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Katherine E. Kelly, PhD: Editing in the Humanities & Humanities Related Social Sciences; Presentations on Grant Writing and Funding in the Humanities and Humanistic Social Sciences

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Upcoming deadlines for all Fogarty funding opportunities
What Is the Intellectual Significance of Your Proposed Humanities Project?

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A Review by Katherine E. Kelly, PhD

Katherine E. Kelly is a retired English professor from Texas A&M University. She is the author of several books and numerous articles supported by research grants and served as a contributing editor for an academic journal for five years. She provides editorial services to ARFS clients on proposals, journal articles, and manuscripts and presents seminars on grant writing and funding in the humanities and humanistic social sciences.

One of the most challenging criteria used to rank the merits of a humanities (or any) proposal is the first one mentioned by most funders: what is its intellectual significance? In other words, why should reviewers favor your proposal for funding over the dozens of additional meritorious proposals before them?

It often seems to those of us in the humanistic disciplines that science and technology projects are given nearly a free pass on this criterion; that is, their work is presumed to have use value. Even in the case of NSF’s funding of “pure” research, theoretical discoveries are presumed eventually to find real-world application in the broad realm of practical problem solving. But how could poetry ever be imagined to contribute to the gross national product? How might a study of Egyptian tomb-making extend human life? Why should it matter that an historian creates a more complete understanding of C18th geographical boundaries in the Americas?

Establishing the significance of a particular humanistic study will vary by field, but we can ask a couple of generic questions of any project to help us explain its promise to a potential funder. (1) What are the specifics (data) of our study (verbal phrases, historical battles, political elections, theatrical performances) and do they differ from those used in prior studies? Is there new, previously unknown or unacknowledged data? Is it more valid data? And (2) How might the application of a theoretical model broaden the implications of our data across disciplinary fields?

In his delightful 2019 book, How to Get Grant Money in the Humanities and Social Sciences, Raphael Folsom writes, “(S)ome (modest) portion of your grant application should focus on the big ideas that guide your thinking about what you study.” If, for example, you find yourself curious about references to painting in Virginia Woolf’s novels, you would soon find yourself reading about Woolf’s membership in the Bloomsbury Circle, which would, in turn, take you to scholarship about the Circle’s aesthetic, social, and political ideas and practices. What kind of question would you formulate to guide your further research? You could study what made the coterie called “Bloomsbury” distinct, describing in historical detail its particular social, aesthetic, and political beliefs; or, you could study its similarities to other artistic coteries of the period, including the ideas and practices it shared with similar groups in western Europe and the U.S.

Or, more to the point, you could adopt social history as your theoretical model, combining these two emphases by accounting for the widespread forming of artistic coteries early in the twentieth century west and revealing the uniqueness of Bloomsbury within these groups. What began as a narrow curiosity about references to visual art in Woolf’s novels ends
with placing Woolf’s coterie in the context of many coteries during the same historical period. In structuring a project along these lines, the author avoids the over specificity of historical study and the over generality of sociological methods, as explained by Peter Burke in his 1992 survey of theoretical models, *History and Social Theory*. The wider context invites an exchange of ideas with allied fields and broadens the “significance” of the proposed project.

To the end of strengthening a project’s significance, a theory developed to explain events in one historical period or geographical location may be judiciously adapted to explain them in another. Raphael Folsom describes an author adapting from David Nirenberg’s book about the Medieval world, *Communities of Violence*, the notion that “violence can be a useful tool for communities to employ, particularly in areas where no single . . . group has a monopoly on its use, such as borderlands.” The author applied the concept to his study of violence in C17th-C19th Southwestern U.S. Borderlands.

Compelling statements of significance declare the purpose of the proposed project and explain how it will contribute by adding to, revising, or correcting an existing field of knowledge. Consider this example from an NEH proposal: “My history of Mexicans and Mexican Americans in the U.S. South . . . ‘recovers’ tens of thousands of immigrants . . . lost to the historical record, revealing the origins of the contemporary wave of immigration. It also joins typically discrete subfields of U.S. history—Southern and Mexican American—and conceptualizes a transnational history of racial formation between the United States and Mexico. In so doing, the book shifts the terrain on which these historiographies rest.” New data and a new concept of transnational racial formation give this proposal an intellectual vigor, legitimacy, and excitement needed to set it apart from hundreds of like applications.

*Intellectual significance does not reveal itself to reviewers. It’s created by the carefully written claims an author makes in the first few paragraphs of a proposal.* Expect to rewrite these opening statements many times to achieve the clarity and persuasiveness you will need to set your proposal apart from others.
Humanities and Arts Funding Opportunities and News*

*Potential applicants should visit agency websites to confirm deadlines, requirements, etc.

**John Carter Brown Library Short-Term Fellowship Deadline: December 1, 2019**
Sponsorship of research at the John Carter Brown Library is reserved exclusively for work centered on the colonial history of the Americas, North and South, including all aspects of European, African, and Native American engagements in global and comparative contexts. Short-term fellowships are open to those engaged in pre- and post-doctoral, or independent research, regardless of nationality. [https://jcblibrary.org/fellowships](https://jcblibrary.org/fellowships)

**Japan Foundation Center for Global Partnership: Intellectual Exchange Deadline: Dec. 2, 2019 6:00 PM EST**
This program supports US-Japan collaborative projects that explore current, policy-relevant issues of mutual concern to the US and Japan. Projects with tangible outcomes, and effective dissemination plans with broad policy impact are emphasized. [https://www.jpf.go.jp/cgp/e/index.html](https://www.jpf.go.jp/cgp/e/index.html)

**Dedalus Foundation Dissertation Fellowship Deadline: December 2, 2019, 5 p.m. EST**
“This fellowship is awarded annually to a Ph.D. candidate at a university in the United States who is working on a dissertation related to painting, sculpture and allied arts from 1940-1991, with a preference shown to Abstract Expressionism. The fellowship carries a stipend of $25,000. Candidacy for the fellowship is by nomination only. Nominees need not be U.S. citizens.” Nominations accepted beginning September 15, 2019. Direct inquiries to fellowships@dedalusfoundation.org

**NEA Military Healing Arts Network (Clinical Component) Deadline: December 3, 2019**
The Creative Forces: NEA Military Healing Arts Network (Creative Forces) places creative arts therapies at the core of patient-centered care for military patients and veterans who live with traumatic brain injuries and related psychological health conditions. The purpose of this Program Solicitation is to select an organization to manage the clinical component of the Creative Forces program. [https://www.arts.gov/program-solicitation-nea-military-healing-arts-network-clinical-component](https://www.arts.gov/program-solicitation-nea-military-healing-arts-network-clinical-component)

**Harvard University Center for Jewish Studies Harry Starr Fellowship in Judaica Deadline: December 3, 2019**
The Harvard University Center for Jewish Studies invites applications for the Harry Starr Fellowship in Judaica. Applicants may come from any discipline in the humanities or social sciences associated with studies in Judaica; junior faculty are especially encouraged to apply. The 2020-21 theme is "The Changing Contours of Jewish Thought." The program will assemble a working group of six scholars whose work deals substantively with Jewish Thought. Proposals may address any topic in Jewish thought in any geographic region and in any historical period, but preference will be given to projects focusing upon the changes that scholarship in the field has undergone in the recent past. Award Amount: $40,000 for the spring semester or $60,000 for the full academic year. [http://cjs.fas.harvard.edu/harry-starr-fellowship-in-judaica/](http://cjs.fas.harvard.edu/harry-starr-fellowship-in-judaica/)
**NEH Scholarly editions and translations grants**  **Deadline: Dec. 4, 2019**

This NEH program “awards organizations to support the preparation of editions and translations of pre-existing texts of value to the humanities that are currently inaccessible or available only in inadequate editions or translations. . . . Typically, the texts and documents are significant literary, philosophical, and historical materials, but other types of work, such as musical notation, may also be the subject of an edition.” Maximum award amount $300,000; **up to $525,000 may be available for projects that respond to “A More Perfect Union,” (see above) an NEH Special Initiative Advancing Civic Education and Celebrating the Nation’s 250th Anniversary. Open to Organizations only.**


**NEH Collaborative Research  **  **Deadline: December 4, 2019**

The Collaborative Research program aims to advance humanistic knowledge through sustained collaboration between two or more scholars. Collaborators may be drawn from a single institution or several institutions across the United States; up to half of the collaborators may be based outside of the U.S. The program encourages projects that propose diverse approaches to topics, incorporate multiple points of view, and explore new avenues of inquiry in the humanities for scholars and general audiences. [https://www.neh.gov/grants/research/collaborative-research-grants](https://www.neh.gov/grants/research/collaborative-research-grants)

**Library of Congress Kluge Fellowships in Digital Studies  **  **Deadline: December 6, 2019**

Award Amount: $4,200 per month for up to 11 months

The Kluge Fellowship in Digital Studies provides an opportunity for scholars to utilize digital methods, the Library's large and varied digital collections and resources, curatorial expertise, and an emerging community of digital scholarship practitioners. Interdisciplinary and cross-cultural research is particularly welcome in the Kluge Digital Studies program. [https://www.loc.gov/programs/john-w-kluge-center/chairs-fellowships/fellowships/kluge-fellowships-in-digital-studies/](https://www.loc.gov/programs/john-w-kluge-center/chairs-fellowships/fellowships/kluge-fellowships-in-digital-studies/)

**The National Academies of Sciences, Engineering and Medicine/Ford Foundation Postdoctoral Fellowships  **  **Deadline: December 10, 2019**

Postdoctoral fellowships will be awarded in a national competition administered by the National Academies of Sciences, Engineering, and Medicine (the National Academies) on behalf of the Ford Foundation. Awards will be made for study in research-based programs. Examples include the following major disciplines and related interdisciplinary fields: American studies, anthropology, archaeology, art and theater history, astronomy, chemistry, communications, computer science, cultural studies, earth sciences, economics, education, engineering, ethnic studies, ethnomusicology, geography, history, international relations, language, life sciences, linguistics, literature, mathematics, performance study, philosophy, physics, political science, psychology, religious studies, sociology, urban planning, and women's studies. Also eligible are African American studies and Native American studies, and other interdisciplinary programs, such as area studies, peace studies, and social justice. Each Fellow is expected to begin tenure on June 1 (for 12 months) or September 1 (for 9 or 12 months) of the year in which the award is received. [http://sites.nationalacademies.org/pga/fordfellowships/index.htm](http://sites.nationalacademies.org/pga/fordfellowships/index.htm)

**Smithsonian Institute Fellowship Program (SIFP)  **  **Deadline: Dec. 15, 2019**

Research on the topic of one of the Smithsonian Institutes: Archives of American Art; Astrophysical Observatory; Conservation Biology Institute; Environmental Research Center; Marine Station at Fort Pierce; Museum Conservation Initiative; Smithsonian Institution Archives; Smithsonian Libraries; and the Tropical Research Institute.  

[https://www.smithsonianofi.com/fellowship-opportunities/smithsonian-institution-fellowship-program/](https://www.smithsonianofi.com/fellowship-opportunities/smithsonian-institution-fellowship-program/)
Blakemore Freeman Fellowships  Deadline: 5:00 p.m. PST on December 30, 2019
“These fellowships are awarded for one academic year of advanced level language study in East or Southeast Asia. Eligible languages: Chinese, Japanese, Korean, Burmese, Indonesian, Khmer, Thai, and Vietnamese. The Blakemore Foundation makes grants for study only at specific language programs. Please refer to their website for a current list of approved programs.”
http://www.blakemorefoundation.org/language.html

The National Council for Eurasian and East European Research (NCEEER)  National Research Competition  Deadline: Dec. 31, 2019
This competition provides funds for both collaborative and individual research projects in the humanities and social sciences in or on any country of Eurasia or Eastern Europe. Research Contracts support collaborative projects involving multiple scholars who are US citizens and PhD holders, with a maximum award of $10,000. Contracts provide funding to scholars or researchers via institutional awards, while Grants are awarded directly to the scholar or researcher. Accordingly, Contracts and Grants involve different application forms and guidelines, which can be found in the Apply section of the NCEER website. https://www.nceeer.org/programs/national-research-competition.html

Witter Bynner Foundation Poetry Grants  Deadline: Dec. 31, 2019
Organizations may apply annually for grant support between $1,000 and $10,000. Multi-year grants are one-year grants that may be renewed at the discretion of the foundation. A letter of intent is required before a grant application can be submitted. Letters of intent are accepted from August 1 through December 31 each year. https://www.bynnerfoundation.org/grants/

POSCO Visiting Fellows  Deadline: Dec. 31, 2019 (formerly Pohang Iron and Steel Company--a South Korean steel-making company headquartered in Pohang, South Korea)
Fellows carry out policy-relevant research on contemporary issues in Korean studies. In particular, the POSCO Fellowship Program is intended to generate constructive and informative research in four important areas: (1) The two Koreas and Northeast Asia; (2) Security issues for Korea and Northeast Asia; (3) Economic and social issues in South Korea; and (4) Political challenges in Korea.
https://www.eastwestcenter.org/research/visiting-fellow-programs/posco-visiting-fellowship-program

The Folger Shakespeare Library Fellowships for 2020-2021  Deadline: January 1, 2020
The Library is embarking on a major renovation project to commence in early 2020. The renovation offers the Institute the opportunity to create new kinds of awards, to make fellowships more adaptable, and to forge new relationships with archives, collections, libraries, and museums around the world. Fellowship awards will be $3,500 to support four continuous weeks of work. The deadline for applications is January 1, 2020. Fellowships may be undertaken between July 2020 and May 2021.
www.folger.edu/institute/fellowships

NEH Public Humanities Projects  Deadline: January 8, 2020
The program supports projects in three categories: Exhibitions (permanent, temporary, or traveling); interpretive programs at Historic Places; and Humanities Discussions related to “A More Perfect Union”: NEH Special Initiative Advancing Civic Education and Commemorating the Nation’s 250th Anniversary. New for 2020: The period of performance for Planning proposals is up to 24 months. The period of performance for Implementation proposals is up to 48 months.
If you are applying for the Implementation funding level, you may now request an additional $100,000 to create a two-year staff full-time position during a four-year period of performance (or $50,000 for a
one-year period of performance, and a one-year full-time staff position) within your institution to work on the proposed project. These additional funds support full-time employment opportunities for recent graduates with an MA or PhD in the humanities. Applicants that wish to increase annual compensation above $50,000 for these positions must use their own funds to do so.

Humanities Discussions must be related to “A More Perfect Union:” NEH Special Initiative Advancing Civic Education and Commemorating the Nation’s 250th Anniversary.

