**Volume 4, Issue 4: December 15, 2013**

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**Research Development & Grant Writing News ©**

Published monthly for faculty and research professionals by

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Mike Cronan & Lucy Deckard, co-Publishers

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About the co-publishers

**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 for Texas A&M’s VPR and the other for the Texas Engineering Experiment Station (15 research divisions state-wide).

**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. She founded [ARFS](#) in 2010.

About the editor

**Katherine E. Kelly**, Ph.D., is a retired English professor from Texas A&M University. She is the author of several books and numerous articles and served as a contributing editor for an academic journal for five years. She provides editorial services to [RD&GW News](#) and to [ARFS](#) clients on proposals, journal articles, and manuscripts.
ABOUT THE WORKSHOP: This interactive workshop offers a step-by-step “how to” guide to faculty and research offices to help them better meet the unique challenges of successfully writing large team grants (LTG). LTGs differ from smaller grants in many ways that make them more challenging to plan, develop and write. LTGs involve more disciplines, components, and moving parts (i.e., complexity); more team members and team dynamics; more partnered institutions; more time needed to plan, develop, and write; more interdisciplinarity; a clear vision for the synergy required to demonstrate the value-added benefits of team research and center structures; and more development challenges for PIs.

The workshop addresses key LTG topics (below), including, how best to communicate a compelling research vision; demonstrate major value-added benefits to the team structure; achieve research synthesis, integration, and synergy; address multiple program components that build on the research core; offer a management plan that enables the research vision to succeed; propose a convincing research strategic plan over a multi-year performance period; convince program officers and reviewers the proposed research is transformational and not merely incremental; and navigate multiple review gates to funding success.

4-HOUR WORKSHOP SCHEDULE OF TOPICS
- Introduction to Team Grants (30 minutes)
- Interactive Discussion: Characteristics of a Successful Research Vision (15 minutes)
- Strategic Planning (30 minutes)
- Interactive Discussion: Characteristics of Research Synergy (15 minutes)
- Proposal Planning and Production (30 minutes)
- Writing the Project Description (30 minutes)
- Writing Key Narrative Sections (30 minutes)
- Characteristics of Successful Narratives (30 minutes)
- Red Teaming and Writing for Reviewers (30 minutes)

2-HOUR WORKSHOP INCLUDED CONSULTATIONS: Individual consultations with faculty and/or research office staff on workshop topics (e.g., 4 consultations @30 minutes each).

WORKSHOP COSTS: Cost of the 4-hour interactive workshop and 2-hours of individual consultations with faculty and/or research office staff on presentation topics: $3,500 plus travel costs. A second day of consultations is available at a rate of $125/hr (4 hour minimum). Please contact Mike Cronan (mjcronan@gmail.com; 979-229-8009) for a full cost quote that will include travel costs; final workshop cost will be invoiced as one lump sum.

WORKSHOP LOGISTICS: Workshops may be scheduled any day Monday through Saturday, February 1 to May 10, 2014. CLIENT PROVIDES all facilities, handouts, and IT set-up support,
including presentation room, projector, and computer with compatible version of Microsoft PowerPoint. **PRESENTER PROVIDES** all workshop materials to the client in electronic form for loading on the presentation computer and producing hard copy handouts three days prior to the workshop.

**ABOUT THE PRESENTER**
Mike Cronan is a research development and grant writing consultant with Academic Research Funding Strategies, LLC. He is the principal co-publisher of the nationally distributed newsletter *Research Development and Grant Writing News*, co-author of the book *New Faculty Guide to Competing for Research Funding*, and author of the book *Strategies for Planning, Developing and Writing Large Team Grants*. He has 23 years of experience developing and writing successful proposals at Texas A&M University (1987-2010). 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 research agencies, 1990-2000. He developed, staffed, and directed two research and proposal development offices at Texas A&M, one for the 15-division, statewide Texas Engineering Experiment Station (1994-2004), and the second for the Vice President for Research (2004-09). Mike Cronan has undergraduate degrees in **civil engineering** (University of Michigan), **political science** (Michigan State University), and an MFA in **English** (University of California-Irvine). He is a registered professional engineer in Texas (inactive).
Topics of Interest URLs

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NSF Award and Administration Guide, February 2014
Higher Education R&D Expenditures Remain Flat in FY 2012
ARPA-E Reliable Electricity Based on Electrochemical Systems (REBELS)
Responding to Capability Surprise: A Strategy for U.S. Naval Force, NAP
Abrupt Impacts of Climate Change: Anticipating Surprises
The Experimental Program to Stimulate Competitive Research
SERDP FY 2015 Solicitations Released
The Experimental Program to Stimulate Competitive Research
Women, Minorities, and Persons with Disabilities in Science and Engineering: Data Update
Research on Education and Learning (REAL)
NSF EHR Core Research (ECR)
NSF Broadening Participation Portfolio
Robert Noyce Teacher Scholarship Program Webinar
Engaging the Public in Critical Disaster Planning and Decision Making: Workshop Summary
STEM Attrition: College Students’ Paths Into and Out of STEM Fields
Five Steps for Structuring Data-Informed Conversations and Action in Education
The Nexus of Biofuels, Climate Change, and Human Health: Workshop Summary
Capturing Change in Science, Technology, and Innovation: Improving Indicators to Inform Policy
Doctorate Recipients from U.S. Universities: 2012 Data Tables
Veterans and Agent Orange: Update 2012
Programs at NIH for Institutions and for Individuals Related to the NSF AGEP Program Goal
NSF’s Education and Human Resources Directorate is undergoing an extensive reorganization, eliminating number of older programs and introducing three new programs.

As we discussed in last June’s issue of the newsletter, STEM education research funding programs across the federal agencies have been undergoing big changes inspired by a new Strategic Plan released on May 31, 2013 by the National Science and Technology Council (NSCT’s) Committee on STEM Education (CoSTEM). Among other things, the new Strategic Plan names NSF as the lead agency for improving higher education. As part of NSF’s effort to implement the new strategic plan, NSF’s Education and Human Resources Directorate (EHR) is in the process of revamping many of its funding programs. The first impact of these changes, much to the distress of PIs across the country, was the elimination of a number of long-standing funding programs, including Transforming Undergraduate Education in STEM (TUES) and the STEM Talent Expansion Program (STEP). Now NSF is in the process of announcing new programs that will take the place of those grant programs as well as offer new opportunities. NSF has held a number of webinars to inform the research community about three new programs: the EHR Core Research Program (ECR), Improving Undergraduate STEM Education (IUSE), and Research on Education and Learning (REAL). Below, we summarize and discuss the information given in these webinars. (Links to webinar slides or recordings are given at the end of this article; the EHR Core program has a final upcoming webinar scheduled for Dec. 18th.)

Following on the release of the Strategic Plan, NSF and the US Department of Education jointly released the Common Guidelines for Education Research and Development in August 2013. These guidelines were discussed in the October issue of our newsletter, and are required reading for anyone planning to submit a proposal to EHR. In particular, you’ll find the categories of types of research projects laid out in the Guidelines echoed in the programs we’ll describe below. Also, don’t forget that a great way to improve your understanding of a new NSF program, assuming you’re not ready to submit, is to volunteer to be a reviewer for the program.

The EHR Core Research (ECR) Program

In the past, unlike other NSF directorates, EHR did not have core programs (programs with broad, brief program descriptions that accept a wide range of proposals based investigator-initiated ideas). Instead, EHR programs were all solicitation-based and highly structured. The new EHR Core program signals a fundamental shift away from this highly prescriptive approach and an intensifying focus on education research, either as the sole focus or in concert with implementation of new educational initiatives.

The EHR Core Research Program (ECR) is an EHR directorate-wide program that supports fundamental STEM education research across every division of EHR (i.e., the Division of Graduate Education (DGE), Research on Learning in Formal and Informal Settings (DRL), Undergraduate Education (DUE), and Human Resource Development (HRD). Therefore, ECR will
fund research at all levels, ranging from Pre-K to workforce education. The key distinction is that ECR funds foundational research, as defined in the Common Guidelines mentioned earlier. ECR is interested in proposals from all disciplinary communities supported by NSF related to four core areas:

- STEM learning
- STEM learning environments
- STEM workforce development
- Broadening participation in STEM

One reason mentioned in the webinar for establishing the ECR program was to provide a program that addresses all of these core research areas at the foundational level. In the past, a number of programs supported fundamental education research, along with more applied projects, but they were fragmented based on the core areas addressed. For example, the former REESE program (now subsumed into REAL) did not address workforce development. By providing one program, NSF hopes to improve integration of the fundamental education research it supports.

ECR will fund two types of proposals: core research proposals (up to $1.5M over 5 years), which will study a foundational research question or issue related to STEM learning and education, and capacity building proposals (up to $300K for 3 years), which will support groundwork for advancing research in the four core areas listed above.

There is an emphasis on identifying and addressing the STEM education “grand challenges” in these proposals. And, as with all NSF programs, potential impact is very important; you’ll want to emphasize the potential of your proposed research to transform STEM learning and education and contribute to the research knowledge base. Core research proposals should be theory-driven, theory-generating, theory-testing or predictive studies. It is essential that studies are evidence-based. Collaborations are encouraged, particularly those that include the social and behavioral sciences in addition to education. Examples of capacity building proposals cited in the webinar include workshops, sandpits, charrettes, and exploratory/consensus studies.

The ECR solicitation specifies two full proposal target dates: July 12, 2013 (which has passed), and February 4, 2014. After that, the target date is the first Tuesday in February, annually. (Target dates differ from due dates in that you can still submit your proposal after the target date, but review of your proposal may be significantly delayed.)

The Improving STEM Undergraduate Education (IUSE) Program

The IUSE program is funded out of the Division of Undergraduate Education and focuses on increasing student retention in STEM, preparing students to participate in science for tomorrow, improving students’ STEM learning outcomes, generating knowledge on how students learn and on effective practice in undergraduate classrooms, and broadening participation. The target date for proposals is February 4, 2014.

IUSE replaces the former NSF TUES, WIDER and STEP programs. (Caution: If you Google these programs, you may still find old solicitations and program pages that indicate that these programs are still active. Don’t let that fool you—they are not accepting new proposals.) The
reason NSF decided to make this change was to provide a more open, less prescriptive program that might, for example, allow proposals that combine aspects of projects that might variously have been submitted to these three former programs in years past. In keeping with this philosophy, there is no solicitation for IUSE (a common practice for NSF core programs), but there is a relatively lengthy program synopsis on the IUSE program page. There are also no explicit budget limits, but in the webinar it was stated that most projects will be 1 to 3 years, with up to 5 years being allowed if necessary. Creativity is encouraged, and a strong research component will be expected. There are also no tracks specified and no limit on the number of proposals that can be submitted.

When you apply, you must specify which of the six types of research defined in the Common Guidelines your project fits. (These are: 1) Foundational Research, 2) Early-Stage or Exploratory Research, 3) Design and Development Research, 4) Efficacy Research, 5) Effectiveness Research, and 6) Scale-up Research.) While you can submit a proposal that would have fit the former TUES, WIDER or STEP programs, you’re also encouraged to be creative and feel free to cross the boundaries of these programs. Remember that the increased emphasis on rigorous educational research means that your proposal won’t be competitive if you simply propose to implement and assess a new curriculum or lab. Be sure to describe how your project builds on available evidence and theory, and how it will generate new evidence and build current knowledge related to undergraduate education. Baseline data and a theory of change are also encouraged if they fit the project.

IUSE will be overseen by a number of program officers who are organized by discipline (listed on the program page along with their contact information). In answer to a question asked during the webinar, the presenters said they were not yet sure how proposals will be reviewed but suggested they might use disciplinary panels.

Interestingly, the presenters also briefly mentioned that a Dear Colleague letter will be issued in the next few weeks encouraging Ideas Lab proposals related to IUSE. These proposals will have the same target date as regular IUSE proposals (Feb. 4, 2014) but will be internally reviewed. Similar to other NSF Ideas Lab competitions, individuals will submit applications and those selected will attend an NSF-hosted Ideas Lab in which participants, assisted by professional facilitators, will work to put together multi-institutional teams, which will then submit full IUSE proposals. EHR hosted an Ideas Lab for data-intensive research to improve teaching and learning earlier this year. That solicitation might provide some insight into what to expect for the IUSE Ideas Lab competition.

The Research on Education and Learning (REAL) Program

The REAL program is administered by the Division of Research on Learning in Formal and Informal Settings (DRL) and subsumes the old Research in Evaluation on Education in Science and Engineering (REESE), Research on Gender in Science and Engineering (GSE) and Research on Disabilities Education (RDE) programs. Optional letters of intent for the first REESE competition were due Nov. 13, 2013, and the target date for the first full proposals is Jan. 10, 2014. The program has a solicitation, which you can find here.
REAL funds research on all groups and ages, and includes formal and informal education. The program supports “research that informs efforts to understand, build theory to explain, and suggest interventions and innovations to address persistent challenges in STEM interest, education, learning, and participation.” They do not fund curriculum development. The program funds four “strands” of research, but a proposal can reach across more than one strand. These strands are:

- Research on human learning in STEM
- Research on learning in STEM learning environments (e.g., organizational structure, technology, opportunity structures)
- Broadening participation (including underrepresented minorities, women, persons with disabilities, and students from low socioeconomic levels)
- Special emphasis strands (which this year are assessment, undergraduate learning, and technology)

In addition, you must specify into which of six types your proposal fits. These types qualify for different funding levels as follows:

- **Early stage**: up to $500K for 3 years (for projects with no data or with very preliminary or qualitative data)
- **Middle stage**: up to $1.5M for 3 years
- **Later stage**: up to $2.5M for 5 years (for projects that already have evidence and are gathering data for the final push to understand what works and why)
- **Fostering Interdisciplinary Research in Education (FIRE)**: up to $500K for 3 years (for projects that pair an education research with a scientist or engineering so that they can earn from each other. This project is especially meant to help train scientists and engineers to do education research.)
- **Synthesis**: up to $300K for 2 years (for projects that synthesize existing knowledge but package it in a way to provide a direction for moving forward; for example, meta-analyses or a synthesis of what is known in the field)
- **Conferences and workshops**: up to $75K (to develop and host a conference or workshop to catalyze progress on research relevant to REAL)

REAL proposals should include linkages to theory and extant research, a research plan, a discussion of contributions to implementation (where applicable), a discussion of contributions to knowledge, a communication strategy, a data management plan, and a mechanism for obtaining objective external feedback. Proposals should also explain the **purpose** of the research (What are your research questions or hypotheses? How does the research contribute to the evidence base?), the **justification** for the research (What is the policy and practical significance, and what theoretical and/or empirical arguments are there for conducting the study?), **methodology** (What are the key features of the research design, and what are your plans for data collection, analysis, assessment, etc.), and expected **outcomes** of the research (What theory or empirical evidence will the project produce? How might these products or findings be useful?) You should also provide a timeline for the project and describe the expertise of the people doing the research.
Future Changes

NSF’s FY 2014 budget requests $123.08M in funding for a new NSF-wide framework called Catalyzing Advances in Undergraduate STEM Education (CAUSE), which is meant to “provide coherence across all NSF undergraduate education programs.” The programs described above will fall within this framework. CAUSE funding is divided in the budget by directorate as follows: $2.5M for BIO, $97.08M for EHR, $12.6M for ENG, and $10.9M for GEO. CAUSE consolidates a number of former programs: STEM Talent Expansion Program (STEP), Widening Implementation and Demonstration of Evidence-Based Reforms (WIDER), Transforming Undergraduate Biology Education (TUBE), Nanotechnology Undergraduate Education (NUE), Geosciences and Opportunities for Enhancing Diversity in Geoscience (OEDG), and Climate Change Education (CCE). It appears that CAUSE will serve to reduce fragmentation of education-related programs across NSF while still allowing the various directorates to fund education programs focused on their disciplines.

