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Topics of Interest URLs

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Avoid the Stream-of-Consciousness Narrative

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By Mike Cronan, co-publisher

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One of the more challenging research narratives to review and edit is one that reads more like a stream of thought than a carefully crafted document. And as always, the further along the research narrative is when editorial assistance is sought, the more difficult it is to offer substantive editing and comments. When a final proposal draft is complete but contains major structural and organizational issues obscuring the clarity of the narrative, editing becomes very time intensive and may even be impossible because of an impending due date. The best advice research offices can give to researchers seeking a review and edit of a draft proposal is the same advice NSF and NIH give: "talk to us early and often." Bottom line: the first substantive critical review of a proposal should not be made by a program officer and review panel, but should occur prior to submittal by a colleague or research office.

The telltale signs of the "dictated" narrative is that it reads like a stream-of-consciousness novel recorded on a Dictaphone, James Joyce's *Ulysses* being one famous example, and the novels of Jack Kerouac another. Authors used this literary device to give a deeper insight into a character's thought processes in the form of free-flowing interior monologues of thoughts and feeling punctuated by associative leaps from one idea to another. In this process, they also suspended the normal rules of grammar, spelling, and narrative organization.

The most surprising thing about this once revolutionary technique is how often authors of a research narrative adopt it unconsciously. The well written proposal narrative is a well planned and organized document crafted through numerous iterations meant to instill narrative clarity and economy in a prescriptive and orderly way.

The "stream-of-consciousness research narrative" is flawed by some or all of the following characteristics:

- excessively long sentences wherein the information provided lacks a logical sequence;
- an avoidance of the hierarchical order of importance of information;
- long parenthetical statements introducing an important idea or topic;
- a disorganized daisy chain of ideas and topics collected in one long sentence linked by a series of conjunctions, "and" being the most prolifically used;
- ideas and topics seemingly distributed willy-nilly throughout the document with no apparent connectedness of dependencies, i.e., no orderly progression in a stepwise fashion in which new information builds on prior information;
- an author's uncertainty about what is important and what is not important, and hence, a narrative reading like a dumpster of possible ideas, none fully formed, or, as H. L. Menken once observed, "like an army of words marching across the page in search of an idea";
- excessive redundancy;
- a scattering of key information in place of a logical clustering; and

• repeated information described differently in different parts of the narrative, e.g., internally inconsistent project goals and objectives.

Moreover, the "stream-of-consciousness project narrative" invariable falls prey to other bad practices that typically result in proposal narratives failing to impress program offices and reviewers, including:

- overly generalized rather than detailed and specific narrative sections;
- introductions consisting of a long-winded background section rather than an economical response to the key questions all reviewers want answered, such as:
 - what you will do,
 - o why will you do it,
 - o how will you do it,
 - o why is it significant in the context of impacting the field or agency mission,
 - o value-added benefits to your research,
 - o why you have the capacity to do it,
 - o a convincing rationale and methodology,
 - preliminary data, results from prior support, and/or publications that validate your capacity to perform,
 - o a description of expected outcomes.
- The allocation of too much narrative space to what will be done and too little space to how it will be done, i.e., the "too much what and not enough how" narrative flaw.

The typical reviewer comments declining to fund a "stream-of-consciousness project description" include:

- "it is not clear what the proposer actually intends to do," or
- "the goals and objectives are vague and general and lack specifics," or
- "this proposal is confusing."

The badly needed antidote for the "stream of consciousness narrative" is an organizational outline or template for the proposal narrative based on the goals, objectives, and review criteria as enumerated in the funding solicitation. This narrative template requires a disciplined approach to complete, but it is the key starting point to a competitive proposal. But even with the use of a well-crafted template, it is a sad fact of life that some proposal authors easily slip into narrative patterns that work against them and leave the reader exhausted, or exasperated, or worse. It is important for those authors to keep in mind that no program officer or reviewer must read a proposal in its entirety—there is a proposal "off ramp" after every word in your narrative, and your job, and the job of colleagues and others in research offices who assist you by reviewing and editing your proposal, is to convince reviewers not to take it.

Four Key Questions in Editing a Research Narrative

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By Mike Cronan, co-publisher

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Multiple levels of editing can be undertaken in response to a research narrative, all depending upon the editing skills, experience, and disciplinary knowledge of the editor. On team grants, multiple people usually offer proposal review and editing assistance to the PI on each draft of the project description. Each of these has a specific "editorial perspective" on the narrative, from co-PIs and disciplinary colleagues to those in research offices assisting with the production of the proposal.

In practice, those offering a disciplinary perspective on the research narrative do not always offer a global editorial perspective on the proposal's "readability" from the vantage point of program officers and members of a review panel. Most often, co-PIs and other senior research personnel focus in on the "disciplinary weeds" rather than the global readability of the document. Or, as is often the case, as the research narrative progresses through numerous draft iterations, the editorial engagement of the co-PIs and senior research personnel drops off precipitously.

As the due date nears, reviewing, editing, and rewriting sections of the entire document after each draft iteration often falls to the PI and a small number of research development professionals assisting the PI. Of course, at this stage, the readability of the research narrative is of major importance, since that will determine whether or not it is closely read by program officers and reviewers, or, more importantly, understood by program officers and reviewers.

Poorly written research narratives are always noted by reviewers with a recommendation to decline funding. (Here it is best to leave the metaphysical speculation to philosophers and theologians on questions such as "Why do good things happen to bad people?," or, more to the point, "Why do bad proposals sometimes get funded?" It may well be that a declined proposal was poorly reviewed because it lacked scientific merit. But it is essential to make sure a fundable idea was not declined for funding because it was poorly written.

With this in mind, there are multiple levels on which a proposal narrative can be reviewed specific to readability, all of them depending on the expertise the reviewer brings to the review process. In some cases, a review may be merely a general edit for grammar, punctuation, and inadvertent typos. In other cases, however, it may be that an edit/re-write process is needed whereby every sentence and paragraph is reviewed not only as part of a general edit but also for sentence structure, particularly as it relates to the logical organization and presentation of technical information in each sentence and its clarity to the reader. This might be thought of as a deep edit/rewrite, as opposed to a light general edit, since its goal is to identify and correct for the lack of clarity in the research narrative.

Those asked to conduct this type of edit for the PI must keep in mind four key questions a reader is likely to ask:

- 1. What is the author(s) saying?
- 2. What is the author(s) trying to say?
- 3. What does it seem to the reader that the author(s) is saying?

4. What should the author(s) say?

In Step 1, for example, the first step is to read a section of text and determine whether or not you understand what the author is saying. Keep in mind that, in most cases, funding agencies recommend that the research narrative should be written to be understood by the scientifically literate reviewer but not necessarily by an expert in the field. Moreover, interdisciplinary proposals will have multiple disciplines and backgrounds represented on the review panel. A successful proposal must convince each of them a recommendation for funding is warranted. If an experienced editor of research narratives comments to the PI that "I don't understand what you are saying in this paragraph," the savvy PI will respond, "Then we have to re-write it because if you don't understand it, the reviewers won't." There is an old, nuanced adage that "what you actually said is not as important as what people think you said." This is an important distinction to keep in mind in the editing process as well.

Understanding what the author is saying often takes a very close reading, or explication, of the narrative text. A repeated reading of the text is often required to make sure the reviewer understands what is being said, since that is the foundational part of being able to address editing steps 2, 3, and 4. The bottom line in Step 1 is that a review of narrative text—at the sentence, paragraph, or section level—represents an assessment of how able the intelligent (but not expert) reader is to clearly understand what is being said.

In Step 2, based on Step 1, a determination has to be made as to what the author is trying to say, which may differ to varying degrees from what the reviewer understands from an initial reading of the text. For example, excessively long sentences failing to offer a logical, stepwise presentation of information, and poorly punctuated, as well, may obscure the author's intended meaning. This disconnect is one of the most common challenges of editing a research narrative. Moreover, sentences must be more than grammatically correct—they must ensure that the author's intended meaning is grasped by the reader. This is not always the case in the initial drafts of the research narrative. The narrative converges on perfection over numerous iterations—it does not arrive at perfection in the first drafts.

Step 3 is critical because it illuminates what can often be a gap between the reader's understanding and the author's intention.

Step 4 in the process is the culmination of the preceding three steps and represents the outcome in terms of an edited and rewritten portion of the research narrative that more accurately communicates what the author(s) mean and what the reader(s) think they mean.

A substantive read, edit, and re-write of sections of the research narrative is not a trivial task. Moreover, it is one that can be very time consuming, especially for author(s) whose writing skills are woefully unequal to their research skills. But a good edit can mean the difference between being funding and being denied for funding. It is perhaps one of the most impactful proposal development services research offices can offer to assist faculty on research grants of all sizes.

Seed Your Narrative with Explanatory Clauses

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By Mike Cronan, co-publisher

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One of the more common missed opportunities to strengthen and validate claims of research significance in the proposal narrative arises from the author(s) insufficiently "seeding" the project description with parenthetical phrases or clauses. These are inserted into a passage, paragraph or sentence to serve as an explanatory elaboration on the topic or issue being discussed. It is important to do this for several reasons, not the least of which is that it can be done fairly easily at any stage of the narrative's draft development, including, even in the final hours before the proposal is transmitted to the funding agency, although that practice is not recommended.

Moreover, the importance of explanatory clauses can be seen when you consider some of the more common reasons proposals are poorly reviewed. The common reasons include program officers and reviewers struggling with the clarity of the narrative; sensing that the narrative lacks specifics and details that would bolster claims of research significance; feeling the narrative is overly generalized and lacks validating information; sensing the narrative does not sufficiently explain the value-added benefits of the research to the agency mission priorities; deciding that how the research will be accomplished is not adequately addressed; and concluding that the goals and objectives are vague, etc.

In short, one of the best ways to address the common concerns of program officers and reviewers that impact the funding decision is to search every proposal page, paragraph, and/or sentence to identify places where a brief explanatory clause or phrase can be inserted. . Moreover, it is important to keep in mind that the need for explanation does not amount to rewriting a poorly written sentence. The addition of an explanatory clause makes a good sentence better and more convincing—lights it up, so to speak.

So how exactly is this done? In most cases, you will be reviewing a draft document and looking for places where a brief elaboration can be made within or at the end of an existing sentence to provide richer detail or an important validating reference. This is accomplished by, for example, replacing a period in a sentence with a comma followed by an introductory "for example," "for instance," "such as," "furthermore," "moreover," "including," etc., followed by a brief elaboration thoughtfully chosen and crafted to transition a somewhat ordinary sentence into a more compelling one. Brevity is the key here, since you are not launching into a new direction of thought or argument but merely, as noted, bolstering an existing statement.

