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About the Editors

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Which Sounds Better, Analog or Digital Music?
The NSF webinar of September 19, "How to Write a Competitive AISL Proposal," not only addresses the explicit elements of a competitive proposal to the Advancing Informal STEM Learning (AISL) program due November 6 but also implicitly addresses the elements of a competitive proposal to any NSF program area. There is no denying that many funding agency streaming webinars can easily function as a substitute for Ambien and are available without a prescription. In this case, however, program officers make comments and observations that give valuable insight into the nature of a competitive NSF proposal.

The webinar announcement gave a heads up that this webinar might be different and very much worth watching, as noted by the NSF Description, particularly the generic universality inherent in items b and c: “In this webinar, AISL Program Officers will highlight: (a) essential elements that should be in every strong AISL proposal, (b) proposal deficiencies to avoid, and (c) key differences between a highly competitive proposal and a proposal that is not competitive.” (Note: all bold and italic in quotes throughout text are added for emphasis.)

If you intend to submit a proposal under this program, then a full review of the materials, “How to Write a Competitive AISL Proposal - 9/19/17 - Slides, Video, and Q&A” (coming soon!) posted to the InformalScience.org web would be worth your while. This article will focus on the webinar’s more generic information with widespread applicability for writing successful proposals (what to do, what not to do) beyond the specific AISL program.

For example, the program officers giving this webinar note that, when evaluating NSF proposals, “reviewers consider what the proposers want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits would accrue if the project is successful.” Furthermore, it is noted, “These issues apply both to the technical aspects of the proposal and the way in which the project may make broader contributions.” A competitive proposal will address these core questions on page one of the research narrative.

One other important consideration in writing a research narrative is to make an informed determination of how the review panel is constituted—basically learning who is the audience to whom you are writing, i.e., who are the panelists? In proposals narrowly focused on a technical topic, it is likely that the review panel will be constituted by experts in the field. However, as proposals become more interdisciplinary and team based, the review panel will also become more diverse. For example, advice from this webinar on the constitution of the review panel for the AISL program pretty much aligns with the panelists that serve on an interdisciplinary proposal or a larger NSF proposal that integrates research and education. In this case, the authors note specifically that panelists belong to a wide mix of academic communities, including scientists, education and learning researchers, informal education practitioners (museums, science outreach programs, etc.), and university administrators.

The webinar also notes the importance of understanding the proposal’s genre: “Grant proposals are a very specific genre of academic writing. They are similar to but not the same as research articles (e.g., not simply blind judgment of intellectual merit).” The important differences in this regard are that “proposal narratives are not blinded (the person behind the
*Proposal does matter*, and they have relevance beyond the research world, e.g., broader impacts, societal benefits.” Finally, the research narrative is a “projection of future research (not retrospective reporting).”

Moreover, in writing the research narrative, “Do not presume shared knowledge/terminology among the reviewers: reviewers come from diverse research/discourse communities; reviewers can feel overwhelmed by the massive amount of information in the proposals; and avoid assuming that they share your specialized knowledge and technical vocabulary.” Finally, do not use jargon. Jargon can lead to reviewers’ cognitive overload.

The program officers who conducted the webinar also advised viewers to “use a reviewer friendly format, specifically:

- Use the same labels as those used in the call;
- Use bold and leave some blank space (indentations);
- Include some figures/diagrams;
- Clearly structured texts are less overwhelming for readers; and
- Although space is limited (typically 15 pages), *an excessive number of words per page does not necessarily make your proposal stronger!* “

Moreover, the program officers noted, “mind your tone:

- Try to **project a positive image** of the intended research, but also a positive “self image” (as a competent/confident yet **careful** researcher).
- Applicants can come across as **arrogant** and **unrealistic**.
- Understatement and toning down one’s language **not to over-claim the importance** of the work is recommended. (Your project is probably neither “the only” nor “the first.”)

Before you begin writing, program officers recommended that you “do your homework:

- Familiarize yourself with the NSF website.
- Read the solicitation carefully and multiple times.
- Check the NSF Awards Search Page for examples.
- Talk to NSF Program Officers about your ideas:
  - Schedule a call with a PO.
  - POs may ask you to send a 1-2 page summary in advance.”

Other webinar recommendations on writing a successful narrative include:

**“Overview/Rationale: What Makes This Project Important?”**

- How is it innovative or potentially transformative?
- How will it advance knowledge and move the field forward?
- What are the anticipated outcomes or products of this project?
- Who will be interested in these outcomes, and how will you target dissemination of findings to them?
- How might these products or findings be useful on a broader scale?”
“Theoretical Framework: What Have You And Others Done?
• Describe the theoretical and research basis on which the proposal is based.
• How has the prior research influenced this project?
• Discuss how the proposal is innovative and different from similar projects.
• If you have previously been funded by NSF for similar work, provide evidence about the effectiveness and impact of that work.”

“Results of Prior Research
• Does this project build on the results of related prior projects by the PI’s?
• If yes, is there evidence provided about the intellectual merit and broader impacts of the prior project(s)?
• How has the prior project influenced this project?”

In conclusion, while the below from the webinar is included last in this article, it needs to be addressed first in your proposal narrative. Of all the mistakes made in writing the project description of any proposal, not getting to the point quickly represents a serious shortcoming.

Get to the point!

• Reviewers should be able to easily get a sense of what the proposal is about upfront (project summary and introduction).
• Make what they are looking for easy to find, using the language of the review criteria and headings to highlight the elements of the project description.
Some researchers are fortunate enough to have a “funding home” in a single disciplinary program area at a single specific agency; however, most researchers, particularly those new to grant writing or those expanding their research into new, often multidisciplinary domains, will track funding opportunities across several agencies. The most promising agencies include those that fund cross-agency research or have research mission overlap in both basic and applied research, e.g., USDA/NIFA and DOE in bioenergy areas; DHS/DOD/NSF in cyber security; DOE and NSF in smart grids; NSF and NIH in biochemistry, biological sciences, or the BRAIN or Materials initiatives, among many others.

NSF is the most common “go to” agency for those wanting to expand their research domain into new areas. NSF funds research across multiple directorates, ranging from engineering and the physical sciences and mathematics to social and behavioral sciences to STEM education. Of course, when you change or transition to new agencies, you also transition to a new agency culture and mission. Understanding an agency’s mission and culture is the key to funding success and must be part of your transition strategy.

After all, all funding agencies, both basic and applied, have priority strategic investment strategies that help them achieve their research mission objectives through funded awards. In turn, successful proposals all share one common characteristic, regardless of agency: that a clear and compelling case has been made that the proposed research will bring significant value-added benefits to the agency mission and/or advance the disciplinary field in some important way(s).

This is where reviewing abstracts of funding projects comes into your equation for planning, developing, and writing a successful proposal. Specifically, reviewing abstracts of recently funded projects gives researchers yet another source of information about the interests of a funding agency by presenting review panels’ and program officers’ selections of successful proposals. Reading the abstracts of funded projects will give you a more nuanced understanding of the funding agency culture and expectations specific to a solicitation, or cluster of solicitations, within a disciplinary domain. Abstracts from the two most current past funding cycles are typically the most informative because annual grant solicitations often evolve over time. This is particularly true when reading abstracts of research, educational, and institutional initiatives funded by programs with long-running annual solicitations, such as those at NIH and NSF.

The abstracts serve as an excellent complement to the program solicitation by giving examples of successful applicant responses to the research goals and objectives defined in the RFP. In some cases, particularly with institutional and educational initiatives, reviewing the abstracts of projects funded during the past two years reveals a core of programmatic elements and activities common to all successful proposals. That is, clear common
denominators to all funded projects, or most of them, exist and can be discovered. This is particularly the case for educational programs funded by NSF.

In other cases, again, most often for educational and institutional grants or hybrid research and educational grants (e.g., NIH Bridges or NSF INCLUDES), reading ten or twenty abstracts of recently funded projects may reveal common program models or programmatic components viewed by program officers and reviewers as effective for achieving the goals and objectives of the particular solicitation. For instance, the NSF Research Experiences for Undergraduates (REU) program is a very long-standing annual solicitation. The mentoring plan will comprise a core component of a successful proposal. Effective mentoring plans include proven mentoring activities. Reviewing the REU abstracts, along with the REU literature, will help the new applicant understand those models the agency favors, and equally important, gain insight into the models the agency program officers might not favor. Moreover, reading abstracts of funded proposals specific to STEM, or that have a STEM component, may give you more insight into what successful applicants put forward as successful educational models that reflect best practices, evidence-based models, and dissemination plans.

In many cases, abstracts include contact information on the principal investigators, including email addresses. On educational and institutional grants, in particular, the PI may be willing to share observations related to developing a competitive proposal to the particular program, and may even agree to share a copy of the funded proposal, reviewers’ comments, and outcomes of annual performance reviews. PIs are more often willing to share information about educational and institutional grants than about a research grant where you may be viewed as a funding competitor. In many cases, e.g., NSF educational grants, the funding agency expects those funded to disseminate results related to “best practices” in such areas as K-12 education and undergraduate research.

In the final analysis, reading abstracts of funded projects can help researchers, both in education and research, better judge whether their proposal plans are in the ball park of what has been funded in the past or whether their ideas are far afield. Moreover, particularly at an agency like NSF that is continuously expanding its education and research boundaries, reading abstracts can also help determine whether an idea has already been well funded by the agency through various proposals and therefore may be in line for implicit “sunsetting” by the program managers and reviewers who are looking for the next new educational model or research direction.

In conclusion, most NSF program solicitations you might consider will have a link on the program website to “Recent Awards” made under the program; alternatively, you can search at the NSF Award Search Database. It is also helpful to look at the NSF awards made by state to get an idea of award distribution nationally HERE. At NIH, look for award information at REPORTER. At USDA/NIFA, this information is HERE. For NOAA, go HERE. If you are looking for other award databases, a good starting point is a Google search string “NAME OF AGENCY OR PROGRAM Award Database,” or some variant, including your unique specifics, keeping in mind the geologist’s adage “If you don’t ask the right question the rock won’t answer.”
Expanding Your Funding Search to Open BAAs

Research offices helping faculty locate a new funding home, or otherwise seeking to expand into other research opportunities not currently available in published solicitations gleaned from a Grants.gov search, might consider sifting through the currently open Broad Agency Announcements (BAA).

The goal is to identify possible funding opportunities in BAAs that meet three key conditions: (1) match your research interests, (2) match the mission priorities of the BAA, and (3) ensure that the proposed research is unrelated to research that could be submitted under a current agency solicitation. You might think of the BAA as a sandbox for idea generation sparked by the BAA’s general, often open-ended description of research interests, both basic and applied, that may fall within your research domain and are fully joined when your interest in a potential research idea occurs.

When responding to a BAA, consider that the document will list technical point(s) of contact (POC) for the BAA assigned to various research domains of importance to the agency. Engaging with the POC is essential to success, particularly since BAAs are often a multistep process, starting with a technical discussion of your ideas with the POC to determine agency mission relevance, submission of a brief project summary or abstract for further discussion with the POC, submission of a three-to-five page white paper, and finally an invitation to submit a full proposal.

Finding these open BAAs is easily done with a Grants.gov search, as noted in the screen capture graphic at the end of this article, where entering “BAA” in the Keyword(s) search box across all research categories and agencies turns up 76 currently open federal agency BAAs going out as far as 2023. Of the 76 currently open BAAs, the below examples illustrate the process of searching through them for possible funding opportunities, starting with identifying the specific number associated with the BAA on Grants.gov, and, from there, downloading the pdf file of the entire BAA for your review.

- FY18 Long Range Broad Agency Announcement (BAA) for Navy and Marine Corps Science and Technology by DOD/ONR
- NOAA FY 2018 – 2020 - Broad Agency Announcement (BAA)
- DoD USAMRMC FY18-FY22 Broad Agency Announcement for Extramural Medical Research
- DARPA Active Social Engineering Defense (ASED)
- DARPA I2O Office-wide BAA
- Air Force Research Lab Science and Technology for Autonomous Teammates (STAT)
- FY2018 Basic Research Challenge (BRC) Program
- Army Research Laboratory Broad Agency Announcement for Basic and Applied Scientific Research
In reviewing the BAA, you will find some things in common across federal BAAs and others that are specific to a funding agency. The common elements of the BAAs include details on the program objectives, program priorities, open period, content and form of application, submission dates and times, evaluation criteria, review and selection process, and agency program contacts. Elements of the BAA specific to an agency will include a discussion of the agency mission priorities and discussion of the general research domains that would support that mission. White papers and proposals submitted in response to a BAA are judged primarily on technical merit and relevance and contribution to the agency’s mission.

Sifting through open BAAs will prove successful for some faculty and not for others, but for those faculty whose research interests and expertise match the mission of one or more federal mission agencies, assistance from research offices in understanding the BAA process can lead to new funding opportunities. Furthermore, several key skill-building outcomes are learned in the BAA process, including how to map research interests to a funding agency mission, how to interact with program officers, i.e., point of contact, how to engage in a multistep process that includes talking to program officers, writing exploratory abstracts and white papers to determine your fit to an agency’s mission, how to frame your research in terms of value-added benefits to the funding agency mission, etc.

Finally, responding to open BAAs is a good way to expand possible funding paths to support your research, particularly research that may not be addressed in published solicitations but is nonetheless an important and well-funded line of inquiry.
Don’t be Alarmed by Nonlinearity

For some involved in the planning, developing, and writing of proposals, uncertainty, ambiguity, and nonlinearity represent ever present bugaboos that add to the stress as the proposal advances towards the due date. However, the key point to keep in mind about proposal development is that the process is rarely linear, no matter how much we wish it were. Proposals are not like taking the Green Line in Boston and knowing with certainty that you will traverse through Government Center, Park Street, Boylston, and Arlington to get to Copley Square at predetermined times. In the world of proposal development, you may feel more like the forever lost Charlie On the MTA: “Well, did he ever return?/ No he never returned and his fate is still unlearned/ He may ride forever 'neath the streets of Boston/ And he's the man who never returned.”

The best calming analogy for proposal development is the crossword puzzle. Rarely do you solve the puzzle by immediately filling in all the words going across the rows, thereby revealing all the words in the vertical columns, or vice versa. For most mortals, completion of the puzzle amounts to hunting, pecking, and gaining insight incrementally. The first attempts generate hints from the words you do know that help you identify the words you don’t know. And through this back and forth process of trial and error and memory jogging, word patterns slowly emerge until eventually the entire puzzle reveals itself to you. That pretty much represents an overview of what the proposal development process is like from start to submittal.