CAUSE has been on hold because of the sequester, but with a new federal budget deal on the horizon, we may see some progress in implementing it in the near future. We’ll have to wait to see how this all develops, but if you’re interested in education-related funding, you’ll want to keep an eye on this. In particular, enhanced integration will very likely result in higher expectations in many of the discipline-focused education programs. For example, we expect reviewers will expect increased rigor in areas such as evaluation methodology, logic models, and basing interventions on solid education theory.

Other Resources

IUSE Program Webinar Slides
EHR Core Research Program webinar recording
Transcript of the May 14 NSF EHR Core Research Webinar Presentation
EHR Core Research FAQs
REAL Program Webinar Slides
Slides for Webinar on Gender Research and Disabilities Education Research funding available through REAL
Dear Colleague Letter on gender and disabilities research available through REAL
IARPA IARPA invests in high-risk/high-payoff research programs with the potential to provide an overwhelming intelligence advantage over future adversaries. IARPA often selects its research efforts through the Broad Agency Announcement (BAA) process. The BAA will appear first on the FedBizOpps website, and then the IARPA website (e.g., current BAAs are open until February, 2014). You must register to submit to IARPA with the Proposal Evaluation and Management System [IARPA Distribution & Evaluation System (IDEAS)].

IARPA Caveat #1: “Offerors (applicants) should demonstrate that their proposed effort has the potential to make revolutionary, rather than incremental, improvements to intelligence capabilities. Research that primarily results in evolutionary improvement to the existing state of practice is specifically excluded.”

IARPA Caveat #2: “Contracts or arrangements with academic institutions may be undertaken only with the consent of appropriate officials of the institution. It is highly recommended that offerors submit with their proposal a completed and signed Academic Institution Acknowledgement Letter for each U.S. academic organization that is a part of their team, whether the academic organization is serving in the role of prime, or a subcontractor or consultant at any tier of their team. A template of the Academic Institution Acknowledgement Letter is enclosed in the BAA. It should be noted that an appropriate senior official from the institution, typically the President, Chancellor, Provost, or other appropriately designated official, must sign the completed form. Although not required for the proposal, this Letter must be received before IARPA can enter into any negotiations with any offeror when a U.S. academic organization is part of its team.”

IARPA Caveat #3: “Prospective offerors are encouraged to contact Managers (PMs) whose interests are aligned with their proposed concept before submitting an abstract or proposal. It is recommended that a teleconference with individual PMs be scheduled by an electronic mail request with an indication of the topic to be discussed. The purpose of these contacts is to avoid proposals that are misaligned with IARPA’s mission or that are redundant with other IARPA programs or solicitations. As such, IARPA PMs limit their communications with prospective offerors to conceptual questions, which allow the Program Manager to determine whether IARPA would be interested in pursuing the capability/technology.”

IARPA Caveat #4: “Offerors are strongly encouraged to submit an abstract before preparing a full proposal. This procedure is intended to minimize unnecessary effort in proposal preparation and review. IARPA will acknowledge receipt of the abstract and assign a control number that should be used in all further correspondence regarding the proposal abstract. The offeror will be notified whether IARPA is interested in receiving a full proposal. Regardless of IARPA’s response to a proposal abstract, offerors may submit a full proposal. In the abstract [five page limit], the offeror should articulate the innovative concept, the technical path to its realization, milestones for progress along the path, and an estimate of the resources that will be required to achieve the proposed objectives.”
IARPA Caveat #5: IARPA embeds a variant of the Heilmeier Questions (aka Heilmeier Catechism) in agency BAAs. Pay attention to this! Heilmeier was named director of DARPA in 1975 and his key questions have endured across defense agencies. The BAAs specifically state that “successful [IARPA] proposals will **concisely and completely answer** the following questions, broadly known as the Heilmeier Criteria:

1. What are you trying to do?
2. How is it done at present? Who does it? What are the limitations of present approaches?
3. What is new about your approach? Why do you think that you can be successful at this time?
4. If you succeed, what difference will it make?
5. How long will it take? How much will it cost? How will you evaluate progress during and at the conclusion of the effort? (i.e., what are your proposed milestones and metrics?)

IARPA Caveat #6: If you are thinking of submitting to IARPA, first know that your abstract or proposal will be evaluated on some version of the following:

- **Overall Scientific and Technical Merit.** The proposal clearly articulates quantitatively substantiated answers to each of the Heilmeier questions cited above. The technical approach is credible, innovative, and concisely delineated with a clear assessment of primary risks and means to mitigate them. Innovation will be judged in the context of the current state of the art.

- **Effectiveness of the Proposed Work Plan.** The offeror’s approach to achieving quantifiable milestones is explicitly described and substantiated. The milestones are clearly defined and they logically support decisions by the offeror or the Government. The proposed schedule is realistic and critical paths are identified. The role and relationships among team members are balanced and transparent, and the time commitments from key personnel are sufficient.

- **Contribution and Relevance to the IARPA Mission.** The proposed work has the potential to provide the U.S. with an overwhelming intelligence advantage over its future adversaries and the proposed approach to intellectual property rights is in the best interest of the Government.

- **Relevant Experience and Expertise.** The offeror’s capabilities, related experience, facilities, techniques, or unique combination of these that are integral for achieving the proposal's objectives will be evaluated, as well as the qualifications, capabilities, and experiences of the principal investigator and key personnel, which must match the proposal objectives. Time commitments of key personnel must be sufficient for the completion of their proposed responsibilities in the effort.

- **Cost Realism.** The proposed costs are reasonable and realistic for the work proposed. Estimates are "realistic" when they are neither excessive nor insufficient for the effort to be accomplished. The proposal documents all anticipated costs, including those incurred to support subcontractors and consultants. The parsing of costs by task, performer, category, and time is concise and consistent with the proposed work plan.
There are three research offices within IARPA, specifically:

**Office of Incisive Analysis**

Programs in this office focus on maximizing insights from the massive, disparate, unreliable and dynamic data that are - or could be - available to analysts, in a timely manner. We are pursuing new sources of information from existing and novel data, and we are investigating innovative techniques that can be utilized in the processes of analysis.

The following topics (in no particular order) are of interest to IA (Solicitation Number: IARPA-BAA-13-02):

- Methods for developing understanding of how knowledge and ideas are transmitted and change within groups, organizations, and cultures;
- Methods for analyzing social, cultural, and linguistic data;
- Multidisciplinary approaches to assessing linguistic data sets;
- Methods for measuring and improving human judgment and human reasoning;
- Methods for extracting and representing the information in the nontextual contents of documents, including figures, diagrams, and tables;
- Methods for understanding and managing massive, dynamic data;
- Analysis of massive, unreliable, and diverse data;
- Methods for assessing relevancy and reliability of new data;
- Methods for understanding the process of analysis and potential impacts of technology;
- Multidisciplinary approaches to processing noisy audio and speech;
- Development of novel top-down models of visual perception and visual cognition;
- Methods for analyzing significant societal events;
- Methods for estimating and communicating uncertainty and risk;
- Novel approaches for mobile augmented reality applied to analysis and collection;
- Methods for topological data analysis and inferences of high-dimensional structures from low-dimensional representations;
- Methods for the study of algorithms stated in terms of geometry (computational geometry);
- Methods for geolocation of text and social media;
- Novel approaches to biosurveillance;
- Methods to make machine learning more useful and automatic;
- Methods to construct and evaluate speech recognition systems in languages without a formalized orthography; and,
- Methods and approaches to quantifiable representations of uncertainty simultaneously accounting for multiple types of uncertainty.

**Office of Safe & Secure Operations**

Programs in this office focus on countering new capabilities of our adversaries that would threaten our ability to operate freely and effectively in a networked world. Key research focus areas will include information security and assurance, advanced computing technologies and architectures, quantum information science and technology, and advanced counterintelligence technologies and techniques. SSO solicits research that explores or demonstrates the feasibility of revolutionary concepts in computation, trust establishment and
maintenance, and detecting and deflecting hostile intent (Solicitation Number: IARPA-BAA-13-03). Examples include:

- Approaches to operating securely with imperfect equipment, error-prone users and/or a compromised network. Constructing systems that can perform reliable and secure computations when some fraction of their components is unreliable or insecure.
- Computational methods based on architectures other than digital Turing machines whose attributes are matched to efficient or secure solutions to intelligence problems (e.g., optical, analog, biological, brain-based, quantum, or hybrid computing systems). New algorithms and protocols that take advantage of quantum entanglement to perform tasks that are inefficient with use of classical algorithms.
- New approaches to secure transmission of information using optical, electromagnetic, digital packet, chemical, or biological signals. Domains include synchronous and asynchronous communications, bandwidth-constrained digital transmission, and triage of large data flows.
- Methods (including compilers and programming languages) for performing complicated computations securely, e.g. multi-party secure functional computation and full homomorphic encryption, but with low overhead.
- Detection, classification, and mitigation of attempts by adversaries to compromise safety and security, including, but not limited to, penetration and manipulation of electronic infrastructure.
- Novel ideas for technologies enabling energy-efficient computation beyond the efficiency projected for end-of-roadmap silicon, as well as strategies for using existing computing technologies to compute with lower power budgets.

**Office of Smart Collection**

The mission of the Office of Smart Collection is to dramatically improve the value of collected data. Particular areas of interest include:

- Innovative methods or tools for indentifying and/or creating novel sources of new information
- New ways of identifying and assessing collection systems for dramatically improved performance
- Sensor technologies that dramatically improve the reach, sensitivity, size, weight, and power for collection of a broad range of signal or signature types
- Tagging, tracking, and location techniques
- Electrically small antennas and other advanced RF concepts
- Agile architectures that intelligently distill useful information at the point of collection
- Innovative means and methods to ensure the veracity of data collected from a variety of sources.
It’s already established that nothing is so certain in life as death and taxes, but the astute observer of NSF programmatic evolution will add a third certainty of life—NSF’s increasingly rigorous requirements for program evaluation, assessment, and metrics. These requirements determine how well proposed programs meet such core NSF mission goals as the integration of research and education, development of the science and engineering workforce, and diversity. These agency mission goals increasingly require complex and innovative programmatic structures designed to advance integration, synthesis, and synergy of NSF mission objectives. In turn, to remain competitive at NSF, requires new and innovative program structures.

This will often require that more challenging models for program evaluation be developed to validate new and innovative programs. This, in turn, will require that program evaluators select the appropriate metrics that support claims related to program outcomes in line with the NSF mission objectives and new review principles that went into effect last January. This is particularly the case for education and institutional transformation programs at NSF, such as the currently transitioning GRF and IGERT programs.

Typical of many large team grants (LTGs) at NSF, new and innovative programs tend to have more moving parts, thereby adding a level of complexity to the program’s structure, management, and evaluation. More “moving parts” are always a challenge, whether in the case of the “three body problem” in classical mechanics, circus plate spinners, or when writing LTGs premised on achieving synergy generated at the boundary interactions among the “moving parts.” The takeaway message here is to start preparing now for changing NSF requirements related to program outcome metrics and evaluation as the longstanding GRF and IGERT evolve into the NGRF and NRT, as explained below.

With the FY 2014 budget request, according to NSF, the GRF program will be expanded into a National Graduate Research Fellowship program (NGRF) to incorporate features and opportunities that allow fellows to gain specialized experiences and training in key STEM areas. Of course, keep in mind that the counterpoint to the certainty of death and taxes is the uncertainty of the current federal budget process. Be that as it may, IGERT will evolve (budget permitting) into a new program, NSF Research Traineeships (NRT), that will include institutional traineeship program applications incorporating plans for transforming aspects of graduate programs and experiences at those institutions, and that will focus on specific areas of need for both the federal government and the STEM enterprise (also see NSF Postdoctoral Research Fellowships and Other Programs).

Available information on this transformation has been evolving for some time, albeit more fuzzy than specific, depending on the source, not to mention uncertain, due to the budget process. As yet, the new solicitations remain a work in progress within NSF, hopefully to be realized with the FY 2014 budget. Earlier this year, NSF had noted the following on the IGERT
website: “NSF does not anticipate releasing an IGERT solicitation in FY 2013. In concert with the President’s FY 2014 Budget Request to Congress, NSF does anticipate releasing a solicitation for the proposed NSF Research Traineeship Program (NRT) in FY 2014. For additional information about NRT, please see the FY 2014 Budget Request for NSF here.”

Some insight can be gained, however, by exploring the FY 2014 budget request. The following Evaluation Framework Table for both the planned NGRF and the NRT should prove particularly helpful in terms of Program Development, Student Development, and Career Impact as well as the framework for Potential Measure/Indicator and Desired Outcome. Keep in mind that by “outcomes” NSF is referring to long-term changes, often institutionally transformative, rather than just “outputs,” which refer to the immediate numerical sums of a typical input/output model. Here, at least, you are able to view the horizon as NSF sees it.

**Evaluation Framework**
The evaluation framework for both NGRF and NRT is outlined in the table below.

<table>
<thead>
<tr>
<th>Program Development</th>
<th>Potential Measure/Indicator</th>
<th>Desired Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development of coherent solicitations for a fellowship and traineeship program</td>
<td>• Development of targeted opportunities for NGRF and areas of research focus for NRT</td>
<td>• Graduate STEM fellowship and traineeship investments that:</td>
</tr>
<tr>
<td>Implementation of effective collaboration across NSF directorates and federal agencies in graduate fellowships and traineeship investment</td>
<td></td>
<td>• Serve missions of federal agencies</td>
</tr>
<tr>
<td>Identification of agreed-upon outcomes of federal investments in graduate students and graduate education</td>
<td></td>
<td>• Provide clarity and efficiency for applicants for fellowship support</td>
</tr>
<tr>
<td>Development of targeted opportunities for NGRF and areas of research focus for NRT</td>
<td></td>
<td>• Provide opportunities for training for work in areas of national needs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Student Development</th>
<th>Potential Measure/Indicator</th>
<th>Desired Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metrics will include:</td>
<td>• student educational decisions;</td>
<td>• Diverse population of students who are well prepared for:</td>
</tr>
<tr>
<td></td>
<td>• degree attainment;</td>
<td>• a range of career options and potential</td>
</tr>
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**Continues on following page.**
Moreover, as noted in the October 15, 2013 issue of this newsletter, the newly released Common Guidelines for Education Research and Development, A Report from the Institute of Education Sciences, U.S. Department of Education and the National Science Foundation, August 2013, offers a gold mine of insights for those seeking to write more successful education research proposals to these agencies. This 53-page report is particularly useful for those whose research domain shares common ground and complementary program funding with each of these two federal agencies.

In particular, the Guidelines (Frequently Asked Questions) include recommendations for all types of studies that call for external feedback on the work being proposed. However, the feedback offers alternatives to third-party evaluation. External feedback can include a number of approaches, including third-party evaluation, program officer evaluation, and/or regular feedback from advisory groups. It will be up to the proposers to argue for whichever kind of external feedback they identify as appropriately aligned with program requirements.