For example, perhaps your proposal on smart-grid security includes a statement such as "The proposed research is based on our small-scale test bed success in reducing the computational load related to identifying cryptographic signatures and development of a novel way to incorporate challenge-response algorithms to identify counterfeit or "spoofed" GPS time stamps." This would be significant in and of itself. But instead of letting the sentence stand as written, you could replace the period with a comma, and continue briefly to expand the relevance of your proposed research by noting, "moreover, our security solutions to spoofed GPS signals has relevance in other critical societal domains, such as the operational security of drones, smart cars, ships, airplanes, critical civil infrastructures, etc."

The explanatory clause accomplishes an important additional objective: it helps to convince reviewers to fund your research. It expands the scope and scale of your proposed research, giving it broad societal benefits beyond your immediate objective of preventing malicious time stamps in the smart grid.

Moreover, a close review of the first few drafts of a proposal by colleagues and professionals in a research office will often serve as the initial identification of those sentences that can benefit from brief explanatory clauses expanding on the significance of the proposed research activities in some way. After all, the foundation of a funded proposal is how successfully you make the case that the proposed research will advance the mission objectives of the funding agency or advance the disciplinary field in some way. Seeding the research narrative with brief explanatory phrases and clauses is one key way to do this. Done well, these phrases anticipate reviewers' questions about why your proposed research is important and they provide a brief, specific answer.

Surviving Chaos in Proposal Development Meetings

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By Mike Cronan, co-publisher

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The American novelist and short story writer John Cheever once wisely observed that "Art is the triumph over chaos." In grant writing, this translates as a "project plan is the triumph over chaos." Anyone who has not been horrified by the amount of conceptual chaos present in an initial proposal planning meeting has been leading a charmed life or is safely embedded in an alternate reality. To the faint of heart, initial project meetings may seem like a team Rorschach test wherein the funding solicitation plays the role of the ink blot test used by psychologists to determine personality characteristics and emotional functioning. All of these personality traits, including underlying thought disorders, are revealed in one way or another during the first team examination of a new funding opportunity.

Of course the chaos in these initial planning meetings is typically amplified by a subset of attendees who, for one reason or another. *have not actually read the funding solicitation* but are nonetheless eager to make numerous suggestions on the research focus of any effort going forward. The more open among this subset will acknowledge that they have not read the solicitation, starting by noting "I have not actually read the solicitation, but...". They will then proceed to elaborate who should be on the research team and what the research focus should be. Others in this subset who have not read the solicitation may chose not to publically announce this fact.

However, even if all the people at the meeting who did not read the solicitation were put in time out, there is always sufficient conceptual chaos to go around among those who have read it, although often with varying degrees of fidelity, ranging from a quick skim to an explication of text.

In keeping with the analogy of the funding solicitation as an ink blot test, there are always a few people in the meeting that see *only themselves reflected in the solicitation*, as if it were merely a narrowly focused mirror rather than a panorama. This mistaken understanding can lead to long discussions whereby these researchers explain their work in great detail, but fail to put forward a convincing argument as to why their research fits the goals and objectives of the funding agency.

In fact, planning meetings are best started by someone in the meeting offering a detailed account of the research goals and objectives the funding agency expects to be addressed in any proposal submitted to the program. What the funding agency wants can sometimes become lost in the planning discussion, particularly by those under the misguided impression that agencies fund great ideas. They do not. Agencies fund great ideas that bring value-added benefits to the critical mission priorities of the agency. Great ideas untethered from the agency's mission are best taken to the MacArthur Foundation.

Those who support faculty proposal development out of research offices will likely have attended hundreds of initial proposal planning meetings over the years and yet be continuously surprised at how frequently such meetings meander along various paths. Once the focus of remarks turns to a discussion of what the agency actually wants applicants to do in the proposed research, then the meeting can take a more productive turn and begin the critical

focus of mapping the team capacities and expertise to the agency requirements put forward in the funding solicitation. At this point, the group can determine whether or not a competitive proposal can be put forward.

Of course, with the above said, it is important to make the key distinction between "creative chaos" and "uninformed chaos" in initial proposal development meetings. The former is an essential ingredient of a productive discussion on mapping a team's capacity to the goals and objectives of a funding agency through a process of convergence. In this process, various research options and potential team configurations are identified, explored, and either accepted or rejected by the team. Uninformed chaos, however, is detrimental to the development process because discussions uninformed by the solicitation and review criteria seed disorder rather than clarity.

NORDP: A Resource for Pre-award Staff

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By Lucy Deckard, co-publisher

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As we visit universities across the country, we often encounter pre-award and research development staff who are not familiar with the <u>National Organization of Research</u> <u>Development Professionals (NORDP)</u>. Registration for the annual NORDP conference has recently opened, so it's a good time to give our readers an overview of NORPD and how the resources they provide can help them.

What is NORDP?

NORDP is a peer network of research development professionals. That includes administrators and staff responsible for research development strategic planning, assisting faculty and teams with preparing proposals, and training faculty on how to prepare more competitive proposals. NORDP membership ranges from staff in research development offices at large universities to those who comprise a "one-person shop" at small institutions, responsible for all pre-award and post-award services. NORDP differs from the <u>Society of Research Administrators (SRA) International</u> and the <u>National Council of University Research Administrators (NCURA)</u> in its singular focus on the *pre-award* stages of pursuing extramural research funding.

Areas of emphasis at NORDP include supporting large-scale collaborative proposals, enhancing research collaborations, understanding the directions of funders, facilitating grant development, enhancing research capacity, technical writing development, and supporting university research initiatives. NORDP discussions also address various models for organizing research development offices, and how to deal with challenges of overseeing or working in those offices.

What resources does NORDP provide?

Members of NORDP can subscribe to their **listserv**, which provides access to research development administrators across the country. The listserv can be very helpful in cases where you have a specific question, as well as to just monitor news and trending topics in research development. NORDP also provides **professional development**, including a **mentor program**. This can be extremely valuable to staff and administrators who are new to research development, as well as those who are taking on new responsibilities. The **member list** can help you identify and connect with your counterparts at other universities, for example, to help develop collaborations with that university.

The NORDP website also includes special interest "circles" that facilitate more focused discussions. Example circles include "Non-STEM RD," Facilitating Innovative Research," "EPSCoR States," and "Digital Tools for Research Development," among others. The NORDP Job Board also provides a useful venue for recruiting research development staff and for searching for a new research development position. The "Resources" tab on the website includes lists of books, guides, and articles on research development-relevant topics. It also includes lists of people and companies who provide services such as program evaluators and grant writers.

What topics will be covered in the upcoming NORDP Conference?

This year's 9th Annual NORDP Research Development Conference will be held in Broomfield, Colorado (on the outskirts of Denver) on May 8 -10, 2017. Early bird registration rates are available until March 15th. Topics this year include the Federal funding outlook, working with foundations, diversity in research development, and creative team building. The concurrent sessions are still under development but in the past have covered such topics as: methods for identifying funding, the role of research development in team science, building your institution's innovative capacity via international partnerships, fostering research productivity through strategic mentoring, leveraging experience for junior faculty success, and revising, editing and strengthening proposal elements.

Should I attend the NORDP Conference?

This conference is ideal for anyone involved in research development, whether you're working directly with the university's top research administrators to promote new research initiatives, you're involved in training or assisting faculty in developing proposals, you help faculty identify funding opportunities, or you edit proposal drafts. Whether you feel isolated in a one-person grants office, or if you are part of a large research development office and would like to meet and share your experiences with others, the NORDP conference is a great opportunity.

In addition, if your university is thinking about setting up a research development office, this is a great way to explore various structures and strategies for setting up a new office through discussions with those who have been there and can share their experiences. And in general, it's a great way to get new ideas for research development strategies, hear the latest funding news, and make connections across the field.

Helping New Faculty Give Birth to Fundable Ideas

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The BBC (PBS) show, "Call the Midwife," portrays nurse midwives caring for expectant parents in London's desperately poor East End. While it might be a stretch to compare new faculty starting the quest for research funding with expectant residents of the 1950s East End, the commonality lies in the role of the midwife, either the nurse midwife or the "proposal midwife," whereby he or she develops a capacity to listen and help guide someone through a new and seemingly overwhelming experience.

In the case of proposals, while it is important to give workshops for new faculty presenting the how and why strategies of developing competitive proposals, it is equally important to actually work individually with faculty on the process of giving birth to a *fundable idea*. Keep in mind that *all ideas are not born fundable*; rather, most require modification to meet agency funding objectives detailed in the solicitation. Prospective PIs sometimes forget that *funding agencies do not fund good ideas*— only those good ideas that meet their mission priorities and bring significant value-added benefit to that mission. Workshops explain the process to a group of faculty from multiple disciplines with a wide range of grant-writing skills, most often from none to some, whereas individual consultations deliver faculty-specific advice that lasers in on a proposer's unique needs, disciplinary domain, and funding agency.

After all, the research idea itself is entirely in the wheel house of the faculty member, but *making it a fundable idea* benefits from the experience of someone who has, like the East End nurse midwife, been through the "proposal birth process" many times. The experienced, successful veteran of funding competitions can offer guidance based on an "institutional memory" of what to do right, what not to do, and, most importantly, how to refocus a proposal gone awry.

Therefore, individual consultations with new faculty conducted by experienced research development staff are a key complement to workshop programs that help initiate new faculty into the world of successful research grant writing. Grant-writing workshops give a critical overview of many of the key issues confronting new faculty as a group trying to determine how to best meet the research funding expectations of a third-year review and for tenure and promotion—and to jump start this process quickly. Such workshop topics may include presentations, for example, on: (1) Finding research funding at federal agencies and foundations; (2) Analyzing the funding solicitation and review criteria; (3) Understanding the mission, culture, and investment priorities of research agencies; and (4) Writing the major research narrative sections (project summary; introduction and background; vision, goals, objectives, etc.)

Moreover, the most successful new faculty workshops on these kinds of topics are interactive, whereby questions and discussions among presenter and participants on certain key topics are encouraged. For example, the skillful presenter will be prepared to answer "What is research synergy and what does it mean in the context of a successful research narrative?" Or "What constitutes a compelling statement of vision and research significance in a

successful research narrative?" Time permitting, highly effective "hands-on" activities should also be introduced into the workshop. For example, participants may be asked to form small review teams and read and review several examples of research project summaries, and then score the summaries and discuss weaknesses and strengths that went into the review score.

However, these interactive and "hands-on" strategies for workshops benefit enormously from follow-on, individual consultations between each new faculty and a workshop presenter. This allows workshop presenters or research development staffers to take the overarching competitive strategies and information from the workshops and relate them in a very finely grained fashion to the specific research grant-writing needs of the individual faculty member. New faculty bring their own unique questions to many of the general areas where advice is sought and offered on grant writing, such as how to interpret reviews for a possible resubmittal, where to find funding for research in the humanities, how to organize a research narrative, how are proposals reviewed, how to understand the culture of different funding agencies, among countless others.

The consultations, typically performed by research development staff linked to workshops, address specifically the singular questions of particular faculty. In a workshop, by contrast, a presenter will always try to first answer participants' specific questions, but then will follow that with generic answers for the benefit of the entire audience. Workshops can't spend the considerable time required to respond specifically to individual questions, nor are workshop participants as a group prepared for a presenter to go into detail on any one topic of interest to only one person in the group.