Arriving at a clear statement of good ideas in an organized way can be an irksome process, with clarity often eluding you in the early stages of proposal development. Unfortunately, there are no safe spaces in proposal development, but there are many triggers for anxiety, all revolving around answering the core questions that must be answered in any successful proposal, including, for example: what you will propose to do and how will you do it; what is your significant idea and why is it important to the field and the sponsor; how does what you propose fit the goals and objectives of the solicitation; how do you best organize your research narrative; who are the authors contributing to the proposal; what is your proposal production schedule of who does what and when, etc. (See companion article in this month’s newsletter: The Schedule and Task Assignment Table for Proposal Production.)

In a perfect world, proposal planning, developing, writing, and submittal would be a stepwise process, one step logically and clearly following another on a single, predetermined timeline from beginning to end. Unfortunately, this world does not exist. The reality is that proposal development often recreates the experience of moving through a slowly lifting fog, perhaps on the ferry from Seattle to Bainbridge Island in October, or driving sections of the Pacific Coast Highway in early morning. Like these examples, proposal development can be a harrowing experience rife with uncertainty.

As in any harrowing experience, the best antidote to stress and panic is an experienced guide(s) that can help better organize the process and is sufficiently practiced in proposal development that pitfalls hidden and obscured in the fog can be planned for in advance. While
not every single disruptor to the proposal development process can be anticipated, most can be expected with sufficient certainty to ensure a competitive proposal can be submitted in the time allotted. (See companion article in this month’s newsletter: Don’t Let Your Proposal Wear a Disguise on Halloween.)

These “proposal guides” are most often found in one or more research offices and enlisting their services is the best antidote to a disorderly development process that continuously lurches along the brink of disaster. Moreover, there are common characteristics of failed proposal efforts that are essentially generic and hence provide a laundry list for faculty seeking support on a proposal from research offices, including, for example:

- A careless reading or a misreading of the program solicitation, including the review criteria;
- Failure to explain how the proposed research fits the mission priorities of the funding agency or the current state of the field;
- An overly generalized research narrative lacking specifics and details on what will be done and how it will be done;
- A poorly written proposal (mistakes in language, usage, spelling, tense, etc.)
- A poorly planned proposal production schedule;
- A poorly managed proposal production, etc.
Recent Reorganizations and Deadline Changes at NSF

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By Lucy Deckard, co-publisher

NSF had recently made a number of changes, including introducing new programs, reorganizing or consolidating programs (mainly in Engineering), and doing away with some due dates. Below, we summarize the changes and discuss how these changes might affect PIs’ proposal strategies.

New and Reorganized Programs

ECI Program: The Division of Civil, Mechanical and Manufacturing Innovation (CMMI) in the Engineering Directorate, will be combining the Engineering for Natural Hazard (ENH), Geotechnical Engineering and Materials (GEM) and Structural and Architectural Engineering and Materials (SAEM) programs into the Engineering for Civil Infrastructure (ECI) Program. (See the Dear Colleague Letter.) For this program, NSF is encouraging proposals for “research driven by radical rethinking of traditional civil infrastructure in response to emerging technological innovations, changing population demographics, and evolving societal needs is encouraged.” (The GEM program will still accept proposals until Dec. 29, 2017). This new ECI program will start accepting proposals Jan. 10, 2018.

HDBE Program: CMMI is changing the name of the Infrastructure Management and Extreme Events (IMEE) program to the Humans, Disasters and the Built Environment (HDBE) program. The HDBE program is concerned with “the interactions between humans and the built environment as manifested in the context of hazards and disasters.” They emphasize that proposals focused solely on humans or solely on the built environment don’t fit this program.

EDSE Program: CMMI is merging the Engineering and Systems Design (ESD), System Science (SYS), and Design of Engineering Material Systems (DEMS) programs into a new program entitled Engineering Design and Systems Engineering (EDSE). EDSE will fund research in three themes: 1) understanding the development of systems at scale, 2) cognitive support for design and systems engineering, and 3) design of engineering material systems. EDSE specifically encourages proposals from multidisciplinary teams that combine design or systems engineering research with other scientific or engineering domains.

LEAP HI Program: CMMI announced the new Leading Engineering for America’s Prosperity, Health, and Infrastructure (LEAP HI) program. LEAP HI was formed to fund projects that require “a sustained research effort by an integrated, interdisciplinary team” and focus on a fundamental research problem with “CMMI core topics at the heart of the proposal,” integrated with “disciplinary expertise not typically engaged in CMMI-funded projects.”

CIS Program: The focus of the current Civil Infrastructure Systems (CIS) program is being realigned, with three principal changes: 1) all critical civil infrastructure is of interest, including water, pipelines, etc.; 2) disruptive ideas are of special interest (see the Dear Colleague Letter for examples); and 3) proposals in construction engineering are no longer accepted and should instead go to the new ECI program (above).
Potential New OISE Program: In a Dear Colleague Letter, the NSF Office of International Science and Engineering (OISE) is inviting White Papers on STEM topics that are ripe for international network-to-network collaboration. This is an information-gathering effort to “inform OISE of the potential need for a future program or program emphasis.” White Papers are due November 30, 2017.

What This Means for PIs Applying to these Programs

Programs are typically realigned or merged with other programs because of a change in priorities or interests at NSF. This is to be expected since, at least ideally, science should always be progressing, and new questions present themselves as old ones are answered. Outside events and national priorities may also inspire such changes. If you are a PI who usually submitted to one of the programs that has now been modified, this can be an alarming experience, especially if you felt you understood the program well. However, remember that this is also an opportunity. Take some time to understand the changes and investigate NSF’s thinking behind these changes. Analyze the wording in the new program synopsis and in the Dear Colleague Letter. Talk to the Program Officer. For many of the programs above, one common theme is the push toward more interdisciplinarity or, at least, a more integrative and less siloed, approach. This may push you a bit out of your comfort zone, but it may also offer a chance for you to seize a competitive advantage if you propose interesting research with the appropriate team members that aligns with the new program priorities.

In addition, new or realigned programs may be more open to new and unconventional ideas. Often, the Program Officer is not exactly sure where the program will go and may be looking to the research community for their best ideas as long as they align with the overall priorities of the program. For this reason, during this stage you may have the opportunity to jump in with your innovative ideas that might not have previously fit the program.

Due Date Changes

A number of programs have recently eliminated their standing due dates and will accept proposals at any time. These include

- Biological and Environmental Interactions of Nanoscale Materials (ENG/CBET)
- Combustion and Fire Systems (ENG/CBET)
- Process Separations (ENG/CBET)
- Division of Environmental Biology (BIO/DEB)
- Division of Biological Infrastructure Research Resources Cluster (BIO/DBI)

Note that for the ENG programs, since there is now no defined submission window, proposals that have been declined may not be revised and resubmitted until 1 year after the original submission date. This avoids having PIs quickly revise and resubmit a proposal multiple times within a year, which would dramatically increase proposal pressure for the program and result in rushed resubmissions.

The following divisions within the Biological Sciences Directorate (BIO) will not only eliminate due dates for their core programs, but will also discontinue the preliminary proposal mechanism in 2018. (This means PIs can go straight to a full proposal, which can be submitted
at any time. However, this does not affect full proposals already submitted.) See the Dear Colleague Letter and FAQs for more info. Register to receive notice of the new solicitations to be issued in 2018, as well as webinars and presentations, here.

- Division of Integrative Organismal Systems (BIO/IOS)
- Division of Molecular and Cellular Biosciences (BIO/MCB)

What This Means for PIs

NSF is increasingly adopting a no-deadline strategy for its core programs for several reasons: 1) the proposal quality is typically better since proposals weren’t rushed to meet a due date; 2) NSF feels that having no due date will allow more time to build collaborations and think creatively; 3) NSF and submitting institutions will be able to avoid a last-minute flood of proposals just before the due date that require extra resources to handle; and 4) NSF receives fewer proposals overall when there is no defined due date. We suspect that this last reason is the most important since NSF has struggled to handle an ever-increasing volume of proposals.

As the PI, you’ll want to pay extra attention to that last reason. There is the saying, “If something can be done at any time, it will be done at no time.” Many of us are deadline-driven creatures, so that means that it’s very easy to put off developing and submitting your proposal if you don’t have a deadline. To avoid this, you should set a deadline for yourself in order to help you prioritize getting your NSF proposal done. If your proposal will be reviewed by a panel, ask your Program Officer when they expect the panels to meet. Even though there’s no official due date, if a panel will be meeting, for example, in July and you submit your proposal in August, you will probably have to wait until the next panel convenes to have your proposal reviewed. For that reason, you can set yourself a de facto July due date if you want to waiting a longer time to have your proposal reviewed.

All of these changes highlight the importance of keeping up with NSF news by subscribing to NSF’s Dear Colleague Letters. You can easily do that by going here and signing up under “Get Program Announcements & Info Updates” either by email or by RSS.
A poorly planned proposal has little likelihood of success. Walt Kelly’s Pogo once famously observed, “We have met the enemy and he is us!” That observation perfectly fits a poorly planned proposal development effort. But preparation can save you from becoming your proposal’s enemy. A well-planned proposal development effort cannot turn ideas of modest importance into ideas of compelling significance, but it can give your ideas a chance to be realized through a well-crafted proposal rather than disguised by a poorly crafted one.

Two earlier articles in this newsletter addressed the role of the solicitation (RFP, BAA, FOA, etc.) in developing a proposal narrative template (Sept. 15) and in conducting a red team review of a near-final narrative draft (Nov. 15). This article addresses the use of the entire solicitation as a starting point for developing a Schedule and Task Assignment Table (STAT) for producing an entire proposal, from the cover page to the last page. The larger the proposal the more critical this proposal development schedule and task assignment table becomes to realizing a competitive submittal. For major institutional proposals and proposals to develop research or research and education centers, the STAT is the organizational linchpin of the entire effort, and a principal factor in potential success.

Moreover, other factors may make the scheduling and tasking of development assignments more difficult and complex. On large proposals, the number of partner institutions involved in the project where subcontracts or subawards need to be negotiated and finalized specific to research and/or educational roles requires advance scheduling. Another layer of complexity may result when subcontracts need to be in place for outreach institutions unfamiliar with the subcontract or subaward process (e.g., K-12 school districts, museums or science centers, community colleges, and other institutions lacking research and grant contract offices).

Fortunately, most large research and education solicitations by federal agencies operate on annual or biennial schedules, or otherwise announce their deadlines far in advance, to allow a well-planned submission process. In any case, as soon as the solicitation becomes available, it needs to be transformed into a development template for the proposal narrative and a corresponding schedule and task assignment table. These will serve as the key organizational documents ensuring that a competitive proposal is developed, written, and submitted to the funding agency on time.

Of course, the first step in this process is having an established history of successful research that clearly meets the research interests and/or mission of the funding agency as defined in the solicitation. As addressed in the September 15 issue of this newsletter, Writing the Competitive Research Center Proposal, Submitting for the Right Reasons and with the Right PI, the competitive principal investigator who leads the effort must be both a successful
researcher and an experienced manager of research and researchers, as well as adroit at achieving consensus among occasionally competing interests and personalities.

However, once the PI and a team of likely coPIs feels confident that a competitive proposal can be developed and makes the decision to go forward, then this core team forms the nucleus of the proposal development effort and decides how the core group will expand to bring on board the range of expertise needed to respond fully to each item in the solicitation. When this point in the process has been reached, it is time to start the development of the proposal production infrastructures that will support and guide the effort over the coming months. Representative components of the proposal production infrastructure are described and discussed below. A generic example of a Schedule and Task Assignment Table discussed in the rest of this article is located at the conclusion.

Create a Proposal Narrative Template

The most common reasons funding agencies assign a poor review to a proposal can be traced to the proposer’s flawed understanding of the sponsor’s goals and objectives as defined in the solicitation, together with the role these play in structuring a competitive narrative that maps your expertise to the funding agency requirements. To create the narrative template, simply copy and paste, in detail, the RFP’s key sections, research objectives, and review criteria into a beginning draft narrative, typically under a proposal section entitled “Project Description.”

This allows the RFP to serve as an organizational template for the full proposal and a reference point to ensure that subsequent draft iterations of the narrative are continuously calibrated to the guidelines. A detailed narrative template is easily constructed in a few hours by a member of the research team, or an experienced grant writer assisting the PI on the proposal. It is then distributed electronically to everyone contributing to the effort and serves as a navigational compass to keep the proposal continuously on a true course towards success during proposal development meetings and during the writing of the narrative.

Create a Schedule and Task Assignment Table

A version of the narrative template will serve as a component of the Schedule and Task Assignment Table (see example STAT at end of this article), particularly since the section of the proposal typically entitled Project Description functions as the conceptual heart of the proposal. As you will see below, the STAT embeds that critical research narrative in a larger table that lists all information and related documentation requested by the sponsor, assigns a member of the proposal team responsibility for producing and tracking that information, and assigns an internal due date for completion of that task. Internal completion dates will occur well before all of the component pieces of the proposal are assembled into the final document for submittal on, or even better, a day prior to the due date. In the case of the research narrative and other key narrative sections, a series of draft due dates that allow the proposal to converge on excellence through multiple iterations and multiple reviews must be scheduled. Moreover, this production schedule for the narrative should incorporate a red team review. The first substantive outside review and competitive assessment of a large proposal should be made by a red team, not when the funding agency review panel makes the funding decision. The red team process may seem like a brutal and critical ordeal to some, but using a red team
willing and able to play the role of a surrogate review panel will prove an invaluable asset to the competitiveness of a large proposal.

The research description section is typically authored by the research team of principal investigators, along with contributing authors who may write specialized narrative sections, e.g., evaluation and assessment, commercialization, plan for meeting diversity objectives, research training for future faculty. A grant writer with disciplinary expertise in science or engineering and experience as a team member on large proposals will prove invaluable to the principal investigators in this regard. Even better, look for a grant writer who has gained expertise by serving on major research center proposals to NSF, NIH, and the mission agencies, such as DOE, DoD, NASA, USDA, NOAA.

In many ways, the production of a major center proposal is akin to competing in the Iditarod dog sled race, an often grueling event that can be helped enormously by a grant writer “who knows the trail” and can help the PI and coPIs anticipate potential pitfalls and find a way around them. In the end, a host of pitfalls can degrade the competitiveness of a proposal if not anticipated and corrected. A grant writer with experience on many center level proposals will likely have encountered most of the possible pitfalls and can help alert the research team to them. While those pitfalls may come as a surprise to some on the research team new to center development, they should not surprise a person who has served on the team of many center proposals directed to many agencies over many years and hence possesses a knowledge base or “corporate memory” of how best to achieve the significant competitive advantage that results from a well-planned proposal production effort.

