Check Out Our New eBook!

As new faculty arrive on campus, learning how to write a successful research proposal will be a critical skill to master.
Our eBook “New Faculty Guide to Competing for Research Funding” provides an invaluable tool to assist faculty in this process, or as a foundation used by research offices developing grantwriting workshops to help faculty write more competitive proposals.

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About the editor

Katherine E. Kelly, PhD, 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.
Creating a pathway from smaller to larger grants, such as moving from an NSF CAREER award to an NSF center award, typically occurs over a period of time measured by decades rather than years. The path becomes increasingly complex over time, requiring a more multifaceted proposal development and grant-writing expertise beyond the core research expertise of a single-PI proposal. While an NSF path is used here for illustration, the path could have early career starting points at many agencies, terminating in a major center proposal a decade or two later to the same or other federal research agencies, e.g., NIH, DoD, DOE, NSF. The path, however, starts with an early career researcher who makes several transitions of scale on research proposals, starting with single-PI initiatives, to multiple-PI initiatives, to multi- and transdisciplinary initiatives, to major center proposals.

In its optimal form, the path represents a strategic assessment of a researcher’s current and projected position in a decades-long research career. While serving as the PI/Director of a major research center, such as an NSF, ERC, or STC may represent the major achievement of a research career, it is important at the start of that career to navigate several waypoints, including gaining the expertise needed to develop and lead research initiatives viewed as the “building blocks” for eventual success at the level of a major national center proposal.

Once you have the successful building blocks in place, strategically selected for integration, you will have in place the competitive components needed to pursue center-level or center funding. Synergy and integration in center proposals is the equivalent of what in architecture would be called the keystone that holds all the building blocks of a stone arch together. In a center proposal, synergy and integration hold together the center research and its related components.

By analogy, a stonemason will develop the geometric reasoning, understanding of materials, and expertise to cut and fit stone to build a complex arch only after first starting out building more rectilinear structures that hone the skills needed to build structures of more complex geometries and analysis of forces, particularly since stone is extraordinarily strong in compression, but very weak in resisting tensile stresses, hence the geometry of the stone arch is designed to put the stone building blocks in compression and the keystone ties everything together. Similarly, the path from early career research proposals to later career research center proposals resembles that taken by a stonemason who must gradually acquire the knowledge and skills to build a complex arch. It requires continuously expanding your knowledge and expertise base in order to develop and write proposals that represent increasingly more complex configurations, or geometries of research disciplines and other programmatic components.

For example, solicitations for a major research center often feature components resembling smaller research grants funded by the agency over a period of time (again, thinking of these components as center building blocks is helpful). These smaller research building blocks represent one good starting point for success in building a suite of connected grants
funded by one or more agencies that, in aggregate, give you the research and management experience needed to compete for a national center. At some point of your choosing, you, and your center research team, will have gained the needed expertise through a strategic configuration of research grants that will position you to compete for a center solicitation and align your research capacities to achieve a significant research synergy and value-added benefits under a center structure.

Moreover, most often these building blocks include elements in addition to the core research areas to be integrated under a center structure. To configure center building blocks may require your capacity to integrate the core research objectives of a project with complementary programmatic objectives that represent priorities of the particular funding agency. These may include such essential program components as innovation and commercialization, international research experiences for graduate students, K-12 education and outreach, undergraduate research, societal dimensions and impacts, STEM diversity K-PhD, community and climate of the research center in advancing faculty diversity, and program evaluation and assessment, among many others. The more experience and success you and your research team have gained in forming teams and partnerships requiring you to integrate the experience and expertise you have gained on both small and large grants, the more competitive you will be for the very largest grants at the center level.

To compete successfully for a center grant requires, above all, the capacity to present an integrated research team vision and the proven research management experience to clearly demonstrate the likelihood of achieving that vision.

For example, the building blocks for the recently awarded Engineering Research Centers Partnerships in Transformational Research, Education and Technology - A Focused Call for Nanosystems ERCs (September 2012 awards to UT-Austin, NCSU, UCLA) at NSF consisted of a decade of related funding vehicles (i.e., building blocks), including individual grants (unsolicited and Nanoscale Exploratory Research - NERs), small teams (Nanoscale Interdisciplinary Research Teams - NIRTs), and user networks such as National Nanotechnology Infrastructure Network (NNIN) and the Network for Computational Nanotechnology (NCN). Moreover, many other NSF programs over the past decade have also supported research and education activities in nanotechnology, and other agencies, such as DoD, have offered funding as well. These might also have been used as building blocks for this solicitation.

Therefore, to continue the analogy of the center proposal as the keystone, you might think of these small and large research programs at funding agencies as the quarry holding the component pieces, or building blocks, required to eventually build a research center. Of course, center solicitations from all agencies are continuously evolving, and no one can predict how they will evolve over the coming years. However, you are well advised to plan and anticipate the research waypoints that will make your center proposal more competitive when opportunity presents itself, particularly since you can assume that, in the near term, such an opportunity will grow out of existing research priorities and smaller-scale solicitations at individual agencies.

In addition to recognizing that responses to specific research solicitations can serve as building blocks for center funding, you must also understand the importance of “thematic building blocks” to specific agencies. Take, for example, the thematic objectives that NSF
defines as important to Gen-3 ERCs, as listed below. Unlike the references above to a decade of specific solicitations that influenced the research basis for the Nanosystems ERC solicitation, the below represent key themes that cut across all funding at NSF in one way or another, but are all-inclusive at the center level. Each of the thematic areas listed below also represents discrete funding opportunities at NSF, but in aggregate, these thematic building blocks also represent a culture, community, and climate for team research and education that NSF sees as important. The future PI of a successful center proposal must therefore understand and achieve fluency (note agency key words/tags), experience, and expertise in incorporating these below themes into larger, more complex research projects as appropriate to any specific solicitation.

1. Advance discovery and build bridges from science-based discovery to technological innovation to realize transformational engineered systems;
2. Develop a culture in academe that joins research, education, and innovation to create and sustain an innovation ecosystem to enable the center vision;
3. Provide international opportunities for research and education collaboration that will prepare U.S. engineering graduates for leadership in innovation in a global economy;
4. Form teams of diverse and talented faculty who will prepare diverse and talented domestic and international graduates to function effectively in a global world where research, design and production efforts cross national borders;
5. Function with transformational engineering education programs that rest on partnerships with pre-college institutions to attract students to engineering and university departments to strategically impart in engineering graduates the capacity to create and exploit knowledge for technological innovation; and
6. Build and sustain a culture that links discovery to innovation, i.e., the innovation ecosystem, which will include partnerships with members firms/practitioners to strengthen the center and streamline technology transfer; translational research partnerships with small firms to accelerate commercialization of high risk ERC advancements; and innovation partnerships with local level organizations to stimulate entrepreneurship and job creation and enable technological innovation.

Faculty can use the themes embedded in this list to construct thematic research building blocks for a center-level award. Moreover, it is important in this process to have a good understanding of the meaning of the key words used by the agency, as noted above in bold, and how your research can be expressed using the agency language.

Moreover, researchers on a pathway to a center proposal will need to build a strategically planned configuration of key successes in proposals of various scales that, in turn, will give them the experience and multifaceted expertise to eventually win a major research center. This expertise includes the experience of being successful early in your research career in developing research proposals, and then making the transition to larger, more ambitious proposals. A key waypoint in this path is success in developing and writing team and other proposals that are large, integrated research efforts of several millions of dollars or more, but
not yet at the scope and scale of a major center. However, precisely these proposals can serve as the training ground for eventual success at the center level.

How might you imagine traveling the pathway from smaller, single, or a few PI grants to larger, more complex research grants? Consider the elements below:

**More dollars.** With more dollars comes larger proposals, often with more research objectives and “more moving parts.” The development, writing and, if successful, management of a small, single-PI grant is similar to juggling one ball in the air at a time. As the award size increases, so does the number of balls the PI must juggle. It is reasonable to anticipate that you will be required to juggle an additional ball for every $1 million increase in the size of a research proposal. So by the time you are ready to compete for a center proposal, it will be important to demonstrate that you have experience juggling five, ten, or fifteen balls at a time before attempting to juggle the twenty or more required of a PI/Director of a major center.

**More disciplines.** Larger proposals typically mean that the sponsor will require meeting a larger number of disciplinary objectives. Experience managing the integration of multiple disciplines in a research proposal is a critical skill to master. Centers rely upon disciplinary synthesis and integration. The keystone to a successful center proposal is the research vision, synergy, and value-added benefits described in the research narrative. Those critical attributes are grounded on the capacity of the PI and the research team to understand, integrate, and then explain to reviewers how multiple disciplines will intersect and spark significant scientific advances in the particular field. Furthermore, the PI of such a proposal must be sufficiently fluent in the disciplinary topic areas of the proposal to be able to write a compelling, and hence integrative, research narrative. If the PI lacks this experience, it can lead to a research narrative reading more like a collection of complementary journal articles than an integrated project narrative. Integrating disciplines is a learned skill and it can be practiced and strengthened through a series of grants awarded for amounts smaller than those of a center.

**More participants.** Larger proposals with more disciplines means more disciplinary participants. With more participants comes more team dynamics. In the end, it falls to the PI to make the team dynamics work in a way that allows a competitive proposal to be developed and written. This is also a learned skill, as is learning how to be a good team member. For example, a good team member does what she says she will do, does it well, does it on time, and remains fully engaged and available for team communications. Also, it is often small actions that, in aggregate, create good team dynamics and lead to a successful proposal. On a team proposal, for example, every member must (1) read and understand the solicitation in detail, (2) understand that budget allocations are based on value adding contributions to the research by each team member and not just by dividing the total budget by N team members, and (3) understand the research contributions of other team members sufficiently well to allow an integrated narrative to be written. Of course, not only for centers but also for any team-based research grant, regardless of scale, a history of team collaboration is a key ingredient to success.

**More management expertise.** As grants grow larger, they typically grow in research and programmatic objectives, in the relational complexity of multiple research strands to one another and to other program components, in the relational dynamics among team members,
and in complexity of the budget, among many other factors, all of which require a high level of research management experience to navigate well.

Of course, the core attributes determining a PI’s success in managing the development and writing of a large proposal is that the team members respect the PI’s (1) research expertise, (2) planning and organizational skills, (3) fairness and skill in managing team dynamics, (4) communication skills, (5) capacity to define an overarching vision for the research narrative, (6) ability to lead and inspire by describing a research vision that engages other researchers and partner institutions, (7) ability to explain why the integration of the research strands proposed in the research narrative achieves a more compelling research vision and clearly stated synergy not possible were the research strands funded as separate projects, (8) understanding of and appreciation for the importance of all agency-required program components in addition to the core research (something particularly important at NSF where broader impacts, integration of research and education, diversity, etc., are key factors in success), (9) full engagement and passion for the project, and (10) ability to inspire in the research development team a feeling of confidence in the project’s likely success.

More time consuming. Large research proposals take more planning, time, and scheduling to do well. The prospective PI must master the ability to plan the development waypoints for a successful proposal.

More involvement in disciplinary domains outside your expertise. Many large proposals require the PI to become sufficiently informed on partnered disciplinary areas to ensure that competitive decisions are made and the right partners and collaborators are invited to join the proposal during the development and writing stages. This skill will be important to success on any major center proposal. Most importantly, the PI needs to assess the quality of anyone brought on the proposal to meet a particular requirement of the solicitation. This should include not only research partners but collaborators in any major component of the proposal. It is critical that the PI of a large proposal take the time to sufficiently judge the expertise of all potential partners before inviting them to join the effort.

Once a person is invited to join a proposal, it becomes awkward for the PI to disinvite that person, and it can become a significant distraction to the PI should the disinvited person decide to make the parting a messy one. Moreover, many research PI’s, particularly for large NSF proposals, need to have a working understanding of areas of broader impacts, such as innovation, commercialization, diversity, education and outreach, STEM education K-PhD, research community and climate, societal benefits and impacts, evaluation and assessment and mentoring.

Many large research proposals may include some of these topics, but at the center level, it may be that the PI needs to address them all, and more. **The PI must be sufficiently fluent in these topic domains to know that if several partners are included in the proposal to address these issues, then what is proposed will likely be considered meritorious by the funding agency.** It is always important to understand these topic areas in order to best explain in the research narrative how they bring value-added benefits to the proposal. In terms of the bottom line, it is also important for the PI to know who performs good work in these areas and who may not. Just because someone has a two- or three-page write up of his expertise in a broader impacts area or societal impacts area does not mean that that person is necessarily
qualified to be on the proposal, or that the proposed broader impacts work gives a complementary synergy to the proposal. The PI needs to be informed enough, or have team members informed enough, to make this judgment.
“Describe how you will sustain program activities after the award period.” Agencies often require applicants to address this issue in the project description. It is not a trivial request, nor one to be taken lightly, nor one that can be addressed with fiscal smoke and mirrors. It is also a difficult question whose simplest answer can rarely be given: “the president [or dean] commits to sustain the program after the grant period at the same level of funding provided under the grant by including the program in the base budget of the university [or college] for a period of at least N years.”

Unfortunately, base budget allocations at most universities remain tight, often undergoing reductions by state legislatures, increasing the fierce competition for budget allocations within universities. As a consequence, coming up with a sustainability plan for a project after the grant period has ended requires some thinking. This puts you in a position similar to that of nuclear physicists after WWII, when funding for the Manhattan project ended. Nobel Laureate I.I. Rabi famously told his Columbia physics lab colleagues, “Our budget has been cut and there is no more money for experimental equipment. So now we are going to have to start to think.”

Fortunately, researchers can often find some programmatic wiggle room when writing a sustainability statement, and most agencies and foundations do not expect a program to continue forever as a perfect clone of itself after the grant period expires. In fact, some research center solicitations do not require a sustainability plan on the grounds that the research conducted under a five-year award and an additional five-year renewal award should sufficiently address the research questions of interest to the funding agency.

In most cases, project descriptions requiring a sustainability section are specific to a solicitation and require a response unique to that program. The scale of a project will often determine the sponsor’s expectations of a well-crafted sustainability plan. However, as in many areas related to strategies for writing competitive proposals, applicants can take a generic approach, as described below, to developing strategies, plans, and activities for a convincing sustainability plan.

Of course, the most important rule to follow in writing a sustainability section is to give it the detailed attention it deserves as one of many sections of a project description that, in aggregate, will give your proposal a competitive advantage. Don’t waste your time wondering how much weight a sustainability statement will be given in the final award decision. In some cases it may be significant, and in other cases less so. Regardless, it is always best to assume that if a sponsor asks applicants to address a particular topic in the research narrative, then the wise author will respond fully to that topic, creating a reply as close to perfect as is possible. If the funding agency were indifferent to how well you respond to a specific question, then it would not ask the question.

Moreover, avoid treating the sustainability statement as an afterthought to be addressed in the final days of completing the research narrative. Don’t write it as boilerplate.
Thinking of any component of a project description as boilerplate is a recipe for failure. After all, proposals represent the quality of your ideas. If a solicitation requires a sustainability and commitment statement, then that statement should be grounded in your ideas of how best to sustain the project’s goals and objectives after the grant period. The development of the sustainability statement should align itself with the other core elements of the proposal. The core goals and key objectives of any particular project will need to be addressed in a sustainability and commitment statement, or what is sometimes called a project continuance plan.

