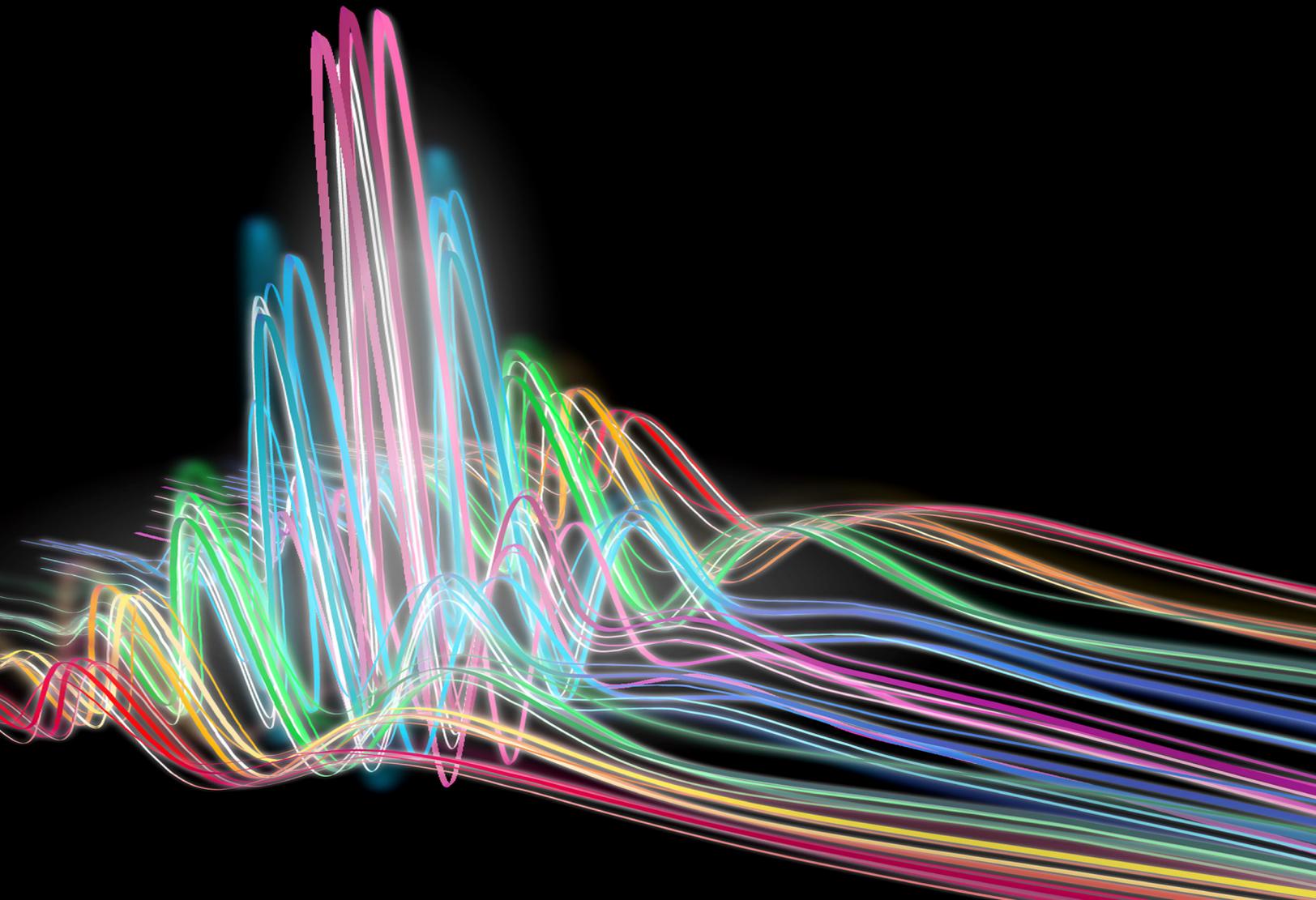
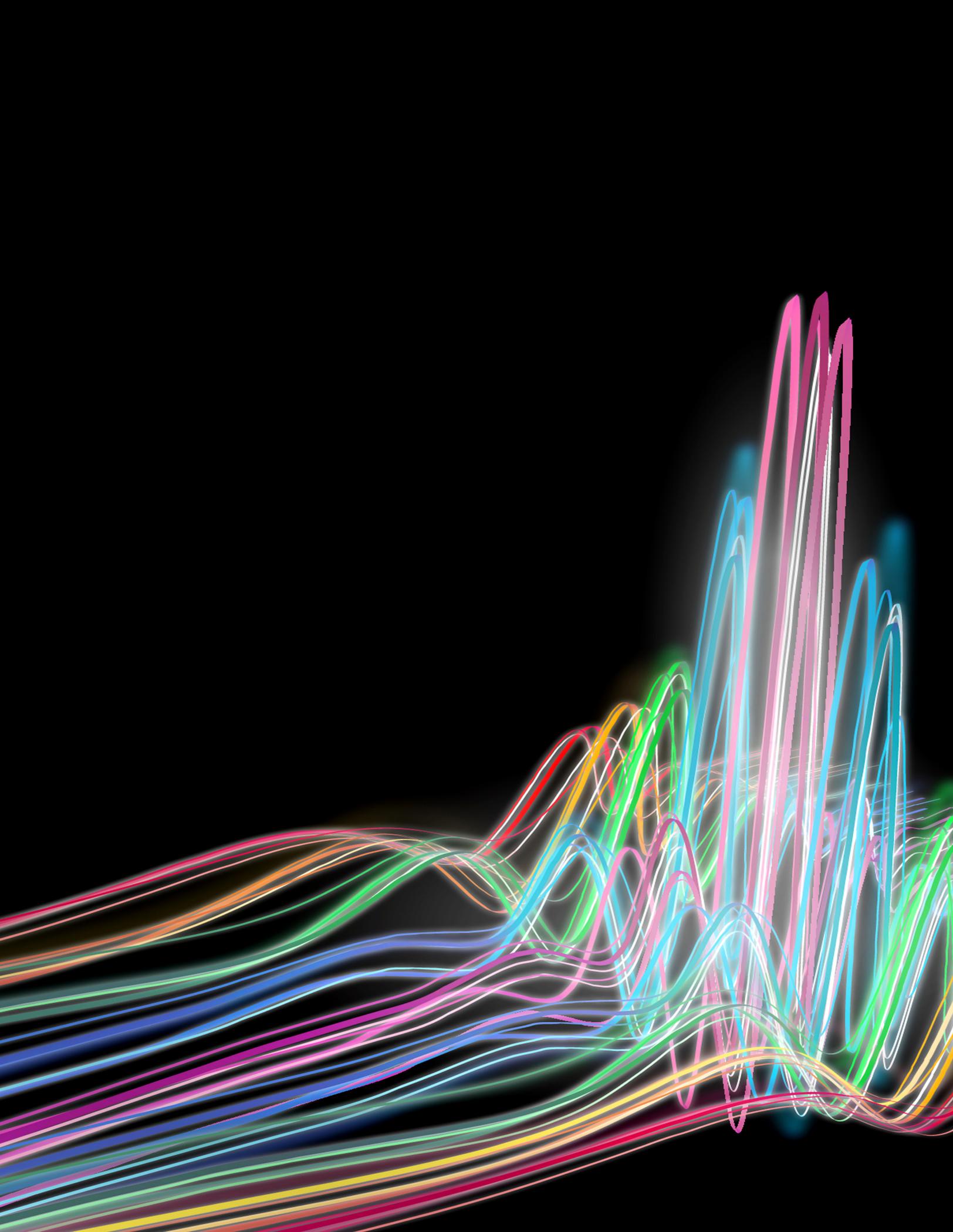


# The National Science Foundation's Merit Review Process

Fiscal Year 2013 Digest





## About This Report

The *FY 2013 Report on the NSF Merit Review Process* responds to a National Science Board (NSB) policy, endorsed in 1977 and amended in 1984, requesting that the NSF Director submit an annual report on the NSF merit review process. This Digest highlights key statistics and important trends in NSF proposals, awards, and merit review. Topics include Competitively Reviewed Proposals and Awards, Diversity of Principal Investigators, Research Grants, Principal Investigators on Research Grants, Mechanisms for Transformative and Interdisciplinary Research, Merit Review, and Workload and Characteristics of Program Officers.

