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Energy Forum 2011
Energy Security and Sustainability - Global Challenges
The Convergence of the Life Sciences, Physical Sciences, and Engineering

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If you have an idea for an article you would like to write for RD&GWN email co-publisher Lucy Deckard with a query.

About the co-publishers—

Lucy Deckard (BS/MS Materials) worked in research development and grant writing at Texas A&M University and across the A&M System for nine years. She directed A&M’s New Faculty Research Initiative (2004-09), helping junior faculty System-wide jumpstart their research careers with federal agency funding. She served as associate director of two research development and grant writing offices.

Mike Cronan, PE (Texas 063512, inactive) has 23 years of experience developing and writing successful proposals at Texas A&M University. He was named a Texas A&M University System Regents Fellow (2001-2010) for developing and writing A&M System-wide grants funded at over $100 million by NSF and other funding agencies. He developed and directed two research development and grant writing offices, one at Texas A&M and the other for the Texas Engineering Experiment Station (15 research divisions state-wide).
The NSF Faculty Early Career Development (CAREER) Program: Things to Keep in Mind When You Start Writing

This is the third in a series of articles discussing various aspects of planning and preparing an NSF CAREER proposal.

The largest single grant program dedicated specifically to junior faculty is the National Science Foundation’s CAREER program. In the November issue, we described the basics of the CAREER program and discussed how to select your research topic, and in December, we discussed the background and planning work you need to do to develop your education component. In this month’s article, we’ll shift our focus to the process of actually writing your CAREER proposal. Even if you’re experienced in writing proposals to NSF, it’s important to keep in mind that the CAREER program differs from other NSF programs in important ways, and therefore when you’re writing a CAREER proposal, you should keep in mind some special considerations.

A CAREER Grant Invests in the PI

First, more than any other program at NSF, the goal of the CAREER is to invest in and promote the PI’s career and research. NSF wants to identify promising early-career researcher/educators working in areas of interest to NSF and provide the boost to help them along a path to become leaders in their fields. It’s therefore important to remember that, as you write your proposal, you’re not just trying to convince reviewers to invest in your five-year project; you’re trying to convince them to invest in you. This means you’ll need to be more present in the text of your proposal than is ordinarily the case in a standard research proposal. You’ll need to explain to reviewers:

1. Your long-term career goals and interests
2. The importance to NSF of your long-term research and education goals
3. Your potential to become a future leader in your field
4. The way in which this grant will help you become a leader in your field.

As you develop your text, you’ll need to make a convincing case that your research plan and objectives are in a high-impact, dynamic area of science or engineering of interest to NSF. (Research topics that have already been well explored and offer opportunities for only incremental advancements are unlikely to give you the opportunity to become a leading researcher and are of less interest to this NSF award.)

You’ll also need to convince reviewers that your project will make a significant contribution to that research area. This means that you’ll need to clearly describe the expected outcomes of your research and how they will advance the state of knowledge in your field. Remember that reviewers may not be experts in your particular subfield, so you’ll need to clearly describe why this research is likely to be significant in your field. You’ll also need to explain how the proposed five-year project fits into your larger career research plans. After your CAREER project is over, where do you expect to go from there? How does this fit into your long-term research goals?
Because NSF is looking to invest in the most promising researchers, you’ll need to explain why you have the potential to become a leading researcher. Be sure to describe your past research and educational accomplishments (usually as part of your “preliminary results” section) clearly and convincingly for reviewers. Don’t allow your important past work to get buried in a voluminous “background” section where reviewers might miss it. If something you did was important, or if you were the first to accomplish something, explain that to the reviewers. Be sure to cite your previous publications.

NSF Uses the CAREER Program to Change Academic Culture

When you read the CAREER solicitation, you’ll find numerous references to integrating research and education. This is a recurring theme at NSF, and it’s important to understand what NSF means by this phrase. NSF feels that academic culture often perceives research and education as competing priorities. If a faculty member at a research-intensive university spends a significant amount of time on educational activities, her department head may become concerned that her research will suffer. Similarly, a predominantly undergraduate institution may discourage faculty from doing research, seeing it as a distraction from its educational mission.

One of NSF’s core missions is to recruit and educate the next generation of engineers and scientists and to promote a scientifically literate society. As NSF sees it, the following are some of the best ways to achieve that mission: to involve students in research, to integrate research results into the curriculum, and to reach out beyond the walls of academe to educate the society at large about science and the latest research. But how can NSF encourage researchers to actively engage in these kinds of education and outreach efforts when faculty see time spent on these activities as a drain on their research, and when department heads, senior colleagues, and promotion and tenure committees don’t value these activities? NSF is tackling this problem using the “carrot” of prestigious CAREER grants, which require integrating education and research along with providing clear institutional support for these activities.

For this reason, reviewers will be looking for evidence that your research and education plans align with your institution’s mission and goals, and that your department head recognizes and fully supports your proposed project. Reviewers want to know that your institution and leadership are invested in the success of both the research and educational activities of your project and that you will be rewarded for these activities by your department. NSF also requires a letter from your department head or chair describing the department head’s and institution’s support for your project and including some language attesting to your eligibility for the CAREER grant (see the solicitation for the exact wording). This letter isn’t just a formality. Reviewers will actually look at this letter to determine whether the PI’s department head enthusiastically supports the PI and her project and will provide the institutional support to help her become successful. (We’ll discuss the department head letter in more detail in a subsequent article)

Reviewers Need to Understand How Your Project Fits Your Institution’s Mission
In your CAREER proposal, you should describe the mission and priorities of your institution (remember that your reviewers may be from other parts of the country and may not know much about your institution) and explain how your activities fit those priorities. Connecting with on-campus educational and outreach activities can also help illustrate to reviewers that your project will benefit activities in which your institution has already invested. Does your institution serve a particular type of student (for example, rural students, non-traditional students, African American students, etc.)? Does your institution have special connections (for example, with local community colleges, industries, high schools, or community organizations)? Describing these existing connections and building on them in your project activities will also illustrate how your project fits the priorities of your institution.

Moreover, if you teach at a predominantly undergraduate institution that’s more education focused, then it’s expected that you’ll have a more extensive education component than if you teach at a Research Intensive institution, since that fits your institution’s mission and priorities. This doesn’t mean that your research plan doesn’t have to be excellent; it just means that the scope of your research plan will probably be smaller, and your education plan should be larger.

Similarly, you’ll need to explain how the topic of your research fits the interests and priorities of your department and institution, and how your project will benefit your institution’s research enterprise. It may be that you were hired as part of a department’s efforts to build capacity in a specific area, or it may be that your institution generally works to build its research activities. Explain this briefly in your proposal so that reviewers will understand the institutional context into which your CAREER project will fit.

Next month, we’ll talk about structuring your Project Description.
Strategies for Funding Water Research: an Introduction

The universe of funding for water research is very large, including 20 federal agencies funding water resources research alone, along with other funding opportunities from state agencies, foundations, and associations.

Areas of university research that can be classified as water research are nearly as ubiquitous as the substance itself. Therefore, opportunities for external funding from federal and state agencies, foundations, associations, and industry related to water research are relevant to many academic departments and colleges across a broad spectrum of academic disciplines. Funding opportunities for water-related research are not limited to the technical disciplines of engineering, physical and biological sciences, agricultural sciences, and computational sciences, but extend beyond these to include the social and behavior sciences and public policy and planning disciplines, among others. Like investigators working in other broad-spectrum areas of research, particularly those related to critical national research priorities, e.g., energy, critical infrastructures, and climate, some water researchers will have a very clearly defined domain of research support from a specific federal agency; others will have to investigate funding opportunities across a range of agencies; and still others may need to form research partnerships to better configure water research capacities that will be more competitive for funding.

Regardless of the approach taken to applying for research support, the process of determining whether your research expertise and interests can compete for funding in the overall water research domain is fairly straightforward. Begin by first characterizing your expertise and interests by placing your research on a continuum stretching between applied and basic research. If your research is more applied, there will likely be more opportunities for you at one of the numerous federal mission agencies, state agencies, or foundations that fund water-related research. If your research is more basic, this may open up funding opportunities for you at NSF, or basic science programs in mission agencies. In some cases, especially in such research areas as water, materials, and energy, you may have a basic research portfolio that advances water research but is not specifically tied to it (NSF Workshop on Some Current Issues in Environmental Chemical Sciences, e.g., fundamental molecular-level chemical insights related to water).

As mentioned, the process begins by first completing a finely-grained characterization of your water research capacities and interests, along with the potential role your expertise might play in a multidisciplinary effort, or in a larger research partnership addressing water topics. You will then map this position to the research interests of potential sponsors as you begin to converge on possible funding opportunities. In the case of water research, as described below, this is a very large universe of opportunity, and most agencies have water-related research roadmaps, strategic plans, and priority investment plans that help you better map your capacities to the specific agency, solicitation, and research goals and objectives of each funding opportunity (more).

Reviewing these key documents is an essential first step to ensure a competitive fit between your research and specific agencies and programs. For example, in its 2001 report,
Envisioning the Agenda for Water Resources Research in the Twenty-First Century, the Water Science and Technology Board of the National Research Council identified 43 critical research areas related to water falling into three interrelated categories: water availability; water use; and water institutions. These findings were again addressed in the 2004 report Confronting the Nation’s Water Problems: The Role of Research by the National Academies’ Committee on Assessment of Water Resources Research. The committee conducted a comprehensive survey to compile budget information from some 20 federal agencies in 71 categories of water resources research for three recent fiscal years. The graphic below shows the percentage of total federal funding for water resources research allocated by various federal agencies in FY 2000 (see Report in Brief). Both of these reports are further addressed in Water Resources Research in the 21st Century in the Journal of Contemporary Water Research and Education (H. Vaux, Dec. 10, 2010).

Researchers seeking funding in water resources research would be well advised to review the 43 areas of critical water resources research to best map your expertise to those critical research areas most likely to offer external support to universities. Moreover, it is important to keep in mind that water resources research is only a part of the water research universe, not all of it. Specifically, water resources research can generally be understood as focusing on ensuring an adequate quantity and quality of water to meet human and ecological needs in the face of growing competition among domestic, industrial–commercial, agricultural, and environmental water uses.

Moreover, the National Water Research and Development Initiative (H.R.1145; April 23, 2009) was passed to improve the federal government’s role in a variety of water-related activities. These include the design and implementation of federal water research, development, demonstration, data collection and dissemination, as well as education and technology transfer activities designed to address changes in water use, quality, supply, and demand in the United States. These include providing additional support to increase water supply through greater efficiency, conservation, and measures to abate water-quality impairment. Tracking the developments related to this initiative periodically will help you
better understanding the evolving configuration of water research opportunities funded by federal agencies, *particularly in enabling you to anticipate future research directions and priorities.*

For example, in EPA’s *National Water Program Research Compendium,* a research roadmap for 2009-2014, a three-page *research/disciplinary topic area matrix specific to five key EPA water program areas* provides an excellent way for you to match your research expertise to agency interests. See *Crosswalk – Research Themes and Program Activities* (pages 14-16). In some cases, the EPA identifies program areas specific to water resources research, as defined above, and in other cases, they are aligned or complementary, e.g., aquatic life, wildlife health and assessment. The research topic “water availability” has been identified by the *Technology Innovation Program* (National Institute of Standards and Technology) as a critical national research challenge (see NIST draft report *Water: New Technologies for Managing and Ensuring Future Water Availability,* Oct. 26, 2010).

Like water, energy is another national research challenge to which it is closely linked, and, in many cases has been *linked in research solicitations.* For example, the Department of Energy’s National Laboratories are already collaborating to support an integrated energy-water R&D program (*The Energy-Water Nexus, A Strategy for Energy-Water Security*). According to the DOE, the electricity industry is second only to agriculture as the largest user of water in the United States. To sustain energy production, research must address our understanding of the *interdependencies of water-reliant systems,* balance the needs of all users, and develop technologies to reduce water use and loss. This can be achieved through a focused research and development program that integrates prediction and decision support, scientific and technological innovation, and technology transfer and implementation. Furthermore, this intersection of water, energy, and agriculture is clearly linked in the report *Water Implications of Biofuels Production in the United States* (2007).

The National Academies’ Water Information Center addresses key questions of water research, including, “What is the state of the science for hydrologic and water-related sciences? What has been accomplished? What is cutting edge? Where should the science go from here?” (see *State and Future of the Science*). Within the National Academies, the National Research Council established the *Water Science and Technology Board* (WSTB) in 1982 as a central site dedicated to studies related to water resources and to *water-related topics* in science, engineering, economics, policy, education, and society.

**Examples of Funding Opportunities for Water Research**

The *Institute for Water and Watersheds* at Oregon State University maintains an excellent site listing upcoming research opportunities related to water research. The Institute’s online newsletter, *H2OSU - OSU’s Water Newsletter,* offers another excellent source that will help define your water research domain and will assist you in mapping it to funding opportunities. Additional water relevant grant programs are listed below.

**National Science Foundation**

- Grants
- Water Programs in Environmental Engineering
• Water Sustainability and Climate
• Decadal and Regional Climate Prediction using Earth System Models
• Hydrologic Sciences
  o Chemical Oceanography
  o Ecosystems Sciences
  o Earth Sciences: Instrumentation and Facilities
  o Geography and Spatial Sciences
• Energy for Sustainability
• Chemical and Biological Separations
• Fundamental Research Program for Industry/University Cooperative Research Centers
• Science, Engineering and Education for Sustainability

Environmental Protection Agency, Office of Water
• Grants
• Priority Research Themes

Department of Agriculture
• Grants

USGS Water Resources of the United States

ESTCP Solicits Proposals for FY 2012 Funding
Request pre-proposals due March 8 for the following topics only: (1) Management of Contaminated Groundwater; (2) In Situ Management of Contaminated Sediments; (3) Military Munitions Detection, Discrimination, and Remediation; (4) Recovery of Threatened and Endangered and Sustainment of At-Risk Plant Species; (5) Inventory and Monitoring Technologies for Vertebrate Populations; and (6) Environmentally Sustainable Energetic Materials and Manufacturing Processes. DoD/ESTCP Director Dr. Jeffrey Marqusee will conduct an online seminar “ESTCP Funding Opportunities” on January 20, 2011, from 12:00-1:00 p.m. EST. This “how to play” briefing will offer valuable information for those interested in new ESTCP funding opportunities. During the online seminar, participants may ask questions about the funding process, the current ESTCP solicitation, and the proposal submission process.
Know the Context of Your Research

Successful proposals represent an accumulation of marginal advantage whereby funding success occurs at the boundaries of excellence: A “good” proposal is simply not good enough!

If the mantra of real estate is “location, location,” then the mantra of proposal development and writing is “research context, research context.” Funding agency strategic plans and research road maps, national academy reports, agency-sponsored research workshops, and similar documents all play a key role in helping frame the proposal narrative. These contextualizing documents can make your proposal more compelling by providing it with a more persuasive statement of its importance and significance in the context of both the specific solicitation and the agency’s overall research objectives. When you successfully characterize your research context, particularly as it complements and informs the key references section of your research proposal, you have achieved an important marginal advantage to developing a competitive proposal.

