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

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Topics of Interest URLs

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Planning for Funding Success at NSF

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By Mike Cronan, co-publisher

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Of all the federal research agencies, NSF is a clear standout when it comes to a transparent and easily accessed core of key information that informs the planning, development, and writing of proposals to that agency. Planning for funding success at NSF is easily done by both new and junior faculty as well as experienced senior investigators. This is an important factor since NSF is a premier funder of academic research across its 7 [directorates](#) and 33 divisions, inclusive of engineering, science, mathematics, and the social, behavioral, and economic sciences.

Moreover, NSF is the premier federal agency supporting education at all levels, including STEM education from K-12 to Ph.D., undergraduate research, and graduate fellowships designed to produce the next generation of engineers and scientists. What new faculty has not dreamed of being among the roughly 400 annual recipients of an NSF CAREER award from among the upwards of 3,000 that apply each year. Most importantly, however, NSF-funded research is widely recognized as significantly **validating the research credentials of new faculty**, particularly in the eyes of department heads, senior faculty, and deans who make the promotion and tenure decisions. Additionally, success in funding large NSF grants and centers is the dream of many senior faculty. An NSF-funded ERC or STC may be seen as the **crown jewel in a senior faculty member's research career**.

Moreover, given NSF's push for interdisciplinarity and teaming, many senior faculty who may not have been NSF engaged in a significant way in the past are now seeking large-scale funding from that agency either as PIs or co-PIs. While these are not new or junior faculty in terms of their career, they are often new and junior when it comes to submitting proposals to NSF and can therefore benefit enormously from the insight of research offices in making the somewhat perilous "cultural" journey from submitting proposals to a mission agency, e.g., USDA/NIFA, to an agency such as NSF.

For example, unlike research funded by federal mission agencies such as DOE, NOAA, USDA/NIFA, DOD, etc., where research programs and priority funding solicitations come and go and change with some frequency, NSF remains, like the Rock of Gibraltar, a research beacon that strategically **"plays the long game."** Importantly, moreover, **NSF maps most fully to the broad research and education agendas of universities**, much more so than does, for example, NIH. To use an analogy to antibiotics, **NSF acts like a broad-spectrum agency, whereas NIH functions as a narrow-spectrum agency.**

Of course the key point here is that NSF **strategically** "plays the long game," and that simple fact makes it **possible for new, junior, and senior faculty alike to develop their own personalized "long game" strategic plan for funding success at NSF.** Such a plan might use a strategic funding matrix composed of a series of upcoming NSF grants complemented by NSF near-term strategic plans (review the annual NSF budget request to Congress [[FY2016](#); [2017](#)]). It is not unrealistic to set a two- or three-year strategic planning horizon at NSF with a high degree of certainty that the target solicitations in your funding planning matrix will remain cohesive. The building-block solicitations can often be continuously calibrated to NSF's own

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roadmap of both continued and upcoming solicitations in specific research domains, such as those related to Big Data, The Brain, FEW Nexus, etc.

The recent publication (October 26) of the [NSF statement of support for National Artificial Intelligence Research and Development Strategic Plan](#) is such an example. In this case and in the others noted, NSF develops a strategic document forecasting a five- to ten-year research direction that is complemented by a coordinated cluster of existing and proposed funding solicitations addressing a specific topic area. These new strategic directions at NSF, as noted in the above URLs, **are usually telegraphed in the early stages in the agency's budget request to Congress as well as in other venues.** **Bottom line:** new, junior, and senior faculty alike can use this understanding of the NSF process for funding new research directions as well as continuing to fund long-standing programs to enormous competitive advantage when pursuing funding success at that agency.

In summary, new and junior, as well as senior faculty new to NSF should keep in mind a series of “take away” messages when submitting proposals to that agency, including:

- **Understand that NSF is a basic (i.e., fundamental) research agency, not a mission agency whose funded research must clearly advance the agency's mission-critical objectives, such as at DoD, DOE, NASA, NOAA, NIST, EPA, etc.** Moreover, if your research is applied, most likely NSF will not be your research home, and you should look for funding from a mission agency or industry. NSF defines its research domain as the frontiers of new knowledge, thereby representing [transformational](#) (a favorite NSF word) rather than incremental advancement in a research area. For example, while both DARPA and NSF fund basic research, DARPA's basic research has several constraints, most importantly a constraint to further the DARPA mission by research outcomes in a bounded mission domain. NSF, by contrast, funds unbounded, open-ended, and exploratory basic research unfettered by specific mission objectives and research outcomes other than those promising significant advancement to the field. (If you are seeking funding from the EHR directorate then [intersectionality](#) is another favorite NSF word.) Or, as NSF describes it: **“NSF's job is to determine where the frontiers are, identify the leading U.S. pioneers in these fields and provide money and equipment to help them continue.” NSF believes this “occurs at disciplinary boundaries and intersections rich with the potential for technology development, innovation, and commercialization.”**
- **Develop a strategic plan for your research.** This plan should incorporate your third-year review and six-year P&T research objectives, and map your “P&T” research strategic plan to [funding opportunities at NSF](#).
 - In your strategic planning, look beyond a first grant submission to NSF to consider a related series of NSF “building block” grants with the potential over a six-year time horizon to build a robust configuration of research success.
- **Become self-sufficient in identifying funding opportunities at NSF.** NSF makes it extremely easy for new faculty to **“pack their own funding chute.”** Sign up for [NSF Funding RSS Feeds](#). The time between a grant's announcement and its due date is precious time when writing a successful proposal. Don't depend on others to find grant opportunities for you. Also, sign up for the NSF RSS feeds on [newly published documents](#) that will help you better

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understand the priority funding areas at NSF. NSF *Dear Colleague Letters* are a common way for NSF to communicate this information to potential proposers.

- **Recognize that NSF funds both solicited and unsolicited proposals.** Roughly 50% of NSF grants are in response to unsolicited or investigator-initiated proposals. Most NSF core programs have unsolicited due dates, target dates, or proposal windows that come around once or twice each year (although some core programs accept proposals at any time). This information is posted on the core program webpage at NSF. Also, NSF Dear Colleague Letters post updated information on the unsolicited process, e.g., [Dear Colleague Letter: FY 2017 Innovations at the Nexus of Food, Energy and Water Systems \(INFEWS\) Funding Opportunity on Nitrogen, Phosphorus, and Water](#). See the 2016 [Grant Proposal Guide](#) for specific information on submitting unsolicited proposals and be alert for [Proposal & Award Policies & Procedures Guide \(PAPPG\), January 2017](#).
- **Take the time to understand the NSF mission and culture.** This means that you must know your audience. Selecting the right pitch to use in selling your proposal presupposes you understand the agency's culture and mission. Explore the NSF website, particularly in program areas that map to your research and educational interests. Review [newly published documents](#) for information that will help you write better proposals.
- **Understand the role of Broader Impacts in NSF proposals.** The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes, e.g., education and training, diversity, inclusive workforce, etc. See [NSF Merit Review Process](#).
- **Learn how your proposal will be reviewed at NSF.** NSF supports *basic or fundamental research* in engineering and the sciences using a peer-review process based on intellectual merit and broader impacts. This distinction is particularly important for those new to NSF, and *understanding its multifaceted and sometimes subtle implications represents the keystone for your success at the agency*.
- **Read the NSF Strategic Plan.** Perhaps more so than at any agency, *NSF requires the capacity to contextualize your research in the terms of its strategic plan. This capacity will play a major role in your success or failure at that agency*. See [NSF's New Strategic Plan](#) planning document. Moreover, given NSF's commitment to diversity and inclusion in research, education, and training, anyone new to the agency would be well advised to also review the NSF documents that address this issue, starting with those posted to the agency website, particularly HRD.
- **View NSF webinars.** You are always competing at the margins or boundaries of excellence when submitting a proposal to NSF. To be successful at NSF requires that every opportunity you have to write a better proposal needs to be fully exploited. Viewing an NSF webinar that gives you a deeper and more nuanced understanding of the funding agency's reasons for supporting a program will provide critical information when crafting the arguments you will put forward to convince program officers and reviewers to fund your proposal. Subscribe to the [NSF Events RSS Feed](#) and be alert for agency webinars that address programs of interest to you.
- **Use the [NSF Awards Database](#) to know what is funded and why.** NSF's website is full of helpful information and resources for PIs, one of the most useful of which is NSF's

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searchable award database. This database allows you to find and identify the projects that have been funded by a particular NSF program, to identify projects funded on a particular topic, and to find out who has been funded on what projects. All of this information can be invaluable if you need to: identify which NSF program is likely to fund your research topic; determine what types of projects a particular program or solicitation is likely to fund; and locate collaborators or mentors. Moreover, by reading through abstracts of currently funded research, you will gain a better insight into the competitive characteristics of a successful proposal. In some cases, you can use the database to identify PIs of funded projects and email or call them for additional insights, and possibly even request a copy of their proposal if your area is not competitive with theirs. Never be shy about asking for information that will be helpful to you. See [What's New In The New Award Search](#).

- **Review the GPG.** While your university research office will help guide you through the current NSF Grant Proposal Guide, it is also important that you familiarize yourself sufficiently with this document to help you write a proposal that better meets the criteria of the agency, both for solicited and unsolicited proposals (see [GPG Summary of Changes](#), NSF 16-1 January 25, 2016). This is your guide to success at NSF. **Read it closely and often!**
- **Understand the role of the NSF program officers and how and when to contact them.** One of the most common mistakes new faculty make resulting in an unfunded proposal is the failure to clarify ambiguities that arise in the reading of an NSF funding solicitation or referenced documents in the solicitation. ***In research grant writing, timidity is never rewarded and ambiguities are always punished.*** If any uncertainty or ambiguity arises in your reading of the solicitation documents, call the program officer for clarification. Any ambiguity in the research narrative will leave the reviewers confused or guessing at your research objectives, and will most likely lead to a declined proposal. Do not call a program officer with questions that are clearly answered by ***several close readings*** of the solicitation. Do not call a program officer to ask if it is likely your proposal will be funded. But do call with questions that help clarify the solicitation, or help resolve uncertainties that remain after close readings of the funding solicitation.
- **Talk to your NSF-funded colleagues.** Another good source of information about NSF is colleagues who have been funded by that agency, particularly recent recipients of an NSF CAREER proposal, or more senior faculty who have served as reviewers for NSF or as program rotators at the agency.
- **Learn the “NSF language,”** e.g., “interdisciplinarity, transformational, evidence based, intersectionality, broader impacts, integration of research and education, inclusive scientific workforce,” etc.

Moreover, keep in mind that, at its core, ***every successful proposal, regardless of agency, asks and answers a compelling question***, poses a hypothesis, or fills a technical or societal need that advances the research agenda of the funding agency. The proposal must be framed within the context of the agency mission in a way that clearly demonstrates that your methods of investigation and potential outcomes will advance the field sufficiently to warrant investment in your proposed research. For a proposal to meet with success, it must contain a compelling and persuasive project narrative that poses a significant and exciting research question and convinces reviewers that your methods, expertise, and experience (e.g.,

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preliminary data) will coalesce to contribute to a successful research outcome and bring value-added benefits to the agency's research portfolio.

To achieve this result, you must frame the arguments in your research narrative in a way that demonstrates to program officers and reviewers a full response to the specific solicitation, as well as a complete understanding of how that solicitation fits within the larger context of the agency's overarching research agenda or mission-critical research objectives. This becomes particularly important at NSF, which has framed its research vision in a manner that requires the research narrative to address issues such as the integration of research and education, broader impacts, and societal impacts, among many others specifically configured in the review criteria.

The more you know about what motivates a funding agency, the better and more knowledgably you will be able to advance arguments that convince program officers and reviewers to fund your research because of the significant ways it advances the agency research mission and the field.

Bottom Line: Planning for funding success at NSF is easily done and it will reap huge benefits in terms of funding success.

The Editorial “Clawback” on Page Overruns

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By Mike Cronan, co-publisher

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The term “clawback” has been much in the news lately, but always in the traditional sense of taking back already disbursed funds, sometimes with an added penalty. Clawbacks typically result either from fraud, as in the case of several recent high profile big bank CEOs, or through accounting errors, as recently claimed by the California National Guard clawing back enlistment bonuses of up to a decade old. Clawbacks can be messy, disruptive, and difficult, since they are often aggressively challenged.

While clawbacks in the realm of grant writing rarely appear on the nightly news, they are nonetheless often aggressively and ferociously challenged in the world of grants. This occurs when contributing authors must cut a narrative contribution to comply with a proposal’s predetermined page allocation. In the world of grant writing, some authors equate each word they write to a Gold Krugerrand and resist any effort to reduce their word count, believing “*my section is too important to cut!*” Such is the dynamics of team grant writing that the PI must serve as final arbitrator of the size of a word-count clawback to preserve the competitiveness of the research narrative.

Of course, contributing authors resist word-count clawbacks for several reasons, but most often because it presents a challenge to write efficiently, which takes both time and effort. As Mark Twain famously observed, “*If I had more time, I would have written a shorter letter,*” or, to quote Dr. Seuss, “*The writer who breeds more words than he needs, is making a chore for the reader who reads.*” These quotes get to the crux of the matter: ***wordiness begets fuzziness not precision.***

In most cases, overages on page allocations from contributing authors can be managed in the initial draft iterations, particularly with help from someone in a research office who is familiar enough with the proposed research to help edit and tighten up each version of the text. ***Original text is often excessively wordy and in need of editing or rewriting that will focus the ideas without losing their meaning.*** In fact, tight edits and restructured sentences will most often make the text more clear and hence more accessible to reviewers.

However, at some point in many proposals, a due date looms and the narrative seems as tightly structured as possible—the proposal equivalent to approaching zero body fat. At this point, the PI must make hard decisions to cut some important, albeit not essential, and well-written narrative text.

At this moment, it is critical to resist the temptation to make format changes to compress the document in hopes of avoiding further narrative deletions. This will result in a document that is ***less friendly to reviewers and more impenetrable to the reader.*** For example, the writers might adopt a smaller font size, run paragraphs together, eliminate all white space, eliminate bulleted points in favor of enumerations internal to paragraphs, squeeze down tables and figures until they are unreadable and indecipherable, and use every other possible opportunity and formatting trick to squeeze the narrative into the densest form possible until not even a glimmer of white space remains on the page. Getting within the page count limit using these or similar techniques will likely leave a trail of irritated reviewers in the

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narrative's wake, and irritated reviewers are not known for their generous funding recommendations.

Of course, in the end, this all comes down to proposal production planning. Those who leave a few days open before the due date to spend on editing the final version of the narrative to ensure that it is both tightly structured and reviewer friendly will gain an enormous long-term competitive advantage in the review process.

