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By Katherine E. Kelly, PhD

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Katherine E. Kelly, Ph.D., is a retired English professor from Texas A&M University. She is the author of several books and numerous articles and served as a contributing editor for an academic journal for five years. She provides editorial services to RD&GW News and to ARFS clients on proposals, journal articles, and manuscripts.
Topics of Interest URLs

US Special Operations Command Broad Agency Announcement
AIP Federal Science Budget Tracker
HHS’ Tracking Accountability in Government Grants System (TAGGS) Website
IES Announces Reading, Writing, and Language Development Grant Writing Webinars for New and Early Stage Investigators
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DOE Office of Science Update
Visit NAEP and view 2015 mathematics and reading results
USDA Urban Agriculture Toolkit
Antibacterial Resistance Leadership Group (ARLG)
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Zika virus structure revealed
Dear Colleague Letter: Call for Submission of Conference Proposals to Inform the Design and Success of the Alliances and National Network for NSF INCLUDES
2nd National Energy Education Summit
NIFA Plan of Work Page
Clarification of NIFA Policy for Integrated Research and Extension Reporting
The dramatic increase in interdisciplinarity as the core characteristic of research grant solicitations at smaller scales over the past five years has transformed how proposals are planned, developed, and written. Over the past decade, the increasingly interdisciplinary nature of large research center proposals and their required teaming was limited initially to very large grants in the range of $25 million over five years, such as the NSF Engineering Research Centers and Science and Technology Centers. However, as the complexity of scientific challenges has increased, spurring the need for more interdisciplinary teams, and the competitive benefits of teaming on large grants became apparent, interdisciplinarity and teaming have become inseparable and now represent a fundamental given for success on smaller and smaller grants.

As a result, more and more faculty have had to learn to navigate a much more complex proposal development process as smaller funding solicitations have transitioned from the long-standing highly focused disciplinary grants with a few principal investigators to interdisciplinary efforts with multiple principal investigators in a transdisciplinary environment. For new and junior faculty, team grants are the future. For example, the recent INFEWS (Innovations at the Nexus of Food, Energy and Water Systems) initiative by NSF requires that “proposals must incorporate science from three or more intellectually distinct disciplines that, in aggregate, represent scientific areas typically supported by three or more of the participating NSF directorates.”

Keep in mind that INFEWS is not funded at levels anywhere near traditional center-level funding: Category 2 grants are funded at less than $1 million and Category 1 grants are funded in the $1 to $3 million range. What has been until the last several years the characteristics of large-team, large-dollar grants are increasingly being pushed down to grants of less than $1 million. This is the “new normal.” For example, NSF’s recent large and complex team initiative (February 26), Big Data Regional Innovation Hubs: Establishing Spokes to Advance Big Data Applications, seeks to establish multi-institutional and multi-sector collaborations across academia, industry, government, and non-profits, among others, but within a budget of less than $1 million. While transdisciplinary teaming on smaller grants may involve fewer researchers than it would on large team grants, the complexity of the planning, developing and writing of a team proposal nonetheless remains roughly equivalent, and, in some cases, as with the above Big Data Spokes, very large team grants can now also be smaller dollar grants.

For example, a principal challenge in writing a large, interdisciplinary team grant is to integrate multiple narrative contributions written by disciplinarily distinct authors into a project description that accomplishes narrative synergy and avoids silos. This is no less the case on small interdisciplinary grants, such as the INFEWS and the Big Data Spokes. While smaller in scale, small grant team dynamics can be as challenging as the large team dynamics on large grants. While scholarly writing on the theory of the ideal teaming process is prevalent in the literature, in practice, it is always a much more messy process than the ideal envisions. This is so because the common and most critical challenges faced in writing an interdisciplinary team...
proposal center around the “nuts and bolts” aspects of proposal production, which involve planning, scheduling, writing, and integrating numerous drafts by multiple authors of the research narrative.

Similar to technology transfer and commercialization, the transition of teaming principles from the ideal to the real invariably encounters its own “Valley of Death.” On the positive side, it is in the “Valley of Death” where the real learning about writing team grants occurs, since grant writing is an experientially rather than a theoretically based pursuit. If you are in a research office, you can take heart that you’ve likely visited the “Valley of Death” many times during the proposal development process and are all the better for it, as well as better able to guide others through the teaming process with experience-based “best teaming practices” advice learned by attending the “Proposal School of Hard Knocks.”

In practice, many factors impact the proposal production process and require coordination. These factors include ensuring that team member clearly understand (1) the solicitation’s research objectives, (2) their role in the project, (3) their writing role, (4) the person who will perform the role of narrative integrator for each draft iteration, (5) their prior experience working in a coordinated writing environment, (6) their knowledge of how to coordinate team members’ schedules and availability for participation in meetings, (7) their understanding of the time team members have to devote to the project, and (8) their ability to communicate protocols among team members for document sharing and reviews, among others.

Even a few years ago, workshops on how to develop and write large-team grants would target senior faculty with the background required to compete for a large-center grant, but with the need to better navigate the transition from writing single-PI grants to writing large-team grants. Now, however, it is a critical skill to be learned by new and junior faculty as well. Junior faculty must learn this skill to better prepare them for successfully competing in an environment where small, interdisciplinary team grants have become the norm. Similar to larger team grants, smaller team grants are shaped by the complexity of the scientific problem being addressed, by the disciplines required to address the problem, by the value-added benefits team research brings to solving the problem, by the capacity of the team-research approach to finding synergistic solutions to the problem, and, often, by the capacity for developing new technologies, scientific innovation, and commercialization.

As in the case of larger team grants, small team grants are unique and more complex to plan, develop, and write than are traditional smaller grants with a narrow disciplinary focus. Successful small team grants must communicate a compelling research vision; demonstrate major value-added benefits to the team structure; achieve research synthesis, integration, and synergy; address multiple program components that build on the research core; offer a management plan that enables the team research vision; propose a convincing research strategic plan over the life of the project; and convince program officers and reviewers that the proposed research is transformational and not merely incremental.

As interdisciplinary team grants at all scales become the norm, more and more faculty at all academic levels, including newly hired faculty, are confronted with new and often unfamiliar challenges to writing competitive proposals. One of the more difficult challenges to address is always the formation of the research team. In an ideal world, a research team already exists with a history of collaborative success that is perfectly positioned to respond to a
new funding solicitation the day it is posted. But now that rarely happens in the real world of research development, as smaller interdisciplinary grants become increasingly ubiquitous. Again, it is a “new normal” of teaming at all scales.

To be sure, semiannual, annual, or biannual solicitations that come around again and again with periodic regularity equivalent to the rising and setting of the sun allow applicants to plan long term, but, increasingly, that is no longer the case. What research office does not know of a professor or two not already wisely planning forward two to three years for the next round of NSF STCs and ERCs and putting a team in place? In the case of the ERC, focus areas may change in the 2018 solicitation, but the one certainty will be that whatever research is proposed must fit the ERC 3-planer diagram template.

Long range certainty is becoming a luxury. In the “new normal” of interdisciplinary teaming at all scales, new and unique funding opportunities often arise that present major challenges to a timely team formation. For example, there may be a possible interdisciplinary research team configuration that could compete for a funding opportunity but would represent a “new team” without a track record of significant research collaboration in the past. Moreover, many new interdisciplinary solicitations are truly unique and complex in their research objectives, and while it would be nice if a perfectly fitted team were already in place, that is increasingly less common. When it comes to teaming on smaller scale interdisciplinary grants, the strategy is becoming “build as you go,” somewhat analogous to “just in time” manufacturing.

The end result is that, in many cases, the teaming process itself has to be “jump started” and accelerated in order to assemble a competitive team comprised of members across multiple disciplines that can be fully responsive to a solicitation by the due date. That presents a vetting challenge to the PI of such an interdisciplinary effort who must get the right collaborators on board. Clearly, the key to team formation is the research expertise of the team members as it maps to the research objectives of the funding agency. Too often, however, that is the sole criterion used in bringing a new member onto a team to the exclusion of other factors that also have a major impact on how competitive the proposal will be.

There are other important characteristics of a good team member that also need to be considered when forming a team and vetting members to respond to a specific solicitation. For example, does the potential team member have sufficient time available to participate in team meetings, conference calls, and proposal writing, likely as an author of a narrative section? Does the potential team member show a commitment to the project by taking the time to read and understand the solicitation and the role of each team member in meeting the agency research goals? Does the potential team member understand that the goal of interdisciplinarity is a synergistic and not siloed team dynamic? Does the potential team member write well and meet narrative draft deadlines? And does the potential team member communicate well with other team members? As much as possible, these questions need to be answered before a potential team member is asked to join a team, not answered after, when the absence of these important characteristics is noted in the proposal development process to its detriment.

It is on these and other key attributes of a potential team member where research offices can help faculty, particularly new and junior faculty, better understand the full suite of
competitive factors that go into being positioned for funding on smaller-scale interdisciplinary team grants.
There are legendary sections of dangerous roads nationwide that go by such ominous monikers as Slaughter Alley, Blood Alley, Massacre Mountain, Road of Death, Malfunction Junction, Highway to Hell, and, the most famous of all, the Dead Man’s Curve section of Sunset Boulevard made famous by the 1963 hit song Dead Man’s Curve by the Beach Boys’ Brian Wilson: “Dead Man’s Curve, it's no place to play / Dead Man's Curve, you best keep away / Dead Man’s Curve, I can hear ‘em say / Won’t come back from Dead Man’s Curve.”

While not yet immortalized in song, there are legendary waypoints along the proposal planning, development, and writing road where proposals hit the equivalent of Dead Man’s Curve. They run off the road, crash and burn, and are never considered for funding, or, as the song notes, they “Won't come back from Dead Man's Curve.” A few of the more dangerous waypoints along the proposal development road, which traverses from your Current Location to your Desired Destination (Recommended for Funding), include the following:

**Navigation:** Is the roadway clearly mapped and understood? The roadmap for a proposal is the funding solicitation and referenced documents. It can be a long and winding road to follow, and one where a navigational error caused by not explicitly following the guidelines is a common reason a proposal never arrives at its funding destination. Moreover, if you do run off the road or take a wrong turn caused by a too casual or careless reading of the solicitation guidelines, the process of recalculating a new route to your funding destination is not as simple as it is on Google or Apple Maps. Too often, mistakes made by misinterpreting the funding guidelines lead applicants to take a wrong turn onto the “Road to Perdition” instead of the Road to Funding. Moreover, do not assume anything when reading the program guidelines—certainty, not ambiguity, is required. Remember the old adage, “To assume makes an ass of u and me.” Any ambiguity in the solicitation must be clarified, either by repeated readings or a call to a program officer; otherwise, the proposal is off the road and in the ditch before the journey begins.

