

Grant Opportunity Alerts: Issue: ORD-GOA-2015-07

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Keywords and Areas Included in Funding Opportunities Alerts:

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Department of Energy: Solid Oxide Fuel Cell (SOFC) Innovative Concepts

National Institute of Health: Early Factors Cancer Development, Populations Studies, Big Data BD2K Health Informatics; R01, R03, R21, U01, UH2

NASA: Early Career Faculty Awards, In-Space Validation of Earth Science Technologies, Exploratory Research Awards; ROSES

National Science Foundation

Grant Program: Critical Techniques and Technologies for Advancing Foundations and Applications of Big Data Science & Engineering (BIGDATA)

Agency: National Science Foundation NSF 15-544

RFP Website: <http://nsf.gov/pubs/2015/nsf15544/nsf15544.htm>

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

"Foundations" (F): those developing or studying fundamental theories, techniques, methodologies, technologies of broad applicability to Big Data problems; and *"Innovative Applications" (IA):* those developing techniques, methodologies and technologies of key importance to a Big Data problem directly impacting at least one specific application.

Therefore, projects in this category must be collaborative, involving researchers from domain disciplines and one or more methodological disciplines, e.g., computer science, statistics, mathematics, simulation and modeling, etc. While *Innovative Applications (IA)* proposals may address critical big data challenges within a specific domain, a high level of innovation is expected in all proposals and proposals should, in general, strive to provide solutions with potential for a broader impact on data science and its applications. IA proposals may focus on novel theoretical analysis and/or on experimental evaluation of techniques and methodologies within a specific domain. Proposals in all areas of sciences and engineering covered by participating directorates at NSF are welcome.

While notions of *volume, velocity, and variety* are commonly ascribed to big data problems, other key issues include *data quality and provenance*. Data-driven solutions must carefully ascribe quality and provenance to results in a manner that is helpful to the users of the results. For example, in some cases, such as in education research, data quality may aggregate to test or measurement instrument quality, where a composite of variables may be used to describe one or more constructs.

In addition to approaches such as search, query processing, and analysis, visualization techniques will also become critical across many stages of big data use--to obtain an initial assessment of data as well as through subsequent stages of scientific discovery. Research on visualization techniques and models will be necessary for serving not only the experts, who are collecting the data, but also those who are users of the data, including “cross-over” scientists who may be working with big data and analytics for the first time, and those using the data for teaching at the undergraduate and graduate levels. The BIGDATA program seeks novel approaches related to all of these areas of study.

Awards: Up to \$26,500,000 will be invested in proposals submitted to this solicitation, subject to availability of funds. Projects will be funded in the range of \$200,000 to a maximum of \$500,000 per year in total funding for 3 to 4 years of support.

Letter of Intent: Not Required

Deadline: May 20, 2015

Grant Program: Cyber-Physical Systems (CPS)

Agency: National Science Foundation: NSF 15-541

NIH-NIBIB

DHS

DOT

NASA

RFP Website: <http://nsf.gov/pubs/2015/nsf15541/nsf15541.htm>

Brief Description: Cyber-physical systems (CPS) are engineered systems that are built from, and depend upon, the seamless integration of computational algorithms and physical components. Advances in CPS will enable capability, adaptability, scalability, resiliency, safety, security, and usability that will far exceed the simple embedded systems of today. CPS technology will transform the way people interact with engineered systems -- just as the Internet has transformed the way people interact with information. New smart CPS will drive innovation and competition in sectors such as agriculture, energy, transportation, building design and automation, healthcare, and manufacturing.

Despite significant inroads into CPS technology in recent years, we do not yet have a mature science to support systems engineering of high-confidence CPS, and the consequences are profound. Traditional analysis tools are unable to cope with the full complexity of CPS or adequately predict system behavior. For example, minor events that trip the current electric power grid -- an ad hoc system -- can escalate with surprising speed into widespread power failures. This scenario exemplifies the lack of appropriate science and technology to conceptualize and design for the deep interdependencies among engineered systems and the natural world. The challenges and opportunities for CPS are thus significant and far-reaching. New relationships between the cyber and physical components require new architectural models that redefine form and function. They integrate the continuous and discrete, compounded by the uncertainty of open environments. Traditional real-time performance guarantees are insufficient for CPS when systems are large and spatially, temporally, or hierarchically distributed in configurations that may rapidly change. With the greater autonomy and cooperation possible with CPS, greater assurances of safety, security, scalability, and reliability are demanded, placing a high premium on open interfaces, modularity, interoperability, and verification.