The goals of the guidelines are to:
- Improve the quality and pace of findings from education research and development proposals
- Develop an education infrastructure that supports more rapid and efficient knowledge development
- Aid NSF and ED in making informed choices about where to invest scarce research and development dollars
- Provide clarity for the field (and within the two agencies)
- Provide a good reference for framing research and evaluation.

Furthermore, in thinking about the upcoming NGRF and NRT solicitations, keep in mind NSF’s guidance on evaluation in the GPG under Merit Review Principles: “[Principle 3] Meaningful assessment and evaluation of NSF funded projects should be based on appropriate
metrics, keeping in mind the likely correlation between the effect of broader impacts and the resources provided to implement projects. If the size of the activity is limited, evaluation of that activity in isolation is not likely to be meaningful. Thus, assessing the effectiveness of these activities may best be done at a higher, more aggregated, level than the individual project. With respect to the third principle, even if assessment of Broader Impacts outcomes for particular projects is done at an aggregated level, PIs are expected to be accountable for carrying out the activities described in the funded project. Thus, individual projects should include clearly stated goals, specific descriptions of the activities that the PI intends to do, and a plan in place to document the outputs of those activities.”

According to the FY 2014 budget information, NGRF specifically will support outstanding graduate students in disciplines with significant national need and in areas of particular interest to mission agencies (e.g., Energy, DoD, NOAA, etc.). NGRF awardees would be offered the opportunity to compete for targeted opportunities through which they would be able to develop specialized expertise in critical areas. Such targeted opportunities may involve, for example, internships in industry or government laboratories, work on projects of interest to federal agencies, specialized or advanced training, or international experiences. This set of options builds upon the structures currently in place within the GRF program, such as Graduate Research Opportunities Worldwide (GROW) and emerging workforce needs (see Dear Colleague Letter: NSF Graduate Research Fellowship Program [GRFP] - Graduate Research Opportunities Worldwide [GROW]). This approach will provide flexibility and access to opportunities for students at different stages of their graduate careers, while leveraging the federal investment in these students. Note the operative term “build upon” here, as distinct from “replace.” In this regard, recall the old saying that history doesn’t repeat itself, but it rhymes. The above examples of programs are those that will very likely “rhyme” with the new directions for the NGRF.

The NGRF program will be managed within the current general GRF framework, including consultation with all NSF directorates and other agencies to ensure that the most effective practices are used and suitable targeted opportunities are provided. The stipend, duration, and cost-of-education allowance will be the same as the current GRF Engineering Innovation Fellows program. This model allows NSF to maintain the high standards and broad scope of the GRF program while adding targeted opportunities to meet evolving federal priorities and emerging workforce needs. This approach will provide flexibility and access to opportunities for students at different stages of their graduate careers, while leveraging the federal investment in these students.

Additionally, in FY 2014, NSF will challenge the STEM graduate education community to build “NSF Research Traineeships” projects through the NRT program. These projects will design and implement traineeship programs in emphasis areas that align with national priorities where new areas of science are emerging rapidly. NRT will also provide a mechanism for learning about the implementation and impact of innovative graduate traineeship programs or graduate education policies. The program will build on what has been learned through IGERT, the Graduate STEM Fellows in K-12 Education (GK-12) program, and other relevant NSF-sponsored efforts. NRT will seek transformative approaches to graduate education that keep pace with the transformation of science in emerging fields and in specialized areas.
More clarity will come when solicitations are published, although in the case of new program directions at NSF, they continue to evolve from funding cycle to funding cycle. Regardless, there are sufficient clues in the FY 2014 budget request on these two programs to infer the general direction NSF wants to take as the GRF and the IGERT transition to the NGRF and the NRT.

Moreover, competitiveness at NSF is not solely dependent on echoing back the NSF programmatic thinking or list of possible program components, but requires the applicant to think as well about how any proposed program meets the agency’s overarching national goals. In this case, for example, successful proposals must engage with emerging critical research areas of interest to the mission agencies. After all, NSF significantly changed its approach to broader impacts nearly a year ago because too many proposals were submitted that somewhat mindlessly echoed broader impacts suggestions posted to the NSF website rather than considering the context of broader impacts organically embedded in the proposed research. It is always helpful to think about what NSF is trying to accomplish in the broader sense and apply that to your specific context. In this case, enough clues exist in the FY 2014 budget information to get applicants thinking about these two new programs while awaiting further guidance from NSF in the form of a solicitation.
One of the most important distinctions to be made when understanding an agency’s mission and culture and when assessing your own fittedness for a funding opportunity is the distinction between basic and applied research. Some agencies fund either basic or applied; some fund both. Similarly, applicants need to understand whether or not their proposed project fits a particular agency’s preference for one research type over the other as well as its definition of basic or applied research.

This distinction often confuses applicants, and where confusion exists in the grant-writing process, it will always lead to declined proposals. It is an axiom of grant writing that ambiguities are always punished in the review process. So knowing whether an agency is a basic or applied research agency and whether your research is basic or applied is a precondition to eliminating ambiguity from the grant-writing process.

Fortunately, in the case of ARPA-E, the agency makes this distinction clear to potential applicants. As noted by the agency in the recently released REBEL solicitation (REBELS_FOA_Concept_Papers_11_25_2013 due January 8, 2014), ARPA-E funds applied research and development. The Office of Management and Budget defines applied research as a “study (designed) to gain knowledge or understanding necessary to determine the means by which a recognized and specific need may be met” and as the “systematic application of knowledge or understanding, directed toward the production of useful materials, devices, and systems or methods, including design, development, and improvement of prototypes and new processes to meet specific requirements.”

In short, ARPA-E makes clear that it funds technology-focused applied research to create real-world solutions to important problems in energy creation, distribution, and use and, as such, it will not support basic research, defined as a “systematic study directed toward fuller knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications towards processes or products in mind.” While it is anticipated that in some instances some minor aspects of fundamental science will be clarified or uncovered during the conduct of the supported applied research, ARPA-E explains, the major portion of activities supported by ARPA-E are directed towards applied research and development of new technologies.

While all technology-focused applied research will be considered by ARPA-E, according to the agency, two instances are especially fruitful for the creation of transformational technologies:

1. establishment of a technology based upon recently elucidated scientific principles; and
2. synthesis of scientific principles drawn from disparate fields that do not typically intersect.

Of course, interdisciplinarity (item 2 above) is becoming increasingly common as agencies seek to fund research that addresses increasingly complex scientific and technological problems. It is also the motivation driving many agency funding partnerships. For instance, the
recently released and updated solicitation from NSF (four participating directorates) in partnership with NASA, NIH (seven participating institutes), USDA, and USDA/NIFA on the National Robotics Initiative (NRI/NSF 14-500) concurrent with the 2013 update of the 137-page report, “A Roadmap for US Robotics- From Internet to Robotics,” is an example of how important interdisciplinarity has become at research agencies, both within agencies and when multiple agencies team on solicitations such as this.

Moreover, ARPA-E notes that it exists to support transformational, rather than incremental research. Of course, this is the mantra of many research agencies over the past decade (see the 2007 report, "Enhancing Support of Transformative Research at the National Science Foundation", where the National Science Board presents its findings and recommendations for NSF to enhance its ability to identify and fund transformative research). Now it would be unusual to read an NSF report or solicitation that did not make frequent mention of transformational research. Or, as stated in the companion article in this newsletter on the Intelligence Advanced Research Projects Agency, IARPA Caveat #1, “Offerors (applicants) should demonstrate that their proposed effort has the potential to make revolutionary, rather than incremental, improvements to intelligence capabilities. Research that primarily results in evolutionary improvement to the existing state of practice is specifically excluded.”

The takeaway message here is that researchers and those supporting them will need to develop some version of an “elevator speech” that answers the question why the proposed research is transformational and not just incremental. Moreover, this “elevator speech” will need to be agency specific. Each agency will have defined what is meant by the phrase “transformational and not incremental” within the context of the agency mission. While there may be many similarities across agencies that represent a core meaning to this phrase, perhaps as used in national reports such as from the National Academies, for those responding to a specific solicitation, such as ARPA-E’s recently posted REBEL solicitation, it will be important to address this phrase within the specific agency context where more nuanced meanings will likely have evolved that distinguish one agency’s use of the phrase from another’s.

Also, as addressed in our companion IARPA article in this issue, quantitatively substantiated responses are important in addressing this question of “why transformational?” as are approaches to achieving quantifiable milestones that are explicitly described and substantiated. It is a question that will be asked more and more by program officers and reviewers at many agencies. Be prepared to answer it clearly and simply. Keep in mind another axiom of grant writing when explaining why your research is transformational—do not bestow superlatives upon yourself and your research in making your claim; leave that to reviewers.

Superlatives (adjectives on steroids) are most often used by those who don’t have the quantitatively substantiated arguments needed to make their case explicitly, clearly, and convincingly. Keep in mind the old legal advice given to defense attorneys, “If you don’t have the facts on your side about your client’s innocence, yell and pound the table in hopes of getting the jury on your side emotionally.” It is best to leave that advice to courtroom theatrics and not attempt to use it on program officers and reviewers by hurling a cascade of superlatives as an answer to the question why is your research transformational. Better to keep in mind the
advice in the old Shaker song when answering the “why transformational” question: “Tis the gift to be simple.”

According to ARPA-E, Technologies exist on learning curves (Figure below). Following the creation of a technology, refinements to that technology and the economies of scale that accrue as manufacturing and widespread distribution develop drive technology down that learning curve until an equilibrium cost/performance is reached. While this incremental improvement of technology is important to the ultimate success of a technology in the marketplace, **ARPA-E exists to fund transformational research – i.e., research that creates fundamentally new learning curves rather than moving existing technologies down their existing learning curves.**

![Figure 1: Description of transformational and disruptive technologies in terms of cost, performance, and scale. ARPA-E supports research that establishes new learning curves. A transformational technology becomes disruptive after passing the tipping point.](image)

**ARPA-E will not support basic research aimed at discovery and fundamental knowledge generation, nor will it undertake large-scale demonstration projects of existing technologies.** ARPA-E is not a substitute for existing R&D organizations within the Department of Energy, the agency notes, **but rather complements existing organizations by supporting R&D objectives that are transformational and translational.**

ARPA-E advises applicants interested in receiving basic research financial assistance to work with the Department of Energy’s Office of Science [http://science.energy.gov/](http://science.energy.gov/). Similarly, projects focused on the improvement of existing technology platforms may be appropriate for support by the applied programs – for example, the Office of Energy Efficiency and Renewable Energy [http://www.eere.energy.gov/](http://www.eere.energy.gov/), the Office of Fossil Energy [http://fossil.energy.gov/](http://fossil.energy.gov/), the Office of

STEM Attrition examined data from students who began postsecondary education in STEM fields in the 2003-4 school year, tracking these students’ attrition rates for the following 4 to 6 years. In this report, STEM major fields include mathematics, physical sciences, biological/life sciences, computer and information sciences, engineering and engineering technologies, and science technologies. Of the students tracked by these data who entered STEM fields between 2003 and 2009, 48% of bachelor’s degree candidates and 69% of associate’s degree candidates had left STEM degree programs by 2009. Moreover, the report is timely given the changes in NSF’s Education and Human Resources Directorate and the transition of the NSF GRF and IGERT programs to the NGRF and NRT, respectively, both addressed in companion articles in this month’s newsletter.

While much of the information in this report is likely to be familiar to those seeking support for educational programs that recruit, retain, and advance students through STEM disciplines (e.g., highest-level mathematics course taken in high school as a predictor of STEM performance in first year of college), the aggregate of the attrition factors identified in this report provides a helpful roadmap to those proposing STEM education programs to funding agencies. In addition, it presents numerous data relating an attraction to STEM programs to many commonly identified factors, including not only ethnicity, socioeconomic background, gender, and the like but also a range of other identified factors that give a more finely-grained and nuanced understanding of STEM attrition. The report presents much of this information in extensive data tables.

As noted in the report, producing sufficient numbers of graduates who are prepared for STEM occupations has become a national priority in the United States (also see Science, Technology, Engineering, and Mathematics (STEM) Education: A Primer). To attain this goal, some policymakers have targeted reducing STEM attrition in college, arguing that retaining more students in STEM fields in college is a low-cost, fast way to produce the STEM professionals that the nation needs (President’s Council of Advisors on Science and Technology [PCAST] 2012). Within this context, this Statistical Analysis Report presents an examination of students’ attrition from STEM fields over the course of 6 years in college using data from the 2004-9 Beginning Postsecondary Students Longitudinal Study and the associated 2009 Postsecondary Education Transcript Study. In this SAR, the term STEM attrition refers to enrollment choices that result in potential STEM graduates (i.e., undergraduates who declare a STEM major) leaving STEM fields by switching majors to non-STEM fields or by leaving.
postsecondary education before earning a degree or certificate. The purpose of this attrition study was to gain a better understanding of attrition by:

- determining rates of attrition from STEM and non-STEM fields;
- identifying characteristics of students who leave STEM fields;
- comparing the STEM course-taking and performance of STEM leavers and persisters; and
- examining the strength of various factors associated with STEM attrition.

This report used data from a cohort of students who started postsecondary education in a bachelor’s or associate’s degree program in the 2003–4 academic year to examine students’ movements into and out of STEM fields over the subsequent 6 years through 2009. About 28% of bachelor’s degree students and 20% of associate’s degree students entered a STEM field (i.e., chose a STEM major) at some point within 6 years of entering postsecondary education in 2003–4. Many of these STEM entrants left STEM several years later either by changing majors or leaving college without completing a degree or certificate. A total of 48% of bachelor’s degree students and 69% of associate’s degree students who entered STEM fields between 2003 and 2009 had left these fields by spring 2009, the report notes. Roughly one-half of these leavers switched their major to a non-STEM field, and the rest of them left STEM fields by exiting college before earning a degree or certificate.

According to the report, analysis showed that STEM attrition correlated with a wide range of factors, including students’ demographic characteristics, precollege academic preparation, types of first institution enrolled, and STEM course-taking and performance. For example, in terms of switching majors to non-STEM fields, the results showed that the intensity of STEM course-taking in the first year, the type of math courses taken in the first year, and the level of success in STEM courses bore stronger associations with this outcome than did many other factors. Specifically, taking lighter credit loads in STEM courses in the first year, taking less challenging math courses in the first year, and performing poorly in STEM classes relative to non-STEM classes were associated with an increased probability of switching majors for STEM entrants at both the bachelor’s and associate’s degree levels. Accumulating higher levels of withdrawn/failed STEM credits was also a critical factor for switching majors among bachelor’s degree STEM entrants.

In addition, the report notes, analysis showed that at the associate’s degree level, STEM entrants from various income backgrounds had similar rates of leaving STEM fields by switching majors; after controlling for the other variables, however, those from low-income backgrounds were found to have a lower probability of switching majors than their counterparts from high-income backgrounds. The results further indicated that low- and high-performing STEM entrants may exit STEM fields in different ways. At both the bachelor’s and associate’s degree level, the probability of exiting STEM fields by dropping out of college was higher for low-performing students (i.e., those with an overall college GPA of less than 2.5) than for high-performing students (i.e., those with an overall college GPA of 3.5 or higher), while the probability of leaving STEM fields by switching majors was higher for students in the high-performing group than for their peers in the low-performing group.

