NSF/MPS Grant Opportunities



Physically located in Arlington, VA Virtually located at http://www.nsf.gov/

Jim Whitmore
Division of Physics (PHY)

Guebre X. Tessema Division of Materials Research (DMR)

James Neff
Division of Astronomical
Sciences (AST)



NSF is Moving!

- NSF will move this summer from Arlington, VA to Alexandria, VA.
- The Directorate for Mathematical and Physical Sciences is scheduled to move over Labor Day weekend.

Now: 25 mins to/from DCA



4201 Wilson Blvd. Arlington, VA 22230





Soon:
10 mins to/from DCA

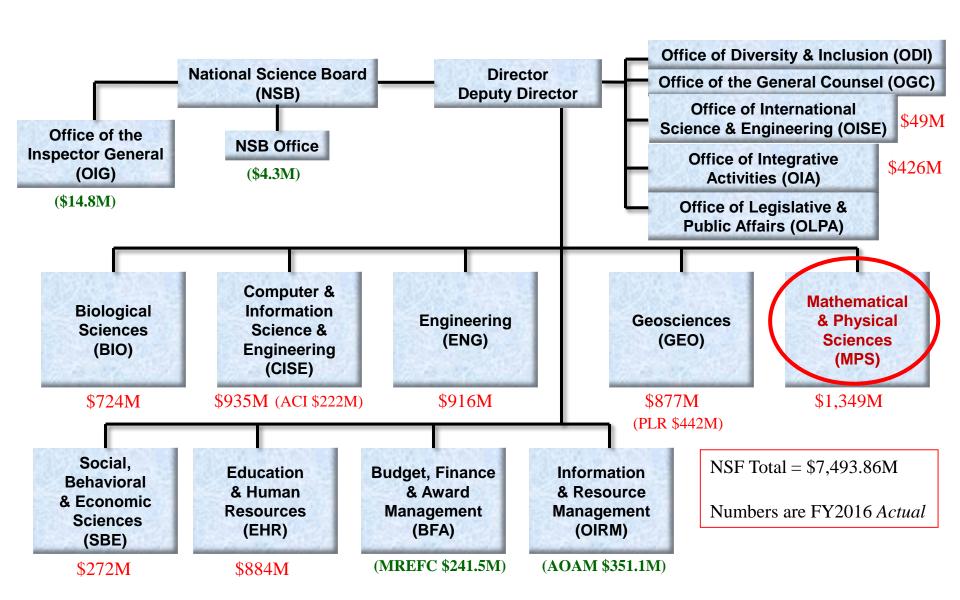


2415 Eisenhower Ave. Alexandria, VA 22314



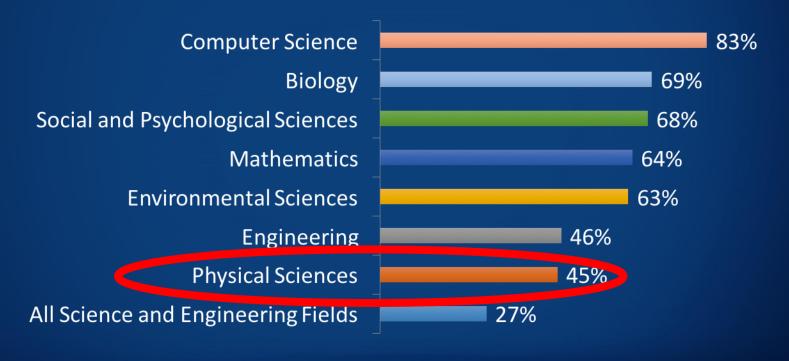


NSF Organization Chart





NSF Support of Academic Basic Research in Selected Fields (as a percentage of total federal support)

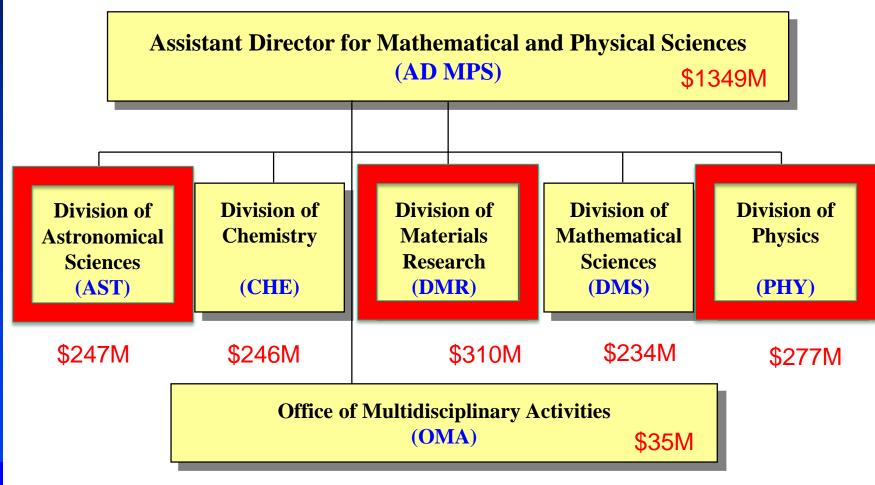


Note: Biology includes Biological Science and Environmental Science. Biology and Psychological Sciences exclude National Institutes of Health funding from the total amount of federal support.