**Self-assessment:** Should you be on this road at all? This gets to the heart of Hamlet’s famous soliloquy on proposal writing: “To submit, or not to submit--that is the question.” This should always be one of the first questions asked after reading the funding solicitation, and one answered based on a hard-headed self assessment of your capacity to submit a competitive proposal. Do not assume, for example, that you are a fit for the agency, that you are competitive at the agency, that your great idea is of interest to the agency, that you can write a competitive proposal by the due date, that you have a research team in place to be fully responsive to the research objectives, that you have the support and resources to develop a proposal, etc. Competitive proposals require, in addition to a compelling idea, significant time, thought, effort, and resources to plan, develop, write, and submit. Make sure that you conduct a realistic “submit or not to submit” analysis before you start your proposal journey to make an informed decision on your competitiveness. Don’t squander resources on a Hail Mary pass. If you feel the need to gamble, buy a $1 lotto ticket.
Narrative clarity: Will your idea hold up under an arduous examination? Keep in mind that the funding solicitation in many ways represents a very scripted and probing interrogation designed by the funding agency to elicit your narrative answers to key questions that will help program officers and reviewers determine your capacity to meet the research goals of the program and the value-added benefits your proposed research might contribute to the agency mission or the field. The most common reason proposals run off the road is because the research narrative withered under the very probing questions posed in the solicitation and failed to respond fully to the questions being asked or the description of the research significance required.

Keep in mind that the questions asked in a funding solicitation are not framed in a general way, but are meant to elicit very concise, convincing responses supported by specifics and details that give program officers and reviewers an in-depth and clear understanding of the value of your research and the benefits of funding it. **The hardest transition to make in proposal development is the one that translates verbal discussions about the proposed research ideas into a clearly written narrative text.** This critical transition from the initial generalized and often elusive verbal discussion of ideas to a concrete conceptual framework for presenting the proposed ideas in the research narrative is one that sends many proposals careening off the road and into funding oblivion.

The above three equivalents of “Dead Man’s Curve,” where proposals commonly run off the road before arriving at the funding destination, are a few of the many places along the proposal submission journey where things can quickly and fatally go awry. However, while it is always possible for a proposal that runs off the road to get back on the road again, given sufficient time to the due date and a determined PI, it is always better by far to anticipate the dangerous sections of road on your proposal’s journey to funding and avoid them altogether.
Human Health-Related Funding at NSF: Dos and Don’ts

By Lucy Deckard, co-publisher

It used to be simple: NSF would not consider funding research related to human disease. It was clear that PIs should apply to NIH for those types of projects. As with many things in modern life, it’s gotten more complicated in recent years. As research related to human health, disease, and health care has become increasing interdisciplinary, incorporating tools from statistics, engineering, computer science, physics, and many other disciplines, the once bright line that separated an NIH project from an NSF project has blurred. However, NSF still returns without review proposals that they feel should go to NIH, so how can a researcher determine whether her human health-related project can be competitive at NSF? Below, we give some guidelines, but remember that this is a fast-moving target, and it’s always advisable to talk to your program officer about your project to make sure what you’re proposing falls into the realm of what NSF will fund.

Submitting to the Directorate for Biological Sciences

It’s important to remember that NSF is almost like a collection of different funding agencies (Directorates) flying in loose formation, each with their own culture, priorities, and sensitivities. Human health-related proposals that will pass muster in the Engineering Directorate might be returned without review for being more appropriate for NIH by the Biological Sciences Directorate. There are historic and cultural reasons for this. Because the topics funded by the Biological Sciences (BIO) Directorate (with a 2015 requested budget of $708 million) are most likely to overlap with biological research topics funded by the NIH (2015 requested budget $30 billion), it’s not surprising that BIO is the most vigilant about setting funding priorities that are clearly distinct from what NIH funds.

If you’re planning to submit a proposal to BIO, there are several things you can do to make your proposal more “NSF-friendly.”

- **Address fundamental biological questions, phenomena, or mechanisms.** While the new knowledge you generate may enable new treatments or diagnoses, don’t frame your project to focus on treatment or diagnosis of disease as your goal. For NSF BIO, the goal should be to advance the field of biology and to generate significant new knowledge on the topics of interest to the core program to which you’re submitting. Improving human health outcomes, disease treatment, or diagnosis should be treated as a broader impact of your project.

- **Make your proposal look like an NSF (not NIH) proposal.** It’s surprising how often PIs will submit a proposal to NSF that looks like an NIH proposal, with a Specific Aims page and Significance, Innovation and Approach sections. While there’s no rule against that as long as you comply with NSF Grant Proposal Guide requirements, a proposal that looks like an NIH proposal will raise red flags in the Program Officer’s and reviewers’ minds about whether it should really go to NIH. It’s wise to avoid this by having “objectives” instead of “specific
aims” and structuring your proposal with different subject headings (for example, “Overview and Significance,” “Background,” “Preliminary Results,” “Methodology,” etc.).

- **Have strong education/outreach activities for your broader impacts.** Since NIH doesn’t have a broader impacts criterion, PIs who are accustomed to applying to NIH may not understand what NSF is looking for in broader impacts. We have written numerous articles on NSF’s broader impacts criterion, and there are many other resources on NSF’s website as well as at universities, so we won’t go into this in detail except to reiterate that PIs should take this seriously and seek advice if they need it.

PIs should also be aware that BIO has special rules about submitting the same or overlapping ideas to both NSF and NIH at the same time. While this is not expressly prohibited by other NSF directorates, BIO does not allow this except for PIs who are “beginning investigators,” defined as “individuals who have not been a principal investigator (PI) or co-principal investigator (co-PI) on a Federally funded award with the exception of doctoral dissertation, postdoctoral fellowship or research planning grants. This rule applies to proposals that are simultaneously pending at both agencies. If, for example, your proposal was declined by NIH, you are then allowed to revamp it and submit it to NSF. It also does not apply to joint NSF/NIH funding initiatives or other instances where the program officers at both agencies have agreed in advance to jointly consider a proposal.

**Submitting to NSF Directorates Other than BIO**

There are now a number of programs at NSF directorates other than BIO that expressly fund topics related to human health. These include:

- **Biomedical Engineering** (ENG, CBET Division)
- **Biotechnology and Biochemical Engineering** (ENG, CBET division)
- **General and Age-Related Disabilities Engineering** (ENG, CBET division)
- **Biophotonics** (ENG, CBET division)
- **Biomechanics and Mechanobiology** (ENG, CMMI division)
- **Smart and Connected Health** (CISE, IIS division)

In addition, many programs that are not expressly focused on human health may fund a project with human health applications. Below are a few examples of such projects:

- “Immunomodulatory ultrathin coatings for pancreatic islet transplantation”, NSF #1306110, funded by the Biomaterials program in MPS (DMR)
- “CAREER: Biofluid Dynamics of the Human Breast: Characterization and Fluid-Structure Interaction,” funded by the Fluid Dynamics program in ENG (CBET)
- “CAREER: Rare Events in Cancer Evolution,” NSF # 1552764, funded by the Service, Manufacturing, and Operations Research program in ENG (CMMI)
- “Mesoporous PVDF Thin Film Device for Implantable Cardiac Power Generation,” NSF #1509369, funded by the Communications, Circuits, and Sensing-Systems program ENG (ECCS)
- “CAREER: Big Computation and the Management of Emerging Infectious Diseases,” NSF #1555141, funded by the Statistics program in MSP (Math)
When submitting a research proposal to any of these programs, keep one key principle in mind: your research questions must excite the reviewers and seek to answer important questions in the field of focus of the program. Strong health-related benefits strengthen your argument for impact, but if reviewers are not convinced that your proposed project will advance the field of focus of the program to which you’re applying, your proposal will not be reviewed well.

For example, if you’re proposing to the Communications, Circuits, and Sensing-Systems program a project to develop a new sensor that can detect indicators of pancreatic cancer, don’t start your proposal with an extended discussion of pancreatic cancer, the number of people afflicted, and the need for earlier detection. One or two sentences on the importance of detecting pancreatic cancer should then segue quickly into the sensor technology challenges presented by this need and the fundamental questions and gaps in sensor technology that you will address. Remember that even though the application, early detection of pancreatic cancer, is extremely important, the new science must be in the field of sensor technology.

If you are not able to make the argument that your project will advance the discipline of the program to which you’re applying—for example, if you are proposing to apply fairly well-developed computer science techniques to a health-related problem in a proposal to CISE’s Smart and Connected Health—you should consider applying to a different program or funder. However, many times when a health-related project is reviewed poorly, the issue is really not the project, but it was framed. By keeping the interests of your audience in mind, making sure you connect clearly to the priorities of the program to which you’re applying, and talking to the Program Officer about your project before you apply, your human health-related proposal can be competitive at NSF.
The most valuable time frame in grant writing begins on the date a solicitation is published and ends at the proposal due date. Unfortunately, potential applicants often fail to become aware of the solicitation for several weeks or more after its publication date. This lost time adversely impacts every aspect of proposal planning, development, and writing, which, in turn, reduces the competitiveness of the proposal. In the most extreme cases, long delays between the posting of a solicitation and an applicant’s becoming aware of it prevents that applicant from competing altogether. This delayed awareness of solicitation postings may result in a setback to a research strategic plan, particularly if that plan is tightly mapped to tenure and promotion decisions.

How and when faculty become aware of potential funding opportunities that fit their research interests is often very haphazard. One typical way is through a daisy chain of forwarded emails that go through multiple reincarnations within and among disciplinary groups on one or more campuses over a period of many weeks or months. Any office that supports faculty research is likely familiar with the common occurrence of faculty seeking support on a proposal that is due in several weeks or less. The resulting fire drill makes for a very chaotic proposal writing process, and most often an unsuccessful one. Moreover, for research offices, poor timing can distort the services offered to other faculty whose proposals are being assisted within a more orderly and well planned time frame.

In the past, and to a much lesser extent today, various subscription-based funding alert services, or similar services by a dedicated person in a research office, would forward published solicitations to faculty via email. Unfortunately, this mass emailing process was a “very blunt instrument” and not guided by any intelligent decision making process or differentiation that mapped open funding opportunities to specific faculty interests. For instance, professors of history, health and kinesiology, dance, mathematics, sociology, etc., along with professors in nuclear engineering, would all received the same email notification of a Department of Energy funding opportunity for advanced reactor technologies. While some funding services allow crude delimited parameters to be set by keywords, these services largely return results that most recipients would view as “funding spam” appearing in a large volume on a daily or even hourly basis.

So the goal is clear: research offices can help faculty develop a personalized system for notifying them of funding opportunities on the date the solicitation is posted, thereby ensuring that the very valuable time from the posted date to the due date is as long as possible to ensure better planning, developing and writing of proposals.

The answer is clear as well: faculty are best advised to pack their own funding chutes. This is easily done and is not an onerous process once faculty members put in place a simple funding tracking procedure that maps to their unique funding interests. The resulting benefits are enormous, including receiving relevant funding solicitations on the date of publication as well as agency information on soon to be published solicitations through what agencies call a Notice of Intent to publish a funding solicitation with a certain period. This period usually runs.
from two to eight weeks, allowing the proposal development process to start prior to a solicitation being funded—an enormous competitive advantage.