Think of grant-writing workshops for new faculty as offering global generic advice and competitive strategies on writing a research proposal—grant writing from the so called "30,000 foot level." At this level, the presenter might explain, in a generic way, to a disciplinarily and agency-diverse audience the key common narrative components and organization of an Introduction and Background section of the research narrative, or how to establish the value-added benefits of the proposed research by demonstrating its significance and context in the field.

Now think of the individual consultations with a faculty member as applying the overarching "theory" of research grant writing *in very specific ways* to the many unique questions each individual faculty member will have when transitioning from the generic overview of grant writing (~85 percent of grant-writing advice is common across agencies and disciplines) to the very specific requirements of writing an actual proposal on a specific disciplinary topic, to a specific agency, to a specific program area with the agency, to a specific funding opportunity within the program area, to a specific mission objective of the solicitation, and to a specific set of review criteria.

The birth of a competitive research proposal often begins with consultations between a new faculty member and an experienced research development staffer functioning, so to speak, as a proposal midwife. These individual consultations improve the overall success of a university funding portfolio by assisting one new faculty member at a time and thereby enhancing the overall competitiveness of the research enterprise.

Research Grant Writing Web Resources

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New Peer Review Videos for Applicants and Reviewers

Friday, February 03, 2017, 3:23:43 PM | NIH Staff

<u>NIH's Center for Scientific Review</u> posted recordings of their most recent webinar series on peer review.

- <u>8 Ways to Successfully Navigate NIH Peer Review and Get a Fellowship Grant</u> covering things applicants need to know about the submission and review of a fellowship grant
- <u>8 Ways to Successfully Navigate NIH Peer Review and Get an R01 Grant</u> covering things applicants need to know about the submission and review of an R01 grant
- NIH Peer Review Briefing for Basic Research Applicants and Reviewers covering NIH's commitment to basic research and helping applicants and reviewers do their part in proposing and reviewing basic research

CSR is the portal for receipt and referral of NIH grant applications, and, for the majority of those applications, carries out the peer review process for assessing scientific and technical merit.

NSF Grants Conference hosted by Carnegie Mellon University - November 14-15, 2016

- Introduction and NSF Overview
- Proposal Preparation
- NSF Merit Review Process
- Overview of NSF Funding Mechanisms
- Award Management
- Faculty Early Career Development (CAREER) Program
- Office of the Inspector General
- NSF Policy Update
- International Research & Education Collaboration: Opportunities & Resources at NSF
- Breakout Sessions:
 - Biological Sciences
 - o Post-Award Monitoring and Compliance
 - Computer and Information Science and Engineering
 - Education and Human Resources
 - Engineering
 - Major Research Instrumentation
 - o **Geosciences**
 - Mathematical and Physical Sciences
 - o International Research and Education Collaboration
 - NSF Grantee Cash Management Section Update
 - o Social, Behavioral and Economic Sciences
 - IT Modernization/Research.gov
 - Emerging Research Institution Roundtable

NSF Update - Fall 2016
Archived Webcast of Fall 2016 NSF Grants Conference
How to Prepare an NSF Proposal: The Good, the Bad and the Ugly - August 2016

Educational Grant Writing Web Resources

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Research in Mathematics Education

As one of the three Rs, 'rithmetic' has always been central to education and education research. By virtue of that centrality, research in mathematics education has often reflected and at times led trends in education research. This chapter provides some deep background on epistemological and other issues that shape current research, with a primary focus on empirical research, which sprouted and flowered over the past 100 years or so--roughly coinciding with the existence of the American Educational Research Association as a professional organization. The author begins by tracing the growth and change in research in mathematics education and its interdependence with research in education in general over much of the 20th century, with an emphasis on changes in research perspectives and methods and the philosophical/empirical/disciplinary approaches that underpin them. He then turns to an overview of currently flourishing research and some indications of potentially productive arenas for future work.

Impact of Collaborative Teaching on K-12 Mathematics and Science Learning

A national effort is underway to transform teacher education program practices and produce effective and highly qualified teachers for 21st century classrooms. This effort prescribes providing preservice teachers (PSTs) with authentic field-based experiences that connects what is taught in teacher preparation programs with what they do in the K-12 classroom. Bridging the gap between theory and practice requires that teacher education programs collaborate with schools districts, redesigning teacher training to better serve prospective teachers and their students (NCATE, 2010). This paper describes a mixed-methods study examining the impact of a STEM site-based professional development program (TEX) on the math and science content knowledge, self-efficacy, and interest in STEM of 4-8 students as well as the self-efficacy and STEM interest in preservice and inservice teachers. The researchers found the TEX program's collaborative model of team planning, teaching, and evaluating have led to increased student achievement and better prepared beginning teachers.

Science Education: From Separation to Integration

Advances in technology, science, and learning sciences research over the past 100 years have reshaped science education. This chapter focuses on how investigators from varied fields of inquiry who initially worked separately began to interact, eventually formed partnerships, and recently integrated their perspectives to strengthen science education. Advances depended on the broadening of the participants in science education research, starting with psychologists, science discipline experts, and science educators; adding science teachers, psychometricians, computer scientists, and sociologists; and eventually including leaders in cultural studies, linguistics, and neuroscience. This process depended on renegotiating power structures, deliberate funding decisions by the National Science Foundation and others, and sustained, creative teamwork. It reflects a growing commitment to ensure that all learners are respected and that all students learn to address the complex scientific dilemmas they face in their lives.

This chapter traces the evolution of research on science education in the United States with a focus on 5- to 17-year-olds. It highlights trends in the view of the learner, the design of instruction, the role of professional development, and the impact of technology. The chapter closes with recommendations designed to realize the full potential of these advances.

Agency Research News

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Public Access to Results of NSF-funded Research

The National Science Foundation (NSF or Foundation) has developed a plan outlining a framework for activities to increase public access to scientific publications and digital scientific data resulting from research the foundation funds. The plan, entitled "Today's Data, Tomorrow's Discoveries," is consistent with the objectives set forth in the Office of Science and Technology Policy's Feb. 22, 2013, memorandum, "Increasing Access to the Results of Federally Funded Research," and with long-standing policies encouraging data sharing and communication of research results.

As outlined in section 3.1 of the plan, NSF requires that either the version of record or the final accepted manuscript in peer-reviewed scholarly journals and papers in juried conference proceedings or transactions must:

- Be deposited in a public access compliant repository designated by NSF;
- Be available for download, reading and analysis free of charge no later than 12 months after initial publication;
- Possess a minimum set of machine-readable metadata elements in a metadata record to be made available free of charge upon initial publication;
- Be managed to ensure long-term preservation; and
- Be reported in annual and final reports during the period of the award with a persistent identifier that provides links to the full text of the publication as well as other metadata elements.

This NSF requirement applies to new awards resulting from proposals submitted, or due, on or after the effective date of the *Proposal & Award Policies & Procedures Guide* (*PAPPG*) issued on January 25, 2016.

This recommended change to the *PAPPG* was announced in the *Federal Register* on May 12, 2015 and followed government-wide procedures for public notice and comment. NSF's current data management plan requirement and policies on costs of publication and data citation in biographical sketches will remain unchanged for the present while the Foundation undertakes activities to engage the research communities around data management in support of public access goals. Additional guidance at the Foundation, directorate, division, office or program levels may become available in the future. As stipulated in section 3.a.ii of the OSTP Feb. 22, 2013, memorandum, NSF's plan (section 7.5) discusses a "mechanism for stakeholders to petition for changing the embargo period."

To receive updates on NSF's Public Access Initiative, events, and future enhancements to Research.gov and/or FastLane, subscribe to "System Updates" on the NSF listserv. To subscribe, simply email system_updates-subscribe-request@listserv.nsf.gov and you will be automatically enrolled. For general information about NSF, including information on the Public Access Initiative, sign up for email notifications at: NSF Updates.

- The Plan
- The Executive Summary
- Press Release

- Frequently Asked Questions (FAQs)
- Search NSF Awards
- NSF Public Access Feedback
- NSF Public Access Repository (NSF-PAR) Beta

See also NSF's Open Government website.

See also Dissemination and Sharing of Research Results.

New NSF-funded videos highlight 'Human Water Cycle'

February 7, 2017

Today, the <u>National Science Foundation (NSF)</u> and <u>NBC Learn</u>, the educational arm of NBC News, released an original video series that explores the **connection between water, food and energy**. The four-part "Human Water Cycle" series **spotlights science and engineering research aimed at helping people use water more efficiently**. Narrated by Anne Thompson of NBC News, the series will air on NBC stations and can be viewed online at this <u>NSF Special Report</u>, <u>NBCLearn.com</u> and <u>Science360.gov</u>.

"Through these videos on one of Earth's most precious resources -- water -- we hope to educate viewers about the connections among water, food and energy," said Roger Wakimoto, NSF assistant director for Geosciences. "Providing adequate fresh water to a population that continues to grow is one of the grand challenges facing our world."

Each episode will focus on a different water issue, including segments on **drinking water**, **agriculture**, **wastewater and the water-food-energy nexus**.

"Our partnership with the National Science Foundation has provided a great platform for showcasing the latest research through original video content," said Mark Miano, executive editor of NBC Learn. "'Human Water Cycle' explores the tight connection between the elements through powerful storytelling and captivating video."

Last year, NSF released a special report highlighting its commitment to clean water research that supports accessible, sustainable water resources. The report, "Cleaner Water, Clearer Future," revealed how engineers are working to create efficient, new systems for water treatment, distribution, reuse and recovery.

"A sustainable water supply is essential for a variety of interconnected human needs, from drinking water to electricity," said Barry Johnson, NSF acting assistant director for Engineering, which co-funded the video series. "To meet our water needs in the future will require research and new water technologies for purification, smart agriculture, energy-positive water treatment and more."

Viewers can learn more about the new series and join the discussion on Facebook, Twitter and Instagram by using the hashtag #HumanWaterCycle.

Now Accepting Applications to Join the FFAR Expert Reviewer Database

The Foundation for Food and Agriculture Research (FFAR) seeks expert reviewers from academia, federal and state governments, industry, commodity groups, professional organizations, and other stakeholder groups to evaluate research proposals submitted in response to calls for proposals in the following <u>challenge areas</u>.

- Forging the Innovation Pathway to Sustainability
- Food Waste and Loss

- Increasing the Food System's Capacity to Cope with Water Scarcity
- Protein
- Urban Food Systems
- Making "My Plate" Your Plate
- Healthy Soils, Thriving Farms

FFAR will establish a database of experts, who will be asked to serve as peer reviewers based on each individual's balance of scientific expertise and experience as deemed appropriate for evaluating the specific research proposal. To be considered, applicants should have expertise in the any of the following topic areas:

- Agricultural water management and use
- Soil health
- Farm animal productivity, resilience, and health
- Plant sciences
- Nutrition and consumer food choices
- Food production system
- Biotechnology
- Socioeconomics

Selected experts will evaluate proposals against criteria established by FFAR, and provide comments and scores which will form the bases of the FFAR funding decision. The evaluation will be done using an e-grantmaking website, <u>proposalCentral</u>. Reviewers will be offered honoraria.