As a first step in developing a sustainability statement, ascertain the sponsor’s expectations. In some cases, the solicitation may be very specific in describing the precise activities that need to be sustained; in other cases, the sponsor may be more general, leaving it up to the applicant to complete a sustainability plan that fits the particular program’s longer-term goals and objectives.

It may be appropriate in the planning, development, and writing of a proposal that requires a sustainability statement to develop a strategic plan for sustainability that identifies the program goals and objectives that need to be sustained. These goals and objectives then need to be mapped to institutional resources that will be available after the grant period to ensure continuation of key program activities. There are often a broad range of institutional resources and program linkages of potential use in continuing key program activities after the grant period, including:

- incorporation of some project activities into a base budget,
- commitment of staff time,
- continuation of space commitments made during the grant period, or new space commitments,
- access to equipment and instrumentation,
- institutional support in seeking other funding opportunities from federal agencies and foundations, industry, or university donors,
- adoption of project goals into strategic plans and mission statements,
- institutionalizing project goals, e.g., changes to community, culture and climate developed under a diversity project, or adoption of new courses developed as part of a research program,
- developing institutional partnerships and collaborations that allow the integration of key project components into existing institutional infrastructures,
- identifying institutional “administrative champions” that support the project’s goals and objectives and will work to sustain them.

Some guidance on development sustainability plans often can be obtained in agency reports and other program documents. For example, *Results from the Best Practices for IGERT Sustainability*, a report by the Center for Innovation and Research in Graduate Education, University of Washington (2007), based on 20 interviews with 19 IGERT PIs, showed that programs were most successful in attaining sustainability if they managed to be integrated early on in wider campus initiatives and fostered close ties to disciplinary home departments. Similarly, the NSF Engineering Research Centers most successful in achieving
sustainability after NSF funding included the following characteristics in their plans, according to the NSF commissioned report *Post-Graduation Status of National Science Foundation Engineering Research Centers, Report of a Survey of Graduated ERCs* (January 2010), SciTech Communications LLC:

- Broad involvement of faculty, staff, industrial partners and university administration in transition planning,
- Institutional factors—degree of university commitment, extent to which the center is prized and whether or not the center’s policies support cross-disciplinary research and education,
- Education program sufficiently valued by faculty and students that it will be maintained,
- Commitment and interest of core group of faculty,
- Active industrial support and continuation of industrial membership and industrial advisory board guidance,
- Effective implementation of a realistic transition strategy that builds on and enhances the center’s strengths.

However, the most critical component of a successful sustainability plan is that the leadership and management of the project during the grant period is exemplary, and that the core goals and objectives of the project align themselves with the institutional mission, strategic plan, and vision. In this regard, keep in mind the old adage that “success has many sponsors, but failure is an orphan.”

*The biggest contributor to a successfully sustained program is that it be grounded on a successful program.*
The ARPA-E webinar of the above title this October 3 presented by Dane A. Boysen, PhD, Program Director, and Ilan Gur, PhD, Program Director and Senior Advisor, gives an excellent insight from the perspective of ARPA-E program directors into what constitutes a competitive technical pitch to that agency. Moreover, while the webinar uses concepts from the ARPA-E funding selection process at the concept stage, the proposal strategies apply to anyone attempting to communicate complex technical information in a short format. Many short documents serving as gates to submitting full proposals, or as the project summary, executive summary, or introduction to a full proposal, feature this skill. The relevance of this skill goes well beyond the requirements for submitting successful grants to ARPA-E.

This skill comes into play across the defense agencies and any federal mission agency using white papers, concept papers, quad charts, preliminary proposals, and other similar gates to determine whether or not you will be invited to submit a full proposal. It is certainly a key skill to master at the concept stage of your research as you respond to open DOD and DARPA BAAs using a short-format document, typically a white paper of a few pages, to make a compelling and convincing case for the significance of your research and its value-added benefits to the agency mission in the hope of being invited to submit a full proposal.

For example, the four-page white paper due last week (October 9) for the FY 2013 Multi-University Research Initiative requires understanding the “deadly sins and five best practices” addressed in this webinar. This understanding avoids the dilemma by which good ideas have been disguised by poorly structured white papers; therefore, expect to create multiple iterations of this brief document that, over time, will sharpen its focus and create an increasingly concise statement of your idea. The below advice by ARPA-E program directors will help you do that.

The 5 Deadly Sins of an ARPA-E proposal are to submit a proposal that is...

1. **Insignificant**: The proposal does not draw a clear connection showing that a successful project would lead to a significant impact on one of ARPA-E's mission areas.

2. **Indistinguishable**: The proposal fails to communicate how the proposed approach is innovative and differentiated from commercial or emerging technologies being funded or developed elsewhere.

3. **Incremental**: The proposal describes a low-risk approach that seems more like an engineering development project vs. disruptive R&D.

4. **Incoherent**: The proposal reads as though several disparate sections by different team partners were written independently and "stapled" together -- lacks cohesive vision/teaming.
5. **Indefinite:** The proposal generically describes ideas being proposed without any detail on the technology, and/or provides no justifications for the claims that are made.

**The Summary of Best Practices include...**
1. Describe the technological innovation in the first sentence.
2. Provide a visual aid describing technology directly after the first paragraph.
3. Back-up claims with data or strong scientific rationale.
4. Compare proposed technology to the state of art.
5. Clearly identify the technical challenges and approaches to solving them.

The following slides from the October 3, 2012 webinar visually elaborate on each of the above points and include the following:

**What makes an ARPA-E program?**

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<td>➤ Large commercial application</td>
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<td>➤ Disrupts existing learning curves</td>
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<th>3. Bridge</th>
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<td>➤ Not researched or funded elsewhere</td>
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The Heilmeier Catechism

- What are you trying to do? Articulate your objectives with absolutely no jargon.
- How is it done today, and what are the limits of current practice?
- What's new in your approach and why do you think it will be successful?
- Who cares?
- If you're successful, what difference will it make?
- How much will it cost?
- How long will it take?
- What are the midterm and final "exams" to check for success?
5 Best Practices

1. Describe the technological innovation in the first sentence

We propose a rechargeable fluorine ion (F-ion) battery that uses a solid state fluorine ion conductor (e.g., La$_{0.5}$Ba$_{0.5}$F$_{2.9}$) with metal fluoride electrodes, such as the CeF$_3$/CuF$_2$ couple. Solid state F-ion batteries with electrodes such as this couple are rechargeable (Figure 2). Several key challenges remain in demonstrating the viability of a F-ion battery including: 1) decreasing electrolyte resistance losses, 2) increasing electrode material utilizations, and 3) maintaining capacity over long cycle life. In the proposed work these challenges will be addressed by: 1) decreasing the electrolyte thickness and doping the electrolyte to increase conductivity, 2) engineering electrode microstructure to better utilize electrode material, and 3) selecting optimal electrode materials for enhanced cyclability.

![Diagram of F-ion battery with CeF$_3$/CuF$_2$ electrodes](image1.png)


2. Provide a visual aid describing technology directly after the first paragraph

We propose a rechargeable fluorine ion (F-ion) battery that uses a solid state fluorine ion conductor (e.g., La$_{0.5}$Ba$_{0.5}$F$_{2.9}$) with metal fluoride electrodes, such as the CeF$_3$/CuF$_2$ couple. Solid state F-ion batteries with electrodes such as CeF$_3$/CuF$_2$ electrodes have a theoretical energy density of 792 Wh/kg (2.9 V) that compares favorably to state-of-the-art Li-ion batteries such as LiCoO$_2$ at 558 Wh/kg (3.6 V). To date, we have demonstrated that the CeF$_3$/CuF$_2$ electrode couple is rechargeable (Figure 2). Several key challenges remain in demonstrating the viability of a F-ion battery including: 1) decreasing electrolyte resistance losses, 2) increasing electrode material utilizations, and 3) maintaining capacity over long cycle life. In the proposed work these challenges will be addressed by: 1) decreasing the electrolyte thickness and doping the electrolyte to increase conductivity, 2) engineering electrode microstructure to better utilize electrode material, and 3) selecting optimal electrode materials for enhanced cyclability.

![Diagram of F-ion battery with CeF$_3$/CuF$_2$ electrodes](image2.png)
3. **Back-up claims with data or strong scientific rationale**

Rechargeable Solid State Fluorine Ion Battery

We propose a rechargeable fluorine ion (F-ion) battery that uses a solid state fluorine ion conductor (e.g., La$_3$Ba$_x$F$_{3+x}$) with metal fluoride electrodes, such as the Ce/I$_2$ couple. Solid state F-ion batteries with electrodes such as Ce/I$_2$ electrodes have a theoretical energy density of 792 Wh/kg (2.9 V) that compares favorably to state-of-the-art Li-ion batteries such as LiC$_x$/CoO$_2$ at 558 Wh/kg (3.6 V). To date, we have demonstrated that the Ce/I$_2$ battery can have a capacity over long cycle life. In the proposed work these challenges will be addressed by: 1) decreasing the electrolyte thickness and doping the electrolyte to increase conductivity; 2) engineering electrode microstructure to better utilize the electrode material; and 3) selecting optimal electrode materials for enhanced cyclability.

![Diagram F-ion battery with Ce/I$_2$ electrodes](image1.png)

![Figure 2. Preliminary charge-discharge cycles at 10 um/cm$^2$ and 150 °C of a Ce/I$_2$ cell.](image2.png)

5 Best Practices

4. **Compare proposed technology to the state of art**

Rechargeable Solid State Fluorine Ion Battery

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![Diagram F-ion battery with Ce/I$_2$ electrodes](image1.png)

![Figure 2. Preliminary charge-discharge cycles at 10 um/cm$^2$ and 150 °C of a Ce/I$_2$ cell.](image2.png)
5 Best Practices

5. Clearly identify the technical challenges and approaches to solving them

Rechargeable Solid State Fluorine Ion Battery

We propose a rechargeable fluorine-ion (F-ion) battery that uses a solid state fluorine ion conductor (e.g., Li₂Ba₂F₇) with metal fluoride electrodes, such as the CeF₃/CuF₂ couple. Solid state F-ion batteries with electrodes such as CeF₃/CuF₂ electrodes have a theoretical energy density of 792 Wh/kg (2.9 V) that compares favorably to state-of-the-art Li-ion batteries such as LiCoO₂/CdO₂ at 568 Wh/kg (3.6 V). To date, we have demonstrated the CeF₃/CuF₂ electrode is rechargeable (Figure 2). Several key challenges remain in demonstrating the viability of a F-ion battery, including: 1) decreasing electrolyte resistance losses, 2) increasing electrode material utilizations, and 3) maintaining capacity over long cycle life. In the proposed work these challenges will be addressed by 1) decreasing the electrolyte thickness and doping the electrolyte to increase conductivity, 2) engineering electrode microstructure to better utilize electrode material, and 3) selecting optimal electrode materials for enhanced cyclability.

![Figure 1. Diagram F-ion battery with CeF₃/CuF₂ electrodes.](image)

![Figure 2. Preliminary charge-discharge cycles at 10 minutes and 100 °C of a CeF₃/CuF₂ cell.](image)
There are many scary Halloween costumes you might inadvertently wear to mask the identity of the research idea put forward in your proposal, and unfortunately, any one of them will result in more tricks than treats when it comes to the success of your grant. Of course, the premise here assumes that a fundable idea lies cloaked beneath a number of correctable grant-writing mistakes identified sufficiently before the due date to allow for their correction. Unlike Halloween, when scary costumes earn treats, program officers and reviewers will not reward ideas cloaked in ghoulish disguises. Unfortunately, a number of all too common scary costumes can so successfully disguise a potentially fundable idea that the idea becomes unrecognizable to the reviewers. To avoid spooking reviewers, don’t submit your proposal cloaked or masked, or wearing one of the more common scary costumes guaranteed to horrify, as addressed in the below examples of possible proposal disguises.

The Unbalanced Disguise

Balance, proportion, and emphasis are key characteristics of a well-written proposal narrative. While the intentional absence or distortion of these characteristics makes for fanciful Halloween masks of ghoulish, frightening features, an unintentional neglect of these characteristics in the proposal narrative will have a similarly disturbing effect on program officers and reviewers. In the case of the ghoulish Halloween mask, the reward may well be a generous amount of candy. But the ghoulishly distorted proposal that knocks on an agency’s door will likely leave empty handed.

Unfortunately, the rules for a well-proportioned and balanced project narrative are not as easily described as Euclid’s golden triangle, where the ratio of 1.618033 was viewed as proportionally perfect. Of course, the ideal proportion in the project narrative is not something the early Greeks addressed, at least as far as we know, and so it is left to the proposal authors to make sure to appropriately balance the narrative’s many sections.

How do proposal narratives become unbalanced or poorly proportioned? When a single author or a team of authors produces the first draft of a proposal, they will typically write most about what they know best. For example, first drafts often feature a disproportionately long background section that imbalances the narrative. Fortunately, creating the first draft of a proposal by following a template or narrative outline drawn from the solicitation and review criteria will reduce the likelihood of writing an imbalanced project narrative.

However, while a narrative template that outlines the required sections and subsections of any specific project description can reduce imbalance, it does not entirely prevent errors in assigning the weight given to particular sections of the proposal, even in cases where a well-crafted template imposes pages limits on sections, or where the solicitation itself imposes page limits on sections. Often, segments receiving the least space in a first draft may emerge as the core sections of the proposal narrative that are not only the most important but also the most
challenging to write. These sections tend to relate to the research vision, synergy among project objectives, and the like, which lie at the core of the competitive submittal.

Balance, proportion, and emphasis in the project description need to be continuously monitored during the writing and internal review process with each thoughtful iteration of the narrative. It is not unusual that initial proposal drafts develop a significant amount of imbalance. This needn’t hamper the proposal’s success as long as the authors recognize that each subsequent draft of the proposal requires a new rebalancing to account for the revised text.

For instance, authors commonly allow a draft narrative, particularly in the early stages of development, to run well over the page limit to ensure that they cast a broad “narrative net” over all of the ideas with a potential to contribute to the proposal’s success. However, as the due date approaches, the process of honing, crafting, and tightening the narrative begins. This is the point at which close attention must be paid to achieving balance among sections of the proposal.

For example, if buffers are not important to the proposed research project, don’t spend narrative time on buffers. Check to see whether or not the management plan is appropriate for the scale and scope of the project, or whether the narrative balance reflects the agency’s weighting of review criteria, or whether the narrative overemphasizes less important questions asked in the solicitation and underemphasizes the most important questions, or whether the narrative description appears untethered from the budget requests.

Balance, proportion, and emphasis are key attributes of the well-written, and hence successful, proposal and need to reflect an internal hierarchy of ideas advanced in the narrative and the support requested in the budget to develop those ideas.

The “I Really Need this Grant” Mask

If you want to strike horror into the hearts of program officers and reviewers alike, then make a need-based arguments to a merit-based research agency. If need is a factor in the review of the proposal, it will be stated as such in the solicitation, e.g., in U.S. Department of Education solicitations, need is sometimes a weighted factor. Moreover, if other non-merit-based factors are part of the review process, then those will be stated in the solicitation as well. For example, in some cases, federal mission agencies look for a geographic distribution in making awards under a specific program. Absent a note in the program solicitation describing review factors other than those related to merit, don’t disguise and overshadow a potentially fundable idea by focusing on need-based descriptions rather than the merit of your ideas.