Moreover, reviewing strategic plans and research road maps, along with other research reports in your domain, helps you better match your research directions with the investment priorities of the funding agencies, an important competitive factor over time. Successful proposals represent an accumulation of marginal advantages that complements the core research idea in a proposal narrative. This is important because funding success at federal research agencies occurs at the boundaries of excellence, particularly in the peer-review process. In this environment, a good proposal is not good enough. An excellent proposal narrative that can compete for funding requires getting everything right, including a persuasive argument describing how your research advances the research objectives of the funding agency, from the finely-grained context (specific goals and objectives in the solicitation) to the larger contexts (agency-wide and national research strategic plans). Clearly stated and persuasive arguments placing your research and its significance in these important contexts represents just one more key element needed to gain a competitive advantage. It is here that you must make the key distinction between describing the nature of your research and describing the significance of your research.

Definitions of significance arise from descriptions of the context of your research, and from linking that context to your research references section. This step is a critical factor in increasing the competitiveness of your proposal at both the basic research agencies (NSF, NIH) and federal mission agencies. The way this is done may differ by agency specifics but not by kind. For example, defining your research context at the federal mission agencies will include defining the significance of your research in the context of the agency’s critical mission area(s) and clearly stating the impact your research will have on one or more mission areas at the agency. All of the Department of Defense agencies are highly mission oriented. The missions of AFOSR, ONR and ARO relate to the management of research that supports the goals and operations of their respective services (Air Force, Navy and Army, respectively), and this context is similar for such other mission agencies as NOAA, EPA, and USDA. Some mission agencies include basic research domains within them, e.g., DARPA at DoD and Office of Science at DOE.
Your key objective in mapping the significance and impact of your research to a broader research context, either basic or mission-critical depending on agency, is to give program officers and review panelists a clear understanding of the value of your research to the research context(s) most important to that agency. It would be difficult, for example, to make credible claims for the uniqueness and innovation of your research without using contextual references that help the reviewers make that judgment. Do not expect reviewers to invent their own understanding of the impact of your research on their agency’s mission—it is your job to make that argument for them. If there is one certain truth in grant writing, it is the command to “always help the reviewers understand the significance of your research!”

Why context is important--

- Understanding the research culture and context of the funding agency helps you to embed more successfully your proposed research plan within the research focus and context of the agency.
- Understanding the context of an agency’s mission-critical areas, strategic plan, research culture, investment priorities, and the rationale behind them helps you weave a compelling and competitive proposal narrative.
- Understanding context helps you better describe how your research plan matches the research goals detailed in the solicitation and advances the agency’s larger research plan.
- Convincing program officers and reviewers that your research advances the agency’s research objectives is a key factor in the decision to fund or not fund your proposal.
- The more knowledgeable you are about the rationale behind a funding agency’s research mission, strategic plans, research culture, and investment priorities, the better able you will be to develop highly competitive, high-impact responses.
- Understanding research context helps you better understand several key elements common to every competitive proposal narrative:
  - Who is the audience?
  - How do you best address that audience?
  - What is a fundable idea within the context of the agency’s research priorities?
  - How are claims of research uniqueness and innovation best supported in the proposal text?
  - What arguments are likely to be most compelling in communicating your capacity to perform the proposed research to reviewers and program officers?

- A good idea is necessary but not sufficient. Agencies fund only good ideas that are clearly developed and tightly linked to their mission, vision, and strategic plan as represented by the research objectives stated in the solicitation and in the broader context of agency strategic plans and research road maps, which in turn are embedded in the context of the national research enterprise.

Finally, extensive “context references” are listed in the last four issues of this newsletter (Sept.-Dec., 2010) in the sections “Agency Research News” and “Agency Reports and Research Roadmaps” for future information on this topic, as well as in articles specific to each agency.
The universe of funding for biofuels (bioenergy, biomass) research is very broad and extends across the spectrum from very basic research to applied research and demonstration projects. The disciplinary spectrum is equally as broad and extends across the biological, physical, computational, agricultural, engineering, and social, behavioral, and policy sciences.

Bioenergy is renewable energy made from any organic material from plants or animals. Sources of bioenergy, called "biomass," include agricultural and forestry residues, municipal solid wastes, industrial wastes, and terrestrial and aquatic crops grown solely for energy purposes, such as “biofuels” (more). Bioenergy research occurs across a very broad disciplinary domain, extending from very basic research (basic cell processes) to applied demonstration projects for determining scalability, to areas such as cell wall technologies. This research takes place within an evolving context of major research reports and publications that both advance and impact federal agency priorities for funding across this broad field, including such pivotal reports as the National Biofuels Action Plan, 2008, USDA/DOE. Researchers at DOE’s Joint BioEnergy Institute have developed a Wiki for Bioenergy Researchers, for example, at Welcome to BioenergyWiki. Moreover, research in this domain extends to the social and policy sciences, particularly at the intersection of policy related to bioenergy impacts, such as bioenergy from an ecological and land use perspective (see Biofuels: Implications for Land Use and Biodiversity).

Finding Funding Opportunities in Bioenergy Areas

Funding opportunities in areas related to biofuels, bioenergy, and biomass are distributed across many of the major federal research agencies. Postings of these new opportunities for 2011 will occur at Grants.gov and/or FedConnect. URLs to some of these opportunities currently open are listed below, but new postings will be made continuously over the coming year. However, it is important to keep in mind that funding bioenergy-related research by responding to published solicitations with specific due dates or submittal windows, or through DoD agency BAAAs that remain open for a year or more, is only one mechanism for supporting your bioenergy research.

Most of the funders of bioenergy research, e.g., Department of Energy, ARPA-E, USDA, NSF, DoD, etc. have mechanisms for submitting unsolicited proposals. Unsolicited proposals related to bioenergy can be submitted through the NSF Early-concept Grants for Exploratory Research (EAGER), for example, whereas the National Energy Technology Laboratory (NETL), Pittsburgh Office, has operational responsibility for the DOE Unsolicited Proposal (USP) Program. All unsolicited proposals should be forwarded by email to John N. Augustine at DOEUSP@NETL.DOE.GOV. He serves as the single point of contact for all Department of Energy (DOE) unsolicited proposals. More information here.

When submitting unsolicited proposals, or preliminary white papers, you must be aware of the specific agency research priorities in your topic area related to bioenergy. You can learn these by reading research roadmaps, workshop and conference reports, and bioenergy
strategic plans published by an agency, as well as by talking to a program officer or becoming informed about current agency funding by reviewing abstracts of funded projects or related postings on the agency web. For example, DOE’s EERE News site publishes information on upcoming solicitations and research summaries of funded programs (Subscribe to EERE News Updates). Many of the federal agencies that fund biofuels research are mission agencies, e.g., DOE, USDA; therefore, the competitiveness of an unsolicited proposal or white paper to the specific mission agency will be a function of how well your research impacts that agency’s unique mission. The following URLs are a starting point to building a biofuels funding matrix for 2011 that maps to your research interests and expertise and fulfills the agency’s mission.

Examples of Upcoming Funding Opportunities in Bioenergy Areas

- USDA Funding Energy Matrix
- Agriculture and Food Research Initiative: Foundational Program, USDA/NIFA
- 2011 Woody Biomass Utilization Grant, Forest Service
- Biotechnology, Biochemical, and Biomass Engineering, NSF
- Energy for Sustainability, NSF
- Biotechnology Risk Assessment Grants Program, USDA/NIFA
- International Science and Education Grants Program, USDA/NIFA
- New Era Rural Technology Competitive Grants Program (RTP), USDA/NIFA
- Plant Feedstock Genomics for Bioenergy: A Joint Research Funding Opportunity Announcement USDA, DOE
- Long Range Broad Agency Announcement for Navy and Marine Corps Science and Technology
- Agriculture and Food Research Initiative: Foundational Program, USDA/NIFA
- Biotechnology Risk Assessment Grants Program, USDA/NIFA
- U. S. Army Engineer Research & Development Center - 2010 Broad Agency Announcement

- Research Interests of the Air Force Office of Scientific Research
  - This program aims to understand and improve the facility of photosynthetic microbes to produce biofuels (specifically, molecular hydrogen and algal lipids) for use in fuel cells and air breathing engines, and also to enhance the power density of enzymatic and microbial biofuel cells and the range of complex, impure or mixed natural substrates that the biofuel cells can oxidize and convert to electricity. Basic research may include areas such as photosynthetic biochemistry, hydrogenase enzymology, genetic and metabolic engineering, systems biology, biocatalysis, microbial physiology and ecology, and lipid biosynthesis.

- Algae Biomass Supply, DOE Golden Field Office
- Integrated Process Improvements for Biochemical Conversion of Biomass Sugars: From Pretreatment to Substitutes for Petroleum-based Feedstocks, Products and Fuels, DOE Golden Field Office
EPA funds a range of programs related to sustainable energy systems. For example: Energy, Biofuels & Climate Change—Research, Tools & Technologies. The DoD has an interest in biofuels and, in 2007, published the DoD Energy Strategy.

The Long-Term Funding Horizon in Biofuels

Wayne Gretzky made the observation that success in hockey requires not merely knowing where the puck is but knowing where it will be. This is relevant to success in the broad domain of bioenergy research as well. The above open solicitations tell you where the “biofuels puck” is, but opportunities like those described below will help you know where the “biofuels puck” will be—in this case the “algal biofuel puck.” Requests for information (RFI) by federal research agencies, as below, are one mechanism used to align future research investment priorities by an agency in a very defined scope of interest, in this case algae biomass. Responding to RFIs such as below can advance both your research and the agency mission. For example, your response to such a request could result in future solicitations that reflect your research. In all cases, your engagement in this process, complemented by a knowledgeable review of agency reports and roadmaps, will help you write a more competitive response to future funding solicitations by helping you better describe in the research narrative how your research relates to and influences the mission of the specific agency in biofuels research.

The Algae Biomass Supply Request for Information of January 3, 2011 is an example of an RFI common to main agencies. In this specific case, the DOE’s Biomass Program released a request for information (RFI) seeking input from industry, academia, and other biofuels stakeholders regarding supply systems and services for the production, handling, storage, transport, and delivery of algae biomass. The RFI and instructions for submitting a response are available on the FedConnect Web site by searching for Reference number: DE-FOA-0000466. Responses are requested by March 1, 2011. Background: The Biomass Program’s National Algal Biofuels Technology Roadmap report, released publicly in June 2010, highlights some of the commercialization opportunities and challenges for algae. The Program intends to address the Roadmap’s technology barriers that can directly impact the cost and sustainability of producing algal biofuels at a commercial scale. The Program is investing in various algal biomass and biofuels production research, development, and demonstration (RD&D) projects. Reliable and readily available supplies of sufficient volumes and varieties of algal biomass and metabolites are currently lacking and are needed to support current and anticipated Department of Energy (DOE) RD&D program efforts. Purpose and Need for Information: The purpose of this RFI is solely to solicit input for DOE consideration in the development of future algal biofuel RD&D programs. Information obtained is meant to be used by DOE on a non-attribution basis. This RFI provides algae stakeholders with an opportunity to contribute their views of any requirements necessary to develop reliable and readily available supplies of algal biomass and metabolites. Multiple types of algae, including microalgae, cyanobacteria, and macroalgae, are of interest. Recommendations are sought for equipment, sustainability factors, common practices, and financing needs to establish and maintain algal biomass supplies. As
the result of this RFI, DOE may determine to issue a formal Funding Opportunity Announcement (FOA) for this area.

The National Advanced Biofuels Consortium (NABC) is developing cost-effective processes to produce biofuels that are compatible with today's transportation infrastructure. Led by the National Renewable Energy Laboratory and Pacific Northwest National Laboratory, the National Advanced Biofuels Consortium includes 17 partners from industry, universities, and national laboratories.

Department of Energy Bioenergy Links

Entry points to bioenergy research at DOE

- Biomass Research Funding Opportunities
- DOE BRC Research Strategies
- 2011 Biomass Program Peer Review Meetings
- Bioenergy, Genomic Science Program
- NREL BioEnergy Atlas
- National Bioenergy Center
- DOE Bioenergy Research Centers, An Overview of the Science, July, 2010
- New Frontiers in Characterizing Biological Systems (Full Report)

In addition to independent solicitations, DOE conducts joint solicitations with the U.S. Department of Agriculture (USDA) as part of the Biomass Research and Development Initiative. Project criteria are specified in each new request for proposals, but information regarding recently-awarded projects may provide guidance for prospective applicants. DOE and USDA encourage you to apply.

Learn more about the laboratories that support the research of the DOE Biomass Program:

Biorefinery R&D: A. Bratis, National Renewable Energy Laboratory
Feedstock Development: R. Graham, Oak Ridge National Laboratory
Biomass Harvesting Technology: J.R. Hess, Idaho National Laboratory
Syngas, Catalysis, and Bioproducts: D. Stevens, Pacific Northwest National Laboratory
Reaction Engineering and Separations: S. Snyder, Argonne National Laboratory.

DOE Bioenergy Research Centers

DOE established three Bioenergy Research Centers in September 2007. Each center pursues the basic research underlying a range of high-risk, high-return biological solutions for bioenergy applications. Advances resulting from the BRCs will provide the knowledge needed to develop new biobased products, methods, and tools that the emerging biofuel industry can use. The scientific rationale for these centers and for other fundamental genomic research critical to the biofuel industry was established at a DOE workshop involving members of the research community. The DOE BRCs have developed automated, high-throughput analysis pipelines that will accelerate scientific discovery for biology-based biofuel research.
• **DOE BioEnergy Science Center** (BESC) led by DOE’s Oak Ridge National Laboratory in Oak Ridge, Tennessee.
• **DOE Great Lakes Bioenergy Research Center** (GLBRC) led by the University of Wisconsin in Madison, Wisconsin, in close collaboration with Michigan State University in East Lansing, Michigan.
• **DOE Joint BioEnergy Institute** (JBEI) led by DOE’s Lawrence Berkeley National Laboratory

**NREL** publishes biomass journal articles, reports, conference papers, and outreach documents:
- Biomass characterization
- Biochemical conversion
- Thermochemical conversion
- Chemical and catalyst science
- Integrated biorefinery processes
- Microalgal biofuels
- Biomass process and sustainability analyses

The **National Advanced Biofuels Consortium** (NABC) is developing cost-effective processes to produce biofuels that are compatible with today’s transportation infrastructure. Led by the National Renewable Energy Laboratory and Pacific Northwest National Laboratory, the National Advanced Biofuels Consortium includes 17 partners from industry, universities, and national laboratories.

Understanding National Investment Priorities in Biofuels, Bioenergy, and Biomass Research

**National Algal Biofuels Technology Roadmap**, May 2010, DOE Office of Biomass Research

A comprehensive NSF-sponsored report entitled *Breaking the Chemical and Engineering Barriers to Lignocellulosic Biofuels: Next Generation Hydrocarbon Biorefineries*.

Recent Biofuels Webinars

**November 18, 2010 - "Advanced Biofuels Research Pathways"**
This Webinar featured an overview of the Program’s ongoing advanced biofuels research, including research on biochemical and thermochemical conversions. This session also discussed the progress the National Advanced Biofuels Consortium (NABC) is making in research, development, and demonstration of process technology strategies to convert biomass feedstock into a form that can be used in a petroleum refinery. These new and innovative approaches can advance the commercialization and adoption of advanced biofuels.

- Presentation slides
- Audio
- Alternate-text version coming soon!

**September 8, 2010 - "The Promise and Challenges of Algae as Renewable Sources of Biofuels."**
This Webinar focused on the program's approach to algal biofuels research and development and included presentations from four representatives of its recently funded consortia. This session also discussed highlights from the National Algal Biofuels Technology Roadmap, which was released by DOE in June 2010.