Identify the Proposal Production Team

The core production team of principal investigators together with an experienced grant writer that first develops the narrative template will have to expand that team to produce the comprehensive Schedule and Task Assignment Table.

The first team members to be brought on board will likely include personnel from your office of research services or sponsored projects office. They will play a key role in producing the budget, budget justification, subawards, etc., and will carry out various process tasks, such as routing for institutional signatures. These tasks, and others, are key items in the STAT. While the capacities and roles of these offices vary by institution, most institutions will likely provide a core of proposal support services. Selected staff will need to join this planning process and the production team. Proposal support services staff need to become fully engaged early on in the process, and kept in the informational loop on development plans that impact their offices. Don’t surprise them with new requirements, if at all possible, and be mindful that uploading a major proposal is a major task that takes time. They should not pay the price for poorly planned and poorly scheduled proposals, hence the importance of the STAT. The STAT, for example, will incorporate the following: Will there be subawards or subcontracts? How many? To whom? Who are the institutional points of contact at those partner institutions responsible for the subaward budget, budget justification, institutional letters of commitment, current and pending support, CVs, etc., and who is listed in the STAT as the person responsible for tracking all this?

Research services offices or OSP staff often take on the task of converting the final proposal file to pdf, if required, and uploading it to the sponsor’s designated portal (e.g.,
Grants.gov, Fastlane), or does a hard copy might go in overnight delivery to the sponsor. The STAT must account for this “endgame” schedule in a way that can accommodate the unexpected, or other difficulties, in bringing together all the component sections of the entire document.

Finally, if your campus has an office tasked with research development and grant writing, take advantage of their expertise and experience on prior center proposals, including insights they gained in the review process or in site visit reviews by a funding agency. Sometimes knowing what went wrong on a prior proposal can be more valuable knowledge than knowing what went right.

More on Constructing the STAT

For large center proposals, many members of the production team will need to be assigned roles and responsibilities by name in the STAT, and many questions will need to be asked and answered regarding the team’s composition. For example, the STAT will address:

- Who is responsible for the first and subsequent drafts of the integrative sections of the project description section, e.g., executive summary, vision statement, rationale for the center, goals and objectives, research focus areas integration plan, benefits of the center, expected research synergies, etc.? [This is not a trivial task and lies at the heart of the competitive research proposal and STAT planning, and it is often nuanced given that your research description is not necessarily the same as a description of the significance of your research.]
- Are lead authors, perhaps coPIs, assigned for each of the research focus areas?
- Who will write the management plan?
- Who will write the five-year strategic plan?
- Does the research team need other support expertise?
- Who is best able to produce professional-quality milestone charts, graphics, illustrations, tables, and other visuals that complement the text and strengthen the overall positive impact the proposal must make on project managers and reviewers?
- Who will be responsible for reading or quickly reviewing all the documents cited by the sponsor in the solicitation, typically by URL, as having relevance to the program, e.g., agency strategic plans, national academy reports, agency reports and workshops, etc. [This is a critical role, since making competitive arguments for the significance of your research without being fully informed of the agency’s research vision, mission, and research investment agenda is often a fatal flaw in the proposal narrative.]
- How will internal references be cited in the proposal?
- Research centers, particularly from NSF and the federal mission agencies, almost always require an education and outreach component. Who will be the lead author of that section, and who will serve as contributing authors, e.g., for undergraduate research, postdoctoral mentoring, research experiences for teachers, etc.? Who are contributing authors from partner institutions? Who will be responsible for assessment and evaluation? Does the capacity for this exist in-house or will an external evaluator have to be included in the budget to write that section of the narrative?
If the proposal requires institutional data, e.g., STEM degrees granted in total and to women and minorities by academic department, who will take responsibility for gathering the data and putting it in the format specified in the solicitation? Who keeps the data? Are data kept by colleges and departments, or by an office of institutional research? Are the data accessible to queries that meet the sponsor requests? Who collects data from partner institutions and from whom?

Schedule Development Meetings
The entire proposal production team benefits when the proposal team holds a major development meeting once a week. Specifics of the agenda may vary, but the foundation of the meeting will consist of a review and discussion of progress made during the past week as it is calibrated to the Schedule and Task Assignment Table.

Keeper/Monitor of the Schedule and Task Assignment Table
A STAT is of little use if it is not used, monitored, and updated daily so that it can provide a current snapshot of the proposal production status. The responsibility for internal performance expectations related to assigned tasks and assigned schedules ultimately falls to the principal investigator, but it is wise to offload as much as possible of process and production tracking from the PI to an experienced assistant. It encourages efficiency and coordination to assign one person the task of tracking all STAT-specific activities, due dates, and status reports, along with informing the PI and the research team of the group’s progress, particularly if any difficulties arise that could potentially alter the proposal production schedule.

STAT: Identify Lead PI at Each Partner Institution
In addition to scheduling and tasking interaction among research services or sponsored projects offices to coordinate preaward process activities, particularly the budget, the STAT should identify a lead person at each partner institution to ensure that partner contributions are completed on time and reviewed for quality control, particularly for the narrative sections in the project description.

STAT: Identify the Keeper of the Proposal Master File
It is of enormous value to identify one person responsible for (a) continuously updating the evolving proposal draft of the project description, (b) keeping the most current version of the proposal file organized and identifiable by version number in the file name, and (3) inserting the date/time of each update as the first line on page one, so that an orderly process of continuous revisions can be achieved. This person assists the PI and supports the coPIs to ensure that narrative contributions, graphs, tables, illustrations, and other documentation in the proposal undergoing continuous revisions and improvements by contributing team members get inserted into the master file. This is not a simple task, but it is important to identify a person that can offload this task from the PI or coPIs so that they spend their time and energy on developing the research narrative critical to success.

This person needs to be highly skilled in manipulating large text files containing graphics (particularly graphic contributions in various formats), tables, and other visuals that may be embedded in the narrative. It is absolutely essential that this person be a skilled user of track-
edit and all its features, including document comparisons. Many disruptive formatting “gremlins” can sneak into a master file when multiple team members contribute to the proposal using different platforms (e.g., Windows, Macs, or even Linux or LaTeX) or various versions of Microsoft Office. On large proposals, these cross-platform format perturbations can amplify the stress level significantly of the person responsible for keeping one master document and reflecting that status in the STAT.

STAT: Establish Document Contribution Protocols

It encourages coordination and efficiency when the PI, coPIs and the person responsible for keeping the most current master document establish a few simple protocols that every contributor to the proposal narrative will be asked to follow. One important protocol involves agreeing on a process whereby track-edit contributions to the master document use an agreed-upon mechanism for accepting or rejecting changes. For example, it may be the PI who reviews, accepts, and/or rejects track-edit contributions before they are merged with the master document. In other cases, it may be the coPI leading a research focus area that serves as the gate to changes made to the master document. The specific process is not as important as a general agreement on establishing some process to bring order to what can quickly become a very chaotic procedure if left to happenstance. There is nothing as dispiriting as realizing at some point that two “master” documents may have evolved because of miscommunications or lack of a clearly understood protocol for reviewing and integrating narrative contributions into the master file.

An important part of the document contribution protocol is that everyone must understand and follow the sponsor’s formatting guidelines. The sponsor may specify margins and font size, but not font type. Define internal formatting standards early on in the process to make it easier on the person keeping the master file. Resist the urge to think a better proposal can be written were the font size were reduced and all white space expunged from the document.

STAT: Identify Institutional Support Required

Deans and vice presidents for research often seem less than charmed by requests for letters of institutional commitment, cost-sharing, or matching funds that are made on the morning of the day a proposal is due. These requirements need to be included in STAT and tracked, particularly to ensure that someone is responsible for drafting letters of commitment that represent actual commitments and not just institutional “best wishes.”

Example Schedule and Task Assignment Table, STAT for a Generic Research Center Proposal

<table>
<thead>
<tr>
<th>Activity</th>
<th>Person(s) Responsible</th>
<th>Completion Dates</th>
</tr>
</thead>
</table>
| Proposal Final and Complete for Uploading | Development Team Final Review  
coPI Final Review  
PI Final Review & Approval for Upload | ~36 hours prior to uploading as insurance against the unexpected |
### Project Description

#### Description of Center Research
- **Vision Statement**
- **Rationale for Center**
- **Goals and Objectives**
  - Research Focus Area 1
  - Research Focus Area 2
  - Research Focus Area 3
  - Research Focus Area 4
- **Evaluation Criteria for Research Plan**
- **Research Strategic Plan**
- **Research Integration Plan**
- **Expected Research Synergies**
- **Research Milestone Chart by Year/5 Years**
- **Research Dissemination Plan**
- **Benefits of Funded Research Center**

#### Description of Management Plan
- **Organizational Diagram**
- **Major Milestone Chart**
- **Role of Key Members of Management Team**
- **Describe External Advisory Committee**
- **Strategic Planning Protocols**
- **Ensuring Cross-Disciplinary Interactions**
- **Research Assessment and Evaluation Plans**
- **Sustainability Plan**

#### Education and Outreach
- **Goals and Objectives**
- **K-12 Engagement Plans**
- **Community College Transition Partnerships**
- **Undergraduate Research**
- **Graduate Training**
- **Course and Curriculum Development**
- **Web-Based Education and Outreach**
- **Workforce Development Plans**
- **Recruitment of Underrepresented Groups**
- **Tracking Student Progress**

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[Note to Project Summary Author: Your research description is not necessarily the same as a description of the significance of your research.]
| Evaluation and Assessment  |  
| Five-Year Degree Data for all Partners by Gender and Ethnicity  |  
| Five-Year Strategic Plan and Milestones  |  
| **Plan for Mentoring Postdocs**  | Draft 1:  
Draft 2:  
Red Team Review:  
Final:  
|  
| **Diversity Objectives**  | Draft 1:  
Draft 2:  
Red Team Review:  
Final:  
|  
| **Knowledge Transfer Objectives**  | Draft 1:  
Draft 2:  
Red Team Review:  
Final:  
|  
| - Publications  |  
| - Technology Transfer  |  
| - Commercialization  |  
| - Plan for Intellectual Property  |  
| - Industrial Collaborations  |  
| **Facilities and Equipment**  | Description of Institutional Infrastructure  
| **Budget, Budget Justification, and Subawards**  | Grants Office/OSP/RS  
| Budget  | Grants Office/OSP/RS  
| Budget Justification  | PI or coPI  
| Budget and Budget Justification for Subaward 1  |  
| Budget and Budget Justification for Subaward 2  |  
| **Other Documents and Appendices**  |  
| References Cited  |  
| Biographical Sketches of Key Personnel  |  
| Current and Pending Support  |  
| Institutional Letters of Support and Commitment  |  
| Table of Relevant Research Past Five Years  |  
| Table of Relevant Education and Outreach  |  
| Address Responsible Conduct of Research and Intellectual Property Rights  |  
| Appendices, Required and Allowed  |  

Don’t Let Your Proposal Wear a Disguise on Halloween

There are many scary costumes your proposal might wear on Halloween, but it is best to forego the annual disguising festivities, not just on Halloween but on any day of the year. Otherwise, you might inadvertently disguise the identity of the great research idea put forward in your proposal, resulting in more tricks than treats when it comes to the success of your grant. Of course, the premise here assumes that a fundable idea lies cloaked beneath a number of correctable grant writing mistakes identified sufficiently before the due date to allow for their correction. Unlike Halloween, when scary costumes earn treats, program officers and reviewers will not reward ideas cloaked in ghoulish disguises. This is a particularly important point to make to new faculty who may just be planning their research career at the time Halloween comes around. Research offices can assist them to make sure they don’t send off their first proposal to a funding agency wearing an inappropriate costume.

Unfortunately, a number of all too common scary costumes can so successfully disguise a potentially fundable idea that the significance of the idea becomes unrecognizable to reviewers. To avoid spooking reviewers, not just for proposals due this October 31, but every due date of the coming year, don’t submit your proposal cloaked or masked, or wearing one of the more common scary costumes guaranteed to horrify reviewers and program officers alike. There are many examples of all too common proposal disguises that will lead to a declined proposal, as detailed below. In this regard, keep in mind former Deputy Director of NIH William Raub’s comment: “There is no grantsmanship that will turn a bad idea into a good one, but there are many ways to disguise a good idea.” So don’t disguise your great ideas with the following masks, costumes, or disguises.

The Oblivious Mask Trio

Three common disguises worn by many proposals are The Oblivious Mask Trio, coming in three versions, but typically together, and unlike the movie ¡Three Amigos! with Steve Martin, Chevy Chase, and Martin Short, providing no amusement to reviewers whatsoever: (1) The Oblivious Mask for the Tentative Grasp of the Program Guidelines, (2) The Oblivious Mask for the Tenuous Grasp of the Review Criteria, and (3) The Oblivious Mask for the Feeble Grasp of the Agency Mission. A proposal wearing mask 1 may have several outcomes, none good. The most extreme of these is to find your proposal returned without review, but more often, it will just receive a poor review and be assigned a “do not fund” recommendation. Surprisingly, the failure of both new and more experienced investigators to carefully read and reread and follow the program solicitation guidelines is one of the more common causes of a negatively reviewed proposal. In some cases, it comes from the mistaken belief that an RFP need not be read carefully because research agencies always fund good ideas. This belief unfortunately abbreviates the more accurate statement that research agencies fund good ideas that advance the agency mission or research priorities in the specific ways defined in the solicitation guidelines. Good ideas untethered to the research realities of the funding agency
mission have little chance of success. A proposal wearing **mask 2** will clearly not be able to incorporate responses in the research narrative that address the review criteria in a convincing way. Wearing mask 2 is somewhat like attempting to play a competitive game without understanding what does or does not constitute points or a winning score. A proposal wearing **mask 3** will prevent you from writing a persuasive research narrative that convinces the agency that your research advances its mission in a significant way, either at the project or program level, or, in some cases, at the level of strategic research priorities, and brings value-added benefits to the agency mission or the field. Regardless, it is difficult to make a compelling case for the relevance and value-added benefits of your research to the agency mission or research priorities if you understand little or nothing about the mission, culture, and funding priorities of the agency itself, or about the role the agency plays in advancing national research priorities.