Applications must be complete, must observe the specified page limits, and must be validated by Grants.gov under the correct funding opportunity number to be considered under this notice. Late, incomplete, or ineligible applications will not be reviewed. https://www.neh.gov/grants/public/public-humanities-projects

The U.S. National Academy of Medicine Competition  Deadline: Early January 2020
The U.S. National Academy of Medicine (NAM) recently launched its Healthy Longevity Global Competition. The NAM, with support from Johnson & Johnson Innovation, will award up to 24 Catalyst Awards per year in 2020-2022: each includes a $50,000 cash prize and travel costs to an annual Innovator Summit. Catalyst Awards will reward bold, new, potentially transformative ideas to improve the physical, mental, or social well-being of people as they age—to extend the human healthspan through innovative approaches. Applications may originate from any field or combination of fields (e.g., biology, chemistry, medicine, engineering, infrastructure, behavioral and social sciences, technology, and policy). Ideas may focus on any stage of life, as long as they ultimately promote health as people age. https://www.afar.org/research/funding/us-nam-catalyst-award/

Yale Fellowships in Agrarian Studies  Deadline: Jan. 6, 2020
The Program in Agrarian Studies at Yale fosters the interdisciplinary study of agrarian societies, historically and across the world. We aim to be the crossroads for the best work in the humanities, the social sciences, environmental studies, and related professional fields that breathe new life into the study of farmers, agriculture, and rural society and captures the texture of lived experience as well contributing to theoretical and conceptual advances. The Agrarian Studies Program appoints three fellows annually, chosen for the promise of their research; they are in residence for the year, present a paper, and attend the weekly colloquium. https://agrarianstudies.macmillan.yale.edu/fellowships

Dedalus Foundation Master of Fine Arts in Painting and Sculpture   Deadline: January 15, 2020, 5 p.m. EST
The Dedalus Foundation Master of Fine Arts Fellowship in Painting and Sculpture is awarded annually to final-year students who are graduating from an M.F.A. degree program in the United States. Each fellowship carries a stipend of $15,000. Candidacy for the fellowship is by nomination only. Each fall, department chairpersons from M.F.A. programs in painting and sculpture are invited to submit nominations. Each institution may nominate two candidates. Nominees should be graduating in the spring semester that directly follows the fall nominating cycle. Nominees need not be U.S. citizens. mfa@dedalusfoundation.org

Larry J. Hackman Research Residency Program  Deadline: January 15, 2020
Residents conduct research at the New York State Archives. Previous Residents have included academic and public historians, graduate students, independent researchers and writers, and primary and secondary school teachers. Projects involving innovative uses of the Archives, such as research for multimedia projects, exhibits, and websites, are welcomed. The topic or area of research must draw on government records in the New York State Archives. Preference will be given to projects that: (1) have application to enduring public policy issues, particularly in New York State, (2) rely on records that have
been little used and are not available electronically or on microfilm, and (3) have a high probability of publication or other public dissemination. See the website for a “Special Invitation-Erie Canal Anniversary 2020” and “Special Invitation-New York Legal and Judicial History”.
http://www.archives.nysed.gov/research/hackman-research-residency

**MacDowell Colony Residencies for Writers, Composers, and Artists**  *Deadline: January 15th for the Summer period (June 1st – September 30th); April 15th for the Fall period (October 1st – January 31st); and September 15th for the Winter-Spring period (February 1st – May 31st).*

Each year about 300 Fellowships, or residencies, are awarded to artists in seven disciplines: architecture, film/video arts, interdisciplinary arts, literature, music composition, theatre, and visual arts. A Fellowship consists of exclusive use of a private studio, accommodations, and three prepared meals a day for two weeks to two months. MacDowell does not offer classes or instruction.
https://www.macdowellcolony.org/

**Virginia Center for the Creative Arts, Residential Fellowships**  *Deadline: January 15, 2020*

Visual arts, film, music composition, writing and literature, and multi-media.
www.vcca.com/applicants-info

**Boston College African & African Diaspora Studies Program--Dissertation Fellowship**  *Deadline: January 16, 2020*

Boston College’s African & African Diaspora Studies Program (AADS) announces its dissertation fellowship competition. Scholars working in any discipline in the Social Sciences or Humanities, with projects focusing on any topic within African and/or African Diaspora Studies, are eligible to apply. We seek applicants pursuing innovative, preferably interdisciplinary, projects in dialogue with critical issues and trends within the field.
http://events.bc.edu/event/dissertation_fellowship_application_deadline#.XbRl21hYapr

**The Kress Foundation**  *Deadline(s): Various—visit website*

Through its Grant Programs, the Kress Foundation supports scholarly projects that promote the appreciation, interpretation, preservation, study and teaching of European art from antiquity to the early 19th century. These areas are also supported through Fellowships. These competitive grants are awarded to institutions only.  http://www.kressfoundation.org/grants/main/

**DePaul Humanities Center**  *Deadline: January 24, 2020*

External Faculty Fellowships: Visiting Humanities Fellows
Applications for our 2020-2021 Visiting Humanities Fellows are now being accepted.
https://las.depaul.edu/centers-and-institutes/depaul-humanities-center/Pages/default.aspx

**Mass Cultural Council Artist Fellowships**  *Sponsor Deadlines: Oct. 7, 2019; Jan. 27, 2020*

FAS/OSP Deadline: not required for grants awarded directly to individuals
Sponsor Deadline: October 7, 2019 (Drawing & Printmaking, Poetry, and Traditional Arts); January 27, 2020 (Choreography, Fiction/Creative Nonfiction, and Painting)
Award Amount: $15,000  https://massculturalcouncil.org/artists-art/artist-fellowships/

**National Science Foundation Directorate for Social, Behavioral and Economic Sciences**

**Ethical and Responsible Research (ER2)**  *Deadline: Feb. 24, 2020*

ER2 research projects will use basic research to produce knowledge about what constitutes or promotes responsible or irresponsible conduct of research, and how to best instill this knowledge into researchers
and educators at all career stages. In some cases, projects will include the development of interventions to ensure ethical and responsible research conduct. Proposals for awards from minority-serving institutions (e.g., Tribal Colleges and Universities, Historically Black Colleges and Universities, Hispanic-Serving Institutions, Alaska Native or Native Hawaiian Serving Institutions), women's colleges, and organizations primarily serving persons with disabilities are strongly encouraged. Proposals including international collaborations are encouraged when those efforts enhance the merit of the proposed work by incorporating unique resources, expertise, facilities or sites of international partners. If possible, the U.S. team's international counterparts should obtain funding through other sources. [https://nsf.gov/funding/pgm_summ.jsp?pims_id=505693]

**Graham Foundation  Grants to Organizations  Deadline: Feb. 25, 2020**
Assist with the production and presentation of significant programs about architecture and the designed environment in order to promote dialogue, raise awareness, and develop new and wider audiences. Support efforts to take risks in programming and create opportunities for experimentation. Recognize the vital role they play in providing individuals with a public forum in which to present their work. Help them to realize projects that would otherwise not be possible without our support. Overall we are most interested in opportunities which enable us to provide critical support at key points in the development of a project or career. [https://Grahamfoundation.org]

**NEH Summer Seminar or Institute for Higher Education  Faculty Deadline: March 1, 2020**
Participants develop a scholarly and/or pedagogical project based on the current topic. Programs take place throughout the United States, and participant stipends help cover travel and living expenses. This year’s programs offer new perspectives on the philosophy of David Hume and Emmanuel Levinas, and the role of imaginal worlds in Buddhism. Other programs cover visual culture from the Civil War Era and the global patterns of empire and decolonization through the lens of radio and sound technology. Those with interests in Latin America could explore social diversity in contemporary Brazilian culture or review archival materials, including maps and pictorial histories, related to colonial Mexico. For a complete list of the seminars and institutes offered this summer, along with eligibility and application requirements, please visit our website at this link: [https://www.neh.gov/divisions/education/summer-programs?f%5B0%5D=summer_program_audience%3A356&field_sort_date=1&sort_by=field_sort_date&sort_order=ASC&utm_medium=email&utm_source=govdelivery]

**NEH Summer Seminars and Institutes for Higher Ed Faculty**

**Gladys Kriebel Delmas Foundation   Deadline: rolling**
The Foundation intends to further the humanities along a broad front, supporting projects which address the concerns of the historical studia humanitatis: a humanistic education rooted in the great traditions of the past; the formation of human beings according to cultural, moral, and aesthetic ideals derived from that past; and the ongoing debate over how these ideals may best be conceived and realized. Most funding is directed to institutions, learned societies, museums, and major editorial projects. The Foundation welcomes projects that cross the boundaries between humanistic disciplines and explore the connection between the humanities and other areas of scholarship. The geographical concentration is primarily but not exclusively directed toward European and American history and letters, broadly defined. [http://delmas.org/programs/#humanities]

**News**
Report from **Minerva Research Initiative** “Future Directions in Social Science”
By George Loewenstein, Kathleen Musante, and Joshua A. Tucker
The report is the product of a workshop held on April 11-12, 2019 at the Basic Research Innovation Collaboration Center in Arlington, VA on the future of problem-based interdisciplinary social science research. It is intended as a resource to the Science and Technology community, including the broader federal funding community, federal laboratories, domestic industrial base, and academia. For a link to the report, visit: Minerva.defense.gov

**The Federal Funding Climate**

The President's FY 2020 budget request has, for the third year, called for the elimination of the National Endowment for the Humanities (NEH), National Endowment for the Arts (NEA), and the Institute of Museum and Library Services (IMLS); however, these agencies continue normal grantmaking operations with allocated FY 2019 funds and they continue to have strong Congressional support. (Source: Harvard Research Administration Services)
AI’s Really Big Footprint Across Disciplines

When Google’s DeepMind GO-playing AI program AlphaGo defeated the then 20-year-old Ke Jie, the world’s number one GO player, in Wuzhen, China, in 2017, it was a really big deal because beating an opponent in GO is considered much more difficult than beating an opponent in a game like chess. In fact, after the match, Ke vowed never again to subject himself to such a “horrible experience.” The success of AlphaGo is considered significant due to the complexity of GO, which has a seemingly infinite number of move options where “human intuition,” “human instinct,” and similar “intangibles” linked to the capacity to learn are key factors to success.

So, for example, here we are two years after AlphaGo defeated Ke Jie and NSF’s newly posted solicitation National Artificial Intelligence (AI) Research Institutes: Accelerating Research, Transforming Society, and Growing the American Workforce represents a very big, $124 million footprint in a joint AI effort joined by multiple agencies (the National Science Foundation [NSF], U.S. Department of Agriculture [USDA] National Institute of Food and Agriculture [NIFA], U.S. Department of Homeland Security [DHS] Science & Technology Directorate [S&T], U.S. Department of Transportation [DOT] Federal Highway Administration [FHWA], and U.S. Department of Veterans Affairs [VA]), to enable such AI research through major AI Research Institutes and planning grants. Moreover, for the “Growing the American Workforce” component of this solicitation, see the article in the October newsletter, “Writing the Workforce Component of STEM Proposals”.

The scale and scope of this announcement likely will not surprise those who read federal research agency strategic plans and see them as a valued harbinger of research funding on the horizon, as in the recent case of The National Artificial Intelligence Research and Development Strategic Plan: 2019 Update and the February 11 Executive Order on Maintaining American Leadership in Artificial Intelligence.

By its nature, AI has broad impacts across numerous academic disciplines and disciplinary tentacles into numerous colleges, departments, centers, and institutes. It is also influencing the strategic plans of major federal research funding agencies, such as NSF’s Ten Big Ideas, where it complements or is driven by such Big Ideas as the Future of Work at the Human-Technology Frontier, Growing Convergence Research, and Harnessing the Data Revolution. In the case of the latter Big Idea, Big Data acts as the “trainer” of AI through data analytics and optimization in many scientific fields, such as agriculture, engineering, atmospheric sciences, medicine, and related health sciences, among many others. Basically AI is an experiential learner, much like a teenage son but with far better decision making capacities, that feasts on massive data sets in order to learn.

For example, Using A.I. to Transform Breast Cancer Care (NYT, 10/24/2019) is a good example of how it is being applied in medicine. More commonly, we have all noticed the appearance of multiple popup ads in our browsers reflecting our past product searches on Google or Amazon Prime. These popup ads have the fingerprint of AI all over them.
The MIT Media Lab’s article, *The evolution of AI research and the study of its social implications*, addresses the question of **which fields are important to AI research**: “External fields reference AI research for a number of reasons. Some fields, such as engineering or medicine (see [Does AI Have a Place in Medicine?](#)), reference AI research because they use AI methods for optimization or data analysis. Other fields, like philosophy, reference AI research because they explore — for example — its moral or ethical consequences for society. Similarly, AI researchers reference other fields, such as mathematics or psychology, because AI research incorporates methods and models from these areas. AI researchers may also cite other fields because they use them as application domains to benchmark AI techniques.” For example, there are certainly moral and ethical questions associated with the ubiquitous use of AI by Huawei Technologies on 5G networks linked to facial recognition databases in every possible public environment from supermarkets to the sidewalks of London, New York, and other cities worldwide.

So you may well ask, **What is the point of all this for research offices?** The answer can be found in a quote by one of hockey’s greatest players, Wayne Gretzky, who famously noted “A good hockey player plays where the puck is. A great hockey player plays **where the puck is going to be.**” In the coming years, the “AI puck,” so to speak, will represent an enormous research investment by federal agencies, foundations, and industry that can, without exaggeration, be described as a **veritable tsunami of research dollars available through funding solicitations.**

Moreover, funding opportunities in AI will impact a very broad range of disciplines from the well known STEM disciplines at NSF, DOD, DOE, NIH, etc., to the social, behavioral and economic sciences and humanities that engage the societal impacts of AI on such questions as privacy, ethics, and income distribution. **The key issue for research offices now is to understand their institutional capacities and possible strategic partnership configurations that can help position faculty to compete for funding opportunities across the “AI Universe.”** For the foreseeable future, this universe will be expanding, offering enormous research opportunities **to those research offices that plan well for it.** See [Dear Colleague Letter: Research Opportunities for the Directorate for Mathematical and Physical Sciences (MPS) in Artificial Intelligence Research Institutes](#).

Additionally, see [Department of Energy plans major AI push to speed scientific discoveries](#), which notes, DOE “is planning a major initiative to use artificial intelligence (AI) to speed up scientific discoveries. At a meeting last week, DOE officials said they will likely ask Congress for between **$3 billion and $4 billion over 10 years**, roughly the amount the agency is spending to build next-generation “exascale” supercomputers . . . DOE is joining a global rush to fund AI. Worldwide corporate AI funding is expected to hit $35.8 billion this year, up 44% from 2018, according to IDC, a market analysis firm. Companies see commercial advantages in AI. It helps banks detect and prevent credit card fraud, and oil and gas companies use it to pinpoint productive drilling sites in mounds of geological data.” **Overall, the AI research and funding domain will significantly impact the external funding directions of university research offices over the coming years and being prepared for that eventuality is critical to long-term success.**

Moreover, it is the moral imperative of research offices to know how best to tap into **that AI revenue stream to maximize external funding successes in the AI domain.** (See [United States should make a massive investment in AI, top Senate Democrat says](#)). As in the film, *The
Graduate, Dustin Hoffman’s character is tipped off that-- “The future is plastics”--so today’s researchers will be told, “The funding future is AI.” In the latest pantheon of hot research topics, AI is right up there with Big Data, The Brain, and Rules of Life, among others (see NSF 20-515, Future of Work at the Human-Technology Frontier: Core Research).

So, in actual practice, what does that mean for research offices? First, research offices will want to develop a general strategic plan for AI funding over the next year or two. That plan should include key information related to ongoing and new funding solicitations in AI at federal agencies; a mapping of those funding opportunities to known institutional research capacities in AI and AI related fields; and a description of needed partnerships that will enhance the successful pursuit of AI funding. In this regard, the objectives of the AI Strategic Plan are nothing short of a laundry list of where federal research agencies, such as those listed above, will focus funding resources over the next five years and longer. The National AI R&D Strategic Plan: 2019 Update establishes a set of objectives for federally funded AI research, identifying the following eight strategic priorities as key inputs to university research offices’ strategic plans for securing AI funding:

- **Strategy 1: Make long-term investments in AI research.** Prioritize investments in the next generation of AI that will drive discovery and insight and enable the United States to remain a world leader in AI.
- **Strategy 2: Develop effective methods for human-AI collaboration.** Increase understanding of how to create AI systems that effectively complement and augment human capabilities.
- **Strategy 3: Understand and address the ethical, legal, and societal implications of AI.** Research AI systems that incorporate ethical, legal, and societal concerns through technical mechanisms.
- **Strategy 4: Ensure the safety and security of AI systems.** Advance knowledge of how to design AI systems that are reliable, dependable, safe, and trustworthy.
- **Strategy 5: Develop shared public datasets and environments for AI training and testing.** Develop and enable access to high-quality datasets and environments, as well as to testing and training resources.
- **Strategy 6: Measure and evaluate AI technologies through standards and benchmarks.** Develop a broad spectrum of evaluative techniques for AI, including technical standards and benchmarks.
- **Strategy 7: Better understand the national AI R&D workforce needs.** Improve opportunities for R&D workforce development to strategically foster an AI-ready workforce.
- **Strategy 8: Expand public-private partnerships to accelerate advances in AI.** Promote opportunities for sustained investment in AI R&D and for transitioning advances into practical capabilities, in collaboration with academia, industry, international partners, and other non-Federal entities.”

In conclusion, AI will open up a whole new funding universe for faculty across most colleges and departments. Communicating what that evolving funding universe looks like will
be one key role played by university research offices assisting faculty to succeed in this new environment.
NSF’s Major Research Instrumentation (MRI) program is a long-standing program that funds acquisition or development of instrumentation ranging from $100K to $4 million. (For non-PhD granting institutions and for researchers in the social, behavioral and economic sciences and in mathematics, requests less than $100K are allowed.) This program provides an excellent opportunity for universities to enhance their research infrastructure by purchasing or developing instruments that can enable new research and education activities at their campuses and in their region. MRI proposals are typically due in January of each year; this cycle, the deadline is January 21, 2020. The solicitation for FY 2020 isn’t out yet, but you can see last year’s solicitation here (if no new solicitation is issued, this one will still apply, although the due date specified in the solicitation is incorrect).