While in some instances at certain funding agencies a compelling description of the need for the project is one review criterion, it is typically not a criterion at the major research funding agencies. Therefore, making need-based pleas in a proposal to a merit-based agency, such as NSF or NIH, arguing that rejecting your proposal amounts to callously shutting down the local orphanage, is not a wise strategy. These arguments are perhaps better directed to a foundation, particularly state or regional foundations, or federal agencies with programs that do account for need as a factor in competitiveness.

Moreover, without guidance from a university research office or members of a university community, some faculty or professional staff without sufficient experience in
reading a solicitation closely, or an understanding of the mission and culture of a particular agency, may mistake a research proposal solicitation for an infrastructure support solicitation. This can often be exacerbated when reduced or flat budget appropriations force some university offices to adopt unrealistic expectations of finding grant funding to support personnel and administrative infrastructures. Or, this can happen when faculty with a history of internal support for various programmatic infrastructures are forced to look elsewhere for funding due to budget cuts and fiscal redirections. In other cases, it may occur when faculty or professional staff in university offices with a history of funding from need-based agencies and foundations are looking for a new revenue stream to support expanded programs, or for those programs that are being defunded.

While this misinterpretation of a merit-based research agency’s mission can be directed to many federal agencies, it is most often directed to the NSF. Taking what is essentially a need-based rather than a merit-based argument to NSF occurs fairly commonly, particularly in the domain of education, where researchers may lack familiarity with NSF’s mission and culture.

Helping potential applicants clearly understand the distinction between need- and merit-based agencies or solicitations as early in the proposal development process as possible can save a significant amount of time and resources, not only for those writing the proposals but also for those who must advise, process, or submit those proposals.
The NSF Major Research Instrumentation Proposal
Avoiding Common Mistakes

The NSF Major Research Instrumentation program offers the opportunity to win funding for expensive instrumentation that researchers could not include in a standard grant; here’s an overview of what reviewers are looking for and common mistakes you should avoid.

NSF’s Major Research Instrumentation (MRI) program is a long-standing program that funds acquisition or development of instrumentation ranging from $100K to $4 million. (For non-PhD-granting institutions and for researchers in the social, behavioral, and economic sciences and in mathematics, requests less than $100K are allowed.) This program provides an excellent opportunity for universities to enhance their research infrastructure by purchasing or developing instruments that can enable new research and education activities at their campuses and in their region. In this article, we’ll go over some basic information about the MRI, and then we’ll discuss common mistakes that PIs make in writing MRI proposals and how to avoid them. MRI proposal are typically due in January of each year; this year, the deadline is January 24, 2013. The solicitation for FY 2013 isn’t out yet, but you can see last year’s solicitation here.

MRI Overview

MRI grants come in two “flavors” – an instrumentation acquisition grant, which funds the purchase of off-the-shelf instrumentation, and an instrument development grant, which funds development of an innovative, new instrument. The number of proposals that can be submitted by an institution is limited; each institution can submit up to a total of three MRI proposals, no more than two of which can be acquisition proposals. If you’re interested in submitting an MRI, be sure to check with your grants office to find out the procedure for selecting which proposals will be submitted from your institution. (Often, institutions run an internal competition to select who can submit, and deadlines for that internal competition are likely coming up soon.)

MRI instrument acquisition grants can be used to buy multiple pieces of equipment needed for a single purpose, such as a transmission electron microscope and a microwafering saw required to prepare the specimens, but it cannot be used to buy multiple pieces of equipment to outfit a lab (for example, a differential scanning calorimeter, a thermomechanical analyzer, and a rheometer for a thermal analysis lab). It also cannot be used to buy general purpose equipment, such as fume hoods, cryogenic storage systems, etc.

It’s important to note that, unlike most NSF programs, cost sharing is required for PhD-granting institutions and non-degree-granting institutions at exactly 30% (more is not allowed) of the total project cost. Non-PhD-granting institutions are exempt from cost shar. For the MRI, a non-PhD-granting institution is defined as one that has awarded fewer than 21 PhD/DSci degrees in NSF-supported disciplines over the last 2 years. Note that the definition of “non-
PhD-granting” is somewhat different for MRI than it is for NSF’s Research in Undergraduate Institutions (RUI) program, so even if you know your institution is eligible for the RUI, it’s a good idea to make sure your institution fits the MRI definition.

You must designate a division within NSF (not the Office of Integrative Activities) to review your proposal. If you feel that more than one division may support the research enabled by the instrument, you may designate a secondary division. The webinar also recommended that if you feel specialized expertise is needed to review your proposal, be sure to suggest appropriate reviewers with the required knowledge.

The project description for an MRI proposal is limited to fifteen pages and must include the following sections (the solicitation includes suggested page counts for each section):

- **Instrument location and type** - see the solicitation for detailed instructions on this section
- **Research activities to be enabled** – detailed description of the researchers who will use the instrument, the students who will be involved, and the research that will be enabled
- **Description of research instrumentation and needs** - describe the instrument, its capabilities, and the need for the instrument
- **Impact on research and training infrastructure** – how the instrument will enhance training and broaden participation
- **Management plan** – for acquisition proposals, how will the instrument be managed (who decides who can use the instrument, how will it be maintained, do you have the expertise at the institution to run the instrument, etc.)? For development proposals, what is your plan for developing and constructing the instrument?

**What are Reviewers Looking For?**

When developing your MRI proposal, remember that NSF is looking for maximum impact for the funds it is investing. For **acquisition proposals**, this means:

- Enables important research of interest to NSF
- Will have multiple users (from multiple disciplines and institutions, if possible)
- Significantly impacts education
- Addresses diversity (will improve abilities to broaden participation in STEM by women, underrepresented minorities, and women)
- The instrument will be well used and well maintained
- The instrument will improve your institution’s capabilities to conduct leading-edge research and provide leading-edge research experiences for undergraduates.

For **development proposals**

- Your plan for developing the instrument is well thought out, detailed, and realistic.
- Your team has the expertise and resources needed to construct the instrument.
- If you have students on your budget, their involvement is needed to construct the instrument, and the experience contributes to their training as the next generation of instrumentalists
- The cost of the new technology is appropriate
The instrument to be developed is needed and will provide significant improvements in capability or performance compared to existing instruments.

There is a larger user community that strongly needs the instrument.

Avoid Common Mistakes

**Inadequate discussion of the science the instrument will enable**

A common mistake is to fail to describe in detail *the new research the instrument will enable that is not currently possible*. PIs often ask potential users to send a description of the research they will conduct with the instrument. The PI then collects these descriptions, which are often standard text that the researcher copied from other proposals or documents. These descriptions discuss each participating faculty’s research, but don’t specifically describe how the new instrument will impact the research, and what the expected new outcomes might be. This is not enough for an MRI proposal! Instead, each user should describe clearly in her research description specifically how access to the proposed instrument will enhance her research and enable results that would not otherwise be possible. What is it that the researcher can’t do now that he could do if he had access to the instrument? Why is this research important? So, for example, instead of writing,

“Dr. x performs research on xyz. She has found ....[standard description of her research project(s)] and results...],

write,

“Dr. x performs research on xyz ... [description of her research and its significance]. Because there is no [requested instrument] at ABC University, her students must travel two hours each way to Big State University to conducted needed measurements This has resulted in ...[describe problems]. If the proposed instrument is acquired, this will enable them to accomplish....”

Or

“... because our current instrument has only X nanometer resolution, this has prevented Dr. X from ...[describe research she can’t do or questions she can’t answer]. If the requested instrument with 0.X nanometer resolution is acquired, this would enable her to ...

In this way, your proposal will paint a clear picture for reviewers of how the requested instrument will impact research at your institution and help users at other institutions. It is often a good idea to include in the *Description of Research Instrumentation and Needs* section sample measurements made using a similar instrument, showing the value of the requested instrument in terms of improved precision, resolution, etc., and perhaps comparing it to measurements taken using your current instrument. If an instrument like the one you are requesting already exists in your institution or at a nearby institution, be sure to explain why that instrument won’t meet your needs (e.g., it is already in full use, or travel to the other institution is impractical or too time consuming).

While it isn’t required that the research to be conducted with the instrument be funded by NSF, it is certainly helpful to show that the instrument will enhance NSF-funded projects. If that’s not possible, you’ll want to make the argument that the research is of interest to NSF, and some of it may be funded by NSF in the future.
For instrument development proposals, the proposal should make a strong argument that the newly developed instrument will enable exciting new science of interest to NSF. Depending on the Directorate, it may also be important to discuss how the instrument might be commercialized.

**Too few or inappropriate users of the Instrument**

The kiss of death for an MRI acquisition proposal is to give the impression that an instrument will be used by a single faculty researcher or a small group of faculty within a department. NSF has a limited amount of funds to award, so they want each grant to impact a significant number of researchers in multiple departments and institutions, if possible (of course, this will depend in part on the type of instrument and your discipline). If you’re in a research-intensive institution, it’s especially important to reach out to smaller, non-research-intensive institutions in your region. If these institutions don’t have active research that would require the instrument, they often can still be involved in educational activities involving the instrument. That said, this is not a numbers competition, and it is better to have seven users with strong research credentials and a strong argument about how the instrument will enhance their research than to have twenty users with a weak argument.

**Failure to address education and diversity**

In order to be competitive, an acquisition MRI must have a strong education and outreach component. Example activities include involving undergraduates in using the instrument or in analyzing data from the instrument, integrating the instrument or data from the instrument in a course, involving high school teachers, K-12 students, community college students, and students from minority-serving, or predominantly undergraduate institutions in research with the instrument. Many predominantly undergraduate institutions have been successful in winning MRI grants by including a strong education component and describing how the new instrument will enhance their research infrastructure. However, it’s important to keep in mind that the instrument should be needed primarily for research, not primarily as an educational instrument (for example, don’t propose an instrument that will be used primarily for a lab course).

**Requesting Extra Bells and Whistles**

Be careful to request funds for the instrument that are essential to conducting the research described, but not more. Reviewers are quick to jump on extra “bells and whistles” on an instrument that add to the price tag and aren’t justified by the research described in the “Research Enabled” section. If, for example, you want to add an attachment that provides a capability that only one of your instrument users will need, be sure that the description of that research is particularly compelling and specifically discusses how that capability will enhance the research. If none of your major users has a current need for the extra capability, avoid the temptation to add the attachment on speculation that it will be needed in the future.

**Inadequate Management Plan**
Reviewers will want to know whether or not you have a place for the instrument, funds to keep it maintained, a qualified operator, and plans for sharing the instrument with multiple users. All of this should be described in your management plan; be sure to spend time on this, as a poor management plan can sink an otherwise good MRI proposal.

Address details such as how you will manage access to the instrument, particularly access by researchers from other institutions. You want to convince reviewers that two things will not happen: (1) the instrument will not really be shared but instead will be dominated by the PI or by a small cadre of users; (2) there will be insufficient resources or expertise at the institution to keep the instrument running and maintained after the funding period; consequently, the instrument will sit unused. Predominantly undergraduate institutions should pay special attention to this section, since reviewers may be more concerned about whether your institution has the space and resources to maintain the instrument.

Be sure to clarify your plan to fairly share the instrument. As PI, you may think you’re doing everyone else a favor by volunteering to take sole responsibility of managing the instrument, but to a reviewer, it may look like you plan to dominate the instrument, preventing other users from gaining fair access to it. A typical successful approach to this problem begins by forming a committee composed of the PI and co-PIs that meets regularly to make decisions related to the distribution of instrument time, dealing with maintenance, etc.

You’ll also want to discuss how you’ll pay for consumables and other expenses. Will there be a user fee? If so, how much will it be? If you plan to accept guest users from other institutions (which is often a good idea), outline your procedure for doing that. Will potential guest users submit a short proposal describing how they will use the instrument? What will the criteria be for evaluating these proposals? Will you assess a higher user fee for guests? How will you publicize the fact that the instrument is available to outside users?

For instrument development proposals, be sure that you have a well-thought-out plan for developing the instrument. In many ways, an instrument development proposal is very much like a research proposal except that the result will be a novel instrument. Therefore, you’ll need to describe your plan for developing the instrument in similar detail to that you’d use if you were describing a research plan.

Other issues

More Expensive Instruments

It’s important to be aware that the review process for MRI proposals varies depending on the amount requested. While smaller proposals are reviewed within the Directorate, larger proposals are generally subjected to additional review at higher levels within NSF. This means that larger proposals will be judged by reviewers from a variety of disciplines; therefore, you should ensure that the arguments you make and the description of the science enabled is compelling and accessible to reviewers outside your field. In addition, for instruments over $2 million, NSF uses the additional review criterion, “What will the instrument’s impact be at the National level and on the research community of interest?”

Institutional Commitment
NSF emphasizes that voluntary cost share is not allowed. That means that if an institution is in the category where cost sharing is required (PhD-granting or non-degree granting), that institution must cost share exactly 30% of the project cost and no more. On the other hand, institutional commitment is a review criterion, and PIs often ask, what’s the difference between cost share and institutional commitment? One important distinction is that cost share can only come from items that are legitimate project costs as defined by NSF, but there are a lot of other expenses that are required to ensure that an instrument will be installed and maintained over the long term. For example, a space must be provided, and that space may require refurbishment, enhanced electrical service, and so on, but NSF will not pay for “bricks and mortar” on this grant. If your institution commits to providing that space, that would be considered institutional commitment, not cost share. The instrument will need to be maintained and a technician may be needed to run it after the three-year NSF funding period; NSF will expect an institutional commitment to provide those resources to keep the instrument running and in good repair unless you have another source to cover those expenses.

**Restrictions on Content of Letters**

In recent years, NSF has become much more restrictive about what can be included in a letter from a collaborator who will use your instrument (probably to prevent PIs from using the letters as a way to work around the Project Description page limit). The solicitation (in the section covering supplementary documents) now includes the exact text that can be used, with blanks provided for the required information. No other information is allowed in these letters.

**Other Resources**

- [NSF MRI Frequently Asked Questions](#)
- [MRI page, with information on past awards](#) – as of this writing, this page hasn’t been updated yet for the FY 2013 competition.
- [MRI presentation slides](#) – on NSF’s MRI website, presented by Randy Phelps at QEM Network Workshop
Links to Data Management Plan Information

- University of Wisconsin-Madison Research Data Services
- University of Virginia Scientific Data Consulting Group
- MIT Data Management and Publishing
- Duke University Data Management Guide

ARPA-E University

- Summit Overview
- Technology Developers Workshop
- Day 1
- Day 2

The Technology Developers Workshop at the 2012 ARPA-E Energy Innovation Summit featured an afternoon of practical seminars on core concepts and skills for transitioning breakthrough technologies into successful commercial products. Given the positive feedback that we received about these seminars, ARPA-E intends to rebroadcast them to the broader community and, where possible, provide live Q&A with the original presenters.

Date: May 30, 2012

Title: **Demystifying Money: The Many Sources of Capital**
Presenter: *Matthew Nordan, Vice President, Venrock Capital*
Description: Taking technology to the next level means navigating a confusing range of financing options: venture capital, angel investors, government grants, bank loans, and many more. Lux Research founder and venture investor Matthew Nordan explains the different types of capital available to early stage technologists, what each looks for to make an investment decision, and what they want in return.

- Watch Rebroadcast
- Download Presentation PDF

Date: June 21, 2012

Title: **The Scientific Method for Getting Technology to Market**
Presenter: *Steve Blank, entrepreneur*
Description: Great technologies don't automatically attract users and thrive in the real world. Successful entrepreneur and professor Steve Blank will show how hypothesis-driven discovery and experimentation can turn your innovations into successful products with societal impact. Learn how to hone in on the true value of your technology through early and effective engagement with customers, and see why Silicon Valley startups, corporations like GE, and the National Science Foundation have adopted this methodology to advance their leading innovations.