**The Wishful Thinking Mask: Blurred Distinction between Basic and Applied Research**

Too often in the search for research funding, the applicant makes an unrealistic assessment of whether the research proposed is truly fundamental research, e.g., to NSF, NIH, DOE, or DARPA, or amounts to applied research inappropriate for a basic research agency, or to basic research programs in mission agencies that fund both basic and applied. This critical distinction requires a very candid self-assessment prior to developing and writing a proposal to avoid the mistake of submitting an applied research proposal to a basic research agency. You must ask and answer the specific question: **“At this particular agency, will my research be characterized as basic or applied?”** Moreover, it can be a more challenging distinction to make on research solicitations that do not clearly spell out specific research objectives that assist the potential applicant in addressing key research questions or testable hypotheses. If you don’t know whether or not your research is appropriately basic for a specific agency, discuss it with a program officer or seek help from a senior colleague well funded at the agency, or experienced as one of its reviewers. **You need to get this distinction right.**

**The Comedy of Errors in Grammar, Usage, and Syntax Mask**

While mistaken identity, puns, and word play are charming in Shakespeare’s play *The Comedy of Errors*, reviewers will not find them amusing in a research narrative. Inadvertent or careless errors in grammar, usage, and syntax might momentarily bemuse reviewers, or worse, **provide them with comic relief.** They will also suggest to them that you are likely to tolerate errors in your research. Moreover, it is not the job of reviewers to reconstruct your true meaning out of a linguistic jumble of poorly structured sentences, jarring and disorderly syntax, and related grammatical errors. If it is possible for a proposal phoenix to rise out of the linguistic ashes of a poorly written research narrative, it will be as a consequence of the author’s recognition and correction of such problems. Authors can learn to recognize such writing errors themselves or they can seek the services of a colleague, research development professional, or editor who can help them **make the proposal professionally presentable, i.e., free of errors.** While reviewers are not likely grammarians, they are likely successful authors of funded proposals, hence good writers, and the gold standard for successful proposals is nothing short of perfection, or as close to it as possible.

**The Poor Writing Disguise**
Poorly written proposals appear shrouded in a fog that introduces ambiguity and hence uncertainty into the reviewers’ understanding and evaluation of the project research description. Ambiguity in grant writing is always punished! Poor writing robs the research narrative of clarity, precision, and the persuasiveness needed to convince reviewers to recommend funding. A narrative fog leaves the reviewers unable to see where the narrative argument is going or where it has been. Poor writing offers readers a meandering journey through a blurred landscape without clear waypoints or clear substance, significance, or focus. As H.L. Menken once observed, badly written sentences appear “like an army of words marching across the page in search of an idea.”

The Cloak of Ambiguity

Cloaking devices worked well when first introduced on the Klingon Bird of Prey, but they are definitely not for use in a research narrative. The cloak of ambiguity will unfortunately obscure the purpose and methods of an otherwise potentially powerful proposal. Ambiguity in the research narrative looms like a dense fog. Reviewers and program officers alike will balk at having to navigate a research narrative befogged by poor or careless writing or both, or by an author’s inability or unwillingness to make the key narrative distinctions that would clarify the research vision, goals, objectives, rationale, and outcomes. Ambiguity in the narrative imposes upon reviewers and program officers in many ways, particularly in asking them to decide what the author actually meant. Most reviewers will not have the time, inclination, or patience for this task, and rightfully so, given that it would be difficult to recommend for funding an idea shrouded in ambiguity. Ambiguity in the narrative implies there is ambiguity in the research goals themselves, as well as in how the goals will be achieved. Agencies want to know clearly what they are funding and do not want to guess at it.

The Boiler Plate Costume

Truly frightening proposals emerge when authors view them as nothing more than generic boilerplate text easily transplanted from an old proposal to a new one with a few minor adjustments. Moreover, there is no more horrifying boiler plate than narrative text gathered from the websites of research team members, an astonishingly common practice. Attempts to find “spare parts for proposals” salvaged from prior efforts that now populate the “grant writing cloud” and other so-called “proposal databases” are ill advised (See Do Not Build Your Proposal Out of Spare Parts, October 2011).

A successful proposal grows from the seed of a compelling and exciting new research idea. Recycling is great for environmental sustainability but it has no place in grant writing! Every required proposal component that evolves from your new idea must do so in an internally integrated manner that adds a logical synthesis, and hence strength, to the core research idea. Attempts to transplant a modified research narrative from an existing proposal into a new proposal will significantly weaken the overall proposal (see NSF’s Perp Walk for Plagiarism in the June 2015 issue). Writing a successful project narrative requires many thoughtful iterations of each proposal section that reveal to the reader the relational symmetry of one section to another. The well-written and convincing research narrative must clearly evolve to reflect and serve the needs of your specific research vision and the performance metrics required for your success. Using so-called boiler plate text in a research narrative will
likely elicit the same response in reviewers as attempting to pass counterfeit $100 bills to a Secret Service agent.

So it is important to beware the notion that a new proposal can be a largely borrowed or heavily modeled statement based upon other proposals, or a tattered template shared “in the grant writing cloud.” *There are not enough immunosuppressant grant-writing techniques available to disguise such “borrowing” from the astute reviewer,* particularly given that the good program officer and reviewer will function as the immune system of a proposal under consideration. If they detect a transplanted research narrative, they should, and most likely will, reject it.

The Mystery Novel Disguise

Many reviewers may in fact enjoy relaxing with a glass of wine and a well-crafted mystery novel, but it is best to leave the crafting of mystery novels to the practitioners of that genre. It is not a good idea to model your proposal after a mystery novel. Asking reviewers and program officers to play the role of “research detective” charged not with determining “who done it?” but with determining “what research is being proposed here?” will likely come to no good end. Reviewers will not be charmed by a proposal forcing them to play the role of, say, Tony Hillerman’s Lieutenant Joe Leaphorn or Walter Mosley’s Easy Rawlins in order to determine what research you are going to do and why it is significant to the funding agency mission and the disciplinary field. So-called “page turners” are a good thing for the success of a mystery novel but not for the success of a proposal. If reviewers must frantically turn pages to figure out what you propose to do, they will become quickly exasperated rather than intrigued at having to guess at what proposed research might be finally revealed at the end. Get right down to the point in your first paragraph.

The Research Topic 101 Mask

Just as proposals are not mystery novels, neither are they journal articles or textbooks. While a discussion of the research topic’s background may be warranted to set the stage for the reviewers to understand the significance and context of your research, avoid the mask of writing a long and meandering narrative tour of the general research topic better suited to an introductory textbook 101 on the topic than to technical reviewers. The background information on the topic must be carefully adjusted to the level of topic expertise the reviewers bring to the review process. For this reason, it is important to understand the review process used by specific funding agencies, particularly how reviewers are selected and assigned. For example, NSF recommends describing the technical topic at a level that might be used in a *Scientific American* article, or for what NSF has described as the “scientifically literate” reader. Moreover, keep the background discussion tightly focused on what is relevant to your proposed research and avoid the temptation to go beyond that. While time intervals may be central to your research, you need not provide background information on the ammonia maser built in 1949 by NIST as the first proof of an atomic clock.

At many points in the development and writing of a proposal only a preliminary idea exists of what will be proposed. In those situations, it is comforting to begin writing text in hopes that this will “self-ignite” and coalesce into a compelling narrative. Unfortunately, however, this can lead to developing several pages of an overly general introductory narrative
unable succinctly to inform the reviewers how your research advances the field in some significant way. Moreover, once written, some authors have great difficulty deleting large blocks of text that have lost their relevance to the research narrative as it has matured through multiple drafts. This becomes a particular danger on single-PI proposals without the benefit of a reading by multiple team members. In either case, a thorough “editorial scrub” of the research narrative by an unsentimental editor can help keep the narrative from becoming a “long and winding road,” something fine in a Beatles song but not in a proposal.

The Black Hole Disguise

A narrative black hole exists when an author becomes convinced that the page limit and font format guidelines in the solicitation are insufficient to explain the proposed idea. This becomes apparent when an author comes to the dubious conclusion that a proposal narrative improves as the font is reduced to the smallest permissible size and all white space is squeezed out of every page to allow more elaboration. In some cases, narrative authors may even try an end run around the font size requirements by placing what is essentially narrative text in graphs, figures, illustrations and tables where smaller fonts are often permissible. Unfortunately, the text eventually becomes so dense that the narrative collapses upon itself and becomes impenetrable to the reviewer. In effect, a too-dense narrative text becomes a laborious read for the reviewers, who will likely balk at the idea of a forced march through dense text imposed on them by an author either unable or unwilling to write a clear and readable research narrative. As Mark Twain once commented in a letter to a friend, “If I had more time I would have written you a shorter letter.” This makes an excellent point. Increasing the density of text and format to the maximum permissible in hopes of including more information that gives your research narrative a competitive advantage is the iron pyrite or “fool’s gold” of grant writing. The goal of a research narrative is to communicate the significance of your research to reviewers, not merely to perform an informational data dump.

The Stove-Pipe Disguise

A proposal narrative disguised as a series of research silos is certain to leave reviewers confused as to the research value lying beneath the stove-pipe costume. Narrative contributions from multiple authors increase the complexity of proposals. Attempts to introduce what are essentially research strangers as research partners with a history of collaboration only after a funding opportunity is identified will be a hard sell to reviewers. Research integration and programmatic synthesis are two key characteristics of competitive proposals. Strategies to ensure the integration of multiple research strands, as well as any other required programmatic components, must begin very early in the proposal process (see Planning for Narrative Synergy in this issue). If a research narrative with multiple strands develops over several draft iterations and still remains more like multiple proposals rather than an integrated whole, then it becomes increasingly difficult to correct the narrative without major revisions. Proposals with multiple research and/or educational strands gain significant advantage by adopting early on a proposal narrative integration plan that will demonstrate a clear research synergy. Solipsistic narrative sections are not rewarded in the review process. Synergy is the Yellow Brick Road of the successful research narrative. Think synergy not silos!
The Recycled Proposal Mask

Recycling discarded, broken, failed, or unused items is great for the environment but not so good for declined proposals. Like most recycled materials, old proposals are best left at curbside to be removed for chemical or mechanical processing, or more specifically in the case of a research narrative, substantive rethinking. Unlike the Phoenix, a mythical sacred firebird, a declined proposal rarely will have the ability to be reborn from its own ashes. A recycled proposal submitted in an attempt to do so will be quickly “unmasked” by program officers and reviewers for the truth that lies beneath it—a PI unwilling, unable, or too disorganized to rethink and restructure a research narrative in a way that remolds it into an essentially new proposal. This is not an easy task, but it is a necessary one. Proposals have a very specific home within a very specific time frame, not a generic home within an open-ended time frame.

Shopping declined proposals around to multiple agencies is something akin to (pick your analogy) a snipe hunt, wild goose chase, or fool’s errand. Proposals are not fungible across agencies, within agencies, or even within programmatic areas within agencies, nor are proposals fungible over time. All proposals enjoy fifteen minutes of fame, as Marshall McLuhan might have observed, during the period when reviewers are making the decision to recommend or not recommend funding. However, when a proposal is declined, a resubmit is many months if not a year away in most cases. It is time to begin anew given that a declined proposal, while perhaps not a lemon, certainly had some serious problems that needed fixing. Don’t try to pass it off “as is” like a used car with mechanical or electrical problems to some other unsuspecting buyer, i.e., some other funding agency.

The Silo Disguise

When an invitation to a “proposal party” arrives in the form of a solicitation wherein research and/or education integration is explicitly addressed as a key factor in the evaluation of the proposal, or research integration across multiple disciplines is implicit in the research objectives and outcomes of interest to the sponsor, don’t show up disguised as research silos or stovepipes. One common and often fatal mistake in writing a proposal that must demonstrate synergy and value-added benefits to multiple research strands is to compose the narrative sections as separate research articles loosely addressing a common research theme without close coordination or integration among principal investigators.

Given the dramatic increase in research funding over the past several years to support research that explores and illuminates the boundaries, interstices, and intersections of multidisciplinary environments in search of new discoveries, it is critical for successful authors to both recognize and avoid siloed sections and learn the more difficult skill of writing integrated research narratives. If the multiple authors of the multiple research sections of a transdisciplinary proposal cannot demonstrate and clearly describe how the intersections of “disciplinary catalysts” accelerate the research discovery process in the research narrative, then programs officers and reviewers will be unlikely to fund the proposal, trusting that the required research integration might magically happen in practice.

The “Trust Me” Mask

The “trust me” mask is typically worn by a very vague proposal narrative containing a lot of reminiscence of past accomplishments and accompanied by long descriptive narrative
sections that read like a textbook, but with only a fuzzy hypothesis and few specifics about what is actually being proposed and its significance. The subtext of the “trust me” proposal is “just give me the money and great research will happen.” It often reads like a daisy chain of effusive superlatives, but lacks any grounding in specificity and detail. Reading a “trust me” proposal will put you in mind, here again, of H. L. Mencken’s comment about “an army of words marching across the page in search of an idea.” In other instances, the “trust me” proposal may present a grandiose idea embellished with vague claims of significance. Ultimately, however, the “trust me” proposal, to quote Macbeth’s famous soliloquy, “is a tale told by an idiot, full of sound and fury, signifying nothing.” The “trust me” proposal is the research equivalent of a politician promising “free beer and wide roads.” It is simply not believable.

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

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

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

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

The All Hat and No Cattle Disguise

Putting forth grandiose ideas grounded on generalities rather than specifics is a fairly common failing of many proposals. Grand visions, overly ambitious plans, and unfocused ideas cobbled to unbridled enthusiasm will not impress reviewers. While effusive epiphanies may have their place on your back deck with a bottle of wine at sunset, they are most often, thankfully, ephemeral, and should not find their way into a proposal narrative.

The No-Value-Added Mask

While economists have long argued the merits of a value-added tax (VAT), there is no such debate over the importance of describing the value-added benefits of your research when it comes to writing a successful proposal (see *Make Your Case for Value-Added Benefits* in the August 15 2015 issue). Describing the value-added benefits of your research—to an agency mission, to a scientific field, and in response to the program objectives defined in a solicitation—is a fundamental requirement for competitiveness across all agencies and foundations, regardless of your academic discipline. Surprisingly, such a description is often overlooked or stated unclearly in the project description on many proposals.

Sometimes PIs neglect such a description because they simply have not thought sufficiently about how the proposed research fits into the overall context of an agency’s mission priorities, or considered how the proposed research meets the overall goals and objectives of a specific solicitation. At other times, unfortunately, the PI may be proposing
Research that does not offer sufficient value-added benefits to warrant funding. Funding agencies support research that advances the disciplinary field in some clear and significant way, or advances the agency’s mission-critical objectives in a clear way and significant way.