**MRI Overview**

MRI grants come in two “flavors” – an instrumentation acquisition grant, which funds the purchase of off-the-shelf instrumentation, and an instrument development grant, which funds development of an innovative, new instrument. NSF also designates two tracks: Track 1 proposal request less than $1M, and Track 2 proposals request $1M - $4M. The number of proposals that can be submitted by an institution is limited; each institution can submit up to a total of three MRI proposals, no more than one of which can be a Track 2 proposal. If you’re interested in submitting an MRI, be sure to check with your grants office to find out the procedure for selecting which proposals will be submitted from your institution. (Often, institutions run an internal competition to select who can submit.)

MRI instrument acquisition grants can be used to buy multiple pieces of equipment that are needed for a single purpose, such as a transmission electron microscope and a microwafering saw required to prepare the specimens, but it cannot be used to buy multiple pieces of equipment to outfit a lab (for example, a differential scanning calorimeter, a thermomechanical analyzer and a rheometer for a thermal analysis lab). It also cannot be used to buy general purpose equipment such as fume hoods, cryogenic storage systems, etc.

It’s important to note that, unlike most NSF programs, cost sharing is required for PhD-granting institutions and non-degree-granting institutions at exactly 30% (more is not allowed) of the total project cost. Non-PhD-granting institutions are exempt from cost-share. For the MRI, a non-PhD-granting institution is defined as one that has awarded less than 21 PhD/D.Sci. degrees in NSF-supported disciplines over the last 2 years. Note that the definition of “non-PhD-granting” is somewhat different for MRI than it is for NSF’s Research in Undergraduate Institutions (RUI) program, so even if you know your institution is eligible for the RUI, it’s a good idea to make sure your institution fits the MRI definition.

You must designate a division within NSF (not the Office of Integrative Activities) to review your proposal. If you feel that more than one division may support the research enabled by the instrument, you may designate a secondary division. If you feel specialized expertise is
needed to review your proposal, be sure to suggest appropriate reviewers with the required knowledge using the designated Fastlane form. The project description for an MRI proposal is limited to 15 pages and must include the following sections (the solicitation includes suggested page counts for each section):

- **Instrument location and type** - see the solicitation for detailed instructions on this section
- **Research activities to be enabled** – detailed description of the researchers who will use the instrument, the students who will be involved, and the research that will be enabled
- **Description of research instrumentation and needs** - describe the instrument, its capabilities and the need for the instrument
- **Broader Impacts, including Impact on research and training infrastructure** – how the instrument will enhance training and broaden participation
- **Management plan** – for acquisition proposals, how will the instrument be managed (who decides who can use the instrument, how will it be maintained, do you have the expertise at the institution to run the instrument, etc.)? For development proposals, what is your plan for developing and constructing the instrument?

Be sure to structure your Project Description with the above sections in the order requested in the solicitation. It can be tempting to reorder these sections because it’s a bit illogical to have to discuss the research enabled before you describe the instrument. Resist this temptation! Reviewers are expecting to see the sections in the order requested, and if you don’t follow that order, you will confuse your reviewer. Remember that a confused reviewers is not a happy reviewer, and your reviews will likely suffer as a consequence. Per PAPPG requirements, you also must include a separately labeled Intellectual Merit section. Where you put this section is entirely up to you.

At the end of this article, we provide detailed outlines for the Project Description (one for Acquisition proposals, and one for Development proposals) that breakdown the solicitation requirements (along with our comments and suggestions). Following that, we include a checklist to help you make sure you’ve included all the required components.

**What are Reviewers Looking For?**

When developing your MRI proposal, remember that NSF is looking for maximum impact for the funds it is investing. For **acquisition proposals**, this means:

- Enables important research of interest to NSF
- Will have multiple users (from multiple disciplines and institutions, if possible)
- Significantly impacts education
- Addresses diversity (will improve abilities to broaden participation in STEM by women, underrepresented minorities, and women)
- The instrument will be well-used and well-maintained
- The instrument will improve your institution’s capabilities to conduct leading-edge research and provide leading-edge research experiences for undergraduate students.

For **development proposals**

- Your plan for developing the instrument is well thought-out, detailed and realistic.
Your team has the expertise and resources needed to construct the instrument.

- If you have students on your budget, their involvement is needed to construct the instrument, and the experience contributes to their training as the next generation of instrumentalists.
- The cost of the new technology appropriate
- The instrument to be developed is needed and will provide significant improvements in capability or performance compared to existing instruments
- There is a larger user community that strongly needs the instrument

### Avoid Common Mistakes

**Inadequate discussion of the science the instrument will enable**

A common mistake is not explicitly describing **what new research the instrument will enable that is not currently possible**. Often, PIs ask potential users to send a description of the research they will conduct with the instrument. The PI then collects these descriptions, which are often standard text that the researcher copied from other proposals or documents. These descriptions discuss each participating faculty’s research but don’t specifically describe how the new instrument will impact the research and what the expected new outcomes might be. This is not enough for an MRI proposal! Instead, each user should describe clearly in their research description specifically how access to the proposed instrument will enhance their research and enable results that would not otherwise be possible. What is it that the researcher can’t do now that she could do if she had access to the instrument? Why is this research important? So, for example, instead of writing,

“Dr. x performs research on xyz. She has found ....[standard description of her research project(s)] and results...],

write,

“Dr. x performs research on xyz ... [description of her research and its significance]. Because there is no [requested instrument] at ABC University, her students must travel 2 hours each way to Big State University to conducted needed measurements This has resulted in ...
[describe problems]. If the proposed instrument is acquired, this will enable them to accomplish....”

Or

“... because our current instrument has only X nanometer resolution, this has prevented Dr. X from ...[describe research she can’t do or questions she can’t answer]. If the requested instrument with 0.X nanometer resolution is acquired, this would enable her to ...”

In this way, your proposal will paint a clear picture for reviewers of how the requested instrument will impact research at your institution and for users at other institutions.

It is often a good idea to include in the **Description of Research Instrumentation and Needs** section sample measurements made using a similar instrument, showing the value of the instrument in terms of improved precision, resolution, etc. and perhaps comparing it to measurements taken using your current instrument. If there is already an instrument like the one you are requesting in your institution or at a nearby institution, be sure to explain why that
instrument won’t meet your needs (e.g., it is already full used, or travel to the other institution is impractical or too time-consuming).

While it isn’t required that the research to be conducted with the instrument is funded by NSF, it is certainly helpful to show that the instrument will enhance NSF-funded projects. If that’s not possible, you’ll want to make the argument that the research is of interest to NSF, and some of it may be funded by NSF in the future.

For instrument development proposals, the proposal should make a strong argument that the newly-developed instrument will enable exciting new science of interest to NSF. Depending on the Directorate, it may also be important to discuss how the instrument might be commercialized.

Too few or inappropriate users of the Instrument

The kiss of death for an MRI acquisition proposal is to give the impression that an instrument will be used by a single faculty researcher or a small group of faculty within a department. NSF has a limited amount of funds to award, so they want each grant to impact a significant number of researchers in multiple departments and institutions, if possible (of course, this will depend in part on the type of instrument and your discipline). If you’re in a research-intensive institution, it’s especially important to reach out to smaller, non-research-intensive institutions in your region. If these institutions don’t have active research that would require the instrument, they often can still be involved in educational activities involving the instrument. That said, this is not a numbers competition, and it is better to have 7 users with strong research credentials and a strong argument about how the instrument will enhance their research than to have 20 users with a weak argument.

Failure to address education and diversity

In order to be competitive, an acquisition MRI must have a strong education and outreach component. Example activities include involving undergraduates in using the instrument or in analyzing data from the instrument, integrating the instrument or data from the instrument in a course, involving high school teachers, K-12 students, community college students, and students from minority-serving, or predominantly undergraduate institutions in research with the instrument. Many predominantly undergraduate institutions have been successful in winning MRI grants by including a strong education component and describing how the new instrument will enhance their research infrastructure. However, it’s important to keep in mind that the instrument should be needed primarily for research, not primarily as an educational instrument (for example, don’t propose an instrument that will be used primarily for a lab course).

Requesting Extra Bells and Whistles

Be careful to request funds for the instrument that is needed to conduct the research described, but not more. Reviewers are quick to jump on extra “bells and whistles” on an instrument that add to the price tag and aren’t justified by the research described in the “Research Enabled” section. If, for example, you want to add an attachment that provides a capability that only one of your instrument users will need, be sure description of that research is particularly compelling and specifically discusses how that capability will enhance the research. If none of your major users has a current need for the extra capability, avoid the temptation to add the attachment on speculation that it will be needed in the future.
Inadequate Management Plan

Reviewers will want to know if you have a place for the instrument, funds to keep it maintained, a qualified operator, and plans for how to share the instrument with multiple users. All of this should be described in your management plan; be sure to spend time on this, as a poor management plan can sink an otherwise good MRI proposal.

Address details such as how access to the instrument will be managed, particularly access by researchers from other institutions. There are two things that you want to convince reviewers will not happen: 1) the instrument is not really shared but is instead dominated by the PI or by a small cadre of users; 2) there are not enough resources or expertise at the institution to keep the instrument running and maintained after the funding period, and the instrument ends up sitting unused. Predominantly undergraduate institutions should pay special attention to this section since reviewers may be more concerned about whether your institution has the space and resources to keep the instrument maintained.

Be careful to make it clear that you have a plan to fairly share the instrument. As PI, you may think you’re doing everyone else a favor by volunteering to take sole responsibility of managing the instrument, but to a reviewer it may look like you plan to dominate the instrument, and other users won’t get fair access to it. A typical successful approach is to form a committee composed of the PI and co-PIs that meet regularly to make decisions related to the distribution of instrument time, dealing with maintenance, etc.

You’ll also want to discuss how you’ll pay for consumables and other expenses. Will there be a user fee? If so, how much will it be? If you plan to accept guest users from other institutions (which is often a good idea), outline your procedure for doing that. Will potential guest users submit a short proposal describing how they will use the instrument? What will the criteria be for evaluating these proposals? Will you assess a higher user fee for guests? How will you publicize the fact that the instrument is available to outside users?

For instrument development proposals, be sure that you have a well-thought-out plan for developing the instrument. In many ways, an instrument development proposal is very much like a research proposal except that the result will be a novel instrument. Therefore, you’ll need to describe your plan for developing the instrument in similar detail to that you’d use if you were describing a research plan.

Other issues

More Expensive Instruments

It’s important to be aware that the review process for MRI proposals varies depending on the amount requested. While smaller proposals are reviewed within the Directorate, larger proposals are generally subjected to additional review at higher levels within NSF. This means that larger proposals will be reviewed by reviewers from a variety of disciplines; therefore, you should make sure that the arguments you make and the description of the science enabled is compelling and accessible to reviewers who are outside your field. In addition, for instruments over $1 million, NSF uses the additional review criterion, “What will the instrument’s impact be at the National level and on the research community of interest?”
Institutional Commitment

NSF is emphasizing that voluntary cost share is not allowed. That means that if an institution is in the category where cost sharing is required (PhD-granting or non-degree granting), that institution must cost share exactly 30% of the project cost and no more. On the other hand, institutional commitment is a review criterion, and PIs often ask, what’s the difference between cost share and institutional commitment? One important distinction is that cost share can only come from items that are legitimate project costs as defined by NSF, but there are a lot of other expenses that are required to ensure that an instrument will be installed and maintained over the long term. For example, a space must be provided, and that space may require refurbishment, enhanced electrical service and so on, but NSF will not pay for “bricks and mortar” on this grant. If your institution commits to providing that space, that would be considered institutional commitment, not cost share. The instrument will need to be maintained and a technician may be needed to run it after the three-year NSF funding period; NSF will expect an institutional commitment to provide those resources to keep the instrument running and in good repair unless you have another source to cover those expenses.

Restrictions on Content of Letters

In recent years, NSF has become much more restrictive about what can be included in a letter from a collaborator who will use your instrument (probably to prevent PIs from using the letters as a way to work around the Project Description page limit). The solicitation (in the section covering supplementary documents) now includes the exact text that can be used, with blanks provided for the required information. Some collaborators may think they’re doing you a favor by adding additional text to their letters. Don’t allow them to do that; no other information is allowed in these letters.

Project Description Outlines with Comments

General MRI Project Description Outline (Acquisition) – 15 pages
(Be sure to check solicitation for full instructions)

a. Information about the Proposal
   a1. Instrument Location and Type
      • Instrument Location (fill in the blank)
      • Concise description of instrument being acquired (1 separate line)

b. Research Activities (approx. 9 pages).
   • (My suggestion) Provide a brief overview briefly describing the instrument, summarizing the need, and putting forward your most compelling arguments (e.g., the amount the funding your users have, or the impact on your institution’s or region’s research capabilities, etc.)
   • Describe the research and research training activities and projects that will be enabled by the desired instrumentation, and sources of support, if any.
   • In narrative or tabular form, list by number and type (e.g., senior personnel, postdoctoral fellows, graduate students, undergraduate students) the personnel who will use the instrumentation for research and research training on a regular basis.
   • This section must include Results from Prior NSF Support if any of the PI/co-PIs have received NSF support for shared research instrumentation in the last 5 years. If not MRI support, then include any applicable Results from Prior NSF Support per PAPPG guidelines)
c. Description of the Research Instrumentation and Needs (approx. 2 pages)

- Provide a technical description of the requested instrumentation, including manufacturer and model number. Proposers are strongly encouraged to submit manufacturers’ quotes for instrument acquisition proposals (in supp docs).
- Explain why equipment is essential and appropriate.
- A listing and/or description of related instrumentation currently available at or near the submitting organization and justification for instrument in this context; if a similar instrument is at or near the performing organization, explain why another instrument is needed.
- Provide preliminary results from existing equipment, or appropriate calculations or models to show the performance (e.g., sensitivity, capacity, stability, resolution or signal-to-noise ratio) to be achieved by the new instrument.
- Justify the necessity and adequacy of the new instrumentation for the proposed research projects, with reference to existing instruments.

d. Broader Impacts, including Impact on Research and Training Infrastructure (Suggested length, 2 pages)

- Description of how the instrumentation will improve institution’s capabilities to conduct leading-edge research.
- Describe the potential impact of the instrument on infrastructure goals of institution.
- How the instrumentation will attract researchers and students, particularly underrepresented groups and women pursuing advanced degrees in science and engineering, and improve the quality of their research training.
- How the instrument will be used by students, including how it can provide research experiences for undergrad students and how their education will be enhanced.
- **Proposals requesting over $1M:**
  - Address potential impact of the instrument on the research community at the local and national level.
  - Discuss concrete plans for enabling access by external users, including those from non-PhD institutions and/or MSIs.
  - Describe the uniqueness of the instrument.

e. Management Plan (Suggested length, 2 pages)

- Detailed business and management plans with information on space, technical staffing for operation.
- Describe the facility in which the instrument will be housed.
- Maintenance and operation projections (About how much of the time do you anticipate the instrument will be in use? What will the maintenance costs be?)
- How and by whom the requested instrumentation will be operated and maintained over the project period of three years and and long-term (a letter of commitment to operations and maintenance is required in Supp. Docs).
- Technical expertise needed to maintain and operate the instrument with anticipated costs (if the expertise is not currently available, describe how it will be obtained).
- Procedures for allocating instrument time, if appropriate, and describe plans for attracting new users. (Will there be a user fee? If so, about how much will it be? Will you set up a committee to review applications for use? Organizational commitments regarding housing and costs associated with instrument maintenance and operations.)

f. Intellectual Merit (My suggestion, 1 paragraph)