What's Your Problem? What's Your Solution?

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By Mike Cronan, co-publisher

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The first page of a competitive proposal quickly addresses in brief some key questions to capture the interest of the reviewers, including: what you propose to do (e.g., goals and objectives), why you propose to do it (e.g., address a problem, answer a question), how you will do it, your rationale, your expertise and qualifications (e.g., preliminary data, results of prior support), and outcomes. These questions may be answered in the preceding order or some other order that better fits the logic of the research narrative. Of course, the overarching objective of this first narrative page is to provide reviewers a synopsis of the journey you will take them on in the next 15, 20 or more pages of the project description.

Your goal on page one is to convince reviewers that you are taking them on a narrative journey worth taking. Unlike a mystery novel, where the author waits until the end to reveal who did it and why, the proposal author reveals on page one both the outcome and the “mystery”: ***how you will do it.*** This “how it will be done” description is at the heart of all successful proposals and is revealed to those who read the research narrative. In short, a mystery novel can be referred to as a “whodunit” and a proposal might be referred to as a “howdunit.” The best mystery novels are often referred to as “page turners.” That is certainly a worthy aspiration for a research narrative as well, although in a more dignified way, of course. Bad mystery novels are often referred to as “sleep aids.” This is not something you want to offer reviewers reading your proposal.

That said, many decisions need to be made while writing the first page of the research narrative to ensure that the reviewers’ interest is captured. In many proposals, this will occur on the first page by stating a problem and outlining a solution in an internally consistent and logical order. However, in other cases, the problem may be stated in the funding solicitation itself. In this case, it may make more sense to address the solution by beginning with the goals and objectives, since the program officers and reviewers alike already know the nature of the problem that needs to be addressed since the problem is the sole purpose of the solicitation. In still other cases, some authors may feel more comfortable structuring the first page of the proposal using a generalized version of the scientific method as the guiding template, e.g., presenting a problem statement, hypothesis, solution, research context, relevance, etc..

Whichever approach you choose, the problem and the solutions must be defined before you can address outcomes with any specificity. However, it is not uncommon on certain types of proposals, particularly those for some type of institutional transformation such as NSF’s AGEP or ADVANCE, for the desired general outcomes to be defined by the agency in the funding solicitation. It is understood that your proposed project is designed to achieve these outcomes. In these cases, a “reverse engineering” process may be used to identify and define the specific project activities designed to achieve the desired outcomes as defined by the funding agency. Moreover, for many technical proposals, the funding agency lists the desired outcomes in the solicitation, e.g., reduce the transmission of vector-borne diseases such as Zika, and it is then up to the applicant to present solutions, activities, etc. that lead to the desired outcome.

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In many cases, logic models ([W.K. Kellogg Foundation Logic Model Development Guide](#)) may be helpful for this “reverse engineering” process, or they may even be required as part of the research narrative. Regardless of whether or not a logic model is required, it can often be a helpful tool to complement the initial development of the organizational outline of the proposal’s first narrative draft.

While beginning the research narrative with a statement of the problem followed by the solution may not grab the reviewers’ attention, it nonetheless plays an important part in planning the order in which the proposal is written. Establishing a compelling order to the statement of the problem and the solution should intrigue reviewers sufficiently that they will read the rest of the proposal with enthusiasm.

After all, in the movie *Apollo 13* (1995) with Tom Hanks playing Commander Jim Lovell, everyone knew the ending, but it was the dramatic telling of the solution to the problem that resulted in nine academy award nominations, including *Best Film Editing*, something that should not be lost on those writing and editing a proposal that begins with a problem and describes its solution.

Initiative to Strengthen US Agricultural Workforce

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By Mike Cronan, co-publisher

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Several weeks ago the Office of Science and Technology Policy (OSTP) and the White House Rural Council, in collaboration with federal agencies and private-sector stakeholders, announced new efforts to expand and diversify the U.S. agricultural workforce. This is of particular importance to university research offices, given the increasing interdisciplinarity of agricultural research that now extends far beyond just land grant institutions and agricultural experiment and extension services. The announcement came after a two-year long fact-finding process involving scientists, educators, industry representatives, academia, federal agencies, and the private sector. See the 117-page report: [Examination of Plant Breeding at U.S. Academic Institutions and Private Companies in 2015](#).

OSTP determined two fundamental goals necessary to meet global workforce and food security challenges:

- Increase the number and diversity of agriculturally-trained workers at all levels of education, taking into account specific program needs and current and future challenges and opportunities.
- Expand research and training in higher education in areas that are experiencing particularly serious workforce shortages and are central to meeting future needs.

The following excerpts quoted from the report demonstrate how wide-ranging the federal actions will be in broadening and diversifying the nation's agricultural workforce to the benefit of increased national, and global, security. If you are in a research office helping faculty in the agricultural and life sciences, engineering, veterinary medicine, chemistry, computational sciences, etc., the following information will give you a nice heads up as to where future funding will be and how to best position faculty to pursue it. ***Of particular importance are the partnerships that arise from this report, e.g., USDA and NSF, as noted below.***

"The **Department of Agriculture (USDA)** will increase its support for the 1890 National Program to ensure a scholarship at each of the nation's 19 Historically Black Colleges and Universities (HBCUs). This program provides funding for tuition, books, school fees, travel, and lodging to outstanding undergraduate students studying agricultural science or statistics at the 1890 Land-Grant Colleges and Universities or Tuskegee University, which represent the nation's HBCUs. Specifically, USDA's **Agriculture Research Service (ARS)** will triple its investment in this program, representing more than half of the increase in support. Additionally,

- USDA's **National Institute of Food and Agriculture (NIFA)** will continue investing in [graduate and post-graduate fellowships](#) for food and agriculture research and agriculture curriculum development.
- The **U.S. Forest Service (FS)**, in collaboration with the **Americas for Conservation and the Arts**, a Latina-founded and operated non-profit organization, and the **Green Amigos Latino Legacy**, will expand the [Woodsy Owl Conservation Corps](#) to promote public awareness of opportunities for conservation and land stewardship through educational

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programming and service learning efforts, focusing primarily on underserved, urban youth with a strong emphasis on Latino youth.

- USDA's **Economic Research Service (ERS)** will continue to invest in the Ag Econ Scholars program that introduces talented Master's and PhD students to careers in applied agricultural economics through hands-on learning opportunities at USDA in commodity market analysis, agricultural finance, and other applied fields of economics.
- USDA's **Agriculture Research Service (ARS)** will launch a new Student and Outreach Database to identify the number of students and post-doctoral fellows training at and visiting any of ARS's more than 90 agriculture research facilities.
- The **USDA Science Council** will **coordinate with the National Science Foundation (NSF)** and will create opportunities for NSF-funded Ph.D. students at USDA research facilities through a new [Graduate Research Internships Program](#).
- USDA's **Animal and Plant Health Inspection Service (APHIS)** will continue to invest in the [AgDiscovery Program](#), a free summer outreach program to help teenagers explore careers in plant and animal science, wildlife management, and agribusiness at an increasing number of participating colleges and universities.
- USDA's **Farm Service Agency (FSA)** will add to USDA's online [resources for teachers and students](#) with the launch of a new FSA Kids Educational Site in 2017 to provide educators, children, and teens with inspiring agriculture educational resources.

The National Science Foundation (NSF)

- NSF's Directorate for Biological Sciences **expects to support a BIO Research Traineeship track in FY 2017** that will be coordinated with the NSF-wide Research Traineeship Program. It would include a topic with the scope to support training in the plant and microbial sciences under the general framework of Understanding the Rules of Life. The 2017 Budget proposes \$2.8 million for BIO's contribution to the NSF-wide NRT program.
- The 2017 Budget proposes \$4.0 million for NSF's **Integrative Organismal Systems** contribution to the **National Plant Genome Initiative (NPGI) Postdoctoral Research Fellowships Program**, which is cosponsored by NSF, the **Department of Energy**, and the **Department of Agriculture (USDA) - Agricultural Research Service**. NSF awards these fellowships to recent recipients of doctoral degrees for research and training in specific areas of need with the goal of developing the workforce in those areas. The fellowships encourage independence at an early stage of the research career to enable fellows to pursue research and training goals in the most appropriate research locations regardless of the availability of funding at that site. **This commitment will lock in disciplines relevant to the National Plant Genome Initiative (NPGI) as one of the focus areas for these research fellowships.** Eligible areas include all genome-scale projects in plant genomics, with an emphasis on quantitative genetics, modern breeding approaches, and bioinformatics.

To build on these Federal actions, OSTP [issued](#) a national call to action in January, and [followed up](#) in July, for private-sector commitments that would:

- Increase the number and diversity of agriculturally trained workers at all levels of education; and
- Expand research and training in higher education in areas that are experiencing particularly serious workforce shortages and are central to meeting future food needs.

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In response to this call, over seventy external organizations have announced new efforts to **expand and diversify the agriculture workforce**. These efforts include:

Support for K-12 agriculture education and teacher training to inspire young people with the challenges and opportunities in agriculture.

- *Pennsylvania Governor Tom Wolf will proclaim the week of October 10-14, 2016, as Agriculture and Food Careers Week in Pennsylvania in recognition of the career pathways that lead to good jobs in agriculture production, food processing, food distribution, forestry and wood products, horticulture, and landscaping. The week will contain a number of events and announcements in support of the theme, including:*
 - Four **National FFA Showcases** in Lancaster, York, Lycoming, and Columbia Counties where best-of-class agriculture education programs will be recognized by visits from the Pennsylvania Secretaries of Agriculture and Education.
 - The **Cole Hammels Foundation** will announce a \$100,000 grant to the W.B. Saul High School of Agriculture Sciences in Philadelphia to repair the greenhouses that support the horticulture program at the high school.
 - The **Lancaster County Agriculture Council** will announce a \$500 pool of scholarship money for FFA students at the Lampeter-Strasburg High School.
 - The **PA Department of Agriculture** will launch a social media campaign across its Facebook and Twitter accounts with an image series and blog posts focusing on agriculture education and career pathways for agriculture and food that will make this information more accessible than what is featured on its static webpages.
 - The **PA Secretary of Labor and Industry** will announce the addition of careers in targeted agriculture industries to the High Priority Occupations List for the Commonwealth, which will make funding available for training through the Workforce Innovation and Opportunity Act (WIOA).
 - The **School District of Philadelphia** will recognize the Fox Chase Elementary School as the only elementary school in the district that uses agriculture as the context for its curriculum, and other schools are expected to follow.
 - Through a collaborative initiative between the **PA Department of Conservation and Natural Resources** and the **PA Department of Labor and Industry**, a new version of the PA Conservation Corps—the PA Outdoor Corp—will begin a new phase of its program which provides a focus on career pathways and entry-level skill development for 18-25-year-olds.
 - A partnership of the **PA Department of Agriculture**, the **PA Department of Conservation and Natural Resources**, and the **PA Department of Community and Economic Development** will present the report of the Green Ribbon Commission to Governor Wolf on October 15, 2016. The report focuses on how to conserve forest land while increasing good paying jobs that depend on the forest.
- *Archer Daniels Midland and the U.S. Department of Agriculture have joined forces with 45 companies, government agencies, universities and not-for-profit organizations to form the Agriculture Diversity & Inclusion Roundtable, whose members will, this month, convene to present their three-year strategic plans for building a diverse and inclusive*

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pipeline of talent and a competitive U.S. agriculture sector. Together, these organizations employ, enroll, represent or speak on behalf of about 30 million people. The member organizations are committed to sharing best practices, building awareness in grades K-12, creating greater access to ag opportunities for all students at the post-secondary level, connecting with students in urban areas, deepening collaborations among ag stakeholders, and promoting more effective funding platforms that consider diversity and inclusion requirements.

- *Seed Your Future will invest more than \$850,000 to promote careers in horticulture.* A strong horticulture workforce is essential to protecting the food and water supply and maintaining a healthy environment, but few Americans know that this field of study offers fulfilling and respected careers. Seed Your Future, led by the American Society for Horticultural Science (ASHS, Alexandria, VA) and Longwood Gardens (Kennett Square, PA), will begin by conducting research that assesses the perceptions of 7th through 10th graders, their parents, and teachers on horticulture and careers in horticulture. With this information, Seed Your Future will commit additional funding to develop an education, marketing, and advocacy campaign to increase awareness of horticultural careers through an educational, advocacy, and marketing plan based on the research results. Horticulture industries will benefit from an increased pool of well-trained and educated students, who will find exciting and rewarding careers in horticulture.
- *The National FFA Organization, Discovery Education and AgCareers.com have partnered to create AgExplorer.* AgExplorer.com is a robust and comprehensive online career resource that will help students explore the broad range of careers in agriculture through access to educational requirements and links to current job openings through a partnership with AgCareers.com. AgExplorer features videos that highlight how an agricultural education and over a half dozen ag career pathways can solve the world's global agricultural challenges. It also offers the Career Finder, an interactive assessment designed to help students find which of the 235 featured agriculture careers is the best fit.
- *The CHS Foundation, DuPont Pioneer, and Growth Energy, as a special project of the National FFA Foundation, have pledged \$625,000 to support the National Teach Ag Campaign's efforts to recruit and retain high quality and diverse agriculture teachers.* As part of the National Teach Ag Campaign initiative preservice agriculture teachers will be able to participate in a special professional development track at the upcoming National Association of Agricultural Educators convention in November. The National Teach Ag Campaign, an initiative of the National Council for Agricultural Education, led by the National Association of Agricultural Educators, just this September announced the preservice teacher institute track that will include professional development, networking, and mentorship. Additionally, in an effort to address the lack of diversity in the agriculture teacher profession, the National Teach Ag Campaign will develop a Diversity and Inclusion Toolkit with handouts, videos, and a research component to inspire a diverse group of educators who will, in turn, inspire the next generation of leaders, problem solvers, entrepreneurs, and agriculturalists.