Finally, the analysis confirmed several patterns observed among bachelor’s degree STEM entrants. All other factors being equal, bachelor’s degree STEM entrants who first
attended public four-year institutions had a higher probability of leaving STEM by switching majors than those who started at private, nonprofit four-year institutions. Bachelor’s degree STEM entrants who were male or who came from low-income backgrounds had a higher probability of leaving STEM by dropping out of college than their peers who were female or came from high-income backgrounds, net of other factors. Similarly, bachelor’s degree STEM entrants who first attended institutions that were among the least selective had a higher probability of leaving STEM by dropping out than students who first attended highly selective institutions.

The two types of STEM leavers, the report noted, (i.e., those who left STEM fields by switching majors and those who left STEM fields by dropping out of college without earning a degree or certificate) exhibited different characteristics. Looking at bachelor’s degree STEM entrants first, proportionally more females than males left STEM fields by switching to a non-STEM major (32 vs. 26%), whereas proportionally more males than females left STEM fields by dropping out of college (24 vs. 14%). While proportionally more students whose parents had only a high school education or less left STEM fields by dropping out of college than their counterparts whose parents earned a bachelor’s or higher degree, no measurable difference by parental education was found in terms of the rate at which students switched their major from a STEM to a non-STEM field. Similarly, the report states, while proportionally more students in the two lowest quarters of the income level left STEM fields by dropping out of college than their counterparts in the highest quarter of the income level, no measurable difference by income levels was observed in terms of the rate at which students switched major from a STEM to a non-STEM field.

STEM attrition rates also varied by students’ precollege academic preparation, as indicated by their high school GPA and the highest level of math course taken in high school. For example, the report notes, 46% of STEM entrants with a high school GPA of less than 2.5 and 41% of those who did not take algebra II/trigonometry or higher math courses in high school left STEM fields by dropping out of college, compared with 14% of those with a high school GPA of 3.5 or higher and 12% of those who took calculus in high school. In terms of switching majors out of STEM fields, 33% of STEM entrants with a high school GPA of between 3.00 and 3.49 did so, compared to 26% of those who earned a GPA of 3.5 or higher. About 32–33% of STEM entrants who took algebra II/trigonometry or precalculus in high school switched majors, while 24% of those who took calculus did so.

The extensive, finely-grained data tables on attrition factors in this report are a valuable reference for those engaged in STEM education proposals, particularly STEM capacity-building proposals and STEM workforce-development proposals to NSF and other federal agencies. Attrition factors are often a combination of common factors and institutionally-specific factors. This report provides an excellent summation of attrition factors and presents those key data that are important to anyone proposing STEM education, given that reducing attrition at key transition gates in the STEM pipeline is often a key or one of the key program components in STEM education grants. If you are planning a proposal that addresses STEM attrition, a review of the extensive data tables in the report will be a helpful adjunct to your program development process.
SERDP Funding Opportunities Webinar – FY 2015

The Strategic Environmental Research and Development Program (SERDP) is the Department of Defense's (DoD) environmental research and development program, planned and executed in partnership with the Department of Energy and the Environmental Protection Agency. SERDP’s role is to fund research and development that addresses environmental issues relevant to the management and mission of the DoD. SERDP-supported efforts lead to the development and application of innovative environmental technologies or methods that improve the environmental performance of DoD by improving outcomes, managing environmental risks, and/or reducing costs or time required to resolve environmental problems. The development and application of innovative environmental science and technology support the long term sustainability of DoD’s installations and ranges, and significantly reduce current and future environmental liabilities. Within its broad areas of interest, the Program focuses on Environmental Restoration, Munitions Response, Resource Conservation and Climate Change, and Weapons Systems and Platforms. SERDP funds research and development programs that range from basic and applied research through advanced development.

The SERDP FY 2015 solicitation was released Thursday, November 7, 2013. The SERDP Executive Director conducted an online seminar “SERDP Funding Opportunities” on November 19, 2013. This “how to play” briefing provided valuable information for those interested in new SERDP funding opportunities. During the online seminar, participants had an opportunity to ask questions about the funding process, the current SERDP solicitations, and the proposal submission process. In addition, the presentation is available in PDF format.

DoD Releases Climate Change Adaptation Roadmap in Support of Sustainability Planning

The Department of Defense (DoD) has released a Climate Change Adaptation Roadmap (CCAR) that details the Department’s plan for managing the effects of climate change on its operations and infrastructure in both the short and long term. This roadmap, a key element of DoD’s annual update of its Strategic Sustainability Performance Plan (SSPP), specifically calls out SERDP’s work to develop climate change assessment tools for DoD’s installations.

HHS: Tips for Preparing Grant Proposals

- Include a DUNS Number. A DUNS Number must be included in order for an application to be reviewed. DUNS numbers can be obtained by accessing http://www.dnb.com/ or by calling 1-866-705-5711. Include the DUNS number next to the OMB Approval Number, which is located in the upper right corner of the application face page.

- Keep the audience in mind. Reviewers will use only the information contained in the application to assess the application. Therefore, the applicant should be sure the application and responses to the program requirements and expectations are complete
and clearly written. Do not assume that reviewers are familiar with the applicant organization. Keep the review criteria in mind when writing the application.

- Start preparing the application early. If applying electronically through Grants.gov please ensure that adequate time is allotted to register and download applicable software and forms. Grants.gov offered a "Webcast" (registration required) entitled "Get Started with Grants.gov" that provides startup requirements and tips.

- Follow the instructions and application guidance carefully. The instructions call for a particular organization of the materials, and reviewers are accustomed to finding information in specific places. Present information according to the prescribed format.

- Be brief, concise, and clear. Make each point understandable. Provide accurate and honest information, including candid accounts of problems and realistic plans to address them. If any required information or data is omitted, explain why. Make sure the information provided in each table, chart, attachment, etc., is consistent with the proposal narrative and information in other tables.

- Be organized and logical. Many applications fail because the reviewers cannot follow the thought process of the applicant or because parts of the application do not fit together.

- Be careful in the use of appendices. Do not use the appendices for information that is required in the body of the application. Be sure to cross-reference all tables and attachments located in the appendices to the appropriate text in the application.

- Carefully proofread the application. Misspellings and grammatical errors will impede reviewers in understanding the application. Be sure pages are numbered (including appendices) and that page limits are followed. Limit the use of abbreviations and acronyms, and define each one at its first use and periodically throughout application.
STEM Attrition: College Students’ Paths Into and Out of STEM Fields
Description: This Statistical Analysis Report presents the most recent national statistics on beginning bachelor’s and associate’s degree students’ entrance into, and attrition from, STEM fields. Using recent transcript data, it provides a first look at STEM coursetaking and examines how participation and performance in undergraduate STEM coursework, along with other factors, are associated with STEM attrition. The study is based on data from the 2004/09 Beginning Postsecondary Students Longitudinal Study (BPS:04/09) and the associated 2009 Postsecondary Education Transcript Study (PETS:09).

Resources for Working with National Science Foundation--Support for Education
- Roundtable Talks: Submitting Competitive NSF Proposals, Advancing Informal STEM Learning (AISL)
- The 2010 User-Friendly Handbook for Project Evaluation, December 2010
- Framework for Evaluating Impacts of Informal Science Education Projects, Report from a National Science Foundation Workshop
- Principal Investigator’s Guide: Managing Evaluation in Informal STEM Education Projects
- Evaluation Publications
- Evaluation Databases
- Evaluation Handbooks
- Websites
  - Dimensions Magazine: the bimonthly magazine of the Association of Science-Technology Centers, features a mix of in-depth analysis and briefs of noteworthy events and resources for the science center field.
  - ExhibitFiles.org: Exhibit case studies and reviews.
  - HowToSmile.org: science and math instructional materials.
  - Informalscience.org: The CAISE collection of projects, research, reference materials, and evaluation records.
  - OpenExhibits.org: open source multitouch multiuser software for exhibits.
  - NAME-aam.org: articles from Exhibitionist, on exhibition theory and practice, exhibition critiques and commentary, book reviews, technical articles, and essays.
  - NISENet.org: educational programs and activities, media, exhibits, evaluation reports, and tools and guides for professional educators.
  - Research2Practice.info: current peer-reviewed research briefs relevant to informal science education (ISE)
  - PearWeb.org: a searchable website of assessment tools for informal science learning
  - VisitorStudies.org: evaluation products and publications archives
- How to Use the Deliverable and Impact Worksheets (see Exhibit 1 following)
Does an Algebra Course with Tutoring Software Improve Student Learning?

Student performance in mathematics remains a source of concern for U.S. educators and policymakers. Although math scores have risen slightly in recent decades, U.S. students still perform poorly on the National Assessment of Educational Progress and in international comparisons with their counterparts from many other countries. In an effort to address this issue, many districts and schools have turned to computer-based tools as a way to boost math performance. These tools allow self-paced instruction and provide students with customized feedback. These features, it is widely held, will improve student engagement and improve proficiency. However, evidence to support these claims remains scarce. In many cases, these tools have been adopted with little or no evaluation.

To make headway in addressing this knowledge gap, a team of RAND researchers assessed whether a popular algebra curriculum that includes tutoring software would be effective in improving the math test scores of middle and high school students. Cognitive Tutor Algebra I (or CTAI), developed by Carnegie Learning, is a first-year algebra course that blends classroom instruction and textbook-based activities with computer-based instruction and has
shown efficacy in improving math performance in isolated, small-scale demonstrations. Algebra is of particular interest because it can function as a gateway subject that leads students to take higher-level math classes. The RAND assessment, one of the largest and most comprehensive studies of its kind to date, used a randomized controlled trial to estimate the effectiveness of CTAI in improving algebra proficiency in a variety of natural school settings, in conditions similar to those of schools that independently adopt it.

**Breaking the Glass Ceiling of Achievement for Low-Income Students and Students of Color**
While gaps between student groups have narrowed over time at the below basic level of performance, gaps at the advanced level have widened. And among higher income groups, gap-widening between white students and students of color is more pronounced. Educators seeking to close gaps must raise the bar for all students. This is the first report in the three-part Shattering Expectations series, which includes "Finding America's Missing AP and IB Students," the second installment.

**Poverty and Education: Finding the Way Forward**
While the United States is among the 35 richest countries in the world, it also holds the distinction of ranking second highest in child poverty, according to a new report from Educational Testing Service (ETS). Such poverty comes with a price - $500 billion per year in lower earnings, less taxes paid, and other long-term economic and educational outcomes. The authors provide an overview of how poverty is measured, describe how various levels of government attempt to address poverty through education, and review the relationship between poverty and student outcomes. The report also offers seven recommendations that are necessary to ensure that the public education system prepares every student to be successful in an increasingly competitive world.

**Does Money Affect Children's Outcomes? A Systematic Review**
This report examines whether money has a causal impact on children's outcomes. There is abundant evidence that children growing up in lower income households do less well than their peers on a range of wider outcomes, including measures of health and education. But is money important in itself, or do these associations simply reflect other differences between richer and poorer households, such as levels of parental education or attitudes towards parenting?

**A Path to Alignment: Connecting K-12 and Higher Education via the Common Core and the Degree Qualifications Profile**
The Common Core State Standards (CCSS), which aim to assure competency in English/language arts and mathematics through the K-12 curriculum, define necessary but not sufficient preparedness for success in college. The Degree Qualifications Profile (DQP), which describes what a college degree should signify, regardless of major, offers useful but not sufficient guidance to high school students preparing for college study. A coordinated strategy to prepare students to succeed in college would align these two undertakings and thus bridge an unfortunate and harmful cultural chasm between the K-12 world and that of higher education. Chasms call for bridges, and the bridge proposed by this white paper could create a vital
thoroughfare.

The white paper begins with a description of the CCSS and an assessment of their significance. A following analysis then explains why the CCSS, while necessary, are not sufficient as a platform for college success. A corresponding explanation of the DQP clarifies the prompts that led to its development, describes its structure, and offers some guidance for interpreting the outcomes that it defines. Again, a following analysis considers the potential of the DQP and the limitations that must be addressed if that potential is to be more fully realized.

**Can Online Learning Communities Achieve the Goals of Traditional Professional Learning Communities? What the Literature Says**

Professional learning communities (PLCs)-teams of educators who meet regularly to exchange ideas, monitor student progress, and identify professional learning needs-reflect a growing interest in promoting professional development that engages teachers and administrators. Increasingly, teachers are able to participate in online and hybrid PLCs in addition to PLCs that meet face-to-face. This report examines: characteristics of PLCs, as reported in the literature; advantages and challenges of online and hybrid PLCs, compared to face-to-face PLCs; and considerations for the design and setup of online and hybrid PLCs.
Robert Noyce Teacher Scholarship Program Workshop

The NSF does not anticipate releasing an IGERT solicitation in FY 2013. In concert with the President’s FY 2014 Budget Request to Congress, NSF does anticipate releasing a solicitation for the proposed NSF Research Traineeship Program (NRT) in FY 2014. For additional information about NRT, please see the FY 2014 Budget Request for NSF here.

IGERT and GRF Evolutions Under FY 2014 NSF Budget

To underscore the importance of these investments, the FY 2014 NSF Budget Request introduces a coherent and streamlined NSF investment strategy for the preparation of tomorrow’s science and engineering workforce. At NSF, about 40,000 graduate students are supported annually at a level of about $1 billion. These dollars are distributed across traineeships (6-8 percent), fellowships (10-15 percent), and research assistantships in individual grants and centers (80 percent).

NSF will provide leadership in developing a more coherent and streamlined strategy for investing in graduate STEM education through a national fellowship program and a new traineeship program. The NSF strategy for building human capital in graduate education has centered on the NSF Graduate Research Fellowship (GRF) and the Integrative Graduate Education and Research Traineeship (IGERT) programs managed in the Division of Graduate Education (DGE). GRF invites applications from the Nation’s most promising students in any STEM field, thereby identifying and supporting the disciplines that are foundational to tomorrow’s science and engineering (S&E). With this FY 2014 request, the GRF program will be expanded into a National Graduate Research Fellowship program (NGRF) to incorporate features and opportunities that allow fellows to gain specialized experiences and training in key STEM areas. IGERT will evolve into a new program, NSF Research Traineeships (NRT) that will allow for institutional traineeship program applications that will incorporate plans for transforming aspects of graduate programs and experiences at those institutions, and that will focus on specific areas of need for both the federal government and the STEM enterprise.

NSF Research Traineeships Program

In FY 2014, NSF will challenge the STEM graduate education community to build “NSF Research Traineeships” projects through the NRT program. These projects will design and implement traineeships programs in emphasis areas that align with national priorities where new areas of science are emerging rapidly. NRT will also provide a mechanism for learning about the implementation and impact of innovative graduate traineeship programs or graduate education policies. The program will build on what has been learned through IGERT, the Graduate STEM
Fellows in K-12 Education (GK-12) program, and in other relevant NSF-sponsored efforts. **NRT will seek transformative approaches to graduate education that keep pace with the transformation of science in emerging fields and in specialized areas.**

**NSF National Graduate Research Fellowship Program**

NGRF will support outstanding graduate students in disciplines where there is significant national need and in areas of particular interest to mission agencies. NGRF awardees would be offered the opportunity to compete for targeted opportunities through which they will be able to develop specialized expertise in critical areas. Such targeted opportunities may involve, for example, internships in industry or government laboratories, work on projects of interest to federal agencies, specialized or advanced training, or international experiences. This set of options build upon the structures currently in place within the GRF program, such as Graduate Research Opportunities Worldwide (GROW) and the Engineering Innovation Fellows program.