- Summarize the new knowledge that is expected to be enabled by this instrument and how it will push disciplines forward (and/or answer important questions).
General MRI Project Description Outline (Acquisition) – 15 pages
(Be sure to check solicitation for full instructions)

a1. **Instrument Location and Type**
   - Instrument Location: __________________
   - Instrument Code: [see solicitation for codes]

a2. **Justification for submission as a Development proposal** - *(Suggested length, 1 page)*
   - Describe how the end result will be a stable, shared-use instrument rather than technology development
   - Describe the new capabilities this instrument will have that are not currently available from an instrument provided by a vendor
   - Describe how the instrument development will require and benefit from the diverse skills of your team
   - Briefly describe potential risks in achieving the required specifications and the need for a mitigation plan
   - Address any other criteria (described in bullets as questions in the solicitation) that apply

b. **Research Activities to be Enabled** *(Suggested length, ~4 pages)*
   - **Overview of project (My suggestion)**
     - Instrument to be developed, enhanced capabilities and exciting research these will enable, general approach, team that will accomplish this – Note: at high funding levels, the scientific impact has be very strong and exciting; *this is where we get the reviewers excited!* (~ 2 paragraphs)
     - Note: the solicitation does not require this, but I think it’s important to lay the groundwork before going into detail, and we can sneak this overview in here.
   - **Intellectual Merit** (this must be separately labeled but is a continuation of your argument above – what is the new knowledge that will be enabled by this instrument?)
   - **Table of potential users with columns something like: Name/Research Topic/# Senior Personnel/# Postdocs/# Grad students/ # Undergrads**
   - **Major users of instrument and descriptions of their research and what new/improved research the instrument will enable. Each major user should contribute a narrative (less than 3/4 page each) following the general format:**
     - **Section Heading**: Topic or title of research, Name of researcher, Department and Institution, Agency/ies from which they have received funding for this topic
     - Description of the research and why it is significant/exciting/of interest to NSF (even if it’s not currently funded by NSF) – include here the details of the funding described in the heading (funding agency, title of project, $ amount, funding period) – good also to cite publications coming out of this research. (Note: there is very little room for background/SOA/problem statement, so this should be very concise and kept to the minimum required for reviewers to understand the research.)
     - Description of what they can’t do now that they could do if they had access to the proposed instrument with its new capabilities (this can be scientific and can also be logistical but I’d recommend emphasizing new science that’s enabled). Note: this part is critical and needs to be concise and easy for the reviewers to find.
     - Description (in concise sentence or two) of what the impact of this new/improved research will be.
     - Results of Prior NSF Support
       - Include this if the PI or any of the co-PIs participated as PI or co-PIs in NSF MRI awards within the last 5 years. If the above doesn’t apply, report on Results from Prior NSF Support per [PAPPG guidelines](#)

c. **Description of the Research Instrumentation and Needs** *(NSF suggests up to 5 pages, but it may make sense to make this shorter and use the extra space in Section e if you anticipate a complex development project)*
   Overview paragraph giving and overview of the general design concept and development strategy, steps to be accomplished and expertise available to make this work (a flow chart might be appropriate here)
• Rationale for the new instrument and design concept and why it is needed (The need for development of a new instrument. Will the proposed instrument enable enhanced performance over existing instruments, or new types of measurement or information gathering? Is there a strong need for the new instrument in the larger user community?)
  o Limitations of currently available systems (imaging results from one of these systems demonstrating limitations might be appropriate here)
  o What is your new approach, challenges that will be addressed or questions that must be answered in order to develop the new system, and why do you think it will work?
  o Detailed description of expected capabilities of the new system with justification (calculations, etc.)
  o Preliminary results if available
• Likely availability of new instrument for shared use after award period
  o How functional will the instrument be at the end of the award period?
  o Do the logistics make it practical for shared use?
  o What will the cost of the new technology be? (Review Criterion: The appropriateness of the cost of the new technology.)

d. Broader Impacts including Impact on Research and Training Infrastructure – NSF suggests up to 2 pages.
• How the instrument will attract researchers and improve the institution’s ability to do leading-edge research
• Potential impact of the instrument on the research community of interest at the regional or national level (Note: this is required for grants over $1 million)
• How instrument will improve the quality of student education, research and training
  ⇒ Note: This section needs to have details in order to be effective: don’t just say undergrads will be involved; say how many, what they will do, etc. Similarly, don’t just say results will be incorporated into the curriculum; say what results, which classes, what level, how many students are in those classes, etc.
  o Discuss impact on students working directly on instrument development, operations, etc. (connect to any funding requested for student support if applicable), and how it will prepare them to be the next generation of instrumentalists (focus on skills they will learn here) (Review Criterion: If direct support for student involvement in development efforts is requested, reviewers will be asked to evaluate the involvement in terms of both project needs and training the next generation of instrumentalists.)
  o Impact of availability of the instrument on education and research experiences of students (this should include undergrads as well as graduate students)
    ▪ Will students use instrument as part of their research?
    ▪ Will results obtained using the instrument be incorporated into the curriculum in some way?
  o Discuss outreach/diversity activities that will be undertaken and/or enhanced by the availability of the instrument Note: You need a strong argument about enhancing diversity (involvement of women, minorities, persons with disabilities in STEM) – don’t just blow this off!
    ▪ Any collaborations with Minority Serving Institution or Predominantly Undergrad Institution faculty and students? Note: if you have ongoing collaborations with faculty at MSIs or PUIs, you could leverage those.
    ▪ Could this instrument or its results be used in any ongoing REUs?
    ▪ Are there any K-12 outreach programs that might collaborate with you in some way to showcase the instrument or results (e.g., SWE’s summer camps for girls or other STEM outreach activities)?

e. Management Plan – NSF suggests 5 pages for instrument development proposals
• Project plan organized by tasks, e.g., as follows
  o Task 1: Name of task and person(s) who will lead task
Objective of task and expertise need to accomplish the tasks (Review Criterion: The availability of appropriate technical expertise to design and construct the instrument.)
- Detailed description of how task will be accomplished
- Description of parts and materials
- Estimated deliverables, associated timelines and anticipated costs
- Any expected challenges, risks and how they will be addressed
  - Task 2, etc. as above
  - A discussion of risks and potential methods for mitigating the risks and for re-analyzing and modifying the project plan to keep it within scope, schedule and budget
  - Schedule and milestone chart (maybe Gantt or similar) (Review criterion: Does the plan have a realistic, detailed schedule? Are mechanisms in place to deal with potential risks?)
- The organization of the project staff and methods of assessing performance
  - For each member of the team, include a description of the responsibilities and explain why a given position is necessary for the completion of the design and construction of the new equipment (Note: I think the intention here is to make sure that faculty are not just put on this when they aren’t really doing the work of designing and building the instrument.)
- Plans for making the instrument design readily available to other researchers
- Plans for long-term operations and maintenance of the instrument
  - Who will manage the system? (Maybe a committee?)
  - How will expenses be covered? (refer to letter documenting TAMU’s commitment to funding operations and maintenance)
  - How will you decide how to allocate time on the instrument?
  - How will you attract and support new users?
  - Information on anticipated usage and downtime if appropriate

NSF Major Research Instrumentation Checklist
Here are a few things you’ll want to double check as work on your proposals.

☐ Are you following the rules of the current PAPPG? This includes having a separate labeled Intellectual Merit section.

☐ Are you following the definitions for “tracks”? For many years, MRI tracks were defined based on whether you were proposing to acquire or develop an instrument. While that distinction still exists, restrictions on the number of submissions from an organization are now based on the dollar amount not whether you’re submitting a development or acquisition proposal. See page 2 of the solicitation for details.

☐ Are you following the Project Description section page-length guidelines provided by NSF in the solicitation? In the MRI solicitation, NSF suggest page lengths for most of the sections (with suggested lengths differing depending on whether it’s an acquisition or development proposal). These page lengths are voluntary, and you may have a legitimate reason not to follow them based on your specific situation, but remember that the page lengths are a strong indicator of how much detail reviewers will be looking for in each section. If your section lengths vary significantly from those suggested by NSF, you should consider whether you are addressing what the solicitation is asking for in each section.

☐ If you’re proposing a development MRI, have you made a convincing argument that your project is, indeed, development? Sometimes it’s obvious that a project fits into the “development” category, but other times it can be a bit unclear (for example, when you are
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buying off-the-shelf items and assembling them). See the list of questions in the solicitation under “a2” and discuss all of the criteria that apply in this section of your proposal. Remember that if you don’t convince NSF that your proposal is, indeed, development proposal, you will have lost the battle for funding before the reviewers read the rest of the proposal.

☐ In your Research Activities to be Enabled section, are you including information about the personnel who will benefit from the instrumentation by type (faculty, postdocs, grad students, undergrads), by number, and by research area?

☐ Are you including information on the funding for specific projects or users that will benefit from the instrument?

☐ In the descriptions of research that will benefit from the instrument, does the researcher state explicitly what will be enabled or how the research will be improved in comparison to what is possible now, rather than just describing research that uses the particular type of instrument that you plan to buy or develop?

☐ Did you include Results of Prior NSF Support in the Research Activities to be Enabled Section? Did the PI and co-PIs who have had NSF support discuss the results as required in the PAPPG, focusing on previous MRIs if applicable, and on other NSF projects if not applicable (note that each PI/co-PI is only required to talk about one NSF-funded project)?

☐ In your Description of Research Instrument Needs section, if you are proposing to acquire an instrument, have you specified a vendor and model number as well as any additional attachments or options? Do you have a quote from the vendor that reflects these specifications exactly?

☐ Are the capacities of the instrument you are asking for clearly justified by the projects you describe in your Research Activities to be Enabled, especially if a cheaper version of the instrument (or a version without certain options or attachments) is available? Expect reviewers to scrutinize options and attachments, so be extra careful about justifying them in terms of the projects that will use the instrument.

☐ In the Broader Impacts section, do you propose activities that will enhance undergraduate education, allow sharing outside your institution (if possible) and broaden participation in science and engineering? If your proposal requests more than $1M, do you have a well-thought-out plan for sharing your instrument at the regional or national level, and for recruiting users from, for example, PUIs or MSIs? Lip service is not enough (including just putting up a website saying you will share the instrument); you need to have a clear process and proactive plan.

☐ If you’re proposing to develop a new instrument, do you have a clear and detailed work plan that describes who will do what when, the expertise of the team members, and risks and mitigation strategies?

☐ If you’re proposing to acquire an instrument, does your management plan state clearly the procedures for allocating time on the instrument, approving users from outside your institution, assessing user fees to cover consumables and maintenance (if applicable), and who will run the instrument? If your instrument will go into an existing core facility, this is
relatively easy, but if not, be careful to provide enough detail to reassure reviewers that you will have the processes in place to ensure the instrument will be properly maintained, used and shared.

☐ If you’re proposing an instrument development project, are you including plans to disseminate the new design to other researchers or commercially? Remember that the impact of the instrument development usually comes from making the new instrument design available to the research community, not just using it at your institution.

☐ In the budget justification, did you fill out the required cost share table provided in the solicitation? Give yourself plenty of time to do this and work with your pre-award staff to get this done.

☐ Did you get the required institutional letters, including a letter that 1) documents the performing institution's commitment to ensuring successful operations and maintenance over the expected lifetime of the instrument, 2) lists the MRI awards made to the organization—regardless of whether the PI or co-PIs were involved—with a start date in the previous five calendar years and briefly describe the status of the instrumentation obtained from each award?

☐ Did you get letters from individuals who will use the instrument, and do these letters follow the form specified in the solicitation without any changes or additions beyond filling in the blanks?

☐ Did you go through the checklist in the solicitation to make sure you remembers all required components?

☐ Did you use the required template for Collaborators and other Affiliations (new as of April 2017) for each Senior Personnel listed?

Other Resources
Best Practices for Writing an MRI for an HPC Cluster
NSF MRI Archive with links to old presentations
Academic Research Funding Strategies’ on-demand MRI webinar series ($40 fee)
Why Do Well Reviewed Proposals Get Declined for Funding?

From the dawn of religious and philosophical discussions, one of the most intractable and unanswerable questions asked of theologians has been “Why do bad things happen to good people?” The grant writing analog to this is “Why do well reviewed proposals get declined for funding?” What member of a university research office has not been asked to explain this contradiction to a frustrated, and perhaps even agitated, recipient of favorable reviews for a proposal that is nonetheless declined for funding.

Unfortunately, the answer to this question is often an unsatisfactory combination of speculation and reasonable assumptions that nonetheless are difficult to clarify, and more particularly, to guide towards a competitive resubmission. Moreover, this problem is distinct from the issue addressed in the October newsletter entitled, “What To Do When Reviewers Disagree.” In this case, reviews are scattered, rather than clustered, among good and not so good observations. However, in this fairly common case, frustration arises from the fact that, in spite of receiving uniformly favorable reviews, the proposal is declined for funding without any clear explanation as to why.

Thus begins the frustrating search for answers among many possibilities, none of which will likely resolve the issue with sufficient clarity. Funding, for example, may be predicted by several factors:

- It may be that, after rank ordering all fundable proposals, there was insufficient funding to support all worthy efforts. Consequently, some well reviewed and fundable proposals of roughly equivalent merit fell outside the funding line.
- Or, it may be that your proposal fell in the “Catch 22” trap often cited by agencies, to the effect that, “We fund exciting research not merely good research.” By implication, the reviewers were not critical of your proposed research in any way but neither were they excited by it as leading convincingly to new lines of scholarship.
- Or, your proposed research may lie in an exciting new area, but one which the agency has recently funded or has scheduled to be funded. In this case, it may rule against further funding on that topic.
- Or, it may be that a final rank ordering of proposals weighed factors in addition to intellectual merit and research significance—perhaps geographic distribution, funding outside of R1 designated institutions, or internal factors in the project description—that served as tie breakers on proposals of equivalent merit. These factors might have included educational components, Broader Impacts, innovation, new curricula, diversity, etc.
- Or, it may be that the reviewers favored funding your proposal, but it lacked a strong advocate willing to push the program officer(s) to fund it.
Unfortunately, the above factors can be frustratingly ambiguous and offer no clear guidance on the path toward revisions and resubmissions. In these cases, the onus of finding the best path forward falls on the proposal team, since the reviewers offer no directional certainty in answering the core question, “How do we improve this proposal for a competitive resubmission?” As in many things, from sports to the economy, when there is an unexplained failure, competitors “return to the fundamentals” and rebuild. In terms of any answer to the above question, a “return to fundamentals” is about as clear as it’s going to get.

Fortunately, the fundamentals of success in grant writing are well known and can be revisited to guide the revision and resubmission process. Basically, all proposals are expected to answer the same iconic questions:

- What will you do?
- Why will you do it?
- How will you do it?
- What is the significance and context of the research to the field or the agency mission?
- What is your research plan?
- What is your relevant capacity and expertise?

When lacking clear guidance from reviewers, use the foregoing to guide your proposal revisions. For example, the explanation of your project’s significance can always be improved. In more common vernacular, reconsider demonstrating how your research is “exciting” in the context of the current state of the field and the “exciting” ways it will advance the field. That said, no matter how well you address the foregoing questions, there may be factors in the funding decision that you cannot improve on a resubmission, such as awards funded on a mix of merit and geographic distribution, something not uncommon at some mission agencies.

In the end, reviews that are neither unfavorable nor sufficiently favorable to result in a funding decision require the research team to brainstorm guided by the above core questions asked of every successful proposal. Keep in mind that the most common characteristic of successful PIs is persistence; consequently, the best path forward following a declined proposal is to persevere.
Mystery writer and playwright Mary Roberts Rinehart is widely credited with making “The butler did it” a murder mystery trope in her 1930 novel, The Door, where indeed the butler did commit the murder. To this day, the butler as suspect is often the first red herring used as a literary device in murder mysteries designed to confuse readers trying to solve a murder. However, in grant writing, the “who done it” or “murderer” of a research narrative is most often its author(s). Unfortunately, in too many cases, those guilty of poor proposal writing are only revealed during an agency review process that results in a declined proposal. Only then, perhaps during an autopsy of the declined proposal and its reviews, is there an unambiguous answer to the key question: “Who killed this proposal?”

In grant writing, the accusation “The author did it!” is unfortunately not a red herring but often correctly points an accusing finger at the guilty party. And, of course, the real question in many cases is not “Who killed this proposal?” but more accurately, “Who killed this great idea?” Nothing in grant writing so undermines a great idea as a poorly written proposal. It is a true tragedy that a great idea, clearly an innocent bystander at the murder scene (research narrative), can be swept up and punished for the writing sins of the proposal’s authors who are found guilty, sentenced to a declined proposal, and often further sentenced to twelve months in “proposal timeout” awaiting the next annual due date before a better written revision and resubmission is possible. This twelve months in time out is never good—as Bob Dylan sings in Odds and Ends, “Lost time is not found again.” As in life, getting the research narrative right the first time is the preferred outcome, particularly since, for many solicitations, no second chances (competitions) exist.