- Presentation slides
- Audio
- Alternate-text

**DOE Webinar January 24: Photosynthesis for Hydrogen and Fuels Production**
The Fuel Cell Technologies Program is offering a Webinar on Monday, January 24, 2011, from 12:00 - 1:00 p.m. Eastern titled "Improving Photosynthesis for Hydrogen and Fuels Production" in conjunction with the Biomass Program. [Register for Webinar.](#)
Analyze the Agency Culture

It is important to understand the research culture of the funding agency in order to more knowledgably embed your proposed research plan within its research focus. For example, while NSF and NIH both fund research in the biological sciences, they often fund research in very different areas under that broad umbrella. Sometimes the differences are clear, and in other cases more nuanced, but the distinctions are there and you need to be aware of them. In most cases, this information can be obtained on the internet by visiting the agency web site. Perusing the web site gives the applicant a sense of how the funding agency views itself and the role it sees itself playing in the national research enterprise. This information can be found in the agency mission statement or strategic plan, for example. In other cases, particularly with regard to private foundations, the applicant will find the annual report a source of useful information about an agency’s mission and agenda. An annual report gives the applicant a profile of funded projects, award amounts, and results. The proposal writer needs this information for several reasons, but principally because it will allow the writer to shape the proposal from its inception to conform to the agency’s mission. It helps the grant writer keep the proposal process on track by reminding participants that the grant ultimately must reflect the funding agency’s mission and the impact of your research on it.

Echo Agency Language and Terminology

Learning to echo the language and terminology of the funding agency is another factor that will enhance the overall competitiveness of a proposal. Funding agencies, like most institutions, often develop a unique phraseology to define and describe common, recurrent components of their mission and research agenda, e.g., “broader impacts” or “research and education integration” at NSF, or “bench to bedside” at NIH. Learning the language of the funding agency is important in writing the narrative section of a proposal; it helps to frame arguments more clearly and communicate more effectively with program managers and reviewers. Once the funding agency’s language is learned, it allows the appropriate translation to occur between the language of the funding agency and that of the applicant. It often helps the clarity of the narrative text to translate the applicant’s institutional language into that used by the agency’s program officers and reviewers. This is not an onerous or difficult task, but involves being alert to any preferred or repeated terms, usages, and meanings favored by the funding agency. Learned fluency in the use of funding agency language and terminology is yet another factor that can enhance competitiveness.

Understand Agency Favored Models

While the core of your research proposal narrative will focus on the significance of your research, there are many other components of some proposals, particularly research and education proposals to NSF, as well as some mission agencies such as NOAA, NASA, and DOE, where you must be aware of agency favored models specific to required programmatic components. For example, many proposals, including center-level research proposals, may require separate sections describing a range of specific components impacted by the core
Research, for example: undergraduate research, graduate student and post-doc mentoring, K-12 STEM outreach to students and teachers, management plans, evaluation plans, dissemination plans, and research strategic planning scenarios, among others. You do not have to reinvent the wheel in this regard, and in many cases specific agencies have been funding these types of components in research proposals for many years and have seen what works best and what does not work. These agency documents that come from this experience may range from the NSF Best Practices Model research centers or the NSF EPSCoR Project Administrators Best Practices Meeting 2010 to best practices models for such programs as IGERTS, CAREER, REUs, RETs, etc. Similarly, NOAA outlines key research for educational models in the report Education Strategic Plan 2009-2029. As one NSF program officer commented in this regard, “Don’t reinvent the flat tire.” So before you write descriptions of educational and other components in your proposal, review the agency literature, reports, and workshops to determine what models or configurations the agency favors, or more importantly, does not favor. You don’t want to propose a “trainer of the trainer” model for STEM teacher professional development to an agency that questions the efficacy of that model.

Intramural versus Extramural Research

Some agencies fund only research by outside scientists (extramural research), while many also hire researchers who conduct research from within the agency (intramural research). NSF and DARPA are examples of agencies that fund only extramural research, while NIH, NASA, the National Labs, DOE, and many other agencies fund both extramural and intramural research. Furthermore, the proportion of intramural versus extramural research funding varies significantly by agency. The National Labs and NIST primarily fund intramural research, while NIH largely funds extramural research. For mission-oriented agencies that fund both intramural and extramural research, it is important for external researchers hoping to be funded by the agency to be familiar with relevant intramural research being conducted at the agency and to network with those intramural researchers. Those researchers are likely to be reviewers on external proposals in their research areas, and it is often expected that external researchers collaborate with agency researchers. The degree of expected collaboration varies by agency and is one aspect of the agency culture that proposers must understand to be competitive.

Contacting Program Officers

Never hesitate to contact a program officer for clarification—timidity is never rewarded in the competitive proposal process, but ambiguities are always punished! Communicate with program officers to resolve real or perceived ambiguities in solicitations, reviews, and other agency documentation that is important to your preparing a competitive proposal, or a competitive resubmission of a proposal. Ambiguities need to be resolved prior to writing a proposal to ensure the project narrative maps to the guidelines with informed certainty. If you are not clearly confident that you understand the proposal guidelines, e.g., agency goals, objectives, and funding rationale, along with the review criteria, budget information, and other key informational components the funding solicitation, you will be at a significant disadvantage in making a clear and compelling case to program officers and reviewers that your research will have a significant impact on the agency’s mission, or meet its research investment priorities.
In FY 2011, subject to availability of funds, approximately $262 million is available for support of the AFRI Program. Of this amount, no less than 30 percent will be made available to fund integrated research, education, and extension programs. Of the AFRI funds allocated to research activities, section 7406 of the FCEA directs 60 percent toward grants for fundamental (or basic) research and 40 percent toward grants for applied research. Of the AFRI funds allocated to fundamental research, not less than 30 percent will be directed toward research by multidisciplinary teams. It is anticipated that no less than 10 percent of the FY 2011 funds will be made available for Food and Agricultural Science Enhancement (FASE) Grants, and no more than two percent of the funds available for fundamental research will be made available for Equipment Grants. AFRI funds may be used to support applications submitted to supplementary AFRI RFAs and/or solicitations for multi-agency programs in which AFRI is and will be participating (more).

AFRI RFAs: In FY 2011, NIFA will issue seven RFAs for the AFRI Program:

1. Foundational Program addressing the six AFRI priority areas
2. Challenge Areas:
   a. Childhood Obesity Prevention
   b. Climate Change
   c. Food Safety
   d. Global Food Security
   e. Sustainable Bioenergy
3. NIFA Fellowships Grant Program soliciting Pre- and Postdoctoral Fellowship Grant applications

Applications for AFRI funds may also be solicited through other announcements including supplemental AFRI RFAs or in conjunction with multi-agency programs.

Foundational Program
The Foundational Program RFA focuses on building a foundation of knowledge in fundamental and applied food and agricultural sciences critical for solving current and future societal challenges. Project types supported by AFRI within this area include single-function Research Projects, multi-function Integrated Projects, and Food and Agricultural Science Enhancement (FASE) Grants.

NIFA may also solicit applications for AFRI funds through other announcements, including supplemental AFRI RFAs or RFAs issued in conjunction with other agencies. Such announcements will be made public in the same manner as this announcement.

- Disaster Resilience for Rural Communities (joint with the National Science Foundation (NSF))

Total Program Funds: Approximately $3 million ($1 million from AFRI)
Information is available at http://nifa.usda.gov/fo/disasterresilienceforruralcommunities.cfm
Dual Purpose with Dual Benefit: Research in Biomedicine and Agriculture Using Agriculturally Important Domestic Species (joint with the National Institute of Health (NIH))

Total Program Funds: Approximately $5 million from AFRI
Information is available at http://nifa.usda.gov/fo/researchinbiomedicineandagricultureafri.cfm

Plant Feedstock Genomics for Bioenergy (joint with DOE)

Total Program Funds: Approximately $6 million ($2 million from AFRI)
Information is available at www.nifa.usda.gov/fo/plantfeedstock.cfm

Plant Health and Production and Plant Products

In FY 2011, AFRI invites Research Project applications relevant to the priorities of the Plant Health and Production and Plant Products Program Area:

Letter of Intent Deadline – March 16, 2011 (5:00 p.m. ET); see Part IV, A (page Error! Bookmark not defined.) for instructions
Program Area e-mail for Submission of Letter of Intent – plants@nifa.usda.gov
Application Deadline – June 8, 2011 (5:00 p.m. ET)
Total Program Funds – Approximately $23 million
Proposed Budgets exceeding $500,000 total (including indirect costs) for a project period of up to 5 years will not be reviewed

In FY 2011, AFRI invites Research Project applications relevant to the priorities of the Animal Health and Production and Animal Products Program Area:

Letter of Intent Deadline – February 22, 2011 (5:00 p.m. ET); see Part IV, A (page Error! Bookmark not defined.) for instructions
Program Area e-mail for Submission of Letter of Intent – animals@nifa.usda.gov
Application Deadline – April 6, 2011 (5:00 p.m. ET)
Total Program Funds – Approximately $20 million
Proposed Budgets exceeding $500,000 total (including indirect costs) for a project period of up to 5 years will not be reviewed

In FY 2011 AFRI invites Research Project applications relevant to the priorities of the Food Safety, Nutrition, and Health Program Area:

Letter of Intent Deadline – February 28, 2011 (5:00 p.m. ET); see Part IV, A (page Error! Bookmark not defined.) for instructions
Program Area e-mail for Submission of Letter of Intent – foodnutrition@nifa.usda.gov
Application Deadline – May 2, 2011 (5:00 p.m. ET)
Total Program Funds – Approximately $11 million
Proposed Budgets exceeding $500,000 total (including indirect costs) for a project period of up to 5 years will not be reviewed

In FY 2011, AFRI invites Research Project applications relevant to the priorities of the Renewable Energy, Natural Resources, and Environment Program Area:

Letter of Intent Deadline – March 3, 2011 (5:00 p.m. ET); see Part IV, A (page Error! Bookmark not defined.) for instructions
Program Area e-mail for Submission of Letter of Intent – naturalres@nifa.usda.gov
Application Deadline – June 3, 2011 (5:00 p.m. ET)
Total Program Funds – Approximately $9 million
Proposed Budgets exceeding $500,000 total (including indirect costs) for a project period of up to 5 years will not be reviewed

In FY 2011, AFRI invites Research Project applications relevant to the priorities of the Agriculture Systems and Technology Program Area:

Letter of Intent Deadline – February 22, 2011 (5:00 p.m. ET); see Part IV, A (page Error! Bookmark not defined.) for instructions
Program Area e-mail for Submission of Letter of Intent – agsys@nifa.usda.gov
Application Deadline – May 11, 2011 (5:00 p.m. ET)
Total Program Funds – Approximately $6 million
Proposed Budgets exceeding $500,000 total (including indirect costs) for a project period of up to 5 years will not be reviewed

In FY 2011, AFRI invites Research and Integrated Project applications relevant to the priorities of the Agriculture Economics and Rural Communities Program Area:

Letter of Intent Deadline – Letter of Intent NOT required for this Program Area
Application Deadline – March 23, 2011 (5:00 p.m. ET)
Total Program Funds – Approximately $12 million
Proposed Budgets exceeding $500,000 total (including indirect costs) for a project period of up to 5 years will not be reviewed

Food and Agricultural Science Enhancement Grants
Food and Agricultural Science Enhancement (FASE) Grants strengthen science capabilities in research, education, and/or extension programs. FASE Grants are designed to help institutions develop competitive projects, and to attract new scientists and educators into careers in high-priority areas of National need in agriculture, food, and environmental sciences. The FASE Grants provide support for Pre- and Postdoctoral Fellowships which will be solicited separately as part of the NIFA Fellowships Grant Program, New Investigators, and Strengthening Grants. Specific eligibility requirements for these grants are described below.
Pre- and Postdoctoral Fellowship Grants
Doctoral candidates and individuals who will soon receive or have recently received their doctoral degree are encouraged to submit an application for a Pre- or Postdoctoral Fellowship Grant, as appropriate, for research, education, extension, or integrated activities to the NIFA Fellowships Grant Program. Program information, including the anticipated RFA release date, is available at www.nifa.usda.gov/afri.

New Investigator Grants
An individual who is beginning his/her career, does not have an extensive scientific publication record, and has less than five years postgraduate, career-track experience is encouraged to submit an application for a New Investigator Grant for research, education, and/or extension activities. The new investigator may not have received competitively awarded Federal funds with the exception of pre- or postdoctoral grants or USDA NRI or AFRI Seed Grants. The application must contain documentation that lists all prior Federal support. The work proposed for New Investigator Grants must address a specific Program Area Priority described under Program Area Description in Part I, C, and the application must be submitted directly to that Program Area by the designated deadline date.

Strengthening Grants
These funds are expected to enhance institutional capacity with the goal of leading to future funding in the project area, as well as strengthen the competitiveness of the investigator’s research, education, and/or extension activities. Strengthening Grants consist of Standard Grant types (both single-function and multi-function projects) as well as Seed Grants, Equipment Grants, and Sabbatical Grants. The work proposed for Strengthening Grants must address a specific Program Area Priority described under Program Area Descriptions in Part I, C, and the application must be submitted directly to that Program Area by the designated deadline date. All applications submitted for Strengthening Grants must fulfill the eligibility requirements described below.
Like many areas of study, materials research can be funded by a variety of agencies.

Materials research is emblematic of the direction many research areas are taking – it is inherently multidisciplinary; it has a wide variety of applications; and it encompasses topics ranging from very basic to highly applied research. By understanding these distinctions and working to match particular projects to the specific interests of the appropriate funding agency, materials researchers can find a wide range of funding opportunities.

Areas of materials research may be categorized by potential application (e.g., energy materials, biomaterials, materials for aerospace), by type of material (e.g., polymers, ceramics, nanomaterials), by function (e.g., piezoelectrics, active materials, multifunctional materials), or by method (e.g., computational materials science, materials by design). We discuss potential funding sources below for all of these categories.

Materials for Energy

The funding for renewable and alternative energy research has increased dramatically and is expected to continue to grow. Challenges related to materials lie at the heart of many of these technologies. The upcoming 2011 World Materials Summit, an invitation-only gathering of technical experts and policymakers, will focus specifically on advanced energy materials. Materials researchers working in this area should keep an eye out for reports and recommendations coming out of this summit, as they are likely to affect future funding plans at NSF. (Note also that graduate students and postdocs are eligible to apply to attend the parallel inaugural Student Congress; if you have a promising student or postdoc working with you in this area, it would be a good idea to encourage them to apply by the deadline of February 1, 2011.) Energy-related projects that could include materials research are being funded by the Department of Energy and the National Science Foundation.

