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Mike Cronan & Lucy Deckard, co-Publishers
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About the co-publishers
Mike Cronan, PE (Texas 063512, inactive) has 23 years of experience developing and writing successful proposals at Texas A&M University. He was named a Texas A&M University System Regents Fellow (2001-2010) for developing and writing A&M System-wide grants funded at over $100 million by NSF and other funding agencies. He developed and directed two research development and grant writing offices, one for Texas A&M’s VPR and the other for the Texas Engineering Experiment Station (15 research divisions state-wide).

Lucy Deckard (BS/MS Materials) worked in research development and grant writing at Texas A&M University and across the A&M System for nine years. She directed A&M’s New Faculty Research Initiative (2004-09), helping junior faculty System-wide jumpstart their research careers with federal agency funding. She served as associate director of two research development and grant writing offices. She founded ARFS in 2010.

About the editor--
Katherine E. Kelly, 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.
NSF’s annual budget represents about 20 percent of the total federal budget for basic research conducted at U.S. colleges and universities, and this share increases to about 60 percent when medical research supported by the National Institutes of Health is excluded. In many fields NSF is the primary source of federal academic support (here). Given this fundamental reality, researchers can develop a more successful and robust funding portfolio for NSF by developing a strategic plan for anticipating the competitive characteristics of future NSF proposals. Just as in developing strategic plans for competitive research capacity configurations that will position your institution for success in grand challenge research areas, such as energy, water and materials, an informed understanding of the scale and scope of innovation ecosystems at NSF and other research agencies allows preliminary positioning in a way that can significantly strengthen future proposals.

For example, the theme of innovation permeates many of the NSF programs, particularly the cross-cutting programs at that agency, as well as those in other agencies that view innovation as a key component of advancing research outcomes to commercialization. For instance, the NSF IGERT program, or NSF center programs, among many other research programs, now emphasize the importance of innovation in research and graduate training.

As defined by NSF, technological innovation is a subset of innovation that draws heavily on the scientific and engineering knowledge pool to create value for society through translational research. It represents an iterative process from basic science and engineering research at the start to production and marketing at the end. This process is accomplished by what NSF defines as “translational research”—research that moves an idea past the basic discovery stage towards and through proof-of-concept (not to be confused with the NIH definition of translational research “from the bench to the bedside”).

Coordinating support and thinking strategically about translating basic research into prototype products, processes, and services, and even early stages of technology development appears in a range of NSF programs that foster and encourage the translation of new knowledge generated through basic research into products, processes, services, and methodologies, including the NSF STC, ERC, MRSEC, EFRI, GOALI, PFI, STTR, SBIR, and I/UCIC.

In support of this emphasis, NSF recently created the division of Industrial Innovation and Partnerships (IIP) in the Engineering Directorate to foster partnerships that advance technological innovation. IIP focuses on successfully investing in engineering research and innovation by leveraging federal, small business, industrial, university, state, and community colleges resources. These infrastructures support the education and training of human capital for the research enterprise and the entrepreneurial aspects of innovation; they develop the social networks characterized by shared commitment and trust that embeds the intellectual capital and know-how embodied in scientists and engineers honed through advanced education.
and training; and they build a base of operational support without which sustainable partnerships cannot exist.

A report entitled “The Role of the National Science Foundation in the Innovation Ecosystem,” released in August 2010 by the NSF Directorate of Engineering defines the process of innovation as “the introduction of new or significantly improved products (goods or services), processes, organizational methods and marketing methods in internal business practices or the market place.” This definition, couched in fundamentally economic terms, emphasizes NSF’s increasing focus on the importance of moving new discoveries to the marketplace, i.e., “translational research.” While NSF is still strongly focused on basic research, center-level programs and educational programs, especially those in the Engineering Directorate, increasingly require collaborations with industry, and training that promotes innovation, commercialization, and entrepreneurial skills.

This innovation ecosystem (see graphic at the end of this article), as NSF defines it, includes a diversified base of private investment; the physical place to provide a context for incubation, technical, managerial, and administrative support; laboratory and other such capacities; communications services; and reliable sources of capital. One end of the innovation spectrum is constituted by the unsolicited research proposal with ideas generated by the academic community, while the other end is composed of the small business research proposal aimed at pursuing opportunities to commercialize products and services.

IIP is home to the Small Business Innovation Research (SBIR) program and the Small Business Technology Transfer (STTR) program. These programs feature nonacademic partnerships as an important component to facilitate engineering innovation under the IIP umbrella. IIP also manages the Partnerships for Innovation (PFI) program, which stimulates innovation by building partnerships across the scientific and engineering community. IIP leverages industrial support through two research programs, the Industry/University Cooperative Research Centers (I/UCRC) program, and the Grants Opportunities for Academic Liaison with Industry (GOALI) program.

The IIP Division accepts only those proposals submitted in response to an open solicitation. Unsolicited proposals are not accepted except for the GOALI program, where the proposals are submitted to the respective disciplinary programs.

The key to the foregoing is the strategic recognition that NSF is in the process of defining an agencywide vision of the Innovation Ecosystem through the creation and strengthening of NSF activities and programs, as well as through links with other government agencies. NSF will fund activities that build a culture of innovation among faculty and students, promote regional coordination and linkages, and develop technology-based networks of researchers, such as the Research Coordination Networks program.

However, keep in mind that this relatively new direction is continuously evolving at NSF as it seeks to define the scope and scale of the critical building blocks of a robust innovation ecosystem (see following graphic) and how best to support them. Importantly, when NSF is in the process of defining its own “programmatic frontiers,” a period of “creative program development” offers a significant advantage to those who plan a configuration of future research partnerships that will map to this new landscape of innovation. In many ways, the
faculty and research offices that strategically plan for research, education, and training activities as components of the innovation ecosystem will, in their turn, influence the direction NSF takes in the future, and hence will achieve success more consistently in that environment.

NSF has a long history of developing programmatic models and using the results of those program models to expand the “programmatic frontiers” of the agency with new programs and new ways to support the scientific enterprise. Those most successful at NSF over time both learn from and contribute to these evolving models. IIP and the related programmatic initiatives that fall under the umbrella of the innovation ecosystem as defined by NSF represent once again an opportunity to take to heart the Wayne Gretzky observation that success is “knowing not just where the puck is but knowing where it will be.” This is good advice when developing partnerships for NSF funding, particularly funding for innovation (here).

NSF Representation of the U.S. Innovation Ecosystem
Source: Adapted from Tassey (2008)
Red teaming proposals offers significant competitive advantages to ensure that a submitted research narrative responds fully to the agency solicitation and makes the most compelling case possible to persuade program officers and reviewers to recommend funding (See Red Teaming Proposals for Funding Success in the November 15, 2010 issue). Equally important to red teaming the proposal is what might be called red teaming the solicitation, a process that needs to start immediately upon publication of a funding solicitation of potential interest.

The term “red team” derives from government and industrial evaluations that use a group—a red team—to review, assess, test, or vet plans, operations, concepts, capabilities, or proposals. Red teaming very thoroughly reviews and evaluates a proposal. In this context, it is important to keep in mind that successful proposals approach excellence through repeated revisions that eradicate ambiguities and bring focus, specificity, and clarity to the proposal. Narratives relying on excessive generalities and unsupported claims rather than specific and validating detail that advances a research vision will quickly lose reviewers’ attention and confidence. The red teaming process can help assure this does not happen.

Importantly, red teaming is a scalable process. While often used for large research proposals, or other major institutional initiatives, the step-by-step red team review process can be adapted to smaller proposals as well, such as NSF CAREER proposals wherein a “critique club” of applicants reading and commenting on each other’s CAREER narrative can significantly enhance success. The red teaming process features a unique and key characteristic: a frank, open and unflinching assessment in the spirit of Tom Hanks’ instructional comment to right-fielder Bitty Schram in the movie, A League of Their Own: “Are you crying? Are you crying?! There’s no crying in baseball!”

Moreover, applying a variant of the red teaming process to analyze the solicitation is the first critical step in making several key strategic decisions that will determine the outcome, i.e., success or failure, of a proposal.

Of course the first critical decision to make is whether or not to submit a proposal based on a candid assessment of your competitiveness as you map your capacities to the research goals defined in the solicitation. Once that analysis is complete, and if a decision is made to submit a proposal, the solicitation becomes to the development and writing of a successful proposal what the North Star was to ancient navigators.

However, correctly analyzing a solicitation prior to developing the proposal amounts to the critical first step in your effort’s ultimate success. Solicitations by their nature tend towards the prescriptive rather than the open ended, in the sense of Lewis Carroll’s observation in Alice in Wonderland: “If you don’t know where you are going, any road will get you there.” That will not work in proposal writing. Solicitations, by analogy, place significant, exacting, and often
nuanced initial conditions on the logical structure of your proposal, e.g., what you propose, how you propose it, and the rationale and arguments you make for the significance of your research to the field or the mission critical objectives of the funding agency.

Moreover, because solicitations are written documents used to convey an often complex set of sponsor instructions and expectations (e.g., vision, goals, objectives, outcomes, etc.), sometimes well written and sometimes not, they typically leave a lot of room for significant ambiguity and misdirection to enter the process of accurately “decoding the solicitation.” This ambiguity typically arises from several sources, often concurrently, including:

- lack of clarify in some portions of the solicitation itself (talk to the program officer),
- failure on your part to thoroughly and accurately analyze the solicitation (read it; read it again),
- failure of team members to closely read the solicitation before advancing ideas (put them in in-school suspension),
- failure of you or your team members to sufficiently understand the research culture and mission objectives of the agency in a way that allows you to gain a deeper and more nuanced insight into the solicitation (e.g., the capacity to “read between the lines” or “understand the subtext”)
- unfamiliarity with the agency’s language used to describe its research vision, goals, and objectives at various scales, from the solicitation to the entire agency.