While there are many gates a proposal must get through to be rewarded with a favorable funding recommendation, the first gate of good writing is critical. Good writing is like turning on the lights in a dark hotel room for reviewers, thereby providing the illumination that allows them to judge whether they want to stay in the room at all, i.e., fund the proposal. But make no mistake about it, poor writing should always be the prime suspect when a proposal is declined for funding. Fortunately, you don’t have to call in Chief Inspector Jane Tennison of the Metropolitan Police, as played by Helen Mirren in the British police procedural Prime Suspect, to solve this crime, but you do need to understand what characterizes a poorly written proposal. Keep in mind that poor writing is an umbrella term with many contributing components, but it is nonetheless the underlying root cause of many declined proposals.

Fortunately, clear and correctable indicators early on in the proposal development process reveal the likelihood that a final narrative is being poorly written. Keep in mind that good writing is much more than grammatically correct writing. If you think of poorly written text as a crime scene, there are always inculpatory “fingerprints” of poor writing to be found. For example, the principal contributor to a poorly written proposal is a poorly organized proposal, truly an unforced error on the part of the authors who did not use the solicitation as an organizational template for the project description. This mistake is easily revealed and corrected early on by comparing the proposal’s narrative outline with the goals, objectives, and
review criteria detailed in the funding solicitation. If there is not a tight mapping of the organizational structure of the first proposal draft to the solicitation guidelines, then the narrative is already at serious risk of being declined for funding.

Another contributor to poor writing is a research narrative comprised of siloed narrative sections that look like an endless Illinois landscape of corn fields punctuated by silos (see Beware of an Off-the-Shelf Contribution to a Team Proposal in the October newsletter). Why are siloed sections a common mistake leading to a declined proposal? They make it difficult for reviewers to conceptualize a coordinated and unified research project, particularly the capacity of the proposed project to achieve the Holy Grail of all successful projects—research synergy.

A few key steps can ensure that the proposal narrative is integrated and not siloed, starting with a proposal team meeting that discusses the reasons why various research expertise was configured as a competitive response to the solicitation to begin with, i.e., basically answering such iconic questions as “Why are we a team?”, “What are the key synergies that result from our research configuration?” “What are the value-added benefits of each disciplinary contribution to the project?”, etc.

Once the team addresses these questions, the author(s) of individual research strands can begin drafting their narrative sections with an end to integrating and incorporating the role of the other research strands in the overall proposal. This part of the narrative benefits enormously from a research graphic illustrating the unifying research elements of the overall project description. Moreover, this part of the narrative-- typically placed in the research plan section of the proposal--and the integrating graphic form the foundation for writing a convincing management plan that demonstrates the researchers’ capacity to meet the goals and objectives of the proposed research. To optimize this process, there should be continuous interaction and communication among those writing and reviewing the multiple research strands that collectively comprise the research narrative as it evolves through a series of iterative drafts on its way to becoming a well written and successful submittal.

Obviously, many other elements characterize a well written proposal, and many mistakes characterize a failed proposal, but chief among these are the two topics addressed above related to a well organized proposal and to a proposal that achieves narrative synergy and avoids narrative silos. Neither of these is difficult to achieve or to correct once identified. But it is nonetheless, a mystery of grant writing how often they do occur and are then called out by reviewers, resulting in a declined proposal.
Explaining Mission Agencies to New Faculty

New and junior faculty at the beginning stages of writing proposals to federal research agencies need to understand the distinct roles of federal mission agencies such as USDA/NIFA, DOE, NOAA, EPA, DOD, DoED, DOI, DOJ. This understanding is in many ways equivalent to the other important distinction new and junior faculty must make, i.e., determining whether their research is basic or applied. Both distinctions will have an impact on where a proposal is submitted and how it is written. Moreover, in practice, the two distinctions are often intertwined.

As a general rule, research at mission agencies is more applied than at the basic research agencies such as NSF and NIH. However, in practice, basic and applied research do not fit neatly into two entirely separate buckets, but represent more of a sliding scale along a research continuum going from very basic to very applied. Moreover, some basic research is funded by some mission agencies, for example, DOE and DOD. But there is a generalized distinction between basic research at NSF and NIH and that funded by DOE’s Office of Science or DOD’s DARPA. The mission agencies’ basic research furthers each agency’s specific mission objectives, whereas basic research at NSF and NIH advances knowledge in the field at a fundamental level. However, it is also the case that the basic research agencies such as NSF and NIH fund applied research that addresses some particular question of importance, e.g., perhaps related to Big Data analytics specific to the Smart Grid or Precision Medicine, respectively.

Understanding these distinctions is an important factor in determining where new and junior faculty seek funding and how they write the proposal once a funding opportunity is found. The key point for new and junior faculty to appreciate when seeking funding from federal mission agencies is that their success will depend entirely on how well they make the case in the research narrative that the proposed research brings clear value-added benefits to the funding agency’s mission. By comparison, success at a basic research agency is entirely dependent on how well the case is made in the research narrative that the proposed research will advance the state of knowledge in the field in some important, possibly transformative, way.

Proposals submitted to mission agencies will have to address the value-added benefits question in a compelling way if they are to be funded. In order to do this, the proposal’s author must understand the mission priorities of the funding agency, both as defined in the funding solicitation itself and in the larger context of the agency’s long-range strategic research plan, something all mission agencies have posted to their websites.

The bottom line here is that understanding the funding agency’s mission is an essential first step in making a convincing argument in the research narrative that the proposed research advances the priority mission objectives of the agency as enumerated in the funding solicitation. When writing a proposal to a mission agency, the proposal’s author must demonstrate the mission impact of the proposed research. This is done by mapping the
goals, objectives, and anticipated outcomes of the proposed research to the agency mission agenda listed in the funding announcement.

Moreover, most mission agencies, with the exception of USDA/NIFA, also fund unsolicited proposals, where an understanding of the agency’s research mission is even more important. The unsolicited proposal route to funding is often much more general than is the process of responding to a specific program announcement posted to Grants.gov. In the latter case, the goals and objectives are addressed in a very specific and detailed way in the solicitation that makes it easier to map the value-added benefits and mission impact of the proposed research to the agency’s funding objectives.

By comparison, the unsolicited process, often addressed in agency BAAs (Broad Agency Announcement), may require a stepwise procedure. This might begin by engaging a program officer with an email inquiry in hopes of being asked to submit a brief research abstract or white paper. The paper might lead to an invitation to submit a preliminary or full proposal. Regardless of the specific process at a mission agency, the unsolicited process itself will be much less guided than those appearing in a published funding solicitation. Therefore, it becomes very important that anyone considering the unsolicited proposal route have an informed understanding of the priority research mission objectives of the particular agency. Moreover, mission agencies are not monolithic. Divisions and program areas with an agency can have different priorities, particularly at mission agencies such as DOE and DOD.

Proposals submitted by new and junior faculty to mission agencies often fail to reflect a full understanding of the agency’s mission as it appears in the context of a specific funding solicitation or as it is expressed in the larger context of the entire agency. Providing an informed description of how proposed research maps to the funding agency’s mission objectives and thereby brings value-added benefits to the agency’s research mission priorities is the key to a funded proposal at a mission agency.
Research Grant Writing Web Resources

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Prepare and submit your Final, Annual, and Interim Project Reports on Research.gov!

Fall 2019 NSF Grants Conference Webcast Registration

NIH Data Management and Sharing Activities Related to Public Access and Open Science

WWC Summarizes the Research on Accelerated Study in Associate Programs (ASAP) for Community College Students
ASAP is a three-year program that is designed to remove barriers to college success and completion for students seeking associate degrees. ASAP offers students financial, academic, and personal supports. ASAP students are required to enroll full time and are encouraged to take any required developmental education courses in the first semester.

National Survey of College Graduates: 2017
The National Survey of College Graduates (NSCG), conducted by the National Center for Science and Engineering Statistics within the National Science Foundation, provides data on the characteristics of the nation's college graduates, with a focus on those in the science and engineering workforce. This report contains technical documentation for the 2017 NSCG, with links to data tables and microdata.

- View all Fogarty funding opportunities
- Search all NIH funding opportunities and notices
- Subscribe to NIH Guide for Grants and Contracts weekly emails

Why NIH is beefing up its data sharing rules after 16 years
The U.S. National Institutes of Health last week released a draft policy that will require all investigators with NIH funding to make their data sets available to colleagues. For the first time, grantees holding any NIH-funded grant—not just those above a $500,000 threshold in direct costs—will need to submit a detailed plan for sharing data, including steps to protect the privacy of research subjects.

For the biomedical research community, the draft rules, which update a 2003 policy, aren’t a big surprise: NIH has been gathering input on its ideas for the past 3 years. “We knew there was a lot of anxiety in the community about this and so we slowly shared our thinking and its evolution,” says Carrie Wolinetz, associate director for science policy at NIH in Bethesda, Maryland. Now, she says, “This is what the policy looks like in draft form.”

NIH will collect comments through 10 January 2020 and hopes to finalize the new rules next year. Here is more background on the policy:

NIH and its 27 institutes already have many data sharing policies, for example for genomic data and clinical trial results. Certain programs require data sharing, such as the
Cancer Moonshot. And journals often have similar requirements. Why is a new NIH-wide policy needed? Because many researchers still aren’t sharing their data, Wolinetz says. At one extreme, genomics researchers have a long tradition of sharing data sets; on the other hand, in epidemiology, “There is a more protective culture of holding on to data.” Sharing among basic researchers also varies by field, she says.

**How are the new draft rules different from the 2003 policy?**
NIH is now asking for more details on how the investigator plans to manage and share their data, Wolinetz says. “This is a little bit weightier than the previous plan” and applies to all NIH-funded research, not just large programs.

NIH isn’t asking that data be released within a certain time frame; it just says they “should be made available as soon as practicable.” Why not specify a timeline? Because different disciplines will have different standards. “We are giving a lot of leeway. It’s impossible to come up with a one-size-fits-all policy,” Wolinetz says. But if a proposal is “out of the norm” for the researcher’s field or funding institute, “that’s going to be taken into account,” she adds.

**Who will check the data sharing plan, and at what stage of the project? And what if a researcher doesn’t comply?**
It will not be part of peer review, but program staff will assess the plan for a project awaiting an award and later “hold you accountable,” Wolinetz says. If an investigator does not follow through and share their data, they “may not receive additional funding.” Although revoking a grant for failing to share data is “a theoretical possibility,” in reality NIH usually resolves such issues through “conversations with institutions and investigators,” she adds.

**NIH has been funding some data repositories, such as Figshare and the STRIDES cloud initiative. Does the agency ultimately want data sets to be deposited in NIH-sponsored repositories?**
No decisions have been made. The best sustainable model for storing data long term “is very much a question on the table right now. These pilots represent our attempt to answer some of those questions,” Wolinetz says.
Fall 2019 NSF Grants Conference Webcast Registration

WWC Summarizes the Research on InsideTrack Coaching for College Students

FY20 Appropriations Bills: STEM Education
This report describes the associations between middle school teacher qualifications and student achievement in Algebra I. The authors used data provided by the Missouri Department of Elementary and Secondary Education. Results suggest that the teacher qualification most strongly associated with middle school student achievement in Algebra I was performance on mathematics certification exams, followed by years of experience teaching mathematics. Teacher performance on mathematics certification exams and years of experience teaching mathematics were also strongly associated with achievement in Algebra I for under-represented and disadvantaged student subgroups.

World Wide Clearing House, What We Do
For more than a decade, the WWC has been a central and trusted source of scientific evidence on education programs, products, practices, and policies. We review the research, determine which studies meet rigorous standards, and summarize the findings. We focus on high-quality research to answer the question “what works in education?” Why Does Quality Matter in Education Research? Not all education research is equal. Identifying well-designed studies, trustworthy research, and meaningful findings to inform decisions and improve student outcomes can be tricky. That’s where the WWC comes in.

By visiting Newsflash you may also sign up to receive information from IES and its four Centers NCES, NCER, NCEE, & NCSER to stay abreast of all activities within the Institute of Education Sciences (IES).
Fall 2019 NSF Grants Conference Webcast Registration
Experience the Fall 2019 NSF Grants Conference virtually. The National Science Foundation will live stream the plenary sessions of the conference from Boston, MA on **November 18 and 19**. There is **no cost or limit for participants to view the live stream**. Click the button at URL to register for the event and learn about the agenda and speakers. The link to the webcast will be emailed to all registrants several days in advance of the event. It will also be made available on the conference website.

**Dear Colleague Letter: Frontera Leadership-Class Computing Allocations**
With this Dear Colleague Letter (DCL), the National Science Foundation (NSF) seeks to inform the community about an opportunity to request access to Frontera, the recently-launched supercomputer hosted at the Texas Advanced Computing Center (TACC) at The University of Texas at Austin. Frontera, the most powerful academic supercomputer ever deployed by NSF, is a Dell EMC system with over 16,000 Intel processors as well as significant graphics processing unit, storage, and memory capabilities. More information about the system can be found at https://www.tacc.utexas.edu/systems/frontera.

**Dear Colleague Letter: 2020 CHE International Supplement**
The National Science Foundation (NSF) Strategic Plan "Building the Future: Investing in Discovery and Innovation" (2018 - 2022) states, "NSF must continue to invest in a world-class research enterprise, support the development of a globally competitive scientific and engineering workforce, and foster greater understanding of science and technology among the American public" and "NSF will promote a research culture that is broadly inclusive in its demography and range of intellectual ideas, has access to cutting-edge infrastructure, and is globally engaged, with increased opportunities for exchanging ideas and collaborating on an international scale. NSF will increase opportunities for broadening the training of U.S. graduate students and early-career researchers through international exchanges and partnerships with industry." NSF's Division of Chemistry seeks to fulfill this vision by advancing research and education in chemistry and ensuring that the U.S. research community remains at the forefront of the field by providing access to the knowledge and resources that exist globally.

In this context, the Division of Chemistry is inviting requests for supplemental funding from its existing awardees who may wish to add a new, or strengthen an existing, international dimension of their award when such collaboration advances the field of chemistry and enhances the U.S. investigator's own research and/or education objectives. Principal Investigators supported by NSF Division of Chemistry awards are advised to consult with their cognizant NSF program director prior to submitting a supplemental funding request. Supplemental funding requests must be received by 5 p.m., submitter’s local time on May 1, 2020. Supplemental funding requests should address how the proposed international collaboration enhances intellectual merit and broader impacts in the following ways:

- Mutual benefit of the collaboration for all partners;
- True intellectual collaboration with the international partner(s);
- Benefits to be realized from the expertise and specialized skills, facilities, sites and/or resources of the international counterpart; and
- Active research engagement of U.S. students and early-career researchers.

**Dear Colleague Letter: Request for Information on Data-Focused Cyberinfrastructure Needed to Support Future Data-Intensive Science and Engineering Research**

This Request for Information (RFI) invites the community to provide input to NSF on specific data-intensive S&E research questions and challenges and the essential data-related CI services and capabilities needed to publish, discover, transport, manage and process data in secure, performant and scalable ways to enable that data-intensive research. Recognizing that data-oriented CI and services exist in many S&E disciplinary domains, NSF is particularly interested in understanding how broader cross-disciplinary and domain-agnostic solutions can be devised and implemented, along with the structural, functional and performance characteristics such cross-disciplinary solutions must possess. Such new CI services and capabilities should allow for seamless data integration and interoperability; support existing S&E drivers, users and usage modes; and foster the initiation of future modes of discovery. While no one technical solution will likely be able to address the expansive S&E research enterprise that NSF supports, NSF is interested in understanding how different data-related CI solutions might support heterogenous ensembles of data-intensive disciplines - owing, for instance, to common requirements due to similarities in data set sizes, types and utilization workflows, or to novel shared goals for cross-disciplinary data integration and discovery. Note that NSF is especially interested in responses that build on existing and future data sources (including repositories) and address services for publishing, discovery, access, management and processing of the data.