The complete Merit Review Report is available on the Web at:

[http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=nsb1432](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsb1432)



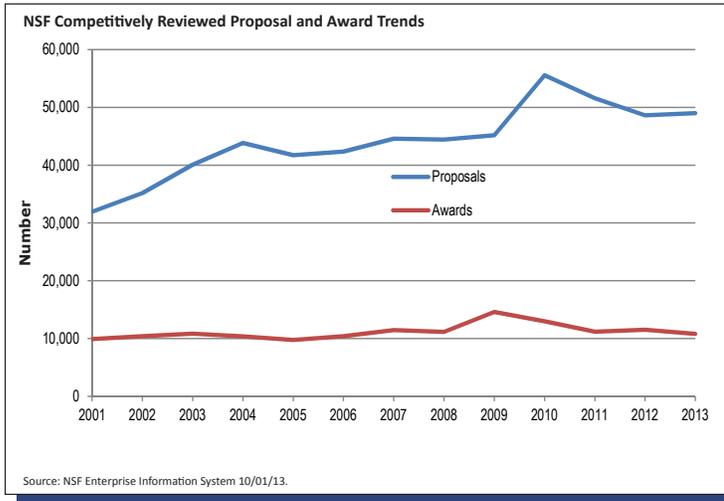
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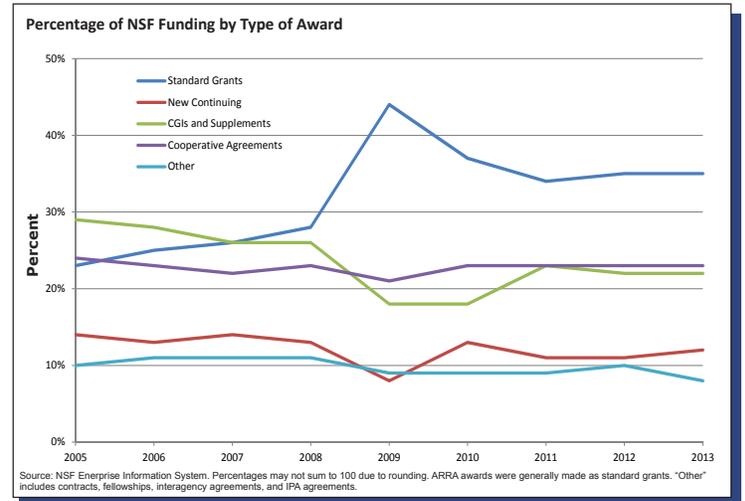
# Competitively Reviewed Proposals and Awards<sup>i</sup>

Although the number of proposals submitted to NSF has generally increased over time, the number of awards made has remained relatively stable. Thus the proposal success rate has declined over time.

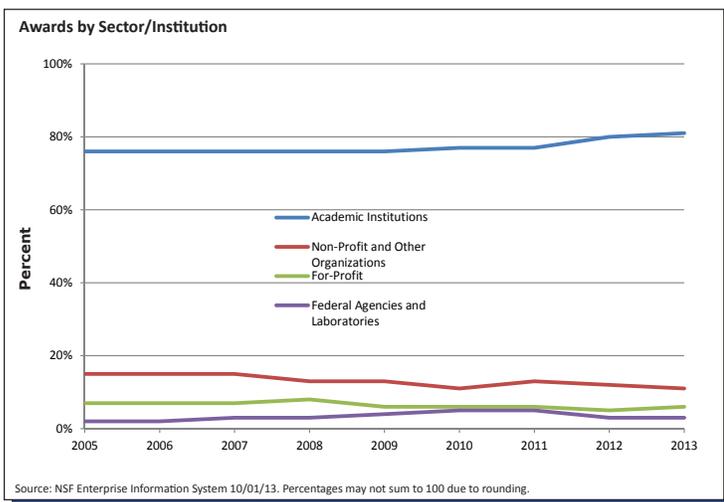
**A** Over the period 2001 to 2013, the number of proposals increased while the number of awards stayed relatively flat (2009 and 2010 included ARRA funding). In FY 2013, NSF completed action on 48,999 proposals and made 10,829 awards, for a proposal success rate of 22% (down from 31% in 2001).



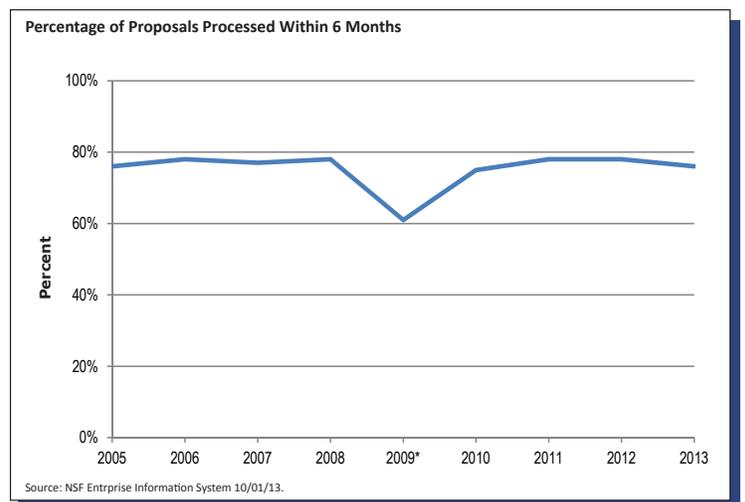
**B** A grant, either standard or continuing\*, is the primary funding mechanism used by NSF. New standard and continuing grants account for 47% of NSF funding and continuing grant increments and supplements account for another 23% of NSF funding.



**C** Most NSF awards go to academic institutions with the remainder going to non-profit and other organizations, for-profit businesses, or Federal agencies and laboratories.

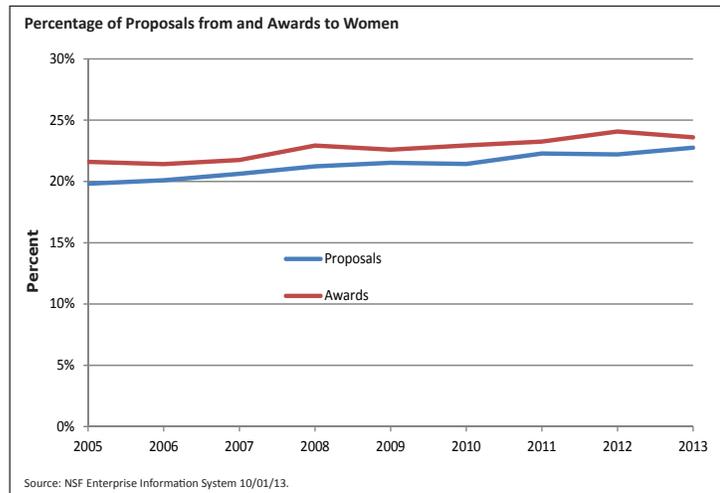


**D** The percentage of PIs informed about funding decisions within six months has been fairly constant over time. In FY 2009, NSF delayed processing proposals that would have been declined due to lack of funding in order to enable some of these proposals to be funded with the ARRA appropriation.