Given the importance of an insightful reading of the solicitation to the ultimate success of a proposal, particularly given that small misinterpretations of the solicitation early on may well be amplified into missed opportunities during the writing of the research narrative, putting together a solicitation review team, i.e., a red team, to analyze the solicitation together rather than separately, offers another opportunity to weight the outcome to your advantage.
It will come as no surprise to those who have made a sufficient number of calls to program officers at federal research agencies that not all program officers are alike, and, like Goldilocks in *The Three Bears*, finding the one that is just right can take some persistence. This can be particularly true when there appears to be some degree of disconnect between various directorates, divisions, and programs at a particular agency, or some level of disconnect between the program officer and agency’s description of the configuration, scope, and scale of research interests, together with the information passed on to describe this.

A common manifestation of such a disconnect often occurs when the agency level advocates broad disciplinary, integrative solutions to complex research problems, while the program officer level, promotes a more siloed approach. This discrepancy is not lost on potential applicants seeking a path to successful funding. Confused researchers seeking clarification may find themselves in the Goldilocks story, which, the editor of *The Annotated Classic Fairy Tales* (2002) describes as “*a cautionary tale that imparts a lesson about the hazards of wandering off and exploring unknown territory.*”

NSF, for example, has implicitly recognized the need to explore unknown territory, as, for instance, with the INSPIRE program. Last November, NSF Director Subra Suresh and the co-chairs of the NSF INSPIRE Working Group presented a live webinar about the new CREATIV (*Creative Research Awards for Transformative Interdisciplinary Ventures*) grant mechanism. CREATIV, the first grant award mechanism under INSPIRE (*Integrated NSF Support Promoting Interdisciplinary Research and Education*), was the only one of its kind launched in FY 2012. Its distinguishing characteristics include: *an internal merit review; proposals of an interdisciplinary and potentially transformative nature; and requests of up to $1,000,000 for a duration of up to five years.* Further announcements will be made regarding INSPIRE activities to be launched in FY 2013 and beyond. The funding for INSPIRE in future years is expected to increase substantially each year, reaching a steady state in FY 2016.

CREATIV represents NSF’s long-term goal of attracting transformational (i.e., unusually creative, high risk/high reward) proposals from *Pis who may have been reluctant to submit their research ideas to NSF’s standard review process.* CREATIV, NSF explains, can be understood as a test to determine “*how many out of the box ideas are out there*” that merit funding but would likely not be funded under NSF’s standard review process. NSF developed the CREATIV program in response to a concern that mainstream NSF review panels do not respond positively to “out of the box ideas.”

However, how programs such as INSPIRE, along with the *OneNSF* focus (designed to strengthen NSF’s support of interdisciplinary, potentially transformative research by complementing existing efforts with a suite of new, highly innovative Foundation-wide
activities and funding opportunities through 2016) get interpreted at all levels can make it difficult at times for some researchers to understand how best to place their research at that agency. This is particularly the case for more junior faculty whose research reflects the transformative interdisciplinarity that NSF promotes at the agency level, or implicitly at the program or solicitation level (e.g., Creative Research Awards for Transformative Interdisciplinary Ventures). The CAREER proposals due later this month, for example, will benefit from a discussion with program officers to determine the directorate or program that best fits your research (see the videos posted at the bottom of the Academic Research Funding Strategies Workshop Webpage). Making this determination can be fairly straightforward or not, as in the case where the research melds several disciplines, such as the physical and social sciences, under the research umbrella of sustainability.

While this interdisciplinarity may fit the oft-repeated agency-level interests of NSF, i.e., societal impacts or behavioral responses to coupled human and natural systems (e.g., “It is not the inability to predict tornados that causes deaths so much as the inability to predict people’s responses to warnings of tornados”), it may become more ambiguous at the program level or among program officers. Unfortunately, there is no easy solution to an apparent disconnect between the agency-level vision and the program-level interests, other than to keep in mind that, in research grant writing, timidity is never rewarded and ambiguity is always punished. So persistence (repeated conversations with program officers) in identifying the best program match for your research is critical.

Moreover, when dealing with rotating program officers, you may receive an enthusiastic response to your research ideas in discussions with one program officer during one grant cycle, perhaps for a CAREER proposal, and skepticism in response to the same ideas in the following grant cycle with another program officer. Regardless, if you believe your research falls into the scope and vision of what NSF calls “transformative interdisciplinary ventures,” don’t give up if you find the agency-level vision modified somewhat in both communications and practice by program officers. Be persistent, even if you feel that sometimes getting clarity on interdisciplinarity from a specific program is somewhat like trying to interview Schrödinger’s cat. In the end, program officers are not all alike, thankfully, and with persistence and a truly well-crafted “elevator pitch,” you will most likely find a research home for a transformative idea or disciplinary configuration.
Avoid the Generic Introduction

A common mistake in proposals is starting with an uninspiring and nondistinctive introduction.

By Lucy Deckard, co-publisher

Put yourself in the place of a reviewer. You’ve been asked to review proposals for a DOE biofuels program, and you have nine proposals to review before you participate in a panel. You open the first proposal, and it starts, “Biofuels are critical to the national goal of achieving energy independence…” The introduction to the proposal continues on for several paragraphs explaining the importance of biofuels and discussing why biofuels need to be developed. Of course, you’ve been asked to review these proposals because you’re an expert in biofuels, so none of this information is news to you.

You finish reading that proposal and open the second one. It starts, “Biofuels are an important component of the US’s future energy policy…” It goes on to explain why biofuels are important and why research on biofuels is needed. You open the third proposal, and guess what? It starts with another discussion of why biofuels are important – some of these discussions even stretch to a page or more. You wade through these proposals, and then you get to the sixth proposal, and it starts out, “A critical problem in making biofuels practical is making step x in the synthesis process more efficient. Our proposed project will address this problem by using the following innovative approach…” and it goes on to outline an interesting and innovative approach to the problem.

Which proposal would you remember?

The First Impression

A common mistake in writing proposals is to spend the first critical paragraphs explaining to the reviewer something that he surely already knows and probably has read in all the proposals leading up to yours. The saying that *you never get a second chance to make a first impression* is particularly true when it comes to proposals. Your reviewer’s interest is at its height when she starts reading your proposal. At that point, you can either get her excited or lull her to sleep. Starting with an introduction that does nothing to distinguish your project from all the other proposed projects will lull her to sleep.

To develop an exciting introduction, you need to identify the kernel of your great idea. How is your idea different from what others will propose? What important problem will it solve? Why is it innovative and exciting? Don’t bury that kernel in the bottom of page 3 after you’ve lulled your reviewer into a pleasant stupor with generic discussions about your topic area. Put it right up front in the first paragraph. When you finish your first paragraph, it should be absolutely distinctive. If that introductory paragraph could be put into another proposal on the same topic area, delete it and start over.
Many PIs like to start their proposal with a description of the need or problem they’re addressing. This approach is fine, but be sure to pinpoint the specific need or problem you’ll be addressing (not “biofuels production needs to be made more economical,” but “step x in the production of biofuels is inefficient”) and quickly follow with a discussion of how you’ll address that problem (e.g., “We have an innovative idea y for increasing efficiency of that step by 40%”).

Providing Context Without Boring the Reviewer

It is important to demonstrate to the funder that you understand the importance of the topic area and the motivation for the program, but it’s not necessary to discuss those things in the first couple of paragraphs. Save that discussion for your background section, which should be placed after an introductory section that provides a compelling overview of your proposed project. This overview should concisely summarize what you’re going to do, why you’re going to do it, and why it’s significant. When you get to that background section, be sure to tailor it to your specific project. You’ll not only want to demonstrate to the funder that you understand the funder’s goals for the program, but at the same time you’ll want to describe how funding your specific project will help the funder achieve those goals.

Similarly, when you discuss the state of the art, it can be tempting (particularly if you’ve been teaching a course on the subject) to write a long section that is essentially an introductory lecture about the topic. Unless you have good reason to believe that the reviewers are not well versed in the subject of your proposal, it’s best to avoid this temptation and instead focus quickly on the specific problem or challenge within the topic that is the focus of your proposed project. What have others done to try to address this problem? What holes in current knowledge must be filled in order to solve this problem?

So, taking our earlier biofuels example, that would mean discussing the state of knowledge about the specific synthesis step that you plan to improve, not providing a long description of the state of the art in biofuels. If your state of the art section could be interchanged with that from any other proposal on the topic, then you can be assured that the reviewer will be asleep by the time he finishes reading the section. Even more concerning, he will have gained no insight into the motivation behind your particular proposal, as compared to all the other proposals he has been reading.

Remember that your proposal will be evaluated along with a pile of other proposals submitted in response to the same funding opportunity. Whatever you can do to make your proposal stand out as more original, more thoughtful, more significant, or more exciting than the others will increase your chances of funding, and that starts with a strong introduction.
Narrative silos are like weeds that need to be eradicated or they will dominate the proposal and diminish its competitiveness. While mathematical integration can be important to the science or engineering proposed, narrative integration plays a central role in the well-written research proposal. Unfortunately, researchers tend to know less about how to integrate language than they do by mathematics, although both are symbolic systems that allow us to understand and convey complex information. However, the successful research narrative must use language to integrate its ideas and methods, particularly as research funding agencies increasingly promote a more multidisciplinary, and often transdisciplinary, approach to addressing complex problems. In this climate, language must serve as the vehicle for crossing and mixing disciplines without mixing up the reviewers.

Therefore, it is helpful in writing a research narrative to clarify the important ways research contributed from various fields intersects at disciplinary boundaries, and to explain the significance of those boundaries simply and clearly to reviewers and program officers alike. Narrative integration is grounded on connections, syntheses, intersections, interstices, and the melding of what is common to various disciplines and the differentiation of what is not. Illuminating connections for the reviewers can determine the proposal’s success; without connections, as E.M. Forester observes in *Howards End*, “we are meaningless fragments, half monks, half beasts, *unconnected arches that have never joined*.” If a successful proposal bridges ideas spanning from a research solicitation to a funded research project, then the arches, or multidisciplinary research themes, must not be left unconnected, or siloed, as current vernacular would describe it.