So where to start on this process of helping faculty set up their own system for tracking research funding? Most faculty research is funded by one or more of the 30 federal research agencies listed on Grants.gov (foundation funding will be addressed in an upcoming article). All federal agency funding solicitations and Notices of Intent to Publish are posted to Grants.gov. Concurrent with funding on Grants.gov, agency-specific funding solicitations and notices are published at each agency website, often in multiple website locations specific to various agency directorates, institutes, program offices, etc. Many federal agencies, e.g., Department of Energy, DARPA, Department of Education, may also concurrently publish some solicitations and notices at one of the following sites in addition to Grants.gov and the agency website: FedConnect - Gateway to Government Opportunities; FedBizOpps; and the Federal Register.

The key point for faculty is that Grants.gov (e.g., How to Use Grants.gov RSS Feeds) and each agency-specific website will allow them to subscribe to automated notifications by email or RSS feeds (e.g., NSF RSS Feeds and Podcasts). For a single faculty member, funding solicitations of interest will number very few at a few agencies. For example, while there may be 30 federal research funding agencies posted to Grants.gov, most faculty have a research home at one or two agencies, or have a primary agency home (USDA/NIFA), but they also track funding opportunities at a few secondary agencies (NSF and Department of Energy if the research area of interest is biofuels).

This multi-agency monitoring is common given the increasing interdisciplinarity of research that may be funded in “different flavors” at several agencies, e.g., in such areas as Big Data, Antimicrobial Resistance, food/ water/energy nexus, etc. The main point is that faculty can limit the amount of information they receive through email alerts and RSS feeds to a very narrow band to ensure that it doesn’t become overwhelming. Moreover, email alerts are easily directed to separate funding folders and your browser gives you the option of saving all your RSS alerts chronologically. So the simple task for faculty is to identify the agencies of interest, identify the programmatic areas of research interest, and then set up Grants.gov and/or agency-specific email and RSS alerts. Monitoring these alerts for solicitations of possible interest takes only a few minutes per day.

When considering tracking alerts, faculty should know that many program solicitations are published on a periodic basis by funding agencies. These can, therefore, be anticipated prior to their publication. Other program solicitations that are new to an agency need to be monitored through email or RSS alerts. Yet other funding opportunities come from the unsolicited proposal process. Most federal agencies, with the notable example of USDA/NIFA, have an internal process set up for receiving unsolicited proposals, something that will be explained in great detail on each agency’s website. DOE, for example, publishes a manual on unsolicited proposals (Guide for the Submission of Unsolicited Proposals). In other cases, BAAs are the source of long-range research funding opportunities.

Broad Agency Announcements are multiyear funding solicitations often used by mission agencies, e.g., defense agencies such as DOE, among others, to solicit research in priority areas. BAAs also contain instructions on the process for applying for unsolicited research funding, a process that often begins with a brief concept paper. BAAs provide a potential funding source
often overlooked by faculty, particularly new and junior faculty, who are often unaware this funding avenue even exists.

The bottom line here is that research offices can do a significant service for faculty by helping them set up a simple and efficient process for tracking research funding opportunities specific to their disciplinary interests. As noted, there is an enormous competitive advantage to be gained from considering a research solicitation within a day or two of its publication and thereby ensuring that all available time between the publication date and the due date can be used to plan, develop, and write a successful proposal.
Around this time each year, depending on the political and budgetary machinations of Congress, federal research agencies present their budgets to Congress for the next fiscal year. These presentations and supporting documents are important to faculty and research offices alike because they give a more detailed view of the research funding landscape for the upcoming fiscal year, particularly as it relates to an agency’s internal budget allocations for existing and new competitive grants programs. Here it is important to avoid becoming distracted by an agency’s total budget numbers. Total agency budgets generally go up, sometimes by a little and sometimes more, or they can flat line or go down. But those changes are less important than the budget testimony and support documentation that can help faculty and research offices better inform research strategic planning scenarios for the coming year.

To repeat, the key information for strategic research planning and team building is not the agency total budget but the support documentation for the budget testimony that details, in a more finely-grained way, the internal allocation of research funding within an agency. For example, some existing competitive grants programs may be eliminated or scheduled for sunsetting each year among all funding agencies. This was clear in the NSF Congressional budget testimony a year ago when the longstanding (since 2010) NSF-wide investment in SEES (Science, Engineering and Education for Sustainability) began phase out and a new, SEES-inspired program in food, energy, and water (FEW) emerged with a funding horizon anticipated until 2021, including the major and recent INFEWS (Innovations at the Nexus of Food, Energy and Water Systems) solicitation due last March 22.

More typically, annual internal research allocations within an agency may result in a decrease or increase to specific program areas based on agency investment strategies, or funding from older programs may be shifted to new programs. Regardless, particularly for research offices, the key to using these Congressional budget documents for strategic research planning is to arrive at an understanding of changing research investment priorities within specific agencies. In some cases, changes in research priorities can be loosely coordinated across multiple federal agencies. This is the case, for example, in the recent federal agency research focus on antimicrobial resistance (AMR) of over $1.2 billion in 2016, shared by such agencies as FDA, CDC, NIH, NSF, USDA, among others.

Multiple sites are devoted to tracking federal agency budgets and posting all budget documents to their websites, including:

- **Federal Science Budget Tracker**. The Federal Science Budget Tracker provides up-to-date information on the status of fiscal year 2017 budgets and appropriations for the physical sciences. It is part of the American Institute of Physics [Bulletin of Science Policy News](https://www.bspnews.org), which includes options for email, RSS and Twitter tracking.
- **AAAS R&D Budget and Policy Program**. The American Association for the Advancement of Science provides timely, comprehensive, and independent analyses of federal
research & development funding trends, including through **AAAS R&D Email Funding Updates**.

- **Association of American Universities**. For each fiscal year, AAU prepares an overview of the Administration’s proposed budget when it is released in early February, including analyses of the proposed budgets for specific research and education agencies. AAU follows the progress of the congressional budget resolution. AAU follows research and education programs at: NIH, NSF, DoD, DOE, NASA, DoED, NEH, USDA.

Tracking information over the coming months posted by these sites will give research offices a greater insight into the 2017 budget landscape. This tracking can provide another tool to help faculty better prepare and position themselves for future funding opportunities, research priority directions, and changes in agency investment priorities.
New Podcast on Writing the Vertebrate Animal Section in Your NIH Application

USDA/NIFA Center of Excellence Designation
Visit the [NIFA website](https://www.nifa.usda.gov) to access a factsheet on the center of excellence (COE) designation process, including COE criteria, and a list of programs offering COE opportunities in fiscal year (FY) 2016. You can also review a recording of COE outreach webinars held in February and March of 2015 from the site. The COE webpages will be updated throughout FY 2016 with additional information, such as a summary of comments received from stakeholders.

OTHER RESOURCES
- Centers of Excellence Provision
- Centers of Excellence Webinars
- Centers of Excellence Frequently Asked Questions
- Centers of Excellence Factsheet

**Reading, Writing, and Language Development Grant Writing Seminar Series for New and Early Stage Investigators**

**Description:** Each session will take place 1:00 – 2:30pm EDT

The National Center for Education Research (NCER) and the National Center for Special Education Research (NCSER), Institute of Education Sciences (Institute), U.S. Department of Education invite new and early stage researchers to attend the *Reading, Writing, and Language Development Grant Writing Seminar Series for New and Early Stage Investigators*. The objective of the 4-session webinar series is to provide more in-depth support for new and early stage investigators to prepare successful grant applications related to literacy. Applications are due by May 16, 2016.

If you have any questions about the Seminar series, please contact [Rebecca McGill-Wilkinson](mailto:rebecca.mcguil-wilkinson@nber.edu) in NCER at (202) 245-7613, [Kimberley Sprague](mailto:kimberley.sprague@ed.gov) in NCSER at (202) 245-8464, or [Sarah Brasiel](mailto:sarah.brasiel@ed.gov) in NCSER at (202) 245-6734.

**Type:** Workshop/Training & Technical Assistance

**Audience:** The Reading, Writing, and Language Development Grant Writing Webinars for New and Early Stage Investigators is open to postdoctoral fellows or new and early stage investigators who have not served as a principal investigator or a co-principal investigator on an Institute grant, and who are interested in submitting an application to the Institute for the Education Research Competition 84.305A or the Special Education Research Competition 84.324A.
<table>
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<tr>
<th>Location:</th>
<th>Webinar Series</th>
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<td>Selected participants will be sent information on how to register for the 4-session webinar series.</td>
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<td>Dates:</td>
<td>Session 1: May 26, 2016</td>
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<td>Organization:</td>
<td>Institute of Education Sciences</td>
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<td>More Information:</td>
<td><a href="#">For more information on the Grant Writing Seminar Series and the application process, click here.</a></td>
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<tr>
<td>Contacts:</td>
<td>Contact McGill-Wilkinson, Rebecca from NCER at (202) 245-7613</td>
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<td></td>
<td>Contact Brasiel, Sarah from NCSER at (202) 245-6734</td>
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<tr>
<td></td>
<td>Contact Sprague, Kimberley from NCSER at (202) 245-8464</td>
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IES Launches Major Website Redesign
The first phase of the redesign updates the five top-level pages of the IES website—the homepage and the landing pages for the four IES centers: the National Center for Education Research (NCER), the National Center for Education Statistics (NCES), the National Center for Education Evaluation and Regional Assistance (NCEE); and the National Center for Special Education Research (NCSER). Additional pages will be moved into the new design in the coming weeks and months.

To develop the new design, IES gathered feedback from website users, studied data and analytics, and looked at current trends in web design. The new site features larger images, brighter colors, and effective use of spacing that makes the pages easier to view. A drop-down navigation menu puts nearly all of IES’ most-visited pages, tools, and resources just a click away. And the site is built to be responsive, meaning it will automatically adjust to whatever device is being used to access it. Currently, 15-20 percent of visitors to the IES website are using a mobile device and that number is expected to grow in the coming years.

The website is an important part of IES’ effort to improve its communications, outreach, and dissemination strategies. In 2015, the IES website received more than 150 million page views. For more information on the new website and current and future IES communications efforts, read a blog post from Ruth Curran Neild, IES’ delegated director.

IES Presentations at Conferences
A list of conferences where IES-funded researchers often present their findings. Included are both conferences hosted by IES-funded Research and Development Centers, and meetings of professional societies.

Search Funded IES Research Grants and Contracts
A link to the IES search engine where you can find a comprehensive listing of IES awarded and funded research grants and detailed abstracts of each grant.

IES Peer Review Process
The Standards and Review Office is responsible for two primary activities: the peer review of Institute reports, and the peer review process for the funding of Institute grant applications. The Standards and Review Office developed, implemented, and refined the peer review procedures beginning shortly after the enactment of ESRA. In January 2006, the National Board for Education Sciences formally approved Institute procedures for the peer review of reports and grant applications.

More about NSF INCLUDES
Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science (NSF INCLUDES) is a comprehensive national initiative designed to
Research Development & Grant Writing News

enhance U.S. leadership in science, technology, engineering and mathematics (STEM) discoveries and innovations. The long-term goal of NSF INCLUDES is to support, over the next ten years, innovative models, networks, partnerships, and research that enable the U.S. science and engineering workforce to thrive by ensuring that women, members of racial and ethnic groups that have been historically underrepresented in STEM (African Americans/Blacks, Hispanic Americans, American Indians, Alaska Natives, Native Hawaiians, Native Pacific Islanders), persons of low socio-economic status, and people with disabilities are represented in percentages comparable to their representation in the U.S. population.