**SERDP Funding Opportunities Webinar – FY 2015**

The SERDP FY 2015 solicitation was released Thursday, November 7, 2013. The SERDP Executive Director conducted an online seminar “**SERDP Funding Opportunities**” on November 19, 2013. This “**how to play**” briefing provided valuable information for those interested in new SERDP funding opportunities. During the online seminar, participants had an opportunity to ask questions about the funding process, the current SERDP solicitations, and the proposal submission process. In addition, the presentation is available in PDF format.

**Agriculture and Food Research Initiative (AFRI) Request for Applications (RFA)**

**Agriculture and Natural Resources Science for Climate Variability and Change Program**

In fiscal year (FY) 2014, **NIFA will not issue new awards** but will support its ongoing research, education, and extension investments within the Agriculture and Natural Resources Science for Climate Variability and Change Program through continuation awards. In FY 2014, NIFA will provide approximately $31 million in funding for continuation awards to support or ongoing investments. Funding will support adaptive management and mitigation potentials of agricultural and natural resource systems to address climate variables such as precipitation and temperature, and their impacts as a result of violent weather extremes, floods, or persistent droughts. This includes: classical breeding, germplasm phenotyping, and genomics work to support the development of new plant varieties and animal breeds adapted to changing climate conditions; and the development of new cropping, forest, and livestock management systems that are responsive to climatic challenges including limits on irrigation water supplies, invasive species, forest fires, and weather extremes.

**Notice of Intent to Issue Funding Opportunity Announcement Vehicle Technologies Incubator**

The purpose of this Notice is to provide potential applicants advance notice that the Department of Energy Office of Energy Efficiency and Renewable Energy intends to issue, on behalf of the Vehicle Technologies Office, a Funding Opportunity Announcement, number DE-FOA-0000988 entitled Vehicle Technologies Incubator. NO APPLICATIONS WILL BE ACCEPTED THROUGH THIS NOTICE. Please do not submit questions or respond to this Notice of Intent.
Prospective applicants to the FOA should begin developing partnerships, formulating ideas, and gathering data in anticipation of the issuance of this FOA. It is anticipated that this FOA will be posted on or about December 2013.

Dear Colleague Letter: EFRI Research Experience and Mentoring (REM) Program
The National Science Foundation (NSF) Directorate for Engineering (ENG), Office of Emerging Frontiers in Research and Innovation (EFRI) continually seeks to further the progress in EFRI topic areas while broadening participation of underrepresented groups in science, technology, engineering, and mathematics (STEM) fields. This letter seeks to call your attention to an opportunity to pursue both of these goals through supplements to active EFRI research awards. Awardees with active EFRI research grants may apply for supplemental funding for this Research Experience and Mentoring (REM) program. REM funding will support costs associated with bringing Research Participants (RPs) into the laboratory over the summer to participate in research aligned with the EFRI-supported research goals. REM funds may also be used to extend the duration of structured mentoring into the academic year.

Dear Colleague Letter: Advancing Recruitment and Retention in Geosciences (ARRG) - Supplemental Funding to Advance Recruitment and Retention in the Geosciences
This is the second of two Dear Colleague Letters being released by the Directorate for Geosciences (GEO) with a focus on cultivating and preparing a diverse geoscience workforce for the future and strengthening geoscience education (also see Dear Colleague Letter NSF 14-014). A well-prepared, innovative science, technology, engineering and mathematics (STEM) workforce is crucial to the Nation’s health and economy. Many recent national policy reports and actions have drawn attention to the opportunities and challenges inherent in increasing the number of highly qualified STEM graduates, including STEM teachers. Priorities include educating students as leaders and innovators in emerging and rapidly changing STEM fields, as well as educating a scientifically literate populace; both of these priorities depend on the nature and quality of the undergraduate education experience. In addressing these STEM challenges and priorities, the National Science Foundation invests in research-based and research-generating approaches to understanding STEM learning; to designing, testing, and studying curricular change; to wide dissemination and implementation of best practices; and to broadening participation of individuals and institutions in STEM fields. The goals of these investments include: increasing student retention in STEM; preparing students well to participate in science for tomorrow; and, improving students’ STEM learning outcomes.

Frequently Asked Questions (FAQs) for NSF 13-555, EHR Core Research (ECR)
1. NSF has released a program announcement for the EHR Core Research (ECR) program. What is the difference between a program announcement and a program solicitation?
2. Do I need to submit my proposal by the target date?
3. Will ECR accept CAREER proposals?
4. What are you looking for in capacity-building proposals?
5. Do I need to be an education researcher to be a PI or co-PI on an ECR project?
6. Can the same PI apply to both ECR and other appropriate EHR programs?
Dear Colleague Letter: SaTC EAGERs Enabling New Collaborations Between Computer and Social Scientists

The National Science Foundation is announcing its intentions to build upon the success of previous Early Concept Grants for Exploratory Research (EAGERs) in the area supported by the Secure and Trustworthy Cyberspace (SaTC) program (see solicitation 13-578: http://www.nsf.gov/pubs/2013/nsf13578/nsf13578.htm) and to accept additional EAGER proposals that encourage novel interdisciplinary research resulting from new collaborations between one or more Computer and Information Science and Engineering (CISE) researchers and one or more Social, Behavioral and Economic Science (SBE) researchers. (Research teams with a history of collaborating together should instead submit directly to the SaTC solicitation.) The proposed research should fit both the Trustworthy Computing (TWC) and the Social, Behavioral and Economic (SBE) Sciences perspectives within the SaTC solicitation.

Below are some examples of the types of topics that computer and social and behavioral scientists could conceivably study together under such an EAGER project. This list is by no means intended to be complete, nor is it meant to suggest what topics are of interest to the NSF. Instead, it is meant to give some notion of the broad spectrum of possibilities for such research. The respective role of social and computer scientists under different topics may vary from fully interdisciplinary involvement of both, which would be ideal, to varying degrees of mutual consultation and resource provision.

- Incentive, communication, and profitability mechanisms of attackers.
- Modeling and experimentation to identify the strengths and weaknesses of incentive mechanisms for enhancing security, particularly in realistic cyber-contexts.
- Methods, including automated methods, for detecting deception or adverse intentions relevant to attacks on cyberinfrastructure.
- Social network analysis and other methods of detecting malware propagation, for instance via social media.
- Socio-technical solutions to reduce end-user risk exposure, such as crowdsourcing.
- Research to ascertain the tradeoffs between security and privacy and how better mixtures of these could be found or negotiated. 
- Methods, including automated methods, to train, incentivize, or nudge end-users to improve their cybersecurity position. 
- The impact of norms and other factors on promoting good citizenship with respect to cyberspace. 
- End-user motivating factors that allow successful security invasion tactics and countermeasures. 
- Cyber-security insurance: obstacles and solutions. 
- The privacy needs of end-users and organizations and how these constrain or do not constrain cybersecurity efforts. 
- Motivators and indicators of insider threat and countermeasures to such threat among end-users, user communities, national and international communities, and so forth. 
- Factors behind susceptibility of subpopulations to cybercrime e.g., youth, the elderly and countermeasures. 
- The impact of trust and institutional design on cybersecurity decisions. 
- Incentives and motivators for cybersecurity in firms and other organizations. 
- International norms, rules of engagement, and escalation dynamics of cyber-attacks and cyber-warfare. 
- Systemic and structural factors that promote or undermine a secure cyberspace. 

The above topics could involve an array of social science fields, including, but not limited to: economics, sociology, psychology, political science, science of organization (organizational research/management science), communication research, education research, linguistics, and anthropology. The subfields that may be relevant are many, and can include such areas as behavioral economics, behavioral decision theory, behavioral game theory, game theory, political psychology, social network analysis and theory, social psychology, cognitive psychology, online communication research, and criminology.

Two rounds of submissions are anticipated, with approximately 4 to 5 EAGERs to be awarded during each round, subject to the availability of funds.
The Experimental Program to Stimulate Competitive Research

The primary federal program designed to ensure that all states are capable of participating the nation's research enterprise fall under the general rubric of the Experimental Program to Stimulate Competitive Research (EPSCOR). The National Science Foundation (NSF), Department of Energy, Department of Agriculture, and National Aeronautics and Space Administration have active EPSCOR programs. Since its inaugural year in 1979, the EPSCOR program has grown from funding programs in five states to awarding funding to 31 states in 2012. The Experimental Program to Stimulate Competitive Research assesses the effectiveness of EPSCOR and similar federal agency programs in improving national research capabilities, promoting an equitable distribution of research funding, and integrating their efforts with other initiatives designed to strengthen the nation's research capacity. This report also looks at the effectiveness of EPSCOR states in using awards to develop science engineering research and education, as well a science and engineering infrastructure within their state. The Experimental Program to Stimulate Competitive Research makes recommendations for improvement for each agency to create a more focused program with greater impact.


A Ready and Resilient Workforce for the Department of Homeland Security: Protecting America's Front Line reviews current workforce resilience efforts, identifies gaps, and provides recommendations for a 5-year strategy to improve DHSTogether, the current DHS workforce resilience program. This report stresses the importance of strong leadership, communication, measurement, and evaluation in the organization and recommends content for a 5-year plan that will promote centralized strategic direction and resource investment to improve readiness and resilience at the department.

While all DHS component agencies share a common mission, each have distinct roles with different stressors attached, making implementation of an organization-wide resilience or wellness program difficult. The recommendations of A Ready and Resilient Workforce for the Department of Homeland Security outline how DHS can focus its efforts on creating a common culture of workforce readiness and resilience, while recognizing the distinct, proud, celebrated cultures of its component agencies.

Research Progress on Environmental, Health, and Safety Aspects of Engineered Nanomaterials

Research Progress on Environmental, Health, and Safety Aspects of Nanomaterials evaluates research progress and updates research priorities and resource estimates on the basis of results of studies and emerging trends in the nanotechnology industry. This report follows up the 2012 report A Research Strategy for Environmental, Health, and Safety Aspects of Engineered Nanomaterials, which presented a strategic approach for developing the science and research infrastructure needed to address uncertainties regarding the potential environmental, health,
and safety risks posed by ENMs. This new report looks at the state of nanotechnology research, examines market and regulatory conditions and their affect on research priorities, and considers the criteria for evaluating research progress on the environmental, health, and safety aspects of nanotechnology.

**Novel Processes for Advanced Manufacturing:**
Summary of a Workshop (2013)
Additive manufacturing is the process of making three-dimensional objects from a digital description or file. The workshop addresses different aspects of additive manufacturing including surface finish and access to manufacturing capabilities and resources. Electromagnetic field manipulation of materials is the use of electric and/or magnetic fields to change the mechanical or functional properties of a material or for the purposes of sintering. The workshop examined research prioritization in this area as well as other objectives. "Design of materials" refers to the application of computational and analytic methods to materials to obtain a desired material characteristic; the workshop features a discussion on materials genomics in this area and more. Novel Processes for Advanced Manufacture: Summary of a Workshop presents a summarization of the key points of this workshop and includes outlines of the open discussions on each area.

**The Nexus of Biofuels, Climate Change, and Human Health:**
Workshop Summary (2013)

Liquid fuels are a major part of modern life. They supply energy for ground, water, and air transportation as well as power for industrial and farming machinery. But fossil fuels - the dominant liquid fuel in use for well over a century - have many disadvantages. The use of fossil fuels has obvious health downsides, such as emissions of pollutants that are directly harmful to health. The burning of fossil fuels produces greenhouse gases, which contribute to global warming, itself a long-term threat to human health. There have also been health concerns related to insecurity of liquid fuel supplies and the potential of international conflicts being caused by fuel scarcity. Furthermore, there are concerns that the world's large but still limited supply of fossil fuels could be strained by the increasing demand that results from societies around the world achieving greater prosperity. In the face of these concerns, new policies have been created that encourage the development of renewable sources of energy in general and biofuels in particular.

In January 2013, the Roundtable on Environmental Health Sciences, Research, and Medicine of the Institute of Medicine held a 2-day, interactive, public workshop on the intersection of biofuels, climate change, and human health. Workshop attendees explored public health issues related to the composition of traditional and alternative fuels and fuel additives, and they discussed the known and potential health impacts associated with the use of these fuels and fuel additives. The Nexus of Biofuels, Climate Change, and Human Health is the summary of that workshop. This report examines air, water, land use, food, and social impacts of biomass feedstock as an energy resource, and the state of the science and health policy implications of using different types (and generations) of biofuels as an energy source.
Responding to Capability Surprise: A Strategy for U.S. Naval Forces
From a military operational standpoint, surprise is an event or capability that could affect the outcome of a mission or campaign for which preparations are not in place. By definition, it is not possible to truly anticipate surprise. It is only possible to prevent it (in the sense of minimizing the number of possible surprises by appropriate planning), to create systems that are resilient to an adversary’s unexpected actions, or to rapidly and effectively respond when surprised.

Responding to Capability Surprise examines the issues surrounding capability surprise, both operational and technical, facing the U.S. Navy, Marine Corps, and Coast Guard. This report selects a few surprises from across a continuum of surprises, from disruptive technologies, to intelligence-inferred capability developments, to operational deployments, and assesses what the Naval Forces are doing (and could do) about them while being mindful of future budgetary declines. The report then examines which processes are in place or could be in place in the Navy, the Marine Corps, and the Coast Guard to address such surprises. Today’s U.S. naval forces continue to face a wide range of potential threats in the indefinite future and for this reason must continue to balance and meet their force structure needs. The recommendations of Responding to Capability Surprise will help to ensure more responsive, more resilient, and more adaptive behavior across the organization from the most senior leadership to the individual sailors, Marines, and Coast Guardsmen.

Abrupt Impacts of Climate Change: Anticipating Surprises
Abrupt Impacts of Climate Change summarizes the state of our knowledge about potential abrupt changes and abrupt climate impacts and categorizes changes that are already occurring, have a high probability of occurrence, or are unlikely to occur. Because of the substantial risks to society and nature posed by abrupt changes, this report recommends the development of an Abrupt Change Early Warning System that would allow for the prediction and possible mitigation of such changes before their societal impacts are severe. Identifying key vulnerabilities can help guide efforts to increase resiliency and avoid large damages from abrupt change in the climate system, or in abrupt impacts of gradual changes in the climate system, and facilitate more informed decisions on the proper balance between mitigation and adaptation. Although there is still much to learn about abrupt climate change and abrupt climate impacts, to willfully ignore the threat of abrupt change could lead to more costs, loss of life, suffering, and environmental degradation. Abrupt Impacts of Climate Change makes the case that the time is here to be serious about the threat of tipping points so as to better anticipate and prepare ourselves for the inevitable surprises.
Plant Feedstock Genomics for Bioenergy: Joint Research FOA by USDA, DOE
The U.S. Department of Energy’s Office of Science, Office of Biological and Environmental Research (OBER), and the U.S. Department of Agriculture (USDA), National Institute of Food and Agriculture (NIFA), hereby announce their interest in receiving applications for genomics based research that will lead to the improved use of biomass and plant feedstocks for the production of fuels such as ethanol or renewable chemical feedstocks. Specifically, applications are sought for research on plants that will improve biomass and oil seed characteristics, yield, or sustainability. Research to overcome the biological barriers to the low-cost, high-quality, scalable and sustainable production of bioenergy feedstocks using the tools of genetics and genomics are encouraged. Preapplication (2-3 pages) due December 19; encourage/discourage January 9, full proposal February 25.