If there were ever a place where teaming is critical, it is in the planning, outlining, developing, and writing of an integrated, and hence competitive, research narrative. Integrated research narratives, by definition, amount to much more than the narratives of single PI proposals, although both types require narrative integration. The difference between the two lies mainly in the increased difficulty to be overcome in achieving integration as proposals increase in interdisciplinary scale and scope.

In practice, moreover, *understanding the required integrative nature of any research narrative needs to start at the beginning of the writing process and not near the end of it*, when the logic and argumentative structure have been fairly well set and consequently have become increasingly resistant to major revision. It is always possible within days of the proposal due date to “seed” or “splice” integrating statements into a siloed research narrative in a desperate attempt to overcome obvious disconnects between or among the core research themes, or between disconnected research themes and any possible required narrative sections related to education or societal impacts and benefits. However, last minute attempts to overcome narrative deficiencies related to siloed text, no matter how skillfully done, may still appear to reviewers as last-minute remodeling or renovation of the research narrative.
In the case of multidisciplinary or transdisciplinary proposals where your competitiveness lies in the capacity to make strong and clear arguments for the value-added benefits and resultant synergy of the proposed disciplinary configurations, members of the writing team should clearly define the scale, scope, and significance of those benefits prior to the start of the writing process, or concurrent with it, but certainly not later than that. While the writing process itself will likely illuminate more benefits to interdisciplinarity, those assigned to write major research sections of the proposal should all understand at the start why the research is being proposed under one “umbrella” proposal rather than as multiple single PI proposals submitted by the various section authors.

It can be helpful, in fact, to devote an early proposal development meeting entirely to identifying the research integration themes and disciplinary research integrators that will be woven into the research narrative itself, so that as section authors get writing assignments, they begin drafting text with the relational framework of the multidisciplinary proposal clearly in mind from the start. This coordinated communication resembles the hunting strategies or “rules” used by wolves, or perhaps quorum-sensing bacteria, in communicating a coordinated and focused action.

Identify and communicate among the proposal writing team the key integrative characteristics of the effort, specifically the value-added benefits and clear synergy prior to each section author beginning a first draft, or one principal author melding input from several coPIs into a first draft. This will better ensure a seamless research narrative that evolves within a relational framework and logical structure that simply and clearly demonstrates the value of the proposed team science. Developing a consensus among writing team members of the key integrative arguments to be made in the research proposal narrative offers one more way to ensure a successful proposal by preventing narrative silos from developing like weeds that dominate the proposal and diminish its competitiveness.
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.

Wearing an NIH Costume to an NSF Costume Party

Perhaps imposter Frank Abagnale, Jr., played in the movie Catch Me If You Can by Leonardo DiCaprio, might pull off this disguise successfully, but in most cases it is best not to attempt to wear an NIH costume to an NSF costume party. Some major alterations will be in order. For example, if your NIH costume identifies you as a biochemist able to significantly accelerate the “bench to bedside” benefits of your research in order to impact a specific human disease, you might want to consider wearing a new costume for the NSF party. In this case, your new, NSF-appropriate costume might better focus on how you will advance the frontiers of biological knowledge, increase our understanding of complex biological systems, and provide a theoretical basis for original research in many other scientific disciplines. Unfortunately, wearing the wrong research costume to the wrong agency costume party is a fairly common "fashion faux pas" not limited to researchers attempting to expand their funding opportunities by moving beyond NIH and including NSF as a potential funder of their research. This faux pas is quickly recognized and noted by reviewers.

The Claiming Rather than Explaining Mask

In grant writing it is always better to explain than to claim. Adjectives and superlatives do not have the power to confer legitimacy on your ideas, nor do they communicate anything more than unsubstantiated opinions. While your intent may be to use adjectives and superlatives to add a compelling “glitter” to the significance of your research narrative, the most likely result is that they will act more like chaff, annoying or distracting reviewers, much like chaff acts as a countermeasure to confuse radar systems. If something is novel, innovative, unique, or compelling about your research, then demonstrate that with the specificity and detail required to prove it. Claiming that your research is novel, innovative, unique, and compelling without proving it by substantive statements and well supported examples is
nothing more than wishful thinking, somewhat analogous to the sixteenth-century English proverb "If wishes were horses, beggars would ride." In the case of a research narrative, it is better to heed Benjamin Franklin’s observation: “Industry need not wish.” The significance of your ideas should not need the adornment of “linguistic bling” in the form of gushing superlatives. A clear and simple statement directed to reviewers and program officers describing the significance of your idea will suffice.

I Love Being in the Weeds Mask
To ensure that reviewers use your proposal as a sleeping aide, overwhelm them with a blizzard of technical minutia achieving the density of a black hole. Take them ever deeper into the disciplinary weeds, page after painful page, extinguishing their hope of finding even a glimmer of significance. Reviewers asked to slog through a seemingly endless series of arcane minutiae will quickly rebel against the numbingly repetitive experience, as desperately as TV meteorologist Phil Connors (Bill Murray) in Groundhog Day tries to escape the endlessly repeated series of trivial events. It can be easier to write page after page of familiar technical detail than to write a more disciplined research narrative representing a clear and simple description convincing reviewers of the significance of your research and its likelihood to advance the field in some way. Use technical detail judiciously to help prove your case rather than disguise it.

In some cases, the initial writing of technical detail can help you psychologically “jump start” the proposal narrative so you at least have the illusion of words on the page rather than a blank page. Ultimately, however, technical data dumps are nothing more than listings of technical capacities, expertise, and details without any guiding intelligence that explains the relational connections among the details and the resultant significance or importance to an agency mission. Excessive technical minutiae in a research narrative unlinked to research relevance forces reviewers into the position of the National Security Agency that gathers massive amounts of global communications but then must mine the “raw data” for relevant information demonstrating a pattern of significance to the agency. Don’t expect reviewers to do that job for you. Use the appropriate amount of technical detail to support your arguments, but never assume that “raw” technical details alone will make the funding case for you.

The All Hat and No Cattle Disguise
Putting forth grandiose ideas grounded on generalities rather than specifics is a fairly common failing of some proposals. Grand visions, overly ambitious plans, and unfocused ideas cobbled to unbridled enthusiasm will not impress reviewers. While effusive epiphanies may have their place on your back deck with a bottle of wine at sunset, they are most often, thankfully, ephemeral, and should not find their way into a proposal narrative.
NORDP Research Development Resources

HHS/HRSA: How to Apply For A Grant
Each funding opportunity has its own application and deadline, but all applications follow the same process. Organizations, not individuals, are eligible to apply. Completing a grant application can take 40 hours or more. Be sure to avoid common mistakes that stop an application before it is even reviewed.
Before you apply, make sure you
- Are an Eligible Organization
- Understand the Grant Process: Pre-Award, Post-Award and Closeout (PDF - 296 KB)
- Consider the Review Process – how applications are selected for award
- Follow the Top 10 Tips

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

Ability To Estimate Quantity Increases In First 30 Years Of Life
NIH-funded study links intuitive number sense to math ability. One of the basic elements of cognition — the ability to estimate quantities — grows more precise across the first 30 years or more of a person’s life, according to researchers supported by the National Institutes of Health. This intuitive grasp of numbers, also called an approximate number sense, or ANS, is tied to concrete math skills at every stage of life, the researchers found. Previously, the researchers have reported that ninth graders with a math disability were more likely to have an imprecise number sense. They also have found a correlation between an inherent grasp of quantity and such basic number skills as counting among children as young as 3 years old. The new finding
that the ANS grows sharper from birth through a person's childhood, teens, and twenties also suggests the possibility that environmental factors, such as education, may influence the strength of the ANS and that education could help improve it. Because ANS proficiency is linked to math ability, instruction to improve the ANS might be used to prevent the development of math learning disability or help remediate this disability, the researchers said. "People who struggle with a math learning disability may also struggle with day-to-day tasks such as estimating a bill or judging calories as part of a diet," said Kathy Mann Koepke, Ph.D., of the Child Development and Behavior Branch of the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD), the NIH institute that supported the study. "Research shows that differences in math ability in school can have a large impact on later health, as well as income, over a lifetime."

**Assessing the Reliability of Complex Models: Mathematical and Statistical Foundations of Verification, Validation, and Uncertainty Quantification**

Advances in computing hardware and algorithms have dramatically improved the ability to simulate complex processes computationally. Today's simulation capabilities offer the prospect of addressing questions that in the past could be addressed only by resource-intensive experimentation, if at all. *Assessing the Reliability of Complex Models* recognizes the ubiquity of uncertainty in computational estimates of reality and the necessity for its quantification. As computational science and engineering have matured, the process of quantifying or bounding uncertainties in a computational estimate of a physical quality of interest has evolved into a small set of interdependent tasks: verification, validation, and uncertainty of quantification (VVUQ). In recognition of the increasing importance of computational simulation and the increasing need to assess uncertainties in computational results, the National Research Council was asked to study the mathematical foundations of VVUQ and to recommend steps that will ultimately lead to improved processes. *Assessing the Reliability of Complex Models* discusses changes in education of professionals and dissemination of information that should enhance the ability of future VVUQ practitioners to improve and properly apply VVUQ methodologies to difficult problems, enhance the ability of VVUQ customers to understand VVUQ results and use them to make informed decisions, and enhance the ability of all VVUQ stakeholders to communicate with each other. This report is an essential resource for all decision and policy makers in the field, students, stakeholders, UQ experts, and VVUQ educators and practitioners.

**NIH Provides “LikeThis” Search Tool in eRA Commons**

The National Institutes of Health eRA Commons has a new [LikeThis](https://era.nih.gov/like-this) search tool to help principal investigators find and learn about other research projects. By entering specific scientific terms or accessing their own grant applications or grants and clicking on LikeThis, investigators will be provided a listing of similar funded projects and/or publications. The LikeThis tool is available to PIs registered in [eRA Commons](https://era.nih.gov/) and is available as a link after logging in to eRA Commons. The search data is confidential and is not available to other users of this site. NIH suggests that PIs can use LikeThis to determine which NIH Institute or study section to list as a preference in
application cover letters. PIs can enter scientific text from their grant application into LikeThis to find similar grants, including the name of the NIH funding Institute as well as a list of the study sections where these were reviewed. Alternatively, PIs can access their previously funded or unfunded grants from the “My Applications” tab in LikeThis to find similarly funded grants. LikeThis is currently available to PIs only. However, after July 20, the tool will be available to Signing Officials as well as others with eRA Commons roles such as Trainee, Post Doc, and Assistant.
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.