The grand challenge of broadening participation in STEM is to transform the overall ecosystem at all levels in order to fully engage the nation's talent for the ultimate improvement of the nation's STEM capacity. Viewing this challenge as a social innovation problem, the objective is to develop networks that involve organizations and consortia from different sectors that are committed to a common agenda to solve a specific STEM inclusion problem at scale.

The multi-year goals of NSF INCLUDES are to:

- Synthesize and build the research base for broadening participation and foster the spread and adaptation of proven effective practices.
- Support the identification, development and attainment of a set of shared goals and objectives developed by stakeholders, including those from specific STEM disciplines, which are essential for achieving inclusion in the nation's scientific workforce and in high quality STEM learning opportunities.
- Support local/regional and discipline-specific or crosscutting multi-stakeholder partnerships and networks (NSF INCLUDES Alliances) and support an NSF INCLUDES National Network.

As part of NSF INCLUDES, collaborative alliances spanning education levels and public and private sectors, and including new partners, will be developed, expanded, organized and built by leveraging state-of-the-art knowledge on scaling of social innovations (Bryk, Gomez, & Grunow, 2011; Waitzer & Paul, 2011). For example, the collective impact approaches that incorporate key success determinants of common agenda, shared measurements, mutually reinforcing activities, continuous communications, and backbone support organizations have the potential to yield large-scale progress towards NSF INCLUDES' goals (Kania & Kramer, 2011).

The latest knowledge from the science of broadening participation provides a strong foundation and novel systems approaches and designs for achieving scale are critical for advancing diversity and inclusion in STEM.

Earlier in FY 2016, Program Solicitation NSF 16-544 delineated a process of mandatory preliminary proposals, invited full proposals, and award decisions that will lead to NSF INCLUDES Design and Development Launch Pilots to be funded in 2016. The Launch Pilots will serve as the foundation for NSF-funded INCLUDES Alliances in FY 2017 and beyond. Over the coming years, NSF anticipates that a number of NSF INCLUDES Alliances will be established and connected together to create the NSF INCLUDES National Network. NSF expects that many of its existing broadening participation programs and funded projects will collaborate with the NSF INCLUDES National Network for increased impact and success.1 The NSF INCLUDES National Network will be created so that organizations and programs, not necessarily funded by NSF, will
also be able to collaborate with Network members for mutual benefit and systemic impact through well-designed "on-ramps."

At the level of an individual Alliance, a "backbone organization" will be required to maximize the probability of success. NSF currently refers to this component of the Alliance as a "mini-backbone" or "vertebrae." Some of its goals might include:

- guide vision and strategy for the Alliance;
- support aligned activities of the partners;
- establish shared measurement practices among the partners;
- build toward the goal and activities among the larger community where the Alliance members operate;
- support implementation research;
- advance policy, operating practices, and relationships among the partners and identify need for mid-course adjustment; and
- mobilize support with partners for the common good.

At the level of the NSF INCLUDES National Network, the activities of all of the Alliances will be coordinated and leveraged for national level progress on broadening participation through the totality of mini-backbones interoperating with a national backbone organization. The backbone of the National Network will need to be designed and structured so as to serve many functions, such as:

- share data, knowledge and best practices among Alliances;
- offer approaches for new organizations to join the NSF INCLUDES National Network;
- provide technical assistance to NSF INCLUDES Alliances;
- monitor progress in broadening participation at the aggregated national level; and
- support the effective use of collective impact-style activities as well as implementation research.
Foundation for Food and Agriculture Research (FFAR)
The 2014 Farm Bill tasked the Foundation for Food and Agriculture Research (FFAR) with "supporting agricultural research activities focused on addressing key problems of national and international significance.

Foundation for Food and Agriculture Research Hires First Director of Development

Dear Colleague Letter: Call for Submission of Conference Proposals to Inform the Design and Success of the Alliances and National Network for NSF INCLUDES

With this DCL, NSF is calling for submission of conference proposals to inform the design of the communications and support structures for how individual NSF INCLUDES Alliances will work together with the NSF INCLUDES National Network. NSF seeks community input and participation in identifying and specifying the most critical design features of both Alliances and the National Network so that they can effectively work together to achieve mutual goals. As such, NSF invites those who have ideas and experiences in building successful large-scale Alliances and Networks (or Networks of Networks) to propose conferences, both face-to-face and virtual, that will bring together various stakeholders who can provide insight on models and designs. In particular, it is expected that representatives of the (soon to be funded) NSF INCLUDES Design and Development Launch Pilots will participate in the conferences, thereby influencing future Alliance proposals and formations. These conference activities will help inform the design and implementation of the NSF INCLUDES National Network as well as how it can function across communities.

In this call for conference proposals, NSF seeks new ideas for leveraging research, effective practices, and emerging technologies to manage the multi-site complexities of Design and Development Launch Pilots, the Alliances, and the NSF INCLUDES National Network. Those ideas would be about how to support vision development, alignment, shared measurement practices, implementation research, evaluation, public support and engagement, policy change and implementation, leveraging of funding, and communication. Each conference proposal should focus on exemplary and/or innovative ideas supported by research for designing an infrastructure that helps to mobilize, coordinate, facilitate and achieve a continuous state of planning, execution and evaluation among the NSF INCLUDES participants. Ideas should build on proven mechanisms of success with technical assistance support structures, resource networks and centers, and other related efforts to create communities of practice.

NSF expects to fund 10-12 conferences, up to $250,000 each, to inform the design of the NSF INCLUDES backbone organization(s) at both the level of Alliances and the National Network. The conferences should be inclusive in terms of presenters and participants, engaging a range of stakeholders and organizations (e.g., representatives from K-12, 2-year and 4-year postsecondary institutions, philanthropic and community-based organizations, and the business sector). The conferences are expected to be equivalent to two to three days of meetings to
focus on possible roles and responsibilities of the **mini-backbones** and **national backbone organization** in each of the key phases of NSF INCLUDES. Conference activities may include contrasting the collective impact model to other models associated with scaling and sustaining innovations designed to address grand challenges in broadening participation in STEM. NSF is open to creative approaches to convening these events, such as virtual meetings, crowd sourcing, social networking, and Wikis.

It is expected that **competitive proposals will address** how the alliances and the network can incorporate novel, innovative features that leverage various kinds of technology resources to advance the NSF INCLUDES initiative. Proposals are expected to address the goals and objectives for the conference activity and the expertise of the investigator(s) and members of the organizing committee especially as their qualifications relate to issues of organizational change, broadening participation, collective impact or similar frameworks. Proposers are also asked to address essential components of the backbone infrastructure for addressing both the short-term and longer-term aspects of NSF INCLUDES at the level of Alliances and/or the National Network (please specify). The conference proposal should also discuss suggested presenters/invitees; proposed topics/sessions/draft agenda, including approaches for assessing feedback from the attendees; strategies for engaging with participant communities; timeline and potential venue; and the framework/outline for the conference report. **It is anticipated that all conferences will be completed by the spring of 2017 and the conference summary reports will be publicly available by early summer of 2017.**

**Dear Colleague Letter: Supporting Research Advances in Microbiomes**

With this Dear Colleague Letter (DCL), the National Science Foundation's (NSF) Directorate for Biological Sciences is announcing its vision to support and encourage microbiome research across the phylogenetic spectrum and biological scales; from host - microbe interactions to ecosystems. NSF BIO will also foster the development of a national research infrastructure to support collaborative science on microbiomes. A Fast Track Action Committee on Mapping the Microbiome (FTAC-MM) established by the National Science and Technology Council (NSTC) in February of 2015 concluded that contemporary microbiome research is "uncovering an unprecedented potential for the application of microorganisms to human, plant, animal, and environmental health; renewable energy production; water treatment; and manufacturing."

NSF BIO encourages proposals that advance discovery in the realm of microbiomes with support through **several programs in fiscal year 2017**. These programs cross the entire BIO Directorate and span basic science through translational research that addresses pressing global challenges and support the development of tools needed for the 21st century. Development of tools and infrastructure to enable new areas of microbiome research will be supported through **programs such as the Enabling Discovery through GEnomic tools (EDGE) in the Division of Integrative Organismal Systems (IOS)**. The first EDGE awards will be made in FY2017 and encourage the development of tools that can impact broad communities of investigators. Projects of interest could include but are not limited to: elucidating fundamental principles by studying multiple microbiomes and across different ecosystems, and the development of computational and modeling tools for studying microbiomes.

**Research proposals in plant - microbe symbiosis and the phytobiomes are being encouraged for support through the new Plant Biotic Interactions (PBI) program jointly**
supported by NSF BIO and the USDA National Institute for Food and Agriculture. The first awards in this program will also be made in FY2017. The scope of the PBI program extends from fundamental mechanisms in model systems to translational efforts that advance agriculture. Exploratory projects that enable the development of breakthrough technologies for animal and plant phenomics and microbiomes are being supported through the EAGER mechanism in collaboration with USDA/NIFA, with awards expected in late FY2016. The Symbiosis, Defense and Self-recognition (SDS) program in IOS supports research in animal - microbe interactions and animal microbiomes as well as symbiotic interactions among microbial communities. SDS also supports research on the virome and animal health and the origins of emerging infectious diseases, an area identified of underinvestment by the FTAC-MM.

Within the Division of Environmental Biology (DEB) all four program clusters (Population and Community Ecology, Evolutionary Processes, Systematics and Biodiversity Science, and Ecosystem Science) support microbiome-related research, in addition to two special programs: Dimensions of Biodiversity and Ecology and Evolution of Infectious Disease. Within the Division of Biological Infrastructure (DBI), the Advances in Biological Informatics (ABI) program supports the development of robust cyberinfrastructure and informatics tools to support the large data analyses as these relate to microbiome research. In the Division of Molecular and Cellular Biosciences (MCB), the Systems and Synthetic Biology Cluster support the application of quantitative and interdisciplinary tools to the study of microbial communities and the microbiome.