- Watch Rebroadcast
- Download Presentation PDF
- Listen to Webinar Q&A

Date: July 31, 2012
Title: *Telling Your Story: Successful Presentation Techniques*
Presenter: *David Merkoski, Greenstart*
Description: From the elevator pitch to your TED talk, the difference between success and failure often depends on the story you tell and how you tell it. David's session will focus on honing your message to connect with any audience and leave a lasting impression in their minds.

[Watch Rebroadcast] [Download Presentation PDF]

Date: October 3, 2012

Title: *Winning Technical Pitches*
Presenter: *Dane Boysen and Ilan Gur*
Description: Funding applications often require something shorter than a research paper, but more substantive than a business pitch—you need a technical pitch. ARPA-E Program Directors Dane Boysen and Ilan Gur share their five best practices and five deadly sins for writing technical proposals. Participants will also learn about ARPA-E’s mission and unique role in funding energy innovation. While the webinar uses concepts from the ARPA-E funding selection process, the proposal strategies are applicable to anyone attempting to communicate complex technical information in a short format.

[Download Presentation PDF]

**Nursing Grant Application Technical Assistance**
**Back to Basics: The Foundations for Grant Writing**
**Join the Live Webcast October 25, 1 to 5 pm ET**

**Who Should Attend**
The webcast is open to all and is especially appropriate if you have written few or no applications for HRSA grant programs. Schools of nursing and other health care organizations eligible to apply to HRSA Nurse Training Program grants, especially those that have never received HRSA Nurse Training grant funding, are encouraged to attend. You will learn how best to approach grant writing and receive helpful tips for strengthening your grant applications.

**Objectives**
- Learn what HRSA funding opportunities are available for schools of nursing and other eligible nurse training programs.
- Understand the funding process.
- See examples of applications that have been selected to receive funding.
- Discover what factors can make it difficult to receive funding.
- Get tips for overcoming barriers.
- Learn how to write strong grant applications.

**Agenda**
1 to 1:10 pm ET **Opening Remarks**
Janet Heinrich, DrPH, RN, FAAN
Research Development & Grant Writing News

Associate Administrator, HRSA Bureau of Health Professions

1:15 to 1:40 pm ET
Overview of HRSA-Division of Nursing & Programs
Julie Sochalski, PhD, RN, FAAN
Director
Alexis Bakos, PhD, MPH, RN
Deputy Director
Division of Nursing, HRSA Bureau of Health Professions

1:45 to 3:15 pm ET
Grant Writing 101
Shanita Williams, PhD, MPH, APRN
Branch Chief
Joan Wasserman, DrPH, RN
Branch Chief
Division of Nursing, HRSA Bureau of Health Professions

3:20 to 4:05 pm ET
Tips for Writing & Submitting Good Grant Proposals
Darren S. Buckner
Lead Grants Management Specialist
Division of Grants Management Operations, HRSA Office of Federal Assistance Management

4:10 to 4:55 pm ET
Strengthening Applications
Gail Lipton, M.S.Ed
Senior Advisor
HRSA Bureau of Health Professions

4:55 to 5 pm ET
Closing Remarks
Shanita Williams, PhD, MPH, APRN

Contact
Kristen Hansen

Office of Rural Health Policy: Rural Guide to Health Professions Funding
U.S. Department of Health and Human Services, Health Resources and Services Administration, The Office of Rural Health Policy, May 2012

Grants Technical Assistance Online: A One-Stop-Shop for Applicants
August 2, 2012: Calling all grant applicants!

The Health Resources and Services Administration (HRSA) announces the launch of a new online technical assistance resource on HRSA.gov. The section contains webinars, application and submission guidance, as well as tips for writing successful proposals. A large part of HRSA’s mission to increase access to health care is accomplished by awarding grants and cooperative agreements. It is HRSA’s policy to promote competition, encourage eligible organizations to apply, and help applicants to succeed.

HRSA expects to award more than $3 billion this year through 2,087 new grant awards from 95 grant programs in the following categories:
- Health Center Programs for community-based health care organizations that provide primary care in underserved areas
- Ryan White HIV/AIDS Programs for eligible States and metropolitan areas, as well as providers of HIV/AIDS health care services
- Maternal and Child Health Programs for States and providers of maternal and child health services, including services for children with special health care needs and MCH training and research
- Health Professions Training Programs for colleges, universities and other accredited health professions training programs
- Rural Health Programs for critical access hospitals and other health care providers in rural areas
- Organ Donation Programs for Organ Procurement Organizations and other organizations involved in organ donation, procurement and transplantation
- Poison Control Centers

Writing educational grants to federal agencies and foundations is helped by developing a knowledge base of proven and successful educational models and STEM standards at the K-12, community college, and university level.

STEM in Postsecondary Education: Entrance, Attrition, and Coursetaking Among 2003-2004 Beginning Postsecondary Students
Science, technology, engineering, and mathematics (STEM) fields are widely regarded as critical to the national economy. To provide a nationally representative portrait of undergraduate students’ experiences in STEM education, these Web Tables summarize longitudinal data from a cohort of first-time, beginning students who started postsecondary education in a bachelor’s or associate’s degree program in 2003–04, examining their entrance into and attrition from STEM fields and the extent to which they participated in STEM coursework over a period of 6 academic years, from 2003–04 to 2008–09.

Recruitment, Retention, and the Minority Teacher Shortage
Using nationally representative data, this study empirically grounds the debate over minority teacher shortages by examining trends in recruitment, employment and retention of minority teachers. The study's findings reveal that a gap continues to persist between the percentage of minority students and the percentage of minority teachers in U.S. schools, but contrary to widespread belief this gap is not due to a failure to recruit new minority teachers. The data show that efforts over recent decades to recruit more minority teachers, and place them in disadvantaged schools, have been very successful. But, these efforts have also been undermined because minority teachers have lower retention - largely because of poor working conditions in their schools.

K-12 Statistics Education Webinars
Recorded web-based seminars on K-12 statistics education topics. The American Statistical Association is the world’s largest community of statisticians. The ASA supports excellence in the development, application, and dissemination of statistical science through meetings, publications, membership services, education, accreditation, and advocacy. Our members serve in industry, government, and academia in more than 90 countries, advancing research and promoting sound statistical practice to inform public policy and improve human welfare.

STatistics Education Web (STEW)
One of the goals of the American Statistical Association is to improve statistics education at all levels. Through the STatistics Education Web (STEW), the ASA is reaching out to K-12 mathematics and science teachers who teach statistics concepts in their classrooms. STEW is an online resource for peer-reviewed lesson plans for K-12 teachers. The web site is maintained by the ASA and accessible to K-12 teachers throughout the world.
Statistics and probability concepts are included in K-12 curriculum standards, in particular the Common Core State Standards, and on state and national exams; however, few K-12 teachers have formal training or applied experience with statistical concepts. K-12 teachers need a place where they can find peer-reviewed teaching materials available in a standard format. Teachers also can benefit from guidance toward activities that are appropriate for their students' maturity levels and from the ability to select relevant, useful, and meaningful applications. The ASA is the logical entity to host a resource to support teachers in their efforts to master the content and incorporate it into their classrooms.

STEW lesson plans identify both the statistical concepts being developed and the age range appropriate for its use. The statistical concepts follow the recommendations of the Guidelines for Assessment and Instruction in Statistics Education (GAISE) Report: A Pre-K-12 Curriculum Framework, Common Core State Standards for Mathematics, and NCTM Principles and Standards for School Mathematics. The web site resource is organized around the four elements in the GAISE guidelines: formulate a statistical question, design and implement a plan to collect data, analyze the data by measures and graphs, and interpret the data in the context of the original question. Teachers can navigate the site by grade level and statistical topic (HERE).

Videos from The Critical Issues in Mathematics Education Workshop
Selected Videos: "What are mathematical practices?" (80 minutes) speakers include: Deborah Ball, William McCallum, and Deborah Schifter; "Examples from classrooms. Implications of the Common Core," (180 minutes) speakers include: Deborah Ball, Elham Kazemi, Judith Jacobs, and Rheta Rubenstein.

The wide adoption of the Common Core State Standards for Mathematics (CCSSM) offers a helpful curricular coherence to the environment of teacher education. And so the CCSSM present both an opportunity and a challenge to teacher education. An opportunity because of the greater focus made possible. A challenge because not only of the ambitious level of the CCSSM, but also of the prominent role in them of Mathematical Practices. While most mathematicians will find these congenial, much needs to be done to make them meaningfully understood by teachers and teacher educators, and, still more, how to enact them as an organic aspect of instruction. The CIME workshop aims to gather and stimulate ideas for how to meet this opportunity and challenge. For more videos from the workshop, go to: http://www.msri.org/web/msri/scientific/workshops/show/-/event/Wm9414.

Opportunities for Learning Mathematics
The goal of this publication is to engage mathematics educators and researchers in analyzing scenarios of K-5 mathematics classrooms and provide alternative suggestions for furthering student understanding. Each scenario is a description of an episode that occurred in a mathematics lesson. These lessons were fully scripted during the process of observing teachers and students in the classroom as part of the Leadership Institute for Teachers (LIFT), a current NSF-funded project. During these observations, researchers documented situations in which opportunities for clarifying and deepening understanding of key mathematical concepts were missed.
**Research Development & Grant Writing News**

**ED Mathematics and Science Partnerships Program Highlights**
This policy brief was commissioned by the U.S. Department of Education as part of Abt Associates' contract to support their Mathematics and Science Partnerships (MSP) Program. The intent of this report is to highlight the work and reform innovations from the U.S. Department’s MSP Program for federal and state-level staff as well as practitioners and educators in the STEM community. To compile this report, the authors reviewed data from three sources: (a) the 2009-2010 state-issued requests for proposal (RFP) for each of the 50 states, DC and Puerto Rico; (b) annual performance reports (APRs) submitted by local projects describing activities taking place between October 1, 2009 and September 30, 2010 (the most recent data available at the time this report was prepared); and (c) supplemental information from state MSP coordinators. The RFP review was undertaken to determine the level of national prominence that each of the key goals of outlined in the program legislation held during this period.

**Higher Education: Gaps in Access and Persistence Study**
The Higher Education: Gaps in Access and Persistence Study is a congressionally-mandated statistical report that documents the scope and nature of gaps in access and persistence in higher education by sex and race/ethnicity. The report presents 46 indicators grouped under seven main topic areas: (1) demographic context; (2) characteristics of schools; (3) student behaviors and afterschool activities; (4) academic preparation and achievement; (5) college knowledge; (6) postsecondary education; and (7) postsecondary outcomes and employment. In addition, the report contains descriptive multivariate analyses of variables that are associated with male and female postsecondary attendance and attainment.

**CADRE Toolkit: Showcasing and Advancing NSF DR K-12 Work**
*The following resources have been produced by CADRE partners and/or DR K-12 PIs with support from CADRE. They provide information on the research that is currently funded, the variety of instruments and methodologies in use, and strategies for effective partnering, dissemination, and knowledge use.*

**Compendium of Research Instruments for STEM Education, PART I: Teacher Practices, PCK, and Content Knowledge**
*August 2012*
The purpose of this compendium is to provide an overview on the current status of STEM instrumentation commonly used in the U.S and to provide resources for research and evaluation professionals. Part 1 of a two-part series, the goal to provide insight into the measurement tools available to generate efficacy and effectiveness evidence, as well as understand processes relevant to teaching and learning. It is focused on instruments designed to assess teacher practices, pedagogical content knowledge, and content knowledge.

**Discovery Research K-12 (DR K-12): Descriptive Overview of Portfolio**
*August 2012*
This overview is intended to describe the scope and depth of research and development DR K-12 has funded and to identify areas that could be advanced by further investigations by CADRE. The overview summarizes the 248 projects that met the criteria for inclusion and analysis.

**Partnering with Users to Develop STEM Education Materials: Insights from Discovery Research K-12 Projects**

*August 2012*

This brief suggests practical ways of engaging teachers and other “end-users” in projects that develop materials for education in the areas of science, technology, engineering, and math (STEM). Projects described in this brief have benefited from school, district, and state users serving as Co-PIs, advisory board members, co-developers, implementation managers, data collectors, professional developers, and project emissaries to the broader field. The brief describes how K-12 end-users and decision-makers are instrumental for developing materials that will be adopted, implemented with essential fidelity, sustained at classroom and organizational levels, and scaled within and to new organizations.

**New Measurement Paradigms**

*April 2012*

This collection of New Measurement Paradigms papers represents a snapshot of the variety of measurement methods in use at the time of writing across several projects funded by the National Science Foundation through its REESE and DR K–12 programs. The collection is designed to serve as a reference point for researchers who are working in projects that are creating e-learning environments in which there is a need to make judgments about students’ levels of knowledge and skills, or for those interested in this but who have not yet delved into these methods.

**Education R&D Partnership Tool**

*January 2012*

Based on the lessons of education practitioners, researchers, and developers who have partnered on R&D projects, this tool is intended to help others assess and improve their own R&D partnerships. The tool includes a worksheet that prompts reflection and discussion as well as tips for starting and sustaining a partnership dialogue.

**Practice-Engaged Research and Development in Education**

*March 2011*

This paper argues that reciprocal arrangements between R&D and practice can have intellectual merit as well as practical value. Specifically, it describes the benefits of education research and development (R&D) arrangements and policies that are centered in practitioners’ purposes and environments, that exploits a multi-stage process of development, that attends to organizational and community contexts, and that builds cumulative knowledge across projects and studies. Based upon business scholarship addressing organizational constraints and opportunities for new approaches to R&D, it acknowledges the education R&D might benefit from considering analogous ideas.
Math and Science Education with English Language Learners: Contributions of the DR K-12 Program
January 2011
CADRE conducted an analysis of the projects within the NSF’s DR K-12 portfolio studying ELLs to better understand how the work supported by the program is advancing our understanding of ELLs’ learning in science and mathematics. The study was designed to answer three research questions: who is being supported by DR K-12 to do this type of research, what are they studying, and how these projects are contributing to the field.

Fostering Knowledge Use in STEM Education: A Brief on R&D Partnerships with Districts and Schools
December 2010
Produced by NSF-supported researchers and developers, this practice brief makes a case for substantive partnerships between STEM education researchers or developers and the districts and schools where the R&D takes place. Partnerships can enhance the quality, relevance, and usability of project outcomes, with implications for the sustained and scaled use of project knowledge. Written for an audience of fellow researchers and developers, the brief summarizes what the authors have learned about creating and maintaining partnerships, as well as potential pitfalls and challenges.

Science Curriculum Targeted Study
September 2010
This study provides an in depth review of the science curriculum projects funded within the DR K-12 portfolio. This study represents a “snapshot in time” of the data available as of August 2010. The synthesis was intended to:

- Describe the key characteristics of the DR K-12 projects related to science curricula
- Identify the types of technologies used in the science curriculum portfolio
- Categorize science curriculum project research questions to help determine if there is coherence and/or gaps

Dissemination in STEM Education R&D: Perspectives on Knowledge Use
November 2009
This paper argues that DR K-12 grantees can enhance the long-term consequences of their work by using insights from research on dissemination. Projects at all stages, from early design work through completion, can benefit from an awareness and understanding of the challenges of knowledge use. In reviewing lessons from research on dissemination, this paper addresses not only communication strategies for disseminating findings, but also the sustained engagement of potential users as partners throughout the R&D process. The research studies reviewed here placed dissemination in the context of knowledge use.

