Research Development & Grant Writing News

Volume 5, Issue 1: September 15, 2014

Table of Contents

! Workshop on Large Team Grants !

Our interactive workshop gives an overview of the successful strategies needed to transition to large team grants such as the NSF STC. Now scheduling for the fall semester. Learn More Here

Our Large Team Grant eBook!

Strategies for Planning, Developing, and Writing Large Team Grants

is a step by step "how-to" guide for faculty and research professionals facing the challenges of transitioning to center-level grants.

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Our New Faculty Guide eBook

New Faculty Guide to Competing for Research Funding is an invaluable tool for **faculty** writing research grants and the research offices assisting them. **Table of Contents**

! Ask about our New Faculty Workshop !

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Research Development & Grant Writing News ©

Published monthly for faculty and research professionals by

Academic Research Funding Strategies, LLC

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.

Workshop

Strategies for Planning, Developing and Writing Large Team Grants

An interactive workshop presented by Mike Cronan

Academic Research Funding Strategies, LLC

(Back to Page 1)

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) such as the newly announced NSF Science and Technology Center. ***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)

SAME DAY POST WORKSHOP INCLUDED CONSULTATIONS: Individual or group consultations with faculty and/or research office staff on workshop topics (e.g., 8 consultations @30 minutes each).

WORKSHOP COSTS: Cost of the 4-hour interactive workshop and 4-hours of individual consultations with faculty and/or research office staff on presentation topics: **$2,950 plus**

travel costs. A second day of consultations is available at a rate of $100/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, October 1 to December 6, 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

(Back to Page 1)

Diversity in STEM: What It Is and Why It Matters
OMB Sequestration Update Report to the President and Congress for Fiscal Year 2015
NSF Natural Hazards Engineering Research Infrastructure 2015 - 2019
A New Way to Think About Pasteur's Quadrant
STEM Learning Is Everywhere: Summary of a Convocation on Building Learning Systems
Upcoming NSF DR K-12 Solicitation Webinars
Federal Funding for Basic Research at Universities and Colleges Essentially Unchanged in FY 2012
Google: Research in Applied Computer Science, Engineering and Related Fields
Verizon Foundation Grant Program
American Assoc of Univ Women Fellowships: Dissertation; Postdoctoral; Summer/Short-Term Research
Program in Early American Economy and Society Fellowships for 2014-2015
Notice of Intent (NOI) Building Energy Efficiency Frontiers and Innovations (BENEFIT) 2015
NOI for FOA DE-FOA-0001167 Buildings University Innovators and Leaders Development (BUILD) - 2015
The American Academy of Arts and Sciences Visiting Scholars Program
U.S. Department of Energy Increases Access to Results of DOE-funded Scientific Research
2011 Data Show U.S. Business R&D Highly Concentrated by State and Metropolitan Location
NSF FY2015 Budget Request to Congress
NSF Sociology Program - Doctoral Dissertation Research Improvement Awards (Soc-DDRI)
NIH Division of Communication & Outreach (DCO)
Women in Biomedical Research
Expanding the Impact of Genomic Data
Societies comment on the NIFA Centers of Excellence
USDA Secretary Announces Creation of Foundation for Food and Agricultural Research
U.S. Department of Energy and Open Access
Food and Agricultural Sciences National Needs Graduate and Postgraduate Fellowship Grants Program
U.S. Borlaug Fellows Graduate Research Grant
Implementation of the NIH Genomic Data Sharing Policy for NIH Grant Applications and Awards
NIH Genomic Data Sharing Policy
Scientific Data
A Roadmap for Including Culture in Health Research
NOSORH Grant Writing Institute: Rural Health Grant Writing Specialist Training
RFI: Specific Clean Energy Manufacturing Focus Areas for a Manufacturing Innovation Institute
NIH Genomic Data Sharing (GDS) Policy
W.E.B. Du Bois Fellowship for Research on Race, Gender, Culture and Crime
Northern Gulf of Mexico Ecosystems and Hypoxia Assessment Program
ERIC Webinar: Restoring Access to ERIC's PDFs
Unemployment for Doctoral Scientists & Engineers Remained Below the National Average in 2013
Survey of Doctorate Recipients, 2013
CyberCorps(R): Scholarship for Service

Writing the NSF STC Proposal

By **Mike Cronan**, co-publisher

(Back to Page 1)

A few weeks ago, NSF issued a new solicitation for the *Science and Technology Centers (STC): Integrative Partnerships* program (NSF 14-600). Now 27-years old, the STC program is, as Humphrey Bogart noted in the movie *The Maltese Falcon* "*such stuff as dreams are made of*." Of course, Bogart was quoting Shakespeare's Prospero from *The Tempest* when he referred to the elusive, mysterious, and priceless jewel-encrusted gold falcon so sought after by a cast of international fortune hunters. However, there is a clear similarity between those dreaming of securing an NSF STC and the more desperate dream of securing the priceless Maltese Falcon—both dreams involve an arduous and challenging journey to be realized, one a dream of great research support and the other a dream of great wealth.

We described the STC program in an April 2011 article entitled, "***NSF STC Preliminary Proposal Webinar Report***." At the time, NSF's STC webinar of April 11 was held some six weeks before the May 31 STC preliminary proposal due date. The new STC preliminary proposal is due to NSF by December 11. Submission of a full proposal due June 16, 2015 is by invitation only and based on reviews of the preliminary. Hopefully, NSF will schedule an STC webinar earlier than six weeks before the current due date for the preliminary proposal, given the high stakes and complex nature of planning, developing, and writing such a large team grant (see our recently published eBook ***Strategies for Planning, Developing, and Writing Large Team Grants*** and our ***Large Team Grant Workshop*** based on the book).

Fortunately, selected portions of the STC webinar of April 11, 2011 remain relevant to the newly released solicitation, particularly in terms of the ***competitive strategies needed to plan, develop, and write a successful STC proposal***. If you have a login ID and password from the 2011 webinar, that will still work for viewing that webinar (**link to webinar archive**). If not, the 41-page transcript from the 2011 STC webinar is available HERE. Reviewing the past webinar transcript to find still relevant "*pearls of wisdo*m," or more appropriately "***pearls of funding success,***" while awaiting a new webinar posting (assuming there will be one) for the current STC ***is an important part of the background competitive positioning it takes to win an STC***.

Along these same lines, the new STC solicitation needs to be read and re-read and discussed in detail by any potential STC development team member The solicitation must be understood ***in its entirety*** by every member of the team. If team members understand the solicitation only in terms of siloed sections applicable to their individual roles in the STC, it will be difficult, if not impossible, to write a successfully integrated research narrative—***the key to funding success***. Remember the 27-year NSF mantra for the STC program is "***INTEGRATIVE PARTNERSHIPS***." Moreover, it will be important that someone on your STC team read through the NSF recommended STC background documents and web links contained in the current solicitation. **Do not even think of skipping this step!**

As NSF notes in the below bulleted quotes from the 2014 solicitation:

- The Center's theme may involve any area of research supported by NSF (Consult the NSF Guide to Programs for further details).
- "PIs are encouraged to exploit aspects of cyberinfrastructure such as high-performance computing, data analysis and visualization, and virtual organizations for distributed communities in order to support the science and engineering goals of the Center, and to enable and enhance collaborations and resource sharing among the partner institutions. (Further information is available in the NSF document, Cyberinfrastructure Vision for 21st Century Discovery.)
- Proposers are also encouraged to access the STC web site for updated information and answers to frequently asked questions (FAQ's) relevant to this competition.
- A comprehensive description of the Foundation's merit review process is available on the NSF website HERE.
- Proposers should also be aware of core strategies essential to the fulfillment of NSF's mission, as articulated in *Investing in Science, Engineering, and Education for the Nation's Future: NSF Strategic Plan for 2014-2018*. These strategies are integrated in the program planning and implementation process, of which proposal review is one part. ***NSF's mission is particularly well-implemented through the integration of research and education and broadening participation in NSF programs, projects, and activities***."

A strategic blueprint for the planning, development, and writing of both a preliminary proposal and a full proposal needs to be created. In particular, even though the full proposal is by invitation only, planning for it (and even a possible site visit) needs to be incorporated into your thinking when drafting the preliminary proposal itself. For example, the project description of the STC preliminary proposal is limited to **8 pages**. The project description for the full STC proposal is limited to **25 pages**, but within that limit, take note of the **proportional importance** NSF assigns through page requirements for component sections 4.a-4.f:

a. **Rationale for Center Approach** (1-page limit);
b. Narrative Description of the **Research Objectives** of the Center (up to 10 pages);
c. Narrative Description of the **Education and Human Resource Development Objectives** of the Center (5-page limit);
d. Narrative Description of the **Broadening Participation Objectives** of the Center (3-page limit);
e. Narrative Description of the **Knowledge Transfer Objectives** of the Center (3-page limit); and
f. Narrative Description of the **Management Plan** for the Research, Education, Broadening Participation, and Knowledge Transfer Activities of the Center (3-page limit).

Note carefully that, out of 25 pages for the full proposal, only 10 pages are devoted to a description of the research objectives. This simple point needs to be fully understood because it will significantly impact the overall center partnership and proposed activities that go beyond the research core and address many of the core NSF values. Those values include the integration of research and education and the diversity of the scientific and engineering workforce. As you start to draft the 8-page preliminary proposal project narrative, make sure

you keep in mind that the successful preliminary proposal will need to set the stage for items a-f above. Your end goal is a successful site visit, so work back from that in a way that ensures a successful first step—a preliminary proposal that will be invited to full.

Two key components of the preliminary proposal are the Project Summary (1 page) and the Project Description (8 pages). You will be required to answer some very challenging questions in both of these sections and do so in a manner that is clear, concise, and demonstrates that you are truly proposing an "**integrative partnership**." Keep in mind NSF's requirement for the Project Summary when writing both of these sections—the writing needs to be "*informative to those working in the same or related field(s),* ***and understandable to a scientifically or technically literate reader***."

Moreover, you will be required to answer several key questions in your 8-page project description. These are not easy questions to answer, especially in the space allowed. Many iterations of the 8-page project description will be required to get this right. For example:

- You will need to articulate a **vision** for the proposed STC that clearly outlines the **grand challenges** being addressed or breakthroughs being sought. You will have to explain what you define as a grand challenge and why, as well as the research context in which the challenge(s) occurs. The absence of a clearly stated vision statement is the Achilles Heel of applications, and often amounts to the root cause of declined center-level grants.
- You will have to explain why the proposed approaches are innovative, and it must be clear how they will transform or significantly impact the research area. You will have to explain what it means to be innovative. You will have to explain why the proposed research is transformational. To do this, you will have to describe your research in a broad research context that places it at the forefront of the field. How do you best do this?
- You will have to describe how the integration of research, education, and knowledge transfer in a center-level activity will advance the proposed research in a way that other funding mechanisms cannot. This is a team/partnership configuration challenge requiring the right expertise on your development team. How do you address this in an informed way?
- You will have to offer a justification for the focus of the education programs and activities included and described in the context of current knowledge of teaching and learning. This follows from the bullet above. How is the team configured to include the expertise needed to address this issue in the project?
- You will be required to include a description of the team members and why each is essential to the project plan (must not be more than 2 of the 8 pages). This is going to be a very challenging 2 pages to write, but it gets to the heart of a center proposal, particularly an STC, where an integrative partnership lies at the core of success. However, in addressing this, you will also be addressing the core issue of ensuring that your proposed STC is seen by reviewers as synergistic and not siloed. A siloed narrative on an STC is the kiss of death. The team needs to struggle with this requirement from the get go. It provides your fundamental reason for being. If you can make a

compelling case in these 2 pages for your proposed team configuration, you will have taken a major step toward an invitation to full.

- Finally, in addition to an outline of research themes, some illustrative examples of specific research directions with sufficient detail to be evaluated by reviewers should be included. Also, in this regard, don't forget the powerful, integrative nature of a good graphic that can capture the essence of the entire narrative in one image that complements the linear nature of text.

The following bulleted items are taken from the April 2011 webinar comments and questions, selected for continued relevance to the current solicitation:

- **Key to success is defining the center vision, the grand challenges the center will address, why the center structure is needed to address the grand challenges, and how the center team is appropriate and necessary to achieve grand challenge breakthroughs.**
- One email query asked what NSF considers a grand challenge. NSF replied, "***You tell us***." Basically, the case for a grand challenge and breakthroughs is made by the PI of the preliminary proposal.
- You must **describe a grand challenge** need for the center research activities and convince reviewers of the significance of your vision of breakthroughs and outcomes.
- ***Management is a key aspect of any successful STC award***. You must convince reviewers that the PI has the necessary management experience and skills to lead a center, as well as the research expertise to address grand challenge breakthroughs.
- ***A successful center must have a critical mass at one institution***. A center is not a distributed virtual center.
- Include sufficient examples of proposed research in the preliminary proposal to excite the reviewers.
- NSF expects to receive 250 to 300 preliminary proposals by May 31. The preliminary proposals will be by panel review only. ***Write the preliminary proposal to the generally knowledgeable reviewer.*** Each panel may have one or two expects in the topic. NSF expects to invite 40 to 50 applicants to submit a full proposal. NSF expects to conduct 10 to 12site visits and to produce "blue ribbon panel" reviews at each site . NSF hopes to make five or six awards.
- **Read the AAAS Report: *National Science Foundation Centers Support Transformative Research, Provide Compelling S&T Education***
- **Preliminary proposals must not include:**
  - Budgets (budget scope must fit within $5 million per year maximum request)
  - Data management plan
  - Postdoctoral mentoring plan
  - Current and pending support
  - Facilities, equipment, and other resources
  - Letters of commitment, support, or endorsement
  - Other supplemental documents

- Centers must have strong research portfolios.
- Centers are large-scale efforts that must have a strong education plan***. Focus on one or two areas most appropriate for the center.*** The education plan must fit the goals of the center. ***A K-12 component is not required***. Its inclusion must make sense for the center plans and capacity to engage K-12 community.
- In addition to education, centers must have strong knowledge transfer plans (***service to society***) and diversity plans.
- Remember that NSF does not fund clinical or medical research.
- ***The key to center success is integration***—describe the ***value added and synergy*** the center structure brings to the research. Include a 5-year plan for the preliminary and a 10-year vision for the center addressing grand challenges/breakthroughs.
- Centers need to identify stakeholders who will benefit from the center.
- The center director needs to be a senior research visionary with the capacity to integrate the center vision and personnel to focus on the 10-year vision.
- The center will need to have a managing director who is responsible for operational details. The center managing director does not have to be in the preliminary proposal.
- The advisory board does not have to be constituted for the preliminary proposal.
- NSF will not fund staff at national labs, but an STC can fund a postdoc who works at a national lab.
- A lot of discussion and questions at the webinar focused on the experience of the PI. While academic rank is not necessarily a rigid factor, ***it is clear from the NSF subtext that a senior, nationally prominent PI with strong management skills and a capacity for visionary research is the most competitive applicant as leader of the proposed center.***

The Role of the Grant Therapist in Funding Success

By **Mike Cronan**, co-publisher

(Back to Page 1)

Scholars have long debated whether or not Sigmund Freud developed his psychoanalytic theory to help his research colleagues at the University of Vienna develop deeper insights into how to write more successful research proposals to the granting agencies of the time. Regardless, one thing is certain, the therapeutic techniques of Freud's "talk therapy" play as important a role in research development and grant writing today as they did in Freud's time. As with other practitioners of psychotherapy, the role of the "Grant Therapist" is first to be a good listener and help explore the grant-writing behaviors of applicants to help them solve problems and achieve higher levels of grants functioning and an enhanced sense of grants well-being. An experienced "Grant Therapist" can help grant applicants take control of their research grant-writing life and respond to challenging grant situations with healthy grant-coping skills.

Those who assist faculty develop and write research grants are often used to playing the role of information provider, perhaps through grant-writing workshops, individual consultations, research office websites, or through participation on proposal planning and development teams. However, no matter how experienced any one person may be in assisting faculty with proposals, there are many situations in which faculty, particularly new and junior faculty, may ask grant-writing questions for which no single best answer or way to proceed exists.

These difficult questions often are very nuanced and unique to a particular researcher, and often seem to border on grant metaphysics. In this situation, University of Chicago historian Daniel J. Boorstin's observation comes to mind-- that "*The greatest enemy of knowledge is not ignorance, it is the illusion of knowledge*." When asked these difficult questions, it is best to acknowledge quickly when you have no answer. Keep in mind the medical axiom "*first do no harm*." At this point, it often helps to pivot the conversation by asking questions that help elicit potential answers from the person seeking advice.