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- *The Algae Foundation will commit \$200,000 to develop and distribute algal-based STEM curricular kits for grades K-12 and formulate community college degrees in Algae Biology & Cultivation and Algae Biotechnology to engage and train a new workforce for algae farming.* The Algae Foundation's "K to Gray" approach for education promotes lifelong education and learning opportunities that will support a workforce of algae farmers, scientists, and entrepreneurs. Algae farming can significantly reduce greenhouse gases while providing a sustainable source of biomass for food, feed, and fuel for a growing population. The Algae Foundation commits to distributing 50 algae curriculum kits to grades 5-6 in the spring of 2017 to two pilot sites, one in the greater San Diego region and one in southwestern Michigan. An additional 200 kits targeted to elementary, middle, and high school students will be distributed nationwide in 2018, and 500 kits will be distributed in 2019 with the initiation of a national algal-based STEM teacher training program. Additionally, in conjunction with the U.S. Department of Energy and its National Renewable Energy Laboratory, the Algae Foundation will develop two community college degrees in algae cultivation and biotechnology through the construction of six online courses supported by intensive, hands-on laboratory exercises.
- Celebrating five years of an employee-driven volunteer program supporting STEM outreach, *Dow AgroSciences' Science Ambassadors program commits to gearing its growth to further inspiring future plant breeders.* The Science Ambassadors will double their impact numbers, reaching an additional half million students, and will increase their volunteer hours by 30 percent by the end of 2020. They will also place priority on engaging underrepresented communities in agricultural sciences by focusing 15 percent of the program's new growth to supporting women, Hispanic, and African American populations. To achieve this, Dow AgroSciences will implement STEM outreach at more than 80 percent of all of its U.S. field stations by 2020. Additionally, it will implement one educator training opportunity each year through its Science Ambassadors, providing early and primary educators with project-based tools to present plant breeding and biotechnology demonstrations to students and community members, to increase learning and retention around agricultural sciences.
- *Syngenta is announcing a new partnership with the American Farm Bureau Foundation for Agriculture (AFBFA) to improve the Syngenta Summer Fellowship program, aligning participants' lesson plans with national standards to broaden their accessibility and ease of use.* The Syngenta Summer Fellowship program is a two-week externship that immerses North Carolina STEM teachers into the world of agricultural biotechnology. Through its new partnership with AFBFA, Syngenta's new fellowship program will enable participants to become more effective science and agriculture communicators. In addition, participants will apply their experiences in the collaborative development of school lesson plans, which, through the AFBFA partnership, will now align with national standards for broad distribution.

Support for the technical training and capacity building needed for a host of important agriculture careers.

- *Fair Trade Fisheries has raised over \$1.2 million to develop Aquaculture. Info, a comprehensive, open-access aquaculture database with Google VR system simulations*

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and computer-based system simulations for a mid-2017 release. Aquaculture systems are a complex interaction of biological, physical, chemical, and economic factors. Open-access, interactive simulations will help new and experienced farmers better understand how these systems work, generating increased interest in the growing aquaculture industry which already provides more than 50 percent of the world's seafood.

- *PT Partners and Chestnut Hollow Farms will use a social entrepreneurship model to develop a hydroponic farm system to train and employ residents of the City of Bridgeport, Connecticut.* PT Partners and Chestnut Hollow Farms partnered with the public housing residents of PT Barnum apartments, the Connecticut Department of Energy and Environmental Protection, Anaergia, an anaerobic bacterial digester facility contracted by the City of Bridgeport as part of its BeGreen 2020 initiative, and the City of Bridgeport to create a sustainable source of affordable fresh foods, beautify and revive a notorious brownfield, and provide local jobs to PT residents through a Host Community Benefit Agreement (HCBA). Chestnut Hollow will manage trainee positions and farming jobs for PT residents to build opportunities in the community. Chestnut Hollow is also collaborating with Anaergia to use byproducts of the digester process to provide heat and light to the farm; carbon dioxide; and a highly concentrated fertilizer.
- *Hunters Point Family and Our Foods are announcing a \$235,000 investment by 50 Fund – the legacy fund of the Super Bowl 50 Host Committee – to build The People's Harvest, an aquaponic produce farm in San Francisco's Bayview Hunters Point (BVHP) community.* The People's Harvest will address persistent unemployment for those with barriers to work, such as the formerly incarcerated, and will feature a six-month aquaponics apprenticeship-like program for an estimated 20 participants annually. In addition to jobs, the farm will also provide BVHP residents with free public education and food using a farming methodology that's 90 percent more water efficient and produces six times the yield per square foot of conventional farming. The education program will consist of free weekly "Aquaponics 101" courses. The farm itself will grow enough produce to support the weekly vegetable intake for an estimated 50 families. By focusing on jobs, education, and food, The People's Harvest will create a vital and diverse pipeline of individuals from under-resourced communities, and those traditionally residing in "food deserts", who will become knowledgeable about the benefits of aquaponics, consumers of its bounty, and able to implement this highly productive agricultural practice as hobbyists, employees, and entrepreneurs.
- *Blue Planet +Plus will launch an online, open source website and manual with detailed instructions for building a hydroponic vertical farming rack system.* This fall, Blue Planet +Plus Farm will launch an online, open-source website and manual that anyone can use to build a hydroponic vertical farming rack system. +Plus Farm is a no-frills approach to vertical hydroponic agriculture that will enable other schools and entrepreneurs to take vertical farming into their own hands to build upon and improve its performance. The +Plus Farm is more than another DIY kit: the +Plus Farm is commercial vertical farming in its most raw form. This system has the potential to engender other new approaches to the challenge of urban and low-resource agriculture and inspire a new generation of young farmers.

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- *Grayson College will partner with Denison High School to offer dual-credit courses in viticulture for high school juniors and seniors.* This new program will train 10 students in vineyard establishment, grapevine biology, fruit harvesting and vineyard maintenance such as pruning, fungicide application and irrigation, and enrollment is anticipated to double to 20 students next year. Grayson College and Denison High School joint-program students will gain valuable skills through immersive, hands-on training that can lead to immediate employment in the ever-growing Texas grape and wine industry. Through these dual-credit courses, students will contribute to the state's economy and may choose to continue their agriculture education by enrolling in a four-year university program.

Investments in higher education that inspire undergraduates and train graduate students and post-doctoral fellows in food systems and agricultural science research.

- *In the next five years, the Consortium for Plant Biotechnology Research (CPBR) will triple its diversity outreach through an Expanded Diversity in Agriculture Sciences Program (EDAS).* CPBR estimates an initial investment of \$300,000 for Years 1 and 2, \$1.5 million for Years 3 to 5, and \$6 million for the total project. EDAS will involve diversity managers from more than 20 member agribusiness companies, increasing the participation of diversity managers by 400 percent. Principal Investigators (PIs) of CPBR projects who are female and underrepresented minorities (URM)—163 PIs in all—will mentor female and URM students at secondary and college levels. Student candidates will be recruited through national Ag organizations such as FFA, 4-H, MANNRS, minority landowner organizations, Farm Bureaus, State commodity associations, the Cooperative Extension Service and other Ag groups. CPBR and EDAS will provide travel grants to female and URM students to present their Ag STEM interests and projects to a national audience of recruiters from research university Ag schools and agribusiness companies at a conference hosted by CPBR and EDAS a conference sponsored by private sector partners to which will be given travel grants. When at full capacity, EDAS will produce an anticipated 4 percent increase in national enrollment percentages of young women and minority students in Ag STEM fields.
- *A collaboration between Yield10 Bioscience, the crop science program of Metabolix, Inc., and North Carolina State University, will supplement Federal awards with new investments of over \$55,000 and \$21,000, respectively, to conduct a series of field trials while providing STEM graduate students the opportunity to see their research move from the laboratory to the field.* The field trials will analyze the yield impact of a series of novel yield traits in the industrial oilseed Camelina, developed by Metabolix and its academic partners, based on research funding targeting breakthrough crop yield technologies from the ARPA-E PETRO program. While developed initially in programs to increase biofuel production with Camelina, these traits have the potential to increase yield in major food and feed crops, which is aligned with Yield10's mission to address global food security. These field trials highlight the commitment of Yield10 to leveraging academic and federal partnerships to support undergraduate and graduate level STEM research in agriculture at academic institutions not only to carry out state of the art research projects to achieve step changes in seed yield but to take successful developments forward to demonstrate commercial viability.

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- *The National Association of State Departments of Agriculture (NASDA) will partner with CHS, Inc. the University of Nebraska-Lincoln, University of Missouri, Iowa State, Colorado State, Kansas State, South Dakota State, and University of Wyoming to sponsor 11 students to attend the NASDA Annual Meeting in 2016. NASDA will expand and diversify its "NASDA's Next Generation Program" to cover the cost of hotel, travel, meeting registration and meals for 11 students to attend NASDA's annual meeting. NASDA's Next Generation (NNG) will join with CHS, Inc. and the University of Nebraska-Lincoln, University of Missouri, Iowa State, Colorado State, Kansas State, South Dakota State and University of Wyoming to sponsor 11 students to attend the NASDA Annual Meeting in 2016. This initiative will continue to grow and aims to reach as many students as possible who are passionate about agriculture and public service careers. NNG is a unique, one of a kind experience for students to network and interact with leaders of state departments of agriculture."*

The EPSCoR Track 4: A New Opportunity for Junior Faculty

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By Lucy Deckard, co-publisher

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NSF recently announced a new opportunity for untenured faculty in NSF [EPSCoR](#) states/jurisdictions eligible for RII funding: Alabama, Alaska, Arkansas, Delaware, Guam, Hawaii, Idaho, Kansas, Kentucky, Louisiana, Maine, Mississippi, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Dakota, Oklahoma, Puerto Rico, Rhode Island, South Carolina, South Dakota, Vermont, US Virgin Islands, West Virginia, and Wyoming. Proposals to the [EPSCoR Research Infrastructure Improvement Track 4: EPSCoR Research Fellows \(RII Track-4\)](#) program are **due February 28, 2017**, so even though it's a very busy time of the semester, eligible faculty should look into this opportunity now if they think they might want to apply.

What does it fund?

This new grant program provides up to \$300K over 2 years for untenured faculty who are either **tenure track** or are **in long-term non-tenure-track positions** at higher education institutions in EPSCoR states or jurisdictions to spend extended periods of time at “the nation’s premier research facilities.” NSF’s motivation for funding these grants is to help build capacity at EPSCoR universities. To do this, they will provide funding to support fellowships that will help untenured faculty at EPSCoR institutions build new collaborations, strengthen existing ones, or obtain access to research facilities that are not otherwise accessible to the PI by spending extended periods of time at a host site. The host site can be any academic, governmental, commercial, or non-profit research facility in the US or its territories (and outside the PI’s home state or jurisdiction). The faculty can conduct research on any topic in NSF’s traditional portfolio (for more information on what NSF funds, see [their website](#)).

This must be a single-PI proposal with no co-PIs, and the grant will cover:

- Research-related expenses
- Up to six months of salary and fringe benefit support for the PI. Support may be for academic, calendar, or summer months. Up to six months of salary and fringe benefit support (including tuition if appropriate) is also allowed for one additional trainee-level participant.
- Travel expenses for the PI and one additional trainee-level researcher, solely for travel between the PI’s home institution and the host site. Multiple trips between the two sites are allowed; however, the total budget for travel expenses may not exceed \$20,000.
- Living expenses for the PI and one additional trainee-level researcher during time spent at the host site. Living expense charges (Lodging, Meals, and Incidental Expenses) may not exceed the per diem rates set by the United States General Services Administration (GSA) for the host site location. The total budget for living expenses may not exceed \$50,000.

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- Up to \$10,000 in additional direct costs are allowed. These funds may be used for shipping equipment, purchasing supplies, and other similar uses directly related to the research activities at the host site.
- Host institutions are not eligible to receive funds under this award. The sole exception is for living expenses, which may include lodging, meals, and incidental expenses. If funds are to be used to pay living expenses to the host institution, the expected costs should be budgeted as travel expenses (and not as a subaward).

PIs should note that only three EPSCoR track-4 proposals are allowed per institution, so there will likely be an internal selection process at your university, assuming more than three faculty are interested in applying. ***The deadline for participating in that internal process may be quite soon, so be sure to check with the office at your institution that deals with limited submission proposals.***

How Do I Make My Proposal Competitive?

NSF allows 10 pages (rather than the more usual 15 pages) for the Project Description.

Remember that you will need to make arguments at two levels:

- **You must convince the reviewers that the research project to be accomplished during the fellowship is significant and well thought out.** You will need to structure this discussion as you would any research proposal, with clear goals and objectives, a discussion of the methods to be employed, a clear description of the new knowledge to be generated, how it will advance the discipline, why it's innovative or novel, and a strong argument for the broader impacts of the project. You'll also want to discuss the roles of your collaborators at the host institution and/or how you will employ the equipment or facilities to which you will have access at the host institution, if appropriate.
- **You must convince the reviewers that the fellowship experience will significantly enhance your capabilities as a researcher and, by extension, the capabilities of your home institution.** At this level, you should also have clear goals and a specific rationale. Describe the unique opportunities that will be provided by this fellowship, how it help you advance your long-term research agenda, how it fits into what you've already done, and how all of this aligns with your institution's needs. Importantly, you need to make a strong case for how this fellowship will have a lasting impact, so be sure to discuss how you will sustain the benefits gained from the experience, for example, through continued collaborations.

Be sure that the required timeline provides enough detail on both your research plan timeline as well as your fellowship timeline. There are clearly a lot of logistical considerations in planning when and how long you will stay at your host institution, and what you will accomplish when. Involving a student or postdoc will add another layer of complexity. A well-organized and detailed timeline will help convince reviewers you have thought this through.

At least three Letters of Support are required (at least one each) from 1) your home institution, 2) Your collaborator(s) at the host site, and 3) administrators at the host institution. **Be sure that these letters are enthusiastic and detailed.** Reviewers will want to be sure that you are

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being strongly supported by your home institution and that your host institution is equally enthusiastic. They will also look for specific plans for how the collaboration will work.

What Are the Review Criteria?

In addition to the standard NSF criteria for Intellectual Merit and Broader Impacts, the solicitation lists the following **additional specific review criteria**:

- Does the proposal provide clear specifications of research goals, performance metrics, and a project timetable?
- Does the proposal make a compelling case for how the PI will benefit as a result of the fellowship both during the period of the award and beyond?
- Does the proposal provide clear evidence that the home institution is supportive of the effort and that there are identifiable benefits to the home institution and/or jurisdiction?
- Does the host site commit appropriate resources, both scientific and logistic, to lend confidence that the fellowship project will be successful?

Conclusion

If you're an untenured faculty member at a university in an EPSCoR state conducting research of interest to NSF, and your research would benefit from enhanced collaborations and/or access to facilities available elsewhere, this is an excellent opportunity. Because this is the first time this grant has been offered, it's very likely that they will have fewer proposals than they will in the future. If you start planning your proposal now, remember that this is not a standard NSF proposal, and write it accordingly, you may have a good chance of winning an EPSCoR Track 4 grant.