**Discipline-Based Education Research: Understanding and Improving Learning in Undergraduate Science and Engineering**

The National Science Foundation funded a synthesis study on the status, contributions, and future direction of discipline-based education research (DBER) in physics, biological sciences, geosciences, and chemistry. DBER combines knowledge of teaching and learning with deep knowledge of discipline-specific science content. It describes the discipline-specific difficulties learners face and the specialized intellectual and instructional resources that can facilitate student understanding. *Discipline-Based Education Research* is based on a 30-month study built on two workshops held in 2008 to explore evidence on promising practices in undergraduate science, technology, engineering, and mathematics (STEM) education. This book asks questions that are essential to advancing DBER and broadening its impact on undergraduate science teaching and learning. The book provides empirical research on undergraduate teaching and learning in the sciences, explores the extent to which this research currently influences undergraduate instruction, and identifies the intellectual and material resources required to further develop DBER.

**NSF Funded Research Team Finds Knowledge of Fractions and Long Division Predicts Long-term Math Success**

A research team led by Carnegie Mellon University's Robert Siegler has identified a major source of the gap - U. S. students' inadequate knowledge of fractions and division. Although fractions and division are taught in elementary school, even many college students have poor knowledge of them. The research team found that fifth graders' understanding of fractions and division predicted high school students' knowledge of algebra and overall math achievement, even after statistically controlling for parents' education and income and for the children's own age, gender, I.Q., reading comprehension, working memory, and knowledge of whole number addition, subtraction and multiplication. Published in *Psychological Science*, the findings demonstrate an immediate need to improve teaching and learning of fractions and division. "We suspected that early knowledge in these areas was absolutely crucial to later learning of more advanced mathematics, but did not have any evidence until now," said Siegler, the Teresa Heinz Professor of Cognitive Psychology at Carnegie Mellon. "The clear message is that we need to improve instruction in long division and fractions, which will require helping teachers to gain a deeper understanding of the concepts that underlie these mathematical operations. At present, many teachers lack this understanding. Because mastery of fractions, ratios and proportions is necessary in a high percentage of contemporary occupations, we need to start..."
making these improvements now." The research was supported by grants from the U.S. Department of Education’s Institute of Education Sciences and by the National Science Foundation's Developmental and Learning Science Group at the Social, Behavioral, and Economic Directorate.


Technology and engineering education continues to evolve as it becomes more apparent that students need this information to become more successful in college and careers. (Custer & Wright 2009; Ritz & Moye, 2011). The International Technology and Engineering Educators Association (ITEEA) has tracked the status of technology education in the United States in three separate studies over the past decade with the research undertaken by its Technology for All Americans Project staff (Newberry, 2001; Meade & Dugger, 2004; and Dugger, 2007). This 2011-12 study provided a fourth inquiry into that research, with engineering education being added as a curriculum area along with technology education.

**A Case Study: Teaching Engineering Concepts in Science**

This study was conducted to describe a teacher developed high school engineering course, to identify teaching strategies used in the process of delivering math and science literacy through this course, to identify challenges and constraints that occurred during its development and delivery, and to describe the strategies that were used to overcome those obstacles. A case study was conducted using semi-structured interviews with the engineering instructor at Benilde-St. Margaret’s in St. Louis Park, Minnesota. In addition, the researcher conducted classroom observations and reviewed instructional materials, teacher lesson plans, and teacher journals.

**The National Indian Education Study: 2011**

The National Indian Education Study (NIES) is designed to describe the condition of education for American Indian and Alaska Native (AI/AN) students in the United States. NIES is conducted under the direction of the National Center for Education Statistics on behalf of the U.S. Department of Education’s Office of Indian Education. The results presented in this report focus on the performance of AI/AN fourth- and eighth-graders on the 2011 National Assessment of Educational Progress in reading and mathematics and on the educational experiences of AI/AN students based on NIES survey data.
RFI - Enhanced Algal Biofuel Intermediate Yields (EABIY)
The purpose of this request for information (RFI) is solely to solicit input for DOE consideration in the development of future algal biofuels research, development, and deployment (RD&D) programs. Information obtained in response to this RFI will be used by DOE on a non-attribution basis. Although DOE may determine as the result of this RFI to issue a formal Funding Opportunity Announcement (FOA), there is no guarantee that future funding opportunities or other activities will be undertaken as a result of this RFI. This RFI provides algae stakeholders with an opportunity to contribute their views to help inform the development of OBP's strategic plans, requirements, and metrics for a potential research and development (R&D) program focused on enhancing the yield of algal biofuel intermediates.

DOE is interested in stakeholders' input regarding multiple types of algae, including microalgae, cyanobacteria, and macroalgae. Specifically, the OBP requests information from algal biofuel developers to help establish appropriate scope, scale, and metrics for consideration in developing two topics: A.) Reductions in Downstream Processing Costs; and B.) Improved Algal Biomass Productivity. The full Request for Information (RFI) is posted on the EERE Exchange website. Information on where to submit questions regarding the content of the RFI and where to submit questions regarding the EERE Exchange system can be found on the EERE Exchange website.

Dear Colleague Letter - Data Infrastructure in Mathematical and Physical Sciences
The opportunities that are afforded by the wealth of data that is currently available to the scientific community represent a critical component of the NSF vision for the Cyberinfrastructure Framework for 21st Century Science and Engineering (CIF21). Through CIF21, NSF aims "to accelerate research and education and new functional capabilities in computational and data-intensive science and engineering". The CIF21 structure is not a monolithic entity but an integrated set of activities that are designed to work in conjunction with each other to ensure that the scientific community has the infrastructure tools that will enable the solution of the major grand challenges that are faced by 21st century science and engineering. One component of this portfolio is the recently-announced crosscutting program announcement Data Infrastructure Building Blocks (DIBBs) that addresses the need to "develop, implement and support the new methods, management structures and technologies to store and manage the diversity, size, and complexity of current and future data sets and data streams."

NIH Common Fund Announces New Programs
New programs exploring novel approaches to cell-to-cell communication and understanding undiagnosed diseases, which represent challenges or scientific opportunities for a wide array of health research, are the latest priorities for the National Institutes of Health Common Fund. The funding was announced today by NIH Director Francis S. Collins, M.D., Ph.D., after he received
broad community input and recommendations from institute and center directors at NIH. The Common Fund targets strategic investments that have the potential for rapid and significant impact. The programs are scheduled to begin during fiscal year 2013.

Dear Colleague Letter: Proposal Solicitation and Evaluation Changes for the Geography and Spatial Sciences (GSS) Program
As has been true for many other parts of the National Science Foundation, the number of proposals submitted to the Geography and Spatial Sciences (GSS) Program has grown at a much faster rate than the number of proposals that GSS can fund. As a result, the percentage of regular research projects funded by GSS relative to the number of proposals the program considered for funding dropped from the 20 percent to 24 percent range in the early 1990s to the 16 percent to 18 percent range for much of the first decade of the 2000s. During the last two fiscal years, that percentage dropped to the 12 percent to 15 percent range. The increase in proposals, many of which are revised and resubmitted without significant improvement within weeks after they have been declined, have created a significant burden on members of the research community who are serving as principal investigators, reviewers, and advisory panel members. To address these problems, the Geography and Spatial Sciences Program has implemented a new schedule for the submission and evaluation of proposals, and it is adopting special merit review criteria in order to better identify potentially transformative research that has larger-scale, longer-term significance. These changes are outlined in a new GSS program solicitation. NSF 12-570. That solicitation also provides more specific guidance regarding the preparation of proposals. Effective immediately, **GSS will conduct one annual competition for new research proposals submitted to the program. The next deadline for submission of these proposals is September 13, 2012. Starting in 2013, the proposal-submission deadline will be the first Thursday in September.** In addition to regular research proposals, proposals for conferences, workshops, group-travel, and other community-development activities as well as research coordination network (RCN) proposals must be submitted by this deadline. Based on merit review, all proposals will be recommended for funding or for declination. Some investigators whose proposals are declined will have an opportunity to submit a revised proposal for consideration by NSF prior to the next annual deadline, but that opportunity will be limited to investigators who receive explicit invitations to resubmit from the

Dear Colleague Letter: New Programs and Refocusing of Existing Programs in CMMI
The Division of Civil, Mechanical, and Manufacturing Innovation (CMMI) announces two new programs as well as the refocusing of several existing program descriptions. These programmatic changes are part of a larger ongoing effort by CMMI to respond to emerging research areas and the needs of its research communities. Descriptions of the new programs in CMMI are as follows:

- The System Science (SYS) program funds fundamental research on engineered systems that will support the creation of a mathematically sound framework for systems engineering. The System Science program invites proposals that address fundamental systems issues including system performance prediction, uncertainty quantification in
the systems context, theoretical foundations for aggregation in systems, decision-making in the systems context, and operation and maintenance in the systems context.

- The Design of Engineering Material Systems (DEMS) program supports innovative, fundamental research intended to lead to new paradigms of design, development, and insertion of advanced engineering material systems. Fundamental research that develops and creatively integrates theory, processing/manufacturing, data/informatics, experimental, and/or computational approaches with rigorous engineering design principles, approaches, and tools to enable the accelerated design and development of materials is welcome.

The creation of these two programs is part of the division's ongoing effort to identify and support emerging fundamental research directions that cut across traditional disciplinary boundaries and/or are aligned with national needs. Such efforts have an ultimate goal to facilitate the building of vibrant research communities and establishing U.S. leadership in these emerging areas. Moreover, these new programs represent a growing desire in CMMI to support and strengthen research communities and areas that cross traditional disciplinary boundaries. At the same time, the division has refocused the scope of existing programs as a means to limit overlap and limit confusion to its communities. SYS and DEMS will begin to accept proposals with the fall (September 1 - October 1) CMMI unsolicited proposal submission window. Future submissions will be accepted during both windows for unsolicited proposals. (September 1 - October 1 and January 15 - February 15). Beginning in FY2013, CAREER proposals will be accepted in these programmatic areas as well.