This pivot to asking probing questions is where the role of The Grant Therapist begins. To use the oft-quoted saying of geologists, that "*if you don't ask the right questions the rock won't answer*," the thoughtful and informed Grant Therapist will ask questions and listen to the responses in such a way that grant applicants will slowly reveal more information that will help them answer their own question(s) in the way that is best for them.

For example, new and junior faculty may feel beleaguered by the demands of teaching, research, and service and exhibit a kind of desperation when it comes to taking one path or another on some important aspect of research grant writing or submission strategies unique to their career path. There can often be a lot of hand wringing over a question such as "*I need to know the best strategy for submitting a proposal to NIH, but I am not certain how to proceed because one Institute where I am known and where I could submit the proposal has lower paylines [see NIH paylines and Paylines and Funding] than the other Institute where I could*

submit the proposal, but I am not known. Should I submit the proposal to the Institute where I am known but with lower paylines or to the Institute with the higher payline where I am not known?"

Questions of this type, and there are many variations like it across all disciplines and funding agencies, are commonly asked and always difficult to answer. This is because ***the person asking the questions is really asking you to predict the outcome of a future event, i.e., a funded proposal, resulting from an essentially unknowable series of future contributing factors***.. In this instance, taking on the role of the Grant Therapist, you may ask several questions to help engage potential grant applicants in a dialog that brings them to the point of making a decision, including, for example:

- *How are you known at the one Institute?*
- *What does it mean to be known at an Institute?*
- *Is there such an equivalency among all possible factors that will determine the funding success of this proposed research that the entire outcome hinges on comparing Institute paylines and noting whether or not you are known at one Institute but not another?*
- *Are there other factors you may not have considered that should be considered in determining the Institute to which you send this proposal?*
- *Have you talked to the program officers?*
- *Have you talked to senior colleagues in your department who have a track record of success at the Institutes you are considering?*

Basically, when you play the role of The Grant Therapist, your strategy is to keep the potential grant applicant talking about the issue to which they have come to you for advice until they begin to answer their own questions while you listen and ask prompting questions when needed to keep the soliloquy going. In many cases, the best answers to challenging questions on grant writing are the ones the applicant settles on as being the correct one for her particular situation. It is surprising how often being a good listener, a sounding board if you will, can draw out of applicants the appropriate answer to their own questions. In these situations, The Grant Therapist is essentially supporting a solitary form of brain storming.

Mentoring Students Applying for the NSF GRFP: An Update

By Lucy Deckard, co-publisher

The NSF GRFP is submitted by individual graduate students, but they need your help to be competitive.

(Back to Page 1)

The NSF Graduate Research Fellowship Program (GRFP), which expects to fund 2,000 fellowships this year, is the largest graduate fellowship program in the U.S. It funds early graduate students (current senior undergraduates and graduate students up to the second semester of their second year) who are pursuing graduate degrees in fields of study funded by NSF (engineering; physical, life, computer, and social sciences; geosciences; psychology; and STEM education and learning). Awardees, who must be US citizens, nationals, or permanent residents (i.e., they must have a green card at the time of application), receive a $32,000 per year stipend for up to 3 years, usable over a 5-year period (if funds are available, they plan to increase this to $34,000 in 2015). In addition, their institutions receive a $12,000 cost-of-education allowance that covers tuition and fees (if the institution's tuition and fees are higher then that, they must waive the cost to the student). Students pursuing research-based MS or PhD degrees are eligible. This year, GRFP applications are due October 29th, October 30th, November 3rd, and November 4th, depending on the discipline. See the solicitation for details on eligibility, due dates, and disciplines funded (look for the list at the very end).

While students apply as individuals for these fellowships, most GRFP winners can point to a faculty mentor who encouraged them to apply and worked with them on their research plans and essays. Helping students apply for fellowships not only benefits the student, it can benefit you as a faculty member in several ways. It can help you to recruit excellent graduate students. By working with talented undergraduates to make them aware of this fellowship opportunity and help them develop a research plan, you will develop a relationship with the student and you'll have a chance to explore together the research they might do with you, increasing the likelihood that they'll continue to graduate school instead of deciding to take that tempting job offer, and making it more likely that they'll choose you as their advisor.

If you are already their advisor, winning a fellowship means your graduate student will be fully supported for three years. Even if they don't win, the exercise of developing and writing up a research plan will help them to focus their ideas and learn to articulate their proposed research concisely. Moreover, your students who have won graduate fellowships will mentor and encourage your newer students as they apply for fellowships, setting up a culture of competing for fellowships among your graduate students. In addition, if you successfully mentor a student who wins the GRFP, you can mention that in your own proposals to NSF when discussing your education track record in the Broader Impacts section. For all of these reasons, it's worth your time to identify students who can be competitive, encourage them to apply, and work with them to polish their essays.

GRFP applications require several components (go here and see the "help" links on the left for detailed instructions):

- biographical information for the applicant

- Transcript(s)
- Personal, Relevant Background and Future Goals Statement (3 pages)
- Graduate Research Plan (2 pages)
- Letters of reference (3 to 5 letters) – *all letters are due Nov. 6, 2014 regardless of discipline*

Because most applicants have high GPAs, the quality of the letters of reference and the essays often determines who wins and who does not (to be competitive for the GRFP, students need good, but not perfect, GPAs—3.7 or higher is typical). Encourage your students to start working on their essays early and have many people read them. You, as their mentor, should also work with your students on their essays, particularly their research plan. Your role can include helping the student develop their research plan, pointing them to the appropriate background material, and reading the essays for style and organization as well as substance (many students, particularly undergraduates, don't yet have an understanding of how to write in a scholarly style, and you can help them with this). Remember, though, that reviewers will also be looking for evidence of independence and original thought, so the essays should be written *by the student* with your guidance. It will be very clear to reviewers if an essay was written largely by you and not the applicant.

It's also important to note that the ***fonts allowed for the GRFP are different from those for regular NSF proposals***: only Times New Roman 12 pt (***not 11 pt***), or Computer Modern (LaTeX) 12 pt are allowed for the body text. Ten point font may be used for references, footnotes, figure captions, and text within figures. Note also that references ***do*** count in the page limits.

Personal, Relevant Background and Future Goals Statement. NSF's prompt for this statement is as follows:

> Please outline your educational and professional development plans and career goals. How do you envision graduate school preparing you for a career that allows you to contribute to expanding scientific understanding as well as broadly benefit society?
>
> Describe your personal, educational and/or professional experiences that motivate your decision to pursue advanced study in science, technology, engineering or mathematics (STEM). Include specific examples of any research and/or professional activities in which you have participated. Present a concise description of the activities, highlight the results and discuss how these activities have prepared you to seek a graduate degree. Specify your role in the activity including the extent to which you worked independently and/or as part of a team. Describe the contributions of your activity to advancing knowledge in STEM fields as well as the potential for broader societal impacts (See Solicitation, Section VI, for more information about Broader Impacts).
>
> NSF Fellows are expected to become globally engaged knowledge experts and leaders who can contribute significantly to research, education, and innovations in science and engineering. The purpose of this essay is to demonstrate your

> potential to satisfy this requirement. Your ideas and examples do not have to be confined necessarily to the discipline that you have chosen to pursue.

This essay should describe why the applicant wants to pursue a career in research. It should discuss personal as well as professional and education experiences, but many students make the mistake of making it *too* personal. The essay should communicate the student's passion for his chosen area of study and career path, but if it's maudlin you may need to help him make the tone a bit more professional.

To address the prompt about previous experiences, keep in mind that reviewers expect students to have had an undergraduate research experience; for this reason, it's a good idea to encourage good students early in their undergraduate careers to pursue undergraduate research. Summer internships, coops or past employment can also provide the experience that reviewers are looking for. Students should discuss at least one research experience in detail with the goal of demonstrating to the reviewers that she has understands the research process. The essay should describe the problem/goal of the project, the scientific background, the methodology and the results. She should also describe her role in the project and what she learned from the experience. If the student had more than one research experience, she should mention the others briefly, but focus on one project so that she has room to describe it in detail.

Reviewers will be looking for evidence that the applicant understands the research process and is motivated to think for herself and understand the larger context of the research. A common mistake is for the student to discuss only what she did (e.g., ran specific tests or analyses) without discussing the broader context for ***why*** these tests needed to be done and what was learned.

In all of the essays, the student must address "Broader Impacts." She could describe any experience she's had with outreach (such as participation in K-12 or community programs) as well as, for example, helping younger students or being a peer mentor). She should also discuss any future plans to reach out beyond her research lab. If the student is a member of a group that's underrepresented in his field, she should be sure to mention that fact and discuss how she plans to leverage that status to reach out to others to broaden participation.

Graduate Research Plan. The prompt for this components is as follows:

> Present an original research topic that you would like to pursue in graduate school. Describe the research idea, your general approach, as well as any unique resources that may be needed for accomplishing the research goal (i.e., access to national facilities or collections, collaborations, overseas work, etc.) You may choose to include important literature citations. Address the potential of the research to advance knowledge and understanding within science as well as the potential for broader impacts on society. The research discussed must be in a field listed in the Solicitation (Section X, Fields of Study).

Reviewers will be looking for evidence that the applicant understands the research process, understands the background of the research project, has a good grasp of the hypothesis, objectives and methods to be used, and knows how to describe the project and its

significance. Since students can apply as senior undergraduates (even before they have selected a graduate school and advisor) all the way up until their second year of graduate school (when they probably have at least a preliminary start on their research), these essays will look very different depending on the stage of the student. Reviewers understand this and judge the essays accordingly. You should also remind the early-stage students that they are not required to pursue the research plan they describe in their essays. NSF understands that projects may change; they are really looking for the students' understanding of the research process and their ability to communicate, rather than intending to fund a particular project. However, remember also that the student should propose to do research that would be of interest to NSF, which means that it should be basic research, not development. Broader impacts must also be addressed in this essay. Will they mentor undergraduates in the lab? Will they participate in K-12 or community outreach? How will they disseminate the results of their research?

Letters of Reference. If you are mentoring, or have mentored , a student, chances are you may be asked to provide a letter of reference for that student. Reviewers look at these letters very carefully, so providing a strong letter is extremely important. If you're not helping him with the rest of the application, ask the student to provide you with copies of all of his essays as well as a resume and any other detailed information that you think might be helpful. For example, if he conducted undergraduate research in your lab two years ago, you may not remember all the details of what he did. Ask the student for a summary of this project, and include some of those details in the letter. The more specific the details you can provide to support your positive statements about the student, the stronger the letter will be. (Note that all letters must be uploaded to Fastlane by the writer.)

As with all NSF proposals, the GRFP application must be uploaded through Fastlane; however, the applicant can self-register, and she doesn't have to go through your research office to submit the application. Encourage your student to register early and take a look at the online application and instructions to avoid last-minute crises with the uploading process.

Also, keep in mind that your student can apply more than once as long as she's still eligible (hasn't finished more than two semesters of graduate study). The good news is that even if they don't win the first time, applicants will receive review comments that will help them improve their application the next year. Many students apply unsuccessfully the first time as an undergraduate or first-year graduate student and then apply again the next year and win.

Defining Your NSF STC Grand Challenge

By Mike Cronan, co-publisher

(Back to Page 1)

As addressed briefly in the STC companion article in this newsletter, writing a successful preliminary proposal for the NSF *Science and Technology Centers: Integrative Partnerships* program (NSF 14-600) due December 11 requires that the foundation of your proposed research must include, to quote from the solicitation, "(4) [Preliminary] Project Description (8-pages maximum). ***The Project Description should articulate a vision for the proposed Center that clearly outlines the grand challenges being addressed or breakthroughs being sought***." This is not as simple a task as it may appear. ***In fact, getting this right is a "grand challenge" in and of itself!***

Writing a compelling vision statement is always a challenge, even for highly experienced principal investigators. In this case, however, the ***articulated vision must also be coupled to and integrated with the grand challenge or breakthroughs*** being addressed by your proposed research. Keep in mind that, at start of the STC process (gauntlet is more appropriate), there are likely 250 to 300 competitors also writing a preliminary proposal, of which perhaps 40 to 50 will be invited to submit a full proposal, and perhaps 8 to 10 of those will have a site visit to determine the final four that will be funded. Getting to the "STC Final Four," as in college basketball's March Madness tournament, means you have to play smart and get as close to perfect as you can at every waypoint—preliminary proposal, full proposal, and site visit.

The STC journey starts with articulating the integrated vision, grand challenge, and breakthroughs of your proposed STC research. ***Start drafting this statement now as a integrated partnership***. It will require numerous iterations to converge on perfection over the next 12 weeks, but this integrated vision, grand challenge, and breakthrough statement will also guide the rest of the proposal development process and coordinate and focus your ***integrative partnership***. The earlier you begin drafting early versions of this statement, the better able you will be to write a research narrative that is truly integrative and synergistic. ***This statement needs to function as the partnership's North Star***. Moreover, you must create this statement ***in a context*** that explains how your proposed research fits in the grand challenge or breakthrough areas nationally .

Using a basic ***compare and contrast strategy,*** you will need to frame for the reviewers where your proposed research fits and why. By analogy, if you were surfing Mavericks Beach or Hawaii's North Shore, you would want to show that you are riding the face of the big grand challenge wave rather than paddling around in the backwash after the wave has passed by.

If "*location, location, location*" is the mantra of success in real estate then "*research context, research context, research context*" should be your analogous mantra for success in pursuit of the STC. As you plan for an STC proposal and consider what constitutes a grand challenge, keep in mind how NSF answered that question in the April 11, 2011 webinar on the STC solicitation. When asked, "**What is a grand challenge**?," NSF program officers replied "**You tell us**." This is not a surprising response from NSF given the agency's penchant for avoiding

overly prescriptive solicitations and focusing on more open-ended research challenges to be described by the proposer in the context of her field and the state of that field nationally.

The full quote from the 41-page 2011 STC transcript (pg. 20) is as follows: "What is NSF's view -- what in NSF constitutes the grand challenge?" Reply: "That is something we're looking at you, to tell us. **We want to hear from the community what they see as grand challenges, we want you to propose those things**. But generally, the successful STC proposals are addressing very significant challenges **that the reviewers consider to be very exciting**." Other responses from NSF program officers about the nature of a grand challenge include "***Whatever you convince the reviewers is a grand challenge***."

Moreover, on page 2 of the 2011 transcript, NSF notes: "The first necessary ingredient, if you're trying to put a proposal together, ***is that you really need to identify a challenging research question that requires a center effort***. So we are looking typically at some ***grand challenges in research that require long-range, typically 10 years, as the duration of a successful center***. A large-scale effort, and by large-scale we really mean that it does require a number of participants, researchers of different types, to work together to solve that problem."

On page 11 of the transcript, NSF continues to discuss the relevance of the grand challenge in the review of a proposal: "So reviewers will be asked to consider **what is the scientific vision and the grand challenge nature of the project**, and also **why is a center mode required**. **Those are the two big overarching questions that reviewers will be asked to consider in the preliminary proposal stage**."

Continuing the discussion on page 12 of the transcript, NSF states: "So again, we mentioned the aspects of the Science and Technology Center and we talked about what the reviewers are going to be looking at, so within this [narrative] section **you need to describe the vision outlining the grand challenge breakthroughs, the research, make sure that it's sufficiently complex, large scale and long term to justify the center mode, and provide innovative approaches that transform or significantly impact the research area**."

Successfully writing this section of the narrative will challenge even the most experienced principal investigators. It will require, as physicist I. I. Rabi told his research team after funding for equipment dried up following the Manhattan project: "*Now we are going to have to start to think*." Excellent advice for writing this section of the STC narrative.

To this end, as NSF notes on page 21 of the transcript in reference to the preliminary proposal: "***We will simply point out that what you are doing, especially in this pre-proposal stage, is conveying this big scientific grand challenge issue, and the impact, and the legacy that you might have within a 10 year time frame***."

It will be helpful in defining your grand challenge or breakthrough area of research to look at the three STCs funded in 2013 by NSF as well as the earlier currently active STCs (here), specifically for 2013: *Biology with X-Ray Free Electron Lasers* (BioXFEL); *A Center for Brains, Minds, and Machines: the Science and Technology of Intelligence* (CBMM); and *Center for Integrated Quantum Materials* (CIQM). ***It's worth noting that the term "grand challenges" has become ubiquitous both in scope and scale***. For example, the DOE Energy Frontier Centers define grand challenges (here); The National Academy of Engineering defines grand challenges (here); Grand Challenges in Global Health (here); Office of Science and Technology Policy define twenty-first century grand challenges (here), among many others.

Bottom line, these examples of grand challenge areas should be seen as just that—examples. It will be important to define your grand challenge and breakthrough research areas in a way that convinces reviewers that you have thought about this issue in depth as it relates to your proposed research, ***why you are proposing it, why it can only be accomplished under a center structure, and how it will impact and transform the field***. Not an easy charge for the author of an STC preliminary proposal, but a very necessary one.