How to go from Research Ideas to Research Dollars Ten Key Steps to Getting Your Ideas Funded

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By Mike Cronan, co-publisher

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As the geologists say, “if you don’t ask the right questions the rock won’t answer.” This expression has its analog in the pursuit of research funding. If you don’t ask the right questions about yourself, your potential funder, the funding solicitation, the process of identifying funding opportunities, and the process of planning, developing, writing and submitting a successful proposal, then the funding agency is unlikely to answer your request for funding in a positive way. In order for you to build a successful portfolio of research awards, you will have to satisfactorily answer many of the following questions. **The questions listed below are essentially the critical touchstones that will transition you from a research idea to a funded research idea.** You must answer some of these questions about yourself and your research readiness before submitting a successful proposal. Others are questions you must ask about the depth of your understanding of the funding agency, research solicitation, review and selection process, and the grant-writing process itself to determine whether you are prepared to write a competitive proposal.

1. **Know yourself** (as Ann Landers once said “**Know yourself. Do not accept your dog’s admiration as conclusive evidence that you are wonderful.**”)
 - a. What are my research strengths?
 - i. How do I most effectively characterize my research strengths, expertise, experience, background, and future directions?
 1. Can I do this succinctly, clearly, and simply?
 2. Can I explain my research and make a convincing case for the importance of my research to a scientifically literate (intelligent or “informed” reader) reviewer who is a nonexpert in my field?
 - ii. What is the significance of my research expertise to my disciplinary field and can I explain this citing the appropriate literature?
 - iii. How will my research contribute to my disciplinary field or other disciplinary fields and advance them in some important way?
 - iv. Is my research disciplinary, multidisciplinary, interdisciplinary, transdisciplinary?
 1. Do I understand how these terms are used by specific agencies, e.g., by NSF?
 - v. Is my area of expertise addressed in the agency’s strategic plan?
 1. How would my research advance the agency strategic plan?
 - vi. Does my research bring value-added benefits to the agency and program?
 - vii. Does my research advance the mission priorities of the agency?

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1. Do I clearly understand the difference between basic research agencies (e.g., NSF, NIH, DARPA) and mission specific agencies (e.g., DOD, NOAA, DOE) and how different agencies characterize value-added benefits?
- viii. Have I prepared a convincing and brief (perhaps 1 page) white paper that serves as a very concise and clearly stated overview of my research goals, objectives, rationale, experience, and expertise that would be of interest to a potential funder? Also, does this white paper (abstract, project summary, executive summary, “elevator speech,” etc.) make a compelling case for the value-added benefits my research would bring to the critical mission areas of the agency, or to the research field, or to other research fields?
- b. What are my research weaknesses?
 - i. Do I lack preliminary data; if so, how will I address that?
 - ii. Do I lack publications on the research topic; if so, how will I address that?
 1. Do I lack the appropriate peer-reviewed publications that will help convince reviewers of the importance of my research and my capacity to perform?
 2. Are my publications too weighted towards non-peer reviewed proceedings, book chapters, conference presentations, etc. that will leave reviewers unconvinced about the importance of my research and my capacity to perform?
 - iii. Do I lack experience and expertise in the field; if so, how will I address that?
 - iv. Do I need research collaborators; if so, how will I address that?
- c. Do I have a strategic plan for my research?
 - i. Where am I going and how do I plan to get there?
 1. Why is it important that I do this research?
 - ii. How do I best characterize the significance of my current research/expertise
 1. To the field?
 2. To other fields?
 3. To the agency?
 4. To an agency mission?
 - iii. Where will my research be in five years, or even ten or twenty years?
 - iv. Does my research require my engagement in “team science” and research collaborations?
- d. Can I define my disciplinary domain of interest (e.g., education, engineering, science, social science, humanities, education, health and biomedical sciences, etc.) with sufficient clarity to begin the process of identifying potential funders of my research?
- e. Can I clearly characterize the nature of my research interests within my disciplinary domain, e.g., is my research predominantly basic or applied, or perhaps applications or contract based?
- f. Have I identified funding agencies whose mission, strategic plan, and investment priorities are aligned with my research interests and expertise;

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- g. If required, do I know how to develop the research and/or educational partnerships and research collaborations with other researchers in other disciplines or at other institutions needed to be competitive at a specific agency or for a specific program area?
- h. Have I gone through the process to further align my research interests with funding agency opportunities by:
 - i. Reviewing past funding solicitations by the agency,
 - ii. Reviewing abstracts of recently funded proposals by the agency in my disciplinary area
 - 1. Reviewing abstracts (aka project summary or executive summary) of recently funded projects gives researchers yet another source of information about the interests of a funding agency by presenting review panels' and program officers' selections of successful proposals. Reading the abstracts of funded projects will give you a more nuanced understanding of the funding agency culture and expectations specific to a solicitation, or cluster of solicitations, within a disciplinary domain. Abstracts from the two most current past funding cycles are typically the most informative because annual grant solicitations often evolve over time. Most agencies post the abstracts of funded projects on their websites.
 - 2. Reviewing agency mission statements. Many avenues lead to gaining a more substantive and nuanced understanding of the mission and culture of the funding agency, including:
 - a. Visiting the agency website and reviewing the mission, strategic plans, and research and educational roadmaps of both the agency and the programmatic areas within the agency;
 - b. Reviewing online postings of agency reports, presentations, and research and/or educational workshops given by agency program officers;
 - c. Talking to colleagues that have been funded by the agency;
 - d. Identifying researchers on your campus that have served as agency program officers (e.g., NSF rotators) and talking to them;
 - e. Identifying researchers on your campus that have served as reviewers for specific agencies and programs and talking to them;
 - f. Reading agency online abstracts of currently funded projects and asking (by email or phone) whether the PI is willing to talk to you about the agency;
 - g. Reading current agency solicitations in your disciplinary area and identifying any reports, presentations, or technical workshops identified in the solicitation as motivating the agency's funding of particular research areas;

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- vi. Do I have an idea whose fittedness I want to discuss with the agency?
- vii. Do I understand I will not be asking about the likelihood of being funded?
- viii. Do I understand the call will not be a meandering fishing expedition?
- ix. Do I understand I will not be asking questions that are easily answerable by a close reading of the solicitation or documents referenced in the solicitation?
- i. Never be hesitate to contact a program officer for clarification—any ambiguities in your understanding of the agency mission priorities or in the funding solicitation need to be resolved; otherwise, it will be impossible to write a successful proposal.
 - i. Timidity is NEVER rewarded in the competitive proposal process!
 - ii. Ambiguities are ALWAYS punished!

3. Identify a funding solicitation

- a. Develop search protocols to fit your research interests
- b. Know relevant agencies likely to fund your research
- c. Learn the agency's grant cycles
- d. Use agency email alerts and RSS feeds to keep you informed of upcoming funding opportunities and relevant reports, workshops, webinars, etc. that can help you write a more competitive proposal
- e. Know the process for unsolicited proposals
 - i. Proposals may be initiated in two general ways by the university researcher:
 - 1. in response to a published solicitation (solicited proposal, RFP, BAA, PA); or
 - 2. by the investigator (unsolicited proposals and white papers).
 - a. ~50% of NSF and ~80% of NIH proposals are unsolicited—learn the process specific to agency
- f. Review open BAAs (Broad Agency Announcements) for program funding opportunities and the process of submitting proposals, included such “multigate” quad charts, white papers, preliminary or preapplication proposals.
 - i. BAAs are commonly used by mission agencies (e.g., DOD, DOE, NOAA). They remain open for some period of time, typically least a year but often longer. The BAA lists the mission priority research areas of interest to the agency along with all information needed to submit a proposal in response to the BAA.
- g. Consider transagency research funding opportunities
 - i. Transagency funding opportunities represent solicitations published jointly by two or more federal research agencies. For example, NSF has published joint solicitations with such agencies as USDA, DOE, DOD, among others, to address key research areas that are interdisciplinary and are common to the core mission of the partnered agencies. For example, NSF and USDA have partnered on the research topic related to water sustainability and climate.
- h. Keep in mind that a funding solicitation is an invitation by a funding agency to submit a proposal focused on addressing **research topic areas of interest to the agency**, i.e., your proposal must map tightly to agency mission and bring value-added benefits to that mission. **Bottom line:** it is your task to fit and be fully

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responsive to the research interests of the funding agency; it is not the task of the research agency to be responsive to your research interests. Moreover, keep in mind that:

- i. The solicitation is a non-negotiable listing of performance expectations reflecting the mission goals and research objectives of the funding agency.
- ii. The solicitation is not a menu or smorgasbord offering you a choice of addressing some research topics but not others, depending on your interest, or some review criteria, but not others.
- iii. The solicitation contains or references all the key information you will need to develop and write a competitive proposal that is fully responsive to an agency's mission, for example, the agency's:
 1. submission process,
 2. research objectives,
 3. review criteria, and
 4. budget requirements.
- iv. Review referenced documents in the funding solicitation, for example:
 1. Understand funding opportunities at all scales: RFP, Program, Division, Agency, Field, National, etc.
 - a. The solicitation resides at the fine grain scale, but it also resides in a larger context, or scale, of how the agency defines its mission at the larger scales, e.g., the agency strategic plan or research roadmap, as well as at the national level, e.g., perhaps a solicitation starts with a workshop or report from the National Academies on some "grand challenge" research topic and, therefore, your success in writing a proposal to a specific solicitation can be significantly influenced by how well you understand the agency's motives for investing in the specific research topic.
 2. Reports, workshops, conferences, webinars, etc.
 - a. This is a key point to keep in mind because successful grants are those that gain a marginal advantage over the competition. You are always competing at the margins or boundaries of excellence, and to do that well means that every opportunity you have to write a better proposal needs to be fully exploited. Viewing a webinar or reading a report that gives you a deeper and more nuanced understanding of the funding agency's reasons for supporting a program will provide critical information when crafting the arguments you will put forward to convince program officers and reviewers to fund your proposal.
 3. Agency mission, culture, investment priorities, strategic plan, etc.
 - a. Agency websites are now very robust and information rich in terms of helping you better understand the mission interest of the agency.

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- v. Understand the agency language used in solicitation, for example:
 - 1. Team science (aka partners, collaborators...)
 - a. Complexity of the scientific problem
 - b. Disciplines required to solve the problem
 - c. Value-added benefits
 - d. Integration and synergy
 - e. Technology development
 - f. Innovation ecosystems (e.g., NSF)
 - g. Commercialization partnerships
 - 2. Value added benefits
 - 3. Interdisciplinarity
 - 4. Transformational research
 - a. NSF, for example, uses this term to describe a range of endeavors that promise extraordinary outcomes, such as revolutionizing entire disciplines, creating entirely new fields, or disrupting accepted theories and perspectives.
 - 5. Synergy not silos
 - 6. Societal Goals
 - 7. Broader impacts
- i. Solicited
- j. Unsolicited (investigator initiated)
- k. Identify your research and education interests and goals
- l. Learn about the types of grants and agencies that fund research in your area
- m. Understand interdisciplinarity and team grants
- n. Learn how to find funding opportunities that fit your goals and interests
- o. Learn how various agencies fund research and education projects, both solicited and unsolicited
- p. Understand the agency's investment priorities/mission
- q. Learn role of BAAs (Broad Agency Announcements) in Your Funding Strategies
 - i. They describe the agency's research interest, either for an individual program requirement or for broadly defined areas of interest covering the full range of the agency's requirements;
 - ii. Describe the application and submission process, particularly any requirements for approval waypoints, such as quadcharts, white papers, preliminary proposals, and preapplications required to be invited to submit a full proposal;
 - iii. Describe the criteria for selecting the proposals, their relative importance, and the method of evaluation;
 - iv. Specify the period of time during which proposals submitted in response to the BAA will be accepted;
 - v. Designate a Point of Contact (POC) specific to agency research topic areas. BAAs typically encourage potential applicants to contact the agency POC to discuss the relevance of their research to the agency mission priorities before preparing proposals

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- r. Develop a long-term strategy for funding your research

4. Map your research to agency opportunity

- a. Make sure your research fits the research interests of the funding agency, either as defined in a specific solicitation or by fitting a list of agency research priority research topics, for example, as listed in an agency BAA.
- b. Talk to a program officer about your research and how well your research fits the interests of the agency.
- c. Talk to colleagues who have been well funded by the agency, served as reviewers for the agency, or have served as rotating program officers at the agency to gain an additional insight into how well your research and your “research readiness” maps to mission of the funding agency.

5. Analyze the solicitation

- a. Does my research expertise fit the goals and objectives of a specific solicitation?
 - i. How well do I understand the agency goals and objectives in the solicitation?
 - ii. Can I address all the research goals and objectives required by the solicitation?
 - 1. Do I need research collaborators for a competitive submission?
 - iii. Am I understanding the solicitation for what it is--**not what I want it to be**?
 - iv. Is there sufficient time to plan, develop, and write a competitive proposal?
- b. Can I make a compelling case for the significance of my research to the solicitation?
 - i. Why is my research significant?
 - 1. Why should an agency want to fund my research?
 - a. Can I explain why my research is exciting and novel?
 - ii. What are my research objectives?
 - 1. Is my research hypothesis-driven?
 - a. If so, can I state the hypothesis clearly?
 - 2. How will my research lead to new knowledge?
 - a. Will my research advance the field in some important way?
 - 3. Is my proposed research based on prior research support?
 - a. What were the outcomes of my past funded research?
 - 4. Do I have preliminary data that bolsters my case for funding?
 - a. Do I have sufficient preliminary data to be competitive?
 - iii. Do I have a realistic research plan?
 - 1. Can I make clear what I propose to do?
 - 2. Can I make clear why I propose to do it?
 - 3. Can I make clear why it is important to do it?
 - 4. Can I make clear that I have the expertise to do it?
 - 5. Can I demonstrate that my research plan is believable and not overly ambitious?
 - 6. Can I present a research plan based on a stepwise, logical approach?
 - 7. Can I instill in reviewers a confidence in my capacity to perform?
 - iv. Is my research basic or applied?

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1. Do I know the difference between basic and applied research?
2. Is the agency a basic research agency or a mission agency?
3. Do I know the difference between a basic and a mission agency?
4. Do I know how this distinction is made at the agency of interest?
 - a. Does the agency fund both basic and applied research?
 - b. Do I know what program offices at a specific agency fund basic research and which fund applied research?
- v. Am I considering the appropriate agency program for my research?
 1. Is there more than one agency program for which my research is fitted?
 2. Does the agency accept unsolicited proposals?
 - a. Do I know the process for submitting an unsolicited proposal?
 3. Have I had sufficient discussions with a program officer to ensure there are no unanswered questions I have about the agency that are key to my competitiveness, and that I have resolved any ambiguities in my understanding of the research funding solicitation, or agency priority areas if I am submitting an unsolicited proposal?