Dear Colleague Letter: Improving Graduate Student Preparedness for Entering the Workforce, Opportunities for Supplemental Support

NSF has identified improvement in graduate student preparedness for entering the workforce (http://www.performance.gov/node/40262?view=public#apg) as one of its Agency Priority Goals. As part of this goal, supplemental funding is available in FY 2016 and FY 2017 to support science and engineering doctoral students so that they can acquire the knowledge, experience, and skills needed for highly productive careers, inside and outside of academe. NSF currently invests in a number of graduate student preparedness activities, and has historically encouraged investigators to include such activities in proposals. This Dear Colleague Letter (DCL) describes a variety of opportunities across the Foundation designed to explore approaches that will position NSF-funded graduate students for success in the 21st century Science, Technology, Engineering, and Mathematics (STEM) workforce. NSF will consider support for supplements to existing research awards to enhance professional development opportunities for students in PhD programs as described by each Directorate/Office. These descriptions can be found below. Interested investigators should contact the cognizant program officers listed on the opportunities. Enhanced experience supplements will enable single/collaborative awardees to request appropriate levels of additional support for existing graduate students to acquire professional development experience that will broaden avenues for entering the workforce. These supplements would provide graduate students with the opportunity to augment their research assistantships, and in some cases fellowships and traineeships, with additional "mentoring" activities and short-term training opportunities.
Dear Colleague Letter: Strengthening Research Capacity at Historically Black Colleges and Universities

NSF invites proposers from HBCUs to submit supplemental funding requests to HBCU-UP and other awards that would increase research capacity of faculty and postdoctoral fellows in NSF-supported areas of research. Activities may include, but are not limited to: new directions or appropriate extensions of disciplinary-based research activities; salary support for faculty and postdoctoral fellows; equipment and research supplies; and establishment of research collaborations with national laboratories, NSF-funded centers, industry, or research-intensive institutions. Supplemental requests to HBCU-UP Implementation Projects and Achieving Competitive Excellence (ACE) Implementation projects or other awards should express a vision for how this project will strengthen research capacity that can be sustained at the institution and describe which mechanisms will be put in place to assist faculty in becoming more productive researchers in areas supported by NSF.

Dear Colleague Letter: Innovative Computational Infrastructure for Understanding the Brain

Through this Dear Colleague Letter (DCL), the National Science Foundation (NSF) Directorate for Computer and Information Science and Engineering (CISE) aims to support initial exploratory activities toward the creation of comprehensive shared computational infrastructure solutions that are designed to transform the practice of collaborative neuroscience and enable systematic and grand-scale investigations of the brain and nervous system.

NSF supports fundamental research across the broad spectrum of disciplines associated with Understanding the Brain (see https://www.nsf.gov/brain), and is a partner in the federal "Brain Research through Advancing Innovative Neurotechnologies" (BRAIN) Initiative. In February 2016, NSF announced the intention to foster the development of national research infrastructure for neuroscience (i.e., "National Brain Observatory,” NBO, effort) to support collaborative and team science for achieving a comprehensive understanding of the brain in action and context (NSF 16-047). Please refer to that DCL for NSF’s overall interests and plans for NBO activities.

The present DCL encourages two types of funding requests: (1) Proposals for Conferences (community workshops) that are designed to bring together domain neuroscientists and computational infrastructure developers to explore needs for and opportunities to develop innovative computational infrastructure solutions that transform the practice of neuroscience; and (2) Early-Concept Grants for Exploratory Research (EAGERs) proposals for high risk/high reward innovative concepts and pilot projects that aim to ultimately result in deployment of ambitious, sustainable computational infrastructure resources, capabilities, and services that will enhance and accelerate the neuroscientific discovery process for a broad base of users.
A Review of the Literature to Identify Leading Indicators Related to Hispanic STEM Postsecondary Educational Outcomes

The purpose of this study was to review recent peer-reviewed studies in order to identify malleable factors measured in K–12 settings that are related to students' postsecondary STEM success, particularly for Hispanic students. Postsecondary STEM success was defined as enrollment in, persistence in, and completion of postsecondary STEM majors or degrees. Twenty-three relevant studies were identified, yet only 4 examined K–12 factors predictive of postsecondary STEM success specifically for Hispanic students. The review found that the number of high school mathematics and science courses taken, and the level of those courses is a consistent predictor of postsecondary STEM outcomes for all student subgroups. However, the literature indicates that minority students, including Hispanics, were less likely to take the highest-level mathematics and science courses. Students' interest and confidence in STEM at the K–12 levels was also predictive of postsecondary STEM success. Yet, despite lower levels of postsecondary STEM success, some studies indicate racial/ethnic minority and White students had similar levels of interest and confidence in STEM. The reviewed research suggests that reducing disparities in mathematics and science preparation between Hispanic and White students and increasing the rates at which Hispanic students take high-level mathematics and science classes has promise for informing interventions designed to improve STEM outcomes.

Informal STEM Education: Resources for Outreach, Engagement and Broader Impacts

Organization: Center for Advancement of Informal Science Education, Oregon State University, National High Magnetic Field Laboratory, American Society for Biochemistry and Molecular Biology, University of Washington, Emory University, Lawrence Hall of Science

Description or Abstract: Over the past ten years, investments in infrastructure for informal STEM education and science communication have resulted in significant growth in the number and variety of resources and depth of expertise available to members of the STEM research community wishing to develop outreach, engagement and broader impacts activities. This report/white paper recounts some of the developments that led to the existing synergy between Informal STEM Education (ISE), science communication, and STEM research, provides examples of infrastructure and resources that support this work, and identifies areas of opportunity to close existing gaps between the ISE, STEM research, and science communication communities.
New Funding Opportunities

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

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

New Funding Solicitations Posted Since April 15 Newsletter

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

USDA-NIFA-AFRI-005823 AFRI Food Security Challenge Area
The AFRI Food Security Challenge Area focuses on the societal challenge to keep American agriculture competitive and end world hunger by ensuring the availability and accessibility of safe and nutritious food. The long-term goal of the AFRI Food Security Challenge Area is to sustainably increase agricultural productivity and the availability and accessibility of safe and
nutritious food. Project types supported within this Challenge Area will propose multi-function Integrated Research, Education, and/or Extension Projects, Food and Agricultural Science Enhancement (FASE) Grants, and conferences and/or workshops. **Priority Area:** New Frontiers in Pollinator Health: From Research to Application. **Due July 7.**

**2016-NIST-NICE-01 Regional Alliances and Multistakeholder Partnerships to Stimulate (RAMPS) Cybersecurity Education and Workforce Development**
The National Initiative for Cybersecurity Education, led by NIST, is soliciting applications from eligible applicants for the establishment of state or regional consortia to identify cybersecurity workforce development pathways that address local workforce needs. **Due July 12.**

**DARPA-BAA-16-39 TRADES**
The Defense Sciences Office (DSO) at the Defense Advanced Research Projects Agency (DARPA) is soliciting innovative ideas to transform design, enabling designs that are unimaginable today. DSO is specifically interested in fundamental research to develop new mathematics and algorithms that enable full incorporation of new materials and fabrication methods in design. Proposed research should investigate innovative approaches that enable revolutionary advances in design. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of practice. **Due July 26.**

**USDA-NIFA-AFRI-005822 Agriculture and Food Research Initiative: Water for Agriculture Challenge Area**
This AFRI Challenge Area addresses critical water resources issues such as drought, excess soil moisture, flooding, quality and others in an agricultural context. Funding will be used to develop management practices, technologies, and tools for farmers, ranchers, forest owners and managers, public decision makers, public and private managers, and citizens to improve water resource quantity and quality. The long-term goal of the AFRI Water for Agriculture Challenge Area is to tackle critical water issues by developing both regional systems for the sustainable use and reuse, flow and management of water, and at the watershed and farm scales, water issues focused on production and environmental sustainability efforts. Project types supported within this Challenge area are multi-function Integrated Research, Education, and/or Extension Projects and Food and Agricultural Enhancement Grants. **Due August 4.**

**Prediction of and Resilience against Extreme Events National Science Foundation**
Natural disasters cause thousands of deaths annually, and in 2013 alone caused over $130 billion in damage worldwide. There is clear societal need to better understand and mitigate the risks posed to the US by natural hazards, consistent with the mandate of the National Science Foundation (NSF); to promote the progress of science [and] advance the national health, prosperity, and welfare; NSF and the Directorate for Geosciences (GEO) have long supported basic research in scientific and engineering disciplines necessary to understand natural hazards and extreme events, including through the Interdisciplinary Research in Hazards and Disasters (Hazards SEES) program and multiple core programs in the GEO Directorate. PREEVENTS is designed as a logical successor to Hazards SEES and is one element of the NSF-wide Risk and Resilience activity, which has the overarching goal of improving predictability and risk.
assessment, and increasing resilience, in order to reduce the impact of extreme events on our life, society, and economy. PREEVENTS will provide an additional mechanism to support research and related activities that will improve our understanding of the fundamental processes underlying natural hazards and extreme events in the geosciences. PREEVENTS is focused on natural hazards and extreme events, and not on technological or deliberately human-caused hazards. The PREEVENTS portfolio will include the potential for disciplinary and multidisciplinary research at all scales, particularly aimed at areas ripe for significant near- or medium-term advances. PREEVENTS seeks projects that will (1) enhance understanding of the fundamental processes underlying natural hazards and extreme events on various spatial and temporal scales, as well as the variability inherent in such hazards and events, and (2) improve our capability to model and forecast such hazards and events. All projects requesting PREEVENTS support must be primarily focused on these two targets. In addition, PREEVENTS projects will improve our understanding of the effects of natural hazards and extreme events and will enable development, with support by other programs and organizations, of new tools to enhance societal preparedness and resilience against such impacts. Due September 19.

**AFRI Sustainable Bioenergy and Bioproducts RFA**

In the Agriculture and Food Research Initiative Sustainable Bioenergy and Bioproducts (SBEBP) Challenge Area specific program areas are designed to achieve the long term outcome of reducing the national dependence on foreign oil through the development and production of regionally-appropriate sustainable bioenergy systems that materially deliver advanced liquid transportation biofuels, biopower, and bioproducts. In FY2016, the SBEBP is soliciting applications in the following priority areas: (1) Regional Bioenergy Coordinated Agricultural Projects (CAPs) that focus on the production and delivery of regionally-appropriate sustainable biomass feedstocks for bioenergy and bioproducts. While the focus of CAPs will be on feedstocks, competitive proposals must present the feedstock development and production in the context of a comprehensive regional sustainable bioenergy and bioproducts supply chain systems; and (2) Investing in America’s Scientific Corps: Preparing a New Generation of Students, Faculty, and Workforce for Emerging Challenges in Bioenergy, Bioproducts, and the Bioeconomy. The anticipated amount available for grants in FY 2016 is approximately $21 million. Due September 22.

**20160929-FT Summer Stipends National Endowment for the Humanities**

Summer Stipends support individuals pursuing advanced research that is of value to humanities scholars, general audiences, or both. Eligible projects usually result in articles, monographs, books, digital materials and publications, archaeological site reports, translations, editions, or other scholarly resources. Summer Stipends support continuous full-time work on a humanities project for a period of two consecutive months. Summer Stipends support projects at any stage of development. Due September 29.