The goal of the CPS program is to develop the core system science needed to engineer complex cyber-physical systems which people can use or interact with and depend upon.

Some of these may require high-confidence or provable behaviors. The program aims to foster a research community committed to advancing research and education in CPS and to transitioning CPS science and technology into engineering practice. By abstracting from the particulars of specific systems and application domains, the CPS program seeks to reveal cross-cutting fundamental scientific and engineering principles that underpin the integration of cyber and physical elements across all application sectors. To expedite and accelerate the realization of cyber-physical systems in a wide range of applications, the CPS program also supports the development of methods, tools, and hardware and software components based upon these cross-cutting principles, along with validation of the principles via prototypes and testbeds. We have also seen a convergence of CPS technologies and research thrusts that underpin "**Smart Cities**" and the **Internet of Things (IoT)**. These domains offer new and exciting challenges for foundational research and provide opportunities for maturation at multiple time horizons.

In 2015, NSF is working closely with multiple agencies of the federal government, including the U.S. Department of Homeland (DHS) Security Science and Technology Directorate (S&T), U.S. Department of Transportation (DOT) Federal Highway Administration (FHWA), U.S. DOT Intelligent Transportation Systems (ITS) Joint Program Office (JPO), National Aeronautics and Space Administration (NASA) Aeronautics Research Mission Directorate (ARMD), and several National Institutes of Health (NIH) institutes and centers [including the National Institute of Biomedical Imaging and Bioengineering (NIBIB), Office of Behavioral and Social Sciences Research (OBSSR), National Cancer Institute (NCI), and National Center for Advancing Translational Sciences (NCATS)], to identify basic research needs in CPS common across multiple application domains, along with opportunities for accelerated transition to practice. Three classes of research and education projects -- differing in scope and goals -- will be considered through this solicitation:

- **Breakthrough** projects must offer a significant advance in fundamental CPS science, engineering and/or technology that has the potential to change the field. This category focuses on new approaches to bridge computing, communication, and control. Funding for Breakthrough projects may be requested for a total of up to \$500,000 for a period of up to 3 years.
- **Synergy** projects must demonstrate innovation at the intersection of multiple disciplines, to accomplish a clear goal that requires an integrated perspective spanning the disciplines. Funding for Synergy projects may be requested for a total of \$500,001 to \$1,000,000 for a period of 3 to 4 years.
- **Frontier** projects must address clearly identified critical CPS challenges that cannot be achieved by a set of smaller projects. Funding may be requested for a total of \$1,000,001 to \$7,000,000 for a period of 4 to 5 years.

Awards: \$500,000 to \$7,000,000

Letter of Intent: Not Required

Deadline: April 20, 2015 - May 04, 2015

Grant Program: Small Business Technology Transfer Program Phase I Solicitation (STTR) and Small Business Innovation Research Program Phase I Solicitation (SBIR)

Agency: National Science Foundation NSF 15-545 and NSF 15-546

RFP Website: <http://nsf.gov/pubs/2015/nsf15545/nsf15545.htm> for STTR and

http://nsf.gov/publications/pub_summ.jsp?WT.z_pims_id=505190&ods_key=nsf15546 for SBIR

Brief Description: The fundamental mission of NSF is to promote discoveries and to advance education across the frontiers of knowledge in science and engineering. Consistent with that mission, the NSF SBIR/STTR Program encourages and supports a wide range of proposals. These proposals are reviewed under NSF's merit review criteria, which cover both the quality of research (intellectual or technical merit) and its potential impact on society (broader/commercial impacts). The following broad solicitation topics conform to the high-technology investment sector's interests. The topics, listed below, are detailed on the [SBIR/STTR website](#):

- **Educational Technologies and Applications (EA)**
- **Information Technologies (IT)**
- **Semiconductors (S) and Photonic (PH) Devices and Materials**
- **Internet of Things (I)**
- **Electronic Hardware, Robotics and Wireless Technologies (EW)**
- **Advanced Manufacturing and Nanotechnology (MN)**
- **Advanced Materials and Instrumentation (MI)**
- **Chemical and Environmental Technologies (CT)**
- **Biological Technologies (BT)**
- **Smart Health (SH) and Biomedical (BM) Technologies**

The topics and subtopics guide the logistics of the review process but do not affect award decisions. In fact, NSF recognizes that innovation often can't be categorized. Therefore, proposals are accepted in any areas of technology that show promise of high commercial and societal impact, not just those listed above.

