**HOW TO FIND FUNDING OPPORTUNITIES AT THE NATIONAL SCIENCE FOUNDATION (NSF)**

The **National Science Foundation** (**NSF**) is an independent agency in the executive branch of the U.S. government that supports fundamental research and education in the non-medical fields of science and engineering. With an annual budget of about $7.0 billion (US dollars for fiscal year 2012), NSF funds approximately 20% of all federally supported basic research conducted by U.S. colleges and universities. In some fields, such as mathematics, computer science, economics and the social sciences, the NSF is the major source of federal backing.

NSF funds a wide range of activities, including research, the procurement and development of instrumentation, education and outreach projects, conferences and workshops, dissertation research in selected areas, research and international experiences for students, international travel, faculty and industry exchanges, and graduate fellowships. It supports the advancement of improved science curriculum materials and fosters the interchange of scientific ideas nationally and internationally.

NSF seeks to fulfill its mission chiefly by issuing competitive, limited-term grants in response to specific proposals from the research community. Some proposals are solicited, and some are not; the NSF funds both types. While some of these funding opportunities are easy to find, some are relatively obscure. Below is an overview of types of funding opportunities offered by NSF and how to find them.

**NOTICE FUNDING OPPORTUNITY ANNOUNCEMENTS**

NSF publishes its Notice of Funding Opportunity Announcements (FOAs) at several locations on its website. One of the easiest places to search for a particular announcement is at <http://www.nsf.gov/funding>. Once on the NSF Find Funding page, there are several options to search for a FOA. For example, you can search the page for a word in the FOA title (such as “research experience”, or you can scroll down the page until you find what you’re looking for. There is also a drop-down menu that allows you to look for archived solicitations in case you’re investigating the funding history of a particular program. On that same page, you can subscribe to RSS feeds or e-mail alert services that will automatically notify you of new funding opportunities or upcoming due dates. Even if you don’t want to subscribe to the RSS feed, clicking on the RSS icon will bring up a list of funding opportunities with the most recently announced at the top; this is often more useful than the list of FOAs organized by due date, since it’s easy to find newly-announced opportunities. Information on using the RSS feed can be found on the NSF Find Funding site.

**UNSOLICITED PROPOSALS TO CORE PROGRAMS**

Responding to announced funding opportunities is not the only (and often not the best) way to win grant funding. Many agencies, including NSF, NIH (National Institute of Health), DoD (Department of Defense), DOE (Department of Energy), DoED (Department of Education) and DARPA (Defense Advanced Research Projects Agency), fund research through “unsolicited” or “investigator-initiated” proposals.

To understand how unsolicited proposals work, it’s helpful to understand how funding mechanisms evolved at the basic research agencies, using NSF as an example. NSF was originally given the broad mandate to fund the best research ideas in science, math and technology. It was set up along disciplinary lines mirroring the structure of universities, with Directorates corresponding to the colleges within a university, Divisions within each Directorate corresponding to university departments, and Programs within each Division. These NSF Programs (often called “Core Programs”) were set up to fund a broad range of research fitting within the “Program Description.” (Tips on how to use the NSF website to identify the core program that best fits your research can be found at the end of this article.) Below is an example [Program Description](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13622&amp;org=PHY&amp;from=home) for NSF’s***Atomic, Molecular and Optical Physics Program*** (which resides in the ***Physics Division****,* which is part of the ***Math and Physical Sciences Directorate****).*

“*The Atomic Molecular and Optical Physics program encompasses four sub-areas of this broad discipline: Precision Measurements, Atomic and Molecular Dynamics, Atomic and Molecular Structure, and Optical Physics. Research supported in the first three sub-areas includes activities in quantum control, cooling and trapping of atoms and ions, low-temperature collision dynamics, the collective behavior of atoms in weakly interacting gases (Bose-Einstein Condensates and dilute Fermi degenerate systems), precision measurements of fundamental constants, and the effects of electron correlation on structure and dynamics. In Optical Physics, support is provided in areas such as nonlinear response of isolated atoms to intense, ultra-short electromagnetic fields, the atom-cavity interaction at high fields, and quantum properties of the electromagnetic field*.”

As you can see, this program accepts proposals based on investigators’ ideas, as long as they fit under the broad program description. It does not offer a detailed solicitation or explicit guidance on acceptable proposal topics beyond the program description, hence, the term “unsolicited” or “investigator-initiated” proposals.

Initially, almost all proposals to NSF were unsolicited proposals. However, over time the agency decided that they wanted to encourage proposals on specific topics of interest – often because they saw great potential in a new area (for example, nanotechnology) or because the agency had specific objectives it wanted to meet (for example, encouraging more undergraduates to pursue majors in science). To encourage more proposals in these high-priority areas and provide more guidance to researchers, NSF began issuing funding opportunity announcements. These solicitations are prescriptive and tend to come to the attention of more people because it is officially “released.” Probably for this reason, unsolicited proposals to NSF generally have higher success rates than proposals written in response to solicitations. In fact, about 50% of grants funded by NSF are unsolicited.

Many NSF programs have started publishing their core programs on the NSF Find Funding page probably to address the fact that these funding opportunities are often overlooked by researchers.