Drilling for Energy Funding at NSF

By **Mike Cronan**, co-publisher

(Back to Page 1)

It is helpful to think of the newly released **NSF Dear Colleague Letter**: *FY 2015 Clean Energy Technologies Funding Opportunities* as the start of exploring for energy funding at that agency rather than as the end of a search. Exploring the links provided in this DCL will reward your efforts, particularly if you use the energy analogy of horizontal drilling, multilateral drilling, extended reach drilling, and complex path drilling to bore deeper into NSF directorates, divisions, and programs as ***part of your FY2015 energy strategic funding plan for that agency***. According to NSF, "All of the Divisions in the following Directorates are participating in clean energy technology research and education through ongoing funding opportunities at: Biological Sciences (BIO), Engineering (ENG), and Mathematical and Physical Sciences (MPS)."

NSF notes, "**For BIO**: ***fundamental*** research topics of interest in clean energy technology include, but are not limited to: systems and synthetic biology to streamline and scale the metabolic and energetic potential of living organisms such as microbes, fungi, algae and plants to produce non-petroleum based sources of important chemicals/materials, feedstocks and fuels. Investigations to assess the impact of fuel and/or bio-renewable chemical production on genome stability, fitness, and phenotype of the production organisms are of interest, as are studies to assess the potential environmental impacts of these technologies."

It further notes, "**For ENG and MPS**: examples of ***fundamental*** research topics of interest in clean energy technologies include, but are not limited to: hydrogen generation and storage; biological, chemical, and catalytic conversion of renewable carbon sources (such as biomass, methane, and carbon dioxide); the development of methods and materials that increase energy efficiency, such as the replacement of stoichiometric with catalytic processes; energy storage, transmission, or distribution (e.g. smart grid); power-electronic and energy-conversion devices; fuel cells; solar energy capture and conversion (including biological and bio-inspired processes for the conversion of sunlight to fuels, electricity, or thermal energy); wind/wave/tidal energy; nuclear energy; studies of energy efficiency and use; and carbon dioxide sequestration and storage."

Note the distinction NSF makes here. While the interest is in "***clean energy technologies***," the research itself must be ***fundamental*** research. If your research in energy technologies is applied, you might do better by taking it to ARPA-E, or some other federal mission agency. ARPA-E (reference FOA No. DE-FOA-0001184), by comparison, defines its mission as " [F]und(ing) applied research and development, defined by the Office of Management and Budget 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.'" ***ARPA-E funds technology-focused applied research*** to create real-world solutions to important problems in

energy creation, distribution and use ***and, as such, 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.' " ***To be successful at NSF in the energy domain, potential proposers to NSF must get this distinction right***.

That said, the above examples of fundamental research topics of interest to NSF in clean energy technologies are just the gateway to the specificity and detail you will encounter ***in the three energy portals into the universe of NSF energy-related solicitations, reports, strategic plans, workshops, and webinars on the core energy topics***.

While multiple variants of energy institutes are seemingly ubiquitous at the university, college, or departmental levels nationally, success in energy-related funding at NSF ***requires a research team with a strategic plan for energy funding***, regardless of researchers' affiliations. An energy institute website alone is not a substitute for a well-thought-out and detailed strategic plan for energy funding that maps research capacities to the specific ***fundamental*** research topics of interest to NSF in clean energy technologies. This mapping can be done at multiple scales, from the institutional level to a small research team within a college or department, but it must be done if you are to be successful in the long term.

You will need to answer the key question: where do your clean energy technology research capacities best map to the roughly $323 million NSF has targeted for that research focus area across the below three directorates for FY 2015? Moreover, energy and energy technologies are often closely linked to ***water sustainability research***, a whole other complementary area of research that would be woven into any FY 2015 energy strategic funding plan specific to NSF. Water, in turn, then leads to climate research. For example, two weeks ago, NSF announced that NSF and NIFA awarded $25 million in grants for the study of water sustainability and climate. These are important research intersections that will impact clean energy technology research when thinking strategically about your funding horizon for FY 2015 and FY 2016.. The NSF FY 2015 budget allocation for clean energy technology breaks down as follows :

In FY 2015, ***BIO support for clean energy technology will total $47.20 million*** (~7% of total BIO directorate funding) for fundamental research in areas such as molecular biophysics, photobiology, genetic engineering, and metabolic biochemistry with relevance to areas such as fuel cells, hydrogen, biomass, and other energy efficiency and use (page BIO-5, FY 2015 BIO Budget Excerpts).

In FY 2015, ***ENG support of $134.41 million*** (~16% of total ENG directorate funding) for clean energy technology-related activities will enhance research and innovations in smart grid technologies, solar energy technologies, biofuels and bioenergy, wind energy generation, and renewable energy storage. The ENG clean energy technology investment will be strategically divided among all divisions (page ENG-5, FY 2015 ENG Budget Excerpts).

In FY 2015, ***MPS support for clean energy technology totals $141 million*** (~11% of total MPS directorate funding). Under this funding, MPS will continue to refine the categorization of Clean Energy Technology, counting appropriate research in its core programs in fuel cells, solar research and development, battery research, biomass conversion, hydrocarbon conversion, and energy storage (page MPS-5, FY 2015 MPS Budget Excerpts).

The 44-page report (July 24, 2014) entitled *Food, Energy, and Water: Transformative Research Opportunities in the Mathematical and Physical Sciences,* will hold particular interest for those developing a strategic funding plan related to energy and therefore seeking more detailed and specific information on the future of energy research at NSF, particularly the MPS Directorate. Key excepts from this report appear below, but the entire report warrants a close read for strategic planning purposes.

"A Mathematics and Physical Sciences Advisory Committee (MPSAC) Subcommittee on Food Security was formed and specifically charged to evaluate current technology gaps that can be addressed by the National Science Foundation/Mathematics and Physical Sciences Directorate (NSF/MPS)" the report notes. "To identify these gaps, the Subcommittee evaluated all aspects of food production, treating food production as a system. In addition, special consideration was given to the ***inextricable roles of water and energy*** in food production, noting that any developed technologies must be efficient with respect to both energy and water use. The Subcommittee gathered information from the literature and from leading experts in these areas."

As noted in the report, "The Subcommittee identified six areas in which NSF MPS researchers could provide key foundational knowledge on which technology breakthroughs could be based: (1) Ensuring a Sustainable Water Supply for Agriculture; (2) 'Closing the Loop' for Nutrient Life Cycles; (3) Crop Protection; (4) Innovations to Prevent Waste of Food and Energy; (5) Sensors for Food Security and Safety; and (6) Maximizing Biomass Conversion to Fuels, Chemicals, Food, and Materials. In all of these areas, the technical gaps that currently exist in maximizing, recycling, and reusing resources associated with global food production were identified."

"A number of common research themes from these six areas were identified," the report states, "including separations, catalyst materials and catalytic processes, chemistry at interfaces, new materials and chemical processes, new analytical techniques and sensors, computational approaches, and renewable energy. Fundamental research in these cross-cutting research themes will provide the foundation to ***yield future technologies for water desalinization, use, and recycling***; fertilizer production and management; novel methods for efficient pest control (such as selective biopesticides); food waste minimization and reuse; and even clean renewable energy generation and conservation. In addition, training next generation scientists in these areas to support sustainable food production was identified as another critical role for NSF/MPS."

Many strategically important funding paths have opened up through the recent **NSF Dear Colleague Letter**: *FY 2015 Clean Energy Technologies Funding Opportunities*. It will be helpful to follow these multiple funding paths at NSF, determine the intersections with other clean energy technology-related research areas, such as water and climate, and come up with a one- or two-year strategic funding matrix that maps your research capacities at any scale, from institutional to small team, to these core funding waypoints planned for in NSF's FY 2015 and 2016 budget process.

Research Grant Writing Web Resources

(Back to Page 1)

New Brief Describes What Readers Need to Know About an Education Research Study's Measures

This brief provides five checklists to help researchers provide complete information describing (1) their study's measures; (2) data collection training and quality; (3) the study's reference population, study sample, and measurement timing; (4) evidence of the reliability and construct validity of the measures; and (5) missing data and descriptive statistics. The brief includes an example of parts of a report's methods and results section illustrating how the checklists can be used to check the completeness of reporting.

Social, Behavioral and Economic Research in the Federal Context

Recent advances in genomics, neuroscience, computing, imaging and other areas have combined to provide revolutionary tools for the social behavioral and economic (SBE) sciences. In order to identify priority research areas and ensure that these new tools are best applied, the National Science and Technology Council established the Subcommittee on Social, Behavioral and Economic Sciences. This interagency, collaborative group identified the cross-cutting research opportunities and priorities articulated in detail in this report. The areas identified primarily lie within the broad areas of Education, Health, Cooperation/Conflict, Societal Resilience/Response to Threats, Creativity/Innovation and Energy/Environment.

The SBE sciences are focused on human activity at every level–from an individual's brain, to behavior, to the actions of groups and organizations. The SBE sciences provide policy-makers with evidence and information that help address many of today's most pressing challenges including: providing high quality education, providing all citizens with healthcare, fighting terrorism, preventing crime, and preparing for and responding to natural disasters. SBE scientists from a broad array of fields are performing interdisciplinary research that takes advantage of a new set of tools and holds the promise of providing insights and solution not otherwise available.

NSF Grants Conference hosted by Colorado State University - June 23-24, 2014

- Introduction and NSF Overview
- Proposal Preparation
- NSF Merit Review Process
- Award Management
- NSF Policy Update
- Crosscutting and Special Interest Programs
- International Programs
- Office of the Inspector General
- Breakout Sessions:
  - Biological Sciences
  - Post-Award Monitoring and Compliance

- Computer and Information Science and Engineering
- Education and Human Resources
- Engineering
- Faculty Early Career Development (CAREER) Program
- Geosciences
- Mathematical and Physical Sciences
- NSF Award Cash Management Service (ACM$)
- Science, Engineering & Education for Sustainability (SEES)
- Social, Behavioral and Economic Sciences
- Research.gov

Educational Grant Writing Web Resources

(Back to Page 1)

Accountability for College and Career Readiness: Developing a New Paradigm

As schools across the country prepare for new standards under the Common Core, states are moving toward creating more aligned systems of assessment and accountability. This paper recommends an accountability approach that focuses on meaningful learning, enabled by professionally skilled and committed educators, and supported by adequate and appropriate resources, so that all students regardless of background are prepared for both college and career when they graduate from high school. Drawing on practices already established in other states and on the views of policymakers and school experts, this paper proposes principles for effective accountability systems and imagines what a new accountability system could look like in an imagined 51st state in the United States. While considerable discussion and debate will be needed before a new approach can take shape, this papers objective is to get the conversation started so the nation can meet its aspirations for preparing college- and career-ready students.

Fixing Our National Accountability System

In this new report, Marc Tucker, NCEEs President, calls for replacing the current system of test-based accountability with a system much more likely to result in improvements in student performance. Tucker points out that the current system has not only failed to improve the performance of the at-risk students it was designed to help, but has alienated the best of our current teachers and created an environment in which able young people choosing careers are less likely to choose teaching.

STEM Learning Is Everywhere: Summary of a Convocation on Building Learning Systems

Science, technology, engineering, and mathematics (STEM) permeate the modern world. The jobs people do, the foods they eat, the vehicles in which they travel, the information they receive, the medicines they take, and many other facets of modern life are constantly changing as STEM knowledge steadily accumulates. Yet STEM education in the United States, despite the importance of these subjects, is consistently falling short. Many students are not graduating from high school with the knowledge and capacities they will need to pursue STEM careers or understand STEM-related issues in the workforce or in their roles as citizens. For decades, efforts to improve STEM education have focused largely on the formal education system. Learning standards for STEM subjects have been developed, teachers have participated in STEM-related professional development, and assessments of various kinds have sought to measure STEM learning. But students do not learn about STEM subjects just in school. Much STEM learning occurs out of school--in organized activities such as afterschool and summer programs, in institutions such as museums and zoos, from the things students watch or read on television and online, and during interactions with peers, parents, mentors, and role models.

To explore how connections among the formal education system, afterschool programs, and the informal education sector could improve STEM learning, a committee of experts from these communities and under the auspices of the Teacher Advisory Council of the National

Research Council, in association with the California Teacher Advisory Council organized a convocation that was held in February 2014. Entitled "STEM Learning Is Everywhere: Engaging Schools and Empowering Teachers to Integrate Formal, Informal, and Afterschool Education to Enhance Teaching and Learning in Grades K-8," the convocation brought together more than 100 representatives of all three sectors, along with researchers, policy makers, advocates, and others, to explore a topic that could have far-reaching implications for how students learn about STEM subjects and how educational activities are organized and interact. This report is the summary of that meeting. STEM Learning is Everywhere explores how engaging representatives from the formal, afterschool, and informal education sectors in California and from across the United States could foster more seamless learning of STEM subjects for students in the elementary and middle grades. The report also discusses opportunities for STEM that may result from the new expectations of the Next Generation Science Standards and the Common Core Standards for Mathematics and Language Arts."

Intensive Math Instruction and Educational Attainment: Long-Run Impacts of Double-Dose Algebra

We study an intensive math instruction policy that assigned low-skilled 9th graders to an algebra course that doubled instructional time, altered peer composition and emphasized problem solving skills. A regression discontinuity design shows substantial positive impacts of double-dose algebra on credits earned, test scores, high school graduation and college enrollment rates. Test score effects under-predict attainment effects, highlighting the importance of long-run evaluation of such a policy. Perhaps because the intervention focused on verbal exposition of mathematical concepts, the impact was largest for students with below average reading skills, emphasizing the need to target interventions toward appropriately skilled students.

Spending More of the School Day in Math Class: Evidence from a Regression Discontinuity in Middle School

For students whose math skills lag expectations, public schools often increase the fraction of the school day spent on math instruction. Studying middle-school students and using regression discontinuity methods, I estimate the causal effect of requiring two math classes—one remedial, one regular—instead of just one class. Math achievement grows much faster under the requirement, 0.16-0.18 student standard deviations. Yet, one year after returning to a regular one-class schedule, the initial gains decay by as much as half, and two years later just one-third of the initial treatment effect remains. This pattern of decaying effects over time mirrors other educational interventions—assignment to a more skilled teacher, reducing class size, retaining students—but spending more time on math carries different costs. One cost is notable, more time in math crowds out instruction in other subjects.

The Use of Online Strategies and Social Media for Research Dissemination in Education

Alongside a growing interest in knowledge mobilization (trying to increase the connection between research, policy and practice) there has been a transformation of how knowledge is produced, accessed and disseminated in light of the internet and social media strategies. Few

studies have explored the use of social media for research dissemination. This paper explores the online strategies used by 44 research brokering organizations (RBOs) in education across Canada. It is organized in four parts. The first provides a literature review of the terminology associated with Web 2.0 and social media as well as outlines the sparse empirical work that exists. The second presents empirical findings of online practices of 44 RBOs. The third section reports on the frequency of social media activity of RBOs as well as the nature of posts in order to ascertain whether or not research is actually being disseminated through these mechanisms. The final section discusses the implications of social media for research dissemination. Overall, use of additional online strategies by RBOs (other than websites) remains modest. Many of the strategies used are passive and do not allow two-way communication. Thirty percent of RBOs use social media; however, this usage in not pervasive and Facebook and Twitter networks are small. Other mechanisms to encourage active participation will be required alongside Web 2.0 and social media tools, if these strategies are to become robust avenues for knowledge mobilization and research dissemination.

Agency Research News

(Back to Page 1)

Informational Webinar on Natural Hazards Engineering Research Infrastructure 2015-2019 (NHERI)

Dear Colleague Letter: Opportunity to Request Instrumentation Funding for Midscale Level Instrumentation in Physics Division

One of the most critical needs of research projects funded through the Physics Division (PHY) is that of having cutting-edge instrumentation that enables Principal Investigators (PIs) to remain competitive in a rapidly-changing scientific environment. Because this instrumentation can often cost significantly beyond what an individual investigator award can provide, the Physics Division has established a special Midscale Instrumentation Fund that enables Program Officers to include an instrumentation allotment in awards beyond the level that might be feasible otherwise.

This Fund does not constitute a separate program to which PIs can apply directly. Rather, anyone needing specialized equipment should request funding for that equipment as part of a regular proposal to a disciplinary program in the Division. Proposals should be submitted via the division-wide solicitation: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf14576 .