The key words here linked to value-added benefits are “clear,” “significant” and “advances.” The benefits that need to be described in the project narrative represent a “unit of change” that advances the current state of knowledge in a field or discipline and moves it forward in some significant way. The intertwining of value-added benefits and significance needs to be described clearly and succinctly in any research narrative if you hope to capture the interest of program officers and reviewers.

Moreover, the exact nature of the value-added benefits your research offers the funding agency is not a trivial consideration. To address it in the most compelling way requires an understanding of the agency mission objectives at multiple scales—from the level of the agency to a specific solicitation. It also needs your keen assessment of how well your research maps to the agency mission objectives and how it does so in the context of the current state of knowledge in the field. Your ability to capture these multiple contexts and weave a compelling narrative statement describing how your proposed research brings value-added benefits to the funding agency will be a key factor in the success of your proposal.

The Overly Ambitious Disguise

While it is common during presidential election years to hear politicians promise the equivalent of “free beer and wide roads” on every conceivable political topic of potential interest to voters, it is not a good strategy when it comes to crafting a research narrative that you hope will impress program officers and reviewers sufficiently for them to recommend funding. They are a critical audience with sufficient experience to distinguish between what you hope to do and what you can realistically accomplish given the constraints on your time, resources, and expertise.

The overly ambitious project description is a fairly common reason for denying funding to proposals, particularly those submitted by more junior investigators whose earnest enthusiasm may charm reviewers but finally requires them to recommend against funding, with perhaps the suggestion to resubmit a more realistic proposal in the next grant cycle. The education and outreach component of an NSF CAREER proposal, for example, often tempts new investigators to overreach, while others may overreach in the proposal research plan.

In any proposal, however, getting this balance right is critical. If you submit a proposal in which the research narrative seems to suffer from inflationary promises that are out of balance with your budget, current and pending support, resources, expertise, and teaching obligations, among other constraints, you will likely not be funded. Be realistic in what you can and cannot accomplish within the constraints that set your operational boundaries, and then reflect that in your project narrative. Reviewers don’t fund promises; they fund promises they are convinced can be kept.

The Solipsist Disguise

While solipsism is largely dismissed as a frivolous philosophical notion best left to late night discussions in bars bordering college campuses, it does, nonetheless, occasionally manifest itself in proposal narratives. Like its philosophical counterpart, the solipsistic project
description is self-absorbed and apparently oblivious to the external reality of an audience, i.e., program officers and reviewers, that will pass judgment on the proposal.

The PIs of self-absorbed project narratives typically make several fatal mistakes, all in some way related to an inability to place their ideas in the proper context, specifically, advancing the research and mission-critical objectives of the funding agency. These narrative flaws include ignoring or attempting to circumvent the mission objectives of the sponsoring agency in the mistaken belief that the PI’s ideas are so important they should be funded whether or not they respond to the agency’s research requirements; ignoring or appearing to be unaware or indifferent to the fact that successful project narratives are written with an audience in mind—program officers and reviewers, who must be convinced of the significance and value-added benefits to funding the proposed research; and ignoring the need to write a research narrative that is easily read, responsive to the specifics of the solicitation, and accessible to program officers and reviewers in making their funding decision. The bottom line here is that funding agencies are not interested in funding promotional “self portraits” of ideas only marginally relevant to the agency mission objectives.

The Slogan Mask

Passing slogans off as ideas may be sufficient for those running for political office, but it is a really bad idea for those writing a proposal. **Slogans are not ideas.** In writing a project description, particularly for certain types of institutional grants where research and educational objectives are intertwined, such as at NSF, or where institutional transformation of some kind is the desired outcome, such as ADVANCE, project narratives often over rely on slogans or too heavily echo an agency phrases picked up from reports, presentations, and conferences.

While it is important to have a common language to describe common programmatic elements, that common language must be used judiciously and, most importantly, be grounded in the specific context of the institutional objectives that motivate the proposal. Making the claim, for example, that your research is transformational or your proposal integrates research and education in innovative ways amounts only to a slogan without substantive programmatic descriptions in the project narrative that outline the specifics and details to support such a claim. Some authors of what are often institutional proposals of one sort of another, as those mentioned above, or authors of educational components required of research proposals such as the NSF CAREER, make the mistake of sprinkling the narrative with key words and phrases used by the agency in multiple solicitations, reports, and presentations. This seems to be done under the mistaken belief that echoing the language used in agency vision statements can substitute for the hard work of grounding an agency’s overarching vision or goals in the unique context of the particular institution or research or educational program.

While echoing back an agency’s language or phrasing is important to demonstrate that you understand and are familiar with the agency’s mission objectives as well as the specific solicitation to which you are responding, the real work, as is always the case in proposal writing, comes when you must move from the general vision to the specific program that will allow that vision to be achieved within your unique institutional context.

So slogans, terms, and phrases adopted by an agency to describe their overarching vision, such as the NSF terms *innovative, transformational, research and education integration,* and numerous others, lack substantive meaning until you define them with the specific details
of your research and/or educational objectives within your unique institutional or programmatic context. Until you perform that hard work, these terms are nothing more than agency vision slogans without substance. Throwing them back at program officers and reviewers without the specificity and detail that gives them substantive meaning will bring no value-added benefit to the agency and no reason to fund your proposal.

The “Why Should I Bother to Write a Budget Justification” Mask

It is wise to treat the budget justification section of the proposal as an opportunity to write a more competitive proposal rather than as an inconvenient boilerplate disconnected from the project description. Whether through inattention or disregard, a poorly written description of the budget justification unlinked to the research narrative risks missing an opportunity to give additional detail and specificity about the operational and management structure of the project, or other factors unique to your proposal.

At the core of a successful proposal must lie a good idea that reviewers judge to be significant, compelling, and meritorious for funding. But it is also the case that your success will depend upon convincing program officers and reviewers that you have the operational and management expertise to manage a research award wisely and successfully over several years or longer, particularly a major award that may involve multiple researchers, post docs, and graduate students, along with other possible program components aligned with the research objectives.

A funded award, after all, represents a major, strategic investment by a research agency in your capacity to perform. Of course, your case for funding is made in the project description in various sections, including in the management and operations sections. However, the budget justification section allows you additional space to explain the budget request at a level of detail that space constraints in the project description may prohibit. In this respect, the budget justification section serves as a functional bridge between the project narrative and the raw budget numbers. It is a place where narrative text and budget numbers may be joined to give reviewers a clearer and deeper understanding of the operational logic of your proposed research and how it will be accomplished using the sponsor’s money.

While the format and content of the budget justification section will vary by agency, and often by program and program size within an agency, it is an another important factor in the success of your proposal (if it is a specified component of the solicitation) and, as such, should be approached by the proposal writing team to ensure that it will serve as an illuminating complement to the project description. After all, successful proposals are the sum of an accumulation of marginal advantages, as economists might describe it, whereby every required component of a proposal is brought as close to perfection as possible, recognizing that the aggregate of these factors cumulatively determines the outcome. Failing to give the budget justification section of a proposal the attention it deserves squanders an opportunity to gain further competitive advantage and hence a funded proposal.

The Freddy Krueger Mask

In the seemingly endless series of Freddy Krueger movies beginning with *Nightmare on Elm Street*, the victims all have recurring nightmares and die in their sleep. Program officers and reviewers might also welcome this fate when the “Freddy Krueger Proposal” is submitted
to their agency for review with every indication that it has come to them by a circuitous route of prior serial rejections by other research agencies. Some of the most egregious examples of horror stories recounted by program officers and reviewers include having to read proposals containing obvious artifacts of prior submittals, such as instances in which a project timeline or most of the research narrative has been clearly copied and pasted into the current proposal from a prior proposal, occasionally so hurriedly as to incorrectly identify the agency to which the “perennial proposal” is currently being submitted.

But even if the most obvious tell-tale signs of a recycled proposal are deleted from the most current resurrection, most reviewers and other readers will quickly recognize other “crime scene” evidence indicating that the proposal’s author is attempting the grant-writing equivalent of “speed dating” funding agencies, perhaps using the same logic that people use in buying lottery tickets. It is fairly easy to recognize when a proposal does not respond to the specific solicitation to which it is being submitted, perhaps because the authors assume such a greatness in the proposed ideas that program officers and reviewers will not care, or eagerly overlook, the fact they are not relevant to the agency mission priorities. Or perhaps authors of recycled proposals assume that all research funding agencies and their programs are fungible, and so a proposal submitted in the past to one of the defense agencies can be tweaked a bit and submitted for an NSF CAREER award.

Unfortunately, the Freddy Krueger Mask is scalable, as the PI’s of large research proposals have likely learned. PI’s should take note, if not actually horrified, when a potential research team member provides an “off the shelf” narrative contribution that has likely been inserted in many past efforts.

The Achilles Heel of recycled proposals is that they ignore the basics of successful grant writing; specifically, they forget that competitive proposals must contain competitive ideas that respond clearly to the funding agency’s mission priorities or other research objectives defined in the solicitation. Recycled proposals are destined for rejection. Before trying to recycle an old proposal for a new program, it would be wise to heed U.S. House Speaker Sam Rayburn’s observation that “there is no education in the second kick of the mule.” A recycled proposal is most likely to have suffered a series of “mule kicks” by reviewers in the past, and this should be taken to heart for future efforts.

Bottom line: if you are proposing new research ideas, express the significance of those new ideas, and all topic components of them, in newly-crafted writing for every word of the proposal narrative. Success in proposal writing will not be achieved using recycled parts—successful proposals are not renovations of the past but a creation for the future, together with the compelling arguments you make for the place and significance of your research ideas in that future.

The “I am a Researcher not a Wordsmith” Mask

Mark Twain once stated that he never trusted a person who could only spell a word one way. Unfortunately, Mark Twain will not be reviewing your proposal, but rather program officers and reviewers who may not be amused by errors in spelling, grammar, and punctuation, and the resultant ambiguities they create. When it comes to the mechanics of writing a research proposal, it is prudent to assume a level of perfection in grammar, spelling,
and usage equivalent to that of writing a computer program with zero tolerance for coding errors.

While one or perhaps two errors in a major proposal may be tolerated by reviewers, or escape notice, anything more than that will likely draw attention, and not of a positive kind. Reviewers will likely assume, and justifiably so, that sloppy errors in language and usage will translate into sloppy errors in research. Unfortunately, there is no equivalent concept in grant writing to the “Navaho rug flaw,” whereby a purposeful imperfection is woven into a wool rug or blanket to allow evil spirits the opportunity to exit the design.

The last comment you want to read in your reviews is that the proposal was poorly written and contained numerous typos, or was in need of wordsmithing. Reviewers will occasionally comment on how well the research narrative was written, or how poorly it was written. But reviewers rarely recommend funding for poorly written proposals. Fortunately, errors of grammar, usage, and spelling are correctable by taking the time to closely proofread your narrative, or, better yet, by getting a fresh set of eyes on the proposal by an experienced editor.

The Unbalanced Disguise

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

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

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

However, while a narrative template that outlines the required sections and subsections of any specific project description can reduce imbalance, it does not entirely prevent errors in assigning the weight given to particular sections of the proposal, even in cases where a well-crafted template imposes pages limits on sections, or where the solicitation itself imposes page limits on sections. Often, segments receiving the least space in a first draft may emerge as the core sections of the proposal narrative that are not only the most important but also the most challenging to write. These sections tend to relate to the research vision, synergy among project objectives, and the like, which lie at the core of the competitive submittal.
Balance, proportion, and emphasis in the project description need to be continuously monitored during the writing and internal review process with each thoughtful iteration of the narrative. It is not unusual that initial proposal drafts develop a significant amount of imbalance. This needn’t hamper the proposal’s success as long as the authors recognize that each subsequent draft of the proposal requires a new rebalancing to account for the revised text.

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

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

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

The “I Really Need this Grant” Mask

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

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

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

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

Helping potential applicants clearly understand the distinction between need- and merit-based agencies or solicitations as early in the proposal development process as possible can save a significant amount of time and resources, not only for those writing the proposals but also for those who must advise, process, or submit those proposals.
NIH Shares Videos To Inform and Educate
YouTube isn’t just for funny cat videos. While that may go without saying, you might not be aware many NIH institutes, including NIAID, use the popular website to share videos to educate and inform viewers. For instance, we broadcast seminars, conferences, Advisory Council meetings, and other news events to keep our audience up to date, wherever they are and whenever they want to watch.

Here are some useful video resources from both NIH and NIAID:

- **NIH Grants YouTube Channel (link is external)** — Find short videos explaining the policies and procedures surrounding NIH grant application, review, and management processes.
- **NIH Videocasting YouTube Channel (link is external)** — Learn about the latest biomedical and health-related research. The channel broadcasts NIH Director’s Wednesday Afternoon Lectures and Director’s Seminars as well as different topic talks of Demystifying Medicine.
- **NIH Center for Scientific Review YouTube Channel (link is external)** — Get advice ahead of your next application to ensure success during peer review, including the series 8 Ways to Successfully Navigate NIH Peer Review.
- **NIH Office of the Director YouTube Channel (link is external)** — Watch interviews and coverage related to NIH-wide priorities and initiatives.
- **National Library of Medicine YouTube Channel (link is external)** — View training videos for PubMed (link is external) users, as well as archived footage relevant to scientific research.
- **NIAID YouTube Channel (link is external)** — See videos covering the research that NIAID supports, including scientific advances, disease information, clinical studies, and educational webinars.
- **NIH Videocasting and Podcasting (link is external)** — Watch council and committee meetings, including NIAID’s Advisory Council and NIH’s Advisory Committee to the Director.
- **Dr. Anthony Fauci in the News** — Find an index of presentations and media appearances from NIAID’s director.

How To Demonstrate Scientific Progress in NIH Annual Reports
Most research projects do not move along in a linear fashion, steadily progressing until inevitably reaching a scientific breakthrough. So how do you describe scientific progress in your annual Research Performance Progress Report (RPPR) (link is external) to demonstrate success and merit while the project is still ramping up?

What Program Officers Look For
A good first step is to know what your program officer is looking for. Program officers assess:

- Is progress satisfactory?
- Is there a change in the scope, goals, or objectives of the project?
- Is there a change in key personnel?
- Is there evidence of scientific overlap?
- Are there human subject issues or concerns?
- Are there animal welfare issues or concerns?
- Are there changes in the use of biohazards or select agents?
- Are there new or additional foreign components?
- If the award requires inclusion monitoring, is the enrollment date appropriate, on target, and updated in the Inclusion Management System?
- Were any products (link is external) reported, such as publications, websites, technologies, inventions, or reagents?
- Is there compliance with sharing policies?
- If the award has special reporting requirements, was the information provided and acceptable?
- Is there an unobligated balance greater than 25 percent? Is the justification acceptable?
- Are there other issues that require action or documentation that must be resolved before issuing an award?