**Dear Colleague Letter: Sustainable Chemistry, Engineering, and Materials (SusChEM)**

The purpose of this Dear Colleague Letter (DCL) is to draw your attention to the opportunity for research and education in the chemical sciences and engineering related to sustainable synthesis, use, and reuse of chemicals and materials under the initiative of Sustainable Chemistry, Engineering, and Materials (SusChEM). For FY 2013, the participating divisions are the Division of Chemistry (CHE); the Division of Chemical, Bioengineering, Environmental, and Transport Systems (CBET); and the Division of Materials Research (DMR). The Materials Processing and Manufacturing program in the Division of Civil, Mechanical and Manufacturing Innovation (CMMI) will also participate, and the Division of Earth Sciences (EAR) will collaborate on proposals with aspects relevant to the geosciences, such as harvesting of elements and geological processes pertinent to the development or fate of technological materials.

The SusChEM initiative is expected to continue and additional divisions are expected to participate in FY 2014 and beyond. **SusChEM is a new emphasis area in the family of programs in the NSF-wide Science, Engineering and Education for Sustainability (SEES) initiative.** As with all SEES programs, SusChEM proposals must advance science, engineering, and education to inform societal actions aimed at environmental and economic sustainability. Proposals are expected to take a systems-based approach to understanding, predicting, and reacting to change. Through support for interdisciplinary research and education, the projects must facilitate the move to global sustainability. Formation of partnerships is strongly encouraged, as
is inclusion of educational experiences to train a highly skilled workforce prepared to face complex challenges.

The SusChEM initiative specifically addresses the interrelated challenges of sustainable supply chains, engineering, production, and environmentally benign use of chemicals and materials by design. Because of the expected complex nature of the proposals, co-review and co-funding among the partnering NSF units is anticipated. Fundamental research topics of interest in SusChEM include replacement of rare, expensive, and/or toxic chemicals with earth-abundant, inexpensive, and benign chemicals; recycling of chemicals that cannot be replaced; development of non-petroleum based sources of important raw materials; discovery of new separation science that will facilitate recycling; and design of chemical processes to include recovering and recycling. Separation of critical metals, separation of gaseous byproducts from biomass conversion, water purification techniques, and chemical processes designed for zero waste are appropriate.

Another example of a suitable topic area is the development of materials for the preservation and extension of natural resources, for improved and extended operation or lifetime, to replace or substitute current materials for a safer and more secure future, or designed for zero waste. Sustainable materials processing is relevant, particularly processes with reduced use of toxic components, such as solvents, carbon emissions, and pollutants; processes under ambient conditions, as opposed to extreme temperatures, pressures or other harsh conditions; and increased conservation of natural resources, such as water, raw material, and energy.

Proposals should be submitted within the existing submission window of the relevant program and under a title that begins with 'SusChEM: '. Proposals are welcome from either multiple or single investigators. Interdisciplinary and Collaborative proposals among Principal Investigators (PIs) are encouraged and should be submitted to the most relevant program in one division while identifying possible co-review programs in the other divisions (by listing the appropriate NSF units on the cover page). Other mechanisms, such as supplement requests to existing grants, EAGERs, or CREATIV may be appropriate, but PIs are urged to check the divisional web-pages for additional guidance and to consult with relevant program officers in advance of submission. While not required, ties with industry, national laboratories, or other organizations are encouraged. If there are strong collaborations with industry, the Grant Opportunities for Academic Liaison with Industry (GOALI) solicitation can be used in conjunction with this effort. For single investigator proposals, the PI should request a budget and duration typical of the program to which the proposal is submitted. For proposals involving multiple investigators, a higher budget consistent with the scope of the proposed research will be considered.
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.

Evaluation of the Updated Site-Specific Risk Assessment for the National Bio- and Agro-Defense Facility in Manhattan, Kansas

DHS selected Manhattan, Kansas, as the site for the new NBAF after an extensive site-selection process that involved an environmental impact statement. The Government Accountability Office (GAO) raised concerns about DHS’s analysis of the potential spread of foot-and-mouth disease virus (FMDv), one of the most serious foreign animal disease threats. Congress directed DHS to conduct a site-specific risk assessment (SSRA) for the NBAF, instructed the National Research Council (NRC) to independently evaluate the SSRA, and prohibited obligation of NBAF construction funds until the NRC review was complete.

An Interim Report on Assuring DoD a Strong Science, Technology, Engineering, and Mathematics (STEM) Workforce

An Interim Report on Assuring DoD a Strong Science, Technology, Engineering, and Mathematics (STEM) Workforce is a report on the science, technology, mathematics, and engineering (STEM) workforce of the Department of Defense (DOD) and the U.S. defense industrial base is part of an 18-month study to assess the STEM capabilities that the DOD will need in order to meet its goals, objectives, and priorities. This study also assesses whether the current DOD workforce and strategy will meet those needs; and indentifies and evaluates options and recommends strategies that the department could use to help meet its future STEM needs. This study was undertaken by the National Academy of Engineering and the National Research Council. This report was issued for the purpose of assisting Assistant Secretary of Defense for Research and Engineering with its fiscal year 2012 planning process and with laying the groundwork for future years. Earlier in the project, the Committee on Science, Technology, Engineering, and Mathematics Workforce Needs for the U.S. Department of Defense and the U.S. Defense Industrial Base convened a workshop on August 1 and 2, 2011, in Rosslyn, Virginia. This workshop met for the purpose of gathering a broad range of views from the public sector and the private sector. This includes major defense contractors, and from nongovernmental organizations (NGOs), all of which are stakeholders in the future STEM workforce. At the conclusion of this study, a final report will be released.

Computing Research for Sustainability

A broad and growing literature describes the deep and multidisciplinary nature of the sustainability challenges faced by the United States and the world. Despite the profound technical challenges involved, sustainability is not, at its root, a technical problem, nor will
merely technical solutions be sufficient. Instead, deep economic, political, and cultural adjustments will ultimately be required, along with a major, long-term commitment in each sphere to deploy the requisite technical solutions at scale. Nevertheless, technological advances and enablers have a clear role in supporting such change, and information technology (IT) is a natural bridge between technical and social solutions because it can offer improved communication and transparency for fostering the necessary economic, political, and cultural adjustments. Moreover, IT is at the heart of nearly every large-scale socioeconomic system-including systems for finance, manufacturing, and the generation and distribution of energy-and so sustainability-focused changes in those systems are inextricably linked with advances in IT. 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.

**Rising Above the Gathering Storm: Developing Regional Innovation Environments: A Workshop Summary**

The ability of the states to drive innovation was the impetus behind a major workshop held in Madison, Wisconsin, on September 20-22, 2011. Titled "Rising Above the Gathering Storm: Developing Regional Innovation Environments," the workshop brought together leaders in education, government, economic development, and industrial innovation to discuss state and regional initiatives to boost competitiveness through science, technology, and innovation. The conference was organized around four major themes:

- Revitalizing K-12 Science and Mathematics Education
- Strengthening Undergraduate Education in Science and Engineering
- Building Effective Partnerships Among Governments, Universities, Companies, and Other Stakeholders
- Fostering Regional Technology Development and Entrepreneurship

**Nuclear Physics: Exploring the Heart of Matter**

The principal goals of the study were to articulate the scientific rationale and objectives of the field and then to take a long-term strategic view of U.S. nuclear science in the global context for setting future directions for the field. Nuclear Physics: Exploring the Heart of Matter provides a long-term assessment of an outlook for nuclear physics. The first phase of the report articulates the scientific rationale and objectives of the field, while the second phase provides a global context for the field and its long-term priorities and proposes a framework for progress.
through 2020 and beyond. In the second phase of the study, also developing a framework for progress through 2020 and beyond, the committee carefully considered the balance between universities and government facilities in terms of research and workforce development and the role of international collaborations in leveraging future investments. Nuclear physics today is a diverse field, encompassing research that spans dimensions from a tiny fraction of the volume of the individual particles (neutrons and protons) in the atomic nucleus to the enormous scales of astrophysical objects in the cosmos. *Nuclear Physics: Exploring the Heart of Matter* explains the research objectives, which include the desire not only to better understand the nature of matter interacting at the nuclear level, but also to describe the state of the universe that existed at the big bang. This report explains how the universe can now be studied in the most advanced colliding-beam accelerators, where strong forces are the dominant interactions, as well as the nature of neutrinos.
New Funding Solicitations Posted Since June 15 Newsletter

**Graham Foundation for Advanced Studies in the Fine Arts**
Makes project-based grants to individuals and organizations and produces public programs to foster the development and exchange of diverse and challenging ideas about architecture and its role in the arts, culture, and society. **Various due dates.**

**German Marshall Fund of the United States Grants and Fellowships**
Grantmaking is one of GMF’s core missions, and through this process, GMF supports a wide range of institutions and individuals working on transatlantic policy issues. **Various due dates.**

**The William and Flora Hewlett Foundation**
The William and Flora Hewlett Foundation has been making grants since 1967 to solve social and environmental problems at home and around the world. **Various due dates.**

**Carnegie Corporation of New York**
Carnegie Corporation of New York makes grants to promote international peace and to advance education and knowledge - primary concerns to which founder Andrew Carnegie devoted the foundation. Its grantmaking staff is organized in two programs: national and international, and in short-term initiatives. **Various due dates.**