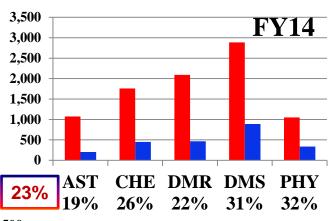
Source: NSF/National Center for Science and Engineering Statistics, Survey of Federal Funds for Research and Development



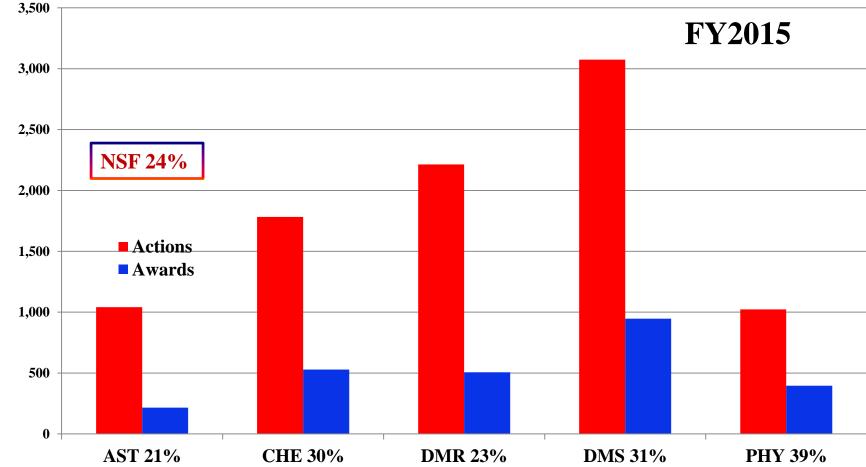
Mathematical and Physics Sciences





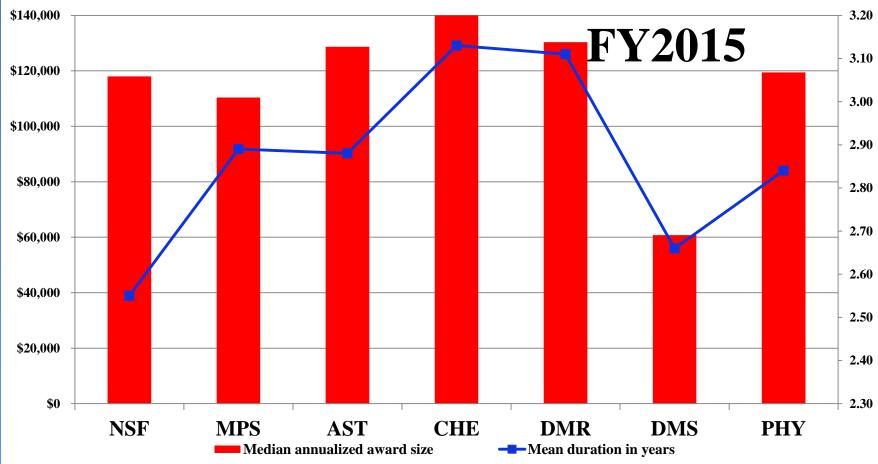


Funding Rates





Median Annualized Award Size and Duration





Award duration from one to five years (longer allowed, but rare)

AST Division Programs

nsf.gov/ast

Individual Investigators (Lead: James Neff)

Mid-scale (Lead: Rich Barvainis)

Facilities

AAG

MSIP

CAREER

Research

AAPF

ATI

Technology/

Instrumentation

ALMA

NRAO

Gemini

NOAO

NSO

Arecibo

GBO & LBO

REU

MRI

PAARE

Education and Special Programs



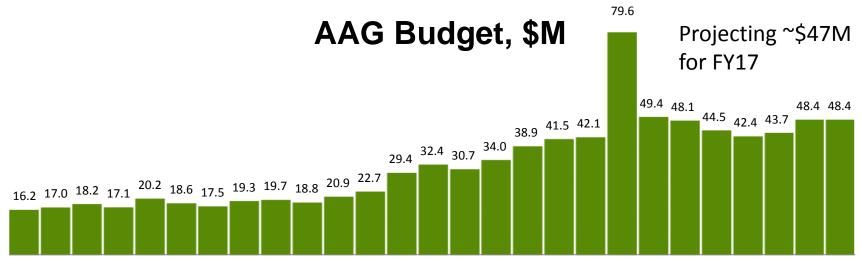
Astronomy and Astrophysics Research Grants (AAG) Solar and Planetary Research Grants (SPG)