**Dear Colleague Letter: Research Experiences for Undergraduates (REU) and Research Experiences for Teachers (RET) Supplemental Funding in Computer and Information Science and Engineering**

The National Science Foundation's (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) Supplements**, following the guidelines in the REU Sites and Supplements solicitation ([NSF 19-582](https://www.nsf.gov)). CISE also invites grantees with active CISE awards to submit requests for **Research Experiences for Teachers (RET) Supplements**, following the guidelines in the RET in Engineering and Computer Science: Supplements and Sites solicitation ([NSF 19-575](https://www.nsf.gov)). Requests will be considered as they are received. CISE strongly encourages the submission of requests before March 30, 2020; the potential for funding requests after this date may be limited.

The participation of students and teachers from groups underrepresented in computing - underrepresented minorities, women, and persons with disabilities - is strongly encouraged. To this end, principal investigators (PIs) submitting REU/RET supplemental funding requests are directed to the CISE Broadening Participation in Computing website ([https://www.nsf.gov/cise/bpc/](https://www.nsf.gov/cise/bpc/)).

**REU Supplements**
REU supplements help undergraduate students engage in meaningful research experiences in pursuit of their educational and career goals. To be eligible for this opportunity, a student must be a US citizen or permanent resident of the US. CISE encourages submission of REU supplemental funding requests that specifically afford US veterans an opportunity to engage in meaningful research experiences.

**RET supplements**

RET supplements help K-12 science, technology, engineering, and mathematics (STEM) teachers engage in meaningful research experiences and translate the knowledge gained into their teaching practices. The focus of their research should be in CISE disciplines rather than on education or curriculum development. Teachers who receive funding from an RET supplement must be currently teaching a STEM subject at their schools. CISE is particularly interested in RET supplements that target K-12 computer science teachers. Since a major goal of a RET activity is to create a bond between the K-12 schools and the host college or university, recruitment of RET teachers should focus on schools or school districts reasonably close to the host institutions.

**Dear Colleague Letter: Research Opportunities for the Directorate for Mathematical and Physical Sciences (MPS) in Artificial Intelligence Research Institutes**

Recent ground-breaking advances in artificial intelligence (AI) have been enabled by increased computing power, algorithmic improvements in machine-learning, and the availability of large data sets. Synergies between research frontiers in AI and Mathematical and Physical Sciences (MPS) have the potential to stimulate further transformative progress in both fields. The National Artificial Intelligence Research Institutes program (described in NSF 20-503) supports teams of scientists, engineers, and educators in multidisciplinary efforts that advance AI and contribute to research challenges in other domains of science and engineering. National AI Research Institutes are characterized by their commitment to pursuing foundational AI research, advancing domain science by leveraging use-inspired AI research, actively building the next generation of talent, and creating a nexus for collaborative research.

This Dear Colleague Letter (DCL) describes opportunities for MPS researchers to participate in the National AI Research Institutes program. There are two tracks described in the Program Solicitation: a Planning Grant track and an Institute Track that has six specific thematic areas. Two of the Institutes Tracks may be of particular interest to researchers working in the fields of Chemistry (CHE) / Chemical, Bioengineering, Environmental and Transport Systems (CBET) and Physics:

- AI for Accelerating Molecular Synthesis and Manufacturing and
- AI for Discovery in Physics

Please note that a webinar answering questions on the National AI Institutes will be given on Thursday, November 7 from 3:30-4:30 pm (EST). Please register online at https://www.nsf.gov/events/event_summ.jsp?cntn_id=299439&org=CISE.

**Dear Colleague Letter: NSF/NSFC Joint Research on Environmental Sustainability Challenges**

The NSF Engineering Directorate (ENG) and the National Natural Science Foundation of China (NSFC) Department of Engineering and Material Sciences (DEMS) and Department of
Geosciences are partnering to encourage joint research by U.S. - China teams collaborating on fundamental research that addresses critical environmental sustainability challenges. Among nations, the U.S. and China have the two largest economies on Earth and also have important engineering, technology, business and trade relationships with each other. Both nations face significant environmental sustainability challenges, for example in the food-energy-water (FEW) nexus, urban sustainability, global change, and manufacturing. Fundamental research is needed to provide the foundational knowledge for addressing these challenges.

This Dear Colleague Letter is for research proposals from joint U.S. - China teams in the environmental sustainability themes of:

"Innovations at the Nexus of Food, Energy, and Water Systems (INFEWS: U.S.-China)"

1. quantitative and computational modeling of a FEW system
2. innovative human and technological solutions to critical FEW systems problems.

Every proposal must include the participation of researchers from at least one U.S. organization and at least one institution in China. Proposals that do not comply with this requirement will be returned without review. The proposal submitted to NSF must conform to NSF proposal requirements as specified in NSF's posted Proposal and Award Policies and Procedures Guide (NSF 19-1), and the matching proposal submitted to NSFC must conform to requirements posted by NSFC. NSF will fund the U.S. researchers up to a total of $500,000 for 4 years for each recommended award, while NSFC will fund the China researchers up to a total of 3 million yuan for 4 years for each recommended award. In total, no more than 6 joint NSF-NSFC project grants are expected to be funded. NSF research funding is pending the availability of funds. Each proposal must include a management plan that clearly specifies the role of team researchers from both the U.S. and China, and the mechanisms through which close collaboration will be assured. The management plan is not to exceed 3 pages and is to be included in the supplementary document file of the electronic submission.
Evaluation of the Minerva Research Initiative
The Minerva Research Initiative is a Department of Defense (DoD) social science grant program that funds unclassified basic research relevant to national security. The goal of the program is to make use of the intellectual capital of university-based social scientists to inform understanding of issues important to DoD and the broader national security community. Evaluation of the Minerva Research Initiative discusses the program's successes and challenges over its first decade of operation, and highlights ways to strengthen the program’s foundations and take advantage of opportunities for broadening its reach and usefulness.

The Science of Effective Mentorship in STEMM
Mentorship is a catalyst capable of unleashing one’s potential for discovery, curiosity, and participation in STEMM and subsequently improving the training environment in which that STEMM potential is fostered. Mentoring relationships provide developmental spaces in which students’ STEMM skills are honed and pathways into STEMM fields can be discovered. Because mentorship can be so influential in shaping the future STEMM workforce, its occurrence should not be left to chance or idiosyncratic implementation. There is a gap between what we know about effective mentoring and how it is practiced in higher education. The Science of Effective Mentorship in STEMM studies mentoring programs and practices at the undergraduate and graduate levels. It explores the importance of mentorship, the science of mentoring relationships, mentorship of underrepresented students in STEMM, mentorship structures and behaviors, and institutional cultures that support mentorship. This report and its complementary interactive guide present insights on effective programs and practices that can be adopted and adapted by institutions, departments, and individual faculty members.

The Convergence of Infectious Diseases and Noncommunicable Diseases: Proceedings of a Workshop
On June 11 and June 12, 2019, the National Academies convened a workshop to explore the growing understanding of how the interplay between humans and microbes affects host physiology and causes noncommunicable diseases. Discussions included an overview of colliding epidemics, emerging research on associations between infectious and noncommunicable diseases, risks posed by chronic diseases to the development and severity of infectious diseases, and the influence of the microbiome. Workshop participants also examined the challenges and opportunities of convergence, the integration of health care delivery models and interventions, potential approaches for research, policy, and practice in the immediate-term, and potential directions for the long-term. This publication summarizes the presentations and discussions from the workshop.
New Funding Opportunities
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URL Links to New & Open Funding Solicitations
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[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

Transitions to Excellence in Molecular and Cellular Biosciences Research (Transitions)
The Division of Molecular and Cellular Biosciences (MCB) has developed a new opportunity to enable researchers with a strong track record of prior accomplishment to pursue a new avenue of research or inquiry. This funding mechanism is designed to facilitate and promote a PI's ability to effectively adopt empowering technologies that might not be readily accessible in the PI's current research environment or collaboration network. Transformative research likely spans disciplines and minimizing the practical barriers to doing so will strengthen research programs poised to make significant contributions. The award is intended to allow mid-career or later-stage researchers (Associate or Full Professor, or equivalent) to expand or make a transition in their research programs via a sabbatical leave or similar mechanism of professional development and then develop that research program in their own lab. This award will also enable the PI to acquire new scientific or technical expertise, facilitate the investigator's competitiveness, and potentially lead to transformational impacts in molecular and cellular bioscience. The award would fund up to six months of PI salary during the first sabbatical or professional development year, followed by support for continued research for two subsequent years upon the PI's return to normal academic duties. Through this solicitation MCB and NSF hope to develop a novel mechanism that will encourage investigators to expand and/or transition to new research areas aligned with MCB priorities, to increase retention of investigators in science, and to ensure a diverse scientific workforce that remains engaged in active research.

Highest funding priority is given to proposals that have outstanding intellectual merit and broader impacts, while proposals with weaknesses in either category (or those that are perceived as likely to have an incremental impact) will not be competitive. Proposals should also demonstrate a strong record of prior accomplishment, a compelling plan for professional development that will enable the PI to forge a new direction in their scholarship, and a strong rationale for why this support is needed for the PI to become competitive in the new research
area. Support for the proposed transition from the PI's department, described in a letter from the department chair or equivalent, will also be required. Proposals that do not describe a plan for a transition in research direction will be considered unresponsive. Proposals that are motivated to understand the molecular and cellular basis of disease and disease treatments are not appropriate for the Division and will be returned without review.

Proposals addressing major open questions at the intersections of biology with other disciplines, such as physics, chemistry, mathematics, computer sciences, and engineering are of particular interest to the program. Proposals Accepted at Any Time.

**Ford Foundation Fellowship Programs**

Through its Fellowship Programs, the Ford Foundation seeks to increase the diversity of the nation’s college and university faculties by increasing their ethnic and racial diversity, maximize the educational benefits of diversity, and increase the number of professors who can and will use diversity as a resource for enriching the education of all students. Predoctoral, Dissertation, and Postdoctoral fellowships will be awarded in a national competition administered by the National Academies of Sciences, Engineering, and Medicine on behalf of the Ford Foundation.

Eligibility to apply for a Ford fellowship is limited to:

• All U.S. citizens, U.S. nationals, and U.S. permanent residents (holders of a Permanent Resident Card), as well as individuals granted deferred action status under the Deferred Action for Childhood Arrivals Program, Indigenous individuals exercising rights associated with the Jay Treaty of 1794, political asylees, and refugees, regardless of race, national origin, religion, gender, age, disability, or sexual orientation,

• Individuals with evidence of superior academic achievement (such as grade point average, class rank, honors or other designations), and

• Individuals committed to a career in teaching and research at the college or university level.

Eligibility includes individuals with current status under the DACA Program, as well as individuals whose status may have lapsed but who continue to meet all the USCIS guidelines for DACA available here. Receipt of the fellowship award is conditioned upon each awardee providing satisfactory documentation that he or she meets all the eligibility requirements. Awards will be made for study in research-based Ph.D. or Sc.D. programs; practice oriented degree programs are not eligible for support (see eligible fields). Prospective applicants should carefully the eligibility requirements, the terms of the fellowship awards, application instructions and other information pertaining to the individual fellowship (Predoctoral, Dissertation, or Postdoctoral) for which they are applying.

In addition to the fellowship award, new Ford Fellows are invited to attend the Conference of Ford Fellows, a unique national conference of a select group of high-achieving scholars committed to diversifying the professoriate and using diversity as a resource for enriching the education of all students. **Due December 10 and 15.** See program announcement.

**RFA-CK-20-002 Detection and Characterization of Emerging Vector-Borne and Zoonotic Pathogens in Indonesia HHS/CDC**
The purpose of this Notice of Funding Opportunity (NOFO) is to support research to enable rapid and accurate identification of emerging vector-borne and zoonotic threats in Indonesia by building upon the scientific and laboratory infrastructure established under two previously awarded NOFOs. Indonesia is a recognized “hotspot” for emerging pathogens. It is the world’s fourth largest population, spread among nearly 1000 inhabited islands stretching 3,400 miles along the equator, making opportunities for an emerging pathogen to become epidemic in the absence of a reliable detection system high. The arthropod-borne viruses (arboviruses) and Rickettsia (typhus and spotted fevers) are of particular concern because of the ease with which vectors can transfer these viruses between wildlife, humans and livestock. Remarkably, little is known about these diseases in Indonesia or their potential for movement within and from the country. For example, only two of 11 pathogenic arboviruses known to be found in neighboring Australia have been identified in Indonesia. Although Indonesia is known historically to be endemic for murine typhus and scrub typhus, they are almost never diagnosed. CDC began a highly successful effort to build Indonesian capacity to identify emerging vector-borne diseases in 2011. This effort helped to (1) build and support a state-of-the-art molecular diagnostic laboratory at Jakarta; (2) conduct countrywide training in virological techniques and biosafety; and (3) pilot a large-scale acute febrile illness (AFI) surveillance network. During the previous cooperative agreement (RFA-CK-15-001), Indonesian and CDC partners identified the first West Nile and Zika virus cases in Indonesia, conducted the first Zika seroprevalence study, and identified Rickettsia felis for the first time as a cause of fatal neurological disease. Indonesia is a leader of the Global Health Security Agenda and the CDC mission supports Indonesia’s efforts to fulfill its Joint External Evaluation (JEE) goals; especially strengthening the national laboratory system and improving the ability of real-time surveillance in detecting emerging pathogens (WHO/OHE/2016.4, Indonesia JEE, November 2017). Due January 16.

**Macrosystems Biology and NEON-Enabled Science  National Science Foundation**

The Macrosystems Biology and NEON-Enabled Science (MSB-NES): Research on Biological Systems at Regional to Continental Scales program will support quantitative, interdisciplinary, systems-oriented research on biosphere processes and their complex interactions with climate, land use, and changes in species distribution at regional to continental scales as well as training activities to broaden participation of researchers in Macrosystems Biology and NEON-Enabled Science. Proposers are encouraged to use NEON resources, and proposals for substantive and innovative NEON-enabled research will be prioritized for funding. Substantive NEON-enabled projects rely on data and/or samples collected by NEON, co-locate research activities at NEON sites, and/or develop tools that will explicitly enhance the processing, use, and/or analysis of NEON data or collections within the context of Macrosystems Biology research questions. Due January 16.

**20-507  Campus Cyberinfrastructure National Science Foundation**

The Campus Cyberinfrastructure (CC*) program invests in coordinated campus-level networking and cyberinfrastructure improvements, innovation, integration, and engineering for science applications and distributed research projects. Learning and workforce development (LWD) in cyberinfrastructure is explicitly addressed in the program. Science-driven requirements are the primary motivation for any proposed activity. Due January 21.
Frontier Research in Earth Sciences (FRES)
The FRES program will support research in Earth systems from the core through the critical zone. The project may focus on all or part of the surface, continental lithospheric, and deeper Earth systems over the entire range of temporal and spatial scales. FRES projects should have a larger scientific scope and budget than those considered for funding by disciplinary programs in the Division of Earth Sciences (EAR). FRES projects may be interdisciplinary studies that do not fit well within EAR's disciplinary programs or cannot be routinely managed by sharing between disciplinary programs. Innovative proposals within a single disciplinary area with outcomes of potential broad relevance to Earth Science research are also encouraged. Investigations may employ any combination of field, laboratory, and computational studies with observational, theoretical, or experimental approaches. Projects should be focused on topics that meet the guidelines for research funded by the Division of Earth Sciences. Due February 5.

HHMI's Driving Change initiative
The goal of the HHMI Driving Change (DC) initiative is to drive genuine and lasting culture change on university campuses so undergraduate students from all backgrounds, particularly those who belong to historically excluded groups, will excel in STEM and graduate from college well prepared to pursue advanced degrees and eventually assume leadership roles in STEM. This initiative encourages a comprehensive approach to culture change with three interlocking elements:

1. A robust framework to support student success in STEM
The first element focuses on the development of a coherent set of activities that provides a robust framework to support student success in STEM. Each grantee campus will create its version of the University of Maryland, Baltimore County (UMBC) Meyerhoff Scholars Program (MYSP), committing to achieve the outcomes and honor the underlying values of each of the MYSP components.

2. A more inclusive STEM learning environment
The second element focuses on creating a more inclusive STEM learning environment that affects all STEM students at the university. Each campus planning to submit a grant proposal will examine its current environment through a self-study. The findings of the self-study will identify practices and behaviors that should change in order to achieve greater inclusivity in the learning environment for all students, especially those students who are from groups historically excluded from STEM.