As you can see, many of these questions concern whether the project has changed since the award was made or when progress was previously reported. Therefore, detail any changes to your Research Plan in the RPPR. Keep in mind, you need our prior approval before making Changes to Project or Budget; do so by following the process laid out in our Prior Approvals for Post-Award Grant Actions SOP. If you requested approval before submitting the RPPR, refer to the previous correspondence.

List any changes in approach and reasons for the change. Describe any problems or delays and what actions you took or plan to take to resolve them. If there is an unobligated balance greater than 25 percent, provide a justification and be prepared to make a carryover request.

Your program officer will assess the progress, delays, and planned next steps you describe and compare that to your budget request and justification for approval. Providing sufficient information in the progress report avoids delays in your award. Program officers will also verify compliance with sharing requirements (link is external), e.g., model organisms, public access policy, genomic data sharing; ClinicalTrials.gov registration and results reporting; and other policies for research with vertebrate animals, human subjects, biohazards, select agents, and foreign involvement.

Above all, program officers directly consider whether progress is satisfactory.

Completing the RPPR

Grantees can demonstrate progress when completing Section B—Accomplishments of the RPPR (see section 6.2 of the NIH and Other PHS Agency RPPR Instruction Guide (link is external)). List publications and other products in Section C—Products (see section 6.3 of the NIH and Other PHS Agency RPPR Instruction Guide).

First, you list the scientific goals of the project (for NIH these are your Specific Aims) and whether they have changed. Then list your accomplishments:

For this reporting period describe: 1) major activities, 2) specific objectives, 3) significant results, including major findings, developments, or conclusions (both positive and negative), and 4) key outcomes or other achievements. Include a discussion of stated goals not met.
When your project is in its initial stages, this section will focus more on the activities you undertake, e.g., enrolling study participants, preparing reagents, or testing compounds *in vitro* before conducting animal studies. In future reports, the focus will shift to results and findings, e.g., showing whether variance among study interventions was statistically significant. Include data, graphs, and images to support your accomplishments section rather than relying solely on bullet-point text.

Remember, too, that NIH is placing increased emphasis on rigor and transparency, so you also need to describe how your research ensures reproducibility.

When you complete your annual RPPR, you should also address any special reporting requirements or deadlines listed in your Notice of Award. Many solicited grants include benchmarks or go/no-go criteria that must be met before NIAID will fund an award’s next budget period. Look at your latest Notice of Award in the [eRA Commons (link is external)](https://eracommons.org) to find any special reporting requirements.

**In Conclusion**

Take the reporting of scientific progress seriously, including any pitfalls and ways you plan to overcome them. Doing so will help keep your research on track and lay the groundwork for a future renewal application. And in some circumstances your program officer can work with you to overcome some of the obstacles.

For additional help and resources, refer to NIAID’s [Research Performance Progress Report (RPPR) SOP](https://eracommons.org).
The Center for Advancement of Informal Science Education (CAISE)
In September of 2016, CAISE received a new 5-year award from NSF to explore opportunities for synergy among those who conduct and/or study informal STEM learning and science communication and public engagement activities. CAISE will provide forums and spaces for these communities to come together to address the common challenges of sustaining connections between practice and research, building understanding of and capacity for evaluation and measurement and broadening participation of underrepresented groups in STEM. By catalyzing mutual learning and sharing moments and structures, CAISE hopes to build new and strengthen existing connections between professionals and the growing bodies of knowledge in these fields. CAISE will coordinate these efforts with the work of the National Informal STEM Education Network (NISE Net), the AAAS Center for Public Engagement with Science and Technology, National Alliance for Broader Impacts (NABI), the Arizona State University (ASU) Center for Engagement & Training in Science & Society, the Research + Practice Collaboratory and others as appropriate.

Popular CAISE Resources: All documentation and products of CAISE’s work can be found on the InformalScience.org website, a curated repository of project descriptions, evaluation reports, research, and grey literature related to informal STEM learning. Some of CAISE’s most accessed resources include Inquiry Group white papers on Public Engagements with Science, Public Participation in Scientific Research (Citizen Science, e.g.), Collaborations Between Informal Science Education and Schools and the Informal STEM Education: Resources for Outreach, Engagement and Broader Impacts report written in 2016 for STEM researchers. Other CAISE products include the Principal Investigator’s Guide to Managing Evaluation in Informal STEM Education Projects, and summary papers from convenings on evaluation capacity building, shared/common measures and assessments, practice and research and the National Science Foundation Inclusion Across the Nation of Community of Learners of Underrepresented Discoverers in Engineering and Science (INCLUDES) initiative. Information about and materials from all CAISE convenings can be found here.

CIRCL (Center for Innovative Research on CyberLearning)

STELAR (STEM Learning and Research Center)

MSPnet (Math and Science Partnership Network), serving the Math Science Partnership and STEM + Computer Science programs

CADRE (Community for Advancing Discovery Research in Education)

CS for All Teachers (Computer Science for All Teachers)

Evaluate, funded by the NSF Advanced Technological Education program
US Department of Education Grant Information Links

- **G5** - The Department of Education's Grants Management system. G5 replaces the former e-Grants, Grant Administration and Payment systems. G5 is available to applicants, grantees, payees as well as internal Education staff.

- **Guide to U.S. Department of Education Programs and Resources** - A guide to our programs: descriptions, eligibility information, contact numbers for more info about applying, and more.

- **Federal Student Aid** - Information about our FSA grant and loan programs, including the Free Application for Federal Student Aid (FAFSA).

- **Grants Forecast** - Information and projected deadlines on new discretionary grant competitions. The online Grants Forecast will be updated periodically. *Note: This notice is advisory only and is not an official application notice of the Department of Education.*

- **Grant Application Announcements** - Grant program announcements requesting applications and other announcements in the Federal Register. Link to other ED Federal Register documents.

- **ED Electronic Grant Initiatives** - The Department is using electronic submission systems with selected programs. The e-Grants portal provides access to several sites: e-Application (Electronic Grant Application System), e-Reports (Electronic Grant Performance Reporting System), e-Reader (Electronic Peer Review System).

- **Protection of Human Subjects in Research** - Information for grant applicants, contract offerers, and researchers on the Department's Regulations for the Protection of Human Subjects, 34 CFR 97.

- **Grantmaking at ED, Answers to Your Questions About the Discretionary Grants Process** - An overview of the discretionary grants process for new and experienced grant seekers (formerly “What Should I Know about ED Grants”).

- **Other Resources** - Links to other grant, student financial assistance, and contract resources.
DCL NSF: Announcing Realignment of the Civil Infrastructure Systems (CIS) Program
The Division of Civil, Mechanical and Manufacturing Innovation (CMMI), within the National Science Foundation’s Directorate for Engineering, announces a realigned focus for the Civil Infrastructure Systems (CIS) program. The re-aligned Civil Infrastructure Systems (CIS) program focuses on fundamental and innovative research in the design, operation and management of civil infrastructure that contributes to creating smart, sustainable and resilient communities at local, national and international scales. This program emphasizes civil infrastructure as a system in which interactions between spatially and functionally distributed components and inter-system connections exist. This DCL highlights three important program changes as described below.

NEW PROGRAM HIGHLIGHTS:

- All critical civil infrastructure systems are of interest, including transportation, power, water, pipelines and others. The program requires that investigators clearly articulate the basic and fundamental contribution that will be generated.
- The program particularly welcomes potentially disruptive ideas that will open new frontiers and transform relevant research communities. Topics of interest include novel system and service designs that are inspired by or in harmony with nature, that involve humans as part of the design, and that adapt to changing populations and technological advances; system integration that seeks to create seamless integration across physical, cyber and human systems; real-time control, adaptation and intervention requiring the development of a new generation of models and algorithms; big data analytics that challenge existing paradigms and generate methodological breakthroughs; and social-technological-infrastructure connections that create critical knowledge in understanding how people interact with civil infrastructures.
- Proposals in construction engineering are no longer accepted by the CIS program. They should be submitted to the Engineering for Civil Infrastructure (EIC) program.

While certain subject-matter knowledge may be crucial in many research efforts on the design, operation and management of civil infrastructures, the program does not support research with a primary contribution in non-CIS-focused subjects such as materials, sensor technology, extreme event analysis, human factors, climate modeling, structural, geotechnical, hydrologic, environmental or construction engineering. Full program details are available at: https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13352.

DCL NSF: Announcing Realignment of the Infrastructure Management and Extreme Events (IMEE) Program and Change in Program Name to Humans, Disasters and the Built Environment (HDBE)
The Division of Civil, Mechanical and Manufacturing Innovation (CMMI), within the National Science Foundation’s Directorate for Engineering, announces a realignment of the Infrastructure Management and Extreme Events (IMEE) program. Consistent with realignment, the program name has changed to Humans, Disasters and the Built Environment (HDBE).
IMEE will no longer accept proposals; active awards in IMEE will be managed by the HDBE Program Director and will remain eligible for supplements and extensions.

**NEW PROGRAM HIGHLIGHTS:**

The HDBE program supports fundamental, multidisciplinary research on the interactions between humans and the built environment within and among communities exposed to natural, technological and other types of hazards and disasters. The program seeks proposals that enrich understanding and explore implications of these interactions, whether through theoretical, methodological or empirical advances, thereby contributing to society's capabilities to learn from, prepare for and respond to hazards and disasters.

The program's context is provided by ongoing and emerging changes in three interwoven elements of a community: its population, its built environment (critical infrastructures, physical and virtual spaces, and buildings and related structures) and the hazards and disasters to which it is exposed. The HDBE program seeks research that integrates these elements and that can contribute to theories that hold over a broad range of scales and conditions.

Examples include but are not limited to unified frameworks and theoretical models that encompass non-hazard to extreme hazard and disaster conditions, theoretical and empirical studies that consider how interactions between a community's population and its built environment may suppress or amplify hazard exposure or its effects, and studies that seek to inform scholarship through the development of shared data and related resources. In these and other areas funded through the HDBE program, research that challenges conventional wisdom on the interactions among humans, the built environment and hazards and disasters is particularly encouraged.

Given the richness of the phenomena under study, the HDBE program seeks research that advances theories, methods and data within and across diverse disciplines, whether in engineering, the social sciences, computing or other relevant fields. Ultimately, research funded through this program is expected to inform how communities can cultivate and engage a broad range of physical, social and other resources to ensure improved quality of life for their inhabitants.


**Dear Colleague Letter: Announcing Creation of the Engineering Design and Systems Engineering (EDSE) Program which Merges and Replaces the Engineering and Systems Design (ESD), System Science (SYS), and Design of Engineering Material Systems (DEMS) Programs**

The Engineering Design and Systems Engineering (EDSE) program of the Division of Civil, Mechanical and Manufacturing Innovation (CMMI) within the National Science Foundation's Directorate for Engineering accepts proposals for fundamental research on theory and methodology of engineering design and systems engineering. This program merges and replaces the Engineering and Systems Design (ESD), System Science (SYS), and Design of Engineering Material Systems (DEMS) programs. The ESD, SYS and DEMS programs will no longer accept proposals; active awards in ESD, SYS, and DEMS will be managed by the EDSE Program Director and will remain eligible for supplements and extensions.

The goal of this merger is to simplify proposal submission for investigators and to provide a larger combined program budget that will allow more flexibility in award amounts.
and duration. The EDSE program will seek to advance frontiers of knowledge broadly across the disciplines of engineering design and systems engineering so as to promote more effective design and systems engineering practices, and to enable the development of increasingly complex, integrated, and interactive engineered systems demanded by advanced technologies and emerging societal imperatives.

The EDSE program will continue to emphasize the major research thrusts of the constituent programs, namely to foster the emergence of a rigorous theory of engineering design and systems engineering, including both normative and descriptive aspects. In pursuit of this emphasis, EDSE will support fundamental research in the applications of probability theory, decision theory, game theory, optimization, organizational theory, behavioral science and other relevant disciplines to engineering design and systems engineering practices and processes. Support will be provided both for studies of a purely theoretical nature and studies of an observational or experimental nature.

Like the programs it replaces, EDSE does not support the development of ad-hoc methods or the application of known techniques to new problems. Furthermore, proposals should pursue contributions that are either independent of engineering domain or consistent with the disciplinary thrusts of the CMMI division.

The program especially encourages proposals consistent with the following three themes:

**Understanding the Development of Systems at Scale.** Research investigating challenges of designing and validating extremely large scale or complex technical and socio-technical platforms and systems.

**Cognitive Support for Design and Systems Engineering.** Research advancing fundamental understanding about how advanced computing technologies firmly grounded in cognitive science/engineering can best be utilized to support human cognition, decision making, and effective collaboration during design and systems engineering.

**Design of Engineering Material Systems.** Research advancing methodology specific to the design of engineering material systems. Successful proposals will identify a specific material system and leverage the unique aspects of that system to realize novel design methods that are driven by performance metrics and incorporate processing/manufacturing considerations. Advances in materials modeling and processing are welcome to the extent they support advances in design methodology.

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**Dear Colleague Letter: Announcing Creation of the Engineering for Civil Infrastructure (ECI) Program which is Replacing the Engineering for Natural Hazard (ENH), Geotechnical Engineering and Materials (GEM), and Structural and Architectural Engineering and Materials (SAEM) Programs**

The Division of Civil, Mechanical and Manufacturing Innovation (CMMI) within the National Science Foundation’s Directorate for Engineering, announces creation of the Engineering for Civil Infrastructure (ECI) program. The ECI program represents a new and integrated vision for fundamental research to underpin transformative innovations for the built environment that are resilient, economical, and adaptable to enhance national prosperity and societal benefits. In support of this vision, the ECI program replaces the Engineering for Natural Hazard (ENH), Geotechnical Engineering and Materials (GEM), and Structural and Architectural Engineering
and Materials (SAEM) programs. ECI will also support research in construction engineering that is compatible with this vision.

The ENH and SAEM programs will no longer accept proposals. The GEM program will not accept proposals after 5:00 p.m. submitter's local time on December 29, 2017. Active awards in ENH, GEM and SAEM programs will be managed by the ECI Program Directors and will remain eligible for supplements and extensions.