The emphasis of this STTR Phase I solicitation is the commercialization of previously NSF-funded fundamental research (NSF funding lineage). It is highly desirable that the core innovation described in the submitted proposals can in some manner be linked to fundamental research funded by the NSF. This lineage must be documented in the Project Description section of the proposal.

Proposals should describe the development of an innovation that demonstrates the following characteristics:

- Involves a high degree of technical risk – for example:
 - Has never been attempted and/or successfully done before;
 - Is still facing technical hurdles (that the NSF-funded R&D work is intended to overcome).
- Has the potential for significant commercial impact and/or societal benefit, as evidenced by:
 - Having the potential to disrupt the targeted market segment;
 - Having good product-market fit (as validated by customers);
 - Presenting barriers to entry for competition;
 - Offering potential for societal benefit (through commercialization under a sustainable business model).

The aim of the Phase I project should be to demonstrate technical feasibility of the proposed innovation and thereby bring the innovation closer to commercialization.

Awards: Standard Awards

Letter of Intent: Not Required

Deadline: June 18, 2015 (STTR), June 16, 2015 (SBIR)

Department of Defense

Grant Program: Young Faculty Award

Agency: DARPA Microsystems Technology Office DARPA-RA-15-32

RFP Website:

https://www.fbo.gov/index?s=opportunity&mode=form&id=6f337c26de13352bd2f1fbe3537859b2&tab=core&_cview=0

Brief Description: The DARPA Young Faculty Award (YFA) program aims to identify and engage rising stars in junior faculty positions in academia and equivalent positions at non-profit research institutions and expose them to Department of Defense (DoD) and National Security challenges and needs. In particular, this YFA will provide high-impact funding to elite researchers early in their careers to develop innovative new research directions in the context of enabling transformative DoD capabilities. The long-term goal of the program is to develop the next generation of scientists and engineers in the research community who will focus a significant portion of their future careers on DoD and National Security issues.

DARPA is soliciting innovative research proposals in physical sciences, engineering, materials, mathematics, biology, computing, informatics, and manufacturing of interest to DARPA's Defense Sciences Office (DSO), Biological Technology Office (BTO) and Microsystems Technology Office (MTO). Further detail regarding technical areas of interest can be found in the Technical Areas topics list. Proposals that fail to respond directly to a Technical Area will be considered nonresponsive.

Proposals responding to this RA should clearly describe the DoD problem being addressed, the current state-of-the-art technology, new insights to address the problem, a credible research plan and schedule, and critical, quantitative milestones to be pursued over each 12 month phase. Proposers should familiarize themselves with and address the Heilmeyer Catechism in responding to this RA.

Proposed research should focus on innovations that will enable revolutionary advances in the selected topic area. High-risk/high-payoff ideas that could potentially transform a field or technology are strongly encouraged. Proposed research should investigate innovative approaches that enable revolutionary advances in science, devices, or systems. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of practice.

Proposals that offer only incremental advances upon existing R&D and technologies will be deemed nonresponsive to this RA.

Awards: DARPA intends to award grants to eligible university faculty and nonprofit research organizations; each grant will encompass funding for a 24-month base period consisting of two 12-month phases (a maximum of \$250,000 per 12-month phase) and a 12-month option period (a maximum of \$500,000).

Letter of Intent: Not Required

Deadline: April 13, 2015

Grant Program: Communicating with Computers (CwC)

Agency: DARPA - Information Innovation Office DARPA-BAA-15-18

RFP Website:

<https://www.fbo.gov/index?tab=documents&tabmode=form&subtab=core&tabid=6a6f9af2a5dec8dd379a3ef1b8e4a790>

Brief Description: DARPA is soliciting innovative research proposals in the area of natural communication with computers. This program is a 6.1 basic research effort that aims to accelerate progress toward two-way communication between people and computers in which the machine is more than merely a receiver of commands and in which a full range of natural modes is tapped, including potentially language, gesture and facial or other expressions.

The CwC program is based on four premises:

- 1) Complex ideas are composed from elementary ones;
- 2) Most elementary ideas are about the physical world;
- 3) Language specifies how to compose complex ideas; but,
- 4) Context is often needed to boost the specificity of complex ideas that can be composed given language.