Annual AAG deadline: November 15 (no deadline for SPG)

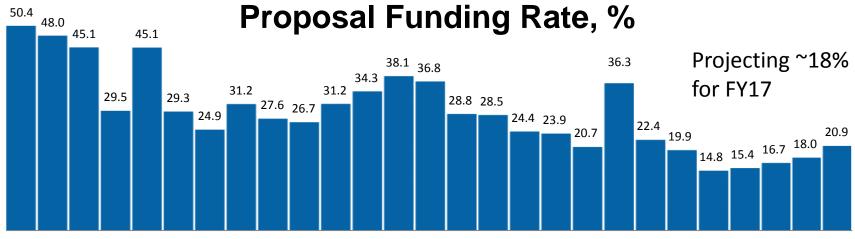
- Research grants for observational, theoretical, laboratory, and archival data studies in all areas of astrophysics
- Also support programs that *enable* new research capabilities
- Proposals may span multiple disciplines and/or areas of study and may utilize multiple techniques.



AAG Funding History, 1990-2016



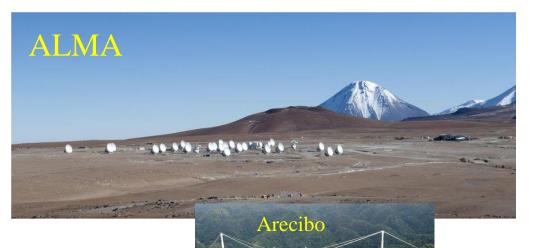
1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016





1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016

Our Facilities



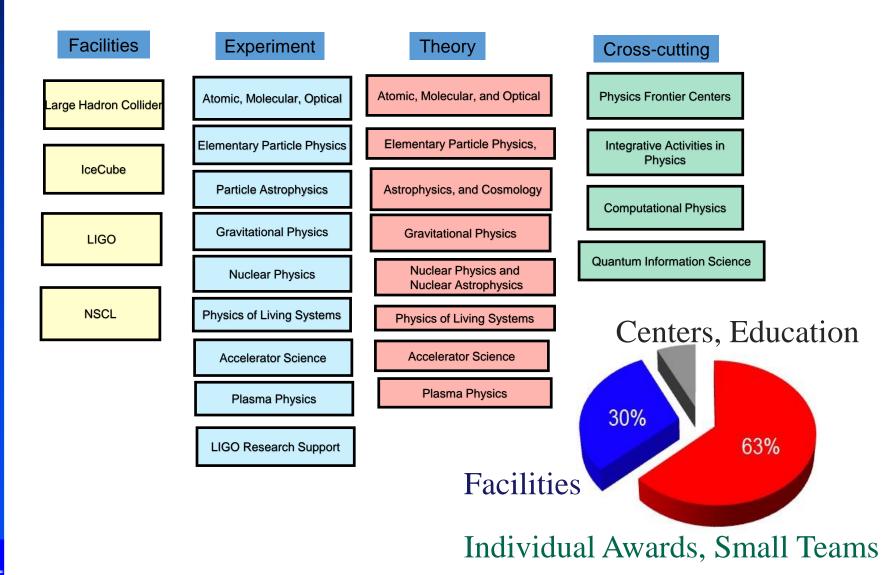








Anyone may propose for observing time on NSF AST-funded facilities





Program Solicitation: Investigator-Initiated Research Projects (17-561)

https://www.nsf.gov/pubs/2017/nsf17561/nsf17561.pdf

Note: CMP is in DMR, not PHY

New requirements for some PIs
Does not override existing solicitations such as
CAREER, REU sites, etc
Initiated deadlines instead of target dates

Separate deadlines for different Physics programs



PIs with concurrent sources of support:

- Explain how the proposed work is distinct from other funded activities.
- Discuss commitments (such as deliverables, specific projects) associated with other support
- Put in the Current/Pending Support section.

Additional Information for Midscale Instrumentation

This section applies to proposals for support of instrumentation acquisition or development at the level of \$4 million and above. This language may also apply to requests for lesser amounts if the cognizant Program Director concludes that the complexity of the instrumentation merits this approach. Investigators should first contact the Program Director for their physics discipline. Proposals should be submitted to the PHY Program (not a separate solicitation.)