3. A learning community of institutions
The third element reaches beyond the individual grantee university by convening a learning community of institutions that are engaged in DC. The DC learning community will meet regularly throughout the five years of the initiative to share their aspirations, experiences, and progress.

HHMI expects to award up to six grants to research universities with awards beginning as early as September 2021. Each grant will provide up to $500,000 per year for five years and will be non-renewable. These grants are intended to provide “start-up” funds to assist the grantee institution as it launches its DC program. The grant will not pay for student tuition and fees, nor will it provide indirect costs to the grantee institutions. The grantee university will
carefully assess its progress, evaluate its program, and initiate strategies that will sustain progress beyond the duration of the HHMI grant. **LOI February 7.**

**NSF 20-516 Improving Undergraduate STEM Education: Pathways into the Earth, Ocean, Polar and Atmospheric & Geospace Sciences (IUSE:GEOPAths)**

The National Science Foundation’s (NSF’s) Improving Undergraduate STEM Education (IUSE) Initiative is a Foundation-wide effort to accelerate improvements in the quality and effectiveness of undergraduate education in all STEM fields including the learning, social, behavioral, and economic sciences. Undergraduate STEM education is critical for preparing both a diverse STEM workforce and a STEM-literate public that is ready to support and benefit from the progress of science [Reference 1]. The IUSE initiative provides a Foundation-wide framework of investments to support the agency's commitment to the highest caliber undergraduate STEM education. By improving the quality and effectiveness of undergraduate education in all STEM fields, IUSE investments enable NSF to lead national progress toward a diverse and innovative workforce and a STEM-literate public. Through the IUSE framework, NSF coordinates its investments in undergraduate programs and undergraduate STEM education to maximize impact, and to use shared metrics and appropriate program evaluation approaches. These investments are made across all directorates and address both STEM education in general and specific disciplinary needs. IUSE investments support a variety of activities including the inclusion of inquiry-based and active learning approaches in undergraduate STEM instruction, efforts to increase undergraduate STEM research experiences and courses, and research on the persistence and graduation of students in STEM programs. In addition, specific emerging cross-disciplinary needs include data science preparation for students in all majors, recruitment and retention of women and of students from underrepresented groups in STEM degree programs, incorporation of undergraduate research in STEM fields for STEM majors and non-majors, and re-envisioning of introductory courses in light of new research findings and theories. IUSE also seeks to broaden participation in STEM fields from all sectors and groups in society and proposers are encouraged to establish linkages, as appropriate, with components of the national network of NSF INCLUDES projects [Reference 2 in the Program Description section]. The Directorate for Geosciences (GEO) contributes to the IUSE initiative through the Improving Undergraduate STEM Education: Pathways into the Geosciences - Earth, Ocean, Polar and Atmospheric Sciences (IUSE:GEOPAths) funding opportunity. IUSE:GEOPAths invites proposals that specifically address the current needs and opportunities related to education within the geosciences community through the formation of STEM Learning Ecosystems that engage students in the study of the Earth, its oceans, polar regions and atmosphere. The primary goal of the IUSE:GEOPAths funding opportunity is to increase the number of students pursuing undergraduate and/or postgraduate degrees through the design and testing of novel approaches that engage students in authentic, career-relevant experiences in geoscience. In order to broaden participation in the geosciences, engaging students from historically excluded groups or from non-geoscience degree programs is a priority. While maintaining elements from the legacy tracks of GEOPATHS, this solicitation features three new funding tracks that focus on Geoscience Learning Ecosystems (GLEs): 1. GEOPAths: Informal Networks (IN). Collaborative projects in this track will support geoscience learning and experiences in informal settings for teachers, pre-college (e.g., upper level high school) students, and early undergraduates in the
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geosciences. 2. GEOPAths: Undergraduate Preparation (UP). Projects in this track will engage pre-college and undergraduate students in extra-curricular experiences and training in the geosciences with a focus on service learning [Reference 3 in the Program Description section] and workplace skill building. 3. GEOPAths: Graduate Opportunities (GO). Projects in this track will improve research and career-related pathways into the geosciences for undergraduate and graduate students through institutional collaborations with a focus on service learning and workplace skill building. Due February 14.

DE-FOA-0002184, Environmental System Science, Department of Energy - Office of Science
The DOE SC program in Biological and Environmental Research (BER) hereby announces its interest in receiving applications for research in Environmental Systems Science (ESS), including Terrestrial Ecosystem Science (TES) and Subsurface Biogeochemical Research (SBR). The goal of the Environmental System Science (ESS) activity in BER is to advance a robust, predictive understanding of the set of interdependent physical, biogeochemical, ecological, hydrological, and geomorphological processes for use in Earth system, ecosystem and reactive transport models. Using an iterative approach to model-driven experimentation and observation, and interdisciplinary teams, ESS-supported scientists work to unravel the coupled physical, chemical and biological processes that control the structure and functioning of terrestrial ecosystems and integrated watersheds across critical spatial and temporal scales. This FOA will consider applications that focus on improving the understanding and representation of terrestrial and subsurface environments in ways that advance the sophistication and capabilities of local, regional, and larger scale models. Using new measurements, field experiments, more sophisticated modeling and/or synthesis studies, this FOA will encompass two topic areas: 1) Terrestrial Ecology, specifically linking above and belowground processes, as well as methane biogeochemistry; and 2) Subsurface and Watershed Hydro-biogeochemistry, specifically studying the function and dynamics of hydro-biogeochemical processes within watersheds. All applications are required to clearly delineate an integrative, hypothesis-driven approach and describe the existing needs/gaps in state-of-the-art models. Applicants should provide details on how the results of the proposed research will be used to improve the predictability and sophistication of integrated watershed systems and/or terrestrial ecosystem models. Due Feb. 20.

NSF 20-515 Future of Work at the Human-Technology Frontier: Core Research
The specific objectives of the Future of Work at the Human-Technology Frontier program are to (1) facilitate convergent research that employs the joint perspectives, methods, and knowledge of computer science, design, engineering, learning sciences, research on education and workforce training, and social, behavioral, and economic sciences; (2) encourage the development of a research community dedicated to designing intelligent technologies and work organization and modes inspired by their positive impact on individual workers, the work at hand, the way people learn and adapt to technological change, creative and supportive workplaces (including remote locations, homes, classrooms, or virtual spaces), and benefits for social, economic, educational, and environmental systems at different scales; (3) promote deeper basic understanding of the interdependent human-technology partnership to advance societal needs by advancing design of intelligent work technologies that operate in harmony
with human workers, including consideration of how adults learn the new skills needed to interact with these technologies in the workplace, and by enabling broad workforce participation, including improving accessibility for those challenged by physical or cognitive impairment; and (4) understand, anticipate, and explore ways of mitigating potential risks arising from future work at the human-technology frontier. Ultimately, this research will advance understanding of how technology and people interact, distribute tasks, cooperate, and complement each other in different specific work contexts of significant societal importance. It will advance the knowledge base related to worker education and training and formal and informal learning to enable all potential workers to adapt to changing work environments. It will advance our understanding of the links between the future of work at the human-technology frontier and the surrounding society, including the intended potential of new technologies and the unintended consequences for workers and the well-being of society. For the purposes of this solicitation, work is defined as mental or physical activity to achieve tangible benefit such as income, profit, or community welfare. The Future of Work at the Human-Technology Frontier is, in turn, a conceptualization of work in the future that will be enabled or improved by advances in intelligent technology and their synergistic integration with human skill to achieve broad participation in the workforce and improve the social, economic, and environmental well-being of society. To reach this goal, research is sought that is anchored in work. Proposals must clearly define the work and work context addressed by the research. Technological innovations should be integrated with advances in the learning sciences, research on education and workforce training, and social, behavioral, and economic science perspectives. Potential results should contribute to fundamental advances in optimizing the human-technology team, the science and technology of future workforce development and education, work environments, and positive work outcomes for workers and society at large. Proposals are encouraged that are oriented toward the future of work at the human-technology frontier and that are not overly couched in current technology or work practices. A proposal for a research grant in this program must focus on advancing fundamental understanding of future work, and potential improvements to work, workplaces, workforce preparation, or work outcomes for workers and society. Due March 9.

DE-FOA-0002204  Energy Frontier Research Centers
The Department of Energy’s (DOE) Office of Basic Energy Sciences (BES) announces the call for Energy Frontier Research Centers (EFRC) proposals and encourages both new and renewal applications. Applications will be required to address priority research directions and opportunities identified in recent BES workshop and roundtable reports, the scientific grand challenges identified in the report Directing Matter and Energy: Five Challenges for Science and the Imagination, and the opportunities described in the report Challenges at the Frontiers of Matter and Energy: Transformative Opportunities for Discovery Science. All of these reports are described below. BES is soliciting proposals in four (4) topical areas: 1) Environmental Management (new and renewal proposals); 2) Quantum Information Science (new proposals only); 3) Microelectronics (new proposals only); and 4) Polymer Upcycling (new proposals only). Funding will be competitively awarded to the successful Energy Frontier Research Center applications selected by Federal officials, based on a rigorous merit review process as detailed in Section V of this Funding Opportunity Announcement (FOA). Due April 7.
Solicitations Remaining Open from Prior Issues of the Newsletter

**Biosensing**
The Biosensing program is part of the Engineering Biology and Health cluster, which also includes 1) the Biophotonics program; 2) the Cellular and Biochemical Engineering program; 3) the Disability and Rehabilitation Engineering program; and 4) the Engineering of Biomedical Systems program. The Biosensing program supports fundamental engineering research on devices and methods for measurement and quantification of biological analytes. Examples of biosensors include, but are not limited to, electrochemical/electrical biosensors, optical biosensors, plasmonic biosensors, and paper-based and nanopore-based biosensors. In addition to advancing biosensor technology development, proposals that address critical needs in biomedical research, public health, food safety, agriculture, forensic, environmental protection, and homeland security are highly encouraged. Proposals that incorporate emerging nanotechnology methods are especially encouraged. **Proposals accepted anytime.**

**Research in the Formation of Engineers**
The NSF Engineering (ENG) Directorate has launched a multi-year initiative, the Professional Formation of Engineers, to create and support an innovative and inclusive engineering profession for the 21st century. Professional Formation of Engineers (PFE) refers to the formal and informal processes and value systems by which people become engineers. It also includes the ethical responsibility of practicing engineers to sustain and grow the profession in order to improve quality of life for all peoples. The engineering profession must be responsive to national priorities, grand challenges, and dynamic workforce needs; it must be equally open and accessible to all. Professional Formation of Engineers includes, but is not limited to:
- Introductions to the profession at any age;
- Development of deep technical and professional skills, knowledge, and abilities in both formal and informal settings/domains;
- Development of outlooks, perspectives, ways of thinking, knowing, and doing;
- Development of identity as an engineer and its intersection with other identities; and
- Acculturation to the profession, its standards, and norms.

The goal of the Research in the Formation of Engineers (RFE) program is to advance our understanding of professional formation. It seeks both to deepen our fundamental understanding of the underlying processes and mechanisms that support professional formation and to demonstrate how professional formation is or can be accomplished. Ultimately RFE aims to transform the engineer-formation system, and thus the impact of proposed projects on this system must be described. Principal Investigators (PIs) should provide a roadmap detailing how they envision the proposed research will eventually broadly impact practice within the engineer-formation system, even if these activities are not within the scope of the submitted proposal. **Proposals Accepted Anytime.**

**Biophotonics**
The Biophotonics program is part of the Engineering Biology and Health cluster, which also includes: 1) the Biosensing program; 2) the Cellular and Biochemical Engineering program; 3)
the Disability and Rehabilitation Engineering program; and 4) the Engineering of Biomedical Systems program. The goal of the Biophotonics program is to explore the research frontiers in photonics principles, engineering and technology that are relevant for critical problems in fields of medicine, biology and biotechnology. Fundamental engineering research and innovation in photonics is required to lay the foundations for new technologies beyond those that are mature and ready for application in medical diagnostics and therapies. Advances are needed in nanophotonics, optogenetics, contrast and targeting agents, ultra-thin probes, wide field imaging, and rapid biomarker screening. Low cost and minimally invasive medical diagnostics and therapies are key motivating application goals. Research topics in this program include:

- **Macromolecule Markers:** Innovative methods for labeling of macromolecules. Novel compositions of matter. Methods of fabrication of multicolor probes that could be used for marking and detection of specific pathological cells. Pushing the envelope of optical sensing to the limits of detection, resolution, and identification.
- **Low Coherence Sensing at the Nanoscale:** Low coherence enhanced backscattering (LEBS). N-dimensional elastic light scattering. Angle-resolved low coherence interferometry for early cancer detection (dysplasia).
- **Neurophotonics:** Studies of photon activation of neurons at the interface of nanomaterials attached to cells. Development and application of biocompatible photonic tools such as parallel interfaces and interconnects for communicating and control of neural networks.
- **Microphotonics and Nanophotonics:** Development and application of novel nanoparticle fluorescent quantum-dots. Sensitive, multiplexed, high-throughput characterization of macromolecular properties of cells. Nanomaterials and nanodevices for biomedicine.
- **Optogenetics:** Novel research in employing light-activated channels and enzymes for manipulation of neural activity with temporal precision. Utilizing nanophotonics, nanofibers, and genetic techniques for mapping and studying in real-time physiological processes in organs such as the brain and heart. Innovative proposals outside of these specific interest areas may be considered. However, prior to submission, it is recommended that the PI contact the program director to avoid the possibility of the proposal being returned without review.

**Proposals Accepted Anytime**

**PD-20-1491 Cellular and Biochemical Engineering National Science Foundation**

The Cellular and Biochemical Engineering (CBE) program is part of the Engineering Biology and Health cluster, which also includes: 1) the Biophotonics program; 2) the Biosensing program; 3) the Disability and Rehabilitation Engineering program; and 4) the Engineering of Biomedical Systems program.

The Cellular and Biochemical Engineering program supports fundamental engineering research that advances understanding of cellular and biomolecular processes. CBE-funded research may lead to the development of enabling technology for advanced biomanufacturing in support of the therapeutic cell, biochemical, biopharmaceutical, and biotechnology industries. Fundamental to many research projects in this area is the understanding of how biomolecules, subcellular systems, cells, and cell populations interact, and how those interactions lead to changes in structure, function, and behavior. A quantitative treatment of problems related to biological processes is considered vital to successful research projects in the CBE program.
The program encourages highly innovative and potentially transformative engineering research leading to novel bioprocessing and biomanufacturing approaches. The CBE program also encourages proposals that effectively integrate knowledge and practices from different disciplines while incorporating ongoing research into educational activities.

Major areas of interest for the program include:

• Metabolic engineering and synthetic biology for biomanufacturing, including the design of synthetic metabolic components and synthetic cells,
• Quantitative systems biotechnology,
• Microbiome structure, function, synthesis, and maintenance,
• Protein and enzyme engineering, and
• Single cell and population dynamics and modeling in the context of biomanufacturing.

Proposals Accepted Anytime

Division of Environmental Biology, National Science Foundation

The Division of Environmental Biology (DEB) Core Track supports research and training on evolutionary and ecological processes acting at the level of populations, species, communities, and ecosystems. DEB encourages research that elucidates fundamental principles that identify and explain the unity and diversity of life and its interactions with the environment over space and time. Research may incorporate field, laboratory, or collection-based approaches; observational or manipulative studies; synthesis activities; phylogenetic discovery projects; or theoretical approaches involving analytical, statistical, or computational modeling. Proposals should be submitted to the core clusters (Ecosystem Sciences, Evolutionary Processes, Population and Community Ecology, and Systematics and Biodiversity Sciences). DEB also encourages interdisciplinary proposals that cross conceptual boundaries and integrate over levels of biological organization or across multiple spatial and temporal scales. Research addressing ecology and ecosystem science in the marine biome should be directed to the Biological Oceanography Program in the Division of Ocean Sciences; research addressing evolution and systematics in the marine biome should be directed to the Evolutionary Processes or Systematics and Biodiversity Science programs in DEB. All DEB programs also encourage proposals that leverage NSF-supported data networks, databases, centers, and other forms of scientific infrastructure, including but not limited to the National Ecological Observatory Network (NEON), Environmental Data Initiative (EDI), and Integrated Digitized Biocollections (iDigBio). The Rules of Life Track supports integrative proposals that span population, species, community and ecosystem scales normally funded by DEB, to organismal, cellular and molecular scales typically funded by other divisions in the Biological Sciences. Discovery of fundamental principles and enabling infrastructure will advance understanding and further predict how key properties of living systems emerge from the interaction of genomes, phenotypes, and environment acting over space and time. This track provides opportunities to advance understanding of the Rules of Life by new mechanisms for review and funding of proposals that span two or more divisions in the Biological Sciences Directorate. Proposals accepted at anytime.