Here, the word "idea" denotes a representation of the meaning of a communicative act. The CwC program is committed to a compositional account of meaning by which a vast space of ideas can be composed from a relatively small set of elementary ideas. On this account, the purpose of communication is to share complex ideas.

Awards: DARPA anticipates that the Communicating with Computers program will consist of three phases: two 18-month phases and one 24-month phase. DARPA anticipates one research award for Technical Area 1 (TA1), multiple awards addressing technical areas 2, 3 and 4, and at most one award for TA5 (Evaluation). A combined award for TA1 and TA5 might be made; no other awards for TAs combined with TA5 will be considered. Combined awards for TAs 1, 2, 3, and/or 4 may be considered.

Letter of Intent: Abstract Due Date: March 6, 2015, 12:00 noon (ET)

Full Proposal Deadline: April 9, 2015, 12:00 noon (ET)

Department of Energy

Grant Program: Solid Oxide Fuel Cell (SOFC) Innovative Concepts and Core Technology Research Program

Agency: Department of Energy DE-FOA-0001229

RFP Website: <http://www.fedconnect.net/FedConnect/?doc=DE-FOA-0001229&agency=DOE>

Brief Description: To award research projects that will improve the reliability, robustness and endurance of Solid Oxide Fuel Cell (SOFC), stack, and system technology that is nearing commercial viability. This will support the development of commercially viable SOFC technology for entry into service products, which will eventually lead to SOFC technology that is viable for large scale central generation applications.

Awards: Total funding \$9,500,000

Letter of Intent: Not Required

Full Proposal Deadline: April 6, 2015

National Institutes of Health

Grant Program: Early-life Factors and Cancer Development Later in Life (R03, R21 and R01)

Agency: National Institutes of Health NCI PA 15-124, 125 and 126

PAR-15-121, PAR-15-090, PAR-15-091

RFP Website: <http://grants.nih.gov/grants/guide/pa-files/PA-15-124.html> R03

<http://grants.nih.gov/grants/guide/pa-files/PA-15-125.html> R21

<http://grants.nih.gov/grants/guide/pa-files/PA-15-126.html> R01

Brief Description: The purpose of this Funding Opportunity Announcement (FOA) is to stimulate research focused on the role of early-life factors in cancer development later in life. Given that current emerging evidence from limited research indicates a potentially important role for early-life events and exposures in cancer development, it is necessary to better understand:

1) the early-life (maternal-paternal, in utero, birth and infancy, puberty and adolescence, and teenage and young adult years) factors that are associated with later cancer development; 2) how early-life factors mediate biological processes relevant to carcinogenesis; and 3) whether predictive markers for cancer risk based on what happens biologically at early-life can be measured and developed for use in cancer prevention strategies. Markers that predict malignancy or pre-malignant conditions would allow assessment of early-life exposures with relevant outcomes without having to wait 50 years for cancer development.

Ultimately, a better mechanistic understanding of how early-life events and exposures contribute to the etiology of cancer later in life will allow for the development of effective interventions during pregnancy or early life that may have a profound impact on cancer prevention.

This FOA uses the NIH R03 small grant mechanism. The NIH R03 small grant mechanism supports discrete, well-defined projects that realistically can be completed in 2 years and that require limited levels of funding. Examples of the types of projects that the R03 grant mechanism include, but are not limited to, the following:

- Pilot or feasibility studies;
- Secondary analysis of existing data;
- Small, self-contained research projects;
- Development of research methodology; and
- Development of new research technology.

Awards: Standard Grants

Letter of Intent: Not Required

Full Proposal Deadline: [Standard dates](#) apply, by 5:00 PM local time of applicant organization. All types of non-AIDS applications allowed for this funding opportunity announcement are due on these dates.

Applicants are encouraged to apply early to allow adequate time to make any corrections to errors found in the application during the submission process by the due date.

Grant Program: Sudden Cardiac Death in the Young: Population Based Studies (U01)

Agency: NIH NHLBI RFA-HL-16-002

RFP Website: <http://grants.nih.gov/grants/guide/rfa-files/RFA-HL-16-002.html>

Brief Description: To enhance the understanding of SDY, this FOA will support mechanistic, genetic, and other studies to evaluate causes and consequences of and risk factors for SDY. Studies are required to use the SDY Case Registry data and DNA samples as foundations for their research. Results of such studies are expected to be disseminated widely and to provide an evidence base to advance discussions about screening and prevention of SDY.

Selected Research Examples

Research supported by this FOA should fall within the NHLBI mission of heart, lung, blood, and sleep related disease.