6. Develop a proposal production schedule

- a. The end point of the proposal production schedule is the proposal due date and the beginning point is the date you decide you will submit a proposal—these two points bracket your production activities, including scheduling:
 - i. Multiple draft iterations of the research narrative (project description)
 1. If there are multiple authors then draft sections need to be assigned to team members for completion
 - ii. Drafting the proposal budget, writing the budget justification, and preparing or managing the collection of related documents, commitments, and other proposal components not part of the research narrative, e.g., cost sharing commitments, current and pending support, biographical sketches, data management plans, post-doc mentoring plans, letters of support, etc.
 - iii. Task and performance assignments for all team members
 1. Good proposal team members do what they say they will do when they say they will do it and provide material of sufficient quality to enhance the competitiveness of the overall effort.
- b. A poorly planned proposal has little likelihood of success. Walt Kelly's Pogo once famously observed, "***We have met the enemy and he is us!***" That observation perfectly fits a poorly planned proposal development effort.
- c. A well-planned proposal development effort cannot turn ideas of modest importance into ideas of compelling significance, but it can give your ideas a chance to be realized through a well-crafted proposal rather than disguised by a poorly crafted one.

7. Use the solicitation as a draft proposal template

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- a. Copy and paste the solicitation's key sections, research objectives, and review criteria into a beginning draft narrative as an organizational template for the full proposal. This ensures that subsequent draft iterations of the research narrative are continuously calibrated to the guidelines and fully responsive to all of the sponsor's requirements:
 - i. fully responds to all requested information,
 - ii. offers information in the order requested,
 - iii. provides the required level of detail,
 - iv. integrates review criteria into the narrative, and
 - v. makes a complete and compelling case for the significance of your research, i.e., why it has valued-added impact on the agency's mission.
- b. Do I understand how the agency will review my proposal?
 - i. Do I understand the overarching review criteria used by the agency?
 1. Do I understand how basic research agencies review proposals?
 2. Do I understand how mission agencies review proposals?
 - a. Do I understand the role of mission-critical priorities in the review process?
 - ii. Do I understand the program or solicitation's specific review criteria?
 - iii. Do I understand the role of the program officer in the review process?
 1. Are reviews binding on the program officer?
 2. Can the program officer consider some reviews advisory only?
 - iv. Will my proposal be peer reviewed and by what format?
 1. Will there be a panel review?
 2. Will there be a mail review?
 3. Will some other process be used?
 - v. Specific review criteria and review processes differ from agency to agency, as well as by program within an agency, or by type of solicitation. **But the core, generic questions program officers and reviewers want answered can be simply stated:**
 1. What do you propose to do?
 2. Why is it important—what is its significance?
 3. Why are you able to do it?
 4. How will you do it?
 5. How does it contribute to and advance the research interests of the agency or the field?
 - vi. Do I understand "**how to write for reviewers**" and program officers?
 1. Unless you are confident you know otherwise, when writing to reviewers, **write for the intelligent reader and not the expert.** Remember you are most likely writing to a panel of reviewers, each member of which will be selected for a needed expertise. In all cases:
 - a. You must craft a persuasive argument presenting the merit, significance, rigor, and relevance of your research that makes the reviewers want to fund it;

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- b. You must convince reviewers you have the capacity to perform, and the institutional infrastructure to support your research;
 - c. You must extend your argument to discuss the likely impact your research will have in advancing the field and creating new knowledge, both in your research area and possibly in other research fields as well; and
 - d. When writing to federal mission agencies, you must demonstrate to the program managers and reviewers that your research advances the mission of the agency.
2. The author of a funded proposal has accomplished the following basic goals of writing for or with reviewers in mind:
 - a. Ensured the reviewers were intrigued and excited about the proposed research;
 - b. Understood its significance to the agency mission or field;
 - c. Understood that existing research enhances the likely success of the proposed effort;
 - d. Understood how the proposed research will be accomplished;
 - e. Had confidence in the researcher's capacity to perform.
3. Writing for Reviewers—**Generic Narrative Tips**
 - a. Sell your proposal to a good researcher but not an expert;
 - b. Some review panels may not have an expert in your field, or panels may be blended for multidisciplinary initiatives, so write to all the reviewers on the panel;
 - c. Recall that proposals are not journal articles; proposals must be user friendly and offer a narrative that is compelling and memorable to reviewers;
 - d. Proposals are not mystery novels. Reveal the significance of your research early, not at the conclusion;
 - e. Reviewers will assume that sloppy errors in language, usage, grammar, and logic will translate into sloppy errors in your research;
 - f. Write a compelling project summary (or abstract) and narrative introduction:
 - i. This is where you must capture the interest of reviewers and win them over by making them intrigued enough to want to read your entire proposal closely and with interest;
 - ii. Define the significance of the core ideas early, clearly, and concisely;
 - iii. Describe the connectedness of the core ideas to specific research activities and outcomes, and advance your ideas with sufficient detail to make your research memorable after the proposal is read.

8. Draft the project description

- a. Use the solicitation as a template to draft the project narrative;
- b. Make sure all members of the research team have read and understand the expectations of the solicitation;
- c. Answer in narrative form all the questions asked in the solicitation in the order they are asked;
- d. Plan on the use of graphics, visuals and milestone charts to complement the narrative text
 - i. Narrative text is linear. It is grounded on a logical sequence of explanation made coherent and persuasive by the author's writing skills. Graphics, however, function as a "**visual language**" able to capture complex relationships in a simple and unifying way by synthesis, integration, and synergy, the holy grail of the successful narrative.
- e. The generic underpinnings of a successful research grant include five key persuasive elements: **the research vision, goals, objectives, rationale, and specific outcomes**. These five key components are strengthened by preliminary data, results from prior research support, publications in the field, and patents, among other prior performance information that validates your capacity to perform. Depending on the solicitation, these elements may or may not appear in the order described here, but they typically provide the critical mass of the persuasive argument in successful proposals. They also provide clarity through a logically-tiered framework that allows reviewers to differentiate your research at multiple levels of specificity and detail, from the macro-vision to micro-performance details.
- f. Recognize what a successful research narrative **is not**.
 - i. A research plan cloaked in a fog of poorly written text.
 - ii. A vague research vision lacking focus, or reading, as H.L. Menken once observed, "*like an army of words marching across the page in search of an idea.*"
 - iii. A research narrative focusing heavily on general statements about past and planned research, but failing to give details and specifics that help readers understand the importance of the research, or its significance in advancing the field through questions, hypotheses, or solutions.
- g. Recognize what a successful research narrative **is**.
 - i. Starts with an important research idea stated clearly and simply so reviewers can quickly grasp the research questions or hypotheses.
 - ii. Explains why your research is unique and supports this with sufficient specificity and detail to make your case.
 - iii. Explains the importance, significance, or value-added benefits of your research to advancing the field, or advancing the research mission of the funding agency.
 - iv. Provides reviewers with a clear statement of the significance of the project from a precisely written project description that is supported by specificity and detail.

1. Specificity grounds the research vision and goals in the key performance details unique to your research objectives, and thereby illuminates the importance of your research for reviewers.
 2. Specifics serve to both test and prove the value of your ideas, and when they are lacking, it tells a reviewer that your ideas may also be lacking, or have yet to become fully developed.
 3. Stating a goal without then offering compelling specifics that make clear the process you will use to transition a goal to reality, i.e., a research outcome, is the domain of politicians and bumper sticker slogans and not that of the successful research proposal.
- v. Conversely, generalities seem to escape many authors' notice, yet appear as glaring flaws to readers and reviewers alike, especially those searching for the specificity needed to make an informed critical judgment on the project's merit. The experience of reading a narrative laced with generalities leaves the reader and reviewer alike with a foreboding and increasingly exasperating sense of uncertainty about specifically what the proposer actually plans to do.
- vi. Moreover, ambiguity introduces significant uncertainty into the research narrative, although ambiguity in the narrative does offer one certainty—an unfunded proposal. ***This is because ambiguity in the project description imposes unwanted riddles on program officers and reviewers alike*** that may lead them to believe reading the research narrative is an experience somewhat akin to attempting to interview Schrödinger's Cat without opening the box to determine its state, either dead or alive. However, narrative ambiguity exists in only one state—confusion.

9. Ask colleagues to critique your drafts

- a. Too often, the first – and final – substantive outside review of a proposal narrative occurs when the funding agency makes the funding decision. ***This is too late in the process to ensure success!***
- b. Ask colleagues to review your proposal prior to submission and with sufficient time remaining for you to make narrative changes. Let them know upfront that you want the ***“brutal, frank and honest”*** review option and not the ***“nice and sensitive to your feelings”*** review option. Ask them to:
 - i. Find weaknesses, deficiencies, and ambiguities in the proposal text;
 - ii. Identify inconsistencies and omissions between the proposal narrative and the requirements of the solicitation and review criteria;
 - iii. Play the devil's advocate when necessary;
 - iv. Challenge the vision, assumptions, and other statements in the text that are not well supported or clearly stated, or are poorly argued;
 - v. Make observations on the persuasiveness of the arguments you put forward describing the uniqueness of your research;
 - vi. Offer suggestions that both correct identified deficiencies in your research narrative and better amplify identified strengths.

10. Converge on narrative perfection

- a. The key to a successful proposal represents the outcome of a process of continuous iteration and improvement of the project narrative that, over a sufficient amount of time, *converges on perfection*.

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Research Grant Writing Web Resources

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[NSF Proposal & Award Policy Update, Fall 2016](#)

[Comprehensive information on how to write a grant to NIH](#)

[STEM 2026: A Vision for Innovation in STEM Education](#)

This report describes a vision (hereafter referred to as “STEM 2026”) for the future of STEM education, preschool–12th grade (P–12) and beyond. STEM 2026 is aspirational but builds on the priorities the Obama Administration has established on improving innovation and equitable access to high-quality learning experiences in these critical fields. The key components of the vision resulted from a series of workshops and discussions held in 2015 that were organized by the U.S. Department of Education (the Department), with support from American Institutes for Research (AIR). Nearly 30 individuals representing a wide diversity of expertise, experience, and perspectives were invited to exchange knowledge and ideas for leveraging the opportunities of today to design a possible future of STEM education. This vision is not intended to prescribe a set of activities or practices. Rather, STEM 2026 is meant to start a conversation about opportunities for innovation, and propel research and development that can build a stronger evidence base for what works in various contexts, best serves diverse learners, and motivates action toward achieving transformative change.

As recognized in the Every Child Succeeds Act (ESSA), President Obama’s Computer Science for All initiative, and the competitive priority to focus attention on STEM in several of the Department’s discretionary grant programs, STEM is a crucial component of a well-rounded education for all students—an education that provides access to science, social studies, literature, the arts, physical education and health, and the opportunity to learn an additional language. The process of learning and practicing the STEM disciplines can instill in students a passion for inquiry and discovery and fosters skills such as persistence, teamwork, and the application of gained knowledge to new situations (Bailey et al., 2015; Betrus, 2015). Experts contend that these are the types of growth mindsets and habits that demonstrate one’s capacity for academic tenacity and lifelong learning in a rapidly changing world (Dweck, Walton, & Cohen, 2014; Sharples, 2000).

[NSF Grants Conference hosted by Portland State University - February 29 - March 1, 2016](#)

- [Introduction and NSF Overview](#)
- [Proposal Preparation](#)
- [NSF Merit Review Process](#)
- [Overview of NSF Funding Mechanisms](#)
- [Award Management](#)
- [Faculty Early Career Development \(CAREER\) Program](#)
- [Office of the Inspector General](#)
- [NSF Policy Update](#)
- Breakout Sessions:



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- [Biological Sciences](#)
- [Post-Award Monitoring and Compliance](#)
- [Computer and Information Science and Engineering](#)
- [Education and Human Resources](#)
- [Engineering](#)
- [Major Research Instrumentation](#)
- [Geosciences](#)
- [Mathematical and Physical Sciences](#)
- [International Research and Education Collaboration](#)
- [NSF Grantee Cash Management Section Update](#)
- [Social, Behavioral and Economic Sciences](#)
- [IT Modernization/Research.gov](#)
- [Emerging Research Institution Roundtable](#)



[Archived Webcast of Fall 2015 NSF Grants Conference](#)

[How to Prepare an NSF Proposal: The Good, the Bad and the Ugly - August 2016](#)


What Does NIH Look For in Research Proposals?

The NIH provides financial support in the form of [grants](#), [cooperative agreements](#), and [contracts](#) . This assistance supports the advancement of the [NIH mission](#)  of enhancing health, extending healthy life, and reducing the burdens of illness and disability. While NIH awards many grants specifically for research, we also provide grant opportunities that support research-related activities, including: fellowship and training, career development, scientific conferences, resource and construction. Learn more about the [types of programs](#) NIH supports. We encourage:

- **Projects of High Scientific Caliber**

NIH looks for grant proposals of high scientific caliber that are relevant to public health needs and are within [NIH Institute and Center](#)  (IC) priorities. ICs highlight their research priorities on their individual [websites](#) . Applicants are urged to contact the [appropriate scientific program staff](#) at the Institute or Center to discuss the relevancy and/or focus of their proposed research before submitting an application.

- **NIH-Requested Research**

NIH Institutes and Centers regularly identify specific research areas and program priorities to carry out their scientific missions. To encourage and stimulate research and the submission of research applications in these areas, many ICs will issue [funding opportunity announcements \(FOAs\)](#) in the form of [program announcements \(PAs\)](#) and [requests for applications \(RFAs\)](#). These FOAs may be issued to support research in an understudied area of science, to take advantage of current scientific opportunities, to address a high scientific program priority, or to meet additional needs in research training and infrastructure. To find an FOA in your scientific field, search the [NIH Guide for Grants and Contracts](#) which includes all funding opportunities offered by NIH, or [Grants.gov](#)  to search across all Federal agencies.

- **Unsolicited Research**

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NIH supports “unsolicited” research and training applications that do not fall within the scope of NIH-requested targeted announcements. These applications originate from your research idea or training need, yet also address the scientific mission of the NIH and one or more of its ICs. These “unsolicited” applications should be submitted through “[parent announcements \(PAs\)](#)”, which are funding opportunity announcements that span the breadth of the NIH mission.

- **Unique Research Projects**

Projects must be unique. By law, NIH cannot support a project already funded or pay for research that has already been done. Although you may not send the same application to more than one [Public Health Service \(PHS\)](#) agency at the same time, you can apply to an organization outside the PHS with the same application. If the project gets funded by another organization, however, it cannot be funded by NIH as well.