**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-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.**

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

- [HHS Grants Forecast](#)
- [American Cancer Society Index of Grants](#)
- [SAMHSA FY 2014 Grant Announcements and Awards](#)
- [DARPA Microsystems Technology Office Solicitations](#)
- [Open Solicitations from IARPA (Intelligence Advanced Research Projects Activity)](#)
- [Bureau of Educational and Cultural Affairs, Open Solicitations, DOS](#)
- [ARPA-E Funding Opportunity Exchange](#)
- [DOE Funding Opportunity Exchange](#)
- [NIAID Funding Opportunities List](#)
- [NPS Broad Agency Announcements (BAAs)](#)
- [NIJ Current Funding Opportunities](#)
- [NIJ Forthcoming Funding Opportunities](#)
- [Engineering Information Foundation Grant Program](#)
- [Comprehensive List of Collaborative Funding Mechanisms, NORDP](#)
- [ARL Funding Opportunities — Open Broad Agency Announcements (BAA)](#)
- [HHS Grants Forecast](#)
- [American Psychological Association, Scholarships, Grants and Awards](#)
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Solicitations Remaining Open from Prior Issues of the Newsletter

**Air Force Fiscal Year 2017 Young Investigator Research Program (YIP)**
The Fiscal Year 2017 Air Force Young Investigator Research Program (YIP) intends support for scientists and engineers who have received Ph.D. or equivalent degrees 1 April 2011 or later that show exceptional ability and promise for conducting basic research. The program objective is to foster creative basic research in science and engineering; enhance early career development of outstanding young investigators; and increase opportunities for the young investigator to recognize the Air Force mission and related challenges in science and engineering. Individual awards are made to U.S. institutions of higher education, industrial laboratories, or non-profit research organizations where the principal investigator is employed on a full-time basis and holds a regular position. YIP primary investigators must be a U.S. citizen, national, or permanent resident. Researchers working at a Federally Funded Research and Development Center or DoD Laboratory are not eligible for this competition. Most YIP awards are funded at $120,000 per year for three years, for a total of $360,000. Exceptional proposals will be considered individually for higher funding levels and/or longer duration. Please review the remainder of this announcement for additional information. We anticipate approximately fifty (50) awards under this competition if funds are available. **Due June 1.**

**NSF/USDA/NIFA Plant-Biotic Interactions**
The Plant-Biotic Interactions (PBI) program supports research on the processes that mediate beneficial and antagonistic interactions between plants and their viral, bacterial, oomycete,
fungal, plant, and invertebrate symbionts, pathogens and pests. This joint NSF-NIFA program supports projects focused on current and emerging model and non-model systems, and agriculturally relevant plants. The program scope extends from fundamental mechanisms to translational efforts, with the latter seeking to put into agricultural practice insights gained from basic research on the mechanisms that govern plant-biotic interactions. Projects must be strongly justified in terms of fundamental biological processes and/or relevance to agriculture and may be purely fundamental or applied, or include aspects of both perspectives. All types of symbiosis are appropriate, including commensalism, mutualism, parasitism, and host-pathogen interactions. Research may focus on the biology of the plant host, its pathogens, pests or symbionts, interactions among these, or on the function of plant-associated microbiomes. The program welcomes proposals on the dynamics of initiation, transmission, maintenance and outcome of these complex associations, including studies of metabolic interactions, immune recognition and signaling, host-symbiont regulation, reciprocal responses among interacting species and mechanisms associated with self/non-self recognition such as those in pollen-pistil interactions. Explanatory frameworks may include molecular, genomic, metabolic, cellular, network and organismal processes, with projects guided by hypothesis and/or discovery driven experimental approaches. Where appropriate, quantitative modeling in concert with experimental work is encouraged. Overall, the program seeks to support research that will deepen our understanding of the fundamental processes that mediate interactions between plants and the organisms with which they intimately associate and advance the application of that fundamental knowledge to benefit agriculture. Note that PBI does not require submission of preliminary proposals. Due June 6.

**NOAA-NWS-NWSPO-2017-2004858 NOAA Science Collaboration Program**
The NOAA Science Collaboration Program (NSCP/$75 million) represents an effort to support the development of undergraduate, graduate, and postdoctoral researchers and scientists with expertise in NOAA-related sciences. This will be accomplished through collaborations between these scientists and professionals in areas of mutual interest across the full spectrum of NOAA sciences. It is expected that some of the scientists will collaborate onsite at NOAA facilities and laboratories. NOAA will also support associated workshops that will serve to further enhance collaborative relationships. Through this funding opportunity, NOAA is also interested in supporting complementary earth-systems modeling efforts in areas such as hydrology and coastal dynamics which can serve as a catalyst for collaborations between NOAA professionals and scientists supported through this program. NOAA will support social science research that evaluates the impact of NOAA-related science to society and seeks to find ways to determine how environmental and related sciences can be communicated and utilized more effectively to protect life and property, assist decision makers, and enhance economic development. Due June 13.

**US Ignite: Networking Research and Application Prototypes Leading to Smart & Connected**
US Ignite is an initiative that seeks to promote US leadership in the development and deployment of next-generation gigabit applications with the potential for significant societal impact. The primary goal of US Ignite is to break a fundamental deadlock: there is insufficient investment in gigabit applications that can take advantage of advanced network infrastructure
because such end-to-end infrastructure is rare and geographically dispersed. And conversely, there is a lack of broad availability of advanced broadband infrastructure for open experimentation and innovation because there are few advanced applications and services to justify it. US Ignite aims to break this deadlock by providing incentives for imagining, prototyping, and developing gigabit applications that address national priorities, and by leveraging and extending this network testbed across US college/university campuses and cities.

This solicitation builds on the experience and community infrastructure gained from initial US Ignite activities to further engage the US academic research and non-profit communities along with local cities, municipalities, and regions in exploring the challenges of developing and applying next-generation networking to problems of significant public interest and benefit. In particular, this solicitation has two focus areas: the first encourages the development of application ideas and prototypes addressing national priority areas that explore new uses for high-speed networks and give rise to the Smart & Connected Communities of the future, as well as novel networking and application paradigms; and the second pursues fundamental research advances in networking technology and protocols that will further both the capabilities and our understanding of gigabit networking infrastructure to meet current and future application demands. In 2016, NSF is also working with the U.S. Department of Justice (DOJ) Office for Access to Justice (ATJ) to identify additional application ideas and prototypes and basic research directions that may serve national priority areas of mutual interest. Due June 14.

**Small Business Innovation Research Program Phase I (SBIR) - June 2016 Submission**

The Small Business Innovation Research (SBIR) Program is intended to stimulate technological innovation in the private sector by strengthening the role of small business concerns in meeting Federal research and development needs, increasing the commercial application of federally supported research results, and fostering and encouraging participation by socially and economically disadvantaged and women-owned small businesses. The SBIR/STTR program solicits proposals from the small business sector consistent with NSF's mission. The program is governed by Public Law 112-81 (SBIR/STTR Reauthorization Act of 2011). SBIR/STTR policy is provided by the Small Business Administration (SBA) through the SBA Policy Directive. A main purpose of the legislation is to stimulate technological innovation and increase private sector commercialization. The NSF SBIR/STTR program is therefore in a unique position to meet both the goals of NSF and the purpose of the SBIR/STTR legislation by transforming scientific discovery into both social and economic benefit, and by emphasizing private sector commercialization. Due June 16.

**PD-16-7680 Broadening Participation in Engineering**

The Broadening Participation in Engineering (BPE) Program is a Directorate-wide initiative dedicated to supporting the development of a diverse and well-prepared engineering workforce. Across every educational juncture (e.g., elementary, secondary, and postsecondary levels), efforts to improve engineering interests, preparation, connections, experiences, and opportunities among underrepresented groups is of major importance to BPE.
In FY 2016, aligned with NSF-wide INCLUDES, BPE is interested in funding projects that bring together multiple groups (e.g., school districts, community colleges, engineering schools, industry, philanthropy, government, etc.) and offer the greatest return on investment by producing outcomes that are scalable, sustainable, and applicable to various contexts, settings, and demographics within the engineering enterprise. For example, it is interested research projects that help us to analyze and understand the problem of insufficient interest and poorly sustained participation in engineering across underrepresented demographic groups; insignificant preparation and scarce opportunities for members of underrepresented demographic groups to learn meaningful, relevant engineering and other STEM-related content; insufficient access to support systems and social networks that raises career awareness about different engineering pathways among underrepresented groups; and structural inequalities and biases within educational and workforce systems that may influence engineering persistence.

For FY 2016, BPE is equally interested in funding demonstration projects that focus on issues associated with diversity within the engineering professoriate, with a particular interest in proposals concentrating on racial and ethnic minorities. Such projects should be informed by the current theoretical and scientific literature as well as add to the extant knowledge base. Given the breadth of targeted groups, it is expected that all institutions of higher learning (i.e., 2-year and 4-year) have at least one if not more targeted demographics that they could propose a strategy for improving diversity (e.g., creation of a professoriate preparation program for graduate students, development of a postdoctoral program, or creation of a mentoring program for early career faculty).

A successful proposal should, therefore, provide appropriate data to support selection of the targeted group(s), with specific and applicable objectives, demonstrate applicable knowledge of the relevant literature on underrepresentation and describe a clear strategy for improving representation. These demonstration projects should also integrate assessment and evaluation protocols capable of measuring how well they achieve their stated objectives as part of the project management plans. The effectiveness of the proposed evaluation is one aspect of a project’s intellectual merit. Similarly, there should be evidence of clear, measureable outcomes and consideration of how the strategy will work for disparate institutions. It is expected that proposed projects would advance our knowledge of this field in many ways.

In closing, before submitting a research or demonstration project proposal to the BPE program, prospective PIs are strongly encouraged to speak to the program director to obtain guidance as to whether the proposed ideas are aligned with the strategic goals of the BPE. It is also strongly recommended that proposals be submitted to the BPE not later than the Full Proposal Target Date of June 16 to enable full consideration of the proposed project for the related fiscal year's funding.

**Materials Research Science and Engineering Centers**

Materials Research Science and Engineering Centers (MRSECs) provide sustained support of interdisciplinary materials research and education of the highest quality while addressing fundamental problems in science and engineering. MRSECs address research of a scope and complexity requiring the scale, synergy, and interdisciplinarity provided by a campus-based research center. They support materials research infrastructure in the United States, promote
active collaboration between universities and other sectors, including industry and international institutions, and contribute to the development of a national network of university-based centers in materials research, education, and facilities. A MRSEC may be located at a single institution, or may involve multiple institutions in partnership. Preliminary July 1; full December 2.

**PA-AFRL-AFOSR-2016-0001 Fiscal Year 2017 Defense University Research Instrumentation Program (DURIP)**

The Department of Defense (DoD) announces the Fiscal Year 2017 Defense University Research Instrumentation Program (DURIP). DURIP is designed to improve the capabilities of accredited United States (U.S.) institutions of higher education to conduct research and to educate scientists and engineers in areas important to national defense, by providing funds for the acquisition of research equipment or instrumentation. For-profit organizations are not eligible for DURIP funding. This announcement seeks proposals from universities to purchase equipment and instrumentation in support of research in areas of interest to the DoD. DoD interests include the areas of research supported by the Army Research Office (ARO), the Office of Naval Research (ONR), and the Air Force Office of Scientific Research (AFOSR), hereafter generally referred to collectively as “we, our, us, or administering agency.” Each administering agency will make grant awards to fund the purchase of research equipment or instrumentation costing $50,000 or more that cannot typically be purchased within the budgets of single-investigator awards. We generally cannot make any individual award that exceeds more than $1,500,000 in DoD funding unless your proposal qualifies for an exception. We intend to award approximately $47 million this competition, subject to availability of funds. DURIP awards are typically one year in length. DURIP is part of the University Research Initiative (URI). All the application forms you need are available electronically on Grants.gov. We will not provide paper copies of this announcement, or accept paper applications. All applications must be submitted electronically through Grants.gov. Due July 22.