Research questions of interest include, but are not limited to the following:

- What is the prevalence of ion channel mutations or other candidate genes known to be associated with arrhythmias in cases compared to controls?
- How do ion channel mutations differ between cases of SUID and cases of sudden cardiac death in older children?
- Is competitive athletics a risk factor for sudden cardiac death?
- Using next-generation sequencing techniques, can novel risk variants be identified?
- Are there diurnal variations in sudden cardiac death in the young, as is the case for some cardiovascular conditions in adults?
- Are there significant environmental or contextual differences between cases and controls, such as socioeconomic status, history of drug exposure, serum toxicology screens, family history, and other factors?
- What is the yield of molecular autopsy (defined as postmortem molecular, typically genetic diagnosis) in autopsy-negative cases of SDY?
- What is the prevalence of cardiac disease in relatives of a SDY victim?
- What is the prevalence of sickle cell trait in those that die from SDY?

Applications that develop collaborations with the SDY Case Registry funded medical examiner's/coroner's offices and/or state public health agencies or their bona fide agents are of high programmatic interest. Applications that disseminate research findings promptly are also of high programmatic interest.

Applications which seek to determine the incidence of SDY are outside the scope of this FOA, will be considered non-responsive, and will not proceed to review. The CDC, NHLBI, NINDS and SDY Case Registry Steering Committee will be responsible for evaluating incidence.

Awards: Application budgets are limited to \$540,000 direct costs per year.

Letter of Intent: May 15, 2015

Full Proposal Deadline: June 15, 2015, by 5:00 PM local time of applicant organization. All types of non-AIDS applications allowed for this funding opportunity announcement are due on this date.

Applicants are encouraged to apply early to allow adequate time to make any corrections to errors found in the application during the submission process by the due date.

Grant Program: Big Data to Knowledge (BD2K) Advancing Biomedical Science Using Crowdsourcing and Interactive Digital Media (UH2)

Agency: NIH RFA-CA-15-006 Exploratory/Development Cooperative Agreement Phase-1

RFP Website: <http://grants.nih.gov/grants/guide/rfa-files/RFA-CA-15-006.html>

Brief Description: In response to the opportunities and challenges presented by the dawning era of big data in biomedical research, the NIH launched the Big Data to Knowledge ([BD2K](#)) initiative as a trans-NIH initiative to cultivate the digital research enterprise within biomedicine, to facilitate discovery and support new knowledge, and to maximize community engagement.

In the BD2K initiative, the term "Biomedical Big Data" is inclusive of the diverse digital objects which may have impact in basic, translational, clinical, social, behavioral, environmental, or informatics research questions. Such data types may include imaging, phenotypic, genotypic, molecular, clinical, behavioral, environmental, and many other types of biological and biomedical data. They may also include biologically-relevant data generated for other purposes (e.g., social media, search histories, economic, geographical, or smart phone data). Finally, they also encompass the metadata, data standards, and software tools involved in data processing and analysis.

BD2K supports a variety of related efforts designed to enhance the utility of biomedical big data. As part of that larger effort, this FOA focuses on the development of interactive digital media that enable biomedical research via crowdsourcing.

Biomedical research areas amenable to interactive digital media and crowdsourcing approaches include, but are not limited to, the following:

- Biomedical text comprehension, transcription, and parsing – such as analysis of electronic health records, biomedical publications, social media data streams, and patient care notes
- Biomedical data enrichment – such as the application of metadata, data quality assurance, or annotation of data in large biomedical datasets
- Biological complexity – such as understanding cell to cell interactions, cell community dynamics, and cell cooperation and competition
- Biomedical image analysis – such as identifying the edges of a tumor in a pathology image
- Feature extraction – such as behavioral or social predictors of health outcomes from wearable technology data
- Structural Biology – such as the manipulation or rearrangement of structural components of proteins, cells, or organs
- Biomedical network analysis – such as intracellular signaling pathway or gene network dynamics, or social network dynamics
- Categorization – such as identifying cell types in microscopy images
- Language parsing and interpretation – such as the analysis of speech in audio recordings
- Elucidating disease evolution and propagation – such as how an infectious disease adapts to and spreads through populations

Awards: Application budgets may not exceed \$200,000 per year in direct costs and should reflect the actual needs of the proposed project. \$2,500,000 available.

