

NSF Nuclear Physics Overview for NSAC



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- ▶ NSF Funding Opportunities
 - NSF 14-576 Solicitation
 - Other opportunities Computational Physics (CDS&E), CAREER, MRI, etc.
- ▶ Announcements
 - Highlights
 - Diversity
- ▶ Budget
- ▶ Physics Division Personnel



New – NSF Physics Division: Investigator-Initiated Research Projects (14-576)

As of October 2014, **all proposals** submitted to the Division of Physics programs (Expt'l Nuclear Physics, Theoretical Nuclear Physics, Particle Astrophysics, Computational Physics, *etc.*) **must go through this solicitation!**

- **Deadlines instead of target dates:**
 - ✓ October 29, 2014 for Experimental Nuclear Physics
 - ✓ October 29, 2014 for Particle Astrophysics
 - ✓ November 14, 2014 for Theoretical Nuclear Physics
 - December 4, 2014 Computational Physics
 - February 4, 2015 for Accelerator Science
 - 17:00 in the PI's time zone



New – NSF Physics Division: Investigator-Initiated Research Projects (14-576)

- **PI Effort and Sources of Support:**

- PIs who have or anticipate **additional concurrent sources of support should clearly explain the differences** between this proposal and the other awards (including ALL grants regardless of the agency of origin)

- Where? **Project Description** or **Current & Pending**

➔ – *“The proposal review process will include an assessment of the proposers’ ability to carry out the proposed research in light of these commitments”*

- PIs with similar proposals for different agencies will be expected to withdraw all other applications should one of them be funded



New – NSF Physics Division: Investigator-Initiated Research Projects (14-576)

- **Instrumentation:**

- For proposals involving development or construction of **complex instrumentation** (typically above \$1M), the following aspects will be assessed during the review:
 - Ability of the proposers to deliver within the proposed budget
 - Cost, schedule and risk mitigation management (project management documentation should **be uploaded as a Supplementary Document**)
 - Prior to final selection, these projects may be evaluated via a cost, schedule, and management review.
 - **Contact the corresponding NSF Program Officer for details**



New – NSF Physics Division: Investigator-Initiated Research Projects (14-576)

- Collaborators:



- List of collaborators that do not fit in the Bio sketches (such as those of large collaborations) should be included as a Supplementary Document
 - For those who belong to large collaborations (> 30 members), identify those members with whom the PIs and Co-PIs work closely e.g. members of the same Working Group.
 - Indicate collaborations which the PIs and Co-PIs left more than 48 months ago but are still listed as co-authors because of the publishing rules of the collaboration.
 - Include collaborations for experiments that have been proposed if the PIs and Co-PIs have worked closely with others in the collaboration in the last 48 months, *even if the proposed measurements have not taken place.*



Accelerator Science

- Second year for this program and there has been a very robust response to this new program. Twelve awards in FY14.
- Intended to fund accelerator **science**, not R&D for specific projects. Collaboration with a national lab (e.g. prototyping) is fine.
- Next deadline is **February 4, 2015**
- Apply to **Physics Division Solicitation 14-576**



Mid-Scale Instrumentation

- The Physics Division has established a mid-scale instrumentation fund. The intention is to fund projects above the MRI limit (\$4M).
- This funding is NOT available for “operations” so program funds will have to be used to run the experiment.
- **Contact us for more information.** PIs cannot apply to mid-scale directly; **all proposals must go through the program.**
- A priority of the division (and the directorate) is to increase the resources available for mid-scale.

Major Research Instrumentation (MRI)



- Solicitation is posted: NSF 15-504
- Due date = **22-jan-2015**

**At beginning of solicitation
– read it carefully!**

- New things to be aware of:
 - Description of single and multiple instruments revised
 - **Acquisition proposals:** equipment cost > 70% of TPC
 - PhD granting institutions – grant funds only for equipment; any eligible cost beyond equipment must be in cost sharing
- Two types of awards: development and acquisition
- Limited submissions from each university
- Maximum award is \$4 million; awards above \$1 million must compete across the entire foundation
- Will be judged in part by merit of science that will be done with instrument
- Proposals from non-PhD granting institutions have slightly different requirements
- **Contact program officers well ahead of submission to discuss (avoid pitfalls)**



Computational Physics (CP)