U.S. Department of Energy

DOE supports materials research at both the basic and applied levels. The DOE Office of Science (whose core programs generally fund more basic science) supports the Materials Sciences and Engineering Division (within the Basic Energy Sciences [BES] program), which funds research on subjects such as molecularly-tailored nanostructured materials, stress corrosion and corrosion fatigue, and research to understand the atomistic basis of materials properties and behavior. The division has three focus areas: Materials Discovery, Design and Synthesis; Condensed Matter and Materials Physics; and Scattering and Instrumentation Sciences. Researchers should be aware, however, that a large portion of DOE’s Office of Science funding goes to supporting intramural research (i.e., research conducted internally by scientists employed by DOE or the National Labs); however, some funding is available for extramural research. If you’re considering pursuing funding from the Office of Science, it’s extremely helpful to develop connections and collaborations with scientists within DOE and the national labs who are doing research similar to your own. You can find information on submitting an unsolicited proposal to the core BES program here, and solicitations can be found here.
Another resource can help you understand the interests of the Basic Energy Sciences program: the 2007 report from the Basic Energy Sciences Advisory Committee, “Directing Matter and Energy: Five Challenges for Science and the Imagination.” This report outlines five grand challenges for basic energy sciences, most of which concern basic materials science. You can find other BES reports here.

DOE is also funding typically more applied research as part of its programs aimed at new/renewable energy technologies, including Energy Frontier Research Centers (funded out of the Office of Science) and specific grants funded out of the National Energy Technology Laboratory (NETL). Very few of these are purely materials-related programs, but many (for example, Solid-state Lighting Core Technologies) have significant materials components. ARPA-E has six main programs, the most materials focused of which is Agile Delivery of Electrical Power Technology (ADEPT), which invests in materials research to advance soft magnetics, high-voltage switches, and high-density charge storage.

National Science Foundation

NSF is probably the largest funder of materials research in academia. They have quite a few core programs related to materials as well as many materials-related solicitations; however, it’s important to understand the types of materials research each program prefers to fund. The Division of Materials Research, part of the Math and Physical Sciences Directorate (MPS), tends to fund more basic materials science. The danger, particularly for materials engineers, is that they may propose research projects to DMR that are too engineering oriented and don’t address fundamental materials principles. These types of proposals often don’t fare well at DMR, and researchers often find that these kinds of projects fit better with one of the materials-related programs in the Engineering Directorate. Carefully reading the program synopsis, looking at the abstracts of grants funded out of a program, and talking to the Program Officer will best help you determine the program that most closely matches your project. Below are links to materials-related programs at NSF:

Core Programs within the Division of Materials Research

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

Example Solicitations

- Instrumentation for Materials Research - this is funded some years and not others; if it is funded, the due date typically occurs in January
- Materials Research Centers and Teams – these tend to be relatively large, multi-PI grants (Centers are larger than Teams); competitions typically run every two years
- Chemistry and Materials Research at the Interface between Science and Art – funds collaborations aimed at developing science that can be used for historical conservation
• **Materials World Network** – funds the US side of international collaborations to conduct fundamental materials research

• **Partnerships for Research and Education in Materials** – funds multi-investigator research and education partnerships between minority-serving institutions and DMR-supported centers; competitions typically occur every two to three years.

The **Engineering Directorate (ENG)** also funds a significant amount of materials research, but, as one might expect, this research tends to be less basic than DMR-funded materials research. PIs should, however, keep in mind that any research at NSF still must address basic questions, even though these questions may be more closely tied to specific applications. (Even ENG program officers emphasize that they fund research, not development, so proposed research must generate new knowledge that can be applied beyond the specific application of your project.) Core programs in ENG that fund materials research include:

• **Geomechanics & Geomaterials**
• **Materials and Surface Engineering**
• **Mechanics of Materials**
• **Nano and Bio Mechanics**
• **Structural Materials and Mechanics**
• **Materials Processing and Manufacturing**
• **NanoManufacturing**

Quite a few other programs invite multidisciplinary projects that could easily include materials science and engineering components, including:

• **Communications, Circuits, and Sensing Systems**
• **Electronics, Photonics, and Magnetic Devices**
• **Environmental Sustainability**

In addition, many solicitations out of ENG could fund materials research, including:

• **Science and Technology Centers** – these competitions usually run every two to four years (a new solicitation is expected in 2011)
• **Nanoelectronics for 2020 and Beyond**

**Department of Defense**

The Department of Defense funds a wide range of materials research and engineering related to the challenges in manufacturing, maintaining, and developing new defense systems. If you’re interested in pursuing funding from DoD for your materials research, you must draw a clear connection between your research and DoD’s mission. Moreover, since each service has specific materials issues (for example, the Navy is particularly concerned about corrosion), be sure to understand the technical concerns of the particular service to which you’re applying. To understand fully the research interests and needs of a DoD agency, get to know the appropriate program officer and connect with scientists and engineers within the agency who are conducting research similar to yours. Many of the defense labs host faculty during the summer to conduct research with their intramural researchers. This offers an excellent opportunity to develop a strong understanding of the service’s research needs and to forge a
relationship that often leads to funding. To find more information on the types of research funded by each defense research office, see their long-term BAAs (links are provided below) and then contact the appropriate program officer. (To find information related to materials in the BAAs below, type CNTRL F and search for “material.”

- Army Research Office Long-Range BAA
- Air Force Office of Scientific Research Long-Range BAA
- Office of Naval Research Long-Range BAA for Science and Technology
- DARPA
  - Defense Sciences Office
  - Microsystems Technology Office
  - Strategic Technology Office

National Institute of Standards and Testing (NIST)
NIST has always been deeply involved in materials research; however, most of this research is conducted by scientists and engineers within NIST. Even though NIST doesn’t fund a large number of external grants, it sometimes offers funding opportunities, particularly when an external researcher is collaborating with NIST scientists. NSF also provides supplements to their grants to support collaborations with NIST scientists and use of NIST facilities. It’s also very useful to keep apprised of NIST’s materials research activities, since they are often at the forefront of thinking on where the field is going, and workshops and reports from NIST often inform materials funding priorities at other agencies. Below are some useful links for NIST:

- NIST Materials Science Portal
- NIST Nanotechnology Portal
- NIST Manufacturing Portal
- NIST Funding Opportunities
- NIST Material Measurement Laboratory
NSF Directions:  Science, Engineering, and Education for Sustainability

In 2010 NSF made 70 awards totally $66 million under five SEES solicitations. In FY2011 SEEs will have a continued emphasis on developing the sustainability workforce, with specific efforts targeting early career scientists and post-docs. Overall, NSF invested more than $600 million in SEES-related activities in FY2010. The FY2011 budget requests $765 million for SEES-related activities (Request page 31). The below compilation from various NSF sources offers comprehensive research and education opportunities across disciplines.

Science, Engineering and Education for Sustainability (SEES), an NSF-Wide Investment

NSF established the Science, Engineering, and Education for Sustainability (SEES) investment area in FY2010 in order to address challenges in climate and energy research and education using a systems-based approach to understanding, predicting, and reacting to change in the linked natural, social, and built environment. Initial efforts were focused on coordination of a suite of research and education programs at the intersection of climate and environment, including specific attention to incorporating human dimensions.

SEES is constructed as a portfolio of investments (e.g., individual investigators, small interdisciplinary teams, and larger groups) that include new as well as augmented ongoing activities in climate and energy research and education that are directly relevant to the SEES goal of informing societal actions needed for a sustainable Earth. This portfolio-based approach by NSF is intended to facilitate coordination, monitoring and impact across the major NSF investments.

In 2010, five NSF solicitations resulted in 70 awards totaling $66 million (listed below). Combined with support for SEES-related research funded through the core programs, NSF invested more than $600 million in SEES-related activities in FY2010. Updated versions of these, and new solicitations, are anticipated in the coming fiscal years.

- NSF Awards Grants for Study of Water Sustainability and Climate (NSF 10-182)
- NSF Awards Grants to Study Effects of Ocean Acidification (NSF 10-186)
- Climate Change Education Partnership Awards (NSF 10-165)
- NSF Awards Grants to Study Dimensions of Earth’s Biodiversity (NSF 10-179)
- NSF Awards Grants on Interactions Among the Environment, Economy and Society (NSF 10-194)

In FY 2011, NSF plans to encourage interdisciplinary research and education on energy sustainability, with a particular emphasis on the socioeconomic and environmental implications. Potential areas of emphases include the development of sustainable energy technologies, development of techniques for effective and efficient use of water resources, and research in transportation technology. A continued focus will be placed on creating the necessary workforce to address sustainability challenges and connecting elements of the SEES portfolio. Specific efforts will support postdoctoral researchers and early career scientists at the interfaces between social sciences and other science and engineering disciplines.
FY11 requests in millions by directorate/office are: Biological Sciences, $126.00; Computer and Information Science and Engineering, $29.36; Engineering, $120.00; Geosciences, $230.70; Mathematical and Physical Sciences, $110.50; Social, Behavioral and Economic Sciences, $27.98; Office of Cyberinfrastructure, $5.00; Office of International Science and Engineering, $8.20; Office of Polar Programs, $69.26; Office of Integrative Activities, $26.50.

The SEES proposed FY2011 $765 million portfolio will support research and education projects that span all eleven NSF Directorates and Offices, including:

- research at the energy-environment-society nexus
- novel energy production, harvesting, storage, transmission, and distribution technologies, and their intelligent control that minimizes environmental impact and corresponding adoption, socioeconomic, and policy issues
- innovative computational science and engineering methods and systems for monitoring, understanding and optimizing life-cycle energy costs and carbon footprints of natural, social and built systems (including IT systems themselves)
- data analysis, modeling, simulation, visualization, and intelligent decision-making facilitated by advanced computation to understand impacts of climate change and to analyze mitigation strategies
- study of societal factors such as vulnerability and resilience, and sensitivity to regional change
- short and long term research enabled by a new generation of experimental and observational networks
- support for interdisciplinary education/learning science research, development, and professional capacity-building related to sustainability science and engineering
- creation of research and education partnerships around forefront developments in sustainability science and engineering, both nationally and internationally
- development of the workforce required to understand the complexities of environmental, energy, and societal sustainability
- engaging the public to understand issues in sustainability and energy
- development of the cyberinfrastructure and research instrumentation needed to enable sustainability science and engineering
- support of the physical, cyber, and human infrastructure necessary to achieve SEES goals

SEES is expected to be a 5-year effort, extending through FY15. Continuing efforts will focus on supporting research that facilitates global community sustainability, specifically through building connections between current projects, creating new nodes of activity, and developing personnel needed to solve sustainability issues. Future efforts will be expanded to include sustainable energy research in science and engineering, and its socioeconomic and environmental implications.

Major drivers for establishing and expanding the NSF SEES portfolio, include the August 2009 National Science Board Report Building a Sustainable Energy Future and the IPCC Fourth Assessment Report: Climate Change 2007. NSF is working across directorates and offices to
coordinate and grow its portfolio of research and education efforts associated with climate, energy, and sustainability.

In FY 2011, potential areas of emphases include the development of sustainable energy technologies, development of techniques for effective and efficient use of water resources, and research in transportation technology. Moreover, in FY11, NSF will continue to support and emphasize creative, interdisciplinary research that underpins the development of innovative solutions to pressing problems in sustainability science and engineering. SEES activities will focus on integrated science and engineering research in climate change and energy. This research – in such areas as complex environmental and climate-system responses and pathways – will be complemented by activities focused on sustainable and renewable energy technologies. It is expected to include conceptual, theoretical, empirical, and computational research to further develop the basic science, engineering, education, and policy knowledge base, and address the multifaceted challenges of sustainability at both individual and systems levels. SEES research investments in FY11 are expected to include a broad array of research in the area of sustainable energy, such as: novel energy storage schemas; ecosystem impacts of energy technologies; improving the efficiency and yield of established sustainable energy systems, e.g. wind, solar; and the discovery and development of novel energy sources, e.g. biofuels, ocean/kinetic power. Energy-intelligent computational performance in computer and network systems, the use of information technology in smart sensing systems that have promise to save energy, and energy efficiency in manufacturing and materials will also be important emphases (more).

SEES-related Solicitations
Researchers who are interested in SEES-related topics are encouraged to consider the following near term activities, as well as periodically check the SEES web page (http://www.nsf.gov/sees) for specific guidance on future research funding opportunities:

- The Dynamics of Coupled Natural and Human Systems (CNH) program is encouraging submission of projects related to SEES themes for its FY 2011 competition (NSF 10-612). CNH is jointly managed by the Biological Sciences; Geosciences; and Social, Behavioral, and Economic Sciences, while other NSF units (including the Directorate for Engineering, the Directorate for Education and Human Resources, the Office of International Science and Engineering, and the Office of Polar Programs) participate in evaluation of proposals and, when appropriate, in funding awards. The CNH program is one of many standing programs contributing to the NSF portfolio of investments for SEES.
- The Catalyzing New International Collaborations program (NSF 11-508) provides support for the early phase of developing and coordinating research and education activities with foreign partner(s). These activities include, but are not limited to: planning visits, small workshops, initial data gathering activities, and the development of research coordination networks.
- The Research Coordination Networks program (NSF 10-566) supports planning activities that bring together novel groupings of researchers (including education researchers and experts in public engagement) and the development of innovative methods for networking investigators working on topics related to SEES.
Where appropriate, researchers are encouraged to include support for postdoctoral researchers within new proposal submissions, especially those SEES-related projects providing opportunities to integrate the social and natural sciences.

Interdisciplinary workshops are encouraged that would help inform the development of SEES activities over the coming years. Investigators should discuss their ideas with Program Officers in the most relevant NSF core program(s) to determine the saliency of their concepts with SEES goals. See Chapter II.D.8 of the Grant Proposal Guide for information about proposals for conferences, symposia and workshops (http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg).


Text Specific to Science, Engineering, and Education for Sustainability (SEES, pg. 29-31)

Goal: To generate the discoveries and capabilities in climate and energy science and engineering needed to inform societal actions that lead to environmental and economic sustainability.

Description and Rationale: Major drivers for establishing the NSF SEES portfolio are the August 2009 report from the National Science Board: Building A Sustainable Energy Future and the IPCC Fourth Assessment Report: Climate Change 2007.

The scope of the SEES portfolio parallels the NSB’s call for integrated approaches that “increase U.S. energy independence, enhance environmental stewardship and reduce energy and carbon intensity, and generate continued economic growth.” The NSB provided specific guidance to NSF that emphasized systems approaches to research programs, education and workforce development, public awareness and outreach, and the importance of partnerships with other agencies, states, universities, industry, and international organizations.

The IPCC Synthesis Report presented a number of key scientific uncertainties that if resolved would improve our ability to predict future climate change, its consequences, and the potential success of mitigation and adaptation strategies. The two-way interaction of human activity with environmental processes now defines the challenges to human survival and wellbeing. Human activity is changing the climate and the ecosystems that support human life and livelihoods. Reliable and affordable energy is essential to meet basic human needs and to fuel economic growth, but many environmental problems arise from the harvesting, generation, transport, processing, conversion, and storage of energy. Climate change is a pressing anthropogenic stressor, but it is not the only one. The growing challenges associated with climate change, water and energy availability, emerging infectious diseases, invasive species, and other effects linked to anthropogenic change are causing increasing hardship and instability in natural and social ecologies throughout the world.

Solutions to these emergent, coupled problems will have to be based on sound multidisciplinary and quantitative principles derived from science, engineering, and technology. It is not only urgent, but also timely and achievable to generate understanding of the links between energy sources and systems, climate forcings and feedbacks of the Earth system, and social, educational, and policy responses. This research will lay the foundation for technologies to
mitigate against, and adapt to, environmental change that threatens sustainability. By
informing policy, education, and management decisions, we will address the major challenge of
ensuring human wellbeing over the long term.