**NEW PROGRAM HIGHLIGHTS:**

The ECI program supports fundamental research that will shape the future of our nation's constructed civil infrastructure, subjected to and interacting with the natural environment and to meet the needs of humans. In this context, research driven by radical rethinking of traditional civil infrastructure in response to emerging technological innovations, changing population demographics, and evolving societal needs is encouraged.

The ECI program focuses on the physical infrastructure, such as the soil-foundation-structure-envelope-nonstructural building system; geostuctures; and underground facilities. It seeks proposals that advance knowledge and methodologies within geotechnical, structural, architectural, materials, coastal, and construction engineering, especially that include collaboration with researchers from other fields, including, for example, biomimetics, bioinspired design, advanced computation, data science, materials science, additive manufacturing, robotics, and control theory.

Research may explore holistic building systems that view construction, geotechnical, structural, and architectural design as an integrated system; adaptive building envelope systems; nonconventional building materials; breakthroughs in remediated geological materials; and transformational construction processes. Principal investigators are encouraged to consider civil infrastructure subjected to and interacting with the natural environment under "normal" operating conditions; intermediate stress conditions (such as deterioration, and severe locational and climate conditions); and extreme single or multi natural hazard events (including earthquakes, windstorms, tsunamis, storm surges, sinkholes, subsidence, and landslides). Principal investigators are expected to bear in mind broader impacts associated with, for example, economic, environmental, habitant comfort, and societal benefits, which may include implications for resource and energy efficiency, life cycle, adaptability and resilience, and reduced dependence on municipal services and utilities.

**Dear Colleague Letter: Discovery Research PreK-12: Advancing STEM+Computing**

The *Discovery Research PreK-12* program (DRK-12), in its effort to significantly enhance the learning and teaching of science, technology, engineering, mathematics (STEM) and computer science by preK-12 students and teachers, is encouraging investigators through this Dear Colleague Letter (DCL) to submit proposals studying the integration of computing and/or computational thinking within disciplinary STEM learning and teaching in formal STEM education. Proposals are due November 14, 2017 (DRK-12 Solicitation *NSF 17-584*).

As computing has become integral to the practice of the STEM disciplines, investigators may seek to address such emerging challenges in computational learning and teaching in early childhood education through high school (preK-12). Investigators may seek to address the immediate challenges facing preK-12 STEM integrated with computing, as well as challenges
that anticipate radically different structures and functions of preK-12 teaching and learning. It is anticipated that projects should bring together an intellectually diverse team of educators, scientists, mathematicians, or engineers to frame challenging research questions and propose novel and innovative solutions for problems of research and practice.

The DRK-12 program has three major research and development strands: (1) Assessment; (2) Learning; and (3) Teaching. The program recognizes the synergy among the three strands and that there is some overlap and interdependence among them; however, proposals should identify a clear focus of the proposed research (i.e., assessment, learning, or teaching) consistent with the proposal's main objectives and research questions. The program supports six types of projects: (1) Exploratory, (2) Design and Development, (3) Impact, (4) Implementation and Improvement, (5) Syntheses, and (6) Conferences. All six types of projects apply to each of the three DRK-12 program strands.

Through this DCL, researchers may also submit EARly-concept Grants for Exploratory Research (EAGER) proposals. EAGER proposals are to support exploratory work in its early stages on untested, but potentially transformative, research ideas or approaches. An EAGER proposal submitted in response to this DCL would propose exploratory research studying the integration of STEM and computing. EAGER proposals must conform to the guidelines as specified in Chapter II.E.2 of the NSF Proposal & Award Policies & Procedures Guide (PAPPG), including the requirement to discuss the proposal with a Program Officer prior to submission: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg. Researchers interested in submitting proposals to the DRK-12 Solicitation (17-584) to study the integration of STEM + Computing in response to this DCL, must submit by the DRK-12 proposal deadline: November 14, 2017.

**Dear Colleague Letter: Stimulating Research Related to the Science of Broadening Participation**

Building on previous investments, the Directorate for Social, Behavioral & Economic Sciences (SBE) and the Directorate for Education & Human Resources (EHR) announce their interest in continuing support of research related to the Science of Broadening Participation (SBP). The Science of Broadening Participation will employ the theories, methods, and analytic techniques of the social, behavioral, economic, and learning sciences to better understand the barriers that hinder and factors that enhance our ability to broaden participation in science, technology, engineering, and mathematics (STEM) and other sectors. The results of these efforts will inform approaches to increase the access and involvement of underrepresented groups in STEM and to strengthen our national STEM capabilities and competitive advantage. Ultimately, the SBP research will provide scientific evidence that STEM educators, STEM employers, and policy makers need to make informed decisions and to design effective programs and interventions. In FY 2018, SBE and EHR will partner to support SBP research proposals that will contribute to the overall understanding of the positive and negative factors impacting the participation of underrepresented individuals in STEM education and careers. SBP research proposals may focus on factors such as the following:

- Institutional and organizational factors (e.g., studies of organizational, structural, cultural or climate factors that impact STEM participation)
• Cultural and social factors (e.g., studies of psychological or behavioral factors that affect STEM participation and achievement rates)
• Economic and policy-related factors (e.g., studies of economic factors that impact STEM participation and the relationship between broader participation and social innovation).

We anticipate that many of the fields represented within SBE and EHR can contribute to the Science of Broadening Participation. Some examples of potential research questions related to the SBP include but are not limited to:

• What are the underlying psychological and social issues affecting the different participation and graduation rates in STEM of women, men, persons with disabilities, and racial and ethnic minorities?
• Under which conditions do behavioral, economic, and socio-legal factors influence recruitment and retention in STEM education at the individual, meso, and macro levels?
• What aspects of preK-12, informal, and higher education learning environments and workplace culture moderate the factors impacting underrepresented minorities, women, and/or persons with disabilities?
• What behavioral or economic processes result in outcomes that are associated with success in STEM?
• What theoretical approaches predict success in ensuring that young people from underrepresented groups do not lose interest in science during adolescence?
• What are the impacts of a diverse STEM workforce on scientific productivity and innovation and the national economy?

Scholars with research proposals that contribute to the Science of Broadening Participation should submit proposals to the most relevant programs of the SBE Directorate and designate the proposal as SBP by including "SBP" at the beginning of the proposal title. Information concerning SBE programs may be found on the following websites under each one’s respective Programs and Funding section: Behavioral and Cognitive Sciences, Social and Economic Sciences, and SBE Office of Multidisciplinary Activities.

Alternatively, proposals may also be submitted to appropriate EHR education research programs (https://www.nsf.gov/dir/index.jsp?org=EHR). In particular, scholars may wish to consider the Broadening Participation in STEM strand in the EHR Core Research (ECR) program (https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504924). The Division of Human Resource Development (HRD) also has a Broadening Participation Research in STEM strand in HBCU-UP and TCUP for scholars at Historically Black Colleges and Universities and Tribal Colleges and Universities. Please see the HRD homepage for links to the appropriate program solicitation: https://www.nsf.gov/div/index.jsp?div=HRD.
Asymdystopia: The threat of small biases in evaluations of education interventions that need to be powered to detect small impacts

Evaluators of education interventions are increasingly designing studies to detect impacts much smaller than the 0.20 standard deviations that Cohen (1988) characterized as "small." While the need to detect smaller impacts is based on compelling arguments that such impacts are substantively meaningful, the drive to detect smaller impacts may create a new challenge for researchers: the need to guard against smaller inaccuracies (or "biases"). The purpose of this report is twofold. First, the report examines the potential for small biases to increase the risk of making false inferences as studies are powered to detect smaller impacts, a phenomenon the report calls asymdystopia. The report examines this potential for both randomized controlled trials (RCTs) and studies using regression discontinuity designs (RDDs). Second, the report recommends strategies researchers can use to avoid or mitigate these biases. For RCTs, the report recommends that evaluators either substantially limit attrition rates or offer a strong justification for why attrition is unlikely to be related to study outcomes. For RDDs, new statistical methods can protect against bias from incorrect regression models, but these methods often require larger sample sizes in order to detect small effects.

Enhancing the Resilience of the Nation’s Electricity System

Americans’ safety, productivity, comfort, and convenience depend on the reliable supply of electric power. The electric power system is a complex “cyber-physical” system composed of a network of millions of components spread out across the continent. These components are owned, operated, and regulated by thousands of different entities. Power system operators work hard to assure safe and reliable service, but large outages occasionally happen. Given the nature of the system, there is simply no way that outages can be completely avoided, no matter how much time and money is devoted to such an effort. The system’s reliability and resilience can be improved but never made perfect. Thus, system owners, operators, and regulators must prioritize their investments based on potential benefits.

Enhancing the Resilience of the Nation’s Electricity System focuses on identifying, developing, and implementing strategies to increase the power system’s resilience in the face of events that can cause large-area, long-duration outages: blackouts that extend over multiple service areas and last several days or longer. Resilience is not just about lessening the likelihood that these outages will occur. It is also about limiting the scope and impact of outages when they do occur, restoring power rapidly afterwards, and learning from these experiences to better deal with events in the future.

New Report Recommends Using Model-Based Approaches to Integrate Multiple Data Sources for Crop Estimates

Producing more precise county-level estimates of crops and farmland cash rents will require integrating multiple data sources using model-based predictions that are more transparent and reproducible, says a new report from the National Academies of Sciences, Engineering, and
Medicine. The report provides a vision of how the National Agricultural Statistics Service (NASS) can accomplish this.

NASS surveys are the basis of crop and cash rent estimates, which are vital to efficiency in the agricultural market and the evaluation of farmland, helping industry participants decide on what to grow, how to determine sales, and the availability of food, as well as rental and loan rates for farmland. But over time, survey response rates have declined, creating challenges for county data users including the USDA’s Farm Service Agency and Risk Management Agency, who use the county estimates as part of their processes for administering USDA programs, including providing farm insurance and determining farmland rental rates and farm subsidies. As a result, when official NASS estimates are not reliable due to low survey response, alternative estimates may be used that are neither transparent nor reproducible.

Currently, the Agricultural Statistics Board (ASB) of NASS determines county estimates, using survey responses along with other available information. To achieve transparency and reproducibility, the report recommends developing, evaluating, validating, documenting, and using model-based estimates that incorporate both survey data and complementary data such as administrative data, satellite and other remote sensing data, and precision agriculture data. The recommended inclusion of measures of uncertainty with the model estimates allow users to determine the utility of the estimates. The report further recommends that NASS shift the ASB role from integrating multiple data sources to ensuring that the models used for the integration are continually assessed and validated via a feedback loop that suggests modifications to improve model performance. A key factor in combining survey data with complementary data is the development of a geo-referenced list frame from which the farms to be surveyed are selected. Then the location of the farm can be used to tie the multiple data sources about the farm together with the survey response.
New Funding Opportunities

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Content Order

New Funding Posted Since September 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 September 15 Newsletter

CENTER OF EXCELLENCE: Efficient and Robust Machine Learning (ERML), AFOSR
AFOSR seeks unclassified proposals from educational institutions in the United States for a University Center of Excellence (UCoE) in Efficient and Robust Machine Learning (ERML). Proposals must not contain any proprietary information. Due November 30.

Specialty Crop Research Initiative (SCRI)
The purpose of the SCRI program is to address the critical needs of the specialty crop industry by awarding grants to support research and extension that address key challenges of national, regional, and multi-state importance in sustaining all components of food and agriculture, including conventional and organic food production systems. Projects must address at least one of five focus areas:
• Research in plant breeding, genetics, genomics, and other methods to improve crop characteristics
• Efforts to identify and address threats from pests and diseases, including threats to specialty crop pollinators
• Efforts to improve production efficiency, handling and processing, productivity, and profitability over the long term (including specialty crop policy and marketing)
• New innovations and technology, including improved mechanization and technologies that delay or inhibit ripening
• Methods to prevent, detect, monitor, control, and respond to potential food safety hazards in the production efficiency, handling and processing of specialty crops. Due December 8.

USDA-NIFA-FINI-006393 Food Insecurity Nutrition Incentive Competitive Grant Program
The Food Insecurity Nutrition Incentive (FINI) Grant Program for fiscal year (FY) 2018 to support projects to increase the purchase of fruits and vegetables among low-income consumers
participating in the Supplemental Nutrition Assistance Program (SNAP) by providing incentives at the point of purchase. **Due December 13.**

**Leading Engineering for America's Prosperity, Health, and Infrastructure (LEAP HI)**
The LEAP HI program challenges the engineering research community to take a leadership role in addressing demanding, urgent, and consequential challenges for advancing America's prosperity, health and infrastructure. LEAP HI proposals confront engineering problems that are too complex to yield to the efforts of a single investigator — problems that require sustained and coordinated effort from interdisciplinary research teams, with goals that are not achievable through a series of smaller, short-term projects. LEAP HI projects perform fundamental research that may lead to disruptive technologies and methods, lay the foundation for new and strengthened industries, enable notable improvements in quality of life, or re-imagine and revitalize the built environment.

- LEAP HI supports fundamental research projects involving collaborating investigators, of duration up to five years, with total budget between $1 million and $2 million.
- LEAP HI proposals must articulate a fundamental research problem with compelling intellectual challenge and significant societal impact, particularly on economic competitiveness, quality of life, public health, or essential infrastructure. One or more CMMI core topics must lie at the heart of the proposal, and integration of disciplinary expertise not typically engaged in CMMI-funded projects is encouraged.
- LEAP HI proposals must highlight engineering research in a leadership role.
- LEAP HI proposals must demonstrate the need for a sustained research effort by an integrated, interdisciplinary team, and should include a research integration plan and timeline for research activities, with convincing mechanisms for frequent and effective communication. **LOI due December 15; full February 5.**

**TAT Grant Program FY18 Department of Agriculture Utilities Programs**
The Technical Assistance and Training (TAT) Grant Program has been established to communities with water or wastewater systems through free technical assistance and/or training provided by the grant recipients. Qualified private non-profit organizations will receive TAT grant funds to identify and evaluate solutions to water and waste disposal problems in rural areas, assist applicants in preparing applications for water and waste grants made at the State level offices, and improve operation and maintenance of existing water and waste disposal facilities in rural areas. **Due January 2.**

**SWMFY2018 Solid Waste Management Grant Program Department of Agriculture**
The Solid Waste Management (SWM) Grant Program has been established to assist communities through free technical assistance and/or training provided by the grant recipients. Qualified organizations will receive SWM grant funds to reduce or eliminate pollution of water resources in rural areas, and improve planning and management of solid waste sites in rural areas. **Due January 2.**

**Partnerships for Research and Education in Materials (PREM)**
The DMR Partnerships for Research and Education in Materials Research (PREM) program aims to enable, build, and grow partnerships between minority-serving institutions and DMR-supported centers and/or facilities to increase recruitment, retention and degree attainment (which defines the PREM pathway) by members of those groups most underrepresented in materials research, and at the same time support excellent research and education endeavors that strengthen such partnerships. Due January 29.