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Educational Grant Writing Web Resources

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[Successful K-12 STEM Education: Identifying Effective Approaches in Science, Technology, Engineering, and Mathematics](#)

[Identifying and Supporting Productive STEM Programs in Out-of-School Settings](#)

[Education Department Outlines Six Focus Areas for STEM Ed over Next Decade](#)

[New Practice Guide: Teaching Secondary Students to Write Effectively](#)

Agency Research News

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NIFA Launches ezFedGrants

This fall, NIFA is launching a phased roll out of [ezFedGrants](#), a new grants management system. NIFA and other USDA agencies are adopting ezFedGrants as part of a USDA-wide grants modernization effort to lower costs, streamline the award process, reduce errors, and provide self-service capabilities for applicants and grantees. NIFA staff will begin to use ezFedGrants to process all 2017 capacity program applications starting in fall 2016. Fiscal year 2017 capacity grant applicants will use ezFedGrants to check their application status (starting in November 2016). Institutions also will use ezFedGrants to submit their Federal Financial Report (SF425) electronically when they are due in December 2017. In the future, ezFedGrants will be used for more grant management functions. Visit [NIFA website](#) for ezFedGrants training and informational tools for grantees transition to the new system. If you have any questions about ezFedGrants, please send an email to grantsmod@nifa.usda.gov.

[Dear Colleague Letter: Research Experiences for Undergraduates \(REU\) Supplemental Funding](#)

The NSF Directorate for Computer and Information Science and Engineering (CISE) invites grantees with active CISE awards to submit requests for Research Experiences for Undergraduates (REU) Supplemental funding, following the guidelines in the NSF REU solicitation (see Research Experiences for Undergraduates (REU): Sites and Supplements; [NSF 13-542](#)). Awards under no cost extension (NCE) are not eligible for this supplement. A student must be a US citizen, or a permanent resident of the US. The duration for new requests is typically one year. The proposed start date for a supplement must be after the conclusion of all existing REU supplements on the corresponding active CISE award. Priority will be given to requests submitted before March 30, 2017; the potential for funding requests after this date will be limited. If requests for REU supplemental support exceed funds available in CISE, requests will be considered in the order received. REU supplement funds can be used at any time during the year.

Annual and final reports for a project receiving REU supplements should provide a brief description of activities, impacts and outcomes (including number of support-months for each student) of REU supplement support. REU stipend support helps retain talented students, while providing meaningful research experiences and encouraging research-based careers. The participation of students from groups underrepresented in computing -- underrepresented minorities, women, and persons with disabilities -- is strongly encouraged. In addition, CISE encourages REU supplements that specifically afford U.S. veterans an opportunity to engage in meaningful research experiences. For single investigator projects, CISE REU supplemental funding requests should typically be for no more than two students for one year. Research teams funded through multi-investigator projects may request support for a larger number of students, commensurate with the size and nature of their projects. Requests for larger numbers of students should be accompanied by detailed justifications.

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CISE usually provides up to \$8,000 per student per year through the REU supplemental support mechanism (This amount usually covers stipend but a small portion of the fund can be used for other related purposes e.g.; student travel to a conference). As described in the REU program solicitation ([NSF 13-542](#)), indirect costs (F&A) are not allowed on Participant Support costs in REU Site or REU Supplement budgets.

Dear Colleague Letter (DCL): Enabling New Collaborations Between Computer and Information Science & Engineering (CISE) and Social, Behavioral and Economic Sciences (SBE) Research Communities

With this DCL, the National Science Foundation (NSF) is announcing its intention to build upon the success of previous EARly-Concept Grants for Exploratory Research (EAGERS) in the areas supported by the Secure and Trustworthy Cyberspace (SaTC) program (see NSF 16-580, https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf16580&org=NSF) and to encourage the submission of additional EAGER proposals that foster novel interdisciplinary research carried out in new collaborations between one or more Computer and Information Science and Engineering (CISE) researchers *and* one or more Social, Behavioral and Economic Sciences (SBE) researchers. Note that this DCL is focused on *new* collaborations; research teams with a history of collaborating together should instead submit directly to the SaTC solicitation, pursuant to the proposal preparation guidelines specified therein.

Many scientific and practical challenges of security, privacy, and trust have sociotechnical dimensions, and thus it is important to encourage interdisciplinary collaborations among researchers from the disciplines represented in NSF's CISE and SBE directorates, and on topics that draw on the strengths of each researcher.

Below are some examples of the types of topics that might benefit from collaborations between CISE and SBE researchers under such an EAGER project. This list is by no means intended to be directive or complete. Many important problems demand strong research reflecting integrative perspectives.

- Ethical, political, legal, cultural, or societal dimensions of security and privacy technologies and their impacts.
- Security/privacy in the context of social media, including topics such as data aggregation and algorithmic filtering.
- Addressing online behavioral risks to security, safety, and/or privacy, including trolling, spamming and cyberbullying.
- Interaction design research on how to accommodate individual and/or collective privacy values and concerns.
- Inclusive security or privacy mechanisms that adapt to the needs and abilities of underrepresented or disabled individuals or groups.
- Research on education, training, and awareness around security and privacy for both users and developers of secure and trustworthy systems.
- Understanding and supporting responses to cyberattacks, ranging from the individual to national scales.
- Security/privacy at the level of families, groups, communities, and other understudied levels/units of analysis.

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- Organizational strategies, investments, or governance effects on security/privacy, and approaches for improvement.
- Studies of economic dimensions of security or privacy decision-making, including cost-benefit analyses, incentive structures, and/or mechanism design.
- Methods for modeling intentions and/or behaviors relevant to cybersecurity. For example, methods could include social network analysis, crowdsourcing, and inter-organizational policy analysis, and combinations thereof.

Proposals submitted pursuant to this DCL must include one or more PIs from the fields supported by the Computer and Information Science and Engineering (CISE) directorate, and one or more PIs from those areas supported by the Social, Behavioral, and Economic sciences (SBE) directorate. Proposals should describe how intellectual merit and broader impacts will benefit from the contribution from each discipline. Proposals where one side is mainly in service of the other are not appropriate. Ideally, the research will be interdependent and integrated-sharing visions, models, methods, or discoveries. Such integration may require extra effort in leadership, regular communication, and cross-training. Proposals must also describe how the collaboration will work in the planning, research, and dissemination stages. Two rounds of submissions are anticipated, with approximately five EAGERs awarded during each round, subject to the availability of funds. The anticipated deadlines for submission of EAGER proposals are December 1, 2016, and April 1, 2017, for the first and second rounds, respectively.

[Dear Colleague Letter: Encouraging Reproducibility in Computing and Communications Research](#)

The National Science Foundation (NSF) recognizes a general and growing concern among researchers that a number of influences—including bias toward positive results, competition to rush findings to print, an overemphasis on presenting conceptual breakthroughs in high-impact venues, and a lack of incentives for academic researchers to retract irreproducible findings—have combined to reduce standards of reproducibility and rigor in research, and thus retard the general progress of science and engineering. Given that research in computing and communications is not immune to these influences, and building upon other ongoing efforts to promote reproducibility, the Directorate for Computer and Information Science and Engineering (CISE) announces through this Dear Colleague Letter (DCL) its intention to support research that improves the level of reproducibility in research on computer systems and networking; modeling, analysis and simulation of computing and communication systems; and cybersecurity.

Specifically, CISE encourages principal investigators (PIs) submitting new proposals to or with active awards in its Computer and Network Systems (CNS) core, Computing and Communication Foundations (CCF) core, and Secure and Trustworthy Cyberspace (SaTC) programs to embrace completeness and transparency in developing rigorous protocols as well as in making experimental parameters and collected data available to other researchers. In particular, PIs are strongly encouraged to describe, as part of their data management plans, how they will provide access to well-documented datasets, modeling and/or simulation tools, and codebases to support reproducibility of their methods.

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Reproducibility can occur across different realms-numerical, empirical, computational and statistical-and may be analytical, direct, systematic or conceptual. Reproducibility can be interpreted to include traits such as repeatability, robustness, reliability and generalizability. Through this DCL, the participating programs noted above encourage proposals that specifically seek to reproduce, verify and/or characterize recent results in the disciplines covered under each program's ambit of research. Such proposals should identify the key results to be reproduced, motivate the importance of the results to the community and the need for independent validation, and present rigorous methodologies for experimentation with the goal of extensively and thoroughly characterizing the operating parameters under which these results can be reproduced. Where practical, proposers should also propose models and openly accessible repositories for complete data sharing of all results from these experiments. Research in Undergraduate Institutions (RUI) proposals are particularly encouraged.

Dear Colleague Letter: Provision of Shallow Advanced Piston Coring Capabilities on JOIDES Resolution to the U.S. Research Community: "JR100"

The Division of Ocean Sciences (OCE) of the National Science Foundation (NSF) is providing up to four weeks each year of access to the drill ship *JOIDES Resolution* for U.S. researchers to use the Advanced Piston Coring (APC) system to collect cores up to sub-bottom depths of 100 meters to address research on multiple aspects of geology and geophysics of the ocean basins. This program, referred to as "JR100", will not be part of the *JOIDES Resolution's* participation in the International Ocean Discovery Program (IODP), and will be funded, managed, and implemented separately from the IODP. Proposals for JR100 coring cruises will be accepted by relevant science programs following announcement of the JOIDES Resolution FY2019 schedule after the May 2017 JOIDES Resolution Facility Board meeting. Prospective PIs are strongly encouraged to consult with a Program Officer to determine the applicable program proposal submission guidelines and deadlines.

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Agency Reports, Workshops & Research Roadmaps

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[Reaching Students: What Research Says About Effective Instruction in Undergraduate Science and Engineering](#)

The undergraduate years are a turning point in producing scientifically literate citizens and future scientists and engineers. Evidence from research about how students learn science and engineering shows that teaching strategies that motivate and engage students will improve their learning. So how do students best learn science and engineering? Are there ways of thinking that hinder or help their learning process? Which teaching strategies are most effective in developing their knowledge and skills? And how can practitioners apply these strategies to their own courses or suggest new approaches within their departments or institutions? Reaching Students strives to answer these questions.

Reaching Students presents the best thinking to date on teaching and learning undergraduate science and engineering. Focusing on the disciplines of astronomy, biology, chemistry, engineering, geosciences, and physics, this book is an introduction to strategies to try in your classroom or institution. Concrete examples and case studies illustrate how experienced instructors and leaders have applied evidence-based approaches to address student needs, encouraged the use of effective techniques within a department or an institution, and addressed the challenges that arose along the way.

The research-based strategies in Reaching Students can be adopted or adapted by instructors and leaders in all types of public or private higher education institutions. They are designed to work in introductory and upper-level courses, small and large classes, lectures and labs, and courses for majors and non-majors. And these approaches are feasible for practitioners of all experience levels who are open to incorporating ideas from research and reflecting on their teaching practices. This book is an essential resource for enriching instruction and better educating students.

[From Maps to Models: Augmenting the Nation's Geospatial Intelligence Capabilities](#)

The United States faces numerous, varied, and evolving threats to national security, including terrorism, scarcity and disruption of food and water supplies, extreme weather events, and regional conflicts around the world. Effectively managing these threats requires intelligence that not only assesses what is happening now, but that also anticipates potential future threats. The National Geospatial-Intelligence Agency (NGA) is responsible for providing geospatial intelligence on other countries—assessing where exactly something is, what it is, and why it is important—in support of national security, disaster response, and humanitarian assistance. NGA's approach today relies heavily on imagery analysis and mapping, which provide an assessment of current and past conditions. However, augmenting that approach with a strong modeling capability would enable NGA to also anticipate and explore future outcomes. A model is a simplified representation of a real-world system that is used to extract explainable insights about the system, predict future outcomes, or explore what might happen under plausible what-if scenarios. Such models use data and/or theory to specify inputs (e.g., initial conditions, boundary conditions, and model parameters) to produce an output. From Maps to Models:

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Augmenting the Nation's Geospatial Intelligence Capabilities describes the types of models and analytical methods used to understand real-world systems, discusses what would be required to make these models and methods useful for geospatial intelligence, and identifies supporting research and development for NGA. This report provides examples of models that have been used to help answer the sorts of questions NGA might ask, describes how to go about a model-based investigation, and discusses models and methods that are relevant to NGA's mission.

Strengthening Data Science Methods for Department of Defense Personnel and Readiness Missions

The Office of the Under Secretary of Defense (Personnel & Readiness), referred to throughout this report as P&R, is responsible for the total force management of all Department of Defense (DoD) components including the recruitment, readiness, and retention of personnel. Its work and policies are supported by a number of organizations both within DoD, including the Defense Manpower Data Center (DMDC), and externally, including the federally funded research and development centers (FFRDCs) that work for DoD. P&R must be able to answer questions for the Secretary of Defense such as how to recruit people with an aptitude for and interest in various specialties and along particular career tracks and how to assess on an ongoing basis service members' career satisfaction and their ability to meet new challenges. P&R must also address larger-scale questions, such as how the current realignment of forces to the Asia-Pacific area and other regions will affect recruitment, readiness, and retention.

While DoD makes use of large-scale data and mathematical analysis in intelligence, surveillance, reconnaissance, and elsewhere—exploiting techniques such as complex network analysis, machine learning, streaming social media analysis, and anomaly detection—these skills and capabilities have not been applied as well to the personnel and readiness enterprise. Strengthening Data Science Methods for Department of Defense Personnel and Readiness Missions offers and roadmap and implementation plan for the integration of data analysis in support of decisions within the purview of P&R.