PIs whose **list of collaborators** does not fit into the Biographical Sketches section:

- include as a supplementary document a list that provides the names of the collaborative groups, and lists of all collaboration members with whom the PI works directly.
- There are restrictions on the content in *Letters of Collaboration* or *Membership in large collaborations*



Full Proposal Deadline(s) (due by 5 p.m. submitter's local time):

October 25, 2017 Last Wednesday in October, Annually Thereafter Atomic, Molecular & Optical Physics - Experiment & Theory; Elementary Particle Physics - Experiment; Gravitational Physics - Experiment & Theory; Integrative Activities in Physics; LIGO Research Support; Particle Astrophysics - Experiment; Physics of Living Systems

November 08, 2017 Second Wednesday in November, Annually Thereafter Nuclear Physics - Experiment and Theory

<u>December 07, 2017</u> First Thursday in December, Annually Thereafter Elementary Particle Physics - Theory; Particle Astrophysics and Cosmology - Theory; Quantum Information Science

<u>December 06, 2018</u> First Thursday in December, Annually Thereafter Computational Physics



World Class Major Facilities

Keeping Researchers at the Frontier











Division of Materials Research

Topical Programs (Individual Investigator Programs)

Accept Proposals from October 1-31 each year

- Biomaterials
- Solid-State and Materials Chemistry
- Polymers
- Metals and Metallic Nanostructures
- Condensed Matter Physics
- Electronic and Photonic Materials

Proposals Accepted Anytime

- Condensed Matter and Materials Theory (NSF 16-596)
- Ceramics (NSF 16-597)

Cross-Cutting Activities (Diversity, Education and

International) Crosscutting Activities Program in Materials Research (XC

Include within IIP:

- RUI
- GOALI
- CAREER



Division of Materials Research

- DMR Centers and Teams
 - Materials Research Science and Engineering Centers (MRSEC)
 - Partnerships for Research and Education in Materials (PREM)
 - Designing Materials to Revolutionize and Engineer our Future (DMREF)
 - REU Sites (NSF-Wide)
 - Check website for deadlines/ Program Officers
- Cross-Cutting Activities (Diversity, Education and International) Crosscutting Activities Program in Materials Research (XC)



Division of Materials Research National Facilities and Instrumentation

- National User Facilities: Open access, free of charge, competitive proposals review.
- Major Research Instrumentation (MRI).



Division of Materials Research

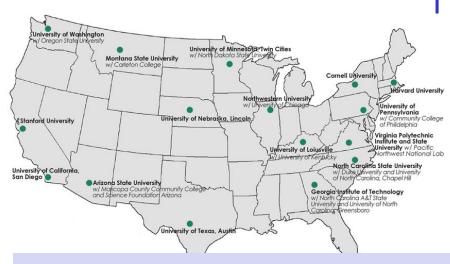
National Facilities and Instrumentation



Cornell High Energy Synchrotron Source (Cornell, Ithaca)



Center for High Resolution Neutron Scattering (NIST, MD)



National Nanotechnology Coordinated Infrastructure



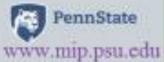
National High Magnetic Field Facility (Florida)



Materials Innovation Platforms (MIP)

MIP Concept: Combine a focused research effort in an interactive feedback loop together with a mid-scale user facility open to the community to accelerate advancement of a materials research topic of national importance





Focus: 2-dimensional chalcogenide materials for future electronics

e.g., Can theory model growth kinetics and guide materials synthesis?





Focus: interfacial materials, combining oxides & 2D materials, for valleytronics & spintronics e.g. Can we design and create new interfacial materials by "breaking" Gibbs' & Pauling's rules?

Current Status:

- Accept user proposals; some samples delivered to users already
- World's first 300-atm floating-zone furnace at Paradim-JHU
- Integrated MBE, CVD, ARPES & STM/AFM later in 2017
- Access to computational, TEM & other capabilities
- Webinars and summer schools





Instrumentation

- Major Research Instrumentation
 (MRI)
- Divisional instrumentation programs
- Research grants





The Major Instrumentation Program (MRI)

NSF – 15-504, FAQ - 15 - 012

Next Deadline: Second Wednesday in January (Jan 18 in FY2018)

Restrictions on organization submission eligibility

Submission limit - Three (3) per organization: *If three proposals are submitted, at least one of the proposals must be for instrument development.*

Awards - up to \$4M for development or acquisition proposals

Cost-sharing at the level of 30% of the **total project cost** is required for Ph.D.-granting institutions and non-degree-granting organizations. **Cost-sharing is not required for non-Ph.D. granting institutions.**

Merit Review - At the time of submission, PI's are asked to identify an NSF division(s) to review proposal. NSF reserves the right to place proposals in the appropriate division(s) for review.



RUI: Facilitating Research at Primarily Undergraduate Institutions

- RUI proposals must be submitted in response to existing NSF funding opportunities and must abide by guidelines and deadlines in those documents.
- Current RUI solicitation is NSF 14-579. Also be familiar with PAPPG (NSF 17-1) and research program solicitation.