National Defense Science and Engineering Graduate
The NDSEG Fellowship is a highly competitive, portable fellowship that is awarded to U.S. citizens and nationals who intend to pursue a doctoral degree in one of fifteen supported disciplines. NDSEG confers high honors upon its recipients, and allows them to attend whichever U.S. institution they choose. NDSEG Fellowships last for three years and pay for full tuition and all mandatory fees, a monthly stipend, and up to $1,000 a year in medical insurance (this excludes dental and vision insurance). The Department of Defense (DoD) is committed to increasing the number and quality of our nation’s scientists and engineers, and towards this end, has awarded approximately 3,200 NDSEG fellowships since the program’s inception 22 years ago. The NDSEG Fellowship is sponsored by the Air Force Office of Scientific Research (AFOSR), the Army Research Office (ARO), the High Performance Computing Modernization Program (HPCM), and the Office of Naval Research (ONR), under the direction of the Director of Defense Research and Engineering (DDR&E). Due December 20.

ARPA-E Reliable Electricity Based on Electrochemical Systems (REBELS)
This program, Reliable Electricity Based on ELectrochemical Systems (REBELS), seeks to disrupt traditional learning curves for distributed stationary power generation, by introducing technology concepts that have the potential for significantly lower cost and that are capable of performance superior to current distributed generation technologies. Fuel cell technologies have been touted for decades due to their high chemical-to-electrical conversion efficiencies
and potential for near-zero greenhouse gas emissions when fueled by hydrogen or operated as part of a carbon capture and storage (CCS) process. However, fuel cell technologies have not achieved widespread adoption due primarily to high cost relative to incumbent combustion technologies. In this program, ARPA-E seeks to fund transformational fuel cell devices that operate in an intermediate temperature range in an attempt to 1) create new pathways to achieve an installed cost to the end-user of less than $1,500/kW at moderate production volumes, and 2) create new fuel cell functionality to increase grid stability and integration of renewable energy technologies such as wind and solar. ARPA-E is encouraging outstanding scientists and engineers from different organizations, scientific disciplines, and technology sectors to form new project teams for REBELS applications and projects. ARPA-E believes that inter-disciplinary and cross-organizational collaborations can facilitate scientific and technological discoveries that a single group alone would not be able to achieve. ([REBELS FOA Concept Papers 11 25 2013]) Concept Paper Due January 8.

**NSF EHR Core Research (ECR)**
The EHR Core Research (ECR) program establishes a mechanism in the Directorate for Education and Human Resources to provide funding in foundational research areas that are broad, essential and enduring. EHR seeks proposals that will help synthesize, build and/or expand research foundations in the following core areas: STEM learning, STEM learning environments, workforce development, and broadening participation in STEM. We invite researchers to identify and conduct research on questions or issues in order to advance the improvement of STEM learning in general, or to address specific challenges of great importance. Two types of proposals are invited: Core Research Proposals (maximum 5 years, $1.5 million) that propose to study a foundational research question/issue designed to inform the transformation of STEM learning and education and Capacity Building Proposals (maximum 3 years, $300,000) intended to support groundwork necessary for advancing research within the four core areas. Due February 4.

**Environmental Education Model Grants -- Solicitation Notice for 2013 EPA-EE-13-01**
Under this solicitation EPA is seeking grant applications from eligible applicants to support environmental education projects that promote environmental stewardship and help develop knowledgeable and responsible students, teachers, and citizens. This grant program provides financial support for projects that design, demonstrate, and/or disseminate environmental education practices, methods, or techniques, as described in this notice, and that will serve as models that can be replicated in a variety of settings. Under this solicitation EPA expects to award environmental education grants from the 10 EPA Regional offices and from Headquarters. Due February 4.

**2014-NIST-SURF-01, Summer Undergraduate Research Fellowship (SURF) Program**
NIST is soliciting applications from eligible colleges and universities in the U.S. and its territories, nominating undergraduate students to participate in the Summer Undergraduate Research Fellowship (SURF) Program (SURF Program). The SURF Program will provide research opportunities for undergraduate students to work with internationally known NIST scientists, to
expose them to cutting-edge research, and to promote the pursuit of graduate degrees in science and engineering. **Due February 14.**

**EJ Collaborative Problem-Solving Cooperative Agreements Program**
The Environmental Justice Collaborative Problem-Solving (CPS) Cooperative Agreement Program provides funding for eligible applicants for projects that address local environmental and public health issues within an affected community. The CPS Program is designed to help communities understand and address exposure to multiple environmental harms and risks. **Due February 18.**

**Solid State Lighting Advanced Technology Research & Development – 2014, National Energy Technology Laboratory DE-FOA-0000973**
Through research and development of solid-state lighting (SSL), including both light-emitting diode (LED) and organic light emitting diode (OLED) technologies, the objectives of this opportunity are to: maximize the energy-efficiency of SSL products in the marketplace; remove market barriers through improvements to lifetime, color quality, and lighting system performance; reduce costs of SSL sources and luminaires; improve product consistency while maintaining high quality products; and encourage the growth, leadership, and sustainability of domestic U.S. manufacturing within the SSL industry. The Topic Areas of Interest for this Announcement include topics for LED and OLED technologies: Topic Area 1: LED Core Technology Research; Topic Area 2: OLED Core Technology Research; Topic Area 3: LED Product Development; Topic Area 4: LED Product Development Novel LED Luminaire Systems; Topic Area 5: OLED Product Development; Topic Area 6: LED Manufacturing Research & Development; and Topic Area 7: OLED Manufacturing Research & Development. For additional information regarding Solid-State Lighting Research and Development, please see the program roadmap documents: Solid-State Lighting Research and Development: Multi-Year Program Plan at [http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/ssl_myypp2013_web.pdf](http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/ssl_myypp2013_web.pdf) and Solid-State Lighting Research and Development: Manufacturing Roadmap at[http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/ssl_manuf-roadmap_sept2013.pdf](http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/ssl_manuf-roadmap_sept2013.pdf). The full Funding Opportunity Announcement(FOA) is posted on the EERE eXCHANGE website at [https://eere-exchange.energy.gov](https://eere-exchange.energy.gov). Applications must be submitted through the EERE eXCHANGE website to be considered for award. The applicant must first register and create an account on the EERE eXCHANGE website. A User Guide for the EERE eXCHANGE can be found on the EERE website [https://eere-exchange.energy.gov/Manuals.aspx](https://eere-exchange.energy.gov/Manuals.aspx) after logging in to the system. Information on where to submit questions regarding the content of the announcement and where to submit questions regarding submission of applications is found in the full FOA posted on the EERE eXCHANGE website. **Due February 24.**

**Plant Feedstock Genomics for Bioenergy: A Joint Research Funding Opportunity Announcement USDA, DOE DE-FOA-0001034**
All types of applicants are eligible to apply, except Federally Funded Research and Development Center (FFRDC) Contractors, and nonprofit organizations described in section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995.
DOE Eligibility Criteria: Applicants from U.S. Colleges and universities, non-profit organizations, for-profit commercial organizations, state and local governments, and unaffiliated individuals are eligible to apply, except as described in the preceding paragraph. Researchers from other Federal agencies are encouraged to submit a pre-application referencing DE-FOA-0001034; if a formal application is encouraged, additional submission information will be provided. USDA Eligibility Criteria: The Secretary may award grants to State agricultural experiment stations; colleges and universities; university research foundations; other research institutions and organizations; Federal agencies; national laboratories; private organizations or corporations; individuals; or any group consisting of two or more of the aforementioned entities. Applications from scientists at non-U.S. organizations will not be accepted. Award recipients may subcontract to organizations not eligible to apply, provided such organizations are necessary for the conduct of the project. **Due February 25.**

**Climate and Earth System Modeling: SciDAC and Climate Variability and Change DE-FOA-0001036**

The Climate and Earth System Modeling programs seek to develop and analyze high fidelity community models representing Earth and climate system variability and change, with a significant focus on the response of systems to natural and anthropogenic forcing. As the first of two programs in Climate and Earth System Modeling that participate in this FOA, the Earth System Modeling (ESM) Program seeks to advance computational, dynamical, and biogophysical representations of the Earth system and its components, and to calibrate, test and assess predictive capabilities using uncertainty quantification methodologies. The second program participating in this FOA, the Regional and Global Climate Modeling (RGCM) Program, seeks to enhance the predictive understanding of the Earth system by analyzing the natural and anthropogenic components of global and regional Earth system models. The use of model simulations in combination with observations enables a deeper understanding of climate variability and change. The ESM and RGCM programs are thus complementary, with ESM focused mainly on climate model development, and RGCM focused mainly on climate system analysis. Both modeling programs collaborate and coordinate with the Terrestrial Ecosystem Science (TES) and Atmospheric System Research (ASR) programs, by utilizing TES and ASR process research activities to inform model development, and by using model simulations to identify where further process research is required in atmospheric and terrestrial systems. **Due March 3.**

**2014-NIST Summer Institute for Middle School Science Teachers**

NIST is soliciting applications from eligible public school districts and accredited private educational institutions in the U.S. and its territories nominating middle school science teachers to participate in the NIST Summer Institute Program. The NIST Summer Institute Program will provide selected teachers hands-on activities, lectures, tours, and visits with NIST scientists and engineers at the NIST Campus in Gaithersburg, Maryland. The NIST Summer Institute Program will be held at the NIST Campus in Gaithersburg, Maryland on July 7-18, 2014. **Due March 12.**

**Sunshot Incubator Program Round 9 Golden Field Office DE-FOA-0000923**
The Department of Energy is supporting the development of tools and approaches that will significantly reduce the costs for solar energy systems across all technology areas (i.e. photovoltaics, concentrating solar power, power electronics, balance of system and non-hardware cost such as customer acquisition permitting, financing, interconnection, and inspection.) As part of the SunShot Incubator program, this funding opportunity is designed to help startup businesses and entrepreneurs develop technologies, innovative programs, and streamlined processes that will make solar more accessible for consumers in the U.S. The SunShot Incubator Program is an aggressive pay for performance program focused on helping solar startups rapidly refine and commercialize promising, proven technologies and ideas. The program seeks to accelerate the commercialization of solar energy products and solutions that dramatically lower the cost of solar power. This round of the SunShot Incubator Program is for both hardware and non-hardware solutions that reduce the cost of systems that convert solar energy into electric potential. Due March 13.

Next Generation Photovoltaic Technologies III Golden Field Office DE-FOA-0000990
The Next Generation Photovoltaic Technologies III program seeks to support research that applies basic science towards the realization of devices that demonstrate photovoltaic (PV) effect. Specifically, this Funding Opportunity Announcement (FOA) solicits proposals that apply promising basic materials science that has been proven at the materials properties level to demonstrate photovoltaic conversion improvements that address or exceed SunShot goals. The full Funding Opportunity Announcement (FOA) is posted on the EERE eXCHANGE website at https://eere-exchange.energy.gov. To apply to this FOA, Applicants must register with and submit application materials through EERE Exchange at https://eere-Exchange.energy.gov, EERE's online application portal. Frequently asked questions for this FOA and the EERE Application process can be found at https://eere-exchange.energy.gov/FAQ.aspx. Applicants must submit a Concept Paper by 01/03/2014 to be eligible to submit a Full Application. Due March 24.

The purpose of this notice is to request applications for special projects and programs associated with NOAA's strategic plan and mission goals, as well as to provide the general public with information and guidelines on how NOAA will select proposals and administer discretionary Federal assistance under this Broad Agency Announcement (BAA). This BAA is a mechanism to encourage research, education and outreach, innovative projects, or sponsorships that are not addressed through our competitive discretionary programs. It is not a mechanism for awarding congressionally directed funds or existing funded awards. Funding for potential projects in this notice is contingent upon the availability of Fiscal Year 2014 and Fiscal Year 2015 appropriations. Applicants are hereby given notice that funds have not yet been appropriated for any potential activities in this notice. Publication of this announcement does not oblige NOAA to review an application, or to award any specific project, or to obligate any available funds. Open to September 30, 2014.
Links to New & Open Funding Solicitations

Links verified: Monday, July 08, 2013

- American Cancer Society Index of Grants
- SAMHSA FY 2013 Grant Announcements and Awards
- DARPA Microsystems Technology Office Solicitations
- Open Solicitations from IARPA (Intelligence Advanced Research Projects Activity)
- Bureau of Educational and Cultural Affairs, Open Solicitations, DOS
- ARPA-E Funding Opportunity Exchange
- DOE Funding Opportunity Exchange
- NIAID Funding Opportunities List
- NPS Broad Agency Announcements (BAAs)
- NIJ Current Funding Opportunities
- NIJ Forthcoming Funding Opportunities
- Engineering Information Foundation Grant Program
- Comprehensive List of Collaborative Funding Mechanisms, NORDP
- ARL Funding Opportunities — Open Broad Agency Announcements (BAA)
- HHS Grants Forecast
- American Psychological Association, Scholarships, Grants and Awards
- EPA 2013 Science To Achieve Results (STAR) Research Grants
- NASA Open Solicitations
- Defense Sciences Office Solicitations
- The Mathematics Education Trust
- EPA Open Funding Opportunities
- CDMRP FY 2013 Funding Announcements
- Office of Minority Health
- Department of Justice Open Solicitations
- DOE/EEERE Funding Opportunity Exchange
- New Funding Opportunities at NIEHS (NIH)
- National Human Genome Research Institute Funding Opportunities
- Army Research Laboratory Open Broad Agency Announcements (BAA)
- SBIR Gateway to Funding
- Water Research Funding
- Fellowship and Grant Opportunities for Faculty Humanities and Social Sciences
- DARPA Current Solicitations
- Office of Naval Research Currently Active BAAs
- HRSA Health Professions Open Opportunities
- NIH Funding Opportunities Relevant to NIAID
- National Institute of Justice Current Funding Opportunities
- Funding Opportunities by the Department of Education Discretionary Grant Programs
- EPA’s Office of Air and Radiation (OAR) Open Solicitations
NETL Open Solicitations
DoED List of Currently Open Grant Competitions
Foundation Center RFP Weekly Funding Bulletin

Solicitations Remaining Open from Prior Issues of the Newsletter

Research and Development for Hydrogen Storage Golden Field Office — DE-FOA-0000827
DOE is accepting new applications aimed at research and development (R&D) for the continued development of advanced hydrogen storage systems and novel hydrogen storage materials supported through the Hydrogen Storage program. The goal is to enable the widespread commercialization of hydrogen and fuel cell technologies and specifically to provide adequate hydrogen storage for onboard vehicle applications that meet the DOE hydrogen storage targets, as well as enabling early market applications such as materials handling equipment and portable power applications. Full commercialization of fuel cell systems using hydrogen will require advances in hydrogen storage technologies. Developing systems to enable lightweight, compact, and inexpensive hydrogen storage will help make hydrogen fuel cell systems competitive in a wide range of portable and stationary applications, and enable longer driving ranges for a wider variety of transportation applications. The FOA includes the following topics:
- Topic Area 1: Reducing the cost of compressed hydrogen storage systems
- Topic Area 2: Improved materials for fiber composites and balance of plant components

Hydrogen Production Research and Development
This FOA supports research and development efforts to address critical challenges and barriers for hydrogen production technology development. The long-term goal of production and delivery research and development (R&D) is a high-volume hydrogen cost goal of $2-$4 per gallon gasoline equivalent (gge) (delivered and dispensed, but untaxed) to allow fuel cell electric vehicles (FCEVs) to be competitive on a dollar per mile basis with gasoline in hybrid electric vehicles. More specifically, the portion of the cost goal apportioned to production is <$2/gge hydrogen. Innovative materials, processes, and systems are needed to establish the technical and cost feasibility for renewable and low carbon hydrogen production. With this FOA, the DOE through the Fuel Cell Technologies Office will seek to fund hydrogen production research and development projects in order to move technologies towards reaching the hydrogen production cost goal of less than $2/gge. Concept Paper Due November 26; full applications January 31.

