ESPP Funding Opportunities: January 30, 2013

NSF - Important Notice to Proposers: Grant Proposal Guide - GPG

A revised version of the NSF Proposal & Award Policies & Procedures Guide (PAPPG), NSF 13-1, was issued on October 4, 2012 and is effective for proposals submitted, or due, on or after January 14, 2013. Please be aware that significant changes have been made to the PAPPG to implement revised merit review criteria based on the National Science Board (NSB) report, National Science Foundation's Merit Review Criteria: Review and Revisions.

OPPORTUNITIES FOR STUDENTS AND RECENT GRADUATES

See January 07 Funding Opportunities

OPPORTUNITIES FOR FACULTY

Biology

Sedimentary Geology and Paleobiology – NSF 12-608

Full Proposal Deadline Date: Track 2 Proposal February 22, 2013

For the years 2013-2017, the Sedimentary Geology and Paleobiology Program will be sponsoring a two track opportunity that will consist of the normal SGP competition (Track 1) and bi-annually, a new track termed Earth-Life Transitions (ELT) (Track 2). **Track 2: Earth-Life Transitions:** The goals of the ELT track are: 1) to address critical questions about Earth-Life interactions in deep-time through the synergistic activities of multi-disciplinary science; and, 2) to enable team-based interdisciplinary projects involving stratigraphy, sedimentology, paleontology, proxy development, calibration and application studies, geochronology, and climate modeling at appropriately resolved scales of time and space, to understand major linked events of environmental, climate and biotic change at a mechanistic level.

Energy

Energy for Sustainability – NSF PD 13-7644

Full Proposal Window: January 15 - February 19, 2013

This program supports fundamental research and education that will enable innovative processes for the sustainable production of electricity and transportation fuels. Processes for sustainable energy production must be environmentally benign, reduce greenhouse gas production, and utilize renewable resources. Current interest areas in sustainable energy technologies are:

- **Biomass Conversion, Biofuels & Bioenergy.** Photosynthetic processes used by plants or algae use sunlight to convert atmospheric CO_2 to energy-rich metabolites (carbohydrates, lipids, or hydrocarbons) which can be processed into transportation fuels.
- **Photovoltaic Solar Energy.** Fundamental research on innovative processes for the fabrication and theory-based characterization of future PV devices is an emphasis area of this program.
- **Wind Energy.** Fundamental engineering research, supported by modeling and simulation studies, that leads to new processes to efficiently harness wind energy for the production of electrical power is an interest area of this program.
- **Advanced Batteries for Transportation.** Radically new battery systems or breakthroughs based on existing systems can move the US rapidly toward a more sustainable transportation future.

Engineering

Environmental Engineering – NSF PD 13-1440

Full Proposal Deadline Date: February 19, 2013

The **Environmental Engineering** program supports fundamental research and educational activities across the broad field of environmental engineering. **The goal of this program is to encourage transformative research which applies scientific and engineering principles to avoid or minimize solid, liquid, and gaseous discharges, resulting from human activity, into land, inland and coastal waters, and air, while promoting resource and energy conservation** and recovery. The program also fosters cutting-edge scientific research for identifying, evaluating, and monitoring the waste assimilative capacity of the natural environment and for removing or reducing contaminants from polluted air, water, and soils. Major areas of interest and activity in the program include:

- **Environmental engineering implications of energy and resource consumption** - Focus on conversion of wastes into value-added materials and energy, reduction of energy/water demand for environmental technologies, and the impact of energy and transportation processes on the environment.
- **Availability of high quality water supplies -** Develop innovative biological, chemical and physical treatment processes to meet the growing demand for water; investigate processes that remove and degrade traditional aqueous contaminants, remediate contaminated soil and groundwater, and convert wastewaters into water suitable for reuse; investigate environmental engineering aspects of urban watersheds, reservoirs, estuaries and storm water management; investigate biogeochemical and transport processes driving water quality in the aquatic and subsurface environment.
- **Fate and transport of contaminants of emerging concern in air, water, and soils** - Investigate the fate, transport and remediation of potentially harmful contaminants and their degradates such as pharmaceuticals, personal care products, pesticides and insecticides, perchlorates, endocrine-disrupting compounds, and fire retardants and their degradates. (Please note that research concerning the

environmental health and safety of nanomaterials should be submitted to the Environmental Health and Safety of Nanotechnology program.)

Environmental Sustainability – NSF PD 13-7643

Full Proposal Window: January 15 - February 19, 2013

The Environmental Sustainability program supports engineering research with the goal of promoting sustainable engineered systems that support human well-being and that are also compatible with sustaining natural (environmental) systems. Research in Environmental Sustainability typically considers long time horizons and may incorporate contributions from the social sciences and ethics. This program supports engineering research that seeks to balance society's need to provide ecological protection and maintain stable economic conditions. There are four principal general research areas which are supported, but others can be proposed by contacting the program director:

- **Industrial Ecology** - advancements in modeling such as life cycle assessment, materials flow analysis, input/output economic models, and novel metrics for measuring sustainable systems.
- **Green Engineering** - advance the sustainability of manufacturing processes, green buildings, and infrastructure.
- **Ecological Engineering** - focus on the engineering aspects of restoring ecological function to natural systems.
- **Earth Systems Engineering** - consider aspects of large scale engineering research that involve mitigation of greenhouse gas emissions, adaptation to climate change, and other global scale concerns.