Integrated Science and Engineering Research in Climate Change and Energy

NSF has broad and long-standing investments in environment, energy, climate, social
sciences, mathematics, and many other areas of research and education that provide insight
into the challenges to sustainable well-being in the 21st century. Fundamental research that
underpins the development of innovative solutions to pressing problems in sustainability will
continue to be supported and emphasized across NSF. This research – in such areas as complex
environmental and climate-system responses and pathways – will be complemented by
activities focused on sustainable and renewable energy technologies.

NSF’s unique mandate to support all areas of science, engineering, and science
education allows it to now identify SEES research aimed at tackling the complex system level
problems of sustainability. SEES research will investigate the fundamental role that social,
economic, and political systems play in creating and addressing major issues in sustainability. It
will include conceptual, theoretical, empirical, and computational research needed to further
develop the basic science, engineering, education, and policy knowledge base, as well as
address the multifaceted challenges of sustainability (energy-economy-environment)
at both individual and systems levels.

The NSB report outlined a range of SEES research investments in the area of sustainable
energy: novel energy storage schemas; ecosystem impacts of energy technologies; improving
the efficiency and yield of established sustainable energy systems, e.g. wind, solar; and the
discovery and development of novel energy sources, e.g. biofuels, ocean/kinetic power. Energy-
intelligent computational performance in computer and network systems will be explored as
well as the use of information technology in smart sensing systems that have promise to save
energy. Energy efficiency in manufacturing and materials will be stressed.

Some key scientific uncertainties identified in the IPCC report that SEES research will
address include: interactions between the climate, human and natural systems; feedbacks in
the climate and especially carbon cycles; impacts of ice sheets dynamics on climate change and
sea level rise; regional climate change and causes; the difference between low probability/high
impact vs. high probability/low impact events on risk-based approaches to decision making;
interactions between socio-economic factors and the evolution and utilization of adaptive and
mitigating strategies; barriers, limits and costs of adaptation; effects of lifestyle and behavioral
changes on energy consumption and climate.

Scientific and engineering research in SEES will benefit from creative mathematical,
statistical and computational methods for analysis and simulation. Supercomputing capability
will be enhanced in support of improved predictability and communication at the climate-
energy-society nexus. Many efforts will build on the climate research emphasis initiated in FY
2010, including research on regions highly susceptible to the impacts of environmental changes,
such as coastal areas subject to sea-level rise, the Arctic where permafrost is changing rapidly,
and the Antarctic where sub-ice sheet conditions are being explored and modeled.
In addition to advances in research, these awards will include activities that help prepare an informed, solutions-oriented citizenry and future work force to address the complex problems and decisions associated with sustainability. Experiences for undergraduate, doctoral and postdoctoral students will complement those supported by the Climate Change Education program.

**Management and Assessment**

As an investment portfolio, SEES will support research and education that span ten NSF directorates and offices. Because it will build on and initiate activities that are dispersed, there is a need to create an integrated management framework for the complex, highly interdisciplinary, yet integrated activities that will be effective in addressing the challenge of sustainability. For example, additional planning will occur in order to consult with a wide spectrum of disciplinary communities, form partnerships, and identify shared priorities. Specific measures will therefore be established to provide coordination and guidance across this portfolio.

**The organizational structure will include:**

- A senior leadership committee composed of Assistant Directors/Office Heads to provide long-term planning and provide overall guidance;
- Working groups of program directors, each overseen by Assistant Directors/Office Heads/Division Directors who are most relevant to the specific activity to manage programs or activities; and
- Interagency working groups to coordinate interagency activities, which may require establishment of MOUs/MOAs and joint solicitations between the collaborating agencies.

**Specific outcomes will include:**

- Emergence of new areas of research, identified in FY 2010 and FY 2011, that help close key gaps in the knowledge base;
- Development of new models for the conduct of research, specifically employing integrative, systemic approaches. These will be used by investigators and evaluated between FY 2014 and FY 2016; and
- Generation of new integrated understanding of the interplay of environment, energy, and the economy. Communication and publication of results is expected primarily after awards conclude, beginning as early as FY 2014.

To develop the evaluation framework necessary to monitor progress toward these outcomes, the senior leadership committee will consider a matrix of assessment methods and measures that captures a range of outcomes and impacts. The Advisory Committee for Environmental Research and Education, in addition to other existing NSF advisory committees, will provide input to the senior leadership committee and establish, as appropriate and timely, Committees of Visitors to assess outcomes of programs. NSF engaged the community through workshops in FY 2010 to gather input and explore potential approaches, including those emerging from NSF-funded work in the Science of Science and Innovation Policy program.
Graduate Students and Postdocs Upcoming Funding

(Back to Page 1)

Enhancing the Postdoctoral Experience for Scientists and Engineers: A Guide for Postdoctoral Scholars, Advisers, Institutions, Funding Organizations, and Disciplinary Societies

National Postdoctoral Association: Developing a Postdoctoral Mentoring Plan

About GRAPES
The GRAPES database catalogs extramural funding opportunities of interest to prospective and current graduate students, students working on a master's thesis or doctoral dissertation, and postdoctoral scholars. It contains information on over 500 private and publicly funded awards, fellowships, and internships. Advanced search options allow users to refine their search by field, academic level, award type, award amount, and other criteria. GRAPES is maintained by the Graduate Outreach, Diversity and Fellowships Office. Access the database through the GRAPES Search Form.

Upcoming (2010-2011) Fellowship Funding Opportunities

NCR-SARE
Funds Graduate Student grants in Sustainable Agriculture for projects that address sustainable agriculture issues and are part of the student's degree program. NCR-SARE instituted the Graduate Student grant program in 2002 for officially registered graduate students (Masters and Ph.D.) enrolled at accredited colleges or universities. Projects must benefit agriculture in the North Central Region. Due Jan. 27.

DPDF Student Fellowship Competition
The SSRC/DPDF program is open to doctoral students in social science or humanities disciplines who have completed their major course requirements and are beginning to design research proposals. Students who have completed their comprehensive, general, or qualifying exams are eligible to apply as long as their dissertation proposals will be formally approved by their department after the fall DPDF workshop. Typically such students will be second and third year graduate students, but first and fourth year student may, under exceptional circumstances, be eligible. Due Jan. 28.

NOAA EPP Graduate Sciences Program
The GSP offers between two years (master's candidates) to four years (doctoral students) of NOAA-related research and training opportunities. Instructions. The Graduate Sciences Program (GSP) is aimed primarily at increasing opportunities for students in NOAA-related fields to pursue research and educational training in atmospheric, environmental, remote sensing and oceanic sciences at minority serving institutions (MSI) when possible. The GSP offers between
two years (master’s candidates) to four years (doctoral students) of NOAA-related research and training opportunities. Due Jan. 31.

AHA Predoctoral Fellowship
Helps students initiate careers in cardiovascular and stroke research by providing research assistance and training. Currently offered by: Founders Affiliate, Great Rivers Affiliate, Greater Southeast Affiliate, Mid-Atlantic Affiliate, Midwest Affiliate, Pacific Mountain Affiliate, South Central Affiliate and Western States Affiliate. Due Feb. 3.

AHA Undergraduate Student Research Fellowship
Encourages promising students from all disciplines, including women and members of minority groups underrepresented in the sciences, to consider research careers while supporting the highest quality scientific investigation broadly related to cardiovascular disease and stroke. Currently offered by: Midwest Affiliate, Pacific Mountain Affiliate and Western States Affiliate. Due Feb. 8.

NIJ Ph.D. Graduate Research Fellowship Program FY 2011
DOJ is seeking applications for funding under the Ph.D. Graduate Research Fellowship program, which provides awards for research on crime, violence, and other criminal justice-related topics to accredited academic universities that support graduate study leading to research-based doctoral degrees in disciplines relevant to NIJ’s mission. Due Feb. 28.

Nancy Foster Scholarship Program
The Dr. Nancy Foster Scholarship Program provides support for independent graduate-level studies in oceanography, marine biology or maritime archaeology (including all science, engineering, and resource management of ocean and coastal areas), particularly to women and minorities. Individuals who are U.S. citizens and are applying to or have been accepted to a graduate program at a U.S. accredited institution may apply. Scholarship selections are based on academic excellence, letters of recommendations, research and career goals, and financial need. Dr. Nancy Foster Scholarships may provide yearly support of up to $42,000 per student (a 12-month stipend of $30,000 in addition to an education allowance of up to $12,000), and up to $10,000 support for a four to six week research collaboration at a NOAA facility. A maximum of $94,000 may be provided to masters students (up to 2 years of support and one research collaboration opportunity) and up to $188,000 may be provided to doctoral students (up to 4 years of support and two research collaboration opportunities). Due March 17.

W.E.B. Du Bois Fellowship Program FY 2011
NIJ’s W.E.B. Du Bois Fellowship Program seeks to advance the field of knowledge regarding the confluence of crime, justice, and culture in various societal contexts. Due March 22.

Society for Historians of American Foreign Relations
- SHAFR Dissertation Completion Fellowship
- Stuart L. Bernath Dissertation Research Fellowship
W. Stull Holt Dissertation Fellowship
The Lawrence Gelfand – Armin Rappaport Dissertation Fellowship
Samuel Flagg Bemis Dissertation Research Grants
The Michael J. Hogan Foreign Language Fellowship
William Appleman Williams Junior Faculty Research Grants
The Myrna F. Bernath Fellowship
Due April 1.

**Atmospheric and Geospace Sciences Postdoctoral Research Fellowships (AGS-PRF)**
Awards Postdoctoral Research Fellowships (PRF) to highly qualified investigators within 3 years of obtaining their PhD to carry out an independent research program. The research plan of each Fellowship must address scientific questions within the scope of AGS disciplines. The program supports researchers for a period of up to 2 years with Fellowships that can be taken to the institution or national facility of their choice. The program is intended to recognize beginning investigators of significant potential, and provide them with experience in research that will broaden perspectives, facilitate interdisciplinary interactions and help establish them in leadership positions within the Atmospheric and Geospace Sciences community. Because the Fellowships are offered only to postdoctoral scientists early in their careers, doctoral advisors are encouraged to discuss the availability of AGS Postdoctoral Research Fellowships with their graduate students early in their doctoral programs. **Due April 11.**

**GHI Doctoral and Postdoctoral Fellowships**
The GHI awards short-term fellowships to German and American doctoral students as well as postdoctoral scholars in the fields of German history, the history of German-American relations, and the history of the role of Germany and the USA in international relations. **Due April 15.**

**Fellowships at The Wilson Center 2011-2012**
The Center awards approximately 20-25 residential fellowships annually to individuals with outstanding project proposals in a broad range of the social sciences and humanities on national and/or international issues. Topics and scholarship should relate to key public policy challenges or provide the historical and/or cultural framework to illuminate policy issues of contemporary importance. **Due Oct. 1.**
NIH New Investigator Series

1. "Gearing Up as a New PI" -- June 2010
2. "Cruising for Grant Type? Don't Set Sail Alone" -- June 2010
3. "How to Pick a Project" -- July 2010
5. "Are You Ready to Conduct Your Research?" -- August 2010
   o "Team Science -- Sharing the Sandbox" -- August 2010
7. "Your Application Takes Center Stage" -- September 2010
8. "Your Project's Scope: Plot Your Boundaries" -- September 2010
10. "May the Force Be With Your Application" -- October 2010
11. "Laying the Groundwork for Your Research Plan" -- October 2010
12. "Start Writing Your Application" -- January 2011

NSF Regional Grants Conference hosted by Utah State University and University of Utah - October 25-26, 2010

- Introduction and NSF Overview
- Proposal Preparation
- NSF Merit Review Process
- Award Management
- Transparency, Accountability and You
- Crosscutting and Special Interest Programs
- Office of International Science and Engineering
- Opportunities in Polar Science
- Office of the Inspector General
- Breakout Sessions:
  o Biological Sciences
  o Computer and Information Science and Engineering
  o Education and Human Resources
  o Engineering
  o NSF EPSCoR
  o Faculty Early Career Development (CAREER) Program
  o Geosciences
  o Grant Payment and Federal Financial Report (FFR) Processes
  o Mathematical and Physical Sciences
  o MREFC
  o Office of Integrative Activities: MRI & STC
EPA Tips On Writing a Grant Proposal
Before developing a grant proposal, it is vitally important to understand the goals of the particular Federal agency or private organization, and of the grant program itself. This can be accomplished through careful analysis of the Catalog of Federal Domestic Assistance (CFDA), Request for Initial Proposals (RFIP) or Request for Applications (RFA) and discussions with the information contact listed in each resource description. Through these discussions an applicant may find that, in order for a particular project to be eligible for funding, the original concept may need to be modified to meet the criteria of the grant program. In allocating funds, programs base their decisions on the applicant's ability to fit its proposed activities within the program's interest areas.

Purdue University: How to Write Grants to EPA
The U.S. Environmental Protection Agency (EPA) recognizes that lack of adequate funding may hamper the establishment of new or threaten existing environmental developing activities, such as solid waste management, in communities or non-profit organizations needing this kind of development. For this reason, EPA developed this program to help those communities and non-profit organizations identify financial assistance opportunities for their environmental-oriented development programs. Also, this program was developed to make it easier for applicants to produce more competitive grant applications.

Overview of OJP Grants and Funding
Over the past 10 years, OJP has provided 52,000 funding awards to the criminal justice community totaling more than $26 billion. In Fiscal Year (FY) 2009, OJP awarded 4,900 grants totaling more than $2.5 billion. In FY 2009, OJP also awarded an additional 3,883 Recovery Act grants totaling more than $2.74 billion to state and local and tribal law enforcement and community organizations. Most of OJP’s funding programs are highly competitive; we receive hundreds of grant proposals for the same funding opportunities. Our Grants 101 site will help you navigate the process. Read—The Life of a Grant; Types of Funding; Funding Resources
Writing educational grants to federal agencies and foundations is helped by developing a knowledge base of proven and successful educational models and STEM standards at the K-12, community college, and university level.

**Interactive, Web-Based Proposal Writing Workshop, NSF** Louisiana State University, Oct. 2010
Lead by the Engineering Program Directors of the NSF Division of Undergraduate Education, the Workshop used a series of interactive exercises which will help you not only prepare more competitive proposals for NSF's education programs but also develop a broader perspective for writing any successful proposal.

**PowerPoint Proposal Writing Presentation**
- PowerPoint Project Evaluation/Broader Impacts Presentation
- Broader Impacts Handout
- Materials for Mock Panel Review Webinar
  - Project Summary
  - Project Description
  - Instructions to Reviewers
  - Reviewer Webinar Slides
  - Mock Panel Review PP Presentation

**The MSPnet Toolbox**
Contains materials that projects have found particularly useful in their work and that may be adapted for use by other MSP projects. Tools may include assessment instruments, evaluation protocols, form letters, etc.

**The Math and Science Partnership Network**
MSPnet is an electronic learning community for the Math and Science Partnership Program. With the MSP program, the National Science Foundation implemented an important facet of the President's No Child Left Behind (NCLB) vision for K-12 education. A major research and development effort, the MSP program responds to concern over the performance of the nation's children in mathematics and science. Institutions of higher education partner with K-12 districts and others to effect deep, lasting improvement in K-12 mathematics and science education.

**MSP Library**
The library contains over 1100 articles of interest to leaders engaged in K-12 science and mathematics education reform.