The experts' working language should be English; a good ability to write and discuss in English is an essential requirement.

Submission of Application for Consideration

The call for experts is open without deadline. Interested parties are invited to submit a curriculum vitae (CV) to the "Apply Now" button below. The CV should include a description of education, work experience, and a list of peer-reviewed publications. Experts will be placed in the FFAR database.

Managing Conflicts of Interest

In addition to the CV, applicants must submit the self-identified conflict of interest (COI) form and sign a confidentiality/nondisclosure agreement. The <u>COI form</u> will be reviewed annually. Should a conflict of interest arise in the interim between annual revisions, it is incumbent on the expert reviewer to notify FFAR immediately.

<u>Dear Colleague Letter: Programmatic Changes to the Systematics and Biodiversity Science</u>
<u>Cluster in the Division of Environmental Biology, Directorate for Biological Sciences</u>

The Systematics and Biodiversity Science (SBS) cluster will be reorganized to have one core program — named "Systematics and Biodiversity Science" (SBS) — which will now support all research proposals that were formerly submitted to the Phylogenetic Systematics (PS), Biodiversity: Discovery and Analysis (BDA) and Genealogy of Life (GoLife) programs. This change will be effective for preliminary and full proposals submitted to the 2018 deadlines for the DEB Core Programs solicitation. The revised core program will encompass all expeditionary and exploratory research, tree-based approaches to studies of organismal evolution, and proposals that advance systematics theory and/or development of new methods for phylogenetic or

biodiversity analysis. Further, to recognize a growing interest in macroevolutionary questions within the systematics research community, the revised SBS core program will now consider projects that look to test comparative research questions by collecting and integrating various data layers (e.g., genomic, phenotypic, spatial, ecological, geological, and temporal data) within a phylogenetic context.

Dear Colleague Letter: Announcing Realignment of the Service, Manufacturing, and Operations Research Program and Name Change to the Operations Engineering (OE) Program The Division of Civil, Mechanical and Manufacturing Innovation (CMMI), within the National Science Foundation's (NSF) Directorate for Engineering (ENG) announces a realignment of the Service, Manufacturing, and Operations Research (SMOR) program effective 15 January, 2017. Consistent with that realignment, the program name has changed to Operations Engineering (OE). The OE program will continue to manage existing awards made through the SMOR program and will continue to support quantitative research that addresses operational methods within the service and manufacturing domains, enterprise planning and operations, and other emerging domains, including the public sector. The SMOR program will no longer accept new proposals.

<u>Dear Colleague Letter: Improving Graduate Student Preparedness for the Chemistry</u> Workforce

NSF has identified as one of its Agency Priority Goals an effort to improve graduate student preparedness for entering the workforce

(http://www.performance.gov/node/40262?view=public#apg). As part of this effort, the Division of Chemistry (CHE) supports masters and doctoral students so that they can acquire the knowledge, experience, and skills needed for highly productive careers, inside and outside of academe. This Dear Colleague Letter describes opportunities for supplemental funding to enhance the training experience of graduate students currently supported by active CHE research grants. Examples of experiences targeted by this opportunity include, but are not limited to, limited duration (one to three month) internships or similar experiences in industry (including start-up companies), state or federal government laboratories, policy organizations, and non-profit foundations. Consideration would also be given to professional development courses on, for example, innovation and technology commercialization, business and entrepreneurship training, and communicating science to the public. Such courses should not be undertaken in order to directly benefit the student's research project. Activities that include an international component are also encouraged. It is expected that student participation in these experiences will enhance their skills for attaining a competitive position in the job market. Note: Funding requests for conference attendance will not be considered for this supplemental funding opportunity.

<u>Dear Colleague Letter: Request for Information on Future Needs for Advanced</u>
<u>Cyberinfrastructure to Support Science and Engineering Research (NSF CI 2030)</u>

In this Request for Information (RFI), NSF encourages community input to inform the Foundation's strategy and plans for an advanced cyberinfrastructure that will enable the frontiers of science and engineering to continue to advance over the next decade and beyond

(NSF CI 2030). This whole-of-NSF activity recognizes that researchers in different disciplines may need different resources; may have differing priorities for access, interoperability, and continuity; and may require external expertise to address the most critical problems in their discipline. We therefore strongly encourage researchers in all fields of science, engineering and education to respond to this Request for Information. Contributions must be made using the submission website http://www.nsfci2030.org on or before 5:00 PM Eastern time on April 5, 2017.

<u>Dear Colleague Letter: 2017 Division of Chemistry Supplemental Funding Proposals for</u> International Collaboration

In this context, the Division of Chemistry is inviting proposals for supplemental funding from its existing awardees who may wish to add a new, or strengthen an existing, international dimension of their award when such collaboration advances the field of chemistry and enhances the U.S. investigator's own research and/or education objectives. NSF's Proposal and Award Policies and Procedures Guide (PAPPG) Chapter VI.E.4, provides specific guidance on preparing a request for supplemental funding. Principal Investigators supported by NSF Division of Chemistry awards are advised to consult with their NSF program director prior to submitting a supplemental funding request. Supplemental funding requests should be submitted no later than March 1, 2017.

Agency Reports, Workshops & Research Roadmaps

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Frontiers of Engineering: Reports on Leading-Edge Engineering from the 2016 Symposium

This volume presents papers on the topics covered at the National Academy of Engineering's 2016 US Frontiers of Engineering Symposium. Every year the symposium brings together 100 outstanding young leaders in engineering to share their cutting-edge research and innovations in selected areas. The 2016 symposium was held September 19-21 at the Arnold and Mabel Beckman Center in Irvine, California. The intent of this book is to convey the excitement of this unique meeting and to highlight innovative developments in engineering research and technical work.

Cryptographic Agility and Interoperability: Proceedings of a Workshop

In May 2016, the National Academies of Sciences, Engineering, and Medicine hosted a workshop on Cryptographic Agility and Interoperability. Speakers at the workshop discussed the history and practice of cryptography, its current challenges, and its future possibilities. This publication summarizes the presentations and discussions from the workshop.

<u>Strengthening Data Science Methods for Department of Defense Personnel and Readiness</u> Missions

The Office of the Under Secretary of Defense (Personnel & Readiness), referred to throughout this report as P&R, is responsible for the total force management of all Department of Defense (DoD) components including the recruitment, readiness, and retention of personnel. Its work and policies are supported by a number of organizations both within DoD, including the Defense Manpower Data Center (DMDC), and externally, including the federally funded research and development centers (FFRDCs) that work for DoD. P&R must be able to answer questions for the Secretary of Defense such as how to recruit people with an aptitude for and interest in various specialties and along particular career tracks and how to assess on an ongoing basis service members' career satisfaction and their ability to meet new challenges. P&R must also address larger-scale questions, such as how the current realignment of forces to the Asia-Pacific area and other regions will affect recruitment, readiness, and retention. While DoD makes use of large-scale data and mathematical analysis in intelligence, surveillance, reconnaissance, and elsewhere—exploiting techniques such as complex network analysis, machine learning, streaming social media analysis, and anomaly detection—these skills and capabilities have not been applied as well to the personnel and readiness enterprise. Strengthening Data Science Methods for Department of Defense Personnel and Readiness Missions offers and roadmap and implementation plan for the integration of data analysis in support of decisions within the purview of P&R.

<u>Personnel Selection in the Pattern Evidence Domain of Forensic Science: Proceedings of a</u> Workshop

In July 2016 The National Academies of Sciences, Engineering, and Medicine convened a workshop with the goal of bringing together industrial and organizational (I-O) psychologists,

experts on personnel selection and testing, forensic scientists, and other researchers whose work has a nexus with workforce needs in the forensic science field with a focus on pattern evidence. Participants reviewed the current status of selection and training of forensic scientists who specialize in pattern evidence and discussed how tools used in I-O psychology to understand elements of a task and measure aptitude and performance could address challenges in the pattern evidence domain of the forensic sciences. This publication summarizes the presentations and discussions from the workshop.

The Role of Science, Technology, Innovation, and Partnerships in the Future of USAID

The United States has long recognized that the nation's prosperity and security depend on how we address challenges of disasters, poverty, famine, and disease around the world. The U.S. Agency for International Development (USAID) has played a vital role in promoting U.S. national and international interests by advancing strategies for employing science, technology, and innovation to respond to global challenges. The focus by USAID on science, technology, and innovation is critical to improve development outcomes. At the core of this progress is the engagement of science institutions and other innovative enterprises and their commitment to work in partnership with USAID to research, test, and scale solutions. The Role of Science, Technology, Innovation, and Partnerships in the Future of USAID provides an assessment and advice on the current and future role for science, technology, and innovation in assistance programs at USAID and on the role of partnerships in the public and private sectors to expand impact. This report examines challenges and opportunities for USAID in expanding the utilization of science, technology, and innovation in development assistance; assesses how USAID has deployed science, technology, and innovation; and recommends priority areas for improvement going forward in partnership with others.

New Funding Opportunities

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Content Order

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

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

New Funding Solicitations Posted Since January 15 Newsletter

Special Research Grants Program Potato Breeding Research

The Potato Breeding Research program will fund projects that have great potential for producing new potato varieties with a high value to the commercial U.S. potato industry. The Potato Breeding Research program encourages applicants to establish regional, multi-location, research networks to address priority national or regional science needs of the potato industry. By bringing together expertise across multiple university, federal agency, and industry organizations and states, the Potato Breeding Research program seeks to enhance the effectiveness of limited state, federal, and industry resources and accelerate the development of superior varieties that produce greater benefits to the potato industry. NIFA is soliciting applications for FY2017 Potato Breeding Research program that address one or more of the following research areas that will produce outcomes important to the U.S. potato industry:

- 1. Superior performing varieties developed with resistance to established and emerging pests and diseases including but not limited to potato virus Y, damaging nematodes, the late and early blight pathogen, white mold, powdery scab, storage rot diseases, PMTV, and Dickeya that limit sustained production, profitability, and market competitiveness;
- 2. Improved water and nutrient use efficiency traits for varieties that result in decreased demand for irrigation and fertilizer applications, while maintaining desired yield and quality;
- 3. Desirable yield, storability, consumer, and other value-added quality traits are identified and developed for use in new potato varieties; or
- 4. High throughput methods developed for rapidly selecting traits, specifically for developing new superior-performing varieties and bringing them to market as soon as possible. **Due March 10**.