**Joint DMS/NIGMS Initiative to Support Research at the Interface of the Biological and Mathematical Sciences (DMS/NIGMS)**

The Division of Mathematical Sciences in the Directorate for Mathematical and Physical Sciences at the National Science Foundation and the National Institute of General Medical Sciences at the National Institutes of Health plan to support research in mathematics and statistics on questions in the biological and biomedical sciences. Both agencies recognize the need and urgency for promoting research at the interface between the mathematical sciences and the life sciences. This program is designed to encourage new collaborations, as well as to support existing ones. Due September 14.

**Bridges to the Baccalaureate (R25)**

The NIH Research Education Program (R25) supports research education activities in the mission areas of the NIH. The over-arching goal of this NIGMS R25 program is to support educational activities that enhance the diversity of the biomedical, behavioral and clinical research workforce. To accomplish the stated over-arching goal, this FOA will support creative educational activities with a primary focus on Courses for Skills Development, Research
Experiences, and Curriculum or Methods Development. A proposed program must include each activity and describe how they will be integrated. The Bridges to Baccalaureate Program is intended to provide these activities to community college students to increase transfer and retention to BS graduation in biomedical sciences. This program requires partnerships between community colleges or other two-year post-secondary educational institutions granting the associate degree with colleges or universities that offer the baccalaureate degree. Applicants should directly address how the set of activities will complement and/or enhance the training of a workforce to meet the nation’s biomedical and clinical research needs by discussing 1) the rationale underlying the balance of effort and resources dedicated to each activity; 2) how the activities integrate; and 3) objective indicators that can measure the effectiveness of the program. Recruitment and retention plans are required elements of the program. Due September 25.

**Bridges to the Doctorate (R25)**
The NIH Research Education Program (R25) supports research education activities in the mission areas of the NIH. The over-arching goal of this NIGMS R25 program is to support educational activities that enhance the diversity of the biomedical, behavioral and clinical research workforce. To accomplish the stated over-arching goal, this FOA will support creative educational activities with a primary focus on Courses for Skills Development and Research Experiences. The Bridges to Doctorate Program is intended to provide these activities to master’s level students to increase transition to and completion of PhDs in biomedical sciences. This program requires partnerships between master’s degree-granting institutions with doctorate degree-granting institutions. Applicants should directly address how the set of activities will complement and/or enhance the training of a diverse workforce that also meets the nation’s biomedical and clinical research needs by discussing 1) the rationale underlying the balance of effort and resources dedicated to each activity; 2) how the activities integrate; and 3) objective indicators that can measure the effectiveness of the program. A program application must include each activity, and describe how they will be synergized to make a comprehensive program. Additionally, recruitment and retention plans are expected as part of the application. Due September 25.

**N00014-16-R-F005 Multidisciplinary Research Program of the University Research Initiative Department of Defense Office of Naval Research**
The MURI program supports basic research in science and engineering at U.S. institutions of higher education (hereafter referred to as "universities") that is of potential interest to DoD. The program is focused on multidisciplinary research efforts where more than one traditional discipline interacts to provide rapid advances in scientific areas of interest to the DoD. As defined in the DoD Financial Management Regulation: Basic research is systematic study directed toward greater knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications towards processes or products in mind. It includes all scientific study and experimentation directed toward increasing fundamental knowledge and understanding in those fields of the physical, engineering, environmental, and life sciences related to long-term national security needs. It is farsighted high payoff research that provides the basis for technological progress (DoD 7000.14-R, vol. 2B,
DoD’s basic research program invests broadly in many specific fields to ensure that it has early cognizance of new scientific knowledge. The FY 2017 MURI competition is for the topics listed below. Detailed descriptions of the topics and the Topic Chief for each can be found in Section VIII, entitled, “Specific MURI Topics,” of this FOA. The detailed descriptions are intended to provide the offeror a frame of reference and are not meant to be restrictive to the possible approaches to achieving the goals of the topic and the program. Innovative ideas addressing these research topics are highly encouraged. White papers and full proposals addressing the following topics should be submitted to the Air Force Office of Scientific Research (AFOSR): Topic 1 (AFOSR): Foundations of Interactive Protocols for Quantum Computation and Communications Topic 2 (AFOSR): Bioinspired Low-Energy Information Processing Topic 3 (AFOSR): Autonomous Research Systems for Materials Development Topic 4 (AFOSR): Beam/Wave Dynamics in Geometrically Complex Systems with Emitting Boundaries Topic 5 (AFOSR): Atmospheric disturbances at high altitudes Topic 6 (AFOSR): Revolutionary Advances in Computational Quantum Many Body Physics Topic 7 (AFOSR): Melanin: Unique Biopolymers for Functional Precision Nanoscale Materials Topic 8 (AFOSR): Adaptive Oxides for Biomimetic Synapse Design via Modulation of Internal States White papers and full proposals addressing the following topics should be submitted to the Office of Naval Research (ONR): Topic 9 (ONR): Physics, Chemistry and Mechanics of Polymer Dielectric Breakdown Topic 10 (ONR): Percept formation and scene analysis in echolocating systems Topic 11 (ONR): Phase Change Materials for Photonics Topic 12 (ONR): Event Representation and Episodic Memory Topic 13 (ONR): Nonlinear Phenomena and Interactions Induced by Short and Ultra-Short Pulsed Lasers in the Long-Wave Infrared Regime Topic 14 (ONR): High-Fidelity Simulation Methodologies for Multi-Phase Flows Topic 15 (ONR): Novel Approaches to Modeling Factions and Conflict Topic 16 (ONR): Assuring Composability and Correctness for Intelligent and Learning Systems that Interact with Unstructured Physical Environments White papers and full proposals addressing the following topics should be submitted to the Army Research Office (ARO): Topic 17 (ARO): Additive 3D Self-Assembly of Responsive Materials Topic 18 (ARO): Anyons in 2D materials and cold Atomic gases Topic 19 (ARO): Characterization of Information Content in Data for Multimodal Data Analysis Topic 20 (ARO): Nutritional and Environmental Effects on the Gut Microbiome and Cognition Topic 21 (ARO): Spectral Decomposition and Control of Strongly Coupled Nonlinear Interacting Systems Topic 22 (ARO): Toward Room Temperature Exciton-Polaritonics Topic 23 (ARO): Cyber Deception through Active Leverage of Adversaries’ Cognition Process Proposals from a team of university investigators are warranted when the necessary expertise in addressing the multiple facets of the topics may reside in different universities, or in different departments in the same university. By supporting multidisciplinary teams, the program is complementary to other DoD basic research programs that support university research through single-investigator awards. Proposals shall name one Principal Investigator (PI) as the responsible technical point of contact. Similarly, one institution shall be the primary awardee for the purpose of award execution. The PI shall come from the primary institution. The relationship among participating institutions and their respective roles, as well as the apportionment of funds including sub-awards, if any, shall be described in both the proposal text and the budget. For topic 19, proposals are invited that include participation from UK academic institutions (see Section III.2); however, UK participation is not a requirement. In the case of proposals with UK participation,
there still should be a single US primary institution and one PI submitting the overall proposal. However, funding for the UK participation will be allocated separately by the UK government. **Due November 15.**

**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.]

The United States Agency for International Development (USAID) is seeking concept papers from qualified U.S. and non-U.S. higher education institutions (HEIs) to work with USAID to advance strategic priorities and objectives and achieve sustainable development outcomes, results, and impact. This Annual Program Statement (APS) has the flexibility to award Cooperative Agreements, Grants, Fixed Amount Awards, and leader with Associate Awards. This APS is not supported by specific funding, and any funding for any USAID-HEI partnership proposed under this APS would have to be requested from the specific USAID Mission, Bureau, or Independent Office with which the prospective applicant seeks to collaborate and to which the Concept Paper will be submitted. USAID seeks to optimize its relationship with HEIs by identifying and promoting successful partnerships and collaboration models, and increasing USAID’s access to higher education technical resources. The purpose of this APS is to promote opportunities for leveraging HEI capabilities across USAID’s portfolio and its program cycle, and strengthen developing country HEI capabilities to respond to and solve critical development challenges. **Original Closing Date for Applications: Jun 29, 2016**

**DARPA-BAA-15-39 DSO Office-wide BAA Department of Defense**
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 important, radically new, game-changing technologies for U.S. national security. In support of this mission, this DSO Office-wide BAA invites proposers to submit innovative basic or applied research concepts in one or more of the following technical areas: Physical Systems; Mathematics, Modeling and Design; and Human-Machine Systems. Each of these areas is described below and includes a list of example research topics. For each technical area addressed, proposed research should 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 2, 2016.**

**FY 2016 Continuation of Solicitation for the Office of Science Financial Assistance Program**
The Office of Science (SC) of the Department of Energy hereby announces its continuing
interest in receiving grant applications for support of work in the following program areas: Advanced Scientific Computing Research, Basic Energy Sciences, Biological and Environmental Research, Fusion Energy Sciences, High Energy Physics, and Nuclear Physics. On September 3, 1992, DOE published in the Federal Register the Office of Energy Research Financial Assistance Program (now called the Office of Science Financial Assistance Program), 10 CFR 605, as a Final Rule, which contained a solicitation for this program. Information about submission of applications, eligibility, limitations, evaluation and selection processes and other policies and procedures are specified in 10 CFR 605. This Funding Opportunity Announcement (FOA), DE-FOA-0001414, is our annual, broad, open solicitation that covers all of the research areas in the Office of Science and is open throughout the Fiscal Year. **This FOA will remain open until September 30, 2016, 11:59 PM Eastern Time, or until it is succeeded by another issuance, whichever occurs first.**

**DoD USAMRMC FY16 Broad Agency Announcement for Extramural Medical Research**

The U.S. Army Medical Research and Materiel Command’s (USAMRMC) mission is to provide solutions to medical problems of importance to the American Service member at home and abroad, as well as to the general public at large. The scope of this effort and the priorities attached to specific projects are influenced by changes in military and civilian medical science and technology, operational requirements, military threat assessments, and national defense strategies. The extramural research and development programs play a vital role in the fulfillment of the objectives established by the USAMRMC. General information on USAMRMC can be obtained at [https://mrmc.detrick.army.mil/](https://mrmc.detrick.army.mil/). This Fiscal Year 2016 (FY16) Broad Agency Announcement (BAA) is intended to solicit extramural research and development ideas and is issued under the provisions of the Competition in Contracting Act of 1984 (Public Law 98-369), as implemented in Federal Acquisition Regulation (FAR) 6.102(d)(2) and 35.016. In accordance with FAR 35.016, projects funded under this BAA must be for basic and applied research and that part of development not related to the development of a specific system or hardware procurement. Projects must be for scientific study and experimentation directed toward advancing the state-of-the-art or increasing knowledge or understanding rather than focusing on a specific system or hardware solution. Research and development funded through this BAA is intended and expected to benefit and inform both military and civilian medical practice and knowledge. This BAA provides a general description of USAMRMC’s research and development programs, including research areas of interest, evaluation and selection criteria, pre-proposal/pre-application and full proposal/application preparation instructions, and general administrative information. Specific submission information and additional administrative requirements can be found in the document titled “General Submission Instructions” available in Grants.gov along with this BAA. This FY16 BAA is continuously open for a 12-month period, from October 1, 2015 through September 30, 2016, at 11:59 p.m. Eastern Time. Submission of a pre-proposal/pre-application is required and must be submitted through the electronic Biomedical Research Application Portal (eBRAP) ([https://eBRAP.org/](https://eBRAP.org/)). Pre-proposals/pre-applications may be submitted at any time throughout the 12-month period. If the USAMRMC is interested in receiving a full proposal/application, the PI will be sent an invitation to submit via eBRAP. A full proposal/application must be submitted through Grants.gov
Invited full proposals/applications can be submitted under the FY16 BAA through September 30, 2016.