**Doing What Works, Research Based Education Practices On-line**
Direct link to the NSF-wide Investments section of the FY 2011 Budget Request to Congress

This is a two-day event hosted by the Texas A&M University Energy Engineering Institute. The forum will consist of expert panel discussions, keynote presentations, tours and exhibits. Participants will have opportunities to network with industry, government and other energy stakeholders; meet top energy engineering researchers; and learn more about the Energy Engineering Institute and how to collaborate with them on addressing today’s energy challenges.

**Access to DOE Database of Oil and Natural Gas Research Results Expanded**
The results of nearly four decades of research supported by the U.S. Department of Energy are now available through the OnePetro online document repository.

**DOE Webinar January 24: Photosynthesis for Hydrogen and Fuels Production**
The Fuel Cell Technologies Program is offering a Webinar on Monday, January 24, 2011, from 12:00 - 1:00 p.m. Eastern titled "Improving Photosynthesis for Hydrogen and Fuels Production" in conjunction with the Biomass Program. [Register for Webinar](#).

**ESTCP Solicits Proposals for FY 2012 Funding**
**Pre-Proposal Submissions Are Due March 8, 2011.**
ESTCP (Strategic Environmental Research and Development Program; Environmental Security Technology Certification Program) released its [FY 2012 solicitation on January 13, 2011](#), requesting proposals for demonstration of environmental technologies. Funds are available through a competitive process to Federal and private organizations through the appropriate solicitations noted below. The [DoD Call for Proposals requests pre-proposals related to: (1) Environmental Restoration; (2) Munitions Response; (3) Resource Conservation; and (4) Weapons Systems and Platforms](#). The due date for all pre-proposals from both the Federal and non-Federal sectors is Tuesday, March 8, 2011. More information about the solicitation, including instructions and deadlines, is available on the SERDP and ESTCP web site at [www.serdp-estcp.org/Funding-Opportunities/ESTCP-Solicitations](#). [Webinar for the ESTCP Solicitation](#).

**Special Program Announcement for 2011 Office of Naval Research Basic Research Challenge: “Novel Electronic Devices Based on Coupled Phase Transitions” Due Feb. 25.**
AAAS Report XXXV, Research and Development FY 2011

AAAS Forum on Science & Technology Policy

Changes for NSF Proposals Submitted or Due On or After January 18
The new National Science Foundation Proposal and Award Policies & Procedures Guide (PAPPG) (NSF 11-1) goes into effect for proposals submitted, or due, on or after January 18, 2011. The significant changes to the PAPPG include 1) a requirement that all proposals submitted to NSF contain an up to two-page Data Management Plan as a Supplementary Document and 2) implementation of the National Science Board’s recommendations regarding cost sharing. A complete list of significant changes accompanies the PAPPG.

NIH Application Submission Changes Coming in January
Many changes affecting application submissions are converging on the January 25, 2011 application receipt date, including the elimination of the error correction window mentioned above (described in more detail below), the new policy on post-submission application materials, the new time limit for resubmission applications, and more. If you are planning on submitting an application for a due date on or after January 25 you will want to read this recently published Guide notice (NOT-OD-10-021). It describes all the changes that will take effect on and after January 25 and points you to any related notices for more information.

Algae Biomass Supply
The U.S. Department of Energy is seeking input from industry, academia, and other biofuels stakeholders regarding supply systems and services for the production, handling, storage, transport and delivery of algae. The purpose of this request for information (RFI) is solely to solicit input for DOE consideration in the development of future algal biofuels RD&D programs. Information obtained is meant to be used by DOE on a non-attribution basis. This RFI provides algae stakeholders with an opportunity to contribute their views of any requirements necessary to develop reliable and readily-available supplies of algal biomass and metabolites. Multiple types of algae, including microalgae, cyanobacteria, and macroalgae are of interest. Recommendations are sought for equipment, sustainability factors, common practices, and financing needs to establish and maintain algal biomass supplies. The DOE may determine as the result of this RFI to issue a formal Funding Opportunity Announcement (FOA) for this area. Comments in response to this RFI should be submitted in Microsoft Word or PDF format to algalfeedstocks@go.doe.gov by 8:00 PM Eastern Standard Time on March 1, 2011. DOE prefers that responses to this RFI be no more than 5,000 words in length.

U.S. Secretary of Energy Steven Chu announced today the Department is accepting applications for up to $184 million over three to five years to accelerate the development and deployment of new efficient vehicle technologies that will reduce U.S. dependence on foreign oil, save drivers money, and limit carbon pollution. Projects will span the broad spectrum of
technology approaches, including advanced materials, combustion research, hybrid electric systems, fleet efficiency, and fuels technology.

**DOE NOI - Demonstration Project for Concentrating Solar Technologies**

DOE intends to issue a Funding Opportunity Announcement (FOA) to facilitate the demonstration of utility-scale, *Concentrating Solar Technologies*, which include Concentrating Solar Power (CSP) and Concentrating Photovoltaics (CPV), within the next 30 to 60 days from posted date of Dec. 16. The goal of the DOE Solar Energy Technologies Program (SETP) is to develop solar technologies that are competitive with conventional electricity without subsidy. The objective of the Demonstration Project for Concentrating Solar Technologies FOA is to enable advanced technologies to bridge the gap between system development and commercial deployment. This FOA would support the demonstration of CSP and CPV technology at a sufficient scale to prove their readiness for utility-scale power production. Technologies and systems that successfully complete demonstrations under this program may be better positioned to secure financing from private sources for utility scale projects. Full information on this Notice of Intent (NOI) is found on the FedConnect website. Click on Search Public Opportunities, select Reference Number, Enter DE-FOA-0000233, and click on search.

**NSF SEES FY 2011 Activities**

In FY11, NSF will continue to support and emphasize creative, interdisciplinary research that underpins the development of innovative solutions to pressing problems in *sustainability science and engineering*. SEES activities will focus on integrated science and engineering research in climate change and energy. This research – in such areas as complex environmental and climate-system responses and pathways – will be complemented by activities focused on sustainable and renewable energy technologies. It is expected to include conceptual, theoretical, empirical, and computational research to further develop the basic science, engineering, education, and policy knowledge base, and address the multifaceted challenges of sustainability at both individual and systems levels. SEES research investments in FY11 are expected to include a broad array of research in the area of sustainable energy, such as: *novel energy storage schemas; ecosystem impacts of energy technologies; improving the efficiency and yield of established sustainable energy systems, e.g. wind, solar; and the discovery and development of novel energy sources, e.g. biofuels, ocean/kinetic power.* Energy-intelligent computational performance in computer and network systems, the use of information technology in smart sensing systems that have promise to save energy, and energy efficiency in manufacturing and materials will also be important emphases.

**NSF/DLC: Science, Engineering and Education for Sustainability NSF-Wide Investment Area**

In FY 2011, NSF plans to encourage interdisciplinary research and education on energy sustainability, with a particular emphasis on the socioeconomic and environmental implications. Potential areas of emphases include the development of sustainable energy technologies, *development of techniques for effective and efficient use of water resources, and research in transportation technology*. A continued focus will be placed on creating the necessary workforce to address sustainability challenges and connecting elements of the SEES
portfolio. Specific efforts will support postdoctoral researchers and early career scientists at the interfaces between social sciences and other science and engineering disciplines.  

The SEES Portfolio will support research and education projects that span all eleven NSF Directorates and Offices, including:

- research at the energy-environment-society nexus
- novel energy production, harvesting, storage, transmission, and distribution technologies, and their intelligent control that minimizes environmental impact and corresponding adoption, socioeconomic, and policy issues
- innovative computational science and engineering methods and systems for monitoring, understanding and optimizing life-cycle energy costs and carbon footprints of natural, social and built systems (including IT systems themselves)
- data analysis, modeling, simulation, visualization, and intelligent decision-making facilitated by advanced computation to understand impacts of climate change and to analyze mitigation strategies
- study of societal factors such as vulnerability and resilience, and sensitivity to regional change
- short and long term research enabled by a new generation of experimental and observational networks
- support for interdisciplinary education/learning science research, development, and professional capacity-building related to sustainability science and engineering
- creation of research and education partnerships around forefront developments in sustainability science and engineering, both nationally and internationally
- development of the workforce required to understand the complexities of environmental, energy, and societal sustainability
- engaging the public to understand issues in sustainability and energy
- development of the cyberinfrastructure and research instrumentation needed to enable sustainability science and engineering
- support of the physical, cyber, and human infrastructure necessary to achieve SEES goals

**NSF DLC: Wiki for Enabling International Partnerships for the Basic Research to Enable Agricultural Development Program (BREAD Wiki)**

NSF intends to support a new competition for the Basic Research to Enable Agricultural Development (BREAD) Program in FY 2012. The BREAD Program is a partnership between NSF and the Bill & Melinda Gates Foundation. The goal of BREAD is to support basic research that addresses challenges in smallholder agriculture in developing countries. Further information on the FY 2011 BREAD solicitation, which will form the basis of the FY 2012 Solicitation, may be found at [http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503285&org=BIO](http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503285&org=BIO). The Directorate for Biological Sciences recognizes the need to facilitate communication among potential international partners for new, collaborative projects for the BREAD Program. Accordingly, the NSF has implemented a Wiki, a social networking vehicle, to facilitate collaborations between U.S. Principal Investigators (PIs) and international partners, and to promote development of innovative approaches to address major constraints in developing
country agriculture. On the Wiki, PIs will be able to pose agricultural challenges for which they would like help in finding creative solutions, and others will be able to describe their expertise and interest in addressing those challenges. It is anticipated that the Wiki will allow PIs from different disciplines to come together to develop innovative, interdisciplinary and ethical approaches to address intractable problems facing smallholder farmers. The Wiki is accessible at https://extwiki.nsf.gov/x/JgCF. First-time users must register for an account. Once registered, users will be directed to the main page of the NSF Wiki, where you must accept the terms and conditions before proceeding. Additional guidance for use will be available on the Wiki.

**NSF/DCL: Stimulating Research Related to the Science of Broadening Participation**

The Division of Behavioral and Cognitive Sciences (BCS) and the Division of Social and Economic Sciences (SES) within the Social, Behavioral and Economic Sciences Directorate (SBE) wish to bring to your attention our goal of stimulating research related to the Science of Broadening Participation (SBP). A *Science* of Broadening Participation will employ the cognitive, behavioral, social and economic sciences to inform approaches to broadening participation and will strengthen our national science, technology, engineering, and mathematics (STEM) capabilities and competitive advantage. Ultimately, the SBP can provide policy makers with the evidence needed for informed decisions. In FY 2011, **BCS and SES will support research** that utilizes the theories, methods and analytical techniques of the social, behavioral and economic sciences to better understand the barriers as well as factors that enhance our ability to broaden participation in STEM. Supported research may identify from an empirical standpoint those strategies most likely to improve the representation and participation of women, minorities and persons with disabilities who are under-represented in STEM fields. This is important because it would provide an opportunity to understand from an evidence-based perspective what works to increase the scientific talent pool.

**Frequently Asked Questions for Ethics Education in Science and Engineering (NSF 11-018)**

**Frequently Asked Questions (FAQ) for Cyber-enabled Discovery and Innovation (CDI) Solicitation:** NSF 11-502

**Draft Programmatic EIS Now Available**

The **Solar Energy Development Draft PEIS** is now available for downloading or browsing online. See the [BLM](#) and [DOE](#) press releases and the [Notice of Availability](#) for more information. a comprehensive environmental analysis that has identified proposed ‘solar energy zones’ on public lands in **six western states most suitable for environmentally sound, utility-scale solar energy production.**

**Solar Energy Development PEIS Maps Available**

Programmatic EIS maps and spatial data are available for downloading in several formats, or for interactive online viewing.
EIS Documents
EIS-related documents for downloading or online browsing.

2011 NIH Regional Seminar Registration Opens Soon
The first of two annual seminars will take place on Thursday and Friday, April 28-29 in Scottsdale, Arizona, with optional eRA computer workshops held on Wednesday, April 27. Watch for registration to open mid-December, but in the meantime, check the Save the Date page for more details.
New this year will be:
- A stronger focus on mapping your research career using NIH support
- An opportunity to learn about the nuances of the AREA/R15 program
- Additional sessions on developing a career development application and budget issues

HHMI Professors Suggest Strategy to Change the Culture of Science Education
Thirteen HHMI professors have proposed seven initiatives that they believe would improve the quality of undergraduate science education and student engagement. Education Forum opinion piece published in the journal Science on January 14, 2011.

Policy and Procedural Change Regarding the Publication of Notices of Funding Opportunities in the Federal Register
This notice is to announce that the Department of Labor, Employment and Training Administration (ETA) will no longer publish the full text of Solicitation of Grant Applications (SGAs) in the Federal Register. ETA will publish a Notice of Funding Opportunity in the Federal Register, and the full texts of all ETA SGAs will be posted at the government-wide Web site, http://www.grants.gov, in accordance with the policy directive issued by the Office of Management and Budget (OMB). An applicant for funding may access the full SGA associated with a synopsis posted at http://www.grants.gov by following the universal resource locator (URL) link included in the synopsis, or by visiting ETA’s Web site at http://www.doleta.gov.
The competitiveness of proposals can be enhanced by grounding the arguments you make in the proposal narrative, as appropriate, on national reports, agency research roadmaps, and research workshops that demonstrate your understanding of the national research agenda and how your research advances and maps to that agenda.

The Convergence of the Life Sciences, Physical Sciences, and Engineering
The report defines convergence as "the merging of distinct technologies, processing disciplines, or devices into a unified whole that creates a host of new pathways and opportunities" by combining life sciences, physical sciences, and engineering. Convergence is the "third revolution" in biomedical research, one that will be needed to make health care more affordable, the report says. (The first two revolutions were molecular biology following the 1953 discovery of the structure of DNA and the genomics era and sequencing of the human genome.) The 12 scientists outlined their ideas Jan. 4 in a white paper released in Washington, D.C., at a forum held by MIT and AAAS (ScienceInsider's publisher).

DOE Releases Critical Materials Strategy, December 2010
This report examines the role of rare earth metals and other materials in the clean energy economy. The report focuses on materials used in four technologies – wind turbines, electric vehicles, solar cells and energy-efficient lighting. It was prepared by the U.S. Department of Energy (DOE) based on data collected and research performed during 2010. Its main conclusions include:

- Several clean energy technologies—including wind turbines, electric vehicles, photovoltaic cells and fluorescent lighting—use materials at risk of supply disruptions in the short term. Those risks will generally decrease in the medium and long term.
- Clean energy technologies currently constitute about 20 percent of global consumption of critical materials. As clean energy technologies are deployed more widely in the decades ahead, their share of global consumption of critical materials will likely grow.
- Of the materials analyzed, five rare earth metals (dysprosium, neodymium, terbium, europium and yttrium), as well as indium, are assessed as most critical in the short term. For this purpose, “criticality” is a measure that combines importance to the clean energy economy and risk of supply disruption.
- Sound policies and strategic investments can reduce the risk of supply disruptions, especially in the medium and long term.
- Data with respect to many of the issues considered in this report are sparse.