The proposal will be reviewed by that program as part of its standard merit review process. As noted in the solicitation, for proposals involving development or construction of complex instrumentation (typically at or above the million dollar level), reviewers will be also asked to assess the applicant's ability to successfully deliver the instrumentation within the proposed budget. Applicants are strongly encouraged to articulate all foreseeable costs in the budget of such projects, including adequate plans for risk mitigation. Prior to final selection, these projects may be evaluated via a cost, schedule, and management review. Project management documentation should be uploaded as a supplementary document, if applicable. Investigators are strongly encouraged to contact the appropriate program officer to determine the level of detail that will likely be needed.

Should a funding recommendation be warranted, the Program Officer can request that the instrumentation funds be provided through the Midscale Instrumentation Fund provided the PI has demonstrated that the instrumentation requested is essential to the completion of the project.

The Midscale Instrumentation Fund is not designed to be used for all instrumentation purchases needed by the awardee. Rather, the Fund can only be accessed when the level needed exceeds the $4M limit of the Major Research Instrumentation (MRI) program. Resources from the Fund can only be used for the instrumentation portion of the overall activity. For any award utilizing resources from the Fund, all R&D and operating expenses for the instrumentation must be provided by disciplinary program funds or other sources.

Resources from the Midscale Instrumentation Fund can be used for off-the-shelf purchases or for construction of specialized equipment. In the latter case, the construction must have a well-defined beginning, an explicit funding profile, and a well-defined completion point. Midscale Instrumentation Fund resources are non-renewable and are intended to be one-time investments in the project.

PIs are encouraged to contact the cognizant Program Officer for the program to which the PI is applying prior to submission of a proposal that includes a midscale request. The names of these individuals are attached to the Program Descriptions for the respective programs on the Physics Division web page at http://www.nsf.gov/phy/ .

Dear Colleague Letter: Announcement of Intent to use of Asynchronous Review Mechanism for Proposals submitted to the Physics Division

This message is to inform you that the Physics Division (PHY) will be reviewing proposals using a combination of *ad hoc* and panel review. The panel review portion may use an asynchronous mechanism the Division piloted in FY2013. The review principles remain the same as those with which you may already be familiar. The only mechanistic difference is that panel members are able to review and provide input to the panel discussion in the weeks prior to the panel meeting rather than limiting the discussion to the narrow range of time dedicated to the face-to-face panel meeting itself. Our experience with the pilot indicates that the extra time that this mechanism allows can lead to a more thorough examination of all the proposals by the full panel and hence more useful input to the NSF and feedback to the Principal Investigators (PIs). In the course of implementation, all normal rules of conflict of interest and confidentiality of information will apply.

It is important to stress that the review will strictly follow the established NSF review criteria of intellectual merit and broader impact. Each of the PHY Program Officers will decide on whether to employ this asynchronous mechanism or to continue their review process as they have in the past. Please visit the NSF merit review website for complete information about the merit review process http://www.nsf.gov/bfa/dias/policy/merit_review/. If you have any questions about this process, please contact the cognizant Program Officer for the program to which the PI is applying. The names of these individuals are attached to the Program Descriptions for the respective programs on the Physics Division web page at http://www.nsf.gov/div/index.jsp?div=PHY.

Notice of Intent to Issue Funding Opportunity Announcement DE-FOA-0001167 Buildings University Innovators and Leaders Development (BUILD) - 2015

The U.S. Department of Energy (DOE) Office of Energy Efficiency and Renewable Energy (EERE) intends to issue, on behalf of the Building Technologies Office, a Funding Opportunity Announcement (FOA) entitled "Buildings University Innovators and Leaders Development (BUILD)–2015." The BUILD FOA will have the following objectives:

- Improving the competitiveness of American universities to conduct building energy-efficiency R&D
- Enabling American universities to develop stronger partnerships with industry

- Improving manufacturing education in American universities EERE envisions awarding multiple competitive financial assistance awards in the form of cooperative agreements with an estimated period of performance of approximately 2 years to United States-based university teams to research and develop innovative building energy efficiency technologies.

These student teams must include undergraduate students and be led by faculty with relevant expertise in energy efficient technologies, manufacturing (for projects developing hardware), and commercialization. The Lead Institution must be an Institution of Higher Education, which includes, but is not limited to universities, 2-year community colleges, and predominantly undergraduate institutions. The Lead Institution can choose to team with external partners such as a manufacturer or a government laboratory, but an external partner is not required at the time of application. Teams may propose to develop any technology (hardware), software, or manufacturing process with direct application to residential, multi-family and/or commercial buildings in the United States, with significant primary energy savings potential. For more information, see the full solicitation.

Notice of Intent (NOI) Building Energy Efficiency Frontiers and Innovations (BENEFIT) 2015

The BENEFIT 2015 Funding Opportunity Announcement (FOA) seeks to fund next-generation non-vapor compression HVAC technologies (Innovations) and improvements to existing advanced vapor compression HVAC technologies (Frontiers) that complement the core funding provided to the national laboratories and allow all interested parties, including corporations, universities, and non-profits as well as the national laboratories, to contribute to advancement in these technological areas. These topics are combined into this single, relatively large FOA in order to reduce administrative costs and to ensure that only the best applications are supported. For more information, see the full solicitation.

NIH Revised Policy: Descriptions on the Use of Individual Development Plans (IDPs) for Graduate Students and Postdoctoral Researchers Required in Annual Progress Reports beginning October 1, 2014

The purpose of this Guide Notice is to revise the policy announced in NOT-OD-13-093, issued on July 23, 2013. NIH annual progress reports received on/after October 1, 2014 must include a section to describe how individual development plans (IDPs) are used to identify and promote the career goals of graduate students and postdoctoral researchers associated with the award.

In June 2012, a Working Group of the Advisory Committee to the NIH Director (ACD) issued a report on the biomedical research workforce (http://acd.od.nih.gov/bwf.htm). The Working Group made recommendations to the ACD about the funding and training of graduate students and postdoctoral researchers in order to attract and retain the best and most diverse scientists, engineers and physicians from around the world. One goal of the Working Group was to better prepare students and postdocs to participate successfully in a broad-based and evolving research and research-related economy. The report included the following recommendation:

To provide some structured training experience for graduate students and postdoctoral researchers, NIH should require individual development plans (IDPs) for all NIH-supported

graduate student and postdoctoral researchers, whether on training grants, fellowships, or research project grants. Assessment of implementation of this requirement should be included in the review criteria of training grants.

In response to this recommendation, the NIH will not require but strongly encourages institutions to develop and use IDPs for graduate students and postdoctoral researchers supported by NIH awards, regardless of their position title. IDPs provide a structure for the identification and achievement of career goals. Therefore, NIH encourages grantees to develop institutional policies that employ an IDP for every graduate student and postdoctoral researcher supported by NIH awards. **Beginning on October 1, 2014**, annual progress reports are required to include a description of whether the institution uses IDPs or not and how they are employed to help manage the training and career development of those individuals.

RFI Acceleration of Distributed Generation from Wind Energy Systems

Defining distributed wind by technology application, rather than size, has shifted the Research and Development paradigm to include all wind technologies used in distributed applications (small, medium, and large), not just small wind turbines. DOE invites input from the public regarding this shift in perspective and the Wind Program's present research and development focus areas, which include Wind Resource Characterization and Assessment; Turbine Technology; Distributed Grid Integration; and Soft Cost Reduction. Comments that can be used to evaluate DOE?s new perspective on distributed wind and research and development focus areas will help inform future activities and priorities.

This RFI is not a Funding Opportunity Announcement (FOA); therefore, EERE is not accepting applications at this time. EERE may issue a FOA in the future based on or related to the content and responses to this RFI; however, EERE may also elect not to issue a FOA. There is no guarantee that a FOA will be issued as a result of this RFI. Responding to this RFI does not provide any advantage or disadvantage to potential applicants if EERE chooses to issue a FOA regarding the subject matter. Final details, including the anticipated award size, quantity, and timing of EERE funded awards, will be subject to Congressional appropriations and direction. Responses to this RFI must be submitted electronically to DistributedGenerationRFI@ee.doe.gov no later than 5:00 pm (EST) on **September 25, 2014**. Responses must be provided as .pdf or Microsoft Word (.docx) attachments to an email. It is recommended that attachments with file sizes exceeding 25MB be compressed (i.e., zipped) to ensure message delivery. Only electronic responses will be accepted.

U.S. Department of Energy Increases Access to Results of DOE-funded Scientific Research

WASHINGTON, D.C. – The U.S. Department of Energy is introducing new measures to increase access to scholarly publications and digital data resulting from Department-funded research.

The Energy Department has launched the Public Access Gateway for Energy and Science – **PAGES** – a web-based portal that will provide free public access to accepted peer-reviewed manuscripts or published scientific journal articles within 12 months of publication.

As it grows in content, PAGES will include access to DOE-funded authors' accepted manuscripts hosted primarily by the Energy Department's National Labs and grantee institutions, in addition to the public access offerings of publishers. For publisher-hosted

content, the Department is collaborating with the publisher consortium CHORUS -- the Clearinghouse for the Open Research of the United States. PAGES contains an initial collection of accepted manuscripts and journal articles as a demonstration of its functionality and eventual expanded content. Additional metadata and links to articles and accepted manuscripts will be added as they are submitted, with anticipated growth of 20,000 to 30,000 articles and manuscripts annually.

The Energy Department's Office of Science also has issued new requirements regarding management of digital research data by Office of Science-supported researchers. All proposals for research funding submitted to the Office of Science will be required to include a Data Management Plan that describes whether and how the digital research data generated in the course of the proposed research will be shared and preserved. The new requirements regarding management of digital research data will appear in funding solicitations and invitations issued by the Office of Science beginning **Oct. 1, 2014**. A statement of the new requirements, including guidance on the development of a Data Management Plan, can be found on the Office of Science website. Other Energy Department research offices will implement data management plan requirements within the next year.

DE-FOA-0001177 Notice of Intent to Issue FOA: DE-FOA-0001162, entitled "Targeted Algal Biofuels and Bioproducts (TABB)"

The Office of Energy Efficiency and Renewable Energy (EERE) intends to issue, on behalf of the Bioenergy Technologies Office (BETO), a Funding Opportunity Announcement (FOA) DE-FOA-0001162, entitled "**Targeted Algal Biofuels and Bioproducts (TABB)**". The TABB FOA seeks to reduce the cost of algal biofuels. BETO's 2019 projected state of technology (SOT) for the cost of algal biofuels is modeled at about $7 per gallon gasoline gallon equivalent (gge) without valuable co-products. The TABB FOA will support work at bench and process development scales to develop valuable co-products, crop protection, and CO2 utilization strategies. BETO expects the TABB FOA to result in modeled algal biofuel costs of less than $5 gge by 2019. This will provide alternative, nearer-term pathways to achieve BETO's goal of $3 gge advanced algal biofuels validation by 2030. **This Notice is issued so that interested parties are aware of the EERE's intention to issue this FOA in the near term.** All of the information contained in this Notice is subject to change. EERE will not respond to questions concerning this Notice. This is a Notice of Intent (NOI) only. EERE may issue a FOA as described herein, may issue a FOA that is significantly different than the FOA described herein, or DOE may not issue a FOA at all. Once the FOA has been released, EERE will provide an avenue for potential Applicants to submit questions. 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 to EERE Exchange **September 2014.**

Request for Information (RFI) on Landscape Design for Sustainable Bioenergy Systems

The United States (U.S.) Department of Energy (DOE) Bioenergy Technologies Office (BETO) plans to support the continued increase of sustainably produced domestic bioenergy from renewable cellulosic feedstocks, such as agricultural residues, annual and perennial dedicated

energy crops, and forest resources. DOE is seeking input from producers, industry, academia, research laboratories, government agencies, non-governmental organizations, environmental groups, and other bioenergy stakeholders regarding landscape design approaches that integrate cellulosic feedstock production into existing agricultural and forestry systems while maintaining or enhancing environmental and socio-economic sustainability including ecosystem services and food, feed, and fiber production (**respond by September 2**).

DOE is aware of promising advancements that support the objective of designing sustainable, multi-functional landscapes that supply cellulosic bioenergy feedstocks while maintaining or enhancing environmental sustainability. These advancements include the development of relevant spatial models and decision-support tools, modeling studies that demonstrate potential environmental improvements from biomass production, generation of field data on bioenergy crop and residue recovery performance and sustainability, and development of management practices for bioenergy crop and residue production. However, DOE is not aware of many initiatives that apply the current set of tools and knowledge to proactively design these multi-functional landscapes for increased cellulosic feedstock production, validate the environmental and social sustainability impacts at a watershed or comparable scale, and assess the feedstock characteristics and logistics systems (e.g., harvesting, preprocessing, and transport) associated with those landscape designs. DOE is seeking information on cost-effective, feasible approaches for testing the landscape design approach for increasing cellulosic feedstock production at a watershed, multi-landowner, or comparable spatial scale through a combination of modeling, data collection, field research, and engagement with landowners and other relevant stakeholders.

This is a Request for Information (RFI) only. DOE will not pay for information provided under this RFI and no project will be supported as a result of this RFI. This RFI is not accepting applications for financial assistance or financial incentives. DOE may or may not issue a Funding Opportunity Announcement (FOA) based on consideration of the input received from this RFI. For more information, see the full solicitation.

Dear Colleague Letter: FY 2015 Clean Energy Technologies Funding Opportunities

It is critical to provide sustainable and economical energy systems on a scale sufficient to power all of society's needs. The development of clean energy technologies is an important step in that direction as it addresses the interrelated challenges of producing safe and responsible energy sources while reducing our dependence on foreign oil and minimizing the impact on the environment.

All of the Divisions in the following Directorates are participating in clean energy technology research and education through ongoing funding opportunities: Biological Sciences (BIO), Engineering (ENG), and Mathematical and Physical Sciences (MPS).

For BIO: fundamental research topics of interest in clean energy technology include, *but are not limited to*: systems and synthetic biology to streamline and scale the metabolic and energetic potential of living organisms such as microbes, fungi, algae and plants to produce non-petroleum based sources of important chemicals/materials, feedstocks and fuels. Investigations to assess the impact of fuel and/or bio-renewable chemical production on

genome stability, fitness, and phenotype of the production organisms are of interest, as are studies to assess the potential environmental impacts of these technologies.

For ENG and MPS: examples of fundamental research topics of interest in clean energy technologies include, *but are not limited to*: hydrogen generation and storage; biological, chemical, and catalytic conversion of renewable carbon sources (such as biomass, methane, and carbon dioxide); the development of methods and materials that increase energy efficiency, such as the replacement of stoichiometric with catalytic processes; energy storage, transmission, or distribution (e.g. smart grid); power-electronic and energy-conversion devices; fuel cells; solar energy capture and conversion (including biological and bio-inspired processes for the conversion of sunlight to fuels, electricity, or thermal energy); wind/wave/tidal energy; nuclear energy; studies of energy efficiency and use; and carbon dioxide sequestration and storage.

Within these general guidelines, the Directorates encourage the submission of proposals in the areas of clean energy research. Proposals should be submitted to the NSF program appropriate to the disciplinary area of the proposed research in accordance with the submission window and conditions of that program.

Proposals are welcome from either single or multiple investigators. Interdisciplinary proposals that involve principal investigators traditionally supported by different participating divisions are encouraged. Please follow the guidelines and program descriptions located on the NSF website.

Proposals may be submitted in combination with other solicitations. For example, if there are strong collaborations with industry, the Grant Opportunities for Academic Liaison with Industry (GOALI) solicitation can be used in conjunction with this effort. Similarly, proposals may be submitted in combination with the Faculty Early Career Development (CAREER) or the Research in Undergraduate Institutions (RUI) solicitation. Other NSF funding mechanisms such as Early Concept Grants for Exploratory Research (EAGER) and Integrated NSF Support Promoting Interdisciplinary Research and Education (INSPIRE) may also be appropriate. Principal investigators are urged to consult with the cognizant program officers for additional guidance.

To see examples of awards made in this area visit the NSF Award Abstracts Database and perform a key word search. Alternatively, please visit the webpages of the disciplinary programs of interest in the participating divisions.

We are excited by the opportunities in the clean energy technologies area and encourage our communities to contribute to our sustainable and secure energy future.

DE-FOA-0001158 Request for Information: Specific Clean Energy Manufacturing Focus Areas Suitable for a Manufacturing Innovation Institute

The Advanced Manufacturing Office (AMO) seeks information on mid-Technology Readiness Level (TRL) research and development (R&D) needs, market challenges, supply chain challenges and shared facility needs in addressing advanced manufacturing development challenges impacting clean energy manufacturing. AMO is particularly interested in the challenges associated with advanced manufacturing technology which might be overcome by pre-competitive collaborations conducted via a Clean Energy Manufacturing Innovation Institute.