DOE SBIR STTR

Letters of Intent Due Date: March 15, 2017 by 5:00 pm ET Application Due Date: April 04, 2017 by 11:59 pm ET

NNJ17BR10995R JSC Strategic Education Alliance (SEA) for: STEM Engagement; Internships, Fellowships and Scholarships; Educator Professional Development, and Institutional Engagement

The National Aeronautics and Space Administration (NASA) is releasing a Cooperative Agreement Notice (CAN) Announcement No.NNJ17610995C. NASA/Johnson Space Center Office of Education announces, through the release of this Cooperative Agreement Notice, an opportunity for submission of proposals to work collaboratively in the execution of its education efforts. The goal of the Strategic Education Alliance (SEA) cooperative agreement is to provide high-quality, NASA-unique opportunities to students, educator and the general public that encourages them to consider careers in science, technology, engineering, and mathematics (STEM). **Due March 17**.

<u>DE-FOA-0001737: SAVING ENERGY NATIONWIDE IN STRUCTURES WITH OCCUPANCY</u> RECOGNITION (SENSOR)

This program aims to dramatically reduce the amount of energy used for heating and cooling residential buildings (by 30%) via user-transparent sensor systems that accurately sense human presence (not merely motion). This program also aims to reduce energy usage in commercial buildings (also by 30%) by enabling ventilation control based on sensor systems that can accurately count the number of humans in a pre-determined zone. If these sensing technologies can be widely deployed with disruptively low price targets and failure rates, a significantly lower usage of energy will result without impact to comfort of the occupants of the space. Heating, cooling, and ventilation (HVAC) reduction is only one way energy can be saved; such human presence sensing and people counting will enable drastic improvements in the way buildings communicate with and respond to their occupants. The accuracy, reliability, and cost requirements to deliver such substantial energy savings are far beyond the limits of sensor systems available today. However, ARPA-E believes that by building on recent trends in improved performance and reduced cost in low-power consumer electronics and wireless communication technologies, it is possible to achieve the required performance levels through a focused push in the SENSOR program. Supporting systems currently exist (i.e., thermostats/controls, variable air volume systems, etc.) that could utilize data from such sensor systems to achieve the program's energy reduction targets today, with only slight modifications. In order to ensure impact for the new sensor systems, significant adoption barriers must be identified and clearly understood, technical paths to overcome these barriers must be defined, and real-world performance of these technical solutions validated. Concept paper required prior to due date of March 17.

USDA-NIFA-HSI-006206 Hispanic Serving Institutions -- Education Grants Program

NIFA requests applications for the Hispanic-Serving Institutions (HSI) Education Grants Program for fiscal year (FY) 2017 to promote and strengthen the ability of HSIs to carry out higher education programs that attract, retain, and graduate outstanding students capable of enhancing the nation's food, natural resources, human sciences and agricultural scientific and

professional work force. This RFA is being released prior to the passage of an appropriation act for FY 2017. Enactment of continuing resolutions or an appropriations act may affect the availability or level of funding for this program. The anticipated amount available for grants in FY 2017 is approximately \$8.8 million for new and continuation projects. **Due March 22**.

NIJ FY17 Visiting Fellows Program

Awards made under the NIJ Visiting Fellows Program will bring leading practitioners, policymakers, and researchers into residency at NIJ to make important scholarly contributions in their chosen fields of criminology or criminal justice research, and to work with the NIJ Director and staff to help shape the direction of NIJ's research programs. During their fellowship at NIJ, visiting fellows will work on a significant piece of scholarship that has the potential to advance significantly criminology or criminal justice research, such as a major capstone effort culminating a line of research or some work in a new area that has significant potential to transform our understanding of crime and justice in the US. **Due March 27**.

NIJ FY17 New Investigator/Early Career Program in the Social and Behavioral Sciences

NIJ's New Investigator/Early Career Program provides support for non-tenured assistant professors to conduct applied research on topics relevant to NIJ's Office of Research and Evaluation (ORE) and/or Office of Science and Technology (OST). ORE's primary areas of interest include but are not limited to: social science research on criminal justice systems (e.g., courts, policing, corrections); violence and victimization (e.g., victims of crime, human trafficking, bias crime); and crime control and prevention (e.g., school safety, firearms, gangs). OST's primary areas of interest include but are not limited to: the development and application of technology to criminal justice issues, understanding technology's impact in the field, and exploring policyrelated research questions with regards to technology use and impact. Applications must propose research led by a Principal Investigator (PI) who: was awarded a terminal degree in their field within the four (4) years prior to September 30, 2017; holds a non-tenured assistant professor position at an accredited institution of higher education in the United States; and has not previously served as PI on an NIJ research grant or fellowship. Please note that those who have held Graduate Research Fellowships with NIJ or have served as a PI on an award under the "Data Resources Program" solicitation are not deemed "PIs" under that award and are eligible under this solicitation. NIJ encourages applications from diverse academic disciplines including but not limited to: social and behavioral sciences, technology, engineering and math. Due March 27.

<u>2017-NIST-SSCD-01 NIST Standards Services Curricula Development (SSCD) Cooperative</u> <u>Agreement Program</u>

The NIST SSCD Cooperative Agreement Program provides financial assistance and support for curricula development to integrate standards and standardization content into undergraduate and/or graduate courses, modules, seminars, and learning resources at U.S. colleges and universities. Recipients will work with NIST to strengthen education and learning about standards and standardization. Approximately \$250,000 may be available to fund up to eight (8) projects in the \$25,000 - \$75,000 range with project performance periods of up to twenty-four (24) months. The recipients will work with NIST to strengthen education and learning

about standards and standardization. Recipients are expected to: (1) develop curriculum to educate undergraduate and/or graduate students about the impact and nature of standards and standardization so that they enter the workforce and/or continue their academic studies with a strong understanding and appreciation for the value and benefits of standards and standardization; (2) develop sustainable approaches, methods, and models that can be replicated and/or built upon by the participating accredited institution of higher education (IHE) and by other educational programs at U.S. colleges and universities to support the integration of standards and standardization content into undergraduate and/or graduate level curricula; (3) develop a communication plan to share project information, results, and outcomes with the participating accredited IHE and with other educational programs at U.S. colleges and universities, including an action plan for internal and external outreach that will effectively demonstrate how the proposed project outcomes may be replicated and/or built upon by the participating accredited IHE and other educational programs at U.S. colleges and universities.

Due March 27.

CDC's Collaboration with Academia to Strengthen Public Health Workforce Capacity

The purpose of this FOA is to advance the educational preparation of public health, medical, and baccalaureate and higher degree nursing students and provide opportunities that strengthen population health and public health practice competencies through innovative approaches which include, but are not limited to: 1) improved integration of public/population health concepts into health profession education, 2) hands-on experience for students and emerging health professionals, as well as faculty development opportunities, working with communities, professionals from related disciplines, and public health partners to address the leading causes of death and illness, 3) specific additional projects funded by CDC programs that provide workforce development opportunities in academic or public health practice settings or that introduce public health careers, and 4) programs that provide fellowships and rotational assignments at CDC's domestic offices, state, tribal, local, and territorial health departments, or in other community-based settings. The overall goal is to create the opportunities for academia to develop qualified, knowledgeable and experienced students and emerging health professionals suitably prepared to serve in governmental public health practice, or able to apply public health concepts in various healthcare or other settings, to collectively meet the challenge of improving the population health. Due March 31.

Rehabilitation Engineering Research Centers (RERCs) Program: RERC on Health, Exercise, and Recreation

Purpose of Program: The purpose of the RERC program is to improve the effectiveness of services authorized under the Rehabilitation Act by conducting advanced engineering research on and development of innovative technologies that are designed to solve particular rehabilitation problems or to remove environmental barriers. RERCs also demonstrate and evaluate such technologies, facilitate service delivery system changes, stimulate the production and distribution of new technologies and equipment in the private sector, and provide training opportunities. RERC on Health, Exercise, and Recreation: NIDILRR seeks to fund an RERC to a) conduct research on links between exercise and recreation, and significant health conditions of individuals disabilities, b) develop and foster the adoption of assistive, service, and or systems

technologies to promote healthy activities and to improve or control health conditions among people with disabilities, and c) carry out substantive dissemination, technical assistance, capacity building, and knowledge translation activities. **Due April 6**.

DE-FOA-0001634 Stewardship Science Academic Alliances (SSAA) Program

The Stewardship Science Academic Alliances (SSAA) Program was established in 2002 to support state-of-the-art research at U.S. academic institutions in areas of fundamental physical science and technology of relevance to the SSP mission. The SSAA Program provides the research experience necessary to maintain a cadre of trained scientists at U.S. universities to meet the nation's current and future SSP needs, with a focus on those areas not supported by other federal agencies. It supports the DOE/NNSA's priorities both to address the workforce specific needs in science, technology, engineering, and mathematics and to support the next generation of professionals who will meet those needs. **Due April 30**.

Faculty Early Career Development Program (CAREER) Includes the description of NSF Presidential Early Career Awards for Scientists and Engineers (PECASE)

The Faculty Early Career Development (CAREER) Program is a Foundation-wide activity that offers the National Science Foundation's most prestigious awards in support of early-career faculty who have the potential to serve as academic role models in research and education and to lead advances in the mission of their department or organization. Activities pursued by early-career faculty should build a firm foundation for a lifetime of leadership in integrating education and research. NSF encourages submission of CAREER proposals from early-career faculty at all CAREER-eligible organizations and especially encourages women, members of underrepresented minority groups, and persons with disabilities to apply. **Due July 19-21**.

Mind, Machine and Motor Nexus (M3X)

The Mind, Machine and Motor Nexus (M3X) program supports fundamental research at the intersection of mind, machine and motor. A distinguishing characteristic of the program is an integrated treatment of human intent, perception, and behavior in interaction with embodied and intelligent engineered systems and as mediated by motor manipulation. M3X projects should advance the holistic analysis of cognition and of embodiment as present in both human and machine elements. This work will encompass not only how mind interacts with motor function in the manipulation of machines, but also how, in turn, machine response and function may shape and influence both mind and motor function. The M3X program seeks to support the development of theories, representations, and working models that draw upon and contribute to fundamental understanding within and across diverse fields, including but not limited to systems science and engineering; mechatronics; cognitive, behavioral and perceptual sciences; and applied computing. Research funded through this program is expected to lead to new computable theories and to the physical manifestation of these theories. Application areas supported by the M3X program span the full breadth of the Division of Civil, Mechanical and Manufacturing Innovation. Methodological innovation is emphasized, as is a focus on engaging new and emerging thematic areas. The M3X program does not support disaggregated, parallel efforts from individual disciplines or investigators: rather, supported activities must strongly integrate across disciplines to enable discoveries that would not otherwise be possible.

Additionally, the M3X program will not consider proposals that do not integrate physical considerations in a fundamental way. Principal investigators proposing pure artificial intelligence or pure machine learning research are referred to funding opportunities in the Directorate for Computer and Information Science and Engineering. **Due September 1-15**.