All proposed research should be driven by engineering principles, and be presented explicitly in an environmental sustainability context. Proposals should include involvement in engineering research of at least one graduate student, as well as undergraduates.

Geosciences

Geography and Spatial Sciences Program (GSS) – NSF 12-570

Full Proposal Deadline Date: February 14, 2013

As specified in the Geography and Spatial Sciences Program strategic plan, the goals of the NSF Geography and Spatial Sciences (GSS) Program are:

- To promote scientific research in geography and the spatial sciences that advances theory and basic understanding and that addresses the challenges facing society.
- To promote the integration of geographers and spatial scientists in interdisciplinary research.
- To promote education and training of geographers and spatial scientists in order to enhance the capabilities of current and future generations of researchers.
- To promote the development and use of scientific methods and tools for geographic research.

The Geography and Spatial Sciences Program sponsors research on the geographic distributions and interactions of human, physical, and biotic systems on the Earth's surface. Investigations are encouraged to propose plans for research about the nature, causes, and consequences of human activity and natural environmental processes across a range of scales. Projects on a variety of topics (both domestic and international) qualify for support if they offer promise of contributing to scholarship by enhancing geographical knowledge, concepts, theories, methods, and their application to societal problems and concerns. GSS encourages projects that explicitly integrate undergraduate and graduate education into the overall research agenda.

Other

Infrastructure Management and Extreme Events (IMEE) – NSF PD 10-1638

Full Proposal Window: February 15, 2013

The IMEE program focuses on the impact of large-scale hazards on civil infrastructure and society and on related issues of preparedness, response, mitigation, and recovery. The program supports research to integrate multiple issues from engineering, social, behavioral, political, and economic sciences. It supports fundamental research on the interdependence of civil infrastructure and society, development of sustainable infrastructures, and civil infrastructure vulnerability and risk reduction.

Sensors and Sensing Systems (SSS) – NSF PD 13-1639

Full Proposal Window: February 15, 2013

The Sensors and Sensing System (SSS) program funds fundamental research on sensors and sensing systems. Such fundamental research includes the discovery and characterization of new sensing modalities, fundamental theories for aggregation and analysis of sensed data, fundamentally new approaches for data transmission, and approaches for addressing uncertain and/or partial sensor data. Innovative research in nonlinear prediction, filtering and estimation in the context of sensing systems is also considered in this program.

Interdisciplinary Research in Hazards and Disasters (Hazards SEES) – NSF 12-610

Full Proposal Deadline Date: February 4, 2013

The overarching goal of Hazards SEES is to catalyze well-integrated interdisciplinary research efforts in hazards-related science and engineering in order to improve the understanding of natural hazards and technological hazards linked to natural phenomena, mitigate their effects, and to better prepare for, respond to, and recover from disasters. The goal is to effectively prevent hazards from becoming disasters. Hazards SEES aims to make investments in strongly interdisciplinary research that will reduce the impact of such hazards, enhance the safety of society, and contribute to sustainability. The Hazards SEES program is a multi-directorate program that seeks to: (1) advance understanding of the fundamental processes associated with specific natural hazards and technological hazards linked to natural phenomena, and their

interactions; (2) better understand the causes, interdependences, impacts and cumulative effects of these hazards on individuals, the natural and built environment, and society as a whole; and (3) improve capabilities for forecasting or predicting hazards, mitigating their effects, and enhancing the capacity to respond to and recover from resultant disasters.

Integrated NSF Support Promoting Interdisciplinary Research and Education (INSPIRE) – NSF 13-518

DUE DATES:

Letter of Intent Window: December 10, 2012 - February 20, 2013
INSPIRE Track 2 Inquiries
Letter of Intent Window: December 10, 2012 - March 29, 2013
INSPIRE Track 1 Inquiries
Full Proposal Deadline Date: May 13, 2013
INSPIRE Track 2 Full Proposals
Full Proposal Deadline Date: May 29, 2013
INSPIRE Track 1 Full Proposals
Full Proposal Deadline Date: May 29, 2013
Director's INSPIRE Awards Full Proposals
Full proposal submission is by invitation only.

The INSPIRE awards program was established to address some of the most complicated and pressing scientific problems that lie at the intersection of traditional disciplines. It is intended to encourage investigators to submit bold, exceptional proposals that some may consider to be at a disadvantage in a standard NSF review process; it is ***not*** intended for proposals that are more appropriate for existing award mechanisms. INSPIRE is open to interdisciplinary proposals on any NSF-supported topic, submitted ***by invitation only*** after a preliminary inquiry process initiated by submission of a required