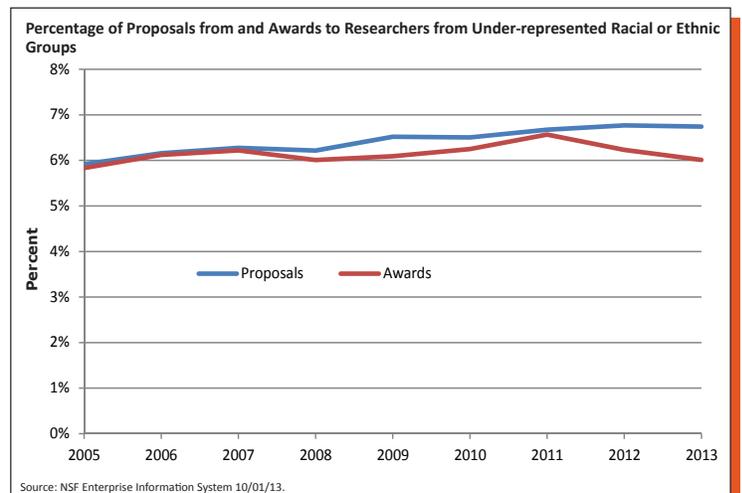


To advance the goals in NSF's Strategic Plan (FY2011-2016), one of the core strategies described is broadening the participation in NSF's activities by members of groups that are currently under-represented in STEM disciplines. This includes ensuring the participation of researchers, educators and students from under-represented groups in NSF's programs.

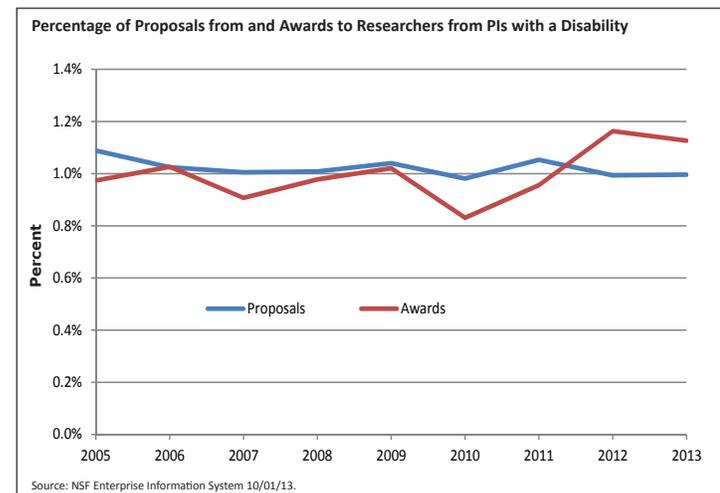
**A** Over the past decade, there has been a relatively steady rate of increase in the proportion of proposals that are submitted by women and a corresponding upward trend in the proportion of awards that are made to women. The success rate for female PIs is slightly higher than that for male PIs.



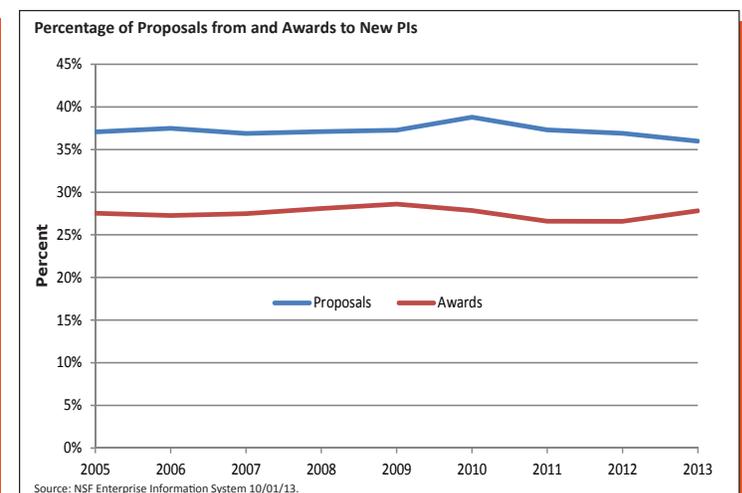
**B** Since FY 2005, there has been a relatively steady increase in the proportion of proposals that are submitted by PIs who identify themselves as belonging to under-represented racial or ethnic groups although the number remains low and the success rate is slightly lower than average.



**C** The proposal success rate for PIs identifying themselves as having a disability has remained comparable to the overall success rate for all PIs. Unlike women and under-represented racial and ethnic groups, the proportion of proposals that come from researchers with disabilities has not grown from FY 2005 – FY 2013.



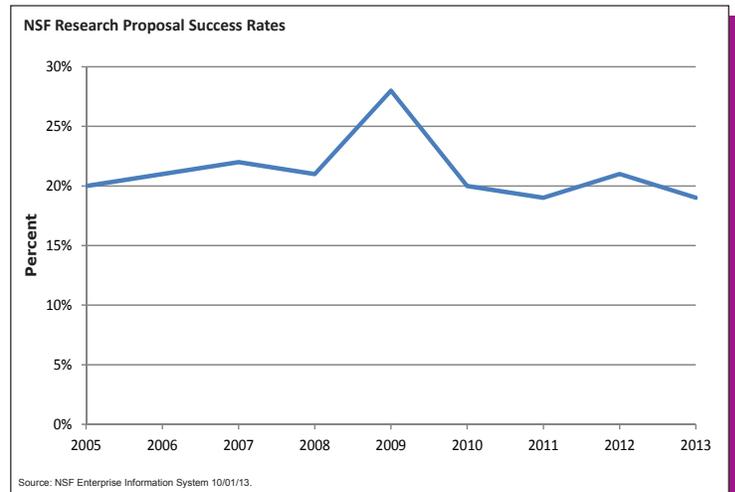
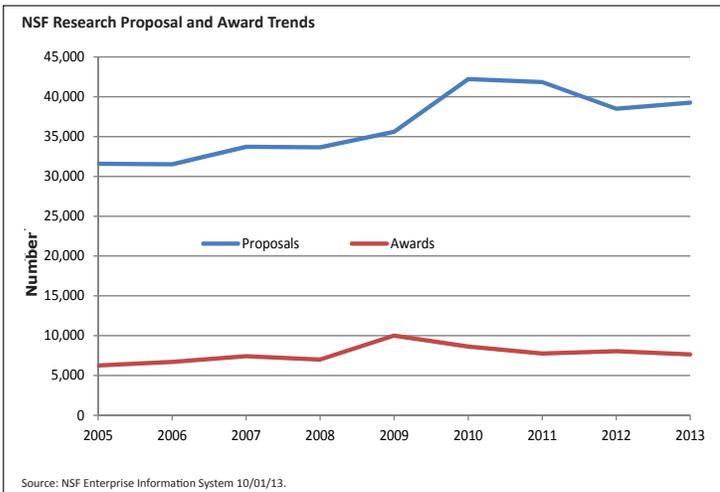
**D** The success rate for PIs who have not previously had an NSF award is lower than that for PIs who have previously submitted a successful NSF proposal. In FY 2013, the proportion of proposals from new PIs was 36%.



Research proposals are proposals for what could be considered a ‘typical’ research project in terms of size and scope. They are distinguished from such things as proposals for facilities, centers and educational activities.