URL Links to New & Open Funding Solicitations

- SAMHSA FY 2014 Grant Announcements and Awards
- DARPA Microsystems Technology Office Solicitations
- Open Solicitations from IARPA (Intelligence Advanced Research Projects Activity)
- Bureau of Educational and Cultural Affairs, Open Solicitations, DOS
- ARPA-E Funding Opportunity Exchange
- DOE Funding Opportunity Exchange
- NIAID Funding Opportunities List
- NPS Broad Agency Announcements (BAAs)
- NIJ Current Funding Opportunities
- NIJ Forthcoming Funding Opportunities
- Engineering Information Foundation Grant Program
- Comprehensive List of Collaborative Funding Mechanisms, NORDP
- ARL Funding Opportunities Open Broad Agency Announcements (BAA)
- HHS Grants Forecast
- American Psychological Association, Scholarships, Grants and Awards
- EPA 2014 Science To Achieve Results (STAR) Research Grants
- NASA Open Solicitations
- Defense Sciences Office Solicitations
- The Mathematics Education Trust
- EPA Open Funding Opportunities
- CDMRP FY 2014 Funding Announcements
- Office of Minority Health
- Department of Justice Open Solicitations
- DOE/EERE Funding Opportunity Exchange
- New Funding Opportunities at NIEHS (NIH)
- National Human Genome Research Institute Funding Opportunities
- Army Research Laboratory Open Broad Agency Announcements (BAA)
- SBIR Gateway to Funding
- Water Research Funding
- Fellowship and Grant Opportunities for Faculty Humanities and Social Sciences
- DARPA Current Solicitations
- Office of Naval Research Currently Active BAAs
- HRSA Health Professions Open Opportunities
- NIH Funding Opportunities Relevant to NIAID

- National Institute of Justice Current Funding Opportunities
- Funding Opportunities by the Department of Education Discretionary Grant Programs
- EPA's Office of Air and Radiation (OAR) Open Solicitations
- NETL Open Solicitations
- DoED List of Currently Open Grant Competitions
- Foundation Center RFP Weekly Funding Bulletin

Solicitations Remaining Open from Prior Issues of the Newsletter

<u>Centers for Oceans and Human Health 3: Impacts of Climate Change on Oceans and Great Lakes (COHH3) (P01)</u>

The purpose of this FOA is to invite applications for multi-component projects that will investigate the impact of climate change on emerging public health threats associated with marine and Great Lakes Basin environments. The focus of the program will be to support research on the exposures, toxicities and human health impacts that arise in these environments and how climate change is influencing these factors now and in the future. The FOA solicits applications that will achieve program goals through integrated, multidisciplinary scientific approaches and a community engagement component. **Due March 7.**

Office of Naval Research (ONR) Immersive Sciences for Training, Education, Mission Rehearsal, and Operations

The Office of Naval Research, Expeditionary Maneuver Warfare and Combating Terrorism S&T Department (Code 30) is soliciting white papers and proposals for basic research in immersive sciences. The Navy and Marine Corps seeks to use augmented reality (AR) and mixed reality technologies to improve training and operations for infantry combat personnel; with a specific focus on small unit leaders (e.g. Squad Leader). This includes a range of applications, including augmented training environments that can simulate environments, assets, and friendly/opposing forces and operational tools that can overlay useful virtual information onto the real-world environment. While the Navy and Marine Corps have envisioned these applications, this research opportunity is focused more on the development of the scientific area than on capability. In support of this goal, the Immersive Sciences research program seeks to address basic research challenges in three key areas: automated methods for generating content and/or behaviors for use augmented and mixed reality technologies (with an emphasis on AR); valid, reliable, and objective measures of presence and immersion; and a human-factors based taxonomy of visualization and interaction in AR. **Due March 9.**

<u>Critical Techniques, Technologies and Methodologies for Advancing Foundations and Applications of Big Data Sciences and Engineering (BIGDATA)</u>

The BIGDATA program seeks novel approaches in computer science, statistics, computational science, and mathematics, along with innovative applications in domain science, including social and behavioral sciences, education, biology, the physical sciences, and engineering that lead towards the further development of the interdisciplinary field of data science. The solicitation invites two categories of proposals:

- •Foundations (F): those developing or studying fundamental theories, techniques, methodologies, and technologies of broad applicability to big data problems, motivated by specific data challenges and requirements; and
- •Innovative Applications (IA): those engaged in translational activities that employ new big data techniques, methodologies, and technologies to address and solve problems in specific application domains. Projects in this category must be collaborative, involving researchers from domain disciplines and one or more methodological disciplines, e.g., computer science, statistics, mathematics, simulation and modeling, etc. Proposals in both categories must include a clear description of the big data aspect(s) that have motivated the proposed approach(es), for example: the scalability of methods with increasing data volumes, rates, heterogeneity; or data quality and data bias; etc. Innovative Applications proposals must provide clear examples of the impacts of the big data techniques, technologies and/or methodologies on (a) specific domain application(s). **Due March 15.**

Systems Biology: The Next Generation for Infectious Diseases (U19)

This Funding Opportunity Announcement (FOA) solicits applications to establish Systems Biology Centers that use systems biology approaches to build predictive models for infectious diseases. These models will be derived from hypotheses related to systems-level host/pathogen molecular interactions during infection or treatment using integrated datasets generated from a combination of high-throughput (HTP) experimental approaches, including omics technologies and computational approaches. Importantly, the Centers must clearly integrate experimental approaches and computational modeling to test and validate hypotheses of significance to the infectious diseases field. The scope of this work requires that interdisciplinary teams be formed that are capable of pursuing coordinated activities that bridge disparate scientific disciplines and expertise in microbiology, immunology, infectious diseases, microbiome, HTP experimental and omics technologies, together with experts in mathematics, physics, bioinformatics, computational biology, machine learning and statistical methods and modeling. Bringing multidisciplinary groups together creates opportunities for synergy that would rarely happen otherwise. The research teams within each Center may be composed of investigators located at one institution, or may be formed through a consortium of different institutions. Due March 15.

<u>STEM + Computing Partnerships (STEM+C)</u>

As computing has become an integral part of the practice of modern science, technology, engineering and mathematics (STEM), the STEM + Computing Partnerships program seeks to address the urgent need to prepare students from the early grades through high school in the essential skills, competencies, and dispositions needed to succeed in a computationally-dependent world. Thus, STEM+C advances the integration of computational thinking and computing activities in early childhood education through high school (pre-K-12) to provide a strong and developmental foundation in computing and computational thinking through the integration of computing in STEM teaching and learning, and/or the applied integration of STEM content in pre-K-12 computer science education. **Due March 29.**

W.E.B. Du Bois Program of Research on Race and Crime FY 2017

The W.E.B. Du Bois Program furthers the Department's mission by advancing knowledge regarding the confluence of crime, justice, and culture in various societal contexts. It supports research on the intersections of race, offending, victimization, and the fair administration of justice for both juveniles and adults. This solicitation seeks investigator-initiated proposals to conduct research on topics linked to race and crime in violence and victimization, crime and prevention, and justice systems (policing, courts, community and institutional corrections). For FY2017, NIJ is particularly interested in research on homicide and other violence in minority communities, and criminal court topics. Funding categories include: 1) W.E.B. Du Bois Scholars who are advanced in their careers; and 2) W.E.B. Du Bois Fellows who are early in their careers. **Due March 31.**

NSF Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM)

The program seeks: 1) to increase the number of low-income academically talented students with demonstrated financial need obtaining degrees in STEM and entering the workforce or graduate programs in STEM; 2) to improve the education of future scientists, engineers, and technicians, with a focus on academically talented low-income students; and 3) to generate knowledge to advance understanding of how factors or evidence-based curricular and co-curricular activities affect the success, retention, transfer, academic/career pathways, and graduation in STEM of low-income students. **Due March 29.**

USDA-NIFA-BRAP-006174 Biotechnology Risk Assessment Research Grants Program (BRAG)

The purpose of the <u>BRAG</u> program is to support the generation of new information that will assist Federal regulatory agencies in making science-based decisions about the effects of introducing into the environment genetically engineered organisms (GE), including plants, microorganisms — such as fungi, bacteria, and viruses — arthropods, fish, birds, mammals and other animals excluding humans. Investigations of effects on both managed and natural environments are relevant. The BRAG program accomplishes its purpose by providing federal regulatory agencies with scientific information relevant to regulatory issues. See RFA for details. Visit the NIFA website to access a factsheet on the Center of Excellence (COE) designation process, including COE criteria, and a list of programs offering COE opportunities in fiscal year 2016. You can also review a recording of COE outreach webinars held in February and March of 2015 from the site. The COE webpages will be updated throughout FY 2016 with additional information, such as a summary of comments received from stakeholders. **Due March 30.**

<u>DOD University Small Grants BAA for Energy-related Basic, Applied, Advanced Research</u>
<u>Projects of interest to Dept. of Defense</u> <u>Due by April 1, 2017</u>

DARPA Information Innovation Office BAA

120 sponsors basic and applied research in three thrust areas:

Cyber. As human activity has moved into cyberspace, cyber threats against our information systems have grown in sophistication and number, and protecting and assuring information is a matter of national security. Progress in the cyber security of best-of-breed systems has been significant over the last few years, giving us hope that we are no longer facing an impossible task. Looking to the future, I2O challenges itself with the goal: Win at Cyber. The

I2O defensive cyber research and development (R&D) portfolio is focused on high-end cyber threats, including advanced persistent threats (cyber espionage and cyber sabotage) and other sophisticated threats to embedded computing systems, cyber-physical systems, enterprise information systems, and national critical infrastructure. I2O develops technologies that create software that is provably secure, applications that enhance cyberspace situational awareness, and systems for planning military operations in the cyber domain. Exploration of offensive methods is undertaken to inform the defensive cyber R&D and to establish viability of developed techniques with transition partners.

Analytics. Exponential increases in computation, storage, and connectivity have combined over the past five years to fundamentally alter science, engineering, commerce, and national security. Going under names such as "big data," "machine learning," and "analytics," empirical modeling and data-driven approaches are providing powerful insight and competitive advantage for astute practitioners from biology to sports to finance. Through new analytics, algorithms, and software ecosystems, the modern data-centric paradigm exploits the increasingly dense, detailed measurements produced by networked sensors to optimize products, services, operations, and strategy. I2O is working to keep the Department of Defense (DoD) at the forefront of data-driven design and decision-making with the goal: Understand the World. I2O explores fundamental mathematical and computational issues such as complexity and scalability and develops applications in high-impact areas such as intelligence, software engineering, and command and control. I2O coordinates its R&D with the national security community to ensure timely transition of tools and techniques.

Symbiosis. The world is moving faster than humans can assimilate, understand, and act. At present we design machines to handle well-defined, high-volume or high-speed tasks, freeing humans to focus on complexity. I2O envisions a future in which machines are more than just tools that execute pre-programmed instructions. Rather, machines will function more as colleagues. Towards this end, I2O sets a goal: Partner with Machines. The symbiosis portfolio develops technologies to enable machines to understand speech and extract information contained in diverse media, to learn, to reason and apply knowledge gained through experience, and to respond intelligently to new and unforeseen events. Application areas in which machines will prove invaluable as partners include: cyberspace operations, where highly-scripted, distributed cyber attacks have a speed, complexity, and scale that overwhelms human cyber defenders; intelligence analysis, to which machines can bring super-human objectivity; and command and control, where workloads, timelines and stress can exhaust human operators. Due August 25.