November 2009
The goal of this report was to provide an overview of the DR K-12 projects that have a focus on assessment. Twenty-four percent of the projects in the portfolio are conducting research on or developing an assessment. The report summarizes key characteristics of these projects.
**Revised Merit Review Criteria Resources for the External Community**

NOTICE: Effective January 14, 2013, the National Science Foundation will implement revised merit review criteria based on the National Science Board (NSB) report, [National Science Foundation’s Merit Review Criteria: Review and Revisions](https://www.nsf.gov/pubs/2013/nsb13010/nsb13010.pdf). While the two merit review criteria remain unchanged (Intellectual Merit and Broader Impacts), guidance has been provided to clarify and improve the function of the criteria. Revisions based on the NSB report have been incorporated into the Foundation’s policies and procedures manuals, websites, and systems. Proposers should familiarize themselves with the Merit Review Principles and Criteria described in [GPG Chapter III.A](https://www.nsf.gov/pubs/2013/nsf13003/nsf13003.pdf).

The resources identified below are provided to allow the research and education communities to prepare proposals in accordance with the revised criteria.

- New Merit Review Website
- Revisions to the Merit Review Criteria
- Fact Sheet – What this means for Proposers
- Fact Sheet – What this means for Reviewers

**NSF Webinars on Transition of Annual Project Reports to Research.gov**

The National Science Foundation (NSF) is hosting a series of webinars for grantees interested in learning more about Research.gov! Each webinar will review current and upcoming services and tools for the research community, including:

- The transition of annual, final and interim project reports to Research.gov
- Financial services available on Research.gov and the upcoming Award Cash Management Service (ACM$)
- Access services such as InCommon and Single-Sign On with FastLane

Upcoming Webinars:


Additionally, NSF offers individual webinars for institutions interested in learning more about Research.gov and its services. Presentations can be customized to the needs of individual institutions and highlight both the public information available through Research.gov, as well as the services available to grantees.


A new version of the NSF [Proposal & Award Policies & Procedures Guide (PAPPG), (NSF 13-1)](https://www.nsf.gov/pubs/2013/nsf13003/nsf13003.pdf), has been issued. The PAPPG is comprised of documents relating to the Foundation’s proposal and award process and consists of the:

a. **Grant Proposal Guide** (GPG) for guidance on the preparation and submission of proposals to NSF; and

b. **Award & Administration Guide** (AAG) to guide, manage, and monitor the award and administration of grants and cooperative agreements made by the Foundation.
This new version of the PAPPG will be effective for proposals submitted or due on or after January 14, 2013. Significant changes to the PAPPG include:

- Revisions to the NSF Merit Review Criteria which implement the National Science Board’s (NSB) recommendations. Changes will affect the project summary and project description sections of proposals. Annual and final reports also will be affected.
- Instructions for preparation of the Biographical Sketch have been revised to rename the "Publications" section to "Products" and amend terminology and instructions accordingly. This change makes clear that products may include, but are not limited to, publications, data sets, software, patents, and copyrights.
- Coverage on compensation of Indirect Costs (also known as Facilities and Administrative Costs (F&A) for Colleges and Universities) has been clarified to specify that, except as noted in the GPG sections on participant support and international travel grants, or as specified in an NSF program solicitation, the applicable indirect cost rate(s) negotiated by the organization with the cognizant negotiating agency must be used in computing indirect costs for a proposal.
- Modification of the Facilities, Equipment and Other Resources section of proposals to assist proposers in complying with the NSF cost sharing policy.
- Additional proposal certifications must be submitted by the Authorized Organizational Representative (AOR) covering organizational support of the proposed research, tax obligations/liability and felony convictions.
- Numerous clarifications also have been made throughout the document.

A by-chapter summary of the changes is provided at the beginning of both the Grant Proposal Guide and the Award & Administration Guide to assist with identifying the changes. Because the revisions to the merit review criteria will have broad repercussions for proposers, reviewers and NSF staff, the Foundation is conducting extensive outreach to the internal and external NSF communities. This purposeful communication is intended to ensure a broad understanding of the revisions to the merit review criteria and provide easy access to supporting materials including:

- A revised NSF Merit Review website with updated information about the revisions;
- A resource website for the proposer community containing presentations, fact sheets and other important links; and
- A webcast will be available in early November 2012 covering all of the PAPPG revisions (send an e-mail to policy@nsf.gov to be notified when this webcast is available).

While this version of the PAPPG becomes effective on January 14, 2013, in the interim, the guidelines contained in the current PAPPG (NSF 11-1) continue to apply. We will ensure that the current version of the PAPPG remains on the NSF website, with a notation to proposers that specifies when the new PAPPG (including a link to the new Guide) will become effective. In addition, we plan to revise existing funding opportunities to alert proposers that significant changes have been made to NSF proposal preparation guidelines. Please direct any questions to the Policy Office in the Division of Institution & Award Support at policy@nsf.gov, or (703) 292-8243.
Revised Pre- and Post-Award Forms and Instructions Available
This Notice announces the availability of newly revised forms and instructions used to submit interim and final progress reports, and other post-award documents associated the monitoring, oversight, and closeout of an award. Related revised Ruth L. Kirschstein National Research Service Award (NRSA) forms are also now available. Revised competing applications and instructions are expected to be implemented in the summer of 2013, following electronic development of applicable forms.

Dear Colleague Letter: Interdisciplinary Research in Hazards and Disasters (Hazards SEES)
The Division of Mathematical Sciences (DMS) announces its participation in a multi-directorate NSF Program: Interdisciplinary Research in Hazards and Disasters (Hazards SEES), NSF 12-610. A variety of factors are contributing to escalating personal and financial costs resulting from disasters linked to natural phenomena. The Hazards SEES Program is aimed at addressing the critical need for scientific research into the understanding of natural and technological hazards linked to natural phenomena. The objective of such research is to help mitigate the effects of hazards, and to prepare for, respond to, and recover from disasters. DMS will play an important role in this activity. The mathematics and statistics communities have been engaged in such investigations in the past, frequently with partners from other disciplines. The participation of DMS in the new solicitation is intended to broaden the involvement of these communities in larger scale investigations which will help reduce the increasing personal and financial costs of disasters brought on by natural and technological hazards. DMS recognizes the potential in its communities to address this need and anticipates DMS investigators will join with other disciplines to submit proposals which will contribute to these issues of national and global importance.

Dear Colleague Letter: Intent for NSF/SBE to Partner in Open Research Area for the Social, Behavioral, and Economic Sciences
This Dear Colleague Letter is to alert US social and behavioral science researchers that NSF’s Directorate for Social, Behavioral, and Economic Sciences (SBE) intends to participate in the Open Research Area (ORA). ORA was started in 2009 by four European funding agencies: the Agence Nationale de la Recherche (ANR, France), Deutsche Forschungsgemeinschaft (DFG, Germany), the Economic and Social Research Council (ESRC, UK), and the Nederlands Organisatie voor Wetenschappelijk Onderzoek (NWO, Netherlands) as a joint funding scheme for collaborative international research projects in the social, behavioral, and economic sciences. In 2013, after two successful rounds of competition, ORA is expanding to include the NSF’s Directorate for Social, Behavioral, and Economic Sciences.

Dear Colleague Letter: Interdisciplinary Research across the SBE Sciences
"Interdisciplinary research is a mode of research by teams or individuals that integrates information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines or bodies of specialized knowledge to advance fundamental understanding or to solve problems whose solutions are beyond the scope of a single discipline or area of research

Rebuilding the Mosaic, which reports the results of the year-long SBE 2020 visioning process, finds that scholars in the social, behavioral, and economic sciences believe that future research will be interdisciplinary, collaborative, and data intensive. The Directorate for Social, Behavioral, and Economic Sciences (SBE) therefore encourages investigators to submit proposals that go beyond the boundaries of traditional disciplines, span across the existing core SBE programs, or extend outside the SBE sciences. The report identifies four cross-cutting themes that appear to be potentially fertile areas for this model of research: population change; disparities in experience and access to resources; language and cognition, including communication, linguistics, and the brain; and new technology/new media and social network analysis. This DCL does not limit eligible proposals to these cross-cutting umbrella topics. The directorate anticipates future activities that will support research in some or all of these thematic areas, and proposals that address research problems from an interdisciplinary perspective within these broad topics are welcome.

A range of different opportunities exist for SBE scientists engaging in interdisciplinary research:

1. SBE has issued a new solicitation for an annual Interdisciplinary Behavioral and Social Sciences (IBSS) competition which seeks to support large interdisciplinary research projects and exploratory research projects.
2. SBE has issued a new solicitation for an annual SBE Postdoctoral Research Fellowships competition, which now includes a track for interdisciplinary education and training.
3. Either individually or through co-review involving multiple programs, SBE programs will consider proposals submitted in response to the Research Coordination Networks (RCNs) solicitation. RCNs support networking activities, not research per se, so that groups of investigators can communicate and coordinate their research, training and educational activities across disciplinary, organizational, geographic and international boundaries. Please note that the RCN solicitation specifies that RCN proposals for SBE programs should be submitted directly to the regular SBE programs in accordance with the due dates specified on SBE program web sites. To determine the possible appropriateness of an RCN proposal for consideration by one or more programs, contact the program officers of the program(s) that might be appropriate. Interdisciplinary RCN projects that SBE programs find meritorious may be eligible for matching support from the SBE Office of Multidisciplinary Activities.
4. Either individually or through co-review involving multiple programs, SBE programs will consider proposals for interdisciplinary research submitted in response to the standing program announcements and program solicitations. Proposals may be submitted by individual investigators or teams but are expected to incorporate an integrated, interdisciplinary approach and generate results that will contribute to multiple disciplines. The lead PI is expected to be from a discipline appropriate for the host SBE program, but collaborators may be from any area of science or engineering. Such projects may require a large team and may also exceed the current average award size
Dear Colleague Letter - Computational and Data-Driven Materials Research (CDMR)
Computation and the innovative use of data in materials research can drive the discovery of new materials and phenomena, transform research and education, and stimulate the creation of new paradigms for performing materials research. To develop this potential, the Division of Materials Research (DMR) announces a new program, PD 12-8029, Computational and Data-Driven Materials Research (CDMR), which offers opportunities distinct from other programs in DMR. For example, simulation, theory, data, and experiment may be combined in a single project to enable a strategic or transformative advance in the fundamental understanding of materials or materials-related phenomena. CDMR supports materials research driven by computation, data, or theory. Areas of interest include new materials design and preparation, structure development, evolution and control, nanoscale materials, multi-scale properties and optimization across the topical, disciplinary, and interdisciplinary areas represented in DMR programs. Successful projects will advance fundamental understanding of materials or materials-related phenomena through transformative research in which a computational, data-centric, or theoretical activity drives a well-integrated experimental activity or vice versa. Research and education activities supported in this program are distinct from those supported in other programs in DMR in their approach: successful projects will focus more on simulation and less on algorithm development and theory than in the Condensed Matter and Materials Theory (CMMT) Program.

Dear Colleague Letter - Changes to the Directorate for Geosciences (GEO) Education and Diversity Programs for Fiscal Year 2013 and Solicitation of Community Input Regarding Broadening Participation Programs in the Geosciences
The purpose of this Dear Colleague Letter (DCL) is to notify the geoscience education and research communities, and relevant stakeholders, of important changes being made to some of the Directorate for Geosciences (GEO) education-related programs, and to invite community input to help shape future priorities for programs that encourage broader participation in the geosciences. Effective immediately, GEO will be revising its portfolio of investments related to geoscience education and diversity. This effort is being undertaken to ensure better
alignment between GEO's programs and those being offered through the Directorate for Education and Human Resources (EHR) and to establish opportunities through which GEO's funding resources can be used most effectively to address the priority needs of the geoscience education community. Consistent with this re-balancing effort, the GEO-Teach program was retired as of August 1, 2012. NSF does not expect to issue a new program solicitation for this program. GeoEd is undergoing significant review and restructuring. The current solicitation (NSF 10-512) has been archived. MORE.

**Dear Colleague Letter: Supplemental Funding Opportunity for Small Business Innovation Research and Small Business Technology Transfer (SBIR/STTR) - Phase IB Option**

The Directorate for Engineering's Division of Industrial Innovation and Partnerships' Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs invites all active SBIR/STTR Phase I grantees to participate in the Phase IB supplemental funding opportunity. Phase IB supplements to Phase I grantees are intended to foster partnerships between strategic partners and investors and the SBIR/STTR companies. NSF is offering a mechanism to advance Phase I research and bridge the gap between Phase I and Phase II funding while encouraging partnering as a means to increase the potential for SBIR/STTR grantees to successfully commercialize their technology.
The competitiveness of proposals can be enhanced by grounding the arguments you make in the proposal narrative, as appropriate, on national reports, agency research roadmaps, and research workshops that demonstrate your understanding of the national research agenda and how your research advances and maps to that agenda.

**Best Practices in Assessment of Research and Development Organizations: Summary of a Workshop**

The National Institute of Standards and Technology (NIST)--recognizing that information and insights gained through continual examination of practices for organizational assessment are useful for decision makers at organizations across the deferral, industrial, academic, and national laboratory sectors--recently requested that the National Research Council (NRC) organize a panel to review best practices in assessment of research and development (R&D) organizations. In response, the NRC established the Panel for Review of Best Practices in Assessment of Research and Development Organizations.

The panel was charged to consider means of assessing the following in a manner that satisfies the requirements of NIST to perform effective assessments but also identifies assessment methods that can be applied selectively to other R&D organizations. These methods include: technical merit and quality of the science and engineering work, the adequacy of the resources available to support high-quality work, the effectiveness of the agency's delivery of the services and products required to fulfill its goals, the degree to which the agency's current and planned R&D portfolio supports its mission, as well as the agency's flexibility to respond to changing economic, political, social and technological contexts.

As one means of data gathering, among others that the panel is performing toward development of a final report of its findings, the panel organized a planning committee for a workshop on best practices in assessment of R&D organizations. **Best Practices in Assessment of Research and Development Organizations: Summary of a Workshop** reviews the workshop conducted at the Keck Center of the National Academies in Washington, D.C., on March 19, 2012.

**Meeting Critical Laboratory Needs for Animal Agriculture: Examination of Three Options**

Outbreaks of animal disease can have catastrophic repercussions for animal agriculture, the food supply, and public health. Rapid detection, diagnosis and response, as well as development of new vaccines, are central to mitigating the impact of disease outbreaks. The proposed National Bio- and Agro-Defense Facility (NBAF) is a next-generation laboratory for animal disease diagnostics, training, and research that would provide core critical components for defense against foreign animal and zoonotic disease threats. But it will be a major investment with estimated construction costs of $1.14 billion, as currently designed.

**Meeting Critical Laboratory Needs for Animal Agriculture: Examination of Three Options** discusses the laboratory infrastructure needed to effectively address the threat posed by animal and zoonotic diseases and analyzes three options for creating this infrastructure: building NBAF as currently designed, building a scaled-back version of the NBAF, or maintaining
current research capabilities at Plum Island Animal Disease Center while leveraging biosafety level-4 large animal capabilities at foreign laboratories.