Programming Grants to Accompany NEH on the Road Exhibitions
These grants support ancillary public humanities programs to accompany NEH on the Road traveling exhibitions. Typical formats involve lectures, reading and discussion programs, film discussion programs, Chautauqua presentations by scholars, family programs, exhibition tours, and other appropriate formats for reaching the general public. Due December 31.

NEH Collaborative Research Grants
Collaborative Research Grants support interpretive humanities research undertaken by a team of two or more scholars, for full-time or part-time activities for periods of one to three years. Support is available for various combinations of scholars, consultants, and research assistants; project-related travel; field work; applications of information technology; and technical support and services. All grantees are expected to communicate the results of their work to the appropriate scholarly and public audiences. Due January 7.

**Robert Wood Johnson Foundation New Careers in Nursing**

The Robert Wood Johnson Foundation New Careers in Nursing is a scholarship program to help alleviate the nursing shortage and increase the diversity of nursing professionals. Through grants to schools of nursing, the program provides scholarships to college graduates without nursing degrees who are enrolled in accelerated baccalaureate and master’s nursing programs. Due January 9.

**Restoring Active Memory (RAM), Department of Defense DARPA-BAA-14-08**

DARPA seeks new methods for analysis and decoding of neural signals in order to understand how neural stimulation could be applied to facilitate recovery of memory encoding following brain injury. Ultimately, it is desired to develop a prototype implantable neural device that enables recovery of memory in a human clinical population. Additionally, the program encompasses the development of quantitative models of complex, hierarchical memories and exploration of neurobiological and behavioral distinctions between memory function using the implantable device versus natural learning and training. Due January 9.

**Ocean Sciences Research Initiation Grants (OCE-RIG), Broadening Participation**

The Division of Ocean Sciences (OCE) offers Research Initiation Grants in an effort to increase the participation of under-represented groups in the ocean sciences. Research Initiation Grants provide start up funding for researchers who have been recently appointed to tenure track (or equivalent) positions, with the twin goals of enhancing the development of their research careers and broadening the participation of under-represented groups in ocean sciences. In this solicitation, the term under-represented groups will refer to and include the following: veterans, persons with disabilities, African Americans, Hispanics, Native Americans, Alaska Natives, and Pacific Islanders. Due January 13.

**NEA Our Town Application, FY 2014**

The Arts Endowment's support of a project may start on or after September 1, 2014. “Grant Program Description Art works to improve the lives of America’s citizens in many ways. Communities across our nation are leveraging the arts and engaging design to make their communities more livable with enhanced quality of life, increased creative activity, a distinct sense of place, and vibrant local economies that together capitalize on their existing assets. The NEA defines these efforts as the process of Creative Placemaking:” In creative placemaking, partners from public, private, nonprofit, and community sectors strategically shape the physical and social character of a neighborhood, town, tribe, city, or region around arts and cultural activities. Creative placemaking animates public and private spaces, rejuvenates structures and
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streetscapes, improves local business viability and public safety, and brings diverse people together to celebrate, inspire, and be inspired. Due January 13

NEH National Digital Newspaper Program
NEH is soliciting proposals from institutions to participate in the National Digital Newspaper Program (NDNP). NDNP is creating a national digital resource of historically significant newspapers published between 1836 and 1922, from all the states and U.S. territories. This searchable database will be permanently maintained at the Library of Congress (LC) and will be freely accessible via the Internet. (See the website, Chronicling America: Historic American Newspapers.) An accompanying national newspaper directory of bibliographic and holdings information on the website directs users to newspaper titles available in all types of formats. During the course of its partnership with NEH, LC will also digitize and contribute to the NDNP database a significant number of newspaper pages drawn from its own collections. Due January 15.

Coastal SEES
Coastal SEES is focused on the sustainability of coastal systems. For this solicitation we define coastal systems as the swath of land closely connected to the sea, including barrier islands, wetlands, mudflats, beaches, estuaries, cities, towns, recreational areas, and maritime facilities; the continental seas and shelves; and the overlying atmosphere. Humans benefit from their use of coastal environments for enjoyment, dwelling, food, industry, and commerce, and benefit from the myriad of ecosystem services that coastal environments provide. However, human activities often result in physical, chemical, and ecological alterations that influence and interact with natural state and variability, over a range of spatial and temporal scales. A major challenge is to understand the dynamics of this coupled human-natural system in order to inform societal decisions about the uses of coastal systems, including for economic, aesthetic, recreational, research, and conservation purposes. Scientific understanding is foundational and must include an understanding of reciprocal feedbacks between humans and the natural environment; how people and organizations interpret, assess, and act upon scientific and other evidence; and how they weigh these interpretations against other interests to influence governance and decision-making. Thus, coastal sustainability relies on broad and intimately interconnected areas of scholarship about natural and human processes. Coastal SEES projects will be expected to lead to generalizable theoretical advances in natural sciences and engineering while, at the same time, integrating key aspects of human processes required to address issues of coastal sustainability. Due January 15.

National Digital Newspaper Program
NEH is soliciting proposals from institutions to participate in the National Digital Newspaper Program (NDNP). NDNP is creating a national digital resource of historically significant newspapers published between 1836 and 1922, from all the states and U.S. territories. This searchable database will be permanently maintained at the Library of Congress (LC) and be freely accessible via the Internet. (See the website, Chronicling America: Historic American Newspapers.) An accompanying national newspaper directory of bibliographic and holdings
information on the website directs users to newspaper titles available in all types of formats. During the course of its partnership with NEH, LC will also digitize and contribute to the NDNP database a significant number of newspaper pages drawn from its own collections. Due January 15.

**International Affairs Fellowship in Nuclear Security**
The International Affairs Fellowship in Nuclear Security (IAF-NS), sponsored by the Stanton Foundation, offers university-based scholars valuable hands-on experience in the nuclear security policymaking field and places selected fellows in U.S. government positions or international organizations for a period of twelve months to work with practitioners. The IAF-NS closes the gap between research and practice and enriches the teaching and scholarship of academics, while also benefiting policymakers by exposing them to cutting-edge scholarly research. The Council on Foreign Relations (CFR) awards approximately two fellowships annually. The fellowships will be awarded on the basis of academic and professional accomplishments, and on the contribution the fellowship will make to the applicant’s academic career development. Potential topics appropriate for the fellowship include nuclear terrorism, nuclear proliferation, nuclear weapons, nuclear force posture, security implications of nuclear energy, international security cooperation, deterrence, and war and conflict. During their fellowship tenures, fellows will be invited to attend CFR meetings and participate in select events, such as the annual International Affairs Fellows Conference in New York City. Due January 17.

**National Robotics Initiative (NRI)**
The goal of the National Robotics Initiative is to accelerate the development and use of robots in the United States that work beside, or cooperatively with, people. Innovative robotics research and applications emphasizing the realization of such co-robots acting in direct support of and in a symbiotic relationship with human partners is supported by multiple agencies of the federal government including the National Science Foundation (NSF), the National Aeronautics and Space Administration (NASA), the National Institutes of Health (NIH), and the U.S. Department of Agriculture (USDA). The purpose of this program is the development of this next generation of robotics, to advance the capability and usability of such systems and artifacts, and to encourage existing and new communities to focus on innovative application areas. It will address the entire life cycle from fundamental research and development to manufacturing and deployment. Methods for the establishment and infusion of robotics in educational curricula and research to gain a better understanding of the long term social, behavioral and economic implications of co-robots across all areas of human activity are important parts of this initiative. Collaboration between academic, industry, non-profit and other organizations is strongly encouraged to establish better linkages between fundamental science and technology development, deployment and use. Due January 21.

**Catalyzing New International Collaborations (CNIC)**
The CNIC program will support US researchers’ participation in activities intended to catalyze new international collaborations designed to open up new scientific directions for the
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proposer. These include, but are not limited to: research planning visits, initial data gathering activities, proof-of-concept, single or multiple visits within a maximum 12-month time period to plan a new international research collaboration, or exploratory workshops designed to bring together US and non-US-based researchers representing several institutions and focused on a topic specified in the Project Description. Generally, CNIC-supported workshops will include between 10-25 individuals, of whom roughly half will be from the US, and are usually expected to take place abroad. However, in special circumstances, they may take place within the US if they include substantial international participation and are held for the purpose of establishing new international collaborations. Due January 22.

Organotypic Culture Models for Predictive Toxicology Center
Grants.gov Key Word Search: “NOAA-OAR-OER-2014-2003874” to download full announcement. The U.S. Environmental Protection Agency (EPA), as part of its Science to Achieve Results (STAR) program, is seeking applications for research centers to investigate toxic effects of chemical substances in three-dimensional (3D) in vitro models, hereafter referred to as ‘organotypic culture models’ (OCMs). OCMs are tissue culture models that mimic in vivo tissue architecture through interactions of heterotypic cell types (e.g., epithelium-stroma) and extracellular matrices (ECM). They can be established from isolated cells or from tissue fragments harvested in vivo, and will bridge the gap between conventional monolayer cell cultures and whole-animal systems. EPA is interested in the potential application of OCMs that mimic complex cell arrangements and physiologies, scalable from mid to higher throughput screening (HTS), and high-content screening (HCS) approaches. This solicitation seeks the formation of research centers that will guide the development and evaluation of OCMs that will accelerate translational research in predictive toxicology. Due January 23.

Long Term Research in Environmental Biology (LTREB)
The Long Term Research in Environmental Biology Program supports the generation of extended time series of data to address important questions in evolutionary biology, ecology, and ecosystem science. Research areas include, but are not limited to, the effects of natural selection or other evolutionary processes on populations, communities, or ecosystems; the effects of interspecific interactions that vary over time and space; population or community dynamics for organisms that have extended life spans and long turnover times; feedbacks between ecological and evolutionary processes; pools of materials such as nutrients in soils that turn over at intermediate to longer time scales; and external forcing functions such as climatic cycles that operate over long return intervals. The Program intends to support decadal projects. Funding for an initial, 5-year period requires submission of a preliminary proposal and, if invited, submission of a full proposal that includes a 15-page project description. Proposals for the second five years of support (renewal proposals) are limited to an eight-page project description and do not require a preliminary proposal. Preliminary January 30; full August 1.

Improving Undergraduate STEM Education
NSF accepts unsolicited proposals to support projects that address immediate challenges and opportunities facing undergraduate STEM education, as well as those that anticipate new
structures and functions of the undergraduate learning and teaching enterprise. In addition, **NSF accepts unsolicited proposals for developing Ideas Labs in biology, engineering, and geosciences** that will bring together relevant disciplinary and education research expertise to produce research agendas that address discipline-specific workforce development needs. **Due February 4.**

**Alliances for Graduate Education and the Professoriate (AGEP)**

AGEP is committed to the national goal of increasing the numbers of underrepresented minorities (URMs), including those with disabilities, entering and completing science, technology, engineering, and mathematics (STEM) graduate education and postdoctoral training to levels representative of the available pool. URMs include African Americans, Hispanic Americans, American Indians, Alaska Natives, Native Hawaiians and other Pacific Islanders. Increased URM participation in advanced STEM education and training is critical for supporting the development of a diverse professional STEM workforce especially a diverse STEM faculty who serve as the intellectual, professional, personal, and organizational role models that shape the expectations of future scientists and engineers. To achieve this long term goal, the AGEP program will support the development, implementation, study, and dissemination of innovative models and standards of graduate education and postdoctoral training that are designed to improve URM participation, preparation, and success. **Due February 5.**

**DoD FY13 CRMRP VRP Hypothesis Development Award**

The FY13 VRP Hypothesis Development Award (HDA) mechanism supports conceptually innovative, high-risk/high-reward research that could ultimately lead to critical discoveries or major advancements that will drive the field of vision research forward. Research projects should include a testable hypothesis based on a strong scientific rationale. This award is not intended to support the continuation of existing studies or the next logical extension and/or incremental step. The HDA is designed to support innovative ideas with the potential to yield impactful data and new avenues of investigation. Important aspects of the HDA are as follows:

- **Impact:** The proposed research is expected to make an important and original contribution to advancing the understanding of visual dysfunction and lead ultimately to improved outcomes for patients. **Due Feb. 6.**

**Global Nuclear Security Engagement Activities, Department of State ISN-ISNCTR-14-003**

The Department of State’s Office of Cooperative Threat Reduction (ISN/CTR) is pleased to announce an open competition for assistance awards through this Request for Proposals (RFP). ISN/CTR invites non-profit/non-governmental organizations and educational institutions to submit proposals for projects that will advance the mission of the Department’s Partnership for Nuclear Security (PNS). ISN/CTR has approximately $7,000,000 available in the current fiscal year to award multiple cooperative agreements in this field. ISN/CTR prefers projects that cost less than $250,000, though awards may involve multiple projects that cumulatively exceed $250,000. **Due February 14.**
Global Biosecurity Engagement Activities, Department of State ISN-ISNCTR-14-001
The Department of State’s Office of Cooperative Threat Reduction (ISN/CTR) is pleased to announce an open competition for assistance awards through this Request for Proposals (RFP). ISN/CTR invites non-profit/non-governmental organizations and educational institutions to submit proposals for projects that will advance the mission of the Department’s Biosecurity Engagement Program (BEP). ISN/CTR has approximately $20,000,000 available in the current fiscal year to award multiple grants and cooperative agreements in this field. ISN/CTR prefers projects that cost less than $500,000, though awards may involve multiple projects that cumulatively exceed $500,000. Due February 14.

Minerva Research Initiative Office of Naval Research
The Office of Naval Research (ONR) is interested in receiving proposals for the Minerva Research Initiative (http://minerva.dtic.mil), a DoD-sponsored, university-based social science research program initiated by the Secretary of Defense. This program is a multi-service effort. Ultimately, however, funding decisions will be made by OSD personnel, with technical inputs from the Services. The program focuses on areas of strategic importance to U.S. national security policy. It seeks to increase the Department’s intellectual capital in the social sciences and improve its ability to address future challenges and build bridges between the Department and the social science community. Minerva brings together universities, research institutions, and individual scholars and supports multidisciplinary and cross-institutional projects addressing specific topic areas determined by the Department of Defense. The Minerva Research Initiative aims to promote research in specific areas of social science and to promote a candid and constructive relationship between DoD and the social science academic community. Due February 14.

NEH Landmarks of American History and Culture: Workshops for School Teachers
The Landmarks of American History and Culture program supports a 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 related subjects in the humanities. Each workshop is offered twice during the summer. Workshops accommodate forty school teachers (NEH Summer Scholars) at each one-week session. Due March 4.

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. Due March 4.

Research Interests of the Air Force Office of Scientific Research
AFOSR plans, coordinates, and executes the Air Force Research Laboratory’s (AFRL) basic research program in response to technical guidance from AFRL and requirements of the Air Force; fosters, supports, and conducts research within Air Force, university, and industry laboratories; and ensures transition of research results to support USAF needs. The focus of
AFOSR is on research areas that offer significant and comprehensive benefits to our national warfighting and peacekeeping capabilities. These areas are organized and managed in three scientific directorates: Aerospace, Chemical and Material Sciences, Physics and Electronics, and Mathematics, Information and Life Sciences. Open until superseded.