Open Solicitations and BAAs

[BAA's remain open for one or more years. During the open period, agency research priorities may change or other modifications are made to a published BAA. If you are submitting a proposal in response to an open solicitation, as below, check for modifications to the BAA at Grants.gov or by utilizing Modified Opportunities by Agency to receive a Grants.gov notification of recently modified opportunities by agency name.]

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 <u>Army Research Laboratory</u> (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 to March 31, 2017**.

US Special Operations Command Broad Agency Announcement

This BAA is intended to solicit extramural research and development ideas, and is issued under the provisions of the Competition in Contracting Act of 1984 (Public Law 98-369), as implemented in Federal Acquisition Regulation 6.102(d) (2) and 35.016. This announcement provides a general description of USSOCOM's research areas of interest, general information, evaluation and selection criteria, and proposal/application preparation instructions. In accordance with FAR 6.102, projects funded under this announcement must be for basic and applied research and that part of development not related to the development of a specific system or hardware procurement. Projects must be for scientific study and experimentation directed toward advancing the state-of-the-art or increasing knowledge or understanding. Projects that are for the development of a specific system or hardware procurement will not be considered. The selection process is highly competitive and the quantity of meaningful proposal/applications (both pre-proposal/pre-applications and full proposal/full applications) typically received exceed the number of awards that available funding can support. This BAA provides a general description of USSOCOM's research and development programs, including research areas of interest, evaluation and selection criteria, pre-proposal/pre-application and full proposal/application preparation instructions, and general administrative information. Specific submission information and additional administrative requirements can be found in the document titled "General Submission Instructions" available in Grants.gov along with this BAA. Open to May 14, 2017.

W911NF-12-R-0012 Army Research Office Broad Agency Announcement for Basic and Applied Scientific Research

The purpose of this Broad Agency Announcement (BAA) is to solicit research proposals in the engineering, physical, life, and information sciences for submission to the Army Research Office (ARO) for consideration for possible funding. For ease of reference, this BAA is an extraction of the ARO sections of the Army Research Laboratory BAA.

(www.arl.army.mil/www/default.cfm?page=8). Open to May 31, 2017

DARPA-BAA-16-46 Defense Sciences Office Office-wide

The mission of the Defense Advanced Research Projects Agency (DARPA) Defense Sciences Office (DSO) is to identify and pursue high-risk, high-payoff research initiatives across a broad spectrum of science and engineering disciplines and to transform these initiatives into game-changing technologies for U.S. national security. In support of this

mission, the DSO Office-wide BAA invites proposers to submit innovative basic or applied research concepts in one or more of the following technical areas: Mathematics, Modeling and Design; Physical Systems; Human-Machine Systems; and Social Systems. Each of these areas is described below and includes a list of example research topics that highlight several (but not all) potential areas of interest. Proposals must investigate innovative approaches that enable revolutionary advances. DSO is explicitly not interested in approaches or technologies that primarily result in evolutionary improvements to the existing state of practice. **Open until June 22, 2017.**

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

University Small Grants Broad Agency Announcement

This is a five-year, open-ended Broad Agency Announcement (BAA) to solicit research proposals for the United States Air Force Research Laboratory (AFRL) Directed Energy (RD) Directorate. This BAA is a university grant vehicle that can provide small grants of \$100k or less to students/professors in a timely manner for the purpose of engaging U.S./U.S. territories' colleges and universities in directed energy-related basic, applied, and advanced research projects that are of interest to the Department of Defense. **Open to April 1, 2017.**

Long Range Broad Agency Announcement (BAA) for Navy and Marine Corps Science and Technology Department of Defense

All responsible sources from academia and industry may submit proposals under this BAA. Historically Black Colleges and Universities (HBCUs) and Minority Institutions (MIs) are encouraged to submit proposals and join others in submitting proposals. However, no portion of this BAA will be set aside for Small Business or other socio-economic participation. All businesses both small and large are encouraged to submit proposals and compete for funding consideration. B. Federally Funded Research & Development Centers (FFRDCs), including Department of Energy National Laboratories, are not eligible to receive awards under this BAA. However, teaming arrangements between FFRDCs and eligible principal Offerors are allowed so long as such arrangements are permitted under the sponsoring agreement between the Government and the specific FFRDC. C. Navy laboratories, military universities, and warfare centers as well as other Department of Defense and civilian agency laboratories are also not eligible to receive awards under this BAA and should not directly submit either white papers or full proposals in response to this BAA. If any such organization is interested in one or more of the programs described herein, the organization should contact an appropriate ONR Technical POC to discuss its area of interest. The various scientific divisions of ONR are identified at http://www.onr.navy.mil/. As with FFRDCs, these types of federal organizations may team with other eligible sources from academia and industry that are submitting proposals under this BAA. D. University Affiliated Research Centers (UARCs) are eligible to submit proposals under this BAA unless precluded from doing so by their Department of Defense UARC contract. E. Teams are also encouraged and may submit proposals in any and all areas. However, Offerors must be willing to cooperate and exchange software, data and other information in an

integrated program with other contractors, as well as with system integrators, selected by ONR. **Open to September 30, 1917.**

HM0210-14-BAA-0001 National Geospatial-Intelligence Agency Academic Research Program

NGA welcomes all innovative ideas for path-breaking research that may advance the GEOINT mission. The NGA mission is to provide timely, relevant, and accurate geospatial intelligence (GEOINT) in support of national security objectives. GEOINT is the exploitation and analysis of imagery and geospatial information to describe, assess, and visually depict physical features and geographically referenced activities on the Earth. GEOINT consists of imagery, imagery intelligence, and geospatial information. NGA offers a variety of critical GEOINT products in support of U.S. national security objectives and Federal disaster relief, including aeronautical, geodesy, hydrographic, imagery, geospatial and topographical information. The NGA Academic Research Program (NARP) is focused on innovative, far-reaching basic and applied research in science, technology, engineering and mathematics having the potential to advance the GEOINT mission. The objective of the NARP is to support innovative, high-payoff research that provides the basis for revolutionary progress in areas of science and technology affecting the needs and mission of NGA. This research also supports the National System for Geospatial Intelligence (NSG), which is the combination of technology, systems and organizations that gather, produce, distribute and consume geospatial data and information. This research is aimed at advancing GEOINT capabilities by improving analytical methods, enhancing and expanding systems capabilities, and leveraging resources for common NSG goals. The NARP also seeks to improve education in scientific, mathematics, and engineering skills necessary to advance GEOINT capabilities. It is NGA's intent to solicit fundamental research under this BAA. Fundamental research means basic and applied research in science and engineering, the results of which ordinarily are published and shared broadly within the scientific community, as distinguished from proprietary research and from Industrial development, design, production, and product utilization, the results of which ordinarily are restricted for proprietary or national security reason. (National Security Decision Directive (NSDD) 189, National Policy on the Transfer of Scientific, Technical, and Engineering Information). NGA seeks proposals from eligible U.S. institutions for path-breaking GEOINT research in areas of potential interest to NGA, the DoD, and the Intelligence Community (IC). Open to September 30, 2017.

NOAA-NFA-NFAPO-2016-2004791 FY2016 to FY2017 NOAA Broad Agency Announcement

This notice is not a mechanism to fund existing NOAA awards. 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. Funding for activities described in this notice is contingent upon the availability of Fiscal Year 2016 and Fiscal Year 2017 appropriations. Applicants are hereby given notice that funds have not yet been appropriated for any activities described in this notice. Publication of this announcement does not oblige NOAA to review an

application beyond an initial administrative review, or to award any specific project, or to obligate any available funds. **Open to September 30, 2017.**

NOAA-OAR-SG-2016-2004772 National Sea Grant College Program 2016-17 Special Projects

The purpose of this notice is to request proposals for special projects associated with the National Sea Grant College Program's (Sea Grant) strategic focus areas, and to provide the general public with information and guidelines on how Sea Grant will select proposals and administer Federal assistance under this announcement. This announcement is a mechanism to encourage research or other projects that are not normally funded through Sea Grant national competitions. This opportunity is open only to Sea Grant Programs. Section III of this announcement describes eligibility requirements in more detail. Funding has not yet been made available to support applications submitted to this Federal Funding Opportunity (FFO), but such funding may become available during the year. Section II.A. below describes individual competition announcements that will be used to announce when funding is available; any restrictions or requirements on such funding, such as matching funds; and other funding details. Awards will be made under this FFO only if funds have been announced as provided in this FFO. **Open to September 30, 2017.**

BAA-16-100-SOL-00002 Broad Agency Announcement (BAA) for the Advanced Development of Medical Countermeasures for Pandemic Influenza- BARDA

BARDA (<u>full announcement</u>) encourages the advanced research, development and acquisition of medical countermeasures such as vaccines, therapeutics, and diagnostics, as well as innovative approaches to meet the threat of Pandemic Influenza in support of the preparedness mission and priorities of the HHS Public Health Emergency Medical Countermeasures Enterprise (PHEMCE) articulated in the 2014 PHEMCE Implementation Plan. The Implementation Plan is located on the ASPR website:

http://www.phe.gov/Preparedness/mcm/phemce/Documents/2014-phemce-sip.pdf The Pandemic and All Hazard Preparedness Act Pub. L. No. 109-417, 42 U.S.C. § 241 et seq. (PAHPA; http://www.gpo.gov/fdsys/pkg/PLAW-109publ417/pdf/PLAW-109publ417.pdf) and The Pandemic and All Hazard Preparedness Reauthorization Act Pub. L. No. 113-5, (PAHPRA: http://www.gpo.gov/fdsys/pkg/PLAW-113publ5/pdf/PLAW-113publ5.pdf) authorizes BARDA to (i) conduct ongoing searches for, and support calls for, potential qualified countermeasures and qualified pandemic or epidemic products; (ii) direct and coordinate the countermeasure and product advanced research and development activities of the Department of Health and Human Services; (iii) establish strategic initiatives to accelerate countermeasure and product advanced research and development (which may include advanced research and development for purposes of fulfilling requirements under the Federal Food, Drug, and Cosmetic Act or section 351 of this Act) and innovation in such areas as the Secretary may identify as priority unmet need areas; and (iv) award contracts, grants, cooperative agreements, and enter into other transactions, for countermeasure and product advanced research and development. Development Area of Interest: The purpose of this BAA is to solicit proposals that focus on one or more of the following area of interest as listed below: Development Area of Interest; Personal Protective Equipment (Mask and Respirators) for Influenza Infection for All- Hazards; Full-Featured Continuous Ventilators for Influenza and All-Hazards; Influenza Test Systems and