- MPS, ENG, and OCI have established a new cross-directorate program in **Computational and Data-Enabled Science and Engineering** (CDS&E: PD 12-8084).
- In Physics this program is implemented in the **Computational Physics** program under the **PHY solicitation 14-576**. It focuses on cyber-infrastructure for the disciplines supported by the Physics Division.
 - » **Deadline = December 4, 2014**
 - » **Bogdan Mihaila** bmihaila@nsf.gov



REU Supplements

- Available to NSF grantees to fund an undergraduate student (US citizen or permanent resident) for the summer.
- Usually \$5,000
- Submit in Fastlane as a supplement to current grant – **after talking with your program officer!**
- *Requests submitted early in the FY are most easily accommodated in the budget*



Career Life Balance

- Instituted in 2012, NSF's Career-Life Balance (CLB) Initiative is an ambitious, *ten-year initiative that will build on the best of family-friendly practices among individual NSF programs to expand them to activities NSF-wide*. This agency-level approach will help attract, retain, and advance graduate students, postdoctoral students, and early-career researchers in STEM fields.
- See the Dear Colleague Letter: NSF 13-075 for information about requesting supplements to CAREER awards.
- *The Physics Division will consider such requests from all awardees. **Contact your program officer for information.***



Diversity

The Physics Division is undertaking a year-long study to increase diversity in the research community:

- What efforts have been most successful?
- Where can we best focus limited resources?
- How can we provide resources beyond funding to the community?
- How can we engage researchers in the field?



Highlights

- Keep program officers informed of major new results.
- These results may not appear on the NSF web page, but **we need them to respond to inquiries by management, to make the case for nuclear physics, Committee of Visitor reports, etc...**
- Examples:
 - **Measurement of parity violation in electron-quark scattering JLab PVDIS collaboration (X. Zheng *et al.*) *Nature* **506**, 67 (2014) JLab press release; NSF *informed ahead of time and posted our own link.***
 - Upcoming article in Science with NSF-funded PIs

NSF FY15 Request Summary



CR through Dec. 11

	FY 12 (M\$)	FY 13 (M\$)	FY 14 (M\$)	FY15 Request (M\$)	Change (from FY14)
NSF Total	7,105.41	6,901.91	7,171.92	7,255.00	+1.2%
R&RA	5,758.30	5,558.88	5,808.92	5,807.46	0.0%
MPS	1,308.70	1,249.34	1,299.80	1,295.56	-0.3%

R&RA: Research and Related Activities (includes directorates)

MPS: Mathematical and Physical Sciences

- Senate Mark-up = President's Request
- House Mark-up = President's Request + ~ \$150M



NSF PHY FY15 Request

PHY Funding (Dollars in Millions)

	FY 2013 Actual	FY 2014 Estimate	FY 2015 Request	Change Over	
				FY 2014 Estimate Amount	Percent
Total, PHY	\$250.45	\$266.30	\$263.70	-\$2.60	-1.0%
Research	164.72	165.99	159.35	-6.64	-4.0%
CAREER	7.68	7.34	7.34	-	-
Centers Funding (total)	1.16	0.02	0.02	-	-
Nanoscale Science & Engineering	1.16	0.02	0.02	-	-
Education	5.31	6.98	5.97	-1.01	-14.5%
Infrastructure	80.42	93.33	98.38	5.05	5.4%
IceCube	3.45	3.45	3.45	-	-
Large Hadron Collider (LHC)	18.00	17.37	18.00	0.63	3.6%
Laser Interferometer Grav. Wave Obs.	30.50	36.43	39.43	3.00	8.2%
Nat'l Superconducting Cyclotron Lab.	21.50	22.50	22.50	-	-
Research Resources	6.97	13.58	15.00	1.42	10.5%

Totals may not add due to rounding.



Budget Trends – NSF Nuclear Physics

FY	Hadrons & Light Nuclei (k\$)	Structure & Heavy Ions (k\$)	Fund. Sym. (k\$)	Nucl. Astro. (k\$)	Theory (k\$)	Program Total (k\$)	NSCL (k\$)	Total Nuclear Physics (k\$)
2009	7,663	4,734	5,572	N/A	1,149	19,118	20,500	39,618
2010	6,421	6,863	5,532	1,078	3,855	23,749	21,000	44,749
2011	5,349	6,485	5,336	1,994	3,719	22,883	21,500	44,383
2012	7,657	3,375	5,855	1,610	3,829	22,326	21,500	43,826
2013	5,218	4,259	5,304	1,654	3,474	19,908	21,500	41,408
2014	5,275	4,215	5,250	2,275	3,514	20,813	22,500	43,313

There was an additional \$11,811K from ARRA in 2009.