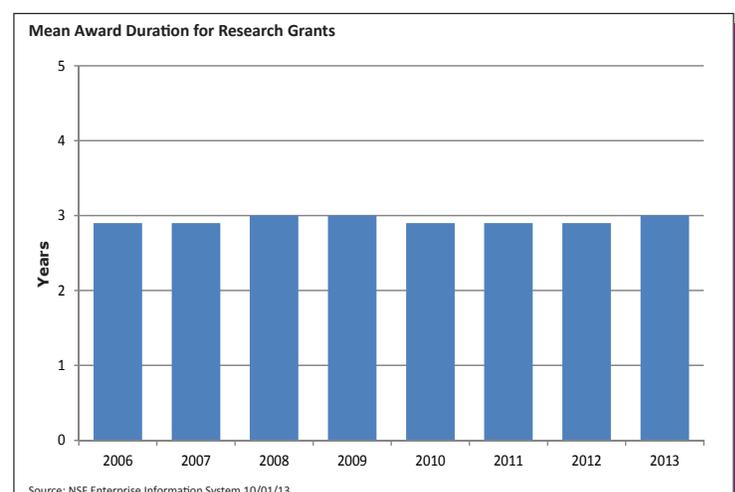
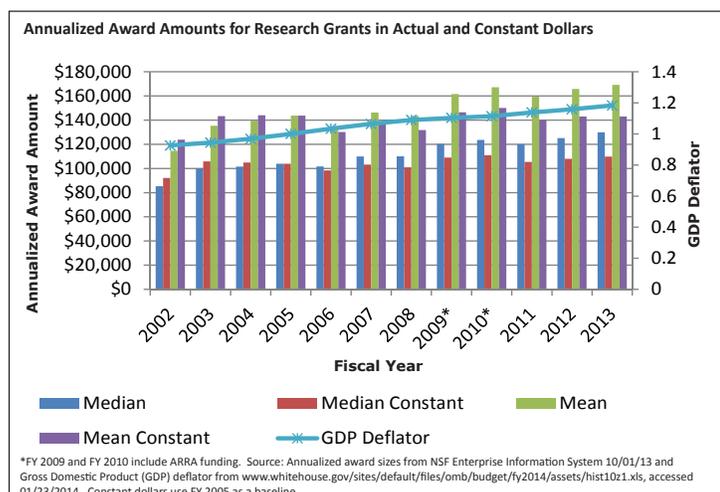
**A** The number of new awards made in FY 2013 was 5% lower than the number made in FY 2012 due partly to a reduction in the amount of funds available as a result of the Budget Control Act of 2011 and the American Taxpayer Relief Act of 2012<sup>iii</sup>, and partly to an increase in mean award size.

**B** These factors, together with the increase in the number of research proposals, contributed to a drop in the success rate for research proposals to 19.5%.<sup>iv,v</sup>



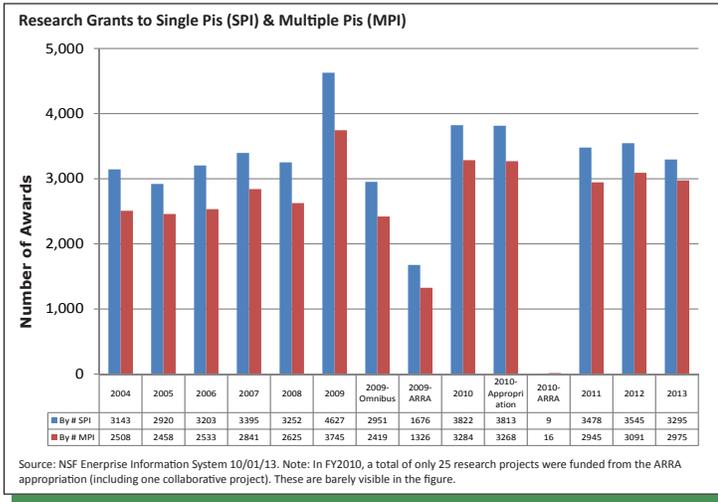
**C** From FY 2003 to FY 2013, the average grant size has been relatively constant in inflation-adjusted dollars.

**D** The average award duration has remained relatively constant.

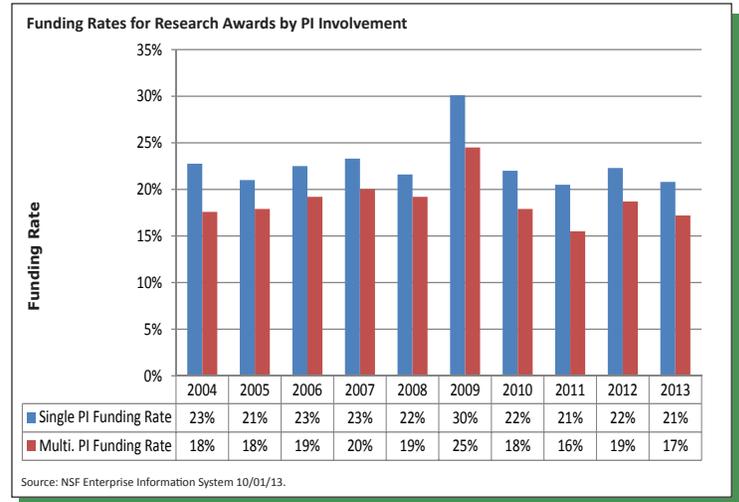


Research grants typically support researchers, graduate students, and postdocs. More research grants go to Single Principal Investigators (SPI) than to Multiple Principal Investigators (MPI).

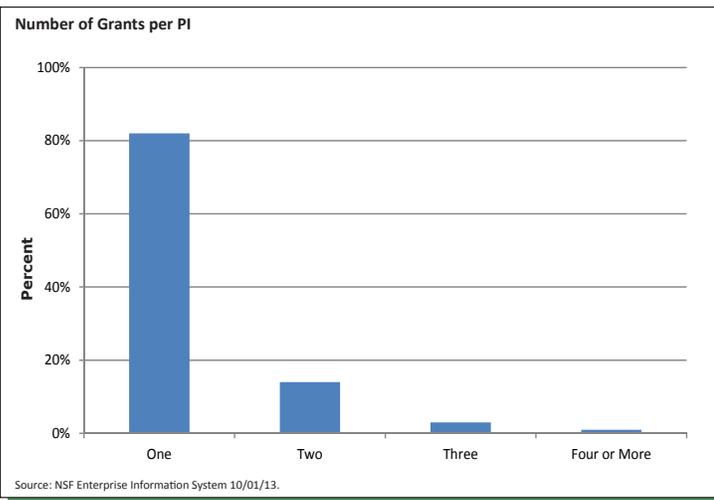
**A** The number of SPI grants remains greater than the number of MPI grants.



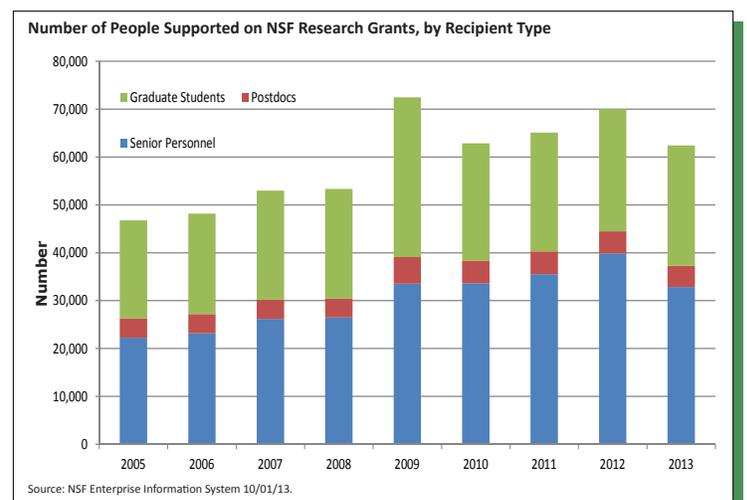
**B** The difference between the SPI and MPI success rates has varied over the last ten years, but the SPI success rate has been consistently higher.