Diagnostic Tools; Influenza Therapeutics; Influenza Vaccines BARDA anticipates that research and development activities awarded from this Broad Agency Announcement (BAA) will serve to advance the knowledge and scientific understanding of candidates' to protect the civilian population of the United States against pandemic influenza and serve to advance candidate medical countermeasures towards licensure or approval by the Food and Drug Administration (FDA). **Open to Oct. 24, 2017.**

AFRL Research Collaboration Program

The objective of the AFRL Research Collaboration program is to enable collaborative research partnerships between AFRL and Academia and Industry in areas including but not limited to Materials and Manufacturing and Aerospace Sensors that engage a diverse pool of domestic businesses that employ scientists and engineers in technical areas required to develop critical war-fighting technologies for the nation's air, space and cyberspace forces through specific AFRL Core Technical Competencies (CTCs). **Open until December 20, 2017.**

FY17 Funding Opportunity Announcement for Navy and Marine Corps Science, Technology, Engineering & Mathematics Education, Outreach and Workforce Program

The ONR seeks a broad range of proposals for augmenting existing or developing innovative solutions that directly maintain, or cultivate a diverse, world-class STEM workforce in order to maintain the U.S. Navy and Marine Corps' technological superiority. The goal of any proposed effort must provide solutions that will establish and maintain pathways of diverse U.S. citizens who are interested in uniformed or civilian DoN (or Navy and Marine Corps) STEM workforce opportunities. As the capacity of the DoN Science and Technology (S&T) workforce is interconnected with the basic research enterprise and STEM education system, ONR recognizes the necessity to support efforts that can jointly improve STEM student outcomes and align with Naval S&T current and future workforce needs. This announcement explicitly encourages projects that improve the capacity of education systems and communities to create impactful STEM educational experiences for students including active learning approaches and incorporating 21st century skills. Projects must aim to increase student engagement in STEM and persistence of students in STEM degrees, while improving student technical capacity. ONR encourages proposals to utilize current STEM educational research for informing project design and advancing our understanding of how and why students choose STEM careers and opportunities of naval relevance. While this announcement is relevant for any stage of the STEM educational system, funding efforts will be targeted primarily toward the future and current DoN (naval) STEM workforce in High School, all categories of Post-Secondary institutions, the STEM research enterprise, and efforts that enhance the current naval STEM workforce and its mission readiness. Open to December 31, 2017.

<u>United States Army Research Institute for the Behavioral and Social Sciences Broad Agency Announcement for Basic, Applied, and Advanced Scientific Research (FY13-18)</u>

Announcement for Basic, Applied, and Advanced Scientific Research. This Broad Agency Announcement (BAA), which sets forth research areas of interest to the United States Army Research Institute for the Behavioral and Social Sciences, is issued under the provisions of paragraph 6.102(d)(2) of the Federal Acquisition Regulation (FAR), which provides for the

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

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

This effort is an open-ended BAA soliciting innovative research concepts for the overall mission of the Human-Centered Intelligence, Surveillance, & Reconnaissance (ISR) Division (711 HPW/RHX). It is intended to generate research concepts not already defined and planned by RHX as part of its core S&T portfolio. The core RHX mission is to develop human-centered S&T that (1) enables the Air Force to better identify, locate and track humans within the ISR environment and (2) enhance the performance of ISR analysts. To accomplish this mission, the RHX core S&T portfolio is structured into three major research areas: (1) Human Signatures develop technologies to sense and exploit human bio-signatures at the molecular and macro (anthropometric) level, (2) Human Trust and Interaction – develop technologies to improve human-to-human interactions as well as human-to-machine interactions, and (3) Human Analyst Augmentation – develop technologies to enhance ISR analyst performance and to test the efficacy of newly developed ISR technologies within a simulated operational environment. The RHX mission also includes research carried over from the Airman Biosciences and Performance Program. While not directly linked to the core S&T strategic plan, there exists a unique capability resident within RHX to address critical Air Force operational and sustainment needs resulting from chemical and biological hazards. Research areas include contamination detection, hazard assessment and management, individual and collective protection, and restoration and reconstitution of operational capability. Open to Feb. 12, 2018.

<u>Air Force BAA - Innovative Techniques and Tools for the Automated Processing and Exploitation (APEX) Center</u>

The AFRL/RIEA branch performs Research and Development (R&D) across a broad area of Air Force Command, Control, Communications, Computers/Cyber, and Intelligence (C4I). All applicable "INTs" are investigated with emphasis on Ground Moving Target Indication (GMTI), Electronic Intelligence (ELINT), Signals Intelligence (SIGINT), Image Intelligence (IMINT), Non Traditional Intelligence, Surveillance and Reconnaissance (NTISR), and Measurement and Signature Intelligence (MASINT). The APEX Center is used to perform analysis for seedling efforts, provide baseline tool development for major programs, and to provide realistic

operational systems/networks/databases for integration efforts. The APEX Center resources will be used by the Government to perform the necessary research, development, experimentation, demonstration, and conduct objective evaluations in support of emerging capabilities within the Processing and Exploitation (PEX) area. Software tools, data sets, metrics (Measures of Performance/Measures of Effectiveness), and analysis are needed for the Government to perform the vetting, maturing, and analysis of efforts related to PEX, e.g. Automatic Tracking, Activity Based Intelligence, Entity, Event & Relationship (EER) Extraction, Association & Resolution (A&R), Analysis & Visualization (A&V), Social Network Analysis, Network Analytics, Pattern Discovery, Scalable Algorithms, and Novelty Detection. The AFRL APEX Center is the AFRL/RI gateway into the cross-directorate PCPAD-X (Planning & Direction, Collection, Processing & Exploitation, Analysis & Production, and Dissemination experimentation) initiative. **Open to FY 2018**.

<u>PAR-16-242 Bioengineering Research Grants (BRG) (R01) Department of Health and Human</u> Services National Institutes of Health

The purpose of this funding opportunity announcement is to encourage collaborations between the life and physical sciences that: 1) apply a multidisciplinary bioengineering approach to the solution of a biomedical problem; and 2) integrate, optimize, validate, translate or otherwise accelerate the adoption of promising tools, methods and techniques for a specific research or clinical problem in basic, translational, or clinical science and practice. An application may propose design-directed, developmental, discovery-driven, or hypothesis-driven research and is appropriate for small teams applying an integrative approach to increase our understanding of and solve problems in biological, clinical or translational science. **Open to May 9, 2019.**

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

Open innovation is a methodology to capitalize on diverse, often non-traditional talents and insights, wherever they reside, to solve problems. Commercial industry has proven open innovation to be an effective and efficient mechanism to overcome seemingly impossible technology and/or new product barriers. AFRL has actively and successfully participated in collaborative open innovation efforts. While these experiences have demonstrated the power of open innovation in the research world, existing mechanisms do not allow AFRL to rapidly enter into contractual relationships to further refine or develop solutions that were identified. This BAA will capitalize on commercial industry experience in open innovation and the benefits already achieved by AFRL using this approach. This BAA will provide AFRL an acquisition tool with the flexibility to rapidly solicit proposals through Calls for Proposals and make awards to deliver innovative technical solutions to meet present and future compelling Air Force needs as ever-changing operational issues become known. The requirements, terms and specific deliverables of each Call for Proposals will vary depending on the nature of the challenge being addressed. It is anticipated that Call(s) for Proposals will address challenges in (or the intersection between) such as the following technology areas: Materials: - Exploiting material properties to meet unique needs - Material analysis, concept / prototype development, and scale up Manufacturing Processes that enable affordable design, production and sustainment operations Aerospace systems: - Vehicle design, control, and coordinated autonomous and/or

manned operations - Power and propulsion to enable next generation systems Human Effectiveness: - Methods and techniques to enhance human performance and resiliency in challenging environments - Man — Machine teaming and coordinated activities Sensors and Sensing Systems: - Sensor and sensing system concept development, design, integration and prototyping - Data integration and exploitation. **Open to July 12, 2019.**

HDTRA1-14-24-FRCWMD-BAA Fundamental Research to Counter Weapons of Mass Destruction

** Fundamental Research BAA posted on 20 March 2015.** Potential applicants are strongly encouraged to review the BAA in its entirety. **Please note that ALL general correspondence for this BAA must be sent to HDTRA1-FRCWMD-A@dtra.mil. Thrust Area-specific correspondence must be sent to the applicable Thrust Area e-mail address listed in Section 7: Agency Contacts.** Open to Sept. 30, 2019.

BAA-RQKH-2015-0001 Methods and Technologies for Personalized Learning, Modeling and Assessment Air Force -- Research Lab

The Air Force Research Laboratories and 711th Human Performance Wing are soliciting white papers (and later technical and cost proposals) on the following research effort. This is an open ended BAA. The closing date for submission of White Papers is 17 Nov 2019. This program deals with science and technology development, experimentation, and demonstration in the areas of improving and personalizing individual, team, and larger group instructional training methods for airmen. The approaches relate to competency definition and requirements analysis, training and rehearsal strategies, and models and environments that support learning and proficiency achievement and sustainment during non-practice of under novel contexts. This effort focuses on measuring, diagnosing, and modeling airman expertise and performance, rapid development of models of airman cognition and specifying and validating, both empirically and practically, new classes of synthetic, computer-generated agents and teammates. An Industry Day was held in November 2014. Presentation materials from the Industry Day and Q&A's are attached. If you would like a list of Industry Day attendees, send an email request to helen.williams@us.af.mil Open until November 17, 2019.

<u>Directorate</u>, Functional Materials and Applications (AFRL/RXA) Two-Step Open BAA

Air Force Research Laboratory, Materials & Manufacturing Directorate is soliciting White Papers and potentially technical and cost proposals under this two-step Broad Agency Announcement (BAA) that is open for a period of five (5) years. Functional Materials technologies that are of interest to the Air Force range from materials and scientific discovery through technology development and transition, and support the needs of the Functional Materials and Applications mission. Descriptors of Materials and Manufacturing Directorate technology interests are presented in the context of functional materials core technical competencies and applications. Applicable NAICS codes are 541711 and 541712. **Open to April 20, 2021.**

Research Interests of the Air Force Office of Scientific Research BAA-AFRL-AFOSR-2016-0007

The Air Force Office of Scientific Research "we, us, our, or AFOSR" manages the basic research investment for the U.S. Air Force. As a part of the Air Force Research Laboratory (AFRL), our technical experts discover, shape, and champion research within the Air Force Research Laboratory, universities, and industry laboratories to ensure the transition of research results to support U.S. Air Force needs. Using a carefully balanced research portfolio, our research managers seek to foster revolutionary scientific breakthroughs enabling the Air Force and U.S. industry to produce world-class, militarily significant, and commercially valuable products. Our focus is on research areas that offer significant and comprehensive benefits to our national warfighting and peacekeeping capabilities. These areas are organized and managed in two scientific Branches: Engineering and Information Sciences (RTA) Physical and Biological Sciences (RTB). **Open until superseded**.

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