JINA-CEE (Joint Institute for Nuclear Astrophysics) \$2,280 k/year

MRI: \$2,360 K in FY12 (normally less than \$1 M)
\$3,021 K in FY13
\$1.105 K in FY14 (2 awards)

FY15 Experimental Nuclear Physics Program Proposals



- Proposals = 53; 4 Collaborative
 - Total year 1 request = \$14.4M
- FY15 ENP R&RA ~ \$16M
 - ~ \$10.5 committed

NSF/MPS/Physics Personnel



- **France Cordova** – Director (sworn in April 2, 2014)
- **Fleming Crim** – Associate Director for MPS
- **Denise Caldwell** – Physics Division Director
- **Brad Keister** – Deputy Division Director
- **Bogdan Mihaila** – Nuclear Theory Program Director
- **Ken Hicks** – Expt'l Nuclear Physics Program Director
- **Allena Opper** – Expt'l Nuclear Physics Program Director
- **Jim Whitmore** – Particle Astrophysics Program Director
- **Jean Cottam** – Particle Astrophysics Program Director
- **Alice Mignerey** – Nuclear Experiment Program Director
(part time)



-
- **Gail Dodge** – returned to ODU in August



For the latest updates, check out

<http://www.nsf.gov/div/index.jsp?div=PHY>

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The screenshot shows the NSF website interface. At the top, there is a navigation bar with links for HOME, FUNDING, AWARDS, DISCOVERIES, NEWS, PUBLICATIONS, STATISTICS, ABOUT NSF, and FASTLANE. Below this is the NSF logo and the text "National Science Foundation Directorate for Mathematical & Physical Sciences (MPS)". A search bar and a "QUICK LINKS" button are also visible. The main navigation bar includes "MPS HOME", "MPS FUNDING", "MPS AWARDS", "MPS DISCOVERIES", "MPS NEWS", and "ABOUT MPS". The page content is divided into two columns. The left column features a "Physics (PHY)" header with a small image of Albert Einstein and a list of links: PHY Home, About PHY, Funding Opportunities, Awards, News, Events, Discoveries, Publications, Career Opportunities, Facilities and Centers, PHY Program Director Jobs, See Additional PHY Resources, and View PHY Staff. Below this is a search box for PHY Staff. The right column has a "Physics (PHY)" header with social media icons for Email, Print, and Share. It contains two main sections: "PHY Replaces DCL with Solicitation NSF 14-576" and "PHY Int'l Activities - Potential Co-Review". The first section includes a paragraph stating that the Physics Division has issued a solicitation (NSF 14-576) for FY2015 that replaces its prior annual Dear Colleague Letter. The second section includes a paragraph stating that the Physics Division has issued a Dear Colleague Letter (NSF 14-009) to announce the guidelines for "International Activities within the Physics Division - Potential International Co-Review". At the bottom of the right column, there is a "Special Announcements" section with two links: "MPS Alliances for Graduate Education and the Professoriate - Graduate Research Supplements (AGEP-GRS) Dear Colleague Letter (NSF 13-071)" and "Dear Colleague Letter - Announcement of Instrumentation Fund to Provide Mid-Scale Instrumentation for FY2014 Awards in Physics Division (NSF 13-118)".



Backup Slides



New – NSF Physics Division: Investigator-Initiated Research Projects (14-576)

- **Exceptions:**

- ➔ – RUI proposals

Use the RUI solicitation (NSF-14-579) instead but **follow the new Deadlines** for each Physics program

- ➔ – CAREER, MRI, INSPIRE, SI2, etc.

NSF-wide solicitations or solicitations from other Divisions (AST, ACI, etc.) are unaffected.

- Supplement proposals and EAGER are unaffected (i.e., you can use NSF 14-1 GPG)



New – NSF Physics Division: Investigator-Initiated Research Projects (14-576)

On Fastlane, choose solicitation
NSF 14-576

Do **NOT** choose
NSF 14-1 GPG or anything else.
Proposal will be **returned**
without review!