AMO recently completed a broad RFI on this topic area. The intent of this RFI is to narrow the focus of a possible Clean Energy Manufacturing Institute and invite discussion on a set of the following specific focus areas. The Topical/Technical Focus Areas under consideration in this RFI are: Advanced Materials Manufacturing (AMM); Advanced Sensing, Control, and Platforms for Manufacturing (ASCPM); High-Efficiency Modular Chemical Processes (HEMCP); and High Value Roll-to-Roll Manufacturing (R2R). Information on where to submit questions regarding the content of the announcement and where to submit questions regarding submission of responses can be found in the full RFI posted on the EERE Exchange website at https://eere-exchange.energy.gov . **Reply by October 3.**

Agency Reports, Workshops & Research Roadmaps

(Back to Page 1)

Community Colleges In The Evolving Stem Education Landscape, Summary of a Summit

Investing in Science, Engineering, and Education for the Nation's Future: NSF Strategic Plan for 2014 - 2018

NSF's new Strategic Plan, Investing in Science, Engineering, and Education for the Nation's Future: NSF Strategic Plan for 2014 - 2018, was released on March 10, 2014. It lays out two strategic goals that embody the dual nature of NSF's mission to advance the progress of science while benefitting the Nation: Transform the Frontiers of Science and Engineering and Stimulate Innovation and Address Societal Needs through Research and Education. A third goal, Excel as a Federal Science Agency, directs NSF to hold itself accountable for achieving excellence in carrying out its mission. This goal structure enables NSF to link its investments to longer-term outcomes. To bridge the gap between these strategic goals and measurable outputs, the Strategic Plan establishes a set of strategic objectives for each strategic goal.

Measuring Research: A Guide to Research Evaluation Frameworks and Tools

Document Introduction: The AAMC asked RAND Europe to conduct a detailed synthesis of existing and previously proposed frameworks and indicators used to evaluate research. The purpose of this review is to stimulate debate among US policymakers and the leadership of US medical schools and teaching hospitals on how best to measure the outcomes of research and ultimately account to US taxpayers and others for the returns on their investment in research. The review also aims to provide a guide to the key considerations that need to be taken into account when developing approaches to research evaluation, to be used as a resource by research funders, managers and policymakers.

The work builds on a previous RAND Europe review commissioned by the Canadian Academy of Health Research in 2008 (Brutscher, Wooding & Grant, 2008); see also CAHS (2009a). The aim of this current report is to update and develop the CAHS review. Specifically the objectives of the project are to:

- Identify frameworks.
- Provide an overview and assessment of frameworks in use for research evaluation.
- Identify the research evaluation tools applied to those frameworks.
- Outline the considerations that need to be taken into account when developing a research evaluation approach, and the trade-offs that need to be made between different characteristics.
- Provide a guide to developing a research evaluation framework that can be used in a range of circumstances.
- Stimulate a wider debate on research evaluation in the US and internationally.

Sustainability Concepts in Decision-Making: Tools and Approaches for the US Environmental Protection Agency

In its current strategic plan, the U.S. Environmental Protection Agency (EPA) describes a cross-agency strategy to advance sustainable environmental outcomes and optimize economic and social outcomes through Agency decisions and actions. Sustainability has evolved from an aspiration to a growing body of practices. The evolution includes a transition from the development of broad goals toward the implementation of specific policies and programs for achieving them and the use of indicators and metrics for measuring progress. Without losing focus on implementing its existing regulatory mandates, EPA's incorporation of sustainability considerations into its decision-making about potential environmental, social, and economic outcomes involves shifting from a focus on specific pollutants in an environmental medium (air, water, or land) to a broader assessment of interactions among human, natural, and manufactured systems. EPA has indicated that it will need to consider the use of a variety of analytic tools and approaches to assess the potential sustainability-related effects of its decisions and actions in response to complex environmental challenges.

Sustainability Concepts in Decision-Making: Tools and Approaches for the U.S. Environmental Protection Agency examines scientific tools and approaches for incorporating sustainability concepts into assessments used to support EPA decision making. Using specific case studies, this report considers the application of analytic and scientific tools, methods, and approaches presented in the 2011 NRC report *Sustainability and the U.S. EPA*. This report examines both currently available and emerging tools, methods, and approaches to find those most appropriate for assessing and/or evaluating potential economic, social and environmental outcomes within an EPA decision context. *Sustainability Concepts in Decision Making* also discusses data needs and post-decision evaluation of outcomes on dimensions of sustainability. A broad array of sustainability tools and approaches are suitable for assessing potential environmental, social, and economic outcomes in EPA's decision-making context. The recommendations of this report will assist the agency to optimize environmental, social, and economic outcomes in EPA decisions.

Surmounting the Barriers: Ethnic Diversity in Engineering Education: Summary of a Workshop

Surmounting the Barriers: Ethnic Diversity in Engineering Education is the summary of a workshop held in September 2013 to take a fresh look at the impediments to greater diversification in engineering education. The workshop brought together educators in engineering from two- and four-year colleges and staff members from the three sponsoring organizations: the National Science Foundation, the National Academy of Engineering and the American Society for Engineering Education.

While the goal of diversifying engineering education has long been recognized, studied, and subjected to attempted interventions, progress has been fitful and slow. This report discusses reasons why past recommendations to improve diversity had not been adopted in full or in part. Surmounting the Barriers identifies a series of key impediments, including a lack of incentives for faculty and institutions; inadequate or only short-term financial support; an unsupportive institutional and faculty culture and environment; a lack of institutional and constituent engagement; and inadequate assessments, metrics, and data tracking. The report also shares success stories about instances where barriers to diversity have been identified and

surmounted, and the resources that could enable real solutions to implement steps toward progress.

New Funding Opportunities

(Back to Page 1)

Content Order

New Funding Posted Since August 15 Newsletter
URL Links to New & Open Funding Solicitations
Solicitations Remaining Open from Prior Issues of the Newsletter
Open Solicitations and BAAs

[User Note: URL links are active on date of publication, but if a URL link breaks or changes a Google search on the key words will typically take you to a working link. Also, entering a grant title and/or solicitation number in the Grants.gov search box will typically work as well.]

New Funding Solicitations Posted Since August 15 Newsletter

Food and Agricultural Sciences National Needs Graduate and Postgraduate Fellowships
This grant program supports: (1) training students for Master's and doctoral degrees in food, agricultural and natural resource sciences, and; (2) Special International Study or Thesis/Dissertation Research Travel Allowances (IRTA) for eligible USDA NNF beneficiaries. Awards are specifically intended to support traineeship programs that engage outstanding students to pursue and complete their degrees in USDA mission areas. Applicants provide clarity about the philosophy of their graduate training, and relevance to USDA mission sciences, NIFA priorities and national science education policies and statistics. Applications are being solicited from institutions that confer a graduate degree in at least one of the following Targeted Expertise Shortage Areas: 1) animal and plant production; 2) forest resources; 3) agricultural educators and communicators; 4) agricultural management and economics; 5) food science and human nutrition; 6) sciences for agricultural biosecurity; and 7) training in integrative biosciences for sustainable food and agricultural systems. **Due September 30.**

Higher Education Multicultural Scholars Program Department of Agriculture
Pursuant to section 1417 of the NARETPA of 1977 (99 Stat. 1548; 7 U.S.C. 3152), applications may be submitted by: (1) land-grant institutions, (2) colleges and universities having significant minority enrollments and a demonstrable capacity to carry out the teaching of food and agricultural sciences, and (3) other colleges and universities having a demonstrable capacity to carry out the teaching of food, and agricultural sciences. Research foundations maintained by an eligible college or university are eligible to submit undergraduate and/or D.V.M. training proposals under this RFA. Applicants should be institutions that confer an undergraduate or D.V.M. degree in at least one of the disciplines in the food and agricultural sciences. Students attending two-year colleges that are legally authorized to offer a two-year or equivalent program of college-level studies which are principally creditable toward a baccalaureate degree, may be awarded a MSP Scholarship from eligible baccalaureate institutions in cases

where an articulation agreement, bridging agreement, or other type of collaborative arrangement exists between the subject baccalaureate-level institution(s) and the two year college. MSP Scholars from 2-year colleges are expected to transfer and complete their baccalaureate degrees in the partner 4-year institution(s). In such instances, the baccalaureate-level institution must be the applicant. **Due September 30.**

Improving Undergraduate STEM Education (IUSE: EHR)

A well-prepared, innovative science, technology, engineering and mathematics (STEM) workforce is crucial to the Nation's health and economy. Indeed, recent policy actions and reports 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 to be 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 evidence-based and evidence-generating approaches to understanding STEM learning; to designing, testing, and studying instruction and 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 the number and diversity of STEM students, preparing students well to participate in science for tomorrow, and improving students' STEM learning outcomes.

The Improving Undergraduate STEM Education (IUSE) program invites proposals that address immediate challenges and opportunities that are facing undergraduate STEM education, as well as those that anticipate new structures (e.g. organizational changes, new methods for certification or credentialing, course re-conception, cyberlearning, etc.) and new functions of the undergraduate learning and teaching enterprise. The IUSE program recognizes and respects the variety of discipline-specific challenges and opportunities facing STEM faculty as they strive to incorporate results from educational research into classroom practice and work with education research colleagues and social science learning scholars to advance our understanding of effective teaching and learning.

Toward these ends the program features two tracks: (1) Engaged Student Learning and (2) Institutional and Community Transformation. Two tiers of projects exist within each track: (i) Exploration and (ii) Design and Development. These tracks will entertain research studies in all areas. In addition, IUSE also offers support for a variety of focused innovative projects that seek to identify future opportunities and challenges facing the undergraduate STEM education enterprise. **Due dates depend on track: October 22, October 24, and January 13.**

NOAA-NMFS-SE-2015-2004209 Fiscal Year 2015 NOAA Gulf of Mexico Bay-Watershed Education and Training (B-WET) Program

The National Marine Fisheries Service Southeast Region (Fisheries Southeast Regional Office) is seeking proposals under the Gulf of Mexico B-WET Program. The Gulf of Mexico B-WET program is an environmental education program that promotes locally relevant, experiential learning in the K-12 environment. Funded projects provide Meaningful Watershed Educational

Experiences (MWEEs) for students, related professional development for teachers, and help to support regional education and environmental priorities in the Gulf of Mexico. This program addresses NOAA's Long-Term Goal of "Healthy Oceans: Marine fisheries, habitats, and biodiversity are sustained within healthy and productive ecosystems" and "NOAA's Engagement Enterprise Objective for An engaged and educated public with an improved capacity to make scientifically informed environmental decisions". **Due October 24.**

Dynamics of Coupled Natural and Human Systems (CNH)

The Dynamics of Coupled Natural and Human Systems (CNH) Program supports interdisciplinary research that examines human and natural system processes and the complex interactions among human and natural systems at diverse scales. Research projects to be supported by CNH must include analyses of four different components: (1) the dynamics of a natural system; (2) the dynamics of a human system; (3) the processes through which the natural system affects the human system; and (4) the processes through which the human system affects the natural system. CNH also supports research coordination networks (CNH-RCNs) designed to facilitate activities that promote future research by broad research communities that will include all four components necessary for CNH funding. **Due November 18.**

NOAA-NOS-NCCOS-2015-2004197 2015 Northern Gulf of Mexico Ecosystems and Hypoxia Assessment Program (NGOMEX); Glider Application to Gulf of Mexico Hypoxic Zone Monitoring: Pilot Study and Transition to Operations

The purpose of this document is to advise the public that NOAA/NOS/NCCOS/CSCOR is soliciting research applications under the Northern Gulf of Mexico Ecosystems and Hypoxia Assessment Program (NGOMEX) for projects expected to last 2 years in duration. Research applications will propose pilot studies to test application of gliders to measure dissolved oxygen in the large hypoxic zone ("dead zone") along the northern Gulf of Mexico continental shelf and, within 2 years, complete a comprehensive plan to transition to operations the deployment of gliders for hypoxic zone monitoring east and west of the Mississippi delta, to complement shipboard and fixed (mooring/platform) observing system monitoring. Funding is contingent upon the availability of Fiscal Year 2015 Federal appropriations. It is anticipated that projects funded under this announcement will have a September 1, 2015 start date. Total funding for this research: approximately $125,000 per year for awards expected to last 2 years. One to two proposals are expected to be funded at the level of approximately $50,000 - $125,000 per year per proposal. Electronic Access: The following web site furnishes supplementary information: Center for Sponsored Coastal Ocean Research – Ecosystem Stressors Research and Hypoxia and Nutrient Pollution Programs: http://coastalscience.noaa.gov/about/centers/cscor Applications should be submitted through Grants.gov, http://www.grants.gov . **Due November 18.**

NOAA-NOS-NCCOS-2015-2004198 2015 Ecological Effects of Sea Level Rise Program Department of Commerce

The purpose of this document is to advise the public that NOAA/NOS/NCCOS/CSCOR is soliciting proposals under the Ecological Effects of Sea Level Rise (EESLR) Program to improve the management of regional and local ecosystem effects of sea level rise and coastal inundation

through targeted research on key technologies, natural and nature-based infrastructure, physical and biological processes, and model evaluation. The overall goal of EESLR is to integrate dynamic physical and biological processes with sea level rise and coastal inundation to improve the prediction of coastal ecosystem effects to enable enhanced coastal resiliency. This information will be used to advance the capacity and capabilities of the NOAA Sentinel Site Program. Funding is contingent upon the availability of Fiscal Year 2015 Federal appropriations. Approximately 2 to 5 projects, 2-3 years in duration, are expected to be funded at the level of $150,000 to $200,000 per year per proposal. Electronic Access: Background information about NOAA's Ecological Effects of Sea Level Rise Program can be found at http://coastalscience.noaa.gov/about/centers/cscor , and the NOAA Sentinel Site Program at http://oceanservice.noaa.gov/sentinelsites/. Proposals should be submitted through Grants.gov, http://www.grants.gov . **Due November 18.**

NOAA-NOS-OCRM-2015-2004211 FY15 Coral Reef NGO Partnership

The purpose of this notice is to invite Non-Governmental Organizations with non-profit 501(c)(3) status and demonstrated expertise and experience in supporting coral reef management in the United States to submit proposals to establish partnerships with the NOAA CRCP to further the conservation of U.S. coral reefs. This document describes the coral reef conservation partnership(s) that the NOAA Coral Reef Conservation Program (CRCP) envisions, identifies the qualities that NOAA desires in a partner, and describes criteria against which applications will be evaluated for funding consideration. Partnerships selected through this notice will be implemented through a cooperative agreement of 12- to 18-months in duration. Pursuant to section 6403 of the Coral Reef Conservation Act (CRCA) (16 U.S.C. 6401 et seq), and pending Congressional appropriations, CRCP funding of approximately $700,000 is expected to be available for initiating partnership(s) with up to four non-governmental organizations in FY 2015. CRCP will consider funding either a single proposal that includes support for all seven coral reef states and territories or up to two proposals in the Pacific Islands (benefitting Hawaii, American Samoa, Guam, and/or the Commonwealth of the Northern Mariana Islands) and up to two proposals in the Atlantic/Caribbean region (benefitting Florida, Puerto Rico, and the U.S. Virgin Islands). Applications must propose a 12- or 18-month work plan, in conformance with the requirements of Section IV of this announcement, and may request between $100,000 and $700,000 (approximately $100,000 per state or territory), depending on how many of the seven coral states and territories will benefit from the proposed project(s). As required by the CRCA, recipients are required to match NOAA's Federal contributions with non-Federal matching contributions at a minimum ratio of 1:1 unless the applicant is granted a waiver to the matching requirement by the agency. **Due November 19.**

Interdisciplinary Behavioral and Social Science Research (IBSS)

The Interdisciplinary Behavioral and Social Science Research (IBSS) competition promotes the conduct of interdisciplinary research by teams of investigators in the social and behavioral sciences. Emphasis is placed on support for research that involves researchers from multiple disciplinary fields, that integrates scientific theoretical approaches and methodologies from multiple disciplinary fields, and that is likely to yield generalizable insights and information that

will advance basic knowledge and capabilities across multiple disciplinary fields. **Due December 2.**

NEH 20141203-PF Sustaining Cultural Heritage Collections

Sustaining Cultural Heritage Collections (SCHC) helps cultural institutions meet the complex challenge of preserving large and diverse holdings of humanities materials for future generations by supporting sustainable conservation measures that mitigate deterioration and prolong the useful life of collections. Libraries, archives, museums, and historical organizations across the country face an enormous challenge: to preserve collections that facilitate research, strengthen teaching, and provide opportunities for life-long learning in the humanities. Ensuring the preservation of books and manuscripts, photographs, sound recordings and moving images, archaeological and ethnographic artifacts, art, and historical objects requires institutions to implement measures that slow deterioration and prevent catastrophic loss. This work is best accomplished through preventive conservation, which encompasses managing relative humidity, temperature, light, and pollutants in collection spaces; providing protective storage enclosures and systems for collections; and safeguarding collections from theft and from natural and man-made disasters. As museums, libraries, archives, and other collecting institutions strive to be effective stewards of humanities collections, they must find ways to implement preventive conservation measures that are sustainable. This program therefore helps cultural repositories plan and implement preservation strategies that pragmatically balance effectiveness, cost, and environmental impact. Sustainable approaches to preservation can contribute to an institution's financial health, reduce its use of fossil fuels, and benefit its green initiatives, while ensuring that collections are well cared for and available for use in humanities programming, education, and research. **Due December 3.**

Science and Technology Centers: Integrative Partnerships

The Science and Technology Centers (STC): Integrative Partnerships program supports innovative, potentially transformative, complex research and education projects that require large-scale, long-term awards. STCs conduct world-class research through partnerships among academic institutions, national laboratories, industrial organizations, and/or other public/private entities, and via international collaborations, as appropriate. They provide a means to undertake significant investigations at the interfaces of disciplines and/or fresh approaches within disciplines. STCs may involve any area of science and engineering that NSF supports. STC investments support the NSF vision of creating and exploiting new concepts in science and engineering and providing global leadership in research and education.

