					8.4	6.3	5.5
Theory →	THY (EPP/Astro/Cosmo)	11.7	12.0	6.8	13.2	14.1	13.6	12.1
	Physics Frontier Centers	6.3	5.9		5.9	6.0	6.0	6.0
TOTAL Particle Physics		98.4	109.5	43.0	119.4	104.9	106.4	88.4
TOTAL Physics Division		285.0	275.5	102.1	307.8	280.3	277.4	250.7
% of Physics Division		34.5%	39.7%	42.1%	38.8%	37.4%	38.4%	35.2%
Allied Funding		7.2	4.9	0.5	12.7	12.3	24.7	20.8
Effective Total		105.5	114.4	43.5	132.1	117.2	131.1	109.2

Particle Physics Funding Details



	FY 2008	FY 2009	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
(in M\$)	Actuals	Omnibus	ARRA	Actual	Actual	Actual	Estimate
Experimental EPP							
EPP Research	20.5	18.8	14.0	25.8	25.0	24.7	21.7
LHC Ops	18.0	18.0		18.0	18.0	18.0	18.0
CESR	13.7	8.5	1.3				
Accel/Instrumentation	4.0	2.2		3.0	4.1	11.9	4.5
Experimental Particle Astro							
Particle Astrophysics	15.8	15.9	15.3	17.9	9.7	11.5	10.4
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Allied Funding



New Activities in FY2014

New in FY 2014: Accelerator Science



The acceleration and control of charged particle beams are essential tools for discovery science within the Physics Division: from high to low energy beams, high intensity sources for secondary or tertiary beams (e.g., neutrinos), nuclear physics, nuclear astrophysics.

- We are starting an accelerator science program with the goal of enabling fundamental discoveries and train students and postdocs across disciplinary boundaries
 - Program Description *PD 13-7243: “Accelerator Science”*
 - http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504937
 - Proposal target date: November 29, 2013
- Broader impacts are significant: industrial applications, medical applications, homeland security, light sources
- Program will focus on transformational developments that are likely to come from curiosity-driven research with strong interdisciplinary links
- Program will evolve with the community as new challenges are identified

New in FY 2014: Dark Matter Solicitation



The current generation of direct dark matter experiments should all achieve their projected sensitivities and complete operations within the next few years. The more sensitive, "second generation" direct detection experiments, will then be required to either search with increased sensitivity or to measure in detail the detected dark matter.

- These next generation experiments will be selected through a solicitation for research and development and then construction beginning in FY 2014.
 - *Solicitation NSF 13-597: “Support for Construction of Direct Detection Dark Matter Experiments in Particle Astrophysics”*
 - http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504939&org=PHY&from=home
 - Letters of Intent due October 23, 2013
 - Full Proposals due November 26, 2013
- NSF and DOE will closely coordinate the selection and funding of the awards and subsequent support for the experiments.

New in FY 2014: Mid-Scale Instrumentation



One of the most critical needs of research projects funded through the Physics Division is that of having cutting-edge instrumentation that enables investigators to remain competitive in a rapidly-changing scientific environment.

- The Physics Division has established a Mid-Scale Instrumentation Fund.
 - Dear Colleague Letter *NSF 13-118*: “Announcement of Instrumentation Fund to Provide Mid-Scale Instrumentation for FY2014 Awards in Physics Division”
 - http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf13118
- This is not a separate program to which investigators can apply directly. PIs should request funding for specialized equipment as part of a regular proposal to a disciplinary program in the Division. The Program Officer can then request funds be provided through the Mid-Scale Instrumentation Fund.
- Resources from the Mid-Scale Instrumentation Fund can be used for off-the-shelf purchases or for construction of specialized equipment.
- Mid-Scale Instrumentation Fund resources are non-renewable and are intended to be one-time investments in the research project.



FY 2014 Dates/Target Dates/Deadlines

✓	October 1-16, 2013	Government Shutdown
✓	October 23, 2013	Letters of Intent for DDDM Solicitation - DL
✓	October 30, 2013	Experimental Elementary Particle Physics - TD
✓	October 30, 2013	Particle Astrophysics - TD
	November 26, 2013	Full Proposals for DDDM Solicitation - DL
	November 29, 2013	Accelerator Science - TD
	December 5, 2013	Theoretical Elementary Particle Physics & Theoretical Particle Astrophysics and Cosmology - TD
	January 23, 2014	Major Research Instrumentation Program - DL
	Feb/Mar 2014	INSPIRE Letters of Intent - DL
	July 2014	CAREER Program - DL

DL = deadline
TD = target date

Final Comments



We congratulate the LHC and its experiments for superb performance over the last several years including the Higgs discovery which has led to the 2013 Nobel Prize for Physics.

NSF is very appreciative of the Particle Physics Community's considerable efforts in the Snowmass 2013 Process which have led to important reports on the science and opportunities in the field.

NSF, with our DOE colleagues, is following P5 closely as they carry out their important work which is now underway.

In spite of the Government Shutdown at the outset, we look forward to a very interesting year!