There is no single Foundation-wide deadline for RUI proposals – see Division programs



MPS AGEP GR Supplements

 Available to PIs at AGEP or AGEP Legacy Institutions

https://www.nsf.gov/mps/broadening_participation/index.jsp

- Graduate Student Eligibility
 - Emphasis placed on under-represented groups
 - Not currently supported by federal government (NSF, DOE, NIH, ...)
 - US Citizen, US National, or US Permanent Resident
- Stipend, tuition, benefits, and IDC (~\$60k)
- Renewable up to two times

See me and DCL 16-125 for more information



CAREER

Faculty Early Career Development Program NSF 17-537

https://www.nsf.gov/pubs/2017/nsf17537/nsf17537.htm

- NSF's most prestigious awards in support of junior faculty exemplifying the role of teacher-scholar
- Enhances and emphasizes the importance of balanced academic careers
- Includes plan to <u>integrate</u> research and education
- Deadline: July 21, 2017



CAREER

- Additional Requirements
 - Associate professors cannot apply
 - No Co-Investigators allowed on Cover Page
 - Requires letter from Department Chair or Equivalent
- SIZE
 - Lower Limit \$400K (total) [except for BIO, ENG,OPP: \$500k]
- DURATION
 - 5 Years
- PECASE
 - HONORARY ONLY (Unlike DOE)



Merit Review Criteria

NSF-funded Projects are expected to be of the highest intellectual quality with the potential to advance, if not transform, the frontiers of knowledge.

Projects are also expected to contribute more broadly to achieving societal goals, either through the research itself or through activities related or complementary to the research.

Two Merit Review criteria are considered when evaluating ALL NSF proposals:

- Intellectual Merit: the potential to advance knowledge
- Broader Impacts: the potential to benefit society and contribute to the achievement of specific, desired societal outcomes



Merit Review Criteria: Intellectual Merit

 How important is the proposed activity to advancing knowledge and understanding within its own field or across

different fields?

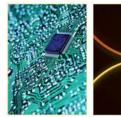
How well qualified is the proposer (individual or team) to conduct the project?

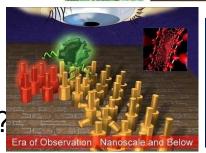
To what extendoes the proposed activity suggest and explore creative, original or potentially transformative concepts?

 How well conceived and organized is the proposed activity?

Is there sufficient access to resources?







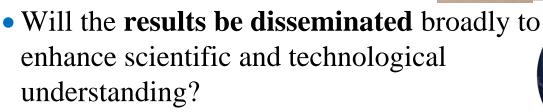




Merit Review Criteria:

Broader Impacts

- How well does the activity advance discovery and understanding while promoting teaching, training, and learning?
- How well does the proposed activity broaden the participation of **underrepresented groups**?
- To what extent will it enhance the **infrastructure** for research and education, such as facilities, instrumentation, networks, and partnerships?



• What may be the benefits of the proposed activity to **society**?







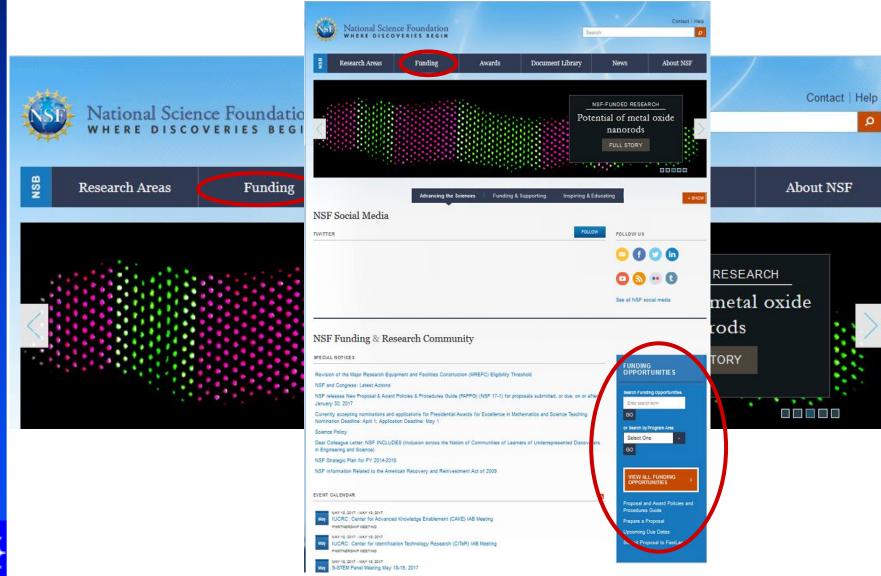
Broader Impacts

NSF Broader Impacts are (intentionally) broadly defined. Examples include, but are *not limited to*:

- improved STEM education and educator development at any level;
- increased public scientific literacy and public engagement with science and technology;
- full participation of women, persons with disabilities, and underrepresented minorities in science, technology, engineering, and mathematics (STEM);
- improved well-being of individuals in society;
- development of a diverse, globally competitive STEM workforce;
- increased partnerships between academia, industry, and others;
- improved national security;
- increased economic competitiveness of the United States;
- enhanced infrastructure for research and education.