**C** The proportion of PIs with various numbers of active grants. Results are averaged over the three years, FY 2011 – FY 2013.

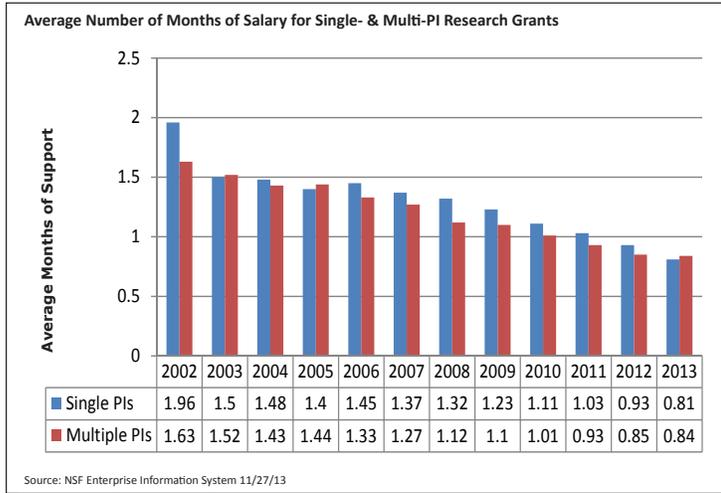


**D** From FY 2005 to FY 2012, the number of senior personnel supported on NSF research grants tended to increase; however, in FY 2013 this number fell back to approximately the FY 2010 level. As a result of ARRA funding, the numbers of graduate students and postdocs peaked in FY 2009.

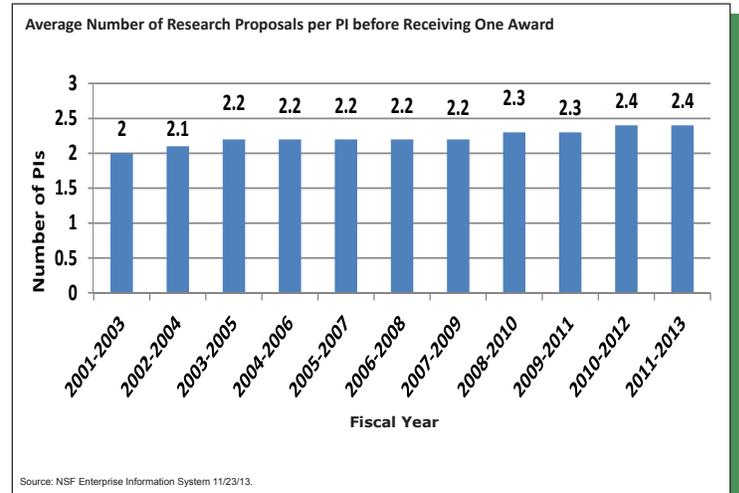


Over time, the amount of salary support, measured in months, covered in a research grant has decreased, the number of proposals submitted before receiving an award increased, and the percentage of principal investigators funded decreased.

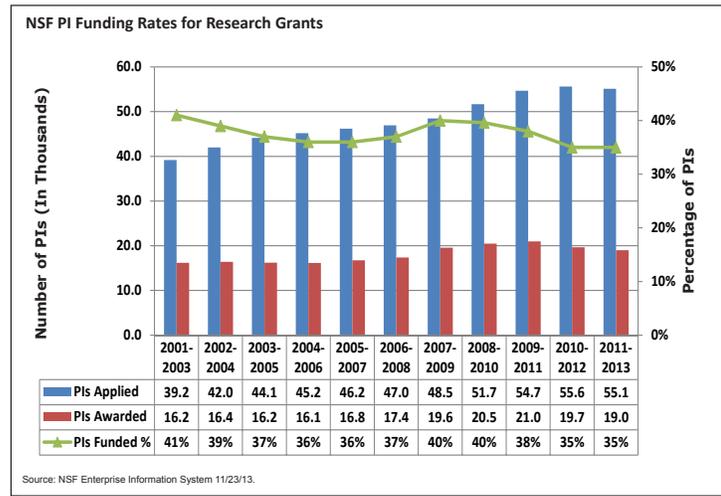
**E** Since FY 2002, the average number of months of salary support for PIs and co-PIs has generally decreased for both single and multiple-PI awards.



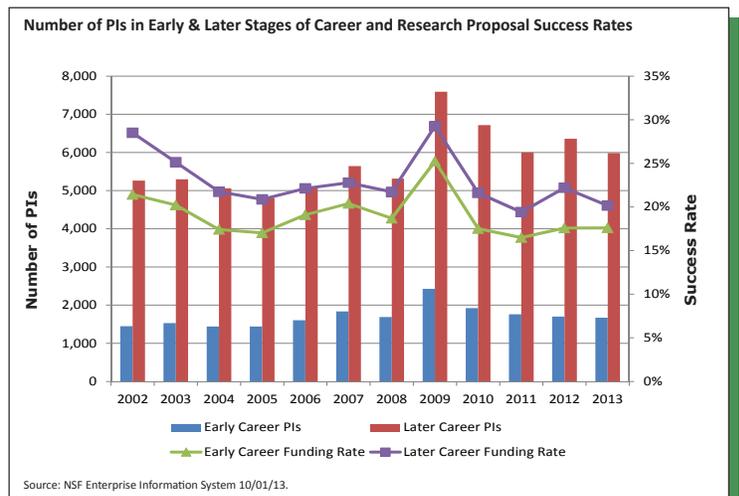
**F** On average, the number of proposals an investigator submits before receiving an award has gradually increased over the past decade.



**G** The number of investigators submitting proposals grew over the past decade at a rate that exceeded the rate of growth of NSF's normal appropriation in inflation adjusted dollars. Consequently, the success rate of PIs declined. The decline in PI success rate was temporarily halted by the funds appropriated under ARRA but resumed after this.

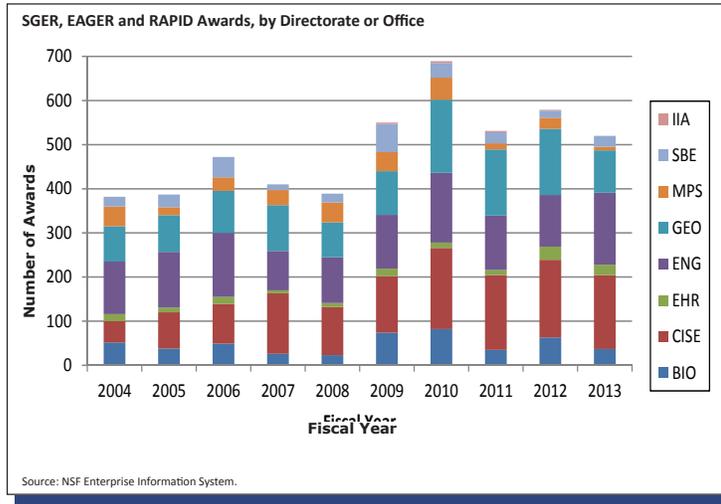


**H** Early career PIs (those within seven years of receiving their last degree at the time of the award) have lower proposal success rates than later career PIs, but the gap in success rates narrowed in 2013.