New Funding Opportunities

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Content Order

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

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

New Funding Solicitations Posted Since October 15 Newsletter

[Plant Feedstocks Genomics for Bioenergy: A Joint Research FOA USDA, DOE](#)

The U.S. Department of Energy's Office of Science, Biological and Environmental Research (BER), and the U.S. Department of Agriculture (USDA), National Institute of Food and Agriculture (NIFA), hereby announce their interest in receiving applications for genomics based research that will lead to the improved use of plant biomass and feedstocks for the production of biofuels and renewable chemical feedstocks. Applications are sought for research on candidate herbaceous and woody plants with improved resistance/tolerance to disease and disease complexes, and non-food oil seed crops with improved winter cold tolerance/survivability and agronomic traits. Research to overcome these biological barriers to the low-cost, high quality, scalable and sustainable production of dedicated bioenergy biomass feedstocks using the tools of genetics and genomics are encouraged. **Pre-Application Due Date: 12/07/2016; Application Due Date: 02/15/2017**

[Food Insecurity Nutrition Incentive \(FINI\) Grant Program](#)

To support projects to increase the purchase of fruits and vegetables among low-income consumers participating in the Supplemental Nutrition Assistance Program (SNAP) by providing incentives at the point of purchase. The program will test strategies that could contribute to our understanding of how best to increase the purchase of fruits and vegetables by Supplemental Nutrition Assistance Program (SNAP) participants that would inform future efforts, and develop effective and efficient benefit redemption technologies. **Due December 12.**

[Industry-University Cooperative Research Centers Program \(IUCRC\)](#)

The Industry-University Cooperative Research Centers (IUCRC) program develops long-term partnerships among industry, academe, and government. The Centers are catalyzed by an investment from the National Science Foundation (NSF) and are primarily supported by industry Center members, with NSF taking a supporting role in the development and evolution of the Center. Each Center is established to conduct research that is of interest to both the industry

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members and the Center faculty. An IUCRC contributes to the nation's research infrastructure base and enhances the intellectual capacity of the engineering and science workforce through the integration of research and education. As appropriate, an IUCRC uses international collaborations to advance these goals within the global context. **Preliminary due January 3; full February 28.**

[BOR-DO-17-F007 Desalination and Water Purification Research Program Fiscal Year 2017 Full Scale Testing Projects](#)

Through DWPR, research sponsors partner with Reclamation to address a broad range of desalting and water purification needs. Reclamation is interested in research where the benefits are widespread but where private-sector entities are not able to make the full investment and assume all the risks. Reclamation is also interested in research that has a national significance – where the issues are of large-scale concern and the benefits accrue to a large sector of the public. The objective of this Funding Opportunity Announcement (FOA) is to invite private industry, universities, water utilities, and other research sponsors to submit proposals to cost share full scale testing projects that address DWPR program goals and objectives. Full scale testing projects are generally preceded by pilot scale testing (funded previously by DWPR or others) that demonstrate that the technology works. **Due January 12.**

[Bioscience Research Projects – Whitehall Foundation](#)

The Whitehall Foundation assists scholarly research in the life sciences through its research grants and grants-in-aid programs. It is the foundation's policy to support those dynamic areas of basic biological research that are not heavily supported by federal agencies or other foundations with specialized missions. The foundation emphasizes the support of young scientists at the beginning of their careers and productive senior scientists who wish to move into new fields of interest. 1) Research: Research grants of up to \$225,000 over three years will be awarded to established scientists of all ages working at accredited institutions in the United States. Grants will not be awarded to investigators who have already received, or expect to receive, substantial support from other sources, even if it is for an unrelated purpose. 2) Grants-in-Aid: One-year grants of up to \$30,000 will be awarded to researchers at the assistant professor level who experience difficulty in competing for research funds because they have not yet become firmly established. Grants-in-Aid can also be made to senior scientists. **Letter of Intent deadline, January 15.**

[Insect Allies Department of Defense DARPA - Biological Technologies Office](#)

The Insect Allies program will develop a platform technology for delivering enhanced crop traits within a single growing season by delivering a modified virus to target plants by a mobile insect vector. **Due January 17.**

Young Faculty Award: [Read the full announcement.](#)

The Defense Advanced Research Projects Agency (DARPA) is soliciting innovative research proposals in the areas of physical sciences, engineering, materials, mathematics, biology, computing, informatics, social science, and manufacturing of interest to DARPA's Defense

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Sciences Office (DSO), Microsystems Technology Office (MTO), and Biological Technologies Office (BTO). **Deadline, January 18.**

Organic Agriculture Research and Extension Initiative. [Read the full announcement.](#)

The OREI seeks to solve critical organic agriculture issues, priorities, or problems through the integration of research, education, and extension activities. The purpose of this program is to fund projects that will enhance the ability of producers and processors who have already adopted organic standards to grow and market high quality organic agricultural products. Priority concerns include biological, physical, and social sciences, including economics. The OREI is particularly interested in projects that emphasize research, education and outreach that assist farmers and ranchers with whole farm planning by delivering practical research-based information. Projects should plan to deliver applied production information to producers. Fieldwork must be done on certified organic land or on land in transition to organic certification, as appropriate to project goals and objectives. **Deadline, January 19**

[Organic Agriculture Research and Extension Initiative](#)

The OREI seeks to solve critical organic agriculture issues, priorities, or problems through the integration of research, education, and extension activities. The purpose of this program is to fund projects that will enhance the ability of producers and processors who have already adopted organic standards to grow and market high quality organic agricultural products. Priority concerns include biological, physical, and social sciences, including economics. The OREI is particularly interested in projects that emphasize research, education and outreach that assist farmers and ranchers with whole farm planning by delivering practical research-based information. Projects should plan to deliver applied production information to producers. Fieldwork must be done on certified organic land or on land in transition to organic certification, as appropriate to project goals and objectives. Refer to the USDA [National Organic Program](#) for organic production standards. **Due January 19.**

[Biological Anthropology Program - Doctoral Dissertation Research Improvement Grants \(BA-DDRIG\)](#)

The Biological Anthropology Program supports multifaceted research to advance scientific knowledge of human biology and ecology, including understanding of our evolutionary history and mechanisms that have shaped human and nonhuman primate biological diversity. Supported research focuses on living and fossil forms of both human and nonhuman primates, addressing time scales ranging from the short-term to evolutionary, encompassing multiple levels of analysis (e.g., molecular, organismal, population, ecosystem), conducted in field, laboratory, captive, and computational research environments, and often incorporating interactions between human biology and culture. Areas of inquiry that promote understanding of the evolution, biology, and adaptability of our diverse species include, but are not limited to: genetic/epigenetic/genomic variation and relationship to phenotype; ecology and socioecology; functional anatomy and skeletal biology; and paleoanthropology and primate paleontology. Multidisciplinary research that integrates biological anthropology with related anthropological fields, such as archaeology, cultural anthropology, and forensic anthropology, also receives support through the Program. **Due January 20.**

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Long Term Research in Environmental Biology [Read the full announcement.](#)

The Long Term Research in Environmental Biology (LTREB) Program supports the generation of extended time series of data to address important questions in evolutionary biology, ecology, and ecosystem science. Research areas include, but are not limited to, the effects of natural selection or other evolutionary processes on populations, communities, or ecosystems; the effects of interspecific interactions that vary over time and space; population or community dynamics for organisms that have extended life spans and long turnover times; feedbacks between ecological and evolutionary processes; pools of materials such as nutrients in soils that turn over at intermediate to longer time scales; and external forcing functions such as climatic cycles that operate over long return intervals. **Deadline, January 23.**

Division of Environmental Biology [Read the full announcement.](#)

The Division of Environmental Biology (DEB) supports fundamental research on populations, species, communities, and ecosystems. Scientific emphases range across many evolutionary and ecological patterns and processes at all spatial and temporal scales. Areas of research include biodiversity, phylogenetic systematics, molecular evolution, life history evolution, natural selection, ecology, biogeography, ecosystem structure, function and services, conservation biology, global change, and biogeochemical cycles. Research on organismal origins, functions, relationships, interactions, and evolutionary history may incorporate field, laboratory, or collection-based approaches; observational or manipulative experiments; synthesis activities; as well as theoretical approaches involving analytical, statistical, or computational modeling. **Deadline, January 23.**

[Postbaccalaureate Research Education Program \(PREP\) \(R25\)](#)

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 Research Experiences and Courses for Skills Development. Applications are encouraged from research-intensive institutions that propose to equip recent baccalaureate science graduates from diverse backgrounds underrepresented in biomedical sciences with the necessary knowledge and skills to pursue Ph.D. degrees in these fields. The program provides support for extensive research experiences and well-designed courses for skills development aimed at preparing individuals from underrepresented backgrounds to complete doctoral degrees. **Due January 24.**

[National Robotics Initiative 2.0: Ubiquitous Collaborative Robots \(NRI-2.0\)](#)

The goal of the National Robotics Initiative (NRI) is to support fundamental research that will accelerate the development and use of robots in the United States that work beside or cooperatively with people. The original NRI program focused on innovative robotics research that emphasized the realization of collaborative robots (co-robots) working in symbiotic relationships with human partners. The NRI-2.0 program significantly extends this theme to focus on issues of scalability: how teams of multiple robots and multiple humans can interact

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and collaborate effectively; how robots can be designed to facilitate achievement of a variety of tasks in a variety of environments, with minimal modification to the hardware and software; how robots can learn to perform more effectively and efficiently, using large pools of information from the cloud, other robots, and other people; and how the design of the robots' hardware and software can facilitate large-scale, reliable operation. In addition, the program supports innovative approaches to establish and infuse robotics into educational curricula, advance the robotics workforce through education pathways, and explore the social, behavioral, and economic implications of our future with ubiquitous collaborative robots. Collaboration between academic, industry, non-profit, and other organizations is encouraged to establish better linkages between fundamental science and engineering and technology development, deployment and use. Well-justified international collaborations that add significant value to the proposed research and education activities will also be considered. The NRI-2.0 program is supported by multiple agencies of the federal government including the National Science Foundation (NSF), the U.S. Department of Agriculture (USDA), the U.S. Department of Energy (DOE), and the U.S. Department of Defense (DOD). Questions concerning a particular project's focus, direction and relevance to a participating funding organization should be addressed to that agency's point of contact listed in section VIII of this solicitation.

Due February 2.

[NOAA Climate Program Office's Regional Integrated Sciences and Assessments \(RISA\) Program](#)

The NOAA Climate Program Office's (CPO) Regional Integrated Sciences and Assessments (RISA) program supports research teams that conduct innovative, interdisciplinary, user-inspired, and regionally relevant research that informs resource management and public policy. CPO funds a network of RISA teams across the United States (US) and Pacific Islands, which are a model for interdisciplinary science and assessment. NOAA's RISA program is overseen by CPO's Climate and Societal Interactions (CSI) division. CSI's mission is to inform improvements in resilience and preparedness in diverse socio-economic regions and sectors throughout the US and abroad through the use of climate knowledge and information. Our research advances the nation's understanding of climate-related risks and vulnerabilities across sectors and regions, and the development of tools to foster more informed decision making. These efforts support NOAA's vision to create and sustain enhanced resilience in ecosystems, communities, and economies. In addition to RISA, CSI's programs include the International Research and Applications Project (IRAP), the Sectoral Applications Research Program (SARP), and the Coastal and Ocean Climate Applications program (COCA). CSI is also an active partner with NOAA efforts to provide integrated regional climate services. This partnership brings together NOAA Regional Climate Services Directors (RCSDs), other NOAA offices, and close external partners such as RISA teams, Regional Climate Centers, State Climatologists, and Sea Grant to help make climate information relevant and accessible to people across the US. NOAA seeks to marshal climate assets and partners towards the common goal of assessing regional needs and vulnerabilities and then supporting the development and delivery of timely climate services that aid adaptation and mitigation choices. RISA and CSI activities address the societal challenges identified in NOAA's Next-Generation Strategic Plan (NGSP): i) climate impacts on water resources; ii) coasts and climate resilience; iii) sustainability of marine ecosystems; and iv) changes in the extremes of

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weather and climate. These efforts support NOAA's vision to create and sustain enhanced resilience in ecosystems, communities, and economies, as outlined in the NGSP. In FY 2017, RISA is holding two competitions for research funding focused on three geographies. We are soliciting proposals for: 1) Competition 1: a RISA team focused on the Arizona/New Mexico region of the US; and 2) Competition 2: a RISA team focused on either the California/Nevada region of the US or on the Midwestern region of the US. We estimate that \$3-\$3.5 million over five years will be available for each competition, pending available funding and budget appropriations. Awards will be at a funding level of \$600,000-\$700,000 per year for up to 5 years. Please download the RISA Information Sheet for more detailed information (<http://www.cpo.noaa.gov/risa/>). **Due February 6.**

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

All responsible sources from academia and industry may submit proposals under this BAA. Historically Black Colleges and Universities (HBCUs) and Minority Institutions (MIs) are encouraged to submit proposals and join others in submitting proposals. However, no portion of this BAA will be set aside for Small Business or other socio-economic participation. All businesses both small and large are encouraged to submit proposals and compete for funding consideration. B. Federally Funded Research & Development Centers (FFRDCs), including Department of Energy National Laboratories, are not eligible to receive awards under this BAA. However, teaming arrangements between FFRDCs and eligible principal Offerors are allowed so long as such arrangements are permitted under the sponsoring agreement between the Government and the specific FFRDC. C. Navy laboratories, military universities, and warfare centers as well as other Department of Defense and civilian agency laboratories are also not eligible to receive awards under this BAA and should not directly submit either white papers or full proposals in response to this BAA. If any such organization is interested in one or more of the programs described herein, the organization should contact an appropriate ONR Technical POC to discuss its area of interest. The various scientific divisions of ONR are identified at <http://www.onr.navy.mil/>. As with FFRDCs, these types of federal organizations may team with other eligible sources from academia and industry that are submitting proposals under this BAA. D. University Affiliated Research Centers (UARC)s are eligible to submit proposals under this BAA unless precluded from doing so by their Department of Defense UARC contract. E. Teams are also encouraged and may submit proposals in any and all areas. However, Offerors must be willing to cooperate and exchange software, data and other information in an integrated program with other contractors, as well as with system integrators, selected by ONR. **Open to September 30, 1917.**

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

The ONR seeks a broad range of proposals for augmenting existing or developing innovative solutions that directly maintain, or cultivate a diverse, world-class STEM workforce in order to maintain the U.S. Navy and Marine Corps' technological superiority. The goal of any proposed effort must provide solutions that will establish and maintain pathways of diverse U.S. citizens who are interested in uniformed or civilian DoN (or Navy and Marine Corps) STEM workforce

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opportunities. As the capacity of the DoN Science and Technology (S&T) workforce is interconnected with the basic research enterprise and STEM education system, ONR recognizes the necessity to support efforts that can jointly improve STEM student outcomes and align with Naval S&T current and future workforce needs. This announcement explicitly encourages projects that improve the capacity of education systems and communities to create impactful STEM educational experiences for students including active learning approaches and incorporating 21st century skills. Projects must aim to increase student engagement in STEM and persistence of students in STEM degrees, while improving student technical capacity. ONR encourages proposals to utilize current STEM educational research for informing project design and advancing our understanding of how and why students choose STEM careers and opportunities of naval relevance. While this announcement is relevant for any stage of the STEM educational system, funding efforts will be targeted primarily toward the future and current DoN (naval) STEM workforce in High School, all categories of Post-Secondary institutions, the STEM research enterprise, and efforts that enhance the current naval STEM workforce and its mission readiness. **Open to December 31, 2017.**

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](#)
- [EPA 2014 Science To Achieve Results \(STAR\) Research Grants](#)
- [NASA Open Solicitations](#)
- [Defense Sciences Office Solicitations](#)
- [The Mathematics Education Trust](#)
- [EPA Open Funding Opportunities](#)
- [CDMRP FY 2014 Funding Announcements](#)

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- [Office of Minority Health](#)
- [Department of Justice Open Solicitations](#)
- [DOE/EERE Funding Opportunity Exchange](#)
- [New Funding Opportunities at NIEHS \(NIH\)](#)
- [National Human Genome Research Institute Funding Opportunities](#)
- [Army Research Laboratory Open Broad Agency Announcements \(BAA\)](#)
- [SBIR Gateway to Funding](#)
- [Water Research Funding](#)
- [Fellowship and Grant Opportunities for Faculty Humanities and Social Sciences](#)
- [DARPA Current Solicitations](#)
- [Office of Naval Research Currently Active BAAs](#)
- [HRSA Health Professions Open Opportunities](#)
- [NIH Funding Opportunities Relevant to NIAID](#)
- [National Institute of Justice Current Funding Opportunities](#)
- [Funding Opportunities by the Department of Education Discretionary Grant Programs](#)
- [EPA's Office of Air and Radiation \(OAR\) Open Solicitations](#)
- [NETL Open Solicitations](#)
- [DoED List of Currently Open Grant Competitions](#)
- [Foundation Center RFP Weekly Funding Bulletin](#)

Solicitations Remaining Open from Prior Issues of the Newsletter

Biosystems Design to Enable Next-Generation Biofuels and Bioproducts

Biological and Environmental Research (BER) of the Office of Science (SC), U.S. Department of Energy (DOE) hereby announces its interest in receiving applications for research of interest to the Genomic Science Program (<http://genomicscience.energy.gov>) in the following research areas:

a) Integrating large-scale systems biology data to model, design, and engineer

microbial systems for the production of biofuels and bioproducts: Interdisciplinary approaches to develop innovative, high-throughput modeling, genome-wide design and editing, and engineering technologies for a broad range of microbes relevant for the production of biofuels and bioproducts from biomass.

b) Plant systems design for bioenergy: To develop novel technologies for genome-scale engineering to re-design bioenergy crops that can grow in marginal environments while producing high yield of biomass that can be easily converted to biofuels and bioproducts. Applications should include strategies to address biocontainment, minimizing risks of potential release of engineered organisms into the environment or other unintended outcomes.