National Artificial Intelligence (AI) Research Institutes
Artificial Intelligence (AI) has advanced tremendously and today promises personalized healthcare; enhanced national security; improved transportation; and more effective education, to name just a few benefits. Increased computing power, the availability of large datasets and streaming data, and algorithmic advances in machine learning (ML) have made it possible for AI development to create new sectors of the economy and revitalize industries. Continued advancement, enabled by sustained federal investment and channeled toward issues of national importance, holds the potential for further economic impact and quality-of-life improvements.

The 2019 update to the National Artificial Intelligence Research and Development Strategic Plan, informed by visioning activities in the scientific community as well as interaction with the public, identifies as its first strategic objective the need to make long-term investments in AI research in areas with the potential for long-term payoffs in AI.

This program, a joint effort of the National Science Foundation (NSF), U.S. Department of Agriculture (USDA) National Institute of Food and Agriculture (NIFA), U.S. Department of Homeland Security (DHS) Science & Technology Directorate (S&T), U.S. Department of Transportation (DOT) Federal Highway Administration (FHWA), and U.S. Department of Veterans Affairs (VA), seeks to enable such research through AI Research Institutes. This program solicitation describes two tracks: Planning and Institute tracks. Submissions to the Planning track are encouraged in any areas of foundational and use-inspired research appropriate to NSF and its partner organizations. Proposals for the Institute track must have a principal focus in one or more of the following themes, detailed in the Program Description under "Institute Track":

- Trustworthy AI;
- Foundations of Machine Learning;
- AI-Driven Innovation in Agriculture and the Food System;
- AI-Augmented Learning;
- AI for Accelerating Molecular Synthesis and Manufacturing; and
- AI for Discovery in Physics. **Due January 30.**

**Science and Technology Studies (STS)**
The Science and Technology Studies (STS) program supports research that uses historical, philosophical, and social scientific methods to investigate the intellectual, material, and social facets of the scientific, technological, engineering and mathematical (STEM) disciplines. It encompasses a broad spectrum of topics including interdisciplinary studies of ethics, equity, governance, and policy issues that are closely related to STEM disciplines.

The program’s review process is approximately six months. It includes appraisal of proposals by ad hoc reviewers selected for their expertise and by an advisory panel that meets twice a year. The deadlines for the submission of proposals are February 2nd for proposals to be funded as early as July, and August 3rd for proposals to be funded in or after January. There is one exception: Doctoral Dissertation Improvement Grant proposals will have only one deadline per year, August 3rd.

The Program encourages potential investigators with questions about the program to contact one of the Cognizant Program Directors. Potential investigators who have concerns about whether their proposal fits the goals of the program are encouraged to send a one-page
prospectus of their proposal idea to the Cognizant Program Directors. Guidelines for developing one-page prospectuses are provided below under Guidelines for Developing Effective STS Proposals.  Due February 3.

**Security and Preparedness (SAP)**
The Security and Preparedness (SAP) Program supports basic scientific research that advances knowledge and understanding of issues broadly related to global and national security. Research proposals are evaluated on the criteria of intellectual merit and broader impacts; the proposed projects are expected to be theoretically motivated, conceptually precise, methodologically rigorous, and empirically oriented. Substantive areas include (but are not limited to) international relations, global and national security, human security, political violence, state stability, conflict processes, regime transition, international and comparative political economy, and peace science. Moreover, the Program supports research experiences for undergraduate students and infrastructural activities, including methodological innovations. The Program does not fund applied research. In addition, we encourage you to examine the websites for the National Science Foundation's Accountable Institutions and Behavior (AIB) and Law and Science (LS) programs.  Due January 15.

**DE-FOA-0001999 Carbon Storage Assurance Facility Enterprise (CarbonSAFE): Site Characterization and CO2 Capture Assessment Department of Energy National Energy Technology Laboratory**
The overall objective of this Funding Opportunity Announcement is to accelerate wide-scale deployment of Carbon Capture, Utilization and Storage (CCUS) through assessing and verifying safe and cost-effective anthropogenic CO2 commercial-scale storage sites, and carbon capture and/or purification technologies.  Due January 15.

**Accountable Institutions and Behavior (AIB)**
The Accountable Institutions and Behavior (AIB) Program supports basic scientific research that advances knowledge and understanding of issues broadly related to attitudes, behavior, and institutions connected to public policy and the provision of public services. Research proposals are expected to be theoretically motivated, conceptually precise, methodologically rigorous, and empirically oriented. Substantive areas include (but are not limited to) the study of individual and group decision-making, political institutions (appointed or elected), attitude and preference formation and expression, electoral processes and voting, public administration, and public policy. This work can focus on a single case or can be done in a comparative context, either over time or cross-sectionally. The Program does not fund applied research. The Program also supports research experiences for undergraduate students and infrastructural activities, including methodological innovations. In addition, we encourage you to examine the websites for the National Science Foundation’s Law and Science (LS) and Security and Preparedness (SAP) programs.  Due January 15.

**Fiscal Year 2020 Consolidated Innovative Nuclear Research**
This FOA is open to U.S. universities, national laboratories, and industry. Research consortia may be composed of diverse institutions including academia, national laboratories, non-profit research institutes, industry/utilities, and international partners. Research teams should strive
to achieve the synergies that arise when individuals with forefront expertise in different methodologies, technologies, disciplines, and areas of content knowledge approach a problem together, overcoming imasses by considering the issue from fresh angles and discovering novel solutions. DOE-NE strongly encourages diversifying its research portfolio through effective partnerships with industry, underrepresented groups, and MSI, which may receive funding support from the project. International partners are encouraged to participate, however no U.S. government funding will be provided to entities incorporated outside of the United States. DOE-NE will evaluate the benefit and contribution of any such proposed partnerships as part of its program relevancy evaluation and scoring. See eligibility requirements in the body of the FOA document to be sure you can apply. **Open to Feb. 12 2020**

**N00173-19-S-BA01  NRL Long Range Broad Agency Announcement (BAA) for Basic and Applied Research**
The NRL’s Broad Agency Announcement (BAA) issued under the provisions of paragraphs 35.016 and 6.102(d)(2) of the Federal Acquisition Regulations (FAR). Proposals may range from theoretical studies to proof-of-concept to include fabrication and delivery of a prototype. However, this is limited to research procurements for which it would be impossible to draft an adequate RFP in sufficient detail without restraining the technical response and thus hindering competition rather than expanding it. BAA topics include all NRL sites located in the Washington, DC area, the Stennis Space Center, MS, and Monterey, CA. Proposals submitted in response to a BAA announcement that are selected for award are considered to be the result of full and open competition and are in full compliance with the provisions of Public Law 98-369, "The Competition in Contracting Act of 1984."

NRL is interested in receiving proposals for the research efforts described under this BAA. This announcement is an expression of interest only and does not commit the Government to make any award or to pay for any proposal preparation costs. The cost of proposal preparation for response to a BAA is not considered an allowable direct charge to any resultant contract or any other contract; however, it may be an allowable expense to the normal bid and proposal indirect cost specified in FAR 31.205-18. **Open to Sept. 10, 2020.**

**Access to Historical Records: Major Initiatives FY 2021**
The National Historical Publications and Records Commission seeks projects that will significantly improve public discovery and use of major historical records collections. The Commission is especially interested in collections of America’s early legal records, such as the records of colonial, territorial, county, and early statehood and tribal proceedings that document the evolution of the nation’s legal history. For more information about how to become an invited applicant, please see the Preliminary Proposal announcement. ([https://www.archives.gov/nhprc/announcement/preliminary-proposal/prelim.html](https://www.archives.gov/nhprc/announcement/preliminary-proposal/prelim.html)) All types of historical records are eligible, including documents, photographs, born-digital records, and analog audio and moving images. Projects may:

- Digitize historical records collections, or related collections, held by a single institution and make them freely available online
- Provide access to born-digital records
Create new freely-available virtual collections drawn from historical records held by multiple institutions
Create new tools and methods for users to access records

The NHPRC welcomes collaborative projects, particularly for bringing together related records from multiple institutions. Projects that address significant needs in the field and result in replicable and scalable approaches will be more competitive. We also encourage organizations to actively engage the public in the work of the project. Applicants should also consult Access to Historical Records: Archival Projects program, which has different requirements and award amounts. For a comprehensive list of Commission limitations on funding, please see: "What we do and do not fund" [http://www.archives.gov/nhprc/apply/eligibility.html]. Applications that consist entirely of ineligible activities will not be considered. Due July 9, 2020.

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.]

HR001119S0071, DSO Office-wide Broad Agency Announcement, Department of Defense DARPA - Defense Sciences Office 2020 BAA

The mission of the Defense Advanced Research Projects Agency (DARPA) Defense Sciences Office (DSO) is to identify and create the next generation of scientific discovery by pursuing high-risk, high-payoff research initiatives across a broad spectrum of science and engineering disciplines and transforming these initiatives into disruptive technologies for U.S. national security. In support of this mission, the DSO Office-wide BAA invites proposers to submit innovative basic or applied research concepts that address one or more of the following technical domains: (1) Frontiers in Math, Computation and Design, (2) Limits of Sensing and Sensors, (3) Complex Social Systems, and (4) Anticipating Surprise. Each of these domains 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 to June 12, 2020.

BAA-AFRL-RQKMA-2016-0007 Air Force Research Laboratory, Materials & Manufacturing Directorate, Functional Materials and Applications (AFRL/RXA) Two-Step Open BAA

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

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

This BAA sets forth research areas of interest to the ARO. This BAA is issued under FAR 6.102(d)(2), which provides for the competitive selection of basic and applied research proposals, and 10 U.S.C. 2358, 10 U.S.C. 2371, and 10 U.S.C. 2371b, which provide the authorities for issuing awards under this announcement for basic and applied research. The definitions of basic and applied research may be found at 32 CFR 22.105. Proposals submitted in response to this BAA and selected for award are considered to be the result of full and open competition and in full compliance with the provision of Public Law 98-369, "The Competition in Contracting Act of 1984" and subsequent amendments. **Open to April 30, 2022.**

**FA9453-17-S-0005 Research Options for Space Enterprise Technologies (ROSET)**

The Air Force Research Laboratory (AFRL) Space Vehicle Directorate (RV) is interested in receiving proposals from all offerors to advance state of the art technology and scientific knowledge supporting all aspects of space systems including payload adapters, on-orbit systems, communications links, ground systems, and user equipment. Efforts will include basic and advanced research, advanced component and technology development, prototyping, and system development and demonstration and will span the range from concept and laboratory experimentation to testing/demonstration in a relevant environment. Specific tasks include design, development, analysis, fabrication, integration, characterization, testing/experimentation, and demonstration of hardware and software products. **Open to September 22, 2022.**

**Broad Agency Announcement for the Army Rapid Capabilities Office**

This Broad Agency Announcement (BAA), W56JSR-18-S-0001, is sponsored by the Army Rapid Capabilities Office (RCO). The RCO serves to expedite critical capabilities to the field to meet Combatant Commanders' needs. The Office enables the Army to experiment, evolve, and deliver technologies in real time to address both urgent and emerging threats while supporting acquisition reform efforts. The RCO executes rapid prototyping and initial equipping of capabilities, particularly in the areas of cyber, electronic warfare, survivability and positioning, navigation and timing (PNT), as well as other priority projects that will enable Soldiers to operate and win in contested environments decisively. This BAA is an expression of interest only and does not commit the Government to make an award or pay proposal preparation costs generated in response to this announcement. Questions concerning the receipt of your submission should be directed: [http://rapidcapabilitiesoffice.army.mil/eto/](http://rapidcapabilitiesoffice.army.mil/eto/)

Technical questions will be sent to the appropriate Technical Points of Contact (TPOC), topic authors, and/or Subject Matter Experts (SMEs) to request clarification of their areas of interest. No discussions are to be held with offerors by the technical staff after proposal submission without permission of the Army Contracting Command-Aberdeen Proving Ground (ACC-APG) Contracting Officer. **Open to March 23, 2023.**
W911NF-18-S-0005 U.S. Army Research Institute for the Behavioral and Social Sciences Broad Agency Announcement for Basic, Applied, and Advanced Research (Fiscal Years 2018-2023)

The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) announces the ARI FY18-23 Broad Agency Announcement for Basic, Applied, and Advanced Scientific Research. This Broad Agency Announcement, 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 U.S. 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.

Those contemplating submission of a proposal are encouraged to contact the ARI Technical Point of Contact (TPOC) for the respective topic area cited in the BAA. If the R&D warrants further inquiry and funding is available, submission of a proposal will be entertained. The recommended three-step sequence is (1) telephone call to the ARI TPOC or responsible ARI Manager, (2) white paper submission, (3) full proposal submission. Awards may be made in the form of contracts, grants, or cooperative agreements. Proposals are sought from educational institutions, non-profit/not-for-profit organizations, and commercial organizations, domestic or foreign, for research and development (R&D) in those areas specified in the BAA. The U.S. Army Research Institute for the Behavioral and Social Sciences encourages Historically Black Colleges and Universities/Minority Serving Institutions (HBCU/MSI) and small businesses to submit proposals for consideration. Foreign owned, controlled, or influenced organizations are advised that security restrictions may apply that could preclude their participation in these efforts. Government laboratories, Federal Funded Research and Development Centers (FFRDCs), and US Service Academies are not eligible to participate as prime contractors or recipients. However, they may be able to participate as subcontractors or Subrecipients (eligibility will be determined on a case by case basis). Open to April 29, 2023.

FA8650-17-S-6001 Science and Technology for Autonomous Teammates (STAT)

The objective of Science and Technology for Autonomous Teammates (STAT) program is to develop and demonstrate autonomy technologies that will enable various AF mission sets. This research will be part of Experimentation Campaigns in: 1 -Multi-domain Command and Control; 2 -Intelligence, Surveillance, Recognizance (ISR) Processing Exploitation and Dissemination (PED); and 3 - Manned-Unmanned combat Teaming to demonstrate autonomy capabilities to develop and demonstrate autonomy technologies that will improve Air Force operations through human-machine teaming and autonomous decision-making. The technology demonstrations that result from this BAA will substantially improve the Air Force's capability to conduct missions in a variety of environments while minimizing the risks to Airmen. The overall
impact of integration of autonomous systems into the mission space will enable the Air Force to operate inside of the enemy’s decision loop.

STAT will develop and apply autonomy technologies to enhance the full mission cycle, including mission planning, mission execution, and post-mission analysis. Particular areas of interest include multi-domain command and control, manned-unmanned teaming, and information analytics. The technology demonstrations that result from this BAA will substantially improve the Air Force’s capability to conduct missions in a variety of environments while minimizing the risks to Airmen. The overall impact of integration of autonomous systems into the mission space will enable the Air Force to operate inside of the enemy’s decision loop.

This effort plans to demonstrate modular, transferable, open system architectures, and deliver autonomy technologies applicable to a spectrum of multi-domain applications. Development efforts will mature a set of technologies that enable airmen to plan, command, control, and execute missions with manageable workloads. The software algorithms and supporting architectures shall:

- Ingest and understand mission taskings and commander’s intent
- Respond appropriately to human direction and orders
- Respond intelligently to dynamic threats and unplanned events

Chosen technologies will be open, reusable, adaptable, platform agnostic, secure, credible, affordable, enduring, and able to be integrated into autonomous systems. The program will be comprised of various technologies developed by AFRL and Industry, integrated into technology demonstrations and deliverables with all the necessary software, hardware, and documentation to support AFRL-owned modeling and simulation environments for future capability developments. Thus, all technology development efforts must adhere to interface designs and standards. **Open to July 23, 2023.**
What We Do--

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

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

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

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

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

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

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

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

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

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