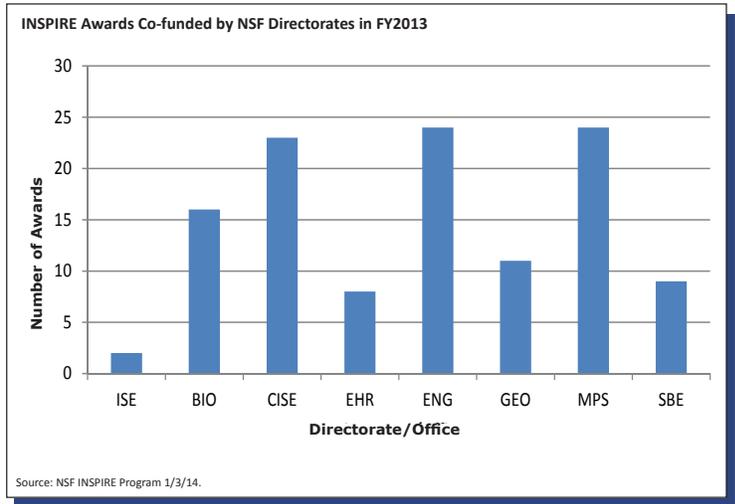


NSF has several mechanisms to encourage submission of potentially transformative research proposals other than core programs and targeted solicitations — Small Grants for Exploratory Research (SGER), Early-concept Grants for Exploratory Research (EAGER), Grants for Rapid Response Research (RAPID), and Integrated NSF Support Promoting Interdisciplinary Research and Education (INSPIRE).

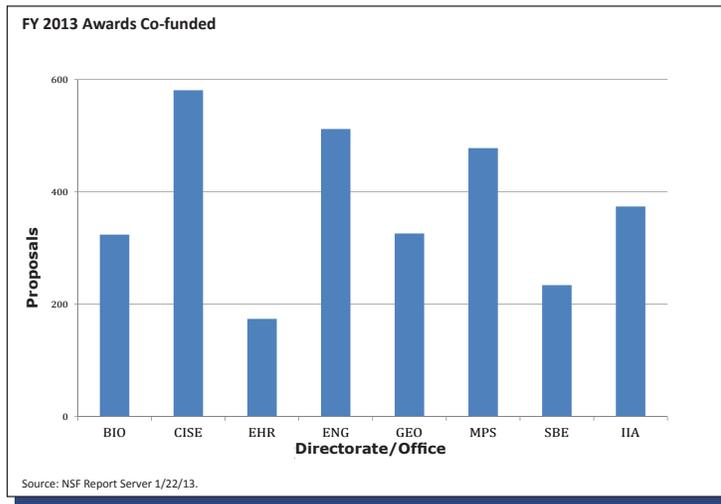
**A** The number of SGER, EAGER and RAPID awards in the period FY 2009 – FY 2013 was larger than anytime during the period FY 2004 – FY 2008 before EAGER and RAPID awards were introduced.<sup>vi</sup> CISE, ENG and GEO together account for three-quarters of these awards.



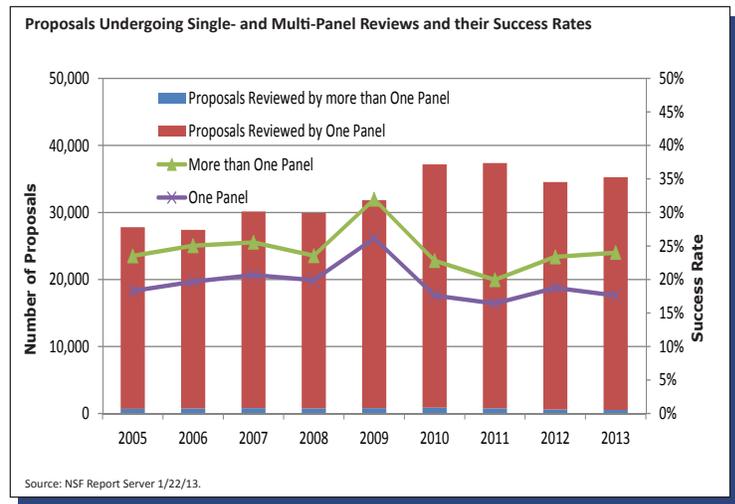
**B** In FY 2013, 53 INSPIRE Track 1 awards were made; up from 40 INSPIRE awards made in FY 2012. Reflecting the interdisciplinary nature of these projects, all were co-funded from different units within NSF.



**C** One indicator of the number of interdisciplinary awards is the number of awards that are funded by more than one part of NSF. In FY 2013, approximately 12.3% of awards were co-funded.<sup>vii</sup>

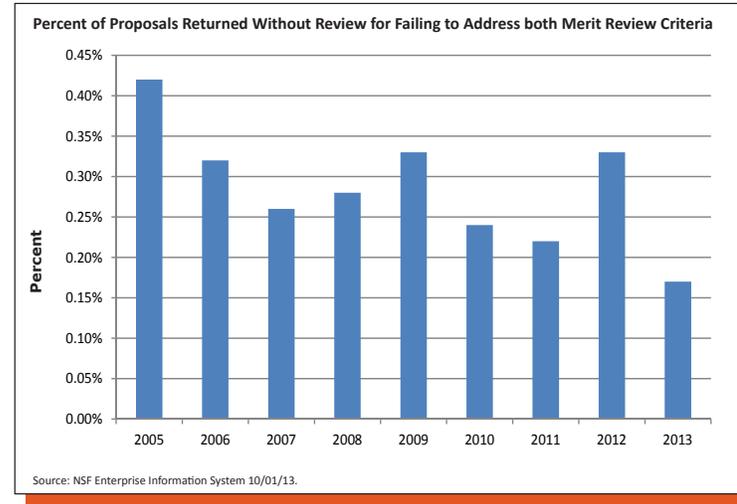


**D** A relatively small fraction of interdisciplinary proposals are reviewed by multiple panels. The success rate for proposals reviewed by more than one panel is consistently 4 to 6 percentage points higher than the rate for proposals that are only reviewed by a single panel.

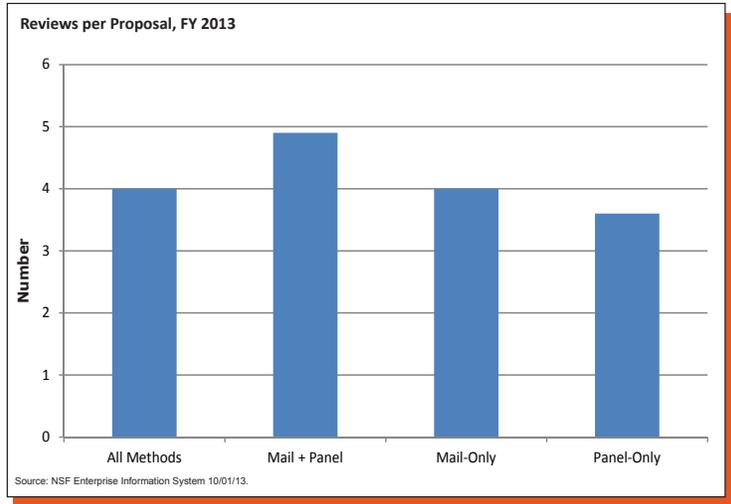


NSF has two merit review criteria--Intellectual Merit and Broader Impacts. The Intellectual Merit criterion encompasses the potential to advance knowledge. The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes. Proposals submitted to NSF are reviewed by three principal methods: (1) "mail-only," (2) "panel-only," and (3) "mail + panel" review. A large number of potentially fundable proposals are declined each year.