Preapplication due Dec. 19.

NOAA Joint Hurricane Testbed , Hazardous Weather Testbed, Hydrometeorology Testbed

This funding opportunity is being issued by the NOAA OAR Office of Weather and Air Quality (OWAQ). There will be three separate competitions resulting from this announcement, one for each of the three high impact weather testbeds supported by OWAQ's U.S. Weather Research

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Program (USWRP): Joint Hurricane Testbed (JHT), Hazardous Weather Testbed (HWT), and the Hydrometeorology Testbed (HMT). These funding competitions will focus on new applied research, development, and demonstration of high impact weather and water research. The ultimate goal (after the award ends and assuming NWS decides to accept it) would be NWS's transition of project outcomes to operational weather and water forecasting services in three to five years from now. The High Impact Weather Testbed program, a component of the USWRP, supports projects that transition applied research to operations and services through close collaboration with NOAA. Its focus is on mature projects that are ready or nearly ready to be tested in a NOAA quasi-operational forecasting environment through one of the above testbeds. It is in these testbeds where project outcomes, such as new data or products, improved analysis techniques, or better statistical or dynamic models and forecast techniques, will be presented to operational forecasters in a quasi-operational environment (a testbed) and evaluated for potential future implementation in the NWS forecast offices at the local, regional, and/or national center levels to improve services to the public. NOAA's National Weather Service (NWS) is also announcing another separate federal funding opportunity that is a companion to this funding opportunity and similarly supports projects to transition new research to NWS operations through the Collaborative Science, Technology, and Applied Research (CSTAR) Program. Please search for funding opportunity number NOAA-NWS-NWSP0-2017-2004957 in grants.gov. The current OAR testbed funding opportunity supports mature projects that are ready or nearly ready for testbed collaborations and demonstrations, while testbed demonstrations are not required with the CSTAR funding opportunity. **Due January 4.**

[DARPA Young Faculty Award in Physical Sciences, Engineering, Materials, Mathematics, Biology, Computing, Informatics, Social Science, Manufacturing relevant to Defense Sciences Office](#)

DARPA is soliciting innovative research proposals in the areas of physical sciences, engineering, materials, mathematics, biology, computing, informatics, social science, and manufacturing of interest to DARPA's Defense Sciences Office (DSO), Microsystems Technology Office (MTO), and Biological Technologies Office (BTO). Further detail regarding the specific technical areas of interest can be found under Section I.E "Topic Areas (TAs)." Proposed research should investigate innovative approaches that enable revolutionary advances in science, devices, or systems. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of practice. **Due January 18.**

[Data Infrastructure Building Blocks \(DIBBs\)](#)

The NSF vision for a Cyberinfrastructure Framework for 21st Century Science and Engineering (CIF21) considers an integrated, scalable, and sustainable cyberinfrastructure to be crucial for innovation in science and engineering (see www.nsf.gov/cif21). The Data Infrastructure Building Blocks (DIBBs) program is an integral part of CIF21. The DIBBs program encourages development of robust and shared data-centric cyberinfrastructure capabilities, to accelerate interdisciplinary and collaborative research in areas of inquiry stimulated by data. DIBBs investments enable new data-focused services, capabilities, and resources to advance scientific discoveries, collaborations, and innovations. The investments are expected to build upon, integrate with, and contribute to existing community cyberinfrastructure, serving as

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evaluative resources while developments in national-scale access, policy, interoperability and sustainability continue to evolve.

Effective solutions will bring together cyberinfrastructure expertise and domain researchers, to ensure that the resulting cyberinfrastructure address researchers' data needs. The activities should address the data challenges arising in a disciplinary or cross-disciplinary context. (Throughout this solicitation, 'community' refers to a group of researchers interested in solving one or more linked scientific questions, while 'domains' and 'disciplines' refer to areas of expertise or application.) The projects should stimulate data-driven scientific discoveries and innovations, and address broad community needs, nationally and internationally. **Due January 3.**

Transdisciplinary Research in Principles of Data Science Phase I (TRIPODS) - TRIPODS Phase I

Transdisciplinary Research In Principles Of Data Science (TRIPODS) aims to bring together the statistics, mathematics, and theoretical computer science communities to develop the theoretical foundations of data science through integrated research and training activities. Phase I, described in this solicitation, will support the development of small collaborative Institutes. Phase II (to be described in an anticipated future solicitation, subject to availability of funds) will support a smaller number of larger Institutes, selected from the Phase I Institutes via a second competitive proposal process. All TRIPODS Institutes must involve significant and integral participation by all three of the aforementioned communities. **LOI January 04, 2017 - January 19, 2017; full March 01, 2017 - March 15, 2017.**

Science of Learning

The Science of Learning program supports potentially transformative basic research to advance the science of learning. The goals of the SL Program are to develop basic theoretical insights and fundamental knowledge about learning principles, processes and constraints. Projects that are integrative and/or interdisciplinary may be especially valuable in moving basic understanding of learning forward but research with a single discipline or methodology is also appropriate if it addresses basic scientific questions in learning. The possibility of developing connections between proposed research and specific scientific, technological, educational, and workforce challenges will be considered as valuable broader impacts, but are not necessarily central to the intellectual merit of proposed research. The program will support research addressing learning in a wide range of domains at one or more levels of analysis including: molecular/cellular mechanisms; brain systems; cognitive affective, and behavioral processes; and social/cultural influences. The program supports a variety of methods including: experiments, field studies, surveys, secondary-data analyses, and modeling. **Due January 18.**

Spectrum Efficiency, Energy Efficiency, and Security (SpecEES): Enabling Spectrum for All

The National Science Foundation's Directorates for Engineering (ENG) and Computer and Information Science and Engineering (CISE) are coordinating efforts to identify bold new concepts to significantly improve the efficiency of radio spectrum utilization while addressing new challenges in energy efficiency and security, thus enabling spectrum access for all users and devices, and allowing traditionally underserved Americans to benefit from wireless-enabled goods and services. The SpecEES program solicitation (pronounced "SpecEase") seeks to fund

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innovative collaborative research that transcends the traditional boundaries of existing programs. **Due January 19.**

[DHS-16-DN-130-NFRA-001 Nuclear Forensics Research Award Department of Homeland Security](#)

The Department of Homeland Security (DHS) Domestic Nuclear Detection Office (DNDO) National Technical Nuclear Forensics Center (NTNFC) is inviting U.S. colleges and universities to apply for the Nuclear Forensics Research Award (NFRA). The NFRA supports the establishment of a team of faculty, students, and technical staff at the national or defense laboratories to conduct research in the field of nuclear forensics. NTNFC was tasked with two core missions: to provide national-level integration, centralized planning, and stewardship for the National Technical Nuclear Forensics (NTNF) community; and to lead the U.S. Government (USG) in establishing a robust and enduring pre-detonation radiological/nuclear materials forensics capability. A top priority of DNDO/NTNFC's stewardship mission is to lead USG efforts in addressing the enduring challenge of sustaining a preeminent Nuclear Forensics (NF) workforce of recognized technical experts and leaders through fostering scholastic and research collaboration between and among academia, the national and defense laboratories, and the NTNF Interagency. **Due January 30.**

[Critical Resilient Interdependent Infrastructure Systems and Processes FY17 \(CRISP\)](#)

The goals of the Critical Resilient Interdependent Infrastructure Systems and Processes (CRISP) solicitation are to: (1) foster an interdisciplinary research community of engineers, computer and computational scientists and social and behavioral scientists, that creates new approaches and engineering solutions for the design and operation of infrastructures as processes and services; (2) enhance the understanding and design of interdependent critical infrastructure systems (ICIs) and processes that provide essential goods and services despite disruptions and failures from any cause, natural, technological, or malicious; (3) create the knowledge for innovation in ICIs so that they safely, securely, and effectively expand the range of goods and services they enable; and (4) improve the effectiveness and efficiency with which they deliver existing goods and services. **Due February 8.**

[DOD University Small Grants BAA for Energy-related Basic, Applied, Advanced Research Projects of interest to Dept. of Defense](#) **Due by April 1, 2017**

[DARPA Information Innovation Office BAA](#)

I2O sponsors basic and applied research in three thrust areas:

Cyber. As human activity has moved into cyberspace, cyber threats against our information systems have grown in sophistication and number, and protecting and assuring information is a matter of national security. Progress in the cyber security of best-of-breed systems has been significant over the last few years, giving us hope that we are no longer facing an impossible task. Looking to the future, I2O challenges itself with the goal: Win at Cyber. The I2O defensive cyber research and development (R&D) portfolio is focused on high-end cyber threats, including advanced persistent threats (cyber espionage and cyber sabotage) and other sophisticated threats to embedded computing systems, cyber-physical systems, enterprise

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information systems, and national critical infrastructure. I2O develops technologies that create software that is provably secure, applications that enhance cyberspace situational awareness, and systems for planning military operations in the cyber domain. Exploration of offensive methods is undertaken to inform the defensive cyber R&D and to establish viability of developed techniques with transition partners.

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

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

[Research Interests of the Air Force Office of Scientific Research BAA-AFRL-AFOSR-2016-0007](#)

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

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.]

[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> 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.**

[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

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directed toward advancing the state-of-the-art or increasing knowledge or understanding. Projects that are for the development of a specific system or hardware procurement will not be considered. The selection process is highly competitive and the quantity of meaningful proposal/applications (both pre-proposal/pre-applications and full proposal/full applications) typically received exceed the number of awards that available funding can support. This BAA provides a general description of USSOCOM's research and development programs, including research areas of interest, evaluation and selection criteria, pre-proposal/pre-application and full proposal/application preparation instructions, and general administrative information. Specific submission information and additional administrative requirements can be found in the document titled "General Submission Instructions" available in Grants.gov along with this BAA. **Open to May 14, 2017.**

[W911NF-12-R-0012 Army Research Office Broad Agency Announcement for Basic and Applied Scientific Research](#)

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

[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.**

[DARPA-BAA-16-46 Defense Sciences Office Office-wide](#)

The mission of the Defense Advanced Research Projects Agency (DARPA) Defense Sciences Office (DSO) is to identify and pursue high-risk, high-payoff research initiatives across a broad spectrum of science and engineering disciplines and to transform these initiatives into game-changing technologies for U.S. national security. In support of this mission, the DSO Office-wide BAA invites proposers to submit innovative basic or applied research concepts in one or more of the following technical areas: Mathematics, Modeling and Design; Physical Systems; Human-Machine Systems; and Social Systems. Each of these areas is described below and includes a list of example research topics that highlight several (but not all) potential areas of interest. Proposals must investigate innovative approaches that enable revolutionary advances. DSO is explicitly not interested in approaches or technologies that primarily result in evolutionary improvements to the existing state of practice. **Open until June 22, 2017.**

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[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-NFAPO-2016-2004791 FY2016 to FY2017 NOAA Broad Agency Announcement](#)

This notice is not a mechanism to fund existing NOAA awards. The purpose of this notice is to request applications for special projects and programs *associated with NOAA's strategic plan*

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

[NOAA-OAR-SG-2016-2004772 National Sea Grant College Program 2016-17 Special Projects](#)

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

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

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

<http://www.phe.gov/Preparedness/mcm/phemce/Documents/2014-phemce-sip.pdf> The Pandemic and All Hazard Preparedness Act Pub. L. No. 109-417, 42 U.S.C. § 241 et seq. (PAHPA; <http://www.gpo.gov/fdsys/pkg/PLAW-109publ417/pdf/PLAW-109publ417.pdf>) and The Pandemic and All Hazard Preparedness Reauthorization Act Pub. L. No. 113-5, (PAHPRA; <http://www.gpo.gov/fdsys/pkg/PLAW-113publ5/pdf/PLAW-113publ5.pdf>) authorizes BARDA to (i) conduct ongoing searches for, and support calls for, potential qualified countermeasures and qualified pandemic or epidemic products; (ii) direct and coordinate the countermeasure and product advanced research and development activities of the Department of Health and Human Services; (iii) establish strategic initiatives to accelerate countermeasure and product advanced research and development (which may include advanced research and development

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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 readiness. The funding opportunity is divided into two sections- (1) Basic Research and (2) Applied Research and Advanced Technology Development. The four major topic areas of research interest include the following: (1) Training; (2) Leader Development; (3) Team and Inter-Organizational Performance in Complex Environments; and (4) Solider/Personnel Issues. Funding of research and development (R&D) within ARI areas of interest will be determined by funding constraints and priorities set during each budget cycle. **Open to February 5, 2018.**

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[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.**

[PAR-16-242 Bioengineering Research Grants \(BRG\) \(R01\) Department of Health and Human Services National Institutes of Health](#)

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

[BAA-RQKD-2014-0001 Open Innovation and Collaboration Department of Defense Air Force -- Research Lab](#)

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

[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.**

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[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.**

[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.**

Academic Research Funding Strategies, LLC ([Page 1](#))

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- 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
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