Tracking Students to 200 Percent of Normal Time: Effect on Institutional Graduation Rates
This Issue Brief examines institutional graduation rates reported at 200 percent of normal time, a time frame that corresponds to completing a bachelor’s degree in 8 years and an associate’s degree in 4 years. The report compares these rates with those reported at 150 percent and 100 percent of normal time for all nine institutional sectors. The purpose is to determine whether the longer time frame results in higher institutional graduation rates.
NSF SciSIP Grantees Workshops: Toward a Community of Practice
Organized and Hosted by the American Association for the Advancement of Science
Session 1: New Tools and Methods of Data Collection and Analysis
• Alan Porter, Georgia Institute of Technology, “Measuring and Tracking Research
  Knowledge Integration” (abstract) (slides)
• Mary Walshok, University of California-San Diego, “Metrics for Capturing Social
  Dynamics of Innovation Regions: Tools for Informing S&T Policy” (abstract) (slides)
• Katy Borner, Indiana University, “Towards a Macroscope for Science Policy Decision
  Making” (abstract) (slides)
• William Ribarsky, University of North Carolina at Charlotte, “A Mixed-Initiative Visual
  Analytics Approach to Topic Modeling Research Collections” (abstract) (slides)

Session 2: How Competitive is the U.S. Scientific Workforce?
• Shulamit Kahn, Boston University, “Should Countries Adopt Policies Requiring the
  Return of Science PhD. Students who Study Abroad?” (abstract) (slides)
• A. Mushfiq Mobrarak, Yale University, “Skilled Immigration and Innovation: Evidence
  from Enrollment Fluctuations in U.S. Doctoral Programs” (abstract) (slides)
• Catherine Weinberger, University of California-Santa Barbara, “Impacts of Institution-
  level Policies on Entry to Computer Science of Engineering Majors and Later Outcomes:
  A ‘Natural Experiment’” (abstract) (slides)
• Marcus Ynalvez, Texas A&M International University, “Transmission of Tacit Skills in East
  Asian Doctoral Science Programs: Learning from Japan, Singapore and Taiwan”
  (abstract) (slides)
• A. Eamonn Kelly, George Mason University, “Advocating for an Inventive and
  Transformative Recovery in National STEM Education” (abstract) (slides)

Session 3: Understanding Science and Innovation
• Alexandra Stone, University of Texas, Austin, “Using Science to Innovate: How do
  Processes for Incorporating Scientific Advances into Innovation Affect Productivity in the
  Pharmaceutical Industry?” (abstract) (slides)
• Ping Wang, University of Maryland-College Park, “Science & Technology Innovation
  Concept Knowledge-base (STICK): Monitoring, Understanding, and Advancing the
  (R)Evolution of Science & Technology Innovation” (abstract) (slides)
• Erica Fuchs, Carnegie-Mellon University, “The Impact of Offshore Manufacturing on
  Innovation” (abstract) (slides)
• Christian Schunn, University of Pittsburgh, “What Makes Engineering Teams Succeed?
  Better Consideration of Options” (abstract) (slides)
• Diego Comin, Harvard University, “Medium Term Business Cycles in Developing
  Countries” (abstract) (slides)

Session 4: What is the Value of the Nation’s Public Investment in Science?
• Sarah Turner, University of Virginia, “Employment Responses to Federal Stimulus Funding for Research” (abstract) (slides)
• Erik Fisher, Arizona State University, “STIR: Socio-Technical Integration Research” (abstract) (slides)
• Jim Murdoch, University of Texas-Dallas, and Rachel Croson, University of Texas-Dallas, “RAPID: The Impact to Stimulus Spending on Energy Efficiency in a Low-Income Dallas Neighborhood: Implications for Science Policy” (abstract) (slides)
• Jason Owen-Smith, University of Michigan, “From Bank to Bench to Breakthrough: The Effects of Funding Policies on Human Stem Cell Science” (abstract) (slides)
New Funding Opportunities

New Funding Solicitations

- DARPA Current Solicitations
- Office of Naval Research Currently Active BAAs
- Department of Commerce, Notice of Grants for FY 2011
- NIH Funding Opportunities Relevant to NIAID
- National Institute of Justice Current Funding Opportunities
- NIST Fiscal Year FY2011 Measurement Science and Engineering Research Grants
- Funding Opportunities by the Department of Education Discretionary Grant Programs
- Humanities Funding Sources A-to-Z
- Science and Technology Funding Sources A-to-Z
- EPA’s Office of Air and Radiation (OAR) Open Solicitations
- NETL Open Solicitations

USDA Higher Education Challenge (HEC) Grants Program, NIFA
Projects supported by the program will: (1) address a State, regional, national, or international educational need; (2) involve a creative or non-traditional approach toward addressing that need that can serve as a model to others; (3) encourage and facilitate better working relationships in the university science and education community, as well as between universities and the private sector, to enhance program quality and supplement available resources; and (4) result in benefits that will likely transcend the project duration and USDA support. Due Feb. 4.

Historically Black Colleges and Universities Undergraduate Program (HBCU-UP)
Provides awards to develop, implement, and study innovative models and approaches for making dramatic improvements in the preparation and success of underrepresented minority students so that they may participate in STEM graduate programs and the workforce. Support is available for Implementation Projects (including Achieving Competitive Excellence), Broadening Participation Research Projects, Targeted Infusion Projects, Planning Grants, Research Initiation Awards, and other funding opportunities. LOI Feb. 7; full April 6.

Earth Sciences: Instrumentation and Facilities (EAR/IF)
The Instrumentation and Facilities Program in Division of Earth Sciences supports meritorious requests for infrastructure that promotes research and education in areas supported by the Division (see http://www.nsf.gov/div/index.jsp?div=EAR). Due Feb. 9 & July 18.

Fuel Cell and Hydrogen Storage System Cost Analyses Funding Opportunity
The Fuel Cell Technologies Program seeks to fund fuel cell system analyses for transportation and stationary applications to envision, define, and determine the cost of reference state-of-the-art or conceptual fuel cell systems for various sizes, applications, and manufacturing
volumes that are optimized for lifecycle cost. The FCT Program is also looking to fund cost analyses for low through high volume manufacturing of hydrogen storage systems for on-board transportation and early market fuel cell applications such as stationary, portable, backup power and material handling (e.g., forklifts). Due Feb. 18.

DHS HS-STEM Career Development Grants (CDG) for Post Secondary Institutions
The Department of Homeland Security (DHS), Science and Technology Directorate (S&T), Office of University Programs (UP) is announcing the fifth annual competition for the Homeland Security Science Technology Engineering and Mathematics (HS-STEM) Career Development Grants (CDG). The CDG program enables U.S. accredited four-year colleges and universities with existing and/or proposed programs in homeland security-related science, technology, engineering or mathematics to award undergraduate scholarships and/or graduate fellowships to qualified students (refer to Section IV.C.5.c.ii) who intend to pursue homeland security scientific, technology, engineering, or mathematic careers. Due Feb. 22.

Rural Innovation Fund Program
The purpose of the Rural Fund is to provide support for highly targeted and innovative grants dedicated to addressing the problems of concentrated rural housing distress and community poverty for projects that demonstrate a great likelihood of substantial impact in addressing the housing needs and community poverty in the project area. HUD is making available awards in two funding categories: Category 1, Single Purpose Grants or Comprehensive Grants that address the need for highly targeted projects that address the problem of concentrated rural housing distress and community poverty in rural areas; and Category 2 Economic Development and Entrepreneurship for Federally Recognized Indian Tribes. Due Feb. 23.


FY 2011 Vehicle Technologies Program Wide Funding Opportunity Announcement Grant
The mission of the VT program is to develop more energy-efficient and environmentally friendly technologies for highway transportation vehicles (cars and trucks) that will meet or exceed performance expectations and environmental requirements, and enable America to use significantly less petroleum and reduce greenhouse gas (GHG) emissions. Due Feb. 28.

International Research and Studies (IRS) Program
The DoED IRS Program provides grants to eligible applicants to conduct research and studies to improve and strengthen instruction in modern foreign languages, area studies, and other international fields. Due March 1.

NEH Summer Seminars and Institutes
These grants support faculty development programs in the humanities for school teachers and for college and university teachers. NEH Summer Seminars and Institutes may be as short as two weeks or as long as five weeks. The duration of a program should allow for a rigorous
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treatment of its topic. NEH Summer Seminars and Institutes extend and deepen knowledge and understanding of the humanities by focusing on significant topics, texts, and issues; contribute to the intellectual vitality and professional development of participants; build a community of inquiry and provide models of civility and excellent scholarship and teaching; and promote effective links between teaching and research in the humanities. **Due March 1.**

**NEH Landmarks of American History: Community College Teachers**
The goals of the workshops are to increase knowledge and appreciation of subjects, ideas, and places significant to American history and culture through humanities readings and site study; build a community of inquiry and provide models of civility and of excellent scholarship and teaching; provide community college faculty with expertise in the use and interpretation of historical and cultural sites and of material and archival resources; and encourage historical and cultural sites to develop greater capacity and scale for professional development programs. **Due March 1.**

**NEH Landmarks of American History and Culture: School Teachers**
The Landmarks of American History and Culture program supports series of one-week residence-based workshops for a national audience of K-12 educators. NEH Landmarks of American History and Culture Workshops use historic sites to address central themes and issues in American history, government, literature, art, music, and other related subjects in the humanities. **Due March 1.**

**Office of Postsecondary Education (OPE)--Business and International Education Program**
The Business and International Education (BIE) Program provides grants to enhance international business education programs and to expand the capacity of the business community to engage in international economic activities. **Due March 2.**

**Research and Development of Fuel Cells for Stationary and Transportation Applications**
The Fuel Cell Technologies Program seeks to fund fuel cell research and development in the areas of fuel cell system balance-of-plant, fuel cell components, and innovative concepts that will reduce the cost, improve the durability, and increase the efficiency of fuel cell systems, thereby enabling a competitive domestic fuel cell industry. **Due March 3.**

**Geoscience Education**
The Geoscience Education Program is part of a portfolio of programs within the Directorate for Geosciences that seeks to increase public understanding of Earth system science and foster recruitment, training and retention of a diverse and skilled geoscience workforce for the future. The program achieves these goals by supporting innovative or transformative projects that improve the quality and effectiveness of formal and informal geoscience education at all educational levels, increase the number of students pursuing geoscience education and career paths, broaden participation of traditionally underrepresented groups in the geosciences, and promote public engagement in Earth system science. **Due March 8.**
Cross-Discipline Research in Biometrics Science & Technology
The Department of Homeland Security (DHS) Science and Technology (S&T) Directorate is soliciting applications for cross-discipline biometrics research projects aligned with the mission and requirements of DHS S&T. Research in biometrics – methods to automatically recognize individuals based upon one or more unique physical or behavioral traits – has been historically conducted by the information technology community but this solicitation seeks to significantly improve the performance or application of biometrics by encouraging new cross-discipline research collaboration. **Due March 14.**

Ethics Education in Science and Engineering
EESE funds research and educational projects that improve ethics education in all fields of science and engineering that NSF supports, with priority consideration given to interdisciplinary, inter-institutional, and international contexts. Although the primary focus is on improving ethics education for graduate students in NSF-funded fields, the proposed programs may benefit advanced undergraduates as well. **Due March 14.**

Cyberinfrastructure Training, Education, Advancement, and Mentoring (CI-TEAM)
The CI-TEAM program supports projects that integrate science and engineering research and education activities that range from local activities to global-scale efforts, as appropriate, to promote, leverage and utilize cyberinfrastructure systems, tools and services. **Due March 16.**

DOJ Research and Evaluation in Justice Systems
This solicitation seeks proposals to examine topics relevant to State and/or local criminal and juvenile justice systems policy and practice. Specific focus areas under this solicitation for Fiscal Year (FY) 2011 include: a multi-State study on the impact of incarceration on families of adults confined to penal institutions; a national study on State budget shortfalls and prison closings; and multi-State research on automated reporting systems and kiosk supervision. Application titles should clearly denote the specific focus area selected. Applications addressing other areas of research related to criminal and/or juvenile justice systems policy and practice also may be considered. However, applicants are strongly encouraged to consider NIJ’s stated priority areas as they are outlined in this solicitation. **Due March 17.**

DOJ Research and Evaluation in Crime Control and Prevention
This is a directed solicitation that seeks proposals to examine topics relevant to State, local, and/or tribal criminal and juvenile justice policy and practice. Specific focus areas under this solicitation for FY 2011 include: research on police investigations; research on police integrity; the impact of technology on policing; research on policing strategies for smaller police agencies; and research on desistance from gangs and gang-related crime. Applications addressing other areas of research related to crime control and prevention policy and practice also may be considered. However, applicants are strongly encouraged to consider NIJ’s stated priority areas as they are outlined in this solicitation. **Due March 17.**
SciDAC: Earth System Model Development
The DOE Office of Biological and Environmental Research announces its interest in receiving applications for Earth System Modeling projects as part of the SciDAC (Scientific Discovery through Advanced Computing) program with DOE’s Office of Advanced Scientific Computing Research. The SciDAC program fosters integration of high performance computing and computational science throughout all mission areas within SC. This opportunity addresses collaborative research to enhance climate model resolution, physical representation of processes, validation, and quantification of uncertainty. All projects should be relevant to the objectives of the Earth System Modeling program within BERs Climate and Environmental Sciences Division (CESD). Due March 21.

Cyber-Physical Systems (CPS)
The term "cyber-physical systems" refers to the tight conjoining of and coordination between computational and physical resources. Research advances in cyber-physical systems promise to transform our world with systems that respond more quickly (e.g., autonomous collision avoidance), are more precise (e.g., robotic surgery and nano-tolerance manufacturing), work in dangerous or inaccessible environments (e.g., autonomous systems for search and rescue, firefighting, and exploration), provide large-scale, distributed coordination (e.g., automated traffic control), are highly efficient (e.g., zero-net energy buildings), augment human capabilities, and enhance societal wellbeing (e.g., assistive technologies and ubiquitous healthcare monitoring and delivery). Due March 21.

NCRR Shared Instrument Grant (SIG) Program
The NCRR Shared Instrument Grant (SIG) program encourages applications from groups of NIH-supported investigators to purchase or upgrade a single item of expensive, specialized, commercially available instrumentation or an integrated system that costs at least $100,000. The maximum award is $600,000. Types of instruments supported include confocal and electron microscopes, biomedical imagers, mass spectrometers, DNA sequencers, biosensors, cell-sorters, X-ray diffraction systems, and NMR spectrometers among others. Due March 23.

Robert Noyce Teacher Scholarship Program
The Robert Noyce Teacher Scholarship Program seeks to encourage talented science, technology, engineering, and mathematics majors and professionals to become K-12 mathematics and science teachers. The Noyce Scholarship Track provides funds to institutions of higher education to support scholarships, stipends, and academic programs for undergraduate STEM majors and post-baccalaureate students holding STEM degrees who earn a teaching credential and commit to teaching in high-need K-12 school districts. Due March 23.