**Development of an Academic Certificate Program in Nuclear Security**
Due July 23.

**Rangeland Research Program**
The goal of RRP is to contribute to the improvement of U.S. rangeland resources and the ecosystem services they provide by supporting the development of new and emerging rangeland science methodologies which specifically address the interrelationships between multiple disciplines. The primary purpose of RRP is to provide U.S. agricultural producers, rural landowners, and land managers with integrated science strategies to make informed land management decisions with an emphasis on enhancing the restoration and sustainable integrity of U.S. rangelands. **Due July 30.**
FY 2012 Evaluation Project to Assess Best Practices in EDA’s University Center Program
Pursuant to its Research and Evaluation program, EDA seeks applications to review the attributes of EDA-funded University Centers (UCs), evaluate the types of activities that have the greatest impact, and identify best practices that will enable policymakers and practitioners to more effectively understand the broad impact of the UC program in supporting regional economic development efforts. **Due August 2.**

Critical Agricultural Materials Program
The Critical Agricultural Materials Competitive Grants Program supports product development, demonstration, and validation of product performance under operational field conditions, specifically for paints, coatings, adhesives for composites, and aerial delivery systems or components which are manufactured from domestically produced agricultural materials and are of strategic and industrial importance to benefit the economy, defense and general well-being of the Nation. Many such products replace petroleum-based products, and offer opportunities to create new businesses and new markets for agricultural materials. **Due August 3.**

Marine Fisheries Initiative (MARFIN)
The National Marine Fisheries Service (NMFS), Southeast Region, is seeking proposals under the Marine Fisheries Initiative Program (MARFIN), for research and development projects that optimize the use of fisheries in the Gulf of Mexico and off the South Atlantic states of North Carolina, South Carolina, Georgia, and Florida involving the U.S. fishing industry (recreational and commercial), including fishery biology, resource assessment, socioeconomic assessment, management and conservation, selected harvesting methods, and fish handling and processing. This program addresses NOAA's mission goal to Protect, Restore, and Manage the Use of Coastal and Ocean Resources Through an Ecosystem Approach to Management. **Due August 9.**

Advanced Drop-In Bio Fuels Production Project
The goal of this project is to establish one or more complete domestic value chains capable of producing drop-in replacement biofuels. This includes feedstock production and logistics, conversion facilities (Integrated Biorefineries), and fuel blending, transportation, and logistics. The Government intends to form an Integrated Biofuels Production Enterprise (IBPE) comprised of partnerships that establish the complete value chain. The contemplated effort will include the design, construction and/or retrofit, validation, qualification and operation of a domestic commercial-scale IBPE that meets a target of at least 10 million gallons per year neat biofuel production capacity. The IBPE will be capable of producing drop-in liquid transportation fuels targeted for military operational use, and as such, must be approved and certified MILSPEC JP-5, JP-8 and/or F-76 equivalents by the time the IBPE becomes operational. **Due August 13.**

National Institute on Disability and Rehabilitation Research
The purpose of the Disability and Rehabilitation Research Projects and Centers Program
is to plan and conduct research, demonstration projects, training, and related activities, including international activities, to develop methods, procedures, and rehabilitation technologies that maximize the full inclusion and integration of individuals with disabilities into society, and support the employment, independent living, family support, and economic and social self-sufficiency of individuals with disabilities, especially individuals with the most severe disabilities; and to improve the effectiveness of services authorized under the Rehabilitation Act of 1973, as amended (Rehabilitation Act). Due August 14.

Food and Agricultural Sciences National Needs Graduate and Postgraduate Fellowship (NNF) Grants Program
NIFA announces the availability of grant funds and requests applications for the Food and Agricultural Sciences National Needs Graduate and Postdoctoral Fellowship (NNF) Grants Program for fiscal year FY-2012 to provide traineeship programs to eligible institutions to develop scientific and professional expertise in the food and agricultural sciences, through graduate level training programs. The amount available for support of this program in FY 2012 is approximately $3.24 million. In addition, NIFA requests stakeholder input from any interested party for use in the development of the next RFA for this program. Due August 15.

American Cultural Centers and Cultural Programming in the People's Republic of China
The Public Affairs Section (PAS) of the U.S. Embassy in Beijing, China is pleased to announce an open competition for assistance awards through this Request for Applications (RFA). PAS invites U.S. post-secondary accredited institutions of higher learning (Public, Private, and State) and not-for-profit organizations subject to 501 (c) (3) of the tax code to submit proposals for the establishment of an American Cultural Center through an existing partnership with a Chinese institution and/or comprehensive U.S. cultural-related programming at space provided by a Chinese partner institution as needed. PAS will have up to US $1 million available to award multiple grants for up to US $100,000 per grant. Due August 15.

Innovative Pilot and Demonstration Scale Production of Advanced Biofuels
The intent of this FOA is to identify, evaluate, and select innovative pilot- or demonstration-scale integrated biorefineries that can produce hydrocarbon fuels that meet military specifications for JP-5 (jet fuel primarily for the Navy), JP-8 (jet fuel primarily for the Air Force), or F-76 (diesel). Integrated biorefineries proposed for this funding opportunity may employ various combinations of feedstocks and conversion technologies to produce a variety of products, but the primary focus must be on producing biofuels. Novel and highly innovative technologies are strongly encouraged. Concept Paper due July 16; full August 23.

Maximum Mobility and Manipulation (M3)
DARPA is soliciting research proposals in the area of actuation. The Maximum Mobility and Manipulation (M3) program is designed to create and demonstrate significant advances in both science and engineering for ground robots. Due August 21.
Cooperative Research Program
The Cooperative Research Program (CRP) provides opportunity to compete for financial assistance for projects which seek to increase and improve the working relationship between fisheries researchers from the NMFS, state fishery agencies, universities, and the U.S. fishing (recreational and commercial) in the Gulf of Mexico (FL, AL, MS, LA, TX), South Atlantic (FL, NC, SC, GA) and Caribbean (USVI and Puerto Rico). The program is a means of involving commercial and recreational fishermen in the collection of fundamental fisheries information in support of management and regulatory options. This program addresses NOAA's mission goal to "Protect, Restore, and Manage the Use of Coastal and Ocean Resources through an Ecosystem Approach to Management." Due August 24.

Software Infrastructure for Sustained Innovation
In order to nurture, accelerate and sustain this critical mode of scientific progress, NSF established the multi-tiered Software Infrastructure for Sustained Innovation (SI2) program, with the overarching goal of transforming innovations in research and education into sustained software resources that are an integral part of the cyberinfrastructure. Grand challenges in the chemical sciences will be advanced through the provision of enabling and sustainable software that allows researchers to flexibly and rapidly prototype and test new algorithms or methods; leverage new heterogeneous architectures; and explore new data-enabled scenarios. The NSF seeks to encourage collaborative software activities with foreign investigators which advance software innovation, capabilities, support and sustainability. This SI2 solicitation is for international software collaborations addressing grand challenges in the chemical sciences, in partnership with the EPSRC in the United Kingdom. Preliminary due August 27; full due September 27.

Higher Education Multicultural Scholars Program
The purpose of this competitive undergraduate scholarship grant program is to increase the multicultural diversity of the food and agricultural scientific and professional workforce, and advance the educational achievement of all Americans by providing competitive grants to colleges and universities. The Multicultural Scholars Program is available every year. Due August 29.

PhRMA: Pre-Doctoral Fellowships (Pharmacology/Toxicology)
Pharmacology/toxicology awards support career-development activities of scientists prepared to engage in research that integrates information on molecular or cellular mechanisms of action with information on the effects of an agent observed in an intact organism, either in experimental animal or clinical studies or both. This program provides up to two years of stipend funding to support the research activities of the doctoral program and only after course work has been completed. Due September 1.

AERA Grants Program
With funding from the National Science Foundation (NSF), the American Educational Research Association (AERA) is pleased to announce the continuation of the AERA Grants Program, which
provides small grants and training for researchers who conduct studies of education policy and practice using quantitative methods and including the analysis of data from the large-scale data sets sponsored by National Center for Education Statistics (NCES) and NSF. Due September 5.

**USDA Small Business Innovation Research Program - Phase I**
The U.S. Department of Agriculture (USDA) invites science-based small business firms to submit research applications under this program solicitation entitled “Small Business Innovation Research Program (SBIR) - Phase I, Fiscal Year 2013.” Firms with strong scientific research capabilities in any of the topic areas described in section 8.0 are encouraged to participate. USDA will support high-quality research or research and development (R/R&D) applications containing advanced concepts related to important scientific problems and opportunities that could lead to significant public benefit. Due September 6.

**Research Experiences for Undergraduates (REU)**
The REU program supports active research participation by undergraduate students in any of the areas of research funded by the National Science Foundation. REU projects involve students in meaningful ways in ongoing research programs or in research projects specifically designed for the REU program. This solicitation features two mechanisms for support of student research: (1) *REU Sites* are based on independent proposals to initiate and conduct projects that engage a number of students in research. REU Sites may be based in a single discipline or academic department or may offer interdisciplinary or multi-department research opportunities with a coherent intellectual theme. Proposals with an international dimension are welcome. (2) *REU Supplements* may be included as a component of proposals for new or renewal NSF grants or cooperative agreements or may be requested for ongoing NSF-funded research projects. Due September 12.