Centers provide a rich environment for encouraging future scientists, engineers, and educators to take risks in pursuing discoveries and new knowledge. STCs foster excellence in education by integrating education and research, and by creating bonds between learning and inquiry so that discovery and creativity fully support the learning process.

NSF expects STCs to demonstrate leadership in the involvement of groups traditionally underrepresented in science and engineering at all levels (faculty, students, and postdoctoral researchers) within the Center. Centers use either proven or innovative mechanisms to address

issues such as recruitment, retention and mentorship of participants from underrepresented groups.

Centers must undertake activities that facilitate knowledge transfer, i.e., the exchange of scientific and technical information with the objective of disseminating and utilizing knowledge broadly in multiple sectors. Examples of knowledge transfer include technology transfer with the intention of supporting innovation, providing key information to public policy makers, or dissemination of knowledge from one field of science to another. **Preliminary Proposals due December 11; full June 16.**

NOAA-NOS-NCCOS-2015-2004202 Center for Sponsored Coastal Ocean Research, Fiscal Year 2015 National Competitive HAB Programs Department of Commerce

The purpose of this document is to advise the public that NOAA/NOS/NCCOS/CSCOR is soliciting proposals for the Ecology and Oceanography of Harmful Algal Blooms Program, the Monitoring and Event Response for Harmful Algal Blooms Program and the Prevention, Control and Mitigation of Harmful Algal Blooms Program. Funding is contingent upon the availability of Fiscal Year 2015 Federal appropriations. It is anticipated that projects funded under this announcement will have a September 1, 2015 start date. Total funding for this research: It is anticipated that up to $2,000,000 may be available in FY 15 for the first year of all HAB projects combined. Awards are expected to last 2 to 5 years. Approximately 6 to 8 projects are expected to be funded at the level of approximately $100,000. to $600,000. per year per proposal. Background information about the NCCOS/CSCOR efforts can be found at http://coastalscience.noaa.gov/about/centers/cscor . Proposals should be submitted through Grants.gov (http://www.grants.gov .) **Due December 15.**

12th Annual P3 Awards: A National Student Design Competition for Sustainability Focusing on People, Prosperity and the Planet

Funding Opportunity Numbers (FON) and Associated Research Areas:
EPA-G2015-P3-Q1 – Energy
EPA-G2015-P3-Q2 – Built Environment
EPA-G2015-P3-Q3 – Materials and Chemicals
EPA-G2015-P3-Q4 – Water
EPA-G2015-P3-Q5 – Urban Green Water Infrastructure
EPA-G2015-P3-Q6 – Clean Cookstoves

The U.S. Environmental Protection Agency (EPA), as part of the P3-People, Prosperity and the Planet Award Program, is seeking applications proposing to research, develop, and design solutions to real world challenges involving the overall sustainability of human society. The P3 competition highlights the use of scientific principles in creating innovative projects focused on sustainability. The P3 Award program was developed to foster progress toward sustainability by achieving the mutual goals of improved quality of life, economic prosperity and protection of the planet -- people, prosperity, and the planet – the three pillars of sustainability. The EPA offers the P3 competition in order to respond to the technical needs of the world while moving towards the goal of sustainability. Please see the P3 website for more details about this program. **Due December 16.**

DE-FOA-0001192 Novel In Situ Imaging And Measurement Technologies For Biological Systems Science

The Office of Biological and Environmental Research (BER) of the Office of Science (SC), U.S. Department of Energy (DOE) hereby announces its interest in receiving research applications for novel imaging and measurement technologies for biological systems science. This Funding Opportunity Announcement (FOA) will consider applications for the development of novel imaging instrumentation and measurement technologies that support the integrative analysis of communication among subcellular compartments, between individual microbial cells and within multicellular communities/plant tissues. The goal is to develop in situ, dynamic and nondestructive approaches to enable multifunctional imaging, quantitative flux measurements, and multiscale integrative analysis of bioenergy-relevant plant and microbial systems. Ideally, these imaging approaches will pave the way for predictive understanding of the spatial and temporal relationships, physical connections, and chemical exchanges that facilitate the flow of materials and information across membranes and between intracellular sp aces. The anticipated outcome of this FOA is the development of in situ imaging and measurement technologies that can (1) resolve multiple key metabolic processes over time within or among cells and (2) bridge the critical gap in linking molecular-scale information to whole-cell, systems-level understanding. **Required Pre-Application due October 15**; **Due December 18.**

Forensic Science Center of Excellence Program

NIST is soliciting applications to establish a Forensic Science Center of Excellence (COE) in which NIST researchers collaborate with interdisciplinary researchers from academia and industry for the wide-spread adoption of probabilistic methods within the forensic science community, specifically in the areas of pattern evidence and digital evidence, by developing the necessary analytical methods, creating a suitable education and training infrastructure in probabilistic methods for the relevant stakeholders, and engaging the forensic science community to promote competence building (more).

Webinar and Website: NIST plans to hold a webinar to offer information on the Forensic Science Center of Excellence program. ***The webinar will be held approximately 30 days after posting of this FFO on August 19..*** The webinar will provide general guidance on preparing applications and provide an opportunity for the public to ask questions about the program. Proprietary technical discussions about specific project ideas will not be permitted, and NIST will not critique or provide feedback on any project ideas during the webinar or at any time before submission of an application to NIST. There is no cost for the webinar, but participants must register in advance. Participation in the webinar is not required for the submission of an application. The webinar will be recorded, and a link to the recording will be available for public access. Additional, information concerning, and registration for, the webinar is available at: www.nist.gov/coe/forensics .

A NIST Forensic Science COE public website exists (www.nist.gov/coe/forensics) that provides information about NIST's involvement in forensic science, including this Forensic Science Center of Excellence Federal Funding Opportunity. NIST anticipates that a "Frequently Asked Questions" section will be maintained and updated as needed to provide additional guidance and clarifying information that may arise related to this Funding Opportunity.

Questions regarding this FFO should be submitted in writing and may be posted in the "Frequently Asked Questions" section. **Due December 19.**

DARPA-BAA-14-49 Biological Robustness in Complex Settings (BRICS)

Through the Biological Robustness in Complex Settings (BRICS) program, DARPA is soliciting innovative research proposals to develop the necessary fundamental understanding and component technologies to create robust engineered biological systems. It is expected that technology developed in the BRICS program will enable the safe transition of synthetic biological systems from stringently controlled laboratory environments to more complex settings (Grants.gov posting). The BRICS portfolio will consist of a set of programs, of which this is the first, that aim to elucidate the design principles of engineering robust biological consortia and apply this fundamental understanding towards specific DoD applications. This announcement calls for the development of generalizable approaches that may be ultimately integrated into a complex biological system. DARPA anticipates a second BAA comprising specific challenge scenarios that require the integration of capabilities developed within this program.

Though not strictly required, it is expected that proposals will involve ***multidisciplinary teams*** that include expertise from both the traditional synthetic biology community, as well as areas that have not typically engaged in this area (e.g., process control and systems engineers, population biologists, and ecologists).

For example, in one technical area, proposers are asked to develop the necessary technology to create a functional, multi-species, ***synthetic microbial community***. The community must be engineered to perform a function, which is at the discretion of the proposers but must require essential contributions from all species of the microbial community. Examples of engineered functions include, but are not limited to, the biosynthesis of a specific molecule or the ability to sense and respond to a substance in the environment. The complexity of community composition and function should increase as the BRICS program progresses.

The development of techniques and tools to rapidly sequence, synthesize, and manipulate genetic material has led to the **rapidly maturing discipline of synthetic biology**. The potential applications enabled by this field include efficient on-***demand bio-production of novel drugs, fuels and coatings; engineered microbes able to optimize human health or prevent or treat disease; and bio-based sensors, tags, or tracking systems***. To date, work in synthetic biology has focused primarily on manipulating individual species of domesticated organisms. These species tend to be fragile, requiring precise environmental controls to survive, and unstable, subject to losing their engineered advantages through genetic attrition or recombination. The costs of maintaining required environmental controls and detecting and compensating for genetic alterations are substantial. If applications such as those highlighted above are to come to fruition, methods to increase the biological robustness and stability of engineered organisms must be achieved while maintaining or enhancing assurances of safety.

The Biological Robustness in Complex Settings (BRICS) program will develop the ***fundamental understanding and component technologies to engineer biosystems*** that maintain their functional value in environments less stringently controlled than those in which these systems are today cultivated, eventually enabling the safe transition of synthetic

biological systems from well-defined laboratory environments into more complex settings where they can achieve greater biomedical, industrial, and strategic potential. While this program will support the development of technologies that would be prerequisite to the safe application of engineered biological systems in the full range of environments in which the DoD has interests, all work performed in this program will occur in controlled laboratory settings.

There are multiple technical focus areas within the solicitation. Initial program funding of $42.5 million. Proposals due February 17.

URL Links to New & Open Funding Solicitations

Links verified: Wednesday, February 19, 2014

- HHS Grants Forecast
- American Cancer Society Index of Grants
- SAMHSA FY 2014 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 2014 Science To Achieve Results (STAR) Research Grants
- NASA Open Solicitations
- Defense Sciences Office Solicitations
- The Mathematics Education Trust
- EPA Open Funding Opportunities
- CDMRP FY 2014 Funding Announcements
- Office of Minority Health
- Department of Justice Open Solicitations
- DOE/EERE 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

Interdisciplinary Research in Hazards and Disasters (Hazards SEES)
Hazards SEES is a program involving multiple NSF Directorates and Offices (CISE, ENG, GEO, MPS, OIIA, and SBE) that seeks to: (1) advance understanding of the fundamental processes associated with specific natural hazards and technological hazards linked to natural phenomena, and their interactions; (2) better understand the causes, interdependences, impacts, and cumulative effects of these hazards on individuals, the natural and built environment, and society as a whole; and (3) improve capabilities for forecasting or predicting hazards, mitigating their effects, and enhancing the capacity to respond to and recover from resultant disasters. The overarching goal of Hazards SEES is to catalyze well-integrated interdisciplinary research efforts in hazards-related science and engineering in order to reduce the impact of hazards, enhance the safety of society, and contribute to sustainability.

Hazards SEES seeks research projects that will productively cross the boundaries of the atmospheric and geospace, earth, and ocean sciences; computer and information science (including cyberinfrastructure); engineering; mathematics and statistics; and social, economic, and behavioral sciences. Successful proposals will integrate across multiple disciplines to promote research that advances new paradigms that contribute to creating a society resilient to hazards. Hazards SEES intends to transform hazards and disaster research by fostering the development of interdisciplinary research that allows for appropriately targeted data collection, integration, and management; modeling (including predictive models for real-time decision making); visualization and simulation; data analytics and data-driven discovery; real-time sensing; cross-cutting knowledge development; and synthesis of applicable models and theory. Proposals must demonstrate the inclusion of the appropriate expertise to address the research questions, hypotheses, and problems being posed. **LOI September 26 ; full November 28.**

NOAA-NWS-NWSPO-2015-2004117 Round 1 of Research to Operations Initiative
This program announcement is for projects to be conducted for a two-year period with an anticipated start date of May 1, 2015 unless otherwise directed. All public or private sources

may submit to this Federal Funding Opportunity; however, partnering with universities is highly encouraged. Eligible applicants are institutions of higher education; other nonprofits; commercial organizations; state, local and Indian tribal governments; and Federal agencies. The NWS Research to Operations (R2O) Initiative is a NOAA initiative to expand and accelerate critical weather forecasting research to operations to address growing service demands and increase the accuracy of weather forecasts. This will be achieved through, (1) accelerated development and implementation of improved global weather prediction models; (2) improved data assimilation techniques; (3) nested regional prediction capabilities; (4) post-processing forecast tools and techniques and (5) improved software architecture and system engineering. The NWS R2O Initiative is soliciting proposals from all public and private sources for projects involving applied science, modeling and/or data assimilation that supports development of the Next Generation Global Prediction System (NGGPS), effective assimilation for environmental observations at global and regional scales and, hurricane and other high-impact weather forecast models that meet societal requirements to effectively mitigate economic disruption. This notice provides guidelines for submission of proposals. This notice also describes opportunities and application procedures to demonstrate capabilities that have the potential to be incorporated into operational NWS numerical weather prediction (NWP) analyses and forecasts. The R2O initiative addresses NOAA's Weather Ready Nation (WRN) strategic goal and supporting objectives. The Program also represents an NOAA/NWS effort to foster a cost-effective transition from basic and applied research to operations and services ***through collaborative research and developmental testing between institutions which have expertise in the environmental sciences and operational forecast scientists.*** These activities will engage researchers in applied research of interest with the operational meteorological community and will improve the accuracy of forecasts and warnings of environmental hazards by applying scientific knowledge and information to operational products and services. **Due September 30.**

NPS-BAA-14-002 FY14 Acquisition Research Program Department of Defense

The Government is interested in stimulating and supporting scholarly research in academic disciplines that bear on public policy and management in the field of government acquisition. These include economics, finance, financial management, information systems, organization theory, operations management, human resources management, risk management, and marketing, as well as the traditional acquisition areas such as contracting, program/project management, logistics, test and evaluation and systems engineering management. The ARP primarily supports scholarly research through assistance vehicles that will benefit the general public and/or private sector to a larger extent than any direct benefits that may be gained by the Department of Defense (DOD). Studies of government processes, systems, or policies should focus on expanding the body of knowledge, theory and/or research methodologies that are also relevant to processes, systems, or policies outside the DOD. The Government in this BAA is interested only in proposals that will provide unclassified and non-proprietary findings suitable for publication in open scholarly literature. Offerors bear prime responsibility for the design, management, direction, and conduct of research, and exercise judgment and original thought toward attaining the goals within broad parameters of the research areas proposed and the resources provided. **Due September 30.**

NPS-BAA-14-001 FY14 Masint Emerging Technologies Research Program

Research Areas: Measurement and Signature Intelligence (MASINT) is an intelligence discipline that employs a broad range of scientific developments to gather foreign intelligence. In our efforts to enhance this intelligence competency we are interested in stimulating and supporting research that creates new knowledge and capabilities, or the transition of current capabilities, that have the potential to enhance the following areas: Remote assessment and detection of weapons of mass destruction, specifically nuclear and radiological weapons, as well as chemical and biological weapons. Remote assessment and detection of directed energy weapons. This would include all lasers that are primarily designed as weapons as well as high-powered microwave (HPM) and electromagnetic pulse (EMP) weapons. Bioinformatics, the science of collecting and analyzing complex biological data such as genetic codes, has become an important part of many areas of biology. Research should focus on how this science promotes the extraction of useful results from large amounts of raw data as well as how its intrinsic characteristics are applicable to many related research topics. Telematics typically is any integrated use of telecommunications and informatics, also known as ICT (Information and Communications Technology). Possible telematics applications can track vehicles, trailers, and shipping containers. Telematics is also used for relaying environmental conditions within vehicles, trailers or shipping containers, fleet management, mobile data and mobile television, wireless vehicle safety communications allowing vehicles to communicate with those around it and emergency warning system for vehicles. Navy seeks White Papers only from the most knowledgeable experts and universities in the field, with submissions briefly describing expertise. Note: Proposals for workshops, conferences, and symposia, or for acquisition of technical, engineering and other types of support services will not be considered (Link to all NPS BAA's). **Due September 30.**