Not all agencies accept unsolicited proposals, and those that do have a variety of mechanisms for providing guidance to researchers on the types of unsolicited proposal they want to see. Some private foundations also accept unsolicited proposals, but their processes can be quite different from those used by government agencies, so we’ll address that subject and provide a list of various federal agencies that accept unsolicited proposals in a future article.)

**TRYING TO DETERMINE WHICH NSF PROGRAM FITS YOUR RESEARCH?**

It can sometimes be tough to determine which program at NSF fits the research in your area. This is further complicated by the fact that many of the NSF “Program” pages now list all funding opportunity announcements issued by the program, including NSF-wide solicitations, making it hard to find the program description for unsolicited proposals. Also, keep in mind that different directorates and divisions within the NSF act like semi-autonomous organizations with different procedures and requirements. This is one reason why it’s important to pinpoint which program or programs you would like to apply to for funding and then learn as much as you can about that program. Here’s one way to find these programs:

* Go to the **“NSF Organization List”** (<http://www.nsf.gov/staff/orglist.jsp>). The list provides links to each Division, organized under its Directorate.
* Click on the link for a **Division** that you think might be interested in your research. *Example: If you’re interested in atmospheric chemistry, click on “Division of Atmospheric Sciences” under “Directorate of Geosciences”*
* Near the top of the page, there will be one or more links to **Disciplinary Programs** funded by that Division (below that, you’ll usually see links to Funding Opportunities).
* Click on the **Disciplinary Program** of interest and you should see a synopsis of the program. This is a relatively broad description of the types of research that will be considered for funding under this Program.

**NSF CATEGORIES OF FUNDING OPPORTUNITIES**

Faculty interested in submitting an NSF grant application should always discuss their idea with the Program Officer before proceeding. The Program Officer will give important feedback to help you decide whether the idea is appropriate for an NSF grant and whether funding is available. In addition, the various Directorates and Divisions differ with respect to the amounts at which they fund each of the categories discussed in this article, so it’s important to learn about the priorities of the Division that funds your research. These funding opportunities can be found @ <http://www.nsf.gov/funding> on the Find Funding page.

***Early-concept Grants for Exploratory Research (EAGER)*** support exploratory, potentially transformative projects at their early stages. The idea behind the EAGER grant is that the money will be used to allow proof of concept work or generation of enough preliminary data to produce a full-fledged research proposal to NSF.

These grants are funded at up to $300K for two years, although typical funding amounts are generally lower. Proposals for EAGER grants are shorter than conventional NSF proposals (5 – 8 pages), and the funding recommendation is made by the Program Officer, not a review panel.

***Grants for Rapid Response Research (RAPID)*** support projects that require quick response because of the nature of the research, such as research related to natural disasters. Funding recommendation is made by the Program Officer, not a review panel and award amounts are up to $200K for one year.

***Grants for Conferences, Symposia, and Workshops*** support hosting conferences, symposia, and workshops that bring experts together to discuss their research findings in special areas of science and engineering, not attendance by applicants to an existing conference or workshop. Proposals should generally be made at least one year in advance of the scheduled date.

***Grants to Support International Travel*** support a university, professional society, or other non-profit organization to coordinate and support US participation in one or more international scientific meeting(s) abroad. More information on NSF grants to support international travel for a variety of reasons related to planning or conducting research is available at NSF’s Office of International Science and Engineering webpage.

**SUPPLEMENTS TO FUNDED PROJECTS**

Project Investigators (PIs) with NSF-funded projects can apply for a range of supplemental funding. These opportunities include:

• ***Research Experiences for Undergraduates (REU Supplement***) provides funding to support one or two undergraduates from the PI’s institution or elsewhere to conduct research on the NSF-funded project.

• ***Research Experiences for Teachers (RET Supplement)*** provides funding for K-12 teachers to work with researchers on the project. (These are described in the REU solicitation near the end, search for “Teacher.” Some Divisions have issued “***Dear Colleague***” letters related to this opportunity.)

• ***Research Opportunity Award Supplement (ROA)*** assists faculty from predominantly undergraduate institutions to pursue research as visiting scientists with NSF-funded investigators.

• ***Facilitation Awards for Scientists and Engineers with Disabilities (FASED)*** support participation in research and training for disabled individuals.

• ***Research Experiences for Graduates Program*** for graduate students conducting research in cultural anthropology and the ***Supplement for Translational Research in the Academic Community in Engineering*** are also made available periodically.

***Dear Colleague Letters*** are not specific grants. The letters often provide guidance to researchers on proposal topics or project types that NSF would particularly like to see. For example, a recent “Dear Colleague” letter announced that NSF will work in collaboration with the National Cancer Institute to accept and review unsolicited proposals involving interdisciplinary approaches to cancer research that include physical science and engineering.

***Major Research Instrumentation (MRI) program*** is the NSF-wide program to fund instrumentation. However, some Directorates fund instrumentation programs and some programs will accept proposals for instrumentation as unsolicited proposals or supplements. You can find this information by going to the Division webpage and looking for instrumentation programs.

<http://www.clayton.edu/Grant-Contract-Programs/Links>