**Partnerships for Innovation: Accelerating Innovation Research (PFI: AIR)**
To continue to strengthen the innovation ecosystem, NSF is revising NSF 12-511 to promote two choices under the Partnerships for Innovation (PFI): Accelerating Innovation Research (AIR) subprogram. The first choice, Technology Translation, encourages the translation of technologically-promising research discoveries made by prior and/or current NSF-funded investigators toward a path of commercialization; while the second choice, Research Alliance, promotes synergistic collaborations between an existing NSF-funded research alliance (including consortia such as Engineering Research Centers, Industry University Cooperative Research Centers, Science and Technology Centers, Nanoscale Science and Engineering Centers, Materials Research Science and Engineering Centers, Centers for Chemical Innovation, and Emerging Frontiers in Research and Innovation grantees) and other public and private entities to motivate the translation and transfer of research discoveries into innovative technologies and commercial reality. Both of these choices are designed to accelerate innovation that results in the creation of new wealth and the building of strong local, regional, and national economies. LOI due September 12; full November 13.
**Geography and Spatial Sciences Program**
The goals of the NSF Geography and Spatial Sciences (GSS) Program are: To promote scientific research in geography and the spatial sciences that advances theory and basic understanding and that addresses the challenges facing society. To promote the integration of geographers and spatial scientists in interdisciplinary research. To promote education and training of geographers and spatial scientists in order to enhance the capabilities of current and future generations of researchers. To promote the development and use of scientific methods and tools for geographic research. The Geography and Spatial Sciences Program sponsors research on the geographic distributions and interactions of human, physical, and biotic systems on the Earth’s surface. Investigations are encouraged to propose plans for research about the nature, causes, and consequences of human activity and natural environmental processes across a range of scales. Projects on a variety of topics (both domestic and international) qualify for support if they offer promise of contributing to scholarship by enhancing geographical knowledge, concepts, theories, methods, and their application to societal problems and concerns. **Due September 13.**

**SunShot Solar Energy Evolution and Diffusion Studies (SEEDS)**
Through the Solar Energy Evolution and Diffusion Studies (SEEDS) Funding Opportunity Announcement (FOA), the Department of Energy will invest up to $9 million over three years to support research on solar energy innovation dynamics and technology adoption patterns. SEEDS supports the development of a diversity of analytical, numerical, and computational tools and methods; implementation of pilot test strategies for modifying current business and policy practices; and assessment of pilot tests outcomes for impact and scalability. Through SEEDS, the Department of Energy seeks to launch a series of systematic investigations that will result in viable methods for dramatically transforming the operations of solar researchers, manufacturers, developers, installers, and policymakers. Selected research efforts will be performed in tandem with industry partners to ensure that results can be applied, tested, and modified in real time. For more information, see the [full solicitation](#). **Due September 17.**

**Kauffman Dissertation Fellowship Program in Entrepreneurship**
The Ewing Marion Kauffman Foundation is pleased to announce the [Kauffman Dissertation Fellowship Program](#), an initiative of great significance to the faculty and students of your institution. During the 2012–2013 academic year, the Kauffman Foundation will award up to 15 Dissertation Fellowship grants of $20,000 each to Ph.D., D.B.A., or other doctoral students for the support of dissertations in the area of entrepreneurship. This initiative will help launch a cohort of world-class scholars into this exciting field, thus laying a foundation for future scientific advancement. We hope that the findings generated by this effort will be translated into knowledge with immediate application for policy makers, educators, service providers, and entrepreneurs. **Due September 19.**
Partnerships for Innovation: Building Innovation Capacity

This program solicitation, Partnerships for Innovation: Building Innovation Capacity (PFI: BIC) starts with an existing sound scientific and/or engineering-based research discovery that can be translated to market-valued solutions through a partnership between academe and small technology-based businesses. The funds will provide support to an academic institution to partner with at least two small technology-based businesses that are not in direct competition with each other to carry out early translational-research activities. The primary aims of the activities of this partnership are three-fold: (1) to build the innovation capacity of the individual participants from academe and from business; (2) to increase the viability of the small business concerns; and (3) to develop the next-generation workforce by providing opportunities for students at different levels to effectively learn from, participate in, and be profoundly changed by exposure to the process of building innovation capacity that occurs in BIC projects. The active collaboration between academe and business could result in solutions with potential for an impact on more than one market. **WEBINAR: A webinar will be held within 6 weeks of the release date of this solicitation to answer any questions about the solicitation.** Details will be posted on the Industrial Innovation and Partnerships (IIP) website as they become available. **LOI due Sept. 26; Full Dec. 12.**

NEH/DFG Bilateral Digital Humanities Program

The National Endowment for the Humanities (NEH) in the United States and the German Research Foundation (Deutsche Forschungsgemeinschaft e.V., DFG) are working together to offer support for projects that contribute to developing and implementing digital infrastructures and services for humanities research. **Due September 27.**

Hal Rothman Dissertation Fellowship

The Hal Rothman Research Fellowship was created to recognize graduate student achievements in environmental history research in honor of Hal Rothman, recipient of ASEH's Distinguished Service award in 2006 and editor of *Environmental History* for many years. The fellowship provides a single payment of $1,000 for Ph.D. graduate student research and travel in the field of environmental history, without geographical restriction. **Open to September 30.**

International Affairs Fellowship Program

Launched in 1967, the International Affairs Fellowship (IAF) is a distinguished program offered by the Council on Foreign Relations (CFR) to assist mid-career scholars and professionals in advancing their analytic capabilities and broadening their foreign policy experience. The program aims to strengthen career development by helping outstanding individuals acquire and apply foreign policy skills beyond the scope of their professional and scholarly achievements. The distinctive character of the IAF Program lies in the contrasting professional experiences fellows obtain through their twelve-month appointment. Selected fellows from academia and the private sector spend fellowship tenures in public service and policy-oriented settings, while government officials spend their tenures in a scholarly atmosphere free from operational pressure. **Open to October 1.**
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.**

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 December 1 to January 31.**

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**Links to New & Open Funding 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]
Research Development & Grant Writing News

- 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
- CDMRP FY 2012 Funding Announcements
- Office of Minority Health
- Department of Justice Open Solicitations
- DOE/EERE Funding Opportunity Exchange
- HHS/Administration for Children and Families Funding Opportunities
- New Funding Opportunities at NIEHS (NIH)
- National Human Genome Research Institute Funding Opportunities
- Army Research Laboratory Open Broad Agency Announcements (BAA)
- SBIR Gateway to Funding
- Water Research Funding
- Fellowship and Grant Opportunities for Faculty Humanities and Social Sciences
- Humanities Funding Sources A-to-Z
- DARPA Current Solicitations
- Office of Naval Research Currently Active BAAs
- HRSA Health Professions Open Opportunities
- NIH Funding Opportunities Relevant to NIAID
- Active Funding Opportunity Announcements (FOAs) for All NICHD
- National Institute of Justice Current Funding Opportunities
- Funding Opportunities by the Department of Education Discretionary Grant Programs
- Science and Technology Funding Sources A-to-Z
- EPA’s Office of Air and Radiation (OAR) Open Solicitations
- NETL Open Solicitations
- Duke University Funding Alerts
- DoED List of Currently Open Grant Competitions
- Foundation Center RFP Weekly Funding Bulletin
- Funding News RSS; Deadline Watch; International Grants and Fellowship Index
Solicitations Remaining Open from Prior Issues of the Newsletter

**DARPA Local Control of Materials Synthesis (LoCo)**
The goal of the Local Control of Materials Synthesis (LoCo) program is to develop a low-temperature process for the deposition of thin films whose current minimum processing temperature exceeds the maximum temperature substrates of interest to the Department of Defense (DoD) can withstand (e.g., chemical vapor deposited diamond on polymers). To achieve this goal, DARPA is soliciting innovative research proposals that independently develop novel chemical and physical processes to meet the energetic/chemical requirements of thin film deposition (e.g., reactant flux, surface mobility, reaction energy, etc.), without reliance on broadband temperature input used in state-of-the-art chemical vapor deposition. **Due July 26.**

**Data Infrastructure Building Blocks (DIBBs)**
Science and engineering research and education are increasingly digital and increasingly data-intensive. Digital data are not only the output of research but their analysis provide input to new hypotheses, enabling new scientific insights, driving innovation and informing education. Therein lies one of the major challenges of this scientific generation: how to develop, implement and support the new methods, management structures and technologies to store and manage the diversity, size, and complexity of current and future data sets and data streams. **Due July 26 and August 30.**

**Opportunities for Promoting Understanding through Synthesis (OPUS)**
All four clusters within the Division of Environmental Biology (Population and Community Ecology, Ecosystem Science, Evolutionary Processes and Systematic Biology and Biodiversity Inventories) encourage the submission of **proposals aimed at synthesizing a body of related research projects conducted by a single individual or a group of investigators over an extended period.** **Due August 1.**

**DARPA-BAA-11-65: Defense Sciences Research and Technology, Response Date 8/09/2012**
The mission of the Defense Advanced Research Projects Agency’s (DARPA) Defense Sciences Office (DSO) is to pursue and exploit fundamental science and innovation for National Defense. Therefore, DSO is soliciting proposal abstracts and full proposals for advanced research and development in a variety of enabling technical areas (more). **Due August 9.**

**Resilient Extreme-Scale Solvers (?RX-Solvers?)**
Advanced Scientific Computing Research (ASCR), Office of Science (SC), US Department of Energy (DOE), thereby invites applications for basic research in Resilient Extreme-Scale Solvers (?RX-Solvers?) that demonstrably advances the state of science and practice for scalable, resilient, extreme-scale numerical algorithms, to enable scientific discovery on the supercomputers expected to come online in the next 5-10 years and lay the foundation for research in numerical algorithms for extreme-scale scientific computing. **Due August 13.**
**Air Force Fiscal Year 2013 Young Investigator Research Program**

AFOSR’s Young Investigator Research Program (YIP) supports scientists and engineers who have received Ph.D. or equivalent degrees in the last five years (on or after 1 May 2007) and who show exceptional ability and promise for conducting basic research. The objective of this program is to foster creative basic research in science and engineering, enhance early career development of outstanding young investigators, and increase opportunities for the young investigators to recognize the Air Force mission and the related challenges in science and engineering. Proposals addressing the research areas of interest for the Air Force Research Laboratory will be considered. The basic research areas of current interest are available on-line at the Grants.gov web site. Search for: BAA-AFOSR-2012-0001, Research Interests of the Air Force Office of Scientific Research. For detailed information regarding technical goals, potential applicants are advised to refer to the announcement cited above and may contact AFOSR program managers listed therein to explore mutual interests before submitting proposals. **Due August 14.**

**Advancing Informal STEM Learning (AISL)**

The Advancing Informal STEM Learning program invests in research and development of innovative and field advancing out of school STEM learning and emerging STEM learning environments. **Preliminary proposal due August 14; full January 14, 2013.**

**Fellowship Programs at Independent Research Institutions**

Grants for Fellowship Programs at Independent Research Institutions (FPIRI) support fellowships at institutions devoted to advanced study and research in the humanities. NEH fellowships provide scholars with research time and access to resources that might not be available at their home institutions. Fellowship programs may be administered by independent centers for advanced study, libraries, and museums in the United States; American overseas research centers; and organizations that have expertise in promoting research on foreign cultures. Individual scholars must apply directly to the institutions themselves. A list of currently funded institutions is available at [http://www.neh.gov/divisions/research/fpiri-supported-fellowships](http://www.neh.gov/divisions/research/fpiri-supported-fellowships). **Due August 16.**