**A Review of the Manufacturing-Related Programs at the National Institute of Standards and Technology: Fiscal Year 2012**

The mission of the National Institute of Standards and Technology (NIST) enables NIST to provide broad support for the advancement of U.S. manufacturing. Research and services supporting manufacturing are intended to be an important component in all of the NIST laboratories. Moreover, since manufacturing is a major part of the U.S. economy, the growth or loss of U.S. manufacturing jobs is a very important issue. Clearly, the successful execution of NIST's programs supporting manufacturing will have a significant impact on manufacturing jobs in the United States. With the multidisciplinary, multisector, and crosscutting nature of manufacturing, the Director of NIST requested that the National Research Council (NRC) assess the manufacturing-related programs at NIST in 2012.

Accordingly, a panel of experts was convened by the National Research Council to perform the assessment. The Panel on review of the Manufacturing-Related Programs at the national Institute of Standards and Technology visited the NIST campus in Gaithersburg, Maryland, on March 26-28, 2012. *A Review of the Manufacturing-related Programs at the National Institute of Standards and Technology: Fiscal Year 2012* contains the results of the panel's assessment.

The assessment considered manufacturing research at NIST broadly, with emphasis on the specific advanced manufacturing areas: Nanomanufacturing (*including Flexible Electronics*); Smart Manufacturing (*including Robotics*); and Next-Generation Materials Measurements, Modeling, and Simulation. The area of Biomanufacturing also reviewed as a subset of the Nanomanufacturing review. As is to be expected for programs covering such wide scope, the boundaries among these broad areas are not rigid and there is some overlap among them. On the basis of its assessment, the panel formed the observations and recommendations which are detailed in this report ([free pdf download of report](#)).

**Designing a Digital Future**

The December 2010 report of the President's Council of Advisors on Science and Technology, *Designing a Digital Future: Federally Funded Research and Development in Networking and Information Technology* calls for continued investment in CPS research because of its scientific and technological importance as well as its potential impact on grand challenges in a number of sectors critical to U.S. security and competitiveness, including aerospace, automotive, chemical production, civil infrastructure, energy, healthcare, manufacturing, materials and transportation.

**Computing Research for Sustainability**

The focus of *Computing Research for Sustainability* is "greening through IT," the application of computing to promote sustainability broadly. The aim of this report is twofold: to shine a spotlight on areas where IT innovation and computer science (CS) research can help, and to urge the computing research community to bring its approaches and methodologies to bear on
these pressing global challenges. *Computing Research for Sustainability* focuses on addressing medium- and long-term challenges in a way that would have significant, measurable impact. The findings and recommended principles of the Committee on Computing Research for Environmental and Societal Sustainability concern four areas: (1) the relevance of IT and CS to sustainability; (2) the value of the CS approach to problem solving, particularly as it pertains to sustainability challenges; (3) key CS research areas; and (4) strategy and pragmatic approaches for CS research on sustainability.

**Understanding Water Reuse: Potential for Expanding the Nation's Water Supply Through Reuse of Municipal Wastewater**

Understanding Water Reuse summarizes the main findings of the National Research Council report *Water Reuse: Expanding the Nation’s Water Supply Through Reuse of Municipal Wastewater*. The report provides an overview of the options and outlook for water reuse in the United States, discusses water treatment technologies and potential uses of reclaimed water, and presents a new analysis that compares the risks of drinking reclaimed water to those of drinking water from traditional sources.
New Funding Opportunities

Content Order

New Funding Posted Since September 15 Newsletter
Links to New & Open Funding Solicitations
Solicitations Remaining Open from Prior Issues of the Newsletter

New Funding Solicitations Posted Since September 15 Newsletter

Upcoming American Sociological Association Grants and Fellowships

- The Sydney S. Spivack Program in Applied Social Research and Social Policy ASA Congressional Fellowship
- Community Action Research Initiative (CARI Grants)
- Fund for the Advancement of the Discipline
- Sorokin Lecture Grants
- Student Forum Travel Awards
- Carla B. Howery Teaching Enhancement Grants
- Postdoctoral Fellowship Program

Nano-Bio Manufacturing Institute NBMI

The objective is to establish a consortium not a manufacturing project. The objective of the NBMI is to accelerate risk assessment and the development of robust mitigation approaches for critical nano-bio materials and fabrication innovations by developing common technology and manufacturing platforms through public-private partnerships between federal laboratories, DoD acquisition centers, academia, US manufacturing enterprises, and commercial industries. To achieve this objective, the institute is envisioned to create a community of large and small companies, academia, federal laboratories, and the states to accelerate innovation by investing in industrially-relevant nano-bio manufacturing technologies. Ultimately, a fully functioning NBMI will have both virtual and physical entities that will enable partners to bridge the gap between basic research and product transition by developing verified and validated open architecture processing-design-performance, forecasting, and risk assessment tools for integration of new nano-bio materials and process technologies. Due November 13.

The Educational Component of the National Cooperative Geologic Mapping Program

U.S. accredited university Geoscience or related Departments are eligible for EDMAP funds. University professors must write and submit the proposals. EDMAP cooperative agreements are intended to fund students doing geologic mapping in the field. Masters and Doctoral students of Geoscience or related Departments at accredited United States colleges and universities are eligible applicants to the EDMAP Program. In addition, qualified undergraduate Juniors and Seniors are also eligible. These undergraduates should have received some basic mineralogy, petrology and structural geology training prior to the time they will do the geologic mapping proposed in this proposal. The primary objective of the EDMAP component of the NCGMP is to
train the next generation of geologic mappers. To do this NCGMP provides funds for graduate and selected undergraduate students in academic research projects that involve geologic mapping as a major component. Through these cooperative agreements NCGMP hopes to expand the research and educational capacity of academic programs that teach earth science students the techniques of geologic mapping and field data analysis. Another important goal is to increase the level of communication between the Nation’s geologic surveys (both State Geological Surveys and the USGS) and geologic mappers in the academic community. Due November 14.

Schlanger Ocean Drilling Fellowship
The program offers merit-based awards for outstanding graduate students to conduct research related to the Integrated Ocean Drilling Program. The $30,000 per year award is to be used for stipend, tuition, benefits, research costs, and travel. Research may be directed toward the objectives of specific expeditions or may address broader themes. The Fellowship year will begin in either June or August (summer or fall semester) 2013. During the summer of 2014, at the conclusion of the fellowship, Schlanger Fellows travel to Ocean Leadership headquarters in Washington, D.C., to present the initial results of their research and take part in U.S. Science Support Program related activities. Due November 15.

FY12 Air Force Defense Research and Development Rapid Innovation Fund (RIF) Program
The National Defense Appropriation Act (NDAA) for FY2011, Section 1073, provided the Department of Defense (DoD) with the authorities to facilitate the rapid insertion of innovative technologies into military systems or programs meeting critical national security needs. The FY2012 NDAA, Section 4201, includes funding to support these efforts. Efforts awarded under this Broad Agency Announcement (BAA) should resolve operational challenges characterized by the national security areas of particular interest to the Air Force and Department of Defense. This BAA describes Air Force implementation of RIF and complies with guidelines established by OSD. Due November 27.

Fall 2013 EPA Science to Achieve Results Fellowships for Graduate Environmental Study
The U.S. Environmental Protection Agency (EPA), as part of its Science to Achieve Results (STAR) program, is offering Graduate Fellowships for master’s and doctoral level students in environmental fields of study. The deadline for submission of applications is November 27, 2012 at 11:59:59 PM. Subject to availability of funding and other applicable considerations, the Agency plans to award approximately 80 new fellowships in the late summer of 2013. Master’s level students may receive support for a maximum of two years. Doctoral students may be supported for a maximum of three years, usable over a period of five years. The fellowship program provides up to $42,000 per year of support per fellowship. Due November 27.

Brownfields Area-Wide Planning Grant
This notice announces the availability of EPA grant funds for projects from eligible entities to facilitate community involvement and conduct research, training and technical assistance necessary to develop area-wide plans and implementation strategies to facilitate brownfields
assessment, cleanup, and subsequent reuse. Brownfields area-wide planning grant funding must be directed to specific areas affected by a single large or multiple brownfield sites, such as a neighborhood, downtown district, city block or local commercial corridor. The grant funding will result in an area-wide plan, including implementation strategies, for the brownfields-affected area. The brownfields area-wide plan will inform the assessment, cleanup and reuse of brownfields properties and promote area-wide revitalization. Due November 30.

**Cyber-Enabled Sustainability Science and Engineering**
The Cyber-Enabled Sustainability Science and Engineering (CyberSEES) program aims to advance interdisciplinary research in which the science and engineering of sustainability are enabled by new advances in computing, and where computational innovation is grounded in the context of sustainability problems. The CyberSEES program is one component of the National Science Foundation's Science, Engineering, and Education for Sustainability (SEES) activities, a foundation-wide effort aimed at addressing the challenge of sustainability through support for interdisciplinary research and education. In the SEES context, a sustainable world is one where human needs are met equitably without harm to the environment or sacrificing the ability of future generations to meet their own needs. Required LOI due Dec. 4; full due Feb. 5.

**Fall 2013 EPA Greater Research Opportunities (GRO) Fellowships For Undergraduate Environmental Study**
The U.S. Environmental Protection Agency (EPA), as part of its Greater Research Opportunities (GRO) Fellowships program, is offering undergraduate fellowships for bachelor level students in environmental fields of study. The deadline for receipt of applications is December 5, 2012, at 11:59:59 PM ET. Subject to availability of funding and other applicable considerations, the Agency plans to award approximately 40 new fellowships in the summer of 2013. Eligible students will receive support for their junior and senior years of undergraduate study and for an internship at an EPA facility during the summer of their junior year. The fellowship provides up to $20,700 per academic year of support and $8,600 of support for a three-month summer internship. Due December 5.

**Scholarly Editions and Translations**
Scholarly Editions and Translations grants support the preparation of editions and translations of pre-existing texts and documents of value to the humanities that are currently inaccessible or available in inadequate editions. These grants support full-time or part-time activities for periods of a minimum of one year up to a maximum of three years. Projects must be undertaken by a team of at least one editor or translator and one other staff member. Grants typically support editions and translations of significant literary, philosophical, and historical materials, but other types of work, such as musical notation, are also eligible. Due December 6.

**NEH Collaborative Research**
Collaborative Research Grants support interpretive humanities research undertaken by a team of two or more scholars, for full-time or part-time activities for periods of a minimum of one year up to a maximum of three years. Support is available for various combinations of scholars,
consultants, and research assistants; project-related travel; field work; applications of information technology; and technical support and services. All grantees are expected to communicate the results of their work to the appropriate scholarly and public audiences. Due December 6.

**National Defense Science and Engineering Graduate (NDSEG) Fellowship**
The National Defense Science and Engineering Graduate (NDSEG) Fellowship is a highly competitive, portable fellowship that is awarded to U.S. citizens and nationals who intend to pursue a doctoral degree in one of fifteen supported disciplines. NDSEG confers high honors upon its recipients, and allows them to attend whichever U.S. institution they choose. NDSEG Fellowships last for three years and pay for full tuition and all mandatory fees, a monthly stipend, and up to $1,000 a year in medical insurance. The Department of Defense (DoD) is committed to increasing the number and quality of our nation’s scientists and engineers, and towards this end, has awarded approximately 3,200 NDSEG fellowships since the program's inception 22 years ago. The NDSEG Fellowship is sponsored by the Air Force Office of Scientific Research (AFOSR), the Army Research Office (ARO), the High Performance Computing Modernization Program (HPCM), and the Office of Naval Research (ONR), under the direction of the Director of Defense Research and Engineering (DDR&E). Due December 14.

**Global Hunger and Food Security Research Strategy: Climate Resilience, Nutrition, and Policy**
Agricultural research investments figure prominently in the Feed the Future initiative, and these investments link agricultural productivity, climate change, nutrition, enabling policies, economic growth, poverty reduction and sustainable natural resources management. The Feed the Future Research Strategy emphasizes a new paradigm of sustainable intensification to catalyze agriculture-led economic growth. It focuses on environmentally sustainable productivity gains through ‘research for development’ activities that are purpose-driven and impact-oriented, and that operate in close coordination with deployment of research outputs through extension, education, evaluation and feedback at the individual country level. This includes the integration of natural science and social science research, such as policy analysis, to increase impacts for developing world farmers. This RFA focuses on climate resilience, nutrition, and policy objectives under the Research Strategy, and welcomes applications in the following specific Program Areas: Program Area No. Program Area 1 High-Yielding, Climate-Resilient Legumes (two distinct opportunities: soy and other legumes) 2 High-Yielding, Climate-Resilient Cereals 3 Increased Livestock Productivity through Climate Resilience and Disease Resistance (two distinct opportunities: vaccine development and breeding/genomics approaches) 4 Small-Scale Irrigation Technologies and Agricultural Water Management Practices 5 Reduced Post-Harvest Losses and Food Waste 6 Food Security Policy. Due December 21.

**Small Business Technology Transfer Program Phase I Solicitation FY-2013 (STTR) Release: 2**
The Small Business Technology Transfer program stimulates technological innovation in the private sector by strengthening the role of small business concerns in meeting Federal research and development needs, increasing the commercial application of federally supported research
results, and fostering and encouraging participation by socially and economically disadvantaged and women-owned small businesses. The Small Business Technology Transfer Program (STTR) requires researchers at universities and other non-profit research institutions to play a significant intellectual role in the conduct of each STTR project. These researchers, by joining forces with a small company, can spin-off their commercially promising ideas while they remain primarily employed at the research institution. The program is governed by Public Law 112-81 (SBIR/STTR Reauthorization Act of 2011). Required LOI January 8; full February 6.

**Cyber-Physical Systems (CPS)**
Cyber-physical systems (CPS) are engineered systems that are built from and depend upon the synergy of computational and physical components. Emerging CPS will be coordinated, distributed, and connected, and must be robust and responsive. The CPS of tomorrow will need to far exceed the systems of today in capability, adaptability, resiliency, safety, security, and usability. Examples of the many CPS application areas include the smart electric grid, smart transportation, smart buildings, smart medical technologies, next-generation air traffic management, and advanced manufacturing. CPS will transform the way people interact with engineered systems, just as the Internet transformed the way people interact with information. However, these goals cannot be achieved without rigorous systems engineering. Due January 14.

**NEA FY 2013 Our Town**
Organizations may apply for creative placemaking projects that contribute to the livability of communities and place the arts at their core. An organization may request a grant amount from $25,000 to $200,000. Due January 14.

**Centers for Water Research on National Priorities Related to a Systems View of Nutrient Management**
This Request for Applications (RFA) is soliciting proposals that take a systems view of nutrient management. A systems view of nutrient management considers every potential link in the breadth of possibilities that may influence water quality. These involve societal and technological considerations and may include, but are not limited to: local resources, prevailing land uses, watershed health, manure management, energy costs, municipal wastewater treatment, in-building water reuse, or nutrient resource recovery. A systems view would also consider valuation of monetized and non-monitized possible co-benefits and consequences (e.g., decreased sediment runoff, improved recreational value) which may be part of a nutrient management program.