**Research Interests of the Air Force Office of Scientific Research**

AFOSR solicits proposals for basic research through this general Broad Agency Announcement (BAA). This BAA outlines the Air Force Defense Research Sciences Program. AFOSR invites proposals for research in many broad areas. These areas are described in detail in Section I, Funding Opportunity Description. AFOSR is seeking unclassified, white papers and proposals that do not contain proprietary information. We expect our research to be fundamental. Open until superseded.

**FY2014 Consolidated Innovative Nuclear Research Idaho Field Office — Department of Energy DE-FOA-0000998**

DOE is seeking applications from U.S. universities, national laboratories and industry to conduct Program Supporting, Mission Supporting and Program Directed nuclear energy-related research in support of the major NE-funded research programs. Additionally, DOE has interest in leveraging multiple needs to the extent possible. Appendix D provides a description of key data needs for validating advanced modeling and simulation tools being developed by NE. Researchers should evaluate their applications in light of these data needs and highlight any potential for capturing key data. Due April 3.

**DARPA Innovative Systems for Military Missions**

The Tactical Technology Office of the Defense Advanced Research Projects Agency is soliciting executive summaries, white papers and proposals for advanced research and development of Innovative Systems for Military Missions. This solicitation seeks system and subsystem level technologies that enable revolutionary improvements to the efficiency and effectiveness of the military. Novel concepts are sought in the following focus areas: Ground Systems, Maritime Systems, Air Systems, and Space Systems. Proposals may be submitted at any time while this solicitation is open. TTO may publish groups of special topics as modifications to this BAA throughout the year. Open to April 9, 2014.

**DARPA Defense Sciences Research and Technology**

DARPA is soliciting innovative research proposals of interest to the Defense Sciences Office. Proposed research should investigate innovative approaches that enable revolutionary advances in science and technology. Specifically excluded is research that results primarily in evolutionary improvements to the existing state of the art. Open to May 22, 2014.

**Climate Change Adaptation Program (GPAP)**

One important effect of global climate change is the reduction in naturally stored water resources which, for Peru, means melting glaciers and a decrease in the size of highland wetlands (paramos). The loss of these areas decreases water availability for upland and lowland communities and increases the potential for Glacial Lake Outburst Floods (GLOFs). This APS
seeks to stimulate adaptation projects that assist indigenous mountain communities, rural and urban areas, and local and regional governments potentially affected by GLOFs or changes in water availability. General project outcomes will be long-term, sustainable approaches that help reduce the impact of climate change on glaciated and highland wetland ecosystems and on those that depend on these ecosystems' services. **Open to June 6, 2014.**

**DARPA Strategic Technology Office (STO) Broad Agency Announcement (BAA)**
DARPA is seeking innovative ideas and disruptive technologies that offer the potential for significant capability improvement across the Strategic Technology Office (STO) focus areas. This includes system and technology development related to Battle Management (BM), Command and Control (C2), Communications, Intelligence, Surveillance, and Reconnaissance (ISR), Electronic Warfare (EW), and Positioning, Navigation and Timing (PNT). Technologies of particular interest would address challenges of operating in contested, denied, and/or austere environments. **Open until June 18, 2014.**

**DARPA-BAA-13-32: Information Innovation Office (I2O) Office-Wide BAA**
The Defense Advanced Research Projects Agency (DARPA) is soliciting innovative research proposals of interest to the Information Innovation Office (I2O). Proposed research should investigate innovative approaches that enable revolutionary advances in science, devices, or systems. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of the art. I2O seeks unconventional approaches that are outside the mainstream, undertaking directions that challenge assumptions and have the potential to radically change established practice. See Full Announcement, DARPA-BAA-13-32 (I2O Office Wide) pdf for further details. **Open until June 25, 2014.**

**DARPA Microsystems Technology Office-Wide**
The Microsystems Technology Office (MTO) supports DARPA’s mission of maintaining technological superiority and preventing technological surprise by investing in areas such as microelectromechanical systems (MEMS), electronics, system architecture, photonics, and biotechnology. In recent years, the proliferation of commercial components and manufacturing processes has allowed our adversaries to achieve capabilities that were previously not possible. **Open to September 1, 2014.**

**NINDS SBIR Technology Transfer (SBIR-TT [R43/R44])**
This Funding Opportunity Announcement (FOA) encourages Small Business Innovation Research (SBIR) grant applications from small business concerns (SBCs) for projects to transfer technology out of the NIH intramural research labs into the private sector. If selected for SBIR funding, the SBC will be granted a royalty-free, non-exclusive internal research-use license for the term of and within the field of use of the SBIR award to technologies held by NIH with the intent that the SBC will develop the invention into a commercial product to benefit the public. **Open November 5, 2011, to September 8, 2014.**

**Long Range Broad Agency Announcement (BAA) for Navy and Marine Corps Science and Technology 14-001 ONRBAA14-001**
This **BAA** is intended for proposals related to basic research, applied research, or advanced technology development. For NAVY and Marine Corps Science, Technology, Engineering & Mathematics (STEM) programs, refer to ONRBAA13-007, which may be found at the ONR Broad Agency Announcement (BAA) webpage [http://www.onr.navy.mil/Contracts-Grants/Funding-Opportunities/Broad-Agency-Announcements.aspx](http://www.onr.navy.mil/Contracts-Grants/Funding-Opportunities/Broad-Agency-Announcements.aspx). A brief description of the ONR Program Codes and the science and technology thrusts that ONR is pursuing is provided below. Additional information can be found at the ONR website at [http://www.onr.navy.mil/Science-Technology/Departments.aspx](http://www.onr.navy.mil/Science-Technology/Departments.aspx). **Open to September 30, 2014.**

**Army Engineer Research and Development Center BAA**

The U.S. Army Engineer Research and Development Center (ERDC) has issued a Broad Agency Announcement (BAA) for various research and development topic areas. The ERDC consists of the Coastal and Hydraulics Lab (CHL), the Geotechnical and Structures Lab (GSL), the Environmental Lab (EL) and the Information Technology Lab (ITL) in Vicksburg, Mississippi; the Cold Regions Research and Engineering Lab (CRREL) in Hanover, New Hampshire; the Construction Engineering Research Lab (CERL) in Champaign, Illinois; and the Topographic Engineering Center (TEC) in Alexandria, Virginia. The ERDC is responsible for conducting research in the broad fields of hydraulics, dredging, coastal engineering, instrumentation, oceanography, remote sensing, geotechnical engineering, earthquake engineering, soil effects, vehicle mobility, self-contained munitions, military engineering, geophysics, pavements, protective structures, aquatic plants, water quality, dredged material, treatment of hazardous waste, wetlands, physical/mechanical/ chemical properties of snow and other frozen precipitation, infrastructure and environmental issues for installations, computer science, telecommunications management, energy, facilities maintenance, materials and structures, engineering processes, environmental processes, land and heritage conservation, and ecological processes. **This research is conducted by Government personnel and by contract with educational institutions, non-profit organizations and private industries.** The BAA is available at [http://erdc.usace.army.mil/](http://erdc.usace.army.mil/) and is open until superseded. Proposals may be accepted at any time. For questions regarding proposals to CHL, EL, GSL, TEC & ITL, contact Allison Hudson at 601-634-5233 or via email at Allison.B.Hudson@usace.army.mil. For questions concerning proposals to CERL, contact Jim Dowling at 217-373-4479 or via email at james.p.dowling@usace.army.mil or Andrea Krouse at 217-373-6746 or via email at andrea.j.krouse@usace.army.mil. For questions concerning proposals to CRREL, contact Wendy Adams at 603-646-4323 or via email at Wendy.A.Adams@usace.army.mil. Contact the technical personnel listed at the end of each topic area for questions concerning the topic areas themselves. **Open to January 31, 2014.**

**Science, Technology, Engineering & Mathematics BAA**

ERDC solicits basic research proposals in the general DoD STEM Education and Outreach Program from colleges, universities, and non-profit organizations. Depending upon the availability of appropriated funds, ERDC may: (1) Make multiple awards under this BAA; and (2) Consider options exercisable for multi-year performance. Area of performance for proposals may be limited to one of the selected locations listed above or may address multiple locations.
Funding is limited and proposals are primarily sought in the not-to-exceed $30,000 range; however, larger awards may be considered when appropriate. Geographically targeted. Open to January 31, 2014.

**Small University Grants Open 5-Year Broad Agency Announcement**
Open to August 26, 2015

**Nuclear Energy University Programs - Fellowship and Scholarship**
This program supports education and training for future nuclear scientists, engineers and policy-makers who are attending U.S. universities and colleges in nuclear-related graduate, undergraduate and two-year study programs. These are zero-dollar awards that will be funded as students apply through the Department of Energy, Office of Nuclear Energy. Open until November 30, 2015.

**FY2011 – 2016 Basic Research for Combating Weapons of Mass Destruction (C-WMD) Broad Agency Announcement (BAA)**

This BAA is focused on soliciting basic research projects that support the DTRA mission to safeguard America and its allies from WMD (e.g., chemical, biological, radiological, nuclear, and high-yield explosives) by providing capabilities to reduce, eliminate, and counter the threat and mitigate its effects.

**Open Solicitations from IARPA (Intelligence Advanced Research Projects Activity)**

**Army Research Laboratory Broad Agency Announcement for Basic and Applied Scientific Research**
This Broad Agency Announcement (BAA), which sets forth research areas of interest to the Army Research Laboratory (ARL) Directorates and Army Research Office (ARO), is issued under the paragraph 6.102(d)(2) of the Federal Acquisition Regulation (FAR), which provides for the competitive selection of basic research proposals. Proposals submitted in response to this BAA and selected for award are considered to be the result of full and open competition and in full compliance with the provision of Public Law 98-369, "The Competition in Contracting Act of 1984" and subsequent amendments. Open June 1, 2012 to March 31, 2017.

**ARL Core Broad Agency Announcement for Basic and Applied Scientific Research for Fiscal Years 2012 through 2017**

**Air Force Research Laboratory, Directed Energy Directorate**

**University Small Grants Broad Agency Announcement**
This is a five-year, open-ended Broad Agency Announcement (BAA) to solicit research proposals for the United States Air Force Research Laboratory (AFRL) Directed Energy (RD) Directorate. This BAA is a university grant vehicle that can provide small grants of $100k or less to students/professors in a timely manner for the purpose of engaging U.S./U.S. territories’ colleges and universities in directed energy-related basic, applied, and advanced research projects that are of interest to the Department of Defense. Open to April 1, 2017.
**AFRL Research Collaboration Program**
The objective of the AFRL Research Collaboration program is to enable collaborative research partnerships between AFRL and Academia and Industry in areas including but not limited to Materials and Manufacturing and Aerospace Sensors that engage a diverse pool of domestic businesses that employ scientists and engineers in technical areas required to develop critical war-fighting technologies for the nation’s air, space and cyberspace forces through specific AFRL Core Technical Competencies (CTCs). **Open until December 20, 2017.**

**United States Army Research Institute for the Behavioral and Social Sciences Broad Agency Announcement for Basic, Applied, and Advanced Scientific Research (FY13-18)**
Announcement for Basic, Applied, and Advanced Scientific Research. This Broad Agency Announcement (BAA), which sets forth research areas of interest to the United States Army Research Institute for the Behavioral and Social Sciences, is issued under the provisions of paragraph 6.102(d)(2) of the Federal Acquisition Regulation (FAR), which provides for the competitive selection of proposals. Proposals submitted in response to this BAA and selected for award are considered to be the result of full and open competition and in full compliance with the provisions of Public Law 98-369 (The Competition in Contracting Act of 1984) and subsequent amendments. The US Army Research Institute for the Behavioral and Social Sciences is the Army’s lead agency for the conduct of research, development, and analyses for the improvement of Army readiness and performance via research advances and applications of the behavioral and social sciences that address personnel, organization, training, and leader development issues. Programs funded under this BAA include basic research, applied research, and advanced technology development that can improve human performance and Army readiness. The funding opportunity is divided into two sections- (1) Basic Research and (2) Applied Research and Advanced Technology Development. The four major topic areas of research interest include the following: (1) Training; (2) Leader Development; (3) Team and Inter-Organizational Performance in Complex Environments; and (4) Soldier/Personnel Issues. Funding of research and development (R&D) within ARI areas of interest will be determined by funding constraints and priorities set during each budget cycle. **Open to February 5, 2018.**

**Research Interests of the Air Force Office of Scientific Research**
The Air Force Office of Scientific Research (AFOSR) manages the basic research investment for the U.S. Air Force (USAF). To accomplish this task, AFOSR solicits proposals for basic research through this general Broad Agency Announcement (BAA). This BAA outlines the Air Force Defense Research Sciences Program. AFOSR invites proposals for research in many broad areas. These areas are described in detail in Section I of the BAA, Funding Opportunity Description. AFOSR plans, coordinates, and executes the Air Force Research Laboratory's (AFRL) basic research program in response to technical guidance from AFRL and requirements of the Air Force; fosters, supports, and conducts research within Air Force, university, and industry laboratories; and ensures transition of research results to support USAF needs. The focus of AFOSR is on research areas that offer significant and comprehensive benefits to our national warfighting and peacekeeping capabilities. These areas are organized and managed in five
scientific directorates: Dynamical Systems and Control (RTA), Quantum & Non-Equilibrium Processes (RTB), Information, Decision, and Complex Networks (RTC), Complex materials and Devices (RTD), and Energy, Power, and Propulsion (RTE). The research activities managed within each directorate are summarized in Section I of the BAA. Open until superseded.

Air Force BAA - Innovative Techniques and Tools for the Automated Processing and Exploitation (APEX) Center
The AFRL/RIEA branch performs Research and Development (R&D) across a broad area of Air Force Command, Control, Communications, Computers/Cyber, and Intelligence (C4I). All applicable "INTs" are investigated with emphasis on Ground Moving Target Indication (GMTI), Electronic Intelligence (ELINT), Signals Intelligence (SIGINT), Image Intelligence (IMINT), Non Traditional Intelligence, Surveillance and Reconnaissance (NTISR), and Measurement and Signature Intelligence (MASINT). The APEX Center is used to perform analysis for seedling efforts, provide baseline tool development for major programs, and to provide realistic operational systems/networks/databases for integration efforts. The APEX Center resources will be used by the Government to perform the necessary research, development, experimentation, demonstration, and conduct objective evaluations in support of emerging capabilities within the Processing and Exploitation (PEX) area. Software tools, data sets, metrics (Measures of Performance/Measures of Effectiveness), and analysis are needed for the Government to perform the vetting, maturing, and analysis of efforts related to PEX, e.g. Automatic Tracking, Activity Based Intelligence, Entity, Event & Relationship (EER) Extraction, Association & Resolution (A&R), Analysis & Visualization (A&V), Social Network Analysis, Network Analytics, Pattern Discovery, Scalable Algorithms, and Novelty Detection. The AFRL APEX Center is the AFRL/RI gateway into the cross-directorate PCPAD-X (Planning & Direction, Collection, Processing & Exploitation, Analysis & Production, and Dissemination eXperimentation) initiative. Open to FY 2018.
What We Do--
We provide consulting for colleges and universities on a wide range of topics related to research development and grant writing, including:

- **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. Proposal development retreats for new faculty.

- **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

**Workshops by Academic Research Funding Strategies**
We offer workshops on research development and grant writing for faculty and research professionals based on all published articles.

(View Index of Articles)

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