**DARPA-BAA-12-47: Deep Exploration and Filtering of Text (DEFT)**

DARPA is soliciting innovative research proposals in the area of deep natural language understanding. The Deep Exploration and Filtering of Text (DEFT) program seeks to develop the ability to see through language to meaning in text, to make use of key information contained in text documents, to cue up information sources that contain new developments for analysts, and to automate the initial stages of report writing. Proposed research should investigate innovative approaches that enable revolutionary advances in science, devices, or systems. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of practice. **Due August 20.**
International Research Experiences for Students (IRES)
The International Research Experiences for Students (IRES) program supports development of globally-engaged U.S. science and engineering students capable of performing in an international research environment at the forefront of science and engineering. The IRES program supports active research participation by students enrolled as undergraduates or graduate students in any of the areas of research funded by the National Science Foundation. IRES projects involve students in meaningful ways in ongoing research programs or in research projects specifically designed for the IRES program. **Due August 21.**

ROSES 2012: Remote Sensing of Water Quality
Research is solicited that addresses the reduction of interference that the atmosphere generates by existing between a satellite (or airborne) remote sensing device and the water of lakes, rivers, and coastal ocean. By addressing this problem, improvements should be possible with current and near-future satellite observations. Research in this topic may also target optimal remote sensing design of future systems so as to maximize the return of the coupled sensor design and radiative transfer algorithm. If this goal is proposed, then explicit connection must be drawn between the approach and goals of the study and potential NASA satellites and/or remote sensing approaches – as either defined by the Decadal Survey and/or NASA sponsored working groups. **Due August 22.**

Louis Stokes Alliances for Minority Participation (LSAMP)
The LSAMP program assists universities and colleges in diversifying the STEM workforce through their efforts at significantly increasing the numbers of students successfully completing high quality degree programs in science, technology, engineering and mathematics (STEM) disciplines. *This solicitation includes a new activity “Bridge to the Baccalaureate Alliances” (B2B) to support community college partner institutions* to accelerate the transfer of under-represented minority STEM students to four-year institutions in pursuit of a Baccalaureate STEM degree. B2B Alliances will be made up entirely of two-year colleges. Proposals may be submitted directly by a single lead two-year institution of higher learning with sub-awards made to partners within the alliance. **Multiple due dates beginning August 28.**

Energy Innovation Hub - Critical Materials
The purpose of this FOA is to fund a Critical Materials Energy Innovation Hub to reduce materials criticality and prevent criticality of new materials that are essential for energy technologies. The Critical Materials Hub will coordinate Research and Development across the entire materials lifecycle. Research and Development will combine basic and applied research with engineering to accelerate scientific discovery utilizing highly collaborative teams across multiple scientific and engineering disciplines. The initial award period is for five years. The Hub will be funded up to a total of $20 million in the first year; up to $10 million of those funds can be devoted to infrastructure start-up for the Hub, including building renovation (but not new construction), lease arrangements, equipment, and instrumentation. It is anticipated that the
Hub will be funded up to $25 million per year for Hub operations in the final four years of the initial award period, pending Congressional appropriations (more). Due August 30.

**Sensors and Sensing Systems (SSS)**
The Sensors and Sensing System (SSS) program funds fundamental research on sensors and sensing systems. Such fundamental research includes the discovery and characterization of new sensing modalities, fundamental theories for aggregation and analysis of sensed data, fundamentally new approaches for data transmission, and approaches for addressing uncertain and/or partial sensor data. Innovative research in nonlinear prediction, filtering and estimation in the context of sensing systems is also considered in this program. **Full Proposal Window:** September 1, 2012 - October 1, 2012.

**State and National Archival Partnership Grants**
The National Historical Publications and Records Commission seeks proposals to strengthen archives and historical records programs in each of the states and build a national archival network. **Due September 6.**

**FY 2013 Research Opportunities in High Energy Physics**
The Office of High Energy Physics at the U. S. Department of Energy’s Office of Science, hereby invites new grant applications for support of research programs in high-energy physics. **Due September 10.**

**Advances in Biological Informatics (ABI)**
The Advances in Biological Informatics (ABI) program seeks to encourage new approaches to the analysis and dissemination of biological knowledge for the benefit of both the scientific community and the broader public. The ABI program is especially interested in the development of informatics tools and resources that have the potential to advance- or transform- research in biology supported by the Directorate for Biological Sciences at the National Science Foundation. The ABI program accepts three major types of proposals: Innovation awards that seek to pioneer new approaches to the application of informatics to biological problems, Development awards that seek to provide robust cyberinfrastructure that will enable transformative biological research, and Sustaining awards that seek to support ongoing operations and maintenance of existing cyberinfrastructure that is critical for continued advancement of priority biological research. **Due September 10.**

**NEH Enduring Questions**
The NEH Enduring Questions grant program supports faculty members in the teaching and development of a new course that will foster intellectual community through the study of an enduring question. This question-driven course will encourage undergraduates and teachers to grapple with a fundamental concern of human life addressed by the humanities, and to join together in a deep and sustained program of reading in order to encounter influential thinkers over the centuries and into the present day. **Due September 13.**
SunShot Solar Energy Evolution and Diffusion Studies (SEEDS)
Through the SEEDS FOA, the Department of Energy will invest up to $9 million over three years to support research on solar energy innovation dynamics and technology adoption patterns. SEEDS supports the development of a diversity of analytical, numerical, and computational tools and methods; implementation of pilot test strategies for modifying current business and policy practices; and assessment of pilot tests outcomes for impact and scalability. Through SEEDS, the Department of Energy seeks to launch a series of systematic investigations that will result in viable methods for dramatically transforming the operations of solar researchers, manufacturers, developers, installers, and policymakers. Due September 17.

Joint DMS/NIGMS Initiative to Support Research at the Interface of the Biological and Mathematical Sciences (DMS/NIGMS)
The Division of Mathematical Sciences in the Directorate for Mathematical and Physical Sciences at the National Science Foundation and the National Institute of General Medical Sciences at the National Institutes of Health plan to support research in mathematics and statistics on questions in the biological and biomedical sciences. Both agencies recognize the need and urgency for promoting research at the interface between the mathematical sciences and the life sciences. This competition is designed to encourage new collaborations, as well as to support existing ones. Due September 17.

Research in Engineering Education (REE)
The Division of Engineering Education and Centers (EEC) supports creation of a more agile engineering education ecosystem, equally open and available to all members of society, that dynamically and rapidly adapts to meet the changing needs of society and the nation's economy. Research is sought that will inform systemic change across all parts of the ecosystem. Due September 20.

Digital Humanities Start-up Grants
The National Endowment for the Humanities (NEH) invites applications to the Digital Humanities Start-Up Grants program. This program is designed to encourage innovations in the digital humanities. By awarding relatively small grants to support the planning stages, NEH aims to encourage the development of innovative projects that promise to benefit the humanities. Proposals should be for the planning or initial stages of digital initiatives in any area of the humanities. Due September 25.

NEH Summer Stipends
Summer Stipends support individuals pursuing advanced research that is of value to humanities scholars, general audiences, or both. Due September 27 for Projects Beginning May, 2013.
Alliances for Graduate Education and the Professoriate

The Alliances for Graduate Education and the Professoriate (AGEP) program will support three types of projects described in this solicitation: 1) AGEP-Transformation; 2) AGEP-Knowledge Adoption and Translation; and 3) AGEP-Broadening Participation Research in STEM Education. This solicitation represents an expansion of the program to include strategic investments in the development and study of new models for STEM graduate education, postdoctoral training, and academic STEM career preparation that eliminate or mitigate negative factors and promote positive practices for underrepresented racial and ethnic minorities. **Due September 28 and October 30.**

Fiscal Year 2012 Funding Opportunity Announcement (FOA) for Navy and Marine Corps Science, Technology, Engineering and Mathematics (STEM) Programs 12-002

The purpose of this announcement is to receive proposals in support of the Naval Strategic Plan and the Office of Naval Research's scientific outreach and education mission to develop its next generation of scientists and engineers. Strengthen the resources and training offered to STEM teachers. For more information on these priorities, please review the Naval STEM Strategic Plan at [www.onr.navy.mil](http://www.onr.navy.mil). ([MORE](http://www.onr.navy.mil)). **Open to September 30, 2012**

EPSCoR Research Infrastructure Improvement Program Track-1: (RII Track-1)

Research Infrastructure Improvement Program Track-1: (RII Track-1) awards provide up to $4 million per year for up to 5 years to support physical, human, and cyber infrastructure improvements in research areas selected by the jurisdiction's EPSCoR steering committee as having the best potential to improve future R&D competitiveness of the jurisdiction. **Due October 3.**

Documenting Democracy: Access to Historical Records

The National Historical Publications and Records Commission seeks proposals that promote the preservation and use of the nation's most valuable archival resources. Projects should expand our understanding of the American past by facilitating and enhancing access to primary source materials. **Due October 4.**

Innovation in Archives and Documentary Editing

The National Historical Publications and Records Commission seeks projects that are exploring innovative methods to improve the preservation, public discovery, or use of historical records. **Due October 4.**

Publishing Historical Records

The National Historical Publications and Records Commission seeks proposals to publish historical records of national significance. **Due October 4.**
Advancing Digitization of Biodiversity Collections (ADBC)
This program seeks to enhance and expand the national resource of digital data documenting existing vouchered biological and paleontological collections and to advance scientific knowledge by improving access to digitized information (including images) residing in vouchered scientific collections across the United States. **Due October 19.**

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.**

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.**

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. [DARPA-BAA-12-09 at FedBizOpps](#). **Open through January 16, 2013.**

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.**

**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.**

**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
Research 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.

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.

**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

**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**

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What We Do--

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

- **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

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**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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