Proposed research areas should include:
- Science to achieve sustainable and cost effective health and environmental outcomes as part of water management.
- Demonstration projects to support efficacy of water management systems with and beyond current technology and information at appropriate scales.
- Community involvement in the design, acceptance and implementation of nutrient management systems.
Successful applicants will develop a multi component framework for research and development activities with a systems view of nutrient management. This framework will support restoration of watersheds; promote attainment of designated uses; encourage water reuse and recovery; provide environmental, economic and social benefits; and identify associated costs across community cohorts including those of limited means. Eligible applicants include public nonprofit institutions/organizations (includes public institutions of higher education and nonprofit hospitals) and private nonprofit institutions/organizations (includes private institutions of higher education and nonprofit hospitals) located in the U.S. State, local, and tribal governments are not eligible to apply under this solicitation. However, cooperative partnerships among the eligible lead grant recipient with academic, state, local, tribal and nonprofit organizations to conduct research, development and field application of innovative water management are strongly recommended as they are important for successful applications. All applications should demonstrate community engagement as part of their project design. Due January 15.

Special Program Announcement for the Office of Naval Research
The selected topics in this special notice are designed to address research and technology gaps in the area of nanoscience and nanotechnology in ONR’s current program portfolio. The program will pursue fundamental research in several specific topics that complement and enhance existing programs in related areas. The Office of Naval Research (ONR) is interested in receiving proposals on the following research topics: Topic #1- Graphene Photonics in the Infrared and Terahertz Regime Topic #2 - Novel Nanomaterial Approaches to Processing of Ultra-High Temperature Materials Topic #3 - Nanoscale Non-Line-of-Sight Conformal Coatings with Controlled Electronic Properties. Due January 17.

National Digital Newspaper Program
NEH is soliciting proposals from institutions to participate in the National Digital Newspaper Program (NDNP). NDNP is creating a national digital resource of historically significant newspapers published between 1836 and 1922, from all the states and U.S. territories. Due January 17.

Interdisciplinary Behavioral and Social Science Research (IBSS)
The Interdisciplinary Behavioral and Social Science Research 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 January 23.

Digital Humanities Implementation Grants
This program is designed to fund the implementation of innovative digital-humanities projects that have successfully completed a start-up phase and demonstrated their value to the field. Such projects might enhance our understanding of central problems in the humanities, raise
new questions in the humanities, or develop new digital applications and approaches for use in the humanities. The program can support innovative digital-humanities projects that address multiple audiences, including scholars, teachers, librarians, and the public. Applications from recipients of NEH’s Digital Humanities Start-Up Grants are welcome. Due January 23.

**The Bill and Rita Clements Research Fellowships for the Study of Southwestern America**
Fellowships are normally for a full academic year but we also welcome applications from scholars interested in a half-year fellowship. Competition is open to individuals in any field in the humanities or social sciences doing research on Southwestern America or the U.S.-Mexico borderlands. The fellowships are designed to provide time for senior or junior scholars to bring book-length manuscripts to completion. One of the fellowships, funded by the generosity of the Summerlee Foundation, supports work on Texas history. Due January 25.

**The Lewis and Clark Fund for Exploration and Field Research**
The Lewis and Clark Fund (initially supported by the Stanford Ascherman/Baruch Blumberg Fund for Basic Science, established by a benefaction from the late Stanford Ascherman, MD, of San Francisco) encourages exploratory field studies for the collection of specimens and data and to provide the imaginative stimulus that accompanies direct observation. Applications are invited from disciplines with a large dependence on field studies, such as archeology, anthropology, biology, ecology, geography, geology, linguistics, paleontology, and population genetics, but grants will not be restricted to these fields. Graduate students and postdoctoral and junior scientists wishing to pursue projects in astrobiological field studies should consult the program description and application forms for the Lewis and Clark Fund in Exploration and Field Research in Astrobiology. Due by February 1.

**Interdisciplinary Research in Hazards and Disasters (Hazards SEES)**
The overarching goal of Hazards SEES is to catalyze well-integrated interdisciplinary research efforts in hazards-related science and engineering in order to improve the understanding of natural hazards and technological hazards linked to natural phenomena, mitigate their effects, and to better prepare for, respond to, and recover from disasters. The goal is to effectively prevent hazards from becoming disasters. Hazards SEES aims to make investments in strongly interdisciplinary research that will reduce the impact of such hazards, enhance the safety of society, and contribute to sustainability. The Hazards SEES program is a multi-directorate program 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. Due February 4.

**Higher Education Challenge Grants Program**
Projects supported by the Higher Education Challenge Grants Program will: (1) address a State, regional, national, or international educational need; (2) involve a creative or non-traditional approach toward addressing that need that can serve as a model to others; (3) encourage and facilitate better working relationships in the university science and education community, as well as between universities and the private sector, to enhance program quality and supplement available resources; and (4) result in benefits that will likely transcend the project duration and USDA support. **Due February 8.**

**Hispanic-Serving Institutions (HSI) Education Grants Program**
This competitive grants program is intended to promote and strengthen the ability of Hispanic-Serving Institutions to carry out higher education programs in the food and agricultural sciences. Programs aim to attract outstanding students and produce graduates capable of enhancing the Nation's food and agricultural scientific and professional work force. **Due February 18.**

**FY 2013 Continuation of Solicitation for the Office of Science Financial Assistance Program**
The Office of Science of the Department of Energy hereby announces its continuing interest in receiving grant applications for support of work in the following program areas: Advanced Scientific Computing Research, Basic Energy Sciences, Biological and Environmental Research, Fusion Energy Sciences, High Energy Physics, Nuclear Physics, and Workforce Development for Teachers and Scientists. This annual FOA DE-FOA-0000768 succeeds FOA DE-FOA-0000600, which was published September 30, 2011. **Open to September 30, 2013.**

**U.S. Army Medical Research and Materiel Command Broad Agency Announcement for Extramural Medical Research**
The U.S. Army Medical Research and Materiel Command's (USAMRMC) mission is to provide solutions to medical problems of importance to the American Warfighter at home and abroad. The scope of this effort and the priorities attached to specific projects are influenced by changes in military and civilian medical science and technology, operational requirements, military threat assessments, and national defense strategies. The extramural research and development program plays a vital role in the fulfillment of the objectives established by the USAMRMC. General information on USAMRMC can be obtained at: (https://mrmc.detrick.army.mil/). This Broad Agency Announcement (BAA) is intended to solicit extramural research and development ideas, and is issued under the provisions of the Competition in Contracting Act of 1984 (Public Law 98-369), as implemented in Federal Acquisition Regulation 6.102(d)(2) and 35.016. This announcement provides a general description of USAMRMC’s research programs, including research areas of interest; general information; proposal/application preparation instructions; and the evaluation and selection criteria. This fiscal year’s BAA contains several changes from previous USAMRMC BAAs. Read each section carefully. **Open to September 30, 2013.**

**Long Range BAA for Navy and Marine Corps Science and Technology**
ONR is constantly looking for innovative scientific and technological solutions to address current and future Navy and Marine Corps requirements. We want to do business with educational institutions, nonprofit and for-profit organizations with ground-breaking ideas, pioneering scientific research and novel technology developments. The following list includes currently active broad agency announcements (BAAs) -- each announcement provides technical and contracting points of reference. Required: All BAAs incorporate a standardized template for the submission of technical and cost proposals for all contract awards. Guidance and assistance in completing the form and spreadsheet can be obtained from points of contact provided in the BAA. Download the forms (updated for 2012) | Email your feedback Open to September 30, 2013.

**FAA Center of Excellence for Environment and Energy**
The FAA is forming a Center of Excellence for Environment and Energy during FY-13. The COE will be a consortium of the FAA, university partners, and private industry affiliates selected by the FAA Administrator to work collectively on business and operational issues of mutual interest and concern. Due October 4, 2013.

### Links to New & Open Funding Solicitations

- [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](#)
- [NIAID Funding Blog](#)
- [EPA 2012 Science To Achieve Results (STAR) Research Grants](#)
- [NASA Open Solicitations](#)
- [Defense Sciences Office Solicitations](#)
- [The Mathematics Education Trust](#)
- [Opportunities for Humanities Funding Announced](#)
- [EPA Open Funding Opportunities](#)
- [DOE Funding Opportunity Exchange](#)
Innovation Corps Teams Program (I-Corps Teams)
The National Science Foundation seeks to develop and nurture a national innovation ecosystem that builds upon fundamental research to guide the output of scientific discoveries closer to the development of technologies, products and processes that benefit society. In order to jumpstart a national innovation ecosystem, NSF has established the NSF Innovation Corps Teams Program (NSF I-Corps Teams). The NSF I-Corps Teams purpose is to identify NSF-funded researchers who will receive additional support - in the form of mentoring and funding - to accelerate innovation that can attract subsequent third-party funding. **Window October 1 to Dec. 17.**

Mellon/ACLS Dissertation Completion Fellowships
ACLS invites applications for the seventh annual competition for the Mellon/ACLS Dissertation Completion Fellowships, which support a year of research and writing to help advanced
graduate students in the humanities and related social sciences in the last year of Ph.D. dissertation writing. The program encourages timely completion of the Ph.D. Applicants must be prepared to complete their dissertations within the period of their fellowship tenure and no later than August 31, 2014. A grant from The Andrew W. Mellon Foundation supports this program. ACLS will award 65 Fellowships in this competition for a one-year term beginning between June and September 2013 for the 2013-2014 academic year. The Fellowship tenure may be carried out in residence at the Fellow’s home institution, abroad, or at another appropriate site for the research. These Fellowships may not be held concurrently with any other fellowship or grant (see Writing Proposals for ACLS Fellowship Competitions). Due October 24.

**Bridges to the Doctorate Program (R25)**
This Funding Opportunity Announcement (FOA) issued by the National Institute of General Medical Sciences (NIGMS), National Institutes of Health (NIH), encourages Research Education Grant (R25) applications from institutions that propose to increase the pool of master’s degree students from underrepresented backgrounds who go on to research careers in the biomedical and behavioral sciences, and who are trained and available to participate in NIH-funded research. This initiative promotes partnerships/consortia between colleges or universities granting a terminal master’s degree with institutions that offer the doctorate degree. The program expects that the joint efforts of doctorate degree-granting and master’s degree-granting institutions will foster the development of a well-integrated institutional program that will provide students with the necessary academic preparation and skills to enable their transition and successful completion of the Ph.D. degree in biomedical and behavioral sciences. Due October 26.

**Bridges to the Baccalaureate Program (R25)**
This Funding Opportunity Announcement (FOA) issued by the National Institute of General Medical Sciences (NIGMS), National Institutes of Health (NIH), encourages Research Education Grant (R25) applications from institutions that propose research education programs to increase the pool of community college students from underrepresented backgrounds who go on to research careers in the biomedical and behavioral sciences and will be available to participate in NIH-funded research. This initiative promotes partnerships/consortia between community colleges or other two-year post-secondary educational institutions granting the associate degree with colleges or universities that offer the baccalaureate degree. The program expects that the joint efforts of baccalaureate degree-granting and associate degree-granting institutions will foster the development of a well-integrated institutional program that will provide students with the necessary academic preparation and skills to enable their transition and successful completion of the baccalaureate and subsequently more advanced degrees in biomedical and behavioral sciences. Due October 26.

**SBE Postdoctoral Research Fellowships (SPRF)**
The Directorate for Social, Behavioral and Economic Sciences (SBE) offers Postdoctoral Research Fellowships in two tracks: (i) Broadening Participation (SPRF-BP), and (ii) Interdisciplinary Research in Behavioral and Social Sciences (SPRF-IBSS). Due October 29.

Rome Prize
Each year, the Rome Prize is awarded to thirty emerging artists and scholars in the early or middle stages of their careers who represent the highest standard of excellence in the arts and humanities. Due November 1. Fellows are chosen from the following disciplines:
  - Architecture
  - Design
  - Historic Preservation and Conservation
  - Landscape Architecture
  - Literature (awarded only by nomination through the American Academy of Arts and Letters)
  - Musical Composition
  - Visual Arts
  - Ancient Studies
  - Medieval Studies
  - Renaissance and Early Modern Studies
  - Modern Italian Studies

Japanese Studies Fellowship Program
This program provides support to outstanding scholars in the field by offering the opportunity to conduct research in Japan. Due November 1.

American College of Surgeons Faculty Research Fellowships
The American College of Surgeons is offering two-year faculty research fellowships, through the generosity of Fellows, Chapters, and friends of the College, to surgeons entering academic careers in surgery or a surgical specialty. The fellowship is to assist a surgeon in the establishment of a new and independent research program. Applicants should have demonstrated their potential to work as independent investigators. The fellowship award is $40,000 per year for each of two years, to support the research. Due November 1.

Small Business Innovation Research Program Phase I Solicitation FY-2013 (SBIR)
(Release-2)
The Small Business Innovation Research (SBIR) Program stimulates technological innovation in the private sector by strengthening the role of small business concerns in meeting Federal research and development needs, increasing the commercial application of federally supported research results, and fostering and encouraging participation by socially and economically disadvantaged and women-owned small businesses. The four broad topics are:
- Biological and Chemical Technologies (BC)
- Education Applications (EA)
- Electronics, Information and Communication Technologies (EI)
Program in Ultrafast Laser Science and Engineering (PULSE)
The Program in Ultrafast Laser Science and Engineering (PULSE) seeks to enable efficient and agile use of the entire electromagnetic spectrum by linking it to the output of an ultrafast laser. The expected outcome of the program is to develop novel sources of radiation that improve upon existing state-of-the-art performance, size, weight, and power. In particular, PULSE aims to develop devices and techniques that will result in low phase-noise microwave oscillators, practical optical time/frequency transfer techniques, tabletop sources of high-quality secondary radiation and high flux isolated attosecond pulses, and other DOD-relevant applications. **Due November 6.**

East Asia and Pacific Summer Institutes for U.S. Graduate Students (EAPSI)
NSF and selected foreign counterpart science and technology agencies sponsor international research institutes for US graduate students in seven East Asia and Pacific locations at times set by the counterpart agencies between June and August each year. These Summer Institutes (EAPSI) operate similarly and the research visits to a particular location take place at the same time. Although applicants apply individually to participate in a Summer Institute, awardees become part of the cohort for each location. Applicants must propose a location, host scientist, and a research project that is appropriate for the host site and duration of the international visit. **Due November 8.**

Doctoral Dissertation Improvement Grants in the Directorate for Biological Sciences (DDIG)
The National Science Foundation awards Doctoral Dissertation Improvement Grants in selected areas of the biological sciences. These grants provide partial support of doctoral dissertation research to improve the overall quality of research. Allowed are costs for doctoral candidates to participate in scientific meetings, to conduct research in specialized facilities or field settings, and to expand an existing body of dissertation research. **Due November 9.**

DOE/OS Terrestrial Ecosystem 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 terrestrial ecosystem science. The goal of the Terrestrial Ecosystem Science (TES) program is to improve the representation of terrestrial ecosystem processes in Earth system models thereby improving the quality of climate model projections and providing the scientific foundation needed to inform DOE’s energy decisions. The TES program will consider applications on measurements, experiments, modeling and synthesis that provide improved quantitative and predictive understanding of the terrestrial ecosystem that, in turn, can affect atmospheric greenhouse gas concentration changes and thereby affect the greenhouse gas forcing of climate. In addition, the Earth System Modeling (ESM) Program, which funds development of the Community Earth System Model (CESM) will consider applications focused on development and coupling of the CESM land model component. The emphasis of this
Funding Opportunity Announcement (FOA) is to understand non-managed terrestrial ecosystems in the context of a changing climate. Applicants should pose their research applications in the context of representing terrestrial ecosystem processes in Earth system models.  **Due November 12.**


The National Science Foundation (NSF) is working jointly with counterpart national, regional and multinational funding organizations worldwide to enhance opportunities for collaborative activities in materials research and education between US investigators and their colleagues abroad. This solicitation promotes joint activities between the NSF Division of Materials Research (DMR) and funding organizations in Africa, Asia, the Americas and Europe.  **Due November 14.**

**Agriculture and Food Research Initiative: Food Safety**

This AFRI Challenge Area promotes and enhances the scientific discipline of food safety, with an overall aim of protecting consumers from microbial and chemical contaminants that may occur during all stages of the food chain, from production to consumption. This requires an understanding of the interdependencies of human, animal, and ecosystem health as it pertains to foodborne pathogens. The long-term outcome for this program is to reduce foodborne illnesses and deaths by improving the safety of the food supply, which will result in reduced impacts on public health and on our economy. In order to achieve this outcome, this program will support single-function Research Projects and multi-function Integrated Research, Education, and/or Extension Projects, and Food and Agricultural Science Enhancement (FASE) Grants that address one of the Program Area Priorities (see Food Safety RFA for details).  **Due November 14.**

**Ford Foundation Fellowship Program**

Through its Fellowship Programs, the Ford Foundation seeks to increase the diversity of the nation’s college and university faculties by increasing their ethnic and racial diversity, to maximize the educational benefits of diversity, and to increase the number of professors who can and will use diversity as a resource for enriching the education of all students. Eligibility to apply for a Ford fellowship is limited to:

- All citizens or nationals of the United States regardless of race, national origin, religion, gender, age, disability, or sexual orientation,
- Individuals with evidence of superior academic achievement (such as grade point average, class rank, honors or other designations),
- Individuals committed to a career in teaching and research at the college or university level.