Choose the Program (e.g.
Hadrons & Light Nuclei, Nuclear
Astrophysics, Nuclear Precision
Measurements, Nuclear
Structure and Reactions) in the
next screen

Talk w/ your SRO!

Program Announcement / Solicitation Number Selection

Select a Program Announcement or, if not in response to a program announcement, choose 'NSF 14-1 GPG: Not in response to a program announcement/solicitation'. If the program announcement is within multiple divisions or programs, the next page will allow you to select from the associated divisions and programs. If the program announcement is associated with only one division and program, the unit of consideration will automatically be selected.

There are currently 305 Program Announcements/Program Descriptions
Program Announcement / Solicitation Number

Select one of the items below:

- NSF 14-1 Grant Proposal Guide - GPG
- NSF 14-579 Facilitating Research at Primarily Undergraduate Institution...
- NSF 14-578 Science of Science and Innovation Policy Doctoral Dissertat...
- NSF 14-577 Advanced Technological Education
- NSF 14-576 Division of Physics: Investigator-Initiated Research Project...**
- NSF 14-575 US-Japan Big Data and Disaster Research
- NSF 14-574 Methodology, Measurement, and Statistics
- NSF 14-572 Tribal Colleges and Universities Program
- NSF 14-571 NSF/Intel Partnership on Cyber-Physical Systems Security and...

Select

Go Back

Unit Selection Lists

Select the organizational unit you wish to consider your proposal from **either** the Division selection box (if you want to review the NSF Divisions and associated Programs) or the Program selection box (if you know the Program you wish to select).

Note: Some program announcements will be associated with multiple Divisions and Programs. In these cases, a logical step-by-step selection process is provided.

Divisions

Select a Division within NSF 14-576
Directorate: MPS-Directorate for Mathematical & Physical Sciences

- PHY-Division of Physics**

Programs

Select a Program within NSF 14-576

- Accelerator Science
- ASTROPHYSICS & COSMOLOGY THEOR
- ATOMIC & MOLECULAR PHYSICS
- ATOMIC THEORY
- COMPUTATIONAL PHYSICS
- ELEMENTARY PARTICLE ACCEL USER
- ELEMENTARY PARTICLE THEORY
- GRAVITATIONAL EXPERIMENTS
- GRAVITATIONAL THEORY

Select Program Show the divisions in this program.



2013 MRI Snapshot by Institution Type

	Ph.D.	non-Ph.D.	Non-degree
# reviewed	512 (32% DEV)	301 (7% DEV)	39 (41% DEV)
Mean request	\$802,520	\$463,500 K	\$701,694
Median request	\$591,442	\$357,400 K	\$636,426
# awards	106	73	6
NSF \$ awarded	\$60.3 M	\$23.3 M	\$2.6 M
MRI \$ awarded	\$47.6 M	\$20.2 M	\$3.2 M
Success rate	20.1%	24.2%	12.8%
Mean award	\$568,794	\$311,071	\$641,766
Median award	\$466,908	\$249,895	\$535,211



Merit Review Principles

- All NSF projects should be of the **highest quality** and have the **potential to advance**, if not transform, the frontiers of knowledge.
- NSF projects, in the aggregate, **should contribute more broadly to achieving societal goals**. These broader impacts may be accomplished through the research itself, through activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. The project activities may be based on previously established and/or innovative methods and approaches, but in either case must be well justified.
- **Meaningful assessment** and evaluation of NSF funded projects should be based on appropriate metrics, keeping in mind the likely correlation between the effect of broader impacts and the resources provided to implement projects. If the size of the activity is limited, evaluation of that activity in isolation is not likely to be meaningful. Thus, assessing the effectiveness of these activities may best be done at a higher, more aggregated, level than the individual project.



The following elements should be considered in the review for both criteria:

1. What is the potential for the proposed activity to:
 - a. **Advance knowledge** and understanding within its own field or across different fields (Intellectual Merit); and
 - b. **Benefit society** or advance desired societal outcomes (Broader Impacts)?
2. To what extent do the proposed activities suggest and explore **creative, original, or potentially transformative concepts**?
3. Is **the plan** for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
4. How **well qualified** is the individual, team, or organization to conduct the proposed activities?
5. Are there **adequate resources** available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?