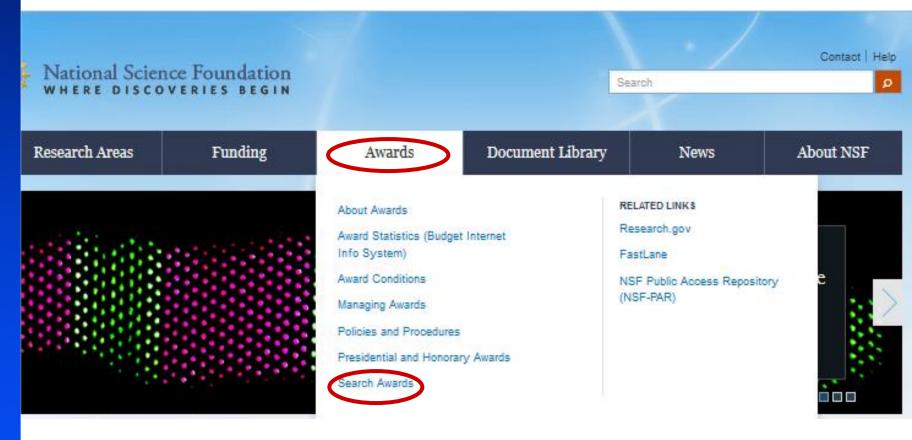


Funding Opportunities www.nsf.gov



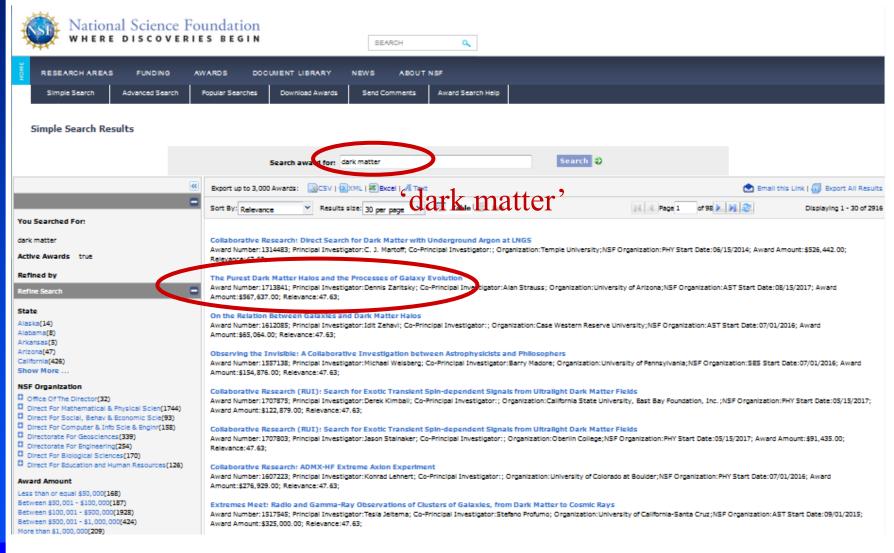


<u>www.nsf.gov</u> – Search Current Awards





www.nsf.gov/awardsearch





www nsf gov/awardsearch

RESEARCH AREAS FUNDING NEWS ABOUT NSF AWARDS: DOCUMENT LIBRARY Awards Award Abstract #1713841 The Purest Dark Matter Halos and the Processes of Galaxy Evolution Division Of Astronomical Sciences Search Awards Recent Awards Initial Amendment Date: May 17, 2017 Presidential and Honorary Awards Latest Amendment Date: May 17, 2017 **About Awards** Award Number: 1713841 How to Manage Your Award Award Instrument: Standard Grant **Grant Policy Manual Grant General Conditions** Program Manager: Peter Kurczynski AST Division Of Astronomical Sciences Cooperative Agreement MPS Direct For Mathematical & Physical Scien Conditions Special Conditions Start Date: August 15, 2017 Federal Demonstration **End Date:** July 31, 2020 (Estimated Partnership Policy Office Website Awarded Amount to Date: \$567.637.00 Investigator(s): Dennis Zaritsky dzaritsky@as.arizona.edu (Principal Alan Strauss (Co-Principal Investigator) Sponsor: University of Arizona 888 N Euclid Ave Tucson, AZ 85719-4824 (520)626-6000 NSF Program(s): EXTRAGALACTIC ASTRON & COSMOLO Program Reference Code(s): 1207 Program Element Code(s): ABSTRACT A galaxy contains a mixture of gas, stars and dark matter. The gas and stars emit light, making them easy to study. But the dark matter is, well, dark: It does not emit light; so, it is difficult to study. Theories of galaxy formation try to account for the mixtures of gas, stars and dark matter in galaxies of all types. Recently, a new type of galaxy was

discovered, the so-called ultra-diffuse galaxies (UDGs), These galaxies contain dark

Division that made the award.