**W912HZ-16-BAA-01 2016 Broad Agency Announcement Department of Defense Engineer Research and Development Center**

The U.S. Army Engineer Research and Development Center (ERDC) has issued a Broad Agency Announcement (BAA) for various research and development topic areas. The ERDC consists of the Coastal and Hydraulics Lab (CHL), the Geotechnical and Structures Lab (GSL), the Environmental Lab (EL), and the Information Technology Lab (ITL) in Vicksburg, Mississippi; the Cold Regions Research and Engineering Lab (CRREL) in Hanover, New Hampshire; the Construction Engineering Research Lab (CERL) in Champaign, Illinois; and the Topographic Engineering Center (TEC) in Alexandria, Virginia. The ERDC is responsible for conducting research in the broad fields of hydraulics, dredging, coastal engineering, instrumentation, oceanography, remote sensing, geotechnical engineering, earthquake engineering, soil effects, vehicle mobility, self-contained munitions, military engineering, geophysics, pavements, protective structures, aquatic plants, water quality, dredged material, treatment of hazardous waste, wetlands, physical/mechanical/chemical properties of snow and other frozen precipitation, infrastructure and environmental issues, computer science, telecommunications management, energy, facilities maintenance, materials and structures, engineering processes, environmental processes, land and heritage conservation, and ecological processes. The BAA is available at [http://erdc.usace.army.mil](http://erdc.usace.army.mil) and is open until superseded. Proposals may be accepted at any time. For questions regarding proposals to CHL, EL, GSL, TEC & ITL, contact Mike Lee at 601-634-3903 or via email at Michael.G.Lee@usace.army.mil. For questions regarding proposals to CERL, contact Wanda Huber at 217-373-6730 or via email at Wanda.L.Huber@usace.army.mil or Andrea Krouse at 217-373-6746 or via email at Andrea.J.Krouse@usace.army.mil. For questions regarding proposals at CRREL, contact Ashley Jenkins at 217-373-7297 or via email at Ashley.M.Jenkins@usace.army.mil. Contact the technical personnel listed at the end of each topic area for questions concerning the topic areas themselves. **Open until January 31, 2017.**

**Open Solicitations from IARPA (Intelligence Advanced Research Projects Activity)**

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

This Broad Agency Announcement (BAA), which sets forth research areas of interest to the Army Research Laboratory (ARL) Directorates and Army Research Office (ARO), is issued under the paragraph 6.102(d)(2) of the Federal Acquisition Regulation (FAR), which provides for the competitive selection of basic research proposals. Proposals submitted in response to this BAA and selected for award are considered to be the result of full and open competition and in full compliance with the provision of Public Law 98-369, "The Competition in Contracting Act of 1984" and subsequent amendments. **Open June 1, 2012 to March 31, 2017.**

**W911NF-12-R-0012 Army Research Office Broad Agency Announcement for Basic and Applied Scientific Research**
The purpose of this Broad Agency Announcement (BAA) is to solicit research proposals in the engineering, physical, life, and information sciences for submission to the Army Research Office (ARO) for consideration for possible funding. For ease of reference, this BAA is an extraction of the ARO sections of the Army Research Laboratory BAA. (www.arl.army.mil/www/default.cfm?page=8). Open to May 31, 2017

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

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

HM0210-14-BAA-0001 National Geospatial-Intelligence Agency Academic Research Program
NGA welcomes all innovative ideas for path-breaking research that may advance the GEOINT mission. The NGA mission is to provide timely, relevant, and accurate geospatial intelligence (GEOINT) in support of national security objectives. GEOINT is the exploitation and analysis of imagery and geospatial information to describe, assess, and visually depict physical features and geographically referenced activities on the Earth. GEOINT consists of imagery, imagery intelligence, and geospatial information. NGA offers a variety of critical GEOINT products in support of U.S. national security objectives and Federal disaster relief, including aeronautical, geodesy, hydrographic, imagery, geospatial and topographical information. The NGA Academic Research Program (NARP) is focused on innovative, far-reaching basic and applied research in science, technology, engineering and mathematics having the potential to advance the GEOINT mission. The objective of the NARP is to support innovative, high-payoff research that provides the basis for revolutionary progress in areas of science and technology affecting the needs and mission of NGA. This research also supports the National System for Geospatial Intelligence (NSG), which is the combination of technology, systems and organizations that gather, produce, distribute and consume geospatial data and information. This research is aimed at advancing GEOINT capabilities by improving analytical methods, enhancing and expanding systems capabilities, and leveraging resources for common NSG goals. The NARP also seeks to improve education in scientific, mathematics, and engineering skills necessary to advance GEOINT capabilities. It is NGA’s intent to solicit fundamental research under this BAA. Fundamental research means basic and applied research in science and engineering, the results of which ordinarily are published and shared broadly within the scientific community, as distinguished from proprietary research and from Industrial development, design, production, and product utilization, the results of which ordinarily are restricted for proprietary or national security reason. (National Security Decision Directive (NSDD) 189, National Policy on the Transfer of Scientific, Technical, and Engineering Information). NGA seeks proposals from eligible U.S.
institutions for path-breaking GEOINT research in areas of potential interest to NGA, the DoD, and the Intelligence Community (IC). Open to September 30, 2017.

NOAA-NFA-NFAP0-2016-2004791 FY2016 to FY2017 NOAA Broad Agency Announcement
This notice is not a mechanism to fund existing NOAA awards. The purpose of this notice is to request applications for special projects and programs associated with NOAA’s strategic plan and mission goals, as well as to provide the general public with information and guidelines on how NOAA will select proposals and administer discretionary Federal assistance under this Broad Agency Announcement (BAA). This BAA is a mechanism to encourage research, education and outreach, innovative projects, or sponsorships that are not addressed through our competitive discretionary programs. Funding for activities described in this notice is contingent upon the availability of Fiscal Year 2016 and Fiscal Year 2017 appropriations. Applicants are hereby given notice that funds have not yet been appropriated for any activities described in this notice. Publication of this announcement does not oblige NOAA to review an application beyond an initial administrative review, or to award any specific project, or to obligate any available funds. Open to September 30, 2017.

NOAA-OAR-SG-2016-2004772 National Sea Grant College Program 2016-17 Special Projects
The purpose of this notice is to request proposals for special projects associated with the National Sea Grant College Program’s (Sea Grant) strategic focus areas, and to provide the general public with information and guidelines on how Sea Grant will select proposals and administer Federal assistance under this announcement. This announcement is a mechanism to encourage research or other projects that are not normally funded through Sea Grant national competitions. This opportunity is open only to Sea Grant Programs. Section III of this announcement describes eligibility requirements in more detail. Funding has not yet been made available to support applications submitted to this Federal Funding Opportunity (FFO), but such funding may become available during the year. Section II.A. below describes individual competition announcements that will be used to announce when funding is available; any restrictions or requirements on such funding, such as matching funds; and other funding details. Awards will be made under this FFO only if funds have been announced as provided in this FFO. Open to September 30, 2017.

BAA-16-100-SOL-00002 Broad Agency Announcement (BAA) for the Advanced Development of Medical Countermeasures for Pandemic Influenza- BARDA
authorsizes BARDA to (i) conduct ongoing searches for, and support calls for, potential qualified countermeasures and qualified pandemic or epidemic products; (ii) direct and coordinate the countermeasure and product advanced research and development activities of the Department of Health and Human Services; (iii) establish strategic initiatives to accelerate countermeasure and product advanced research and development (which may include advanced research and development for purposes of fulfilling requirements under the Federal Food, Drug, and Cosmetic Act or section 351 of this Act) and innovation in such areas as the Secretary may identify as priority unmet need areas; and (iv) award contracts, grants, cooperative agreements, and enter into other transactions, for countermeasure and product advanced research and development.

Development Area of Interest: The purpose of this BAA is to solicit proposals that focus on one or more of the following area of interest as listed below: Development Area of Interest; Personal Protective Equipment (Mask and Respirators) for Influenza Infection for All-Hazards; Full-Featured Continuous Ventilators for Influenza and All-Hazards; Influenza Test Systems and Diagnostic Tools; Influenza Therapeutics; Influenza Vaccines BARDA anticipates that research and development activities awarded from this Broad Agency Announcement (BAA) will serve to advance the knowledge and scientific understanding of candidates' to protect the civilian population of the United States against pandemic influenza and serve to advance candidate medical countermeasures towards licensure or approval by the Food and Drug Administration (FDA). **Open to Oct. 24, 2017.**

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

**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
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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.

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

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

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

**HDTRA1-14-24-FRCWMD-BAA Fundamental Research to Counter Weapons of Mass Destruction**
**Fundamental Research BAA posted on 20 March 2015.** Potential applicants are strongly encouraged to review the BAA in its entirety. **Please note that ALL general correspondence for this BAA must be sent to HDTRA1-FRCWMD-A@dtra.mil. Thrust Area-specific correspondence must be sent to the applicable Thrust Area e-mail address listed in Section 7:**
Agency Contacts. **Open to Sept. 30, 2019.**

**BAA-RQKH-2015-0001 Methods and Technologies for Personalized Learning, Modeling and Assessment Air Force -- Research Lab**
The Air Force Research Laboratories and 711th Human Performance Wing are soliciting white papers (and later technical and cost proposals) on the following research effort. This is an open ended BAA. The closing date for submission of White Papers is 17 Nov 2019. This program deals
with science and technology development, experimentation, and demonstration in the areas of improving and personalizing individual, team, and larger group instructional training methods for airmen. The approaches relate to competency definition and requirements analysis, training and rehearsal strategies, and models and environments that support learning and proficiency achievement and sustainment during non-practice of under novel contexts. This effort focuses on measuring, diagnosing, and modeling airman expertise and performance, rapid development of models of airman cognition and specifying and validating, both empirically and practically, new classes of synthetic, computer-generated agents and teammates. An Industry Day was held in November 2014. Presentation materials from the Industry Day and Q&A’s are attached. If you would like a list of Industry Day attendees, send an email request to helen.williams@us.af.mil Open until November 17, 2019.
What We Do--

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

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

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

- **Large proposals** - Assistance in planning and developing institutional and center-level proposals (e.g., NSF ERC, STC, 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

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

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

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