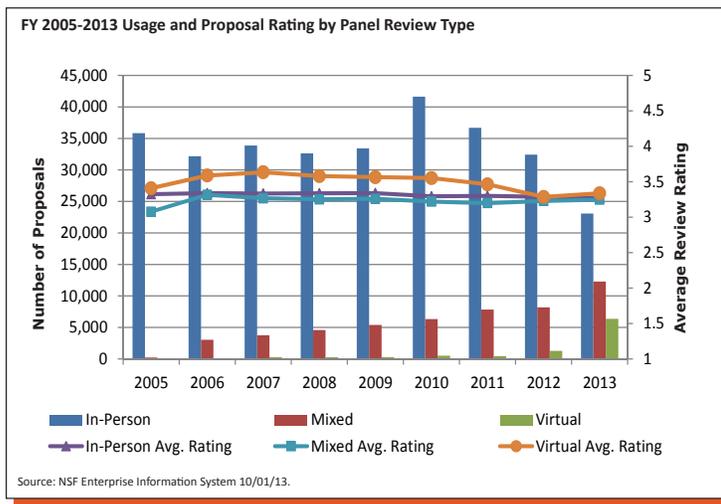
**A** Since 2006, the number of proposals returned without review for failing to address both NSB merit review criteria has been 1 in 300 or fewer.



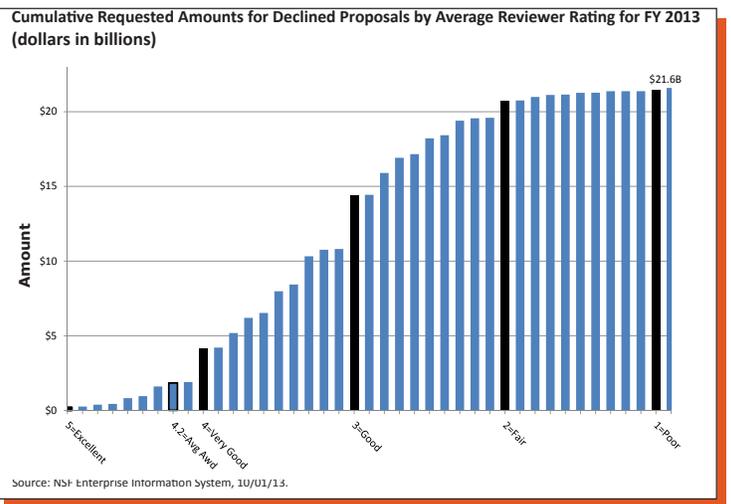
**B** The mail-plus-panel method had the highest number of reviews per proposal, averaging 4.9, while the panel-only method averaged 3.6.



**C** In recent years, "virtual panels" have emerged as an alternative to in-person review panels. However, virtual panels, on average, review fewer proposals per panel than in-person and only 14.5% of proposals that were reviewed by panels went through virtual panels in FY 2013.



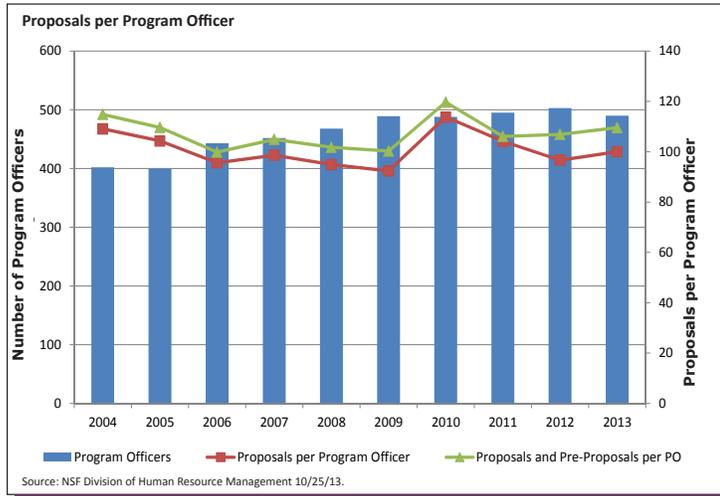
**D** \$1.84 billion was requested in FY 2013 for declined proposals that had received ratings at least as high as the average rating for all awarded proposals. These declined proposals represent a rich portfolio of unfunded opportunities, proposals that, if funded, may have produced substantial research and education benefits.



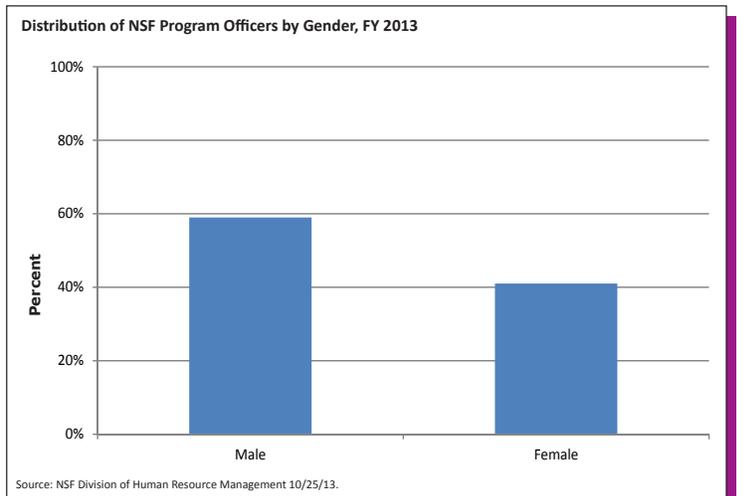
## Workload and Characteristics of Program Officers

Program officers, either permanent NSF employees or non-permanent employees, make the final recommendation on proposals. They look not only at the ratings provided by reviewers but also weigh the comments that reviewers provide on the intrinsic merits of proposals. They also take into consideration other factors that might not have been considered by external reviewers.

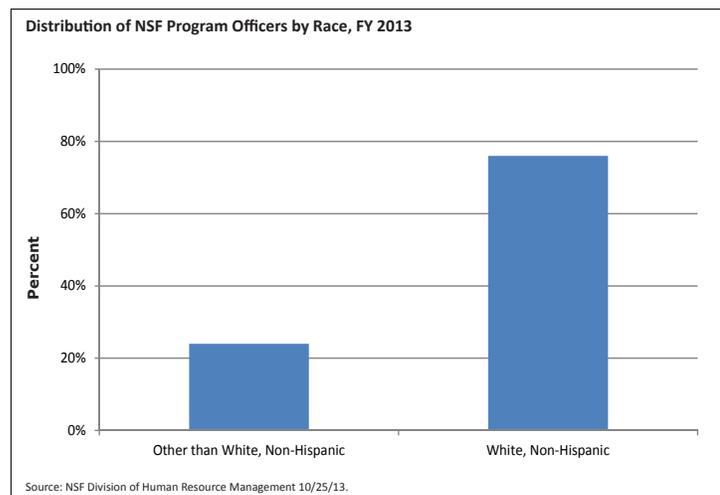
**A** The number of program officers decreased from FY 2012 to FY 2013<sup>viii</sup> and the number of full proposals that were submitted increased. This resulted in a 3.5% increase in proposals processed per program officer.