Program Officer currently managing the award.

Funds allocated to date. See 'expired' awards for std level of investment per award.

Program(s) that funded this award.

Abstract for this award – reviewing abstracts provides information on research scope of the program – does your research fit?



Questions?

Ask Early, Ask Often

Jim Whitmore, jwhitmor@nsf.gov Guebre X. Tessema, gtessema@nsf.gov Jim Neff, jneff@nsf.gov



Outline

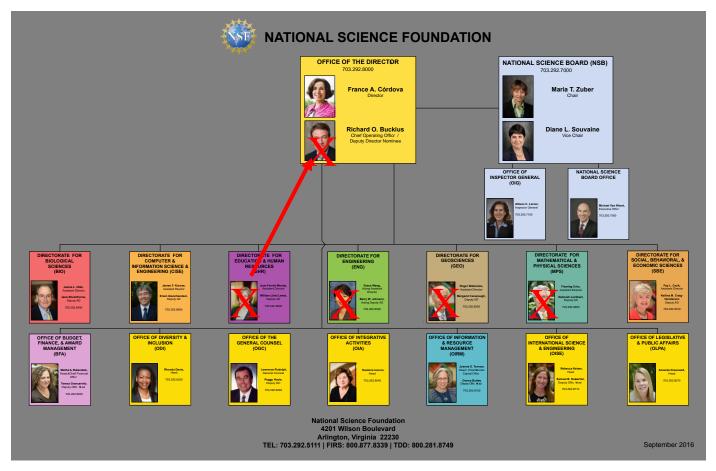
NSF Overview (Jim N)

Division of Astronomical Sciences (Jim N)
Division of Physics (Jim W)
Division of Materials Research (Tess)

Major Research Instrumentation Program (Tess)
RUI (Tess)
MPS AGEP GR Supplements (Tess)
CAREER Proposals (Tess)

Merit Review Criteria (Jim W)
Funding opportunities overview (Jim W)

Transitions: NSF



- Major NSF leadership transition in Jan/Feb
- Acting ADs for MPS, GEO, ENG, and EHR
- New Acting Chief Operating Officer
- GEO AD started on June 1; ENG AD will start on June 19.







MPS Overall Funding—FY 2018 Request

MPS Funding

(Dollars in Millions)

	=			Change Over FY 2016 Actual	
	FY 2016 Actual	FY 2017 (TBD)	FY 2018 Request	Amount	Percent
Astronomical Sciences (AST)	\$246.63	-	\$221.15	-\$25.48	-10.3%
Chemistry (CHE)	246.52	-	221.05	-25.47	-10.3%
Materials Research (DMR)	309.88	-	282.87	-27.01	-8.7%
Mathematical Sciences (DMS)	233.95	-	209.78	-24.17	-10.3%
Physics (PHY)	276.91	-	253.30	-23.61	-8.5%
Office of Multidisciplinary Activities (OMA)	34.89	-	31.28	-3.61	-10.3%
Total	\$1,348.78	-	\$1,219.43	-\$129.35	-9.6%



Principles Applied to MPS

- Support early career
 - CAREER request relatively stable. Targeted REU reductions if undergraduate students could be supported through national facilities and normal research awards. 8,000 graduate students to be supported through research awards.
- Protect the core; cross disciplinary programs
 - Major research facilities are "core" to MPS.
 - Retained flexibility to fund the best science by rolling some crossdisciplinary programs into core programs.
- Strategic and prioritized reductions within directorates
 - Emphasized funding of highest priority facilities; reductions proposed for some facilities in transition.
 - Reduced mid-scale and instrumentation; support individual investigators.
 - Prioritized low-level investments leading to "Big Ideas".