For information regarding level-specific eligibility requirements, stipends, and other program information for each of the three levels of the Fellowship program, please access the fact sheet for the program level of your interest, [predoctoral](#), [dissertation](#) or [postdoctoral](#).  **Due November 14 and 19 by fellowship type.**
AAUW American Fellowships
American Fellowships support women doctoral candidates completing dissertations or scholars seeking funds for postdoctoral research leave from accredited institutions. Candidates must be U.S. citizens or permanent residents. Candidates are evaluated on the basis of scholarly excellence; the quality and originality of project design; and active commitment to helping women and girls through service in their communities, professions, or fields of research. Due November 15.

Fiscal Year 2012 Basic Research Initiative (BRI)
The Air Force Office of Scientific Research (AFOSR) manages the basic research investment for the U.S. Air Force (USAF). As a part of the Air Force Research Laboratory (AFRL), AFOSR’s technical experts foster and fund research within the Air Force Research Laboratory, universities, and industry laboratories to ensure the transition of research results to support USAF needs. AFOSR announces a competition for the Fiscal Year 2012 Basic Research Initiative (BRI) program, for the topics listed below. Detailed descriptions of the topics may be found in Section I of this announcement. It is expected that multiple awards will be made. The Air Force Defense Research Sciences Program is open to November 23, 2012.

DOE/OS Early Career Research Program
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 26.

NSF Science, Engineering and Education for Sustainability Fellows
Through the SEES Fellows Program, NSF seeks to advance science, engineering, and education to inform the societal actions needed for environmental and economic sustainability and human well-being while creating the necessary workforce to address these challenges. The Program's emphasis is to facilitate investigations that cross traditional disciplinary boundaries and address issues of sustainability through a systems approach, building bridges between academic inquiry, economic growth, and societal needs. The Fellow's proposed investigation must be interdisciplinary and allow him/her to obtain research experiences beyond his/her current core disciplinary expertise. Fellows are required to develop a research partnership(s) that will advance and broaden the impact/scope of the proposed research, and present a plan for their own professional development in the area of sustainability science and engineering. Due November 26.

Fellowships at The Huntington 2013-2014
The Huntington is an independent research center with holdings in British and American history, literature, art history, and the history of science and medicine. The Library collections range chronologically from the eleventh century to the present and include seven million manuscripts, 413,000 rare books, 275,000 reference works, and 1.3 million photographs, prints, and ephemera. The Burndy Library consists of some 67,000 rare books and reference volumes in the history of science and technology, as well as an important collection of scientific instruments. Within the general fields listed above there are many areas of special strength, including: Middle Ages, Renaissance, 19th- and 20th-century literature, British drama, Colonial America, American Civil War, Western America, and California. The Art Collections contain notable British and American paintings, fine prints, photographs, and an art reference library. In the library of the Botanical Gardens is a broad collection of reference works in botany, horticulture, and gardening.  

**World Bank Internships**

The Bank Internship offers highly motivated and successful individuals an opportunity to improve their skills while working in a diverse environment. Interns generally find the experience to be rewarding and interesting. To be eligible for the Internship, candidates must possess an undergraduate degree and already be enrolled in a full-time graduate study program (pursuing a Master's degree or PhD with plans to return to school in a full-time capacity. Generally, successful candidates have completed their first year of graduate studies or are already into their PhD programs. This *Internship typically seeks candidates in the following fields*: economics, finance, human development (public health, education, nutrition, population), social science (anthropology, sociology), agriculture, environment, private sector development, as well as other related fields. Fluency in English is required. Prior relevant work experience, computing skills, as well as knowledge of languages such as French, Spanish, Russian, Arabic, Portuguese, and Chinese are advantageous.  

Due November 30.

**10th Annual P3 Awards: A National Student Design Competition for Sustainability Focusing on People, Prosperity and the Planet**

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 economic prosperity, protection of the planet, and improved quality of life for its people—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 11.

**National Robotics Initiative (NRI)**

The goal of the National Robotics Initiative is to accelerate the development and use of robots in the United States that work beside, or cooperatively with, people. Innovative robotics research and applications emphasizing the realization of such co-robots acting in direct support
of and in a symbiotic relationship with human partners is supported by multiple agencies of the federal government including the National Science Foundation (NSF), the National Aeronautics and Space Administration (NASA), the National Institutes of Health (NIH), and the U.S. Department of Agriculture (USDA). The purpose of this program is the development of this next generation of robotics, to advance the capability and usability of such systems and artifacts, and to encourage existing and new communities to focus on innovative application areas. It will address the entire life cycle from fundamental research and development to manufacturing and deployment. Methods for the establishment and infusion of robotics in educational curricula and research to gain a better understanding of the long term social, behavioral and economic implications of co-robots across all areas of human activity are important parts of this initiative. Collaboration between academic, industry, non-profit and other organizations is strongly encouraged to establish better linkages between fundamental science and technology development, deployment and use. **December 11 and January 23.**

**National Defense Science and Engineering Graduate (NDSEG) Fellowship**
The NDSEG Fellowship is a highly competitive, portable fellowship that is awarded to U.S. citizens and nationals who intend to pursue a doctoral degree in one of fifteen supported disciplines. NDSEG confers high honors upon its recipients, and allows them to attend whichever U.S. institution they choose. NDSEG Fellowships last for three years and pay for full tuition and all mandatory fees, a monthly stipend, and up to $1,000 a year in medical insurance. The Department of Defense (DoD) is committed to increasing the number and quality of our nation's scientists and engineers, and towards this end, has awarded approximately 3,200 NDSEG fellowships since the program's inception 22 years ago. The NDSEG Fellowship is sponsored by the [Air Force Office of Scientific Research](https://www.ofr.osd.mil/) (AFOSR), the [Army Research Office](https://www.arof.usarmy.mil/) (ARO), the [High Performance Computing Modernization Program](https://www.hpcm.mil/) (HPCM), and the [Office of Naval Research](https://www.onrdp.navy.mil/) (ONR), under the direction of the [Director of Defense Research and Engineering](https://www.dre.osd.mil/) (DDR&E). **Due December 14.**

**Expeditions in Training, Research, and Education for Mathematics and Statistics through Quantitative Explorations of Data (EXTREEMS-QED)**
The long-range goal of EXTREEMS-QED is to support efforts to educate the next generation of mathematics and statistics undergraduate students to confront new challenges in computational and data-enabled science and engineering (CDS&E). EXTREEMS-QED projects must enhance the knowledge and skills of most, if not all, the institution's mathematics and statistics majors through training that incorporates computational tools for analysis of large data sets and for modeling and simulation of complex systems. Funded activities are expected to provide opportunities for undergraduate research and hands-on experiences centered on CDS&E; result in significant changes to the undergraduate mathematics and statistics curriculum; have broad institutional support and department-wide commitment that encourage collaborations within and across disciplines; and include professional development activities for faculty or for K-12 teachers. **Due December 14.**
FY 12 Funding Opportunity For The National Consortium For Measurement And Signature Intelligence (MASINT) Research Program
FY12 Program: Offerors are invited to present related work, on-going research activities and proposed future activities associated with the following areas: (A) Remote assessment of missile performance characteristics such as location, thrust, throw weight, warhead accuracy, defensive capabilities, etc. (B) Remote assessment and detection of weapons of mass destruction such as nuclear, biological, chemical and radiological weapons. This thrust area does not include improvised explosive devices utilizing standard explosives such as dynamite, TNT, C4, ANFO, etc. (C) 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. Open to Dec. 31, 2012.

Innovation Corps Sites Program (I-Corps Sites)
The National Science Foundation seeks to develop and nurture a national innovation ecosystem that builds upon research to guide the output of scientific discoveries closer to the development of technologies, products and processes that benefit society. In order to contribute to a national innovation ecosystem, NSF is establishing the NSF Innovation Corps Sites Program (NSF I-Corps Sites). Due January 7.

DARPA Strategic Technologies
The Defense Advanced Research Projects Agency's (DARPA) Strategic Technology Office (STO) is soliciting innovative proposals under this Broad Agency Announcement (BAA) for the performance of research, development, design, and testing that directly supports Strategic Technology Office (STO). This includes Finding Difficult Targets; Communications, Networks and Electronic Warfare; Shaping the Environment; and Foundational Technologies that support multiple STO focus areas. DARPA-BAA-12-09, entitled Strategic Technologies, is provided as an attachment to this presolicitation notice and includes information on the specific areas of interest, the submission process, proposal formats, as well as all other pertinent administrative information. Open to January 12, 2013.

SPIE Education Outreach Grants Program Supporting Optics And Photonics Related Education And Outreach Projects
As part of its education outreach mission, SPIE provides support for optics and photonics related education outreach projects. The award process is competitive; applications are judged on their potential to impact students and increase optics awareness. The key criterion in evaluation and ranking applications is the potential to impact students and to increase optics and photonics awareness. Qualifying not-for-profit organizations such as universities, optics centers, science centers, primary and secondary schools, youth clubs, industry associations and international optical societies are eligible for project support. Due January 13, 2013.

Coastal SEES (Coastal SEES) Science, Engineering and Education for Sustainability
Coastal SEES is focused on the sustainability of coastal systems. For this solicitation we define coastal systems as the swath of land closely connected to the sea, including barrier islands,
wetlands, mudflats, beaches, estuaries, cities, towns, recreational areas, and maritime facilities; the continental seas and shelves; and the overlying atmosphere. These systems are subject to complex and dynamic interactions among natural and human-driven processes. Coastal systems are crucial to regional and national economies, hosting valued human-built infrastructure and providing ecosystem services that sustain human well-being. More than half of the world’s human population lived in coastal areas in 2000, and this proportion is predicted to increase to 75 percent by 2025. Due January 13.

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Mexican Partnership Program
The United States Agency for International Development (USAID) Mission in Mexico is seeking concept papers and, later, applications from Mexican for-profit and non-for-profit organizations to implement activities to support the Mexican Partnership Program related to global climate change, economic competitiveness, youth, human rights and rule of law. Eligible organizations include, but are not limited to, non-government organizations (NGOs), associations, cooperatives, universities, civil society organizations, foundations, and private companies. Open to January 29, 2013.

GDA APS 2012 - Addendum Mexico
Through this Addendum to the FY 2012 Global Development Alliance (GDA) Annual Program Statement (APS) No. APS-OAA-12-000003 (the GDA APS), USAID/Mexico is making a special call for the submission of concept papers related to the USG development pillars of private sector competitiveness, environment and education for work in Mexico. The objectives supported under this addendum are to: 1) help mitigate the effects of global climate change, with a focus on the energy and forestry sectors; 2) improve the availability, relevance and quality of youth leadership and workforce development programs in communities most affected by crime and violence; and 3) support Mexico’s implementation of a new criminal justice system. Open to January 31, 2013.

Camille Dreyfus Teacher-Scholar Awards Program
The Camille Dreyfus Teacher-Scholar Awards Program supports the research and teaching careers of talented young faculty in the chemical sciences. Based on institutional nominations, the program provides discretionary funding to faculty at an early stage in their careers. Criteria
for selection include an independent body of scholarship attained within the first five years of their appointment as independent researchers, and a demonstrated commitment to education, signaling the promise of continuing outstanding contributions to both research and teaching. The Camille Dreyfus Teacher-Scholar Awards Program provides an unrestricted research grant of $75,000. Due February 10.

Endangered Language Fund
The Endangered Language Fund provides grants for language maintenance and linguistic field work. The work most likely to be funded is that which serves both the native community and the field of linguistics. Work which has immediate applicability to one group and more distant application to the other will also be considered. Publishing subventions are a low priority, although they will be considered. Proposals can originate in any country. The language involved must be in danger of disappearing within a generation or two. Endangerment is a continuum, and the location on the continuum is one factor in our funding decisions. Due April 22.

Initiative for Conservation in the Andean Amazon Phase II
The United States Agency for International Development (USAID) is seeking concept papers and later, applications, from Non-Governmental Organizations (NGOs), education institutions, partnerships and consortia to implement activities to support the Initiative for Conservation in the Andean Amazon (ICAA) with Landscape-based programs. Please note, at this time we are not accepting full applications or proposals. Only concept papers will be reviewed. Instructions on how to prepare a concept paper are provided within this APS. Open to May 2, 2013.

APS for Food Security, Nutrition, Biodiversity and Conservation
The U.S. Agency for International Development (USAID) continues its commitment to foster more strategic alliances with the private sector’s “solution holders” who are often well positioned to address specific development challenges. The purpose of this APS is to announce USAID/Uganda’s plans to fund a limited number of Public Private Alliances to enhance food security and address issues of biodiversity and conservation. Competition under this APS will consist of a two-step process where applicants first submit a Concept Paper for an initial competitive review. All Concept Papers received will be evaluated for responsiveness to the application criteria specified in this APS. Open to September 15, 2013.

National Oceanic and Atmospheric Administration (NOAA)
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. Open until September 30, 2013.

National Geospatial-Intelligence Agency Academic Research Program
The National Geospatial-Intelligence Agency (NGA) is releasing this solicitation for its [sponsored academic research program](#). This publication constitutes a Broad Agency Announcement (BAA) as contemplated in Department of Defense (DoD) Grant and Agreement Regulations (DoDGARs) 22.315(a). Awards will take the form of grants. However, other instruments may be considered as appropriate based on the proposals. **Open to September 30, 2013.**

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

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

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

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

**Small University Grants Open 5-Year Broad Agency Announcement**
Open to August 26, 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.
What We Do--

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

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

- Training for Faculty - Workshops, seminars and webinars on how to find and compete for research funding from NSF, NIH, DoE and other government agencies as well as foundations. Proposal development retreats for new faculty.

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

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

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

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

Workshops by Academic Research Funding Strategies

We offer workshops on research development and grant writing for faculty and research professionals based on all published articles.

(View Index of Articles)

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