Letter of Intent: May 3, 2015

Full Proposal Deadline: June 3, 2015, by 5:00 PM local time of applicant organization. All types of non-AIDS applications allowed for this funding opportunity announcement are due on this date.

Applicants are encouraged to apply early to allow adequate time to make any corrections to errors found in the application during the submission process by the due date.

NASA

Grant Program: Early Career Faculty Awards

Agency: NASA NNH15ZOA001N-15ECF-B1

RFP Website:

<http://nspires.nasaprs.com/external/viewrepositorydocument/cmdocumentid=448642/solicitationId=%7B7A148E0E-4834-3C10-BADB-0C5060C4F961%7D/viewSolicitationDocument=1/ST-REDDI-2015%20Appendix%20B1%20-%20ECF15.pdf>

Brief Description: NASA's Space Technology Mission Directorate (STMD) hereby solicits proposals from accredited U.S. universities for innovative, early-stage space technology research of high priority to NASA's Mission Directorates.

This specific Appendix is titled Early Career Faculty (ECF) and is one of three calls for proposals from STMD's Space Technology Research Grants (STRG) Program. Early Stage Innovations (ESI) appears as Appendix B2 under the SpaceTech-REDDI NRA, and the NASA Space Technology Research Fellowships (NSTRF) is a separate solicitation.

This Appendix seeks proposals on specific space technologies that are currently at low Technology Readiness Levels (TRL). Investment in innovative low-TRL research increases knowledge and capabilities in response to new questions and requirements, stimulates innovation, and allows more creative solutions to problems constrained by schedule and budget. Moreover, it is investment in fundamental research activities that has historically benefited the Nation on a broader basis, generating new industries and spin-off applications. Our Nation's universities couple fundamental research with education, encouraging a culture of innovation based on the discovery of knowledge. Universities are, therefore, ideally positioned to both conduct fundamental space technology research and diffuse newly-found knowledge into society at large through graduate students and industrial, government, and other partnerships. STMD investments in space technology research at U.S. universities promote the continued leadership of our universities as an international symbol of the country's scientific innovation, engineering creativity, and technological skill.

This ECF Appendix seeks to tap into that talent base, challenging early career faculty to examine the theoretical feasibility of new ideas and approaches that are critical to making science, space travel, and exploration more effective, affordable, and sustainable. At both the faculty and student levels, ECF is aimed at creating, fortifying, and nurturing the talent base of highly skilled engineers, scientists, and technologists to improve America's technological and economic competitiveness.

Awards: \$200,000 per year for three years

Letter of Intent: March 20, 2015

Full Proposal Deadline: April 17, 2015

Grant Program: Research Opportunities in Space and Earth Sciences (ROSES) - 2015

Agency: NASA NNH15ZDA001N

RFP Website:

<http://nspires.nasaprs.com/external/viewrepositorydocument/cmdocumentid=448116/solicitationId=%7B4FCC09A9-DF6-4DF5-EC7A-3881AF72A6A3%7D/viewSolicitationDocument=1/Full%20ROSES%202015%20amend1.pdf>

Brief Description: This National Aeronautics and Space Administration (NASA) Research Announcement (NRA), entitled Research Opportunities in Space and Earth Sciences (ROSES)-2015, solicits basic and applied research in support of NASA's Science Mission Directorate (SMD). ROSES is an omnibus with many individual program elements, each with its own due dates and topics and all together these cover all aspects of basic and applied supporting research and technology in space and Earth sciences, including, but not limited to: theory, modeling, and analysis of SMD science data; aircraft, scientific balloon, sounding rocket, International Space Station (ISS), CubeSat and suborbital reusable launch vehicle investigations; development of experiment techniques suitable for future SMD space missions; development of concepts for future SMD space missions; development of advanced technologies relevant to SMD missions; development of techniques for and the laboratory analysis of both extraterrestrial samples returned by spacecraft, as well as terrestrial samples that support or otherwise help verify observations from SMD Earth system science missions; determination of atomic and composition parameters needed to analyze space data, as well as returned samples from the Earth or space; Earth surface observations and field campaigns that support SMD science missions; development of integrated Earth system models; development of systems for applying Earth science research data to societal needs; and development of applied information systems applicable to SMD objectives and data.

Awards: Awards range from under \$100K per year for focused, limited efforts (e.g., data analysis) to more than \$1M per year for extensive activities (e.g., development of science experiment hardware).

Letter of Intent: March 27, 2015

Deadline: Full Proposal Deadline(s): Full Proposal Due: May 29, 2015