Proposal Preparation: Before You Start

- Investigate Program Websites
- Search the Award Database
- READ the Solicitation and the PAPPG
- Contact the Program Director ?
 - One or two paragraph describing projects
 - Possible phone call to talk about the project
- Especially if collaborative: Start Early
- Possible co-review if inter/cross-disciplinary



Proposal & Award Policies & Procedures Guide

(PAPPG) NSF 17-1

- Combination of the Grant Proposal Guide (GPG) and the Award & Administration Guide (AAG)
- Contains guidelines for all proposals (except when program solicitation stipulates otherwise)
- Provides guidance for Award process, from issuance and administration through closeout
- Describes NSF organizations and offices most relevant to grantees
- Provides a list of Statutes and Executive Orders



Proposal Preparation: Reading the Solicitation

In Program Announcement/Solicitation, look for:

- Goal of Program
- Eligibility
- Special proposal preparation and/or award requirements
- Deadlines/Target dates/ Submission windows
- Pre/Full proposal

In case of a conflict between the PAPPG and the solicitation, the solicitation overrides the PAPPG



Contents of an NSF Proposal

- Intellectual Merit & Broader Impact must be explicitly addressed in both Project Summary and Project Description
- Project Description
 - Results from Prior NSF support
- References
 - See Grant Proposal Guide Chapter II, Section C.2e
 - All Authors, Titles of Articles
- Biographical Sketch
 - See Grant Proposal Guide Chapter II, Section C.2f.
- Post Doc Mentoring One page in Supplementary Docs
- Data Maintenance Plan Two pages in Supplementary Docs
- Collaborator List Single Copy Document; special format

Non-conforming proposals may be returned without review!!!



Things to consider

- Why do it?
- Why you and not someone else?
 - Uniqueness of research, educational opportunities, available facilities...
- What are your strengths?
 - Capture the reviewers' attention in the summary and introduction. Make them want to read more.
- <u>YOU</u> must convince the reviewer you are worthy of funding
- Express yourself clearly
 - It's not the reviewer's job to figure out what you are trying to accomplish and why



Important NSF requirements

Cost-sharing: Inclusion of voluntary cost-sharing is prohibited.

In order to assess the scope of the project, all organizational resources necessary for the project must be described in the Facilities, Equipment and Other Resources section of the proposal. The description should be narrative in nature and must not include any quantifiable financial information.

Post-doc Mentoring Plan:

Required whenever a postdoc is to be supported through the award

Data Management Plan:

All proposals must describe plans for data management and sharing of the products of research, or assert the absence of the need for such plans. Up to two pages in the Supplementary Docs; must be labeled "Data Maintenance Plan"



Funding Decisions

Along with the advice provided by reviewers/panels, NSF staff will give careful consideration to the following in making funding decisions:

Integration of Research and Education

One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects and activities it supports at academic and research institutions. ...

Integrating Diversity into NSF Programs, Projects, and Activities

Broadening opportunities and enabling the participation of all citizens, women and men, underrepresented minorities, and persons with disabilities, are essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.



Before Your Submit Your Proposal

 Get someone else (with experience) to read the proposal, and leave your ego behind

Don't wait until the deadline to submit

 Download and Print the PDF file after finishing and double-check the font size, diagrams, etc.



CAREER

ELIGIBILTY: As of Directorate Deadline

- Hold a doctoral degree by the deadline date in a field supported by NSF;
- Be untenured until October 1 following the deadline; and
- Have not previously received a CAREER award (prior or concurrent Federal support for other types of awards or for non-duplicative research does not preclude eligibility);

AND

• By October 1st following the deadline for submission of CAREER proposals: Be employed in a tenure-track (or tenure-track-equivalent) position as an **assistant professor (or equivalent title)** at an accredited institution located in the U.S., its territories, or possessions, or the Commonwealth of Puerto Rico, that awards degrees in a field supported by NSF;

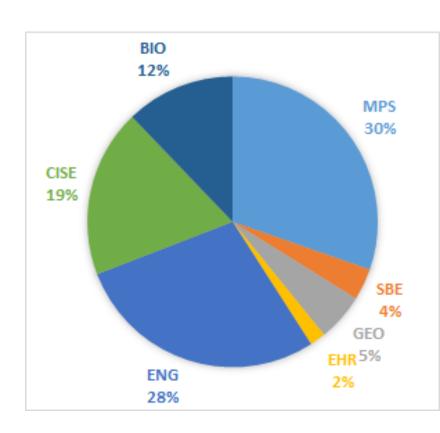
OR

• Be employed in a tenure-track position (or tenure-track-equivalent position) as an **assistant professor** (**or equivalent title**) at an organization located in the U.S., its territories or possessions, or the Commonwealth of Puerto Rico, that is a non-profit, non-degree-granting organization such as a museum, observatory, or research lab.



CAREER Program

Awardees are selected based on their plan of *outstanding* research, excellent education, and the integration of research and education within the context of the mission of their organizations, building a firm foundation for a lifetime of leadership.



FY2016

Increased participation of those traditionally under-represented in science and engineering is encouraged.



Finding Information

Directorate Pages from http://www.nsf.gov