NPS-BAA-14-002 FY14 Acquisition Research Program, Naval Supply Systems Command

The Government is interested in stimulating and supporting scholarly research in academic disciplines that bear on public policy and management in the field of government acquisition. These include economics, finance, financial management, information systems, organization theory, operations management, human resources management, risk management, and marketing, as well as the traditional acquisition areas such as contracting, program/project management, logistics, test and evaluation and systems engineering management. The ARP primarily supports scholarly research through assistance vehicles that will benefit the general public and/or private sector to a larger extent than any direct benefits that may be gained by the Department of Defense (DOD). Studies of government processes, systems, or policies should focus on expanding the body of knowledge, theory and/or research methodologies that are also relevant to processes, systems, or policies outside the DOD. The Government in this BAA is interested only in proposals that will provide unclassified and non-proprietary findings suitable for publication in open scholarly literature. Offerors bear prime responsibility for the design, management, direction, and conduct of research, and exercise judgment and original thought toward attaining the goals within broad parameters of the research areas proposed and the resources provided. **Due September 30.**

Frontier Observatory for Research in Geothermal Energy (FORGE) DE-FOA-0000890

The Department of Energy National Energy Technology Laboratory, on behalf of the Geothermal Technologies Office, is seeking applications for establishing and managing a dedicated Enhanced Geothermal Systems Field Laboratory site. The full Funding Opportunity Announcement is posted on the EERE eXCHANGE website at 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 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 announcement posted on the EERE eXCHANGE website. **Due October 1.**

NSF/DOE Partnership On Advanced Frontiers In Renewable Hydrogen Fuel Production Via Solar Water Splitting Technologies 2014-2016

The Directorate for Engineering at the National Science Foundation (NSF) has established a partnership with the Fuel Cell Technologies (FCT) Office of the U.S. Department of Energy (DOE) in order to address critical fundamental and applied research challenges associated with advanced technologies for the production of hydrogen fuel via solar water splitting processes. The goal of the partnership is to leverage the complementary missions of applied research, development and demonstration (DOE) and use-inspired fundamental research and education (NSF) to address issues of national importance that impact the sustainable production of fuels using renewable resources. The Directorate for Engineering seeks proposals with transformative ideas that meet the detailed requirements delineated in this solicitation. **LOI October 6; full December 11.**

Advanced Technological Education (ATE)

Changes in the ATE program solicitation for FY 2015, FY 2016, and FY 2017 include:
A new focus area for ATE projects called "**ATE-Coordination Networks**" is described.
The Targeted Research on Technician Education track has been expanded. This track now supports planning, exploratory research and development, and full scale research and development proposals. All projects must demonstrate substantive faculty partnerships between 2-year and 4-year colleges and universities. Proposals submitted for a Center renewal may submit up to five pages on Results of Prior Support in the supplementary documents section of the proposal, and refer the reader to that section in the Project Description section.
The funding duration and size of award for the Centers track has been changed, and resource centers renamed to support centers. Large Scale Material Development projects are no longer supported. An additional requirement is described under "Reporting Requirements". This is a requirement to work with ATE Central to archive resources developed with grant funds.
For proposals describing the development of new learning materials and computer software source code developers are encouraged to license these materials (See text under "Reporting Requirements").

With an emphasis on two-year colleges, the Advanced Technological Education (ATE) program focuses on the education of technicians for the high-technology fields that drive our nation's economy. The program involves partnerships between academic institutions and industry to promote improvement in the education of science and engineering technicians at the undergraduate and secondary school levels. The ATE program supports curriculum development; professional development of college faculty and secondary school teachers; career pathways to two-year colleges from secondary schools and from two-year colleges to four-year institutions; and other activities. Another goal is articulation between two-year and four-year programs for K-12 prospective STEM teachers that focus on technological education. The program invites research proposals that advance the knowledge base related to technician education. **Due October 6.**

Centers of Research Excellence in Science and Technology (CREST)

The Centers of Research Excellence in Science and Technology (CREST) program provides support to enhance the research capabilities of minority-serving institutions (MSI) through the establishment of centers that effectively integrate education and research. CREST promotes the development of new knowledge, enhancements of the research productivity of individual faculty, and an expanded presence of students historically underrepresented in science, technology, engineering, and mathematics (STEM) disciplines. HBCU-RISE awards specifically target HBCUs to support the expansion of institutional research capacity as well as the production of doctoral students, especially those from groups underrepresented in STEM, at those institutions. The CREST program supports the following types of projects: CREST Center awards provide multi-year support (typically 5-years) for eligible minority-serving institutions that demonstrate a strong research and education base, a compelling vision for research infrastructure improvement, and a comprehensive plan with the necessary elements to achieve and sustain national competitiveness in a clearly defined area of national significance in science or engineering research. Successful Center proposals will demonstrate a clear vision and synergy with the broad goals of the CREST Program and the Human Resource Development Division with respect to development of a diverse STEM workforce. CREST Centers are expected to provide leadership in the involvement of groups traditionally underrepresented in STEM at all levels (faculty, students, and postdoctoral researchers) within the Center. Centers are required to use either proven or innovative mechanisms to address issues such as recruitment, retention and mentorship of participants from underrepresented groups. [Anticipated number of awards is across fiscal years 2015 and 2016. In fiscal year 2015, up to 2 Broadening Participation Research in STEM Education standard grants, up to 8 SBIR/STTR Diversity Collaborative Supplements, up to 4 Partnership Supplements and up to 4 HBCU-RISE standard grants. In fiscal year 2016, up to 4 CREST Center continuing grants, up to 2 Broadening Participation Research in STEM Education standard grants, up to 8 SBIR/STTR Diversity Collaborative Supplements, up to 3 Partnership Supplements and up to 2 HBCU-RISE standard grants.] **CREST LOI due October 6; CREST preliminary due November 5; and CREST full June 5, 2015.**

DE-FOA-0001163 Advanced Reactor Research and Development Department of Energy

During 2012 and continuing in 2014, DOE used a Technical Review Panel (TRP) process to identify Research and Development (R&D) needs for viable advanced reactor concepts in order to inform DOE-NE R&D investment decisions. That process involved the use of a Request for Information to solicit concept information from industry and engagement of technical experts from industry, universities and National Laboratories to evaluate those concepts. Having completed this process in 2014, DOE desires to partner with industry to conduct cost-shared R&D for selected technology needs identified by the TRP process. The intent of this funding opportunity announcement (FOA) is to solicit proposals to conduct such cost-shared R&D activities. Consistent with the Consolidated Appropriations Act, 2014, funding in the amount of up to $12 million will be made available to fund cost-shared R&D with industry. This FOA is available at Fedconnect located at www.fedconnect.net under reference number DE-FOA-0001163. Applicants must register and acknowledge the FOA at fedconnect.net in order to submit questions and receive DOE notifications including responses to questions and submittals. The closing date for applications is October 7, 2014. Letters of intent are due no later than September 17, 2014. **The DOE will conduct a Webinar on September 15, 2014 at 1:00 p.m. (EDT) covering project details and FOA application instructions**. Webinar login instructions will be provided separately. **Due October 7**.

DE-FOA-0001184: Accelerating Low-Cost Plasma Heating And Assembly (ALPHA)

ALPHA seeks to develop and demonstrate low-cost tools to aid in the development of fusion power, with a focus on approaches to produce plasmas in the final density range of 10^{18}-10^{23} ions/cm^3 (at Lawson conditions). The program goal is to create a toolset that will allow a significant reduction in facilities costs for fusion development and to enable rapid learning through a high shot rate at a low cost-per-shot, enabling rapid progress along new learning curves towards economical fusion power. **Concept paper due October 7.**

CyberCorps(R): Scholarship for Service (SFS) Defending America's Cyberspace

The CyberCorps(R): Scholarship for Service (SFS) program seeks proposals that address cybersecurity education and workforce development. The Scholarship Track provides funding to award scholarships to students in cybersecurity. In return for their scholarships, recipients will work after graduation for a Federal, State, Local, or Tribal Government organization in a position related to cybersecurity for a period equal to the length of the scholarship. The Capacity Track seeks innovative proposals leading to an increase in the ability of the United States higher education enterprise to produce cybersecurity professionals. They contribute to the expansion of existing educational opportunities and resources in cybersecurity and focus on such efforts as research on the teaching and learning of cybersecurity, including research on materials, methods and small-scale interventions; curricula recommendations for new courses, degree programs, and educational pathways with plans for wide adoption nationally; teaching and learning effectiveness of cybersecurity curricular programs and courses; integration of cybersecurity topics into computer science, information technology, engineering and other existing degree programs with plans for pervasive adoption; partnerships between institutions of higher education, government, and relevant employment sectors leading to improved

models for the integration of applied research experiences into cybersecurity degree programs. **Submission windows beginning October 9.**

Research Training Groups in the Mathematical Sciences (RTG)

The long-range goal of the Research Training Groups in the Mathematical Sciences (RTG) program is to strengthen the nation's scientific competitiveness by increasing the number of well-prepared U.S. citizens, nationals, and permanent residents who pursue careers in the mathematical sciences. The RTG program supports efforts to improve research training by involving undergraduate students, graduate students, postdoctoral associates, and faculty members in structured research groups centered on a common research theme. Research groups supported by RTG must include vertically-integrated activities that span the entire spectrum of educational levels from undergraduates through postdoctoral associates. **Due October 14.**

Partnerships for International Research and Education (PIRE)

Partnerships for International Research and Education (PIRE) is an NSF-wide program that supports international activities across all NSF supported disciplines (Frequently Asked Questions (FAQs) for Partnerships for International Research and Education (PIRE)). The primary goal of PIRE is to support high quality projects in which advances in research and education could not occur without international collaboration. PIRE seeks to catalyze a higher level of international engagement in the U.S. science and engineering community. International partnerships are essential to addressing critical science and engineering problems. In the global context, U.S. researchers and educators must be able to operate effectively in teams with partners from different national environments and cultural backgrounds. PIRE promotes excellence in science and engineering through international collaboration and facilitates development of a diverse, globally-engaged, U.S. science and engineering workforce. This PIRE competition will be open to all areas of science and engineering research which are supported by the NSF. **Preliminary due October 21; full May 15.**

Cost-Effective Aviation Technologies and Research to Support Counter-Poaching Operations Related to Endangered, Protected, and/or Regulated Wildlife

With this solicitation, NIJ seeks proposals from interested parties to: (1) identify and assess the highest priority technology needs of the Kenyan Wildlife Services (KWS) Air wing in furtherance of their counter-poaching mission; (2) purchase and deliver aircraft and supporting technologies as informed by the needs assessment; and (3) conduct an operational evaluation of the purchased and delivered aircraft and supporting technologies. While the technology will be delivered to the Kenyan Wildlife Service, the operational evaluation of the aircraft and supporting technology will be made widely available to U.S. State and local law enforcement – particularly those in rural and tribal jurisdictions operating in similar environments as the KWS Air Wing – who are implementing or considering the use of low-cost aircraft to support their mission. This project in part fulfils and promotes the objectives of the **Presidential Executive Order on Combating Wildlife Trafficking issued July 1, 2013,** which calls for enhanced domestic efforts to combat wildlife trafficking and increased assistance to foreign nations in building

capacity to combat wildlife trafficking. **NIJ plans to fund 12-18 month project period at approximately $1 million**. Among other deliverables, the successful applicant will be expected to deliver an electronic document based on the above listed tasks that will serve as both a best practices and lessons learned guide. **The deadline for applications under this solicitation is October 22.**

Improving Undergraduate STEM Education National Science Foundation

The Improving Undergraduate STEM Education (IUSE) program invites proposals that address immediate challenges and opportunities that are facing undergraduate STEM education, as well as those that anticipate new structures (e.g. organizational changes, new methods for certification or credentialing, course re-conception, cyberlearning, etc.) and new functions of the undergraduate learning and teaching enterprise. The IUSE program recognizes and respects the variety of discipline-specific challenges and opportunities facing STEM faculty as they strive to incorporate results from educational research into classroom practice and work with education research colleagues and social science learning scholars to advance our understanding of effective teaching and learning. **Various deadlines beginning October 22.**

W81XWH-14-SCIRP-IIRA DoD Spinal Cord Injury Investigator-Initiated Research Award

The SCIRP Investigator-Initiated Research Award mechanism was first offered in FY09. Since then, 211 Investigator-Initiated Research Award applications have been received, and 47 have been recommended for funding. The SCIRP Investigator-Initiated Research Award is intended to support studies that have the potential to make an important contribution to SCI research and/or patient care. Important aspects of this award mechanism include:  Impact: Applications should articulate both the short- and long-term impact of the proposed research. Projects should address an FY14 Area of Encouragement or other research areas relevant to SCI.  Military Relevance: Projects should impact spinal cord injured military Service Members, Veterans, and/or their family members, as well as their caregivers. All applications must specifically and clearly address the military relevance of the proposed research project. Collaboration with military researchers and clinicians is encouraged.  Preliminary Data: Observations that drive a research idea may be derived from laboratory discovery, population-based studies, a clinician's first-hand knowledge of patients, or anecdotal data. Applications must include preliminary and/or published data that is relevant to SCI and the proposed research project. Investigator-Initiated Research Award applications may focus on any phase of research from basic through translational, including preclinical studies in animal models or human subjects, as well as correlative studies associated with an existing clinical trial. Clinical trials are not allowed under this funding opportunity. **Due October 30.**

DE-FOA-0001059 Resilience for Extreme Scale Supercomputing Systems

The Office of Advanced Scientific Computing Research (ASCR) in the Office of Science (SC), U.S. Department of Energy (DOE), hereby invites proposals for basic research that significantly improves the resiliency of scientific applications in the context of emerging architectures for extreme scale computing platforms. The next-generation of scientific discovery will be enabled by research developments that can effectively harness significant or disruptive advances in

computing technology. Applications running on extreme scale computing systems will generate results with orders of magnitude higher resolution and fidelity, achieving a time-to-solution significantly shorter than possible with today's high performance computing platforms. However, indications are that these new systems will experience hard and soft errors with increasing frequency, necessitating research to develop new approaches to resilience that enable applications to run efficiently to completion in a timely manner and achieve correct results. Of interest are proposals that address challenges in the following topics: 1. Fault Detection and Categorization 2. Fault Mitigation 3. Anomaly Detection and Fault Avoidance More specific information is included under SUPPLEMENTARY INFORMATION in the full funding opportunity announcement document DE-FOA-0001059. The full text of the FOA is located on FedConnect. Instructions for completing the Grant Application Package are contained in the full text of the FOA which can be obtained at: https://www.fedconnect.net/FedConnect/?doc=DE-FOA-0001059&agency=DOE . A companion Program Announcement to DOE Laboratories (LAB 14-1059) will be posted on the SC Grants and Contracts web site at: http://science.energy.gov/grants/ **Due November 3.**

AID-OAA-SOL-14-000170 Support to Agriculture Research and Development

Feed the Future is the United States Government's global hunger and food security initiative. It supports country‐driven approaches to address the root causes of hunger and poverty and forge long‐term solutions to chronic food insecurity and under‐nutrition. Drawing upon resources and expertise of agencies across the U.S. Government, this Presidential Initiative is helping countries transform their own agriculture sectors to grow enough food sustainably to feed their people. To support this effort the U.S. Agency for International Development is requesting applications from qualified organizations to implement the Support to Agricultural Research and Development Program, as described fully inSection I below. At the end of this agreement, USAID expects the implementer to achieve the following results: 1) The availability and implementation of improved agricultural production technologies and systems is increased 4) Agricultural technologies and nutrition information extension systems are strengthened. **Due November 3**.