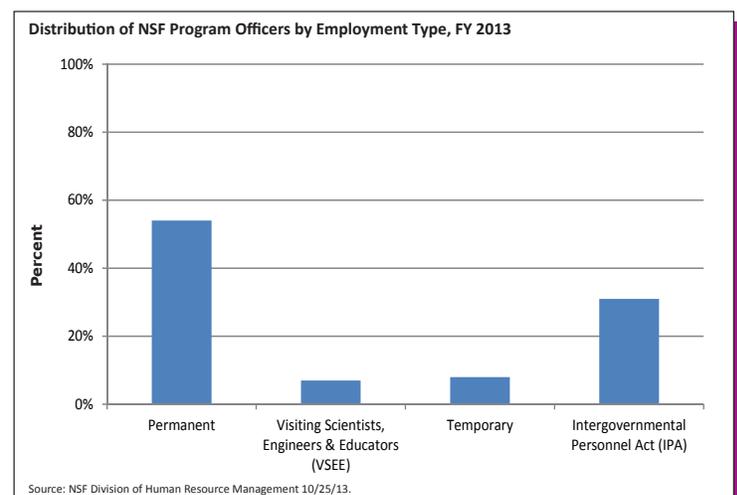
**B** At the end of FY 2013, approximately 41% of the program officers were female.



**C** Between one-quarter and one-fifth of program officers identified themselves as belonging to a racial and ethnic category other than White, Non-Hispanic.



**D** More than half of NSF program officers are permanent employees and an additional almost one-third are IPAs; i.e., temporary employees with appointments under the Intergovernmental Personnel Act.



# Endnotes

<sup>i</sup> Results for FY 2009 and FY 2010 include funding actions made possible by the \$3 billion additional appropriation that NSF received under the American Recovery and Reinvestment Act (ARRA). Approximately \$2.5 billion of the ARRA appropriation was obligated in FY 2009. The remainder was obligated in FY 2010, primarily as facilities awards.

The category of actions associated with “competitively reviewed proposals,” excludes actions on preliminary proposals, contracts, IPA agreements, continuing grant increments, Graduate Research Fellowships, and similar actions.

\* A grant may be funded as either a standard award, in which funding for the full duration of the project is awarded in a single fiscal year, or a continuing grant award, in which funding for a multi-year project is provided in, usually annual, increments.

<sup>ii</sup> The term research grant is used by NSF to represent what could be considered a typical research award, particularly with respect to the award size. Education research grants are included in this category. Excluded are large awards such as centers and facilities, equipment and instrumentation grants, grants for conferences and symposia, grants in the Small Business Innovation Research program, Small Grants for Exploratory Research, and education and training grants.

<sup>iii</sup> These Acts reinstated and adjusted discretionary spending limits on budget authority and had the effect of imposing an approximately 5% sequestration of discretionary spending appropriated for FY 2013. The net result was that NSF’s FY 2013 budget was approximately 2% lower than in FY 2012.

<sup>iv</sup> The ratio of success rates between FY 2013 and FY 2012 is 0.93 [ = (7,652/39,249) ÷ (8,061/38,490) ].

<sup>v</sup> EAGER and RAPID proposals, which have a high success rate, are approximately 1.4% of the research proposals. If these are removed from the total, then the success rate for research proposals is reduced from 19.5% to 18.4%.

<sup>vi</sup> FY 2010 saw an increase in the number of SGER, EAGER and RAPID awards primarily because of RAPIDs awarded to enable researchers to respond to unusual events (earthquakes in Haiti and Chile, and the Gulf of Mexico oil spill).

<sup>vii</sup> Co-funding associated with EPSCoR or international activities does not, of itself, imply interdisciplinary proposal content. If we remove awards in which co-funding is between IIA/ISE or IIA/EPSCoR and a single other division, then the proportion of awards that are co-funded is approximately 9.7% in FY 2013.

<sup>viii</sup> The Division of Human Resource Management revised its methodology for counting program officers. The revised counts for FY 2012 are: Total = 503; Female = 206; Male = 297; White, Non-Hispanic = 376; Permanent = 262; VSEE = 39; Temporary = 39; IPA = 163.



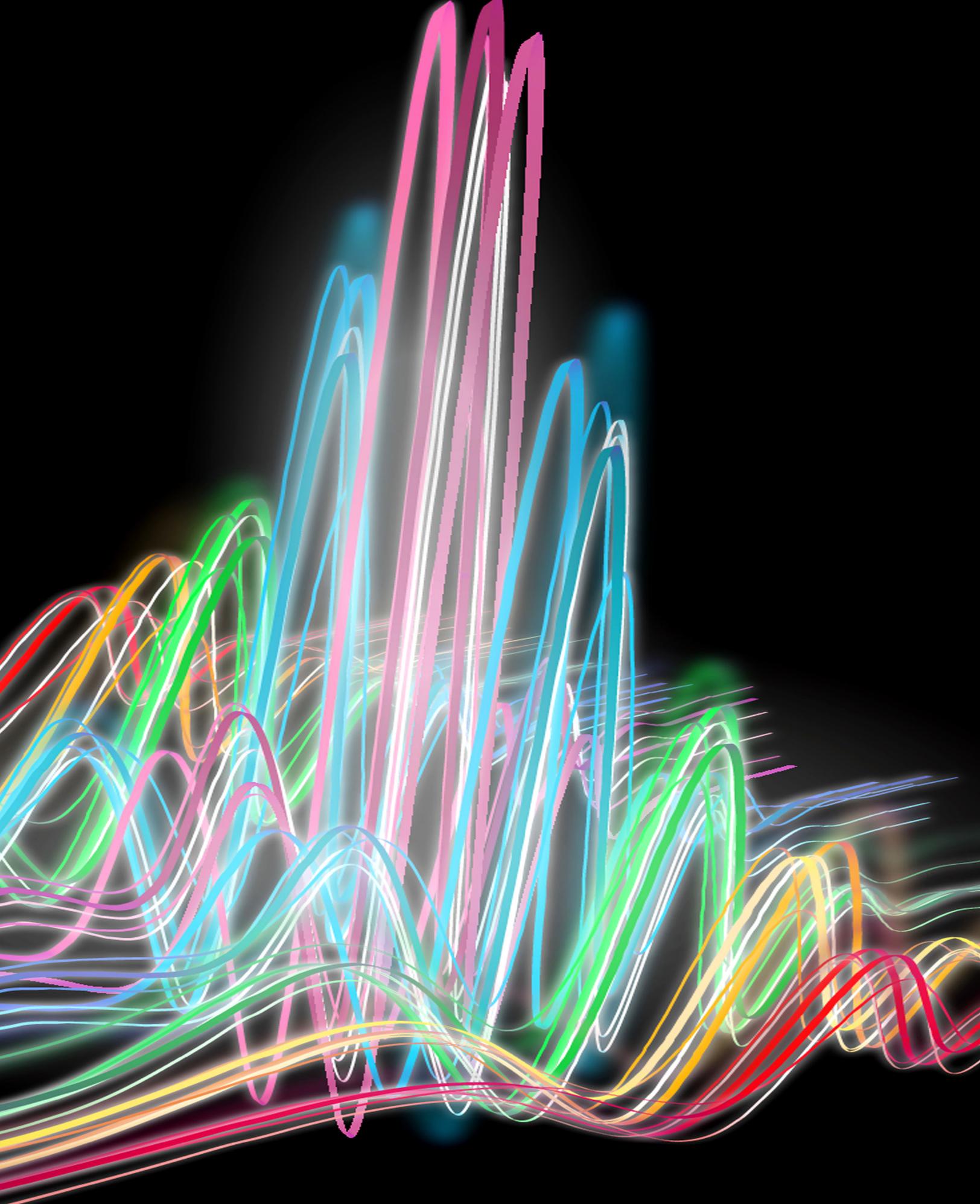


Image Title: A coherent (laser-like) X-ray pulse  
Credit: Tenio Popmintchev and Brad Baxley, JILA, University of Colorado Boulder



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