Mathematics of Sensing, Exploitation, and Execution (MSEE)
The Mathematics of Sensing, Exploitation and Execution Broad Agency Announcement seeks proposals that formulate and develop new mathematical principles underpinning a unified approach to sensor data collection, analysis and follow-on action. Due March 24.
Dimensions of Biodiversity
The goal of the Dimensions of Biodiversity campaign is to transform, by 2020, how we describe and understand the scope and role of life on Earth. The campaign promotes novel, integrated approaches to identify and understand the evolutionary and ecological significance of biodiversity amidst the changing environment of the present day and in the geologic past. **Due March 28.**

Forensic Science Technology Center of Excellence
The National Institute of Justice is seeking applications for funding a Forensic Science Technology Center of Excellence (FTCOE) within the National Law Enforcement and Corrections Technology Center System (the "NLECTC System"). The FTCOE will provide testing, evaluation, technology assistance, and other services with regard to technologies intended for use by crime laboratories, forensic service providers (supporting criminal justice applications), law enforcement and other criminal justice agencies to combat crime. This program furthers the Department’s mission by improving the safety and effectiveness of criminal justice technology and by providing better access to this technology for law enforcement and other criminal justice agencies. **Due April 4.**

Centers of Research Excellence in Science and Technology
The [NSF Centers of Research Excellence in Science and Technology (CREST)](https://www.nsf.gov/grants/cofunded/crest.cfm) program makes resources available to enhance the research capabilities of minority-serving institutions through the establishment of centers that effectively integrate education and research. CREST promotes the development of new knowledge, enhancements of the research productivity of individual faculty, and an expanded presence of students historically underrepresented in STEM disciplines. HBCU-RISE awards specifically target HBCUs to support the expansion of institutional research capacity as well as an increase in the production of doctoral students at those institutions. This solicitation requests proposals for: (1) CREST centers; (2) partnership supplements applied to existing CREST awards; (3) HBCU Research Infrastructure for Science; Engineering (HBCU-RISE) awards; and (4) supplements applied to SBIR/STTR Phase IIA awards for diversity collaboration with existing CREST and HBCU-RISE projects. **Due April 11.**

Forensic Science Training Delivery and Research Program
NIJ seeks proposals for forensic science education projects that will: (1) increase the number of no-cost educational opportunities for public crime laboratory personnel and practitioners in forensic science disciplines and provide forensic science training to other relevant criminal justice partners and professionals involved in treating victims of sexual assault, and (2) support targeted research of formal and informal forensic science training programs employed by the forensic science community at the State and local levels. **Due April 11.**

Atmospheric and Geospace Sciences Postdoctoral Research Fellowships (AGS-PRF)
Awards Postdoctoral Research Fellowships (PRF) to highly qualified investigators within 3 years of obtaining their PhD to carry out an independent research program. The research plan of each Fellowship must address scientific questions within the scope of AGS disciplines. The program
supports researchers for a period of up to 2 years with Fellowships that can be taken to the institution or national facility of their choice. The program is intended to recognize beginning investigators of significant potential, and provide them with experience in research that will broaden perspectives, facilitate interdisciplinary interactions and help establish them in leadership positions within the Atmospheric and Geospace Sciences community. Because the Fellowships are offered only to postdoctoral scientists early in their careers, doctoral advisors are encouraged to discuss the availability of AGS Postdoctoral Research Fellowships with their graduate students early in their doctoral programs. **Due April 11.**

**Dynamic Air Quality Management**
EPA’s Science to Achieve Results (STAR) program is seeking applications proposing research to lay the scientific foundation for improving the air quality management system. Applications may address increasing the rate at which new information is incorporated into regional and local air quality management or improving management of short-term air pollution episodes. **Due April 28.**

**Early Career Projects: Dynamic Air Quality Management**
EPA’s Science to Achieve Results (STAR) program is seeking applications proposing research to lay the scientific foundation for improving the air quality management system. Applications may address increasing the rate at which new information is incorporated into regional and local air quality management or improving management of short-term air pollution episodes. In addition to regular awards, this solicitation includes the opportunity for early career projects. The purpose of the early career award is to fund research projects smaller in scope and budget by early career PIs. Please see Section III of this Request for Applications (RFA) for details on the early career eligibility criteria. **Due April 28.**

**Solicitations Remaining Open from Prior Issues of the Newsletter**

**DARPA-BAA-10-83 Strategic Technologies**
Posted 8 September 2010—**Open to Sept. 8, 2011**
The Defense Advanced Research Projects Agency’s (DARPA) Strategic Technology Office (STO) is [soliciting innovative proposals](#) under this BAA for the performance of research, development, design, and testing that directly supports Strategic Technology Office (STO). This includes Communications, Networks and Electronic Warfare; Cyber; Energy and Self-Sufficient Operations; Finding Difficult Targets; Recapturing Surprise; and Core Strategic Technologies.

**$800 million for all DOE Office of Science new, renewal, and supplemental grants FY2011**
This FOA will remain **open until September 30, 2011** or until replaced by a successor FOA. Applications may be submitted any time during this period. Grants support of work in the following program areas: Advanced Scientific Computing Research, Basic Energy Sciences, Biological and Environmental Research, Fusion Energy Sciences, High Energy Physics, Nuclear Physics, and Workforce Development for Teachers and Scientists. This FOA, DE-FOA-0000411,
is for new applications; a companion FOA, DE-FOA-0000412, exists for renewal and supplemental applications.

**Nanoelectronics for 2020 and Beyond, A Joint Activity between NSF and NRI**
NSF and the semiconductor industry’s Nanoelectronics Research Initiative plan will support innovative research and education activities on the topic of Nanoelectronics for 2020 and Beyond. Activities will be supported as interdisciplinary research team awards. **Due Jan. 19**

**Broadening Participation Research Initiation Grants in Engineering (BRIGE)**
The goal of the BRIGE solicitation is to increase the number of proposals to the Directorate for Engineering from individuals who can serve as role models and mentors for an increasingly diverse engineering student population who will become the workforce of the future. BRIGE supports innovative research and diversity plans that contribute to recruiting and retaining a broad representation of engineering researchers, especially subgroups underrepresented in the engineering population in programs supported by these grants. **Due Jan. 24.**

**CHE-DMR-DMS Solar Energy Initiative**
The NSF Solar Energy Initiative program announced this new solicitation. It supports interdisciplinary efforts by groups of researchers to address the scientific challenges of highly efficient harvesting, conversion, and storage of solar energy. Groups must include three or more co-Principal Investigators, of whom one must be a researcher in chemistry, a second in materials, and a third in mathematical sciences, in areas supported by the Divisions of Chemistry, Materials Research, and Mathematical Sciences, respectively. **Due by Jan. 25.**

**Animal and Biological Material Resource Centers (P40)**
This FOA issued by the National Center for Research Resources (NIH) encourages grant applications for national Animal Model, and Animal and Biological Material Resource Centers. These Centers provide support for special colonies of laboratory animals, as well as other resources such as reagents, cultures (cells, tissues, and organs) and genetic stocks that serve the biomedical research community at large. **Due Jan. 25.**

**NSF Major Research Instrumentation Program: Instrument Acquisition or Development**
New solicitation effective Nov. 1 with application revisions.
MRI serves to increase access to shared scientific and engineering instruments for research and research training in our Nation's institutions of higher education, museums, science centers, and not-for-profit organizations. This program especially seeks to improve the quality and expand the scope of research and research training in science and engineering, by providing shared instrumentation that fosters the integration of research and education in research-intensive learning environments. Development and acquisition of research instrumentation for shared inter- and/or intra-organizational use are encouraged, as are development efforts that leverage the strengths of private sector partners to build instrument development capacity at academic institutions. **Due Jan. 27.**
Plant Genome Research Program
Up to $20 million is available for FY 2011 new awards, pending availability of funds. Four areas of opportunity will be offered as components of the PGRP in Fiscal Year 2011: (1) Genome-Enabled Plant Research (GEPR) awards to tackle major unanswered questions in plant biology on a genome-wide scale; (2) Transferring Research from Model Systems (TRMS) awards to transfer findings made using model systems to plants of economic importance; (3) Tools and Resources for Plant Genome Research (TRPGR) awards to support development of novel tools to enable discovery in plant biology and (4) Improving Plant Genome Annotation (IPGA) awards to improve existing tools or develop new tools for improved annotation of the genomes of plants of economic importance. Due Jan. 28.

DHS Scientific Leadership Awards for Minority Serving Institutions Granting Bachelor Degrees
The Department of Homeland Security supports the development of a coordinated program of education in Homeland Security-related Science, Technology, Engineering, and Mathematics (HS-STEM) to prepare students for careers in research and development of the technology needed to secure our nation. Moreover, DHS strongly supports the development of a workforce that reflects the population of the United States of America. The DHS, S&T Directorate, Office of University Programs solicits applications from eligible Minority Serving Institutions (MSIs) granting bachelor degrees to support early-career faculty and to establish homeland security–related scientific leadership programs in areas critical to homeland security. Due Jan. 31.

Biotechnology, Biochemical, and Biomass Engineering
Supports fundamental engineering research that advances the understanding of cellular and biomolecular processes (in vivo, in vitro, and/or ex vivo) and eventually leads to the development of enabling technology and/or applications in support of the biopharmaceutical, biotechnology, and bioenergy industries, or with applications in health or the environment.

Energy for Sustainability
Program emphasizes two themes which harness solar energy to make fuels and electrical power: biofuels, bioenergy, and photovoltaic solar energy. In addition, this program also supports research in wind and wave energy, sustainable energy technology assessment, and fuel cells.

Challenge Grants for Two-Year Colleges
The National Endowment for the Humanities invites two-year colleges to apply in a special Challenge Grant competition to strengthen their long-term humanities programs and resources. Due Feb. 2.

USDA Organic Research and Extension Initiative
The OREI seeks to solve critical organic agriculture issues, priorities, or problems through the integration of research and extension activities. The purpose of this program is to fund
projects that will enhance the ability of producers and processors who have already adopted organic standards to grow and market high quality organic agricultural products. Priority concerns include biological, physical, and social sciences, including economics. The OREI is particularly interested in projects that emphasize research and outreach that assist farmers and ranchers with whole farm planning, especially those relating to climate change. **Due Feb. 10.**

**The NSF-Census Research Network (NCRN)**
The NSF-Census Research Network will *provide support for a set of research nodes*, each of which will be staffed by a team of scientists conducting interdisciplinary research and educational activities on methodological questions of interest and significance to the broader research community and to the Federal Statistical System, particularly the U.S. Census Bureau. The activities will be expected to advance both fundamental and applied knowledge as well as further the training of current and future generations of researchers in research skills of relevance to the measurement of economic units, households, and persons. **Due Feb. 16.**

**Institute for Advanced Topics in the Digital Humanities**
These NEH grants support national or regional (multistate) training programs for scholars and advanced graduate students to broaden and extend their knowledge of digital humanities. Through these programs, NEH seeks to increase the number of humanities scholars using digital technology in their research and to broadly disseminate knowledge about advanced technology tools and methodologies relevant to the humanities. **Due Feb. 16.**

**Innovative Bioavailability Assays to Assess the Effectiveness of Contaminated Sediment Remediation (R01)**
The National Institute of Environmental Health Sciences (NIEHS) invites qualified investigators from domestic institutions of higher education to submit an application for a Superfund Research Program (SRP) Individual Research Project Grant (R01). This funding opportunity announcement (FOA) encourages the research community to develop innovative bioavailability assays to determine the effectiveness of contaminated sediment remediation. **Due Feb. 17.**

**FY 2012 Fulbright Scholar Program**
The Office of Academic Programs, Bureau of Educational and Cultural Affairs (ECA), U.S. Department of State announces an open competition for a cooperative agreement to assist in the FY 2012 administration of the worldwide Fulbright Scholar Program. **Due Feb. 18.**

**Developing the Next Generation of Air Quality Measurement Technology**
EPA is seeking applications proposing to develop and demonstrate air quality measurement technology. EPA is interested in projects that will improve air pollution measurement technologies to address emerging air pollution issues and improve the spatial and temporal coverage of air pollution measurement data. In addition to regular awards, this solicitation includes the opportunity for early career projects. **Due Feb. 22.**

**New International Competition Focuses on Early Career Scientists**
HHMI launched an international competition to select up to 35 early career scientists working at academic institutions in 18 countries on five continents with the goal of helping these talented individuals establish independent research programs (application). Due by Feb. 23.

Digital Humanities Start-Up Grants
NEH invites applications to the Digital Humanities Start-Up Grants program. This program is designed to encourage innovations in the digital humanities. By awarding relatively small grants to support the planning stages, NEH aims to encourage the development of innovative projects that promise to benefit the humanities. Due Feb. 23.

Data Resources Program 2011: Funding for Analysis of Existing Data
The U.S. Department of Justice is seeking applications for funding for the Data Resources Program 2011: Funding for Analysis of Existing Data. This program furthers the Department’s mission by sponsoring research to provide objective, independent, evidence-based knowledge and tools to meet the challenges of crime and justice at the State and local levels. Due Feb. 28.

Research Experiences for Teachers in Engineering and Computer Science
To help build long-term collaborative partnerships between K-12 STEM teachers, community college faculty, and the NSF university research community by involving the teachers and community college faculty in engineering and computer science research and helping them translate their research experiences and new knowledge into classroom activities. Due Feb. 28.

Undergraduate Research and Mentoring in the Biological Sciences (URM)
The goal of the program is to increase the number and diversity of individuals pursuing graduate studies in all areas of biological research supported by the NSF Directorate for Biological Sciences. Support will be provided to academic institutions to establish innovative programs to engage undergraduates in a year-round research and mentoring activity. Particular emphasis will be placed on broadening participation of members of groups historically underrepresented in science and engineering. Due March 1.

Catalyzing New International Collaborations
This solicitation can support U.S. participation in a variety of different types of activities intended to catalyze new international collaborations. These include, but are not limited to: planning visits, small workshops, initial data gathering activities, and the development of research coordination networks. The community is invited to propose innovative mechanisms and strategies for catalyzing new international collaborations to the stage that competitive research and education proposals can be submitted to relevant NSF programs. Due March 1.

Building and Enhancing Criminal Justice Researcher-Practitioner Partnerships
The U.S. Department of Justice is seeking applicants for funding to support criminal justice researcher-practitioner partnerships. This program furthers the Department’s mission by sponsoring research to provide objective, independent, evidence-based knowledge and tools to meet the challenges of crime and justice at the State and local levels. Due March 1.
Disaster Resilience for Rural Communities (DRRC)
In a joint announcement, the U.S Department of Agriculture (USDA) National Institute of Food and Agriculture (NIFA) and NSF call for proposals to advance basic research in engineering and the social, behavioral, and economic sciences on enhancing disaster resilience in rural communities. **Due March 4**
What We Do--

We provide consulting for colleges and universities on a wide range of topics related to research development and grant writing:

- **Strategic Planning** - Assistance in *formulating research development strategies and building institutional infrastructure* for research development (including special strategies for Predominantly Undergraduate Institutions and Minority Serving Institutions)

- **Training for Faculty** - Workshops, seminars and webinars on *how to find and compete for research funding* from NSF, NIH, DoE and other government agencies as well as foundations

- **Large proposals** - Assistance in *planning and developing institutional and center-level proposals* (e.g., NSF ERC, STC, IGERT, STEP, Dept of Ed GAANN, DoD MURI, etc.)

- **Assistance for new and junior faculty** - help in identifying funding opportunities and developing competitive research proposals, particularly to NSF CAREER, DoD Young Investigator and other junior investigator programs

- **Facilities and Instrumentation** - Assistance in identifying and competing for *grants to fund facilities and instrumentation*

- **Training for Staff** - *Professional Development* for research office and sponsored projects staff

**Note to Potential Contributors**

If you have an idea for an article related to academic research development and grant writing you would like to write for *Research Development & Grant Writing News* email co-publisher Lucy Deckard with a query proposal of up to ~75 words. Our goal is to publish two articles each issue from faculty, researchers, STEM educators, and research development professionals, among others, to gain a diversity of perspectives related to all areas of academic grant writing.

*$100 honorarium paid for published articles*

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