PAR-14-242 Role of the Microflora in the Etiology of Gastro-Intestinal Cancer (R01)

This Funding Opportunity Announcement (FOA) encourages innovative multidisciplinary research projects that will advance our mechanistic understanding of microflora influences on Gastro-Intestinal (GI) carcinogenesis. Recent advances in our knowledge of GI microflora composition and function have generated a flood of new information, technologies, and capabilities that may for the first time allow mechanistic investigations of very complex, networked host/microbiome interactions on a systems wide scale. This FOA encourages investigators to ingrate this new information into hypothesis-driven studies that can define and validate molecular mechanisms that determine microbe-induced carcinogenic outcomes. Applicants may integrate information from existing large data sets, including metagenomic data sets, or may also propose to generate appropriate new data sets, including but not limited to analysis of host and microbial genomes, proteomes, metabalomes, post-translational modifications, secreted signals, and protein-protein interaction data. An additional goal of this

program is to encourage collaborative efforts between scientists currently engaged in GI cancer research with those in scientific disciplines that may not otherwise apply their expertise to study cancer etiology and prevention. **Investigators particularly from the disciplines of microbiology, microbial ecology, molecular biology, immunology, nutrition sciences, bioinformatics, and computational sciences are encouraged to apply.** A value added from stimulating integrated, multidisciplinary experimental approaches may include the discovery of emergent properties of the GI ecosystem that could not be elucidated using either descriptive bioinformatics or molecular studies alone. **Due November 4**

NSF Natural Hazards Engineering Research Infrastructure (2015 - 2019) (NHERI)

This solicitation replaces NSF 13-537, George E. Brown, Jr. Network for Earthquake Engineering Simulation Operations FY 2015-FY 2019 (NEES2 Ops) to establish the Natural Hazards Engineering Research Infrastructure (NHERI) for 2015 - 2019 through support for a network coordination office, experimental facilities, cyberinfrastructure, and computational modeling and simulation tools for earthquake engineering and wind engineering research. This solicitation will support up to ten separate awards to establish NHERI. This solicitation will establish operations of the Natural Hazards Engineering Research Infrastructure (NHERI) for 2015 - 2019. NHERI is the next generation of National Science Foundation (NSF) support for a natural hazards engineering research large facility, replacing the George E. Brown, Jr. Network for Earthquake Engineering Simulation (NEES). NEES was established by NSF as a distributed, multi-user, national research infrastructure for earthquake engineering through a facility construction phase during 2000 - 2004, followed by operations of this infrastructure to support research, innovation, and education activities from October 2004 through September 2014. During 2015 - 2019, NHERI will be a distributed, multi-user, national facility to provide the natural hazards engineering community with access to research infrastructure (earthquake and wind engineering experimental facilities, cyberinfrastructure, computational modeling and simulation tools, and research data), coupled with education and community outreach activities. NHERI will enable research and educational advances that can contribute knowledge and innovation for the nation's civil infrastructure and communities to prevent natural hazard events from becoming societal disasters. NHERI will consist of the following components, established through up to ten individual awards:

- Network Coordination Office (one award),
- Cyberinfrastructure (one award),
- Computational Modeling and Simulation Center (one award), and
- Experimental Facilities for earthquake engineering and wind engineering research (up to seven awards, including one award for a Post-Disaster, Rapid Response Research Facility).

LOI due November 6; full due December 3.

DE-FOA-0001174 Atmospheric System Research Program DOE - Office of Science

The Atmospheric System Research Program (ASR) in the Climate and Environmental Sciences Division (CESD), Office of Biological and Environmental Research (BER) of the Office of Science (SC), U.S. Department of Energy (DOE), supports research on key cloud, aerosol, precipitation, and radiative transfer processes that has the potential to improve the accuracy of regional and

global climate models. The ASR program hereby announces its interest in research grant applications for observational, data analysis, and/or modeling studies that use data from CESD, including Atmospheric Radiation Measurement (ARM) and ASR programs, to improve understanding and model representation of cloud microphysical, convective, aerosol, and radiative transfer processes. **Due November 7.**

DoD PH/TBI Psychological Health Research Award

The FY14 Psychological Health and Traumatic Brain Injury (PH/TBI) Psychological Health Research Award (PHRA) is intended to support both applied (preclinical) research and clinical trials within specific Topic Areas addressing the prevention and treatment of military-relevant psychological health issues. Applications proposing research outside of the Topic Areas listed in the Program Announcement should not be submitted in response to this Program Announcement. **Due November 13.**

Ecology and Evolution of Infectious Diseases (EEID)

The Ecology and Evolution of Infectious Diseases program supports research on the ecological, evolutionary, and socio-ecological principles and processes that influence the transmission dynamics of infectious diseases. The central theme of submitted projects must be quantitative or computational understanding of pathogen transmission dynamics. The intent is discovery of principles of infectious disease transmission and testing mathematical or computational models that elucidate infectious disease systems. Projects should be broad, interdisciplinary efforts that go beyond the scope of typical studies. They should focus on the determinants and interactions of transmission among humans, non-human animals, and/or plants. This includes, for example, the spread of pathogens; the influence of environmental factors such as climate; the population dynamics and genetics of reservoir species or hosts; the cultural, social, behavioral, and economic dimensions of disease transmission. Research may be on zoonotic, environmentally-borne, vector-borne, or enteric diseases of either terrestrial or freshwater systems and organisms, including diseases of animals and plants, at any scale from specific pathogens to inclusive environmental systems. Proposals for research on disease systems of public health concern to developing countries are strongly encouraged, as are disease systems of concern in agricultural systems. Investigators are encouraged to develop the appropriate multidisciplinary team, including for example, modelers, bioinformaticians, genomics researchers, social scientists, economists, epidemiologists, entomologists, parasitologists, microbiologists, bacteriologists, virologists, pathologists or veterinarians, with the goal of integrating knowledge across disciplines to enhance our ability to predict and control infectious diseases.

This revision adds a request for collaborative projects between U.S. scientists and scientists in Israel through a joint effort of the U.S. National Science Foundation, the U.S. National Institutes of Health, and the U.S.D.A. National Institute of Food and Agriculture and the U.S.-Israel Binational Science Foundation. Multinational collaborative projects between U.S., U.K. and Israel scientists are also welcome. See details in the program announcement in the sections titled "US-Israel Collaborative Projects" and "US-UK-Israel Collaborative Projects." **Due November 19.**

Early Career Research Program Department of Energy - Office of Science
The Office of Science of the Department of Energy hereby invites grant applications for support under the Early Career Research Program in the following program areas: Advanced Scientific Computing Research (ASCR); Biological and Environmental Research (BER); Basic Energy Sciences (BES), Fusion Energy Sciences (FES); High Energy Physics (HEP), and Nuclear Physics (NP). The purpose of this program is to support the development of individual research programs of outstanding scientists early in their careers and to stimulate research careers in the areas supported by the DOE Office of Science. **Due November 20.**

Pathogen Predators Solicitation Number: DARPA-BAA-14-51
DARPA is soliciting proposals for research supporting the potential use of Bdellovibrio and/or Micavibrio bacterial predators as therapeutics against infections caused by Gram-negative antibiotic-resistant and priority threat pathogens. **Due December 9.**

NIJ FY 14 Research and Development for Publicly Funded Forensic Science Laboratories to Assess the Testing and Processing of Physical Evidence
With this solicitation, NIJ seeks proposals for research, evaluation, and validation projects that will: (1) inform the forensic community of best practices through the evaluation of existing laboratory protocols, (2) result in the production of a validated method(s) that may be replicated by other laboratories in the forensic community, and (3) have a direct and immediate impact on laboratory efficiency and assist in making laboratory policy decisions. The intent of this program is to direct the findings of the research and validation toward the identification of the most efficient, accurate, reliable, and cost-effective existing methods for the identification, analysis, and interpretation of physical evidence for criminal justice purposes. **Due December 15**.

Open Solicitations and BAAs

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.**

Agriculture and Food Research Initiative: Foundational Program National Institute of Food and Agriculture USDA-NIFA-AFRI-004412

The AFRI Foundational Program is offered to support research grants in the six AFRI priority areas to continue building a foundation of knowledge critical for solving current and future societal challenges. The six priority areas are: Plant Health and Production and Plant Products; Animal Health and Production and Animal Products; Food Safety, Nutrition, and Health; Renewable Energy, Natural Resources, and Environment; Agriculture Systems and Technology; and Agriculture Economics and Rural Communities. Single-function Research Projects, multi-function Integrated Projects and Food and Agricultural Science Enhancement (FASE) Grants are expected to address one of the Program Area Priorities (see Foundational Program RFA for details). **Open until September 29.**

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 . 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. **Open to September 30, 2014.**

NOAA-NFA-NFAPO-2014-2003949 FY 2014 - 2015 Broad Agency Announcement (BAA)

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.**

W912HZ-14-BAA-01 2014 BAA Engineer Research and Development Center — DOD

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. The BAA is available at 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 Derek Howard at 601-634-3310 or via email at Derek.A.Howard@usace.army.mil . For questions concerning proposals to CERL, contact Wanda Huber at 217-373-6730 or via email at wanda.l.huber@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, 2015.**

DARPA-BAA-14-25 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. TTO also welcomes classified submissions. A copy of the Broad Agency Announcement, DARPA-BAA-14-25, has been posted to the Federal Business Opportunities (FedBizOpps.gov) website at https://www.fbo.gov/spg/ODA/DARPA/CMO/DARPA-BAA-14-25/listing.html . **Open to April 24, 2015.**

DARPA-BAA-14-54 Biological Technologies EZ

The Defense Advanced Research Projects Agency (DARPA) is soliciting innovative research proposals of interest to the Biological Technologies Office (BTO). Of particular interest are those proposals from entities (both small and large business) that have never received Government funding, or who do not normally propose to Government solicitations. Proposed research should investigate leading edge approaches that enable revolutionary advances in science, technologies, or systems at the intersection of biology with engineering and the physical and computer sciences. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of the art. BTO seeks unconventional approaches that are outside the mainstream, challenge assumptions, and have the potential to radically change established practice, lead to extraordinary outcomes, and create entirely new fields. **Open to July 23, 2015.**

Broad Agency Announcement for Research Initiatives at Naval Postgraduate School

The Naval Postgraduate School (NPS) is interested in receiving proposals for research initiatives that offer potential for advancement and improvement in the NPS core mission of graduate education and research. Readers should note that this is an announcement to declare NPS's solicitation in competitive funding of meritorious research initiatives across a spectrum of science and engineering, business, politics and public/foreign policy, operational and information sciences, and interdisciplinary disciplines that are in line with the NPS' graduate education and research mission. Additional information on the Naval Postgraduate School's graduate education and research mission is available at: General Information: http://www.nps.edu/About/index.html ; NPS Strategic Plan: http://www.nps.edu/About/NPSStratPlan.html ; Academic Programs: http://www.nps.edu/Academics/index.html ; Research Programs: http://www.nps.edu/Research/index.html ; Prior to preparing proposals, potential Offerors are strongly encouraged to contact an NPS point of contact (POC) whose program and research efforts best match the Offeror's field of interest. The academic and research programs links above can be used to locate an appropriate POC by exploring the information provided about the faculty members in NPS' schools, research institutes, and interdisciplinary centers and research groups. **Open to July 31, 2015**.

Small University Grants Open 5-Year Broad Agency Announcement

Open to August 26, 2015

DHS-2014-OHA-BIOWATCH BioWatch Program: 2014-2015

The BioWatch Program is a cornerstone of the Department of Homeland Security's (DHS) comprehensive strategy for countering biological terrorism. The BioWatch Program is an early warning system that is designed to detect the intentional release of select aerosolized biological agents. The BioWatch Program's mission is to provide and maintain a continuous bio-terrorism air monitoring system in metropolitan areas and coordinate with state and local public health communities to prepare for and respond to a bioterrorist event. This mission is accomplished by serving as an early warning system which enhances the security of jurisdictions by providing the needed time to execute their comprehensive concept of operations plans to counter biological terrorism. The Biowatch Program is a critical part of an ongoing national effort to build and sustain preparedness which helps the United States to maintain momentum through targeted jurisdictional planning that highlights preventative actions necessary to allow for a proper and timely response and begin the process to recovery from a biological agent release. The BioWatch Evaluation Program (BWEP) will be conducted under the BioWatch Quality Assurance Program effective April 1, 2013. This program will consist of independent external audits (Quality Assurance) by Signature Science and internal audits (Quality Control) by BioWatch Systems Program Office field personnel. This approach will initially be conducted with a focus on adherence to the BioWatch Field Operations Standard Operating Procedure (SOP), Version 1.3 and will eventually evolve to encompass the Field Operations Quality Assurance Program Plan (QAPP). In order to ensure a robust QA / QC program the jurisdictions may be

subject to a QA external audit and a QC internal audit during the same cooperative agreement cycle (year). **Closes September 30, 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.**

HM0210-14-BAA-0001 National Geospatial-Intelligence Agency Academic Research Program
NGA welcomes all innovative ideas for path-breaking research that may advance the GEOINT mission. The NGA mission is to provide timely, relevant, and accurate geospatial intelligence

(GEOINT) in support of national security objectives. GEOINT is the exploitation and analysis of imagery and geospatial information to describe, assess, and visually depict physical features and geographically referenced activities on the Earth. GEOINT consists of imagery, imagery intelligence, and geospatial information. NGA offers a variety of critical GEOINT products in support of U.S. national security objectives and Federal disaster relief, including aeronautical, geodesy, hydrographic, imagery, geospatial and topographical information. The NGA Academic Research Program (NARP) is focused on innovative, far-reaching basic and applied research in science, technology, engineering and mathematics having the potential to advance the GEOINT mission. The objective of the NARP is to support innovative, high-payoff research that provides the basis for revolutionary progress in areas of science and technology affecting the needs and mission of NGA. This research also supports the National System for Geospatial Intelligence (NSG), which is the combination of technology, systems and organizations that gather, produce, distribute and consume geospatial data and information. This research is aimed at advancing GEOINT capabilities by improving analytical methods, enhancing and expanding systems capabilities, and leveraging resources for common NSG goals. The NARP also seeks to improve education in scientific, mathematics, and engineering skills necessary to advance GEOINT capabilities. It is NGA's intent to solicit fundamental research under this BAA. Fundamental research means basic and applied research in science and engineering, the results of which ordinarily are published and shared broadly within the scientific community, as distinguished from proprietary research and from Industrial development, design, production, and product utilization, the results of which ordinarily are restricted for proprietary or national security reason. (National Security Decision Directive (NSDD) 189, National Policy on the Transfer of Scientific, Technical, and Engineering Information). NGA seeks proposals from eligible U.S. institutions for path-breaking GEOINT research in areas of potential interest to NGA, the DoD, and the Intelligence Community (IC). **Open to September 30, 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) Solider/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.**

BAA-HPW-RHX-2014-0001 Human-Centered Intelligence, Surveillance Air Force Research Lab

This effort is an open-ended BAA soliciting innovative research concepts for the overall mission of the Human-Centered Intelligence, Surveillance, & Reconnaissance (ISR) Division (711 HPW/RHX). It is intended to generate research concepts not already defined and planned by RHX as part of its core S&T portfolio. The core RHX mission is to develop human-centered S&T that (1) enables the Air Force to better identify, locate and track humans within the ISR environment and (2) enhance the performance of ISR analysts. To accomplish this mission, the RHX core S&T portfolio is structured into three major research areas: (1) Human Signatures - develop technologies to sense and exploit human bio-signatures at the molecular and macro (anthropometric) level, (2) Human Trust and Interaction – develop technologies to improve human-to-human interactions as well as human-to-machine interactions, and (3) Human Analyst Augmentation – develop technologies to enhance ISR analyst performance and to test the efficacy of newly developed ISR technologies within a simulated operational environment. The RHX mission also includes research carried over from the Airman Biosciences and Performance Program. While not directly linked to the core S&T strategic plan, there exists a unique capability resident within RHX to address critical Air Force operational and sustainment needs resulting from chemical and biological hazards. Research areas include contamination detection, hazard assessment and management, individual and collective protection, and restoration and reconstitution of operational capability. **Open to Feb. 12, 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**.

BAA-RQKD-2014-0001 Open Innovation and Collaboration Department of Defense Air Force -- Research Lab

Open innovation is a methodology to capitalize on diverse, often non-traditional talents and insights, wherever they reside, to solve problems. Commercial industry has proven open innovation to be an effective and efficient mechanism to overcome seemingly impossible technology and/or new product barriers. AFRL has actively and successfully participated in collaborative open innovation efforts. While these experiences have demonstrated the power of open innovation in the research world, existing mechanisms do not allow AFRL to rapidly enter into contractual relationships to further refine or develop solutions that were identified. This BAA will capitalize on commercial industry experience in open innovation and the benefits already achieved by AFRL using this approach. This BAA will provide AFRL an acquisition tool with the flexibility to rapidly solicit proposals through Calls for Proposals and make awards to deliver innovative technical solutions to meet present and future compelling Air Force needs as ever-changing operational issues become known. The requirements, terms and specific

deliverables of each Call for Proposals will vary depending on the nature of the challenge being addressed. It is anticipated that Call(s) for Proposals will address challenges in (or the intersection between) such as the following technology areas: Materials: - Exploiting material properties to meet unique needs - Material analysis, concept / prototype development, and scale up Manufacturing Processes that enable affordable design, production and sustainment operations Aerospace systems: - Vehicle design, control, and coordinated autonomous and/or manned operations - Power and propulsion to enable next generation systems Human Effectiveness: - Methods and techniques to enhance human performance and resiliency in challenging environments - Man – Machine teaming and coordinated activities Sensors and Sensing Systems: - Sensor and sensing system concept development, design, integration and prototyping - Data integration and exploitation. **Open to July 12, 2019.**

Academic Research Funding Strategies, LLC (Page 1)

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What We Do--

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

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- 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.
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- 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

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