**URL Links to New & Open Funding Solicitations**

Links verified Tuesday, May 23, 2017

- SAMHSA FY 2017 Grant Announcements and Awards
- 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
- 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 2017 Science To Achieve Results (STAR) Research Grants
- NASA Open Solicitations
- CDMRP FY 2017 Funding Announcements
- Office of Minority Health
- 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)
- Office of Naval Research Currently Active BAAs
- HRSA Health Professions Open Opportunities
- National Institute of Justice Current Funding Opportunities
- Foundation Center RFP Weekly Funding Bulletin

**Solicitations Remaining Open from Prior Issues of the Newsletter**

**Innovations in Graduate Education (IGE) Program**
The Innovations in Graduate Education (IGE) program is designed to encourage the development and implementation of bold, new, and potentially transformative approaches to
STEM graduate education training. The program seeks proposals that explore ways for graduate students in research-based masters and doctoral degree programs to develop the skills, knowledge, and competencies needed to pursue a range of STEM careers. IGE focuses on projects aimed at piloting, testing, and validating innovative and potentially transformative approaches to graduate education. IGE projects are intended to generate the knowledge required for their customization, implementation, and broader adoption. The program supports testing of novel models or activities with high potential to enrich and extend the knowledge base on effective graduate education approaches. The program addresses both workforce development, emphasizing broad participation, and institutional capacity building needs in graduate education. Strategic collaborations with the private sector, non-governmental organizations (NGOs), government agencies, national laboratories, field stations, teaching and learning centers, informal science centers, and academic partners are encouraged. Due October 25.

**Getty/ACLS Postdoctoral Fellowships in the History of Art**
ACLS invites applications for Getty/ACLS Postdoctoral Fellowships in the History of Art, made possible by the generous support of the Getty Foundation. These fellowships are intended to support an academic year of research and/or writing by early career scholars for a project that will make a substantial and original contribution to the understanding of art and its history. The ultimate goal of the project should be a major piece of scholarly work by the applicant. ACLS does not fund creative work (e.g., novels or films), textbooks, straightforward translation, or pedagogical projects. ACLS will award 10 fellowships, each with a salary-replacement stipend of $60,000, plus $5,000 for research and travel during the award period. The fellowships are portable and are tenable at the fellow's home institution, abroad, or at another appropriate site for the work proposed. Awards also will include a one-week residence at the Getty Research Institute following the fellowship period. Due October 25.

**Advancing Informal STEM Learning**
The Advancing Informal STEM Learning (AISL) program seeks to advance new approaches to and evidence-based understanding of the design and development of STEM learning opportunities for the public in informal environments; provide multiple pathways for broadening access to and engagement in STEM learning experiences; advance innovative research on and assessment of STEM learning in informal environments; and engage the public of all ages in learning STEM in informal environments. The AISL program supports six types of projects: (1) Pilots and Feasibility Studies, (2) Research in Service to Practice, (3) Innovations in Development, (4) Broad Implementation, (5) Literature Reviews, Syntheses, or Meta-Analyses, and (6) Conferences. Due November 6.

**DE-FOA-0001725 Technology Development to Ensure Environmentally Sustainable CO2 Injection Operations**
This FOA seeks applications on research to develop techniques, tools, and methodologies that improve detection and assessment of CO2 stored in the target reservoir. Research products developed under this FOA are expected to include monitoring tools and techniques, as well as validation of models and modeling techniques. Successful technologies developed under this
FOA will decrease the operator’s financial burden associated with long-term monitoring by providing them the capability to assess the position of the CO2 plume in the target reservoir with greater certainty throughout the life cycle of the project (i.e., active- and post-injection). **Due November 14.**

**Discovery Research PreK-12**
The Discovery Research PreK-12 program (DRK-12) seeks to significantly enhance the learning and teaching of science, technology, engineering, mathematics and computer science (STEM) by preK-12 students and teachers, through research and development of STEM education innovations and approaches. Projects in the DRK-12 program build on fundamental research in STEM education and prior research and development efforts that provide theoretical and empirical justification for proposed projects. Projects should result in research-informed and field-tested outcomes and products that inform teaching and learning. Teachers and students who participate in DRK-12 studies are expected to enhance their understanding and use of STEM content, practices and skills. The DRK-12 program invites proposals that address immediate challenges that are facing preK-12 STEM education as well as those that anticipate radically different structures and functions of preK-12 teaching and learning.

The DRK-12 program has three major research and development strands: (1) Assessment; (2) Learning; and (3) Teaching. The program recognizes the synergy among the three strands and that there is some overlap and interdependence among them. However, proposals should identify a clear focus of the proposed research efforts (i.e., assessment, learning, or teaching) consistent with the proposal's main objectives and research questions. The program supports five types of projects: (1) Exploratory, (2) Design and Development, (3) Impact, (4) Implementation and Improvement, and (5) Conferences and Syntheses. All five types of projects apply to each of the three DRK-12 program strands. **Due November 14.**

**NEA Literature Fellowships: Translation Projects, FY2019**
An individual may submit only one application for FY 2019 funding. You may not apply for both a Translation Project under this deadline (December 5, 2017) and a Literature Fellowship (in prose or poetry) under the 2018 deadline (when fellowships in prose are offered). The Arts Endowment's support of a project may begin any time between November 1, 2018, and November 1, 2019, and extend for up to two years. The program supports projects for the translation of specific works of prose, poetry, or drama from other languages into English. We encourage translations of writers and of work that are not well represented in English translation. All proposed projects must be for creative translations of literary material into English. The work to be translated should be of interest for its literary excellence and value. Priority will be given to projects that involve work that has not previously been translated into English. Competition for fellowships is rigorous. Potential applicants should consider carefully whether their work will be competitive at the national level. **Due December 5.**

**Ford Foundation Fellowship Programs**
Awards will be made for study in research-based Ph.D. or Sc.D. programs; practice oriented degree programs are not eligible for support (see eligible fields). Prospective applicants should
read carefully the eligibility requirements, the terms of the fellowship awards, application instructions and other information pertaining to the individual fellowship (Predoctoral, Dissertation, or Postdoctoral) for which they are applying. In addition to the fellowship award, Ford Fellows are eligible to attend the Conference of Ford Fellows, a unique national conference of a select group of high-achieving scholars committed to diversifying the professoriate and using diversity as a resource for enriching the education of all students. Due Date of Dec. 7, 14 and January 9.

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.]

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.**

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

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

**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.**
**Strategic Technologies Department of Defense DARPA - Strategic Technology Office**

**Current Closing Date for Applications: Mar 21, 2018**

**Air Force BAA - Innovative Techniques and Tools for the Automated Processing and Exploitation (APEX) Center**

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

**DARPA Biological Technologies Office Open BAA, Department of Defense**

The Defense Advanced Research Projects Agency (DARPA) is soliciting innovative research proposals of interest to the Biological Technologies Office (BTO). Proposed research should investigate leading edge approaches that enable revolutionary advances in science, technologies, or systems at the intersection of biology with engineering and the physical and computer sciences. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of the art. BTO seeks unconventional approaches that are outside the mainstream, challenge assumptions, and have the potential to radically change established practice, lead to extraordinary outcomes, and create entirely new fields. The mission of BTO is to foster, demonstrate, and transition breakthrough fundamental research, discoveries, and applications that integrate biology, engineering, computer science, mathematics, and the physical sciences. BTO’s investment portfolio goes far beyond life sciences applications in medicine to include areas of research such as human-machine interfaces, microbes as production platforms, and deep exploration of the impact of evolving ecologies and environments on U.S. readiness and capabilities. BTO’s programs operate across a wide range of scales, from individual cells to the warfighter to global ecosystems. BTO responds to the urgent and long-term needs of the Department of Defense (DoD) and addresses national security priorities. A listing of priority areas includes but is not limited to below:
Developing and leveraging new technologies that can be applied to agricultural ecosystems for production stabilization, by improving quality or reducing losses from pathogens or pests.

Developing and leveraging new insights into non-human biology across and between populations of microbes, insects, plants, marine life, and other non-human biologic entities.

Developing new technologies and approaches that ensure biosafety, biosecurity, and protection of the bioeconomy.

Understanding emerging threats to global food and water supplies and developing countermeasures that could be implemented on regional or global scales.

Developing new technologies to treat, prevent, and predict the emergence and spread of infectious diseases that have the potential to cause significant health, economic, and social burden.

Proposal Abstracts and Full Proposals will be submitted on a rolling basis until April 26, 2018, 4:00pm ET

**HR001117S0040 Defense Sciences Office (DSO) Office-wide DARPA**
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 disruptive 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 that explore Physical and Natural Systems, Human-Machine and Social Systems, and/or Math and Computational Systems through the lens of one or more of the following technical domains: Complexity Engineering, Science of Design, Noosphere, Fundamental Limits, and New Foundations. 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 to July 2018.

**PAR-16-242 Bioengineering Research Grants (BRG) (R01) Department of Health and Human 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.

**BAA-RQKD-2014-0001 Open Innovation and Collaboration Department of Defense Air Force -- Research Lab**
Open innovation is a methodology to capitalize on diverse, often non-traditional talents and insights, wherever they reside, to solve problems. Commercial industry has proven open
innovation to be an effective and efficient mechanism to overcome seemingly impossible technology and/or new product barriers. AFRL has actively and successfully participated in collaborative open innovation efforts. While these experiences have demonstrated the power of open innovation in the research world, existing mechanisms do not allow AFRL to rapidly enter into contractual relationships to further refine or develop solutions that were identified. This BAA will capitalize on commercial industry experience in open innovation and the benefits already achieved by AFRL using this approach. This BAA will provide AFRL an acquisition tool with the flexibility to rapidly solicit proposals through Calls for Proposals and make awards to deliver innovative technical solutions to meet present and future compelling Air Force needs as ever-changing operational issues become known. The requirements, terms and specific deliverables of each Call for Proposals will vary depending on the nature of the challenge being addressed. It is anticipated that Call(s) for Proposals will address challenges in (or the intersection between) such as the following technology areas: Materials: - Exploiting material properties to meet unique needs - Material analysis, concept / prototype development, and scale up Manufacturing Processes that enable affordable design, production and sustainment operations Aerospace systems: - Vehicle design, control, and coordinated autonomous and/or manned operations - Power and propulsion to enable next generation systems Human Effectiveness: - Methods and techniques to enhance human performance and resiliency in challenging environments - Man – Machine teaming and coordinated activities Sensors and Sensing Systems: - Sensor and sensing system concept development, design, integration and prototyping - Data integration and exploitation. Open to July 12, 2019.

**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.

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.

**BAA-AFRL-RQKMA-2016-0007 Air Force Research Laboratory, Materials & Manufacturing Directorate, 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.**

**Army Research Office Broad Agency Announcement for Basic and Applied Scientific Research**

This BAA sets forth research areas of interest to the ARO. This BAA is issued under FAR 6.102(d)(2), which provides for the competitive selection of basic and applied research proposals, and 10 U.S.C. 2358, 10 U.S.C. 2371, and 10 U.S.C. 2371b, which provide the authorities for issuing awards under this announcement for basic and applied research. The definitions of basic and applied research may be found at 32 CFR 22.105. 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 April 30, 2022.**
Changes at Academic Research Funding Strategies
By Lucy Deckard

Expanded Editing Services

In response to numerous requests, we are now expanding our editing services to accommodate clients working on manuscripts as well as proposals. We are also offering editing only (as opposed to intensive grantsmanship assistance) at several levels:

- **Technical editing:** Editing for technical clarity as well as grammar, punctuation, etc.
- **Editing:** Editing for grammar, punctuation, etc.
- **Editing Especially for Non-native English Speakers:** Editing for grammar, punctuation, usage, etc. with special attention to mistakes commonly made by non-native English speakers.

These options will provide a more economical option for authors who don’t need our intensive review and editing services. More information will be posted on our website soon.

Former NIH branch chief, Dr. John Williamson, joining ARFS

We are excited to announce that [Dr. John Williamson](https://www.arfs.com/dr-john-williamson) is joining Academic Research Funding Strategies as one of our consultants. He will work with clients applying to NIH, providing one-on-one mentoring as well as reviews of NIH proposal drafts. A short bio is provided below.

Dr. Williamson is an emeritus professor of medicinal chemistry at the University of Mississippi, a former NIH branch chief, and currently a research initiatives coordinator at the University of Dayton. During his tenure as a full professor he garnered millions in extramural funding from: federal agencies including the NIH, NSF, CDC, and DoD; pharmaceutical companies including Merck and Schering-Plough; as well as foundations and societies including the Elsa Pardee Foundation, Sigma Xi, the American Society of Pharmacognosy, and the Bill and Melinda Gates Foundation.

At NIH he served as a Branch Chief of Basic and Mechanistic Research, maintaining a branch grants and contract portfolio of approximately $50M/yr. The portfolio included projects associated with brain neuroscience, bioengineering of opiate pathways, mechanisms associated with chronic pain, brain microbiome connection mechanisms, pharmacodynamics and pharmacokinetics and methodologies associated with bioactive natural products, analgesic cannabinoids, various small business awards, complementary medical approaches, and training programs. While at NIH, Williamson’s portfolio contained a broad array of funding mechanisms including: DP1, DP2, F31, F32, K00, K01, K99, P01, P20, P30, P50, R01, R03, R13, R15, R21, R41, R42, R43, R44, R61, R61, R90, T32, T42, T90, and U01s. In addition, he was the named program contact on more than 75 published funding opportunity announcements (RFAs & PAs). Williamson also worked on interagency collaborative programs with the NSF, FDA, USDA, and FTC. He is currently associated with the University of Dayton where, as Research Initiatives Coordinator, he helps faculty and staff in developing and submitting competitive research proposals.
What We Do--

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

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

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

- **Large proposals** - Assistance in planning, developing and writing institutional and center-level proposals (e.g., NSF ERC, STC, NRT, ADVANCE, IUSE, Dept of Ed GAANN, DoD MURI, etc.)

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

- **Assistance on your project narrative**: in-depth reviews, rewrites, and edits

- **Editing and proof reading of journal articles, book manuscripts, proposals, etc.**

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

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

**Workshops by Academic Research Funding Strategies**

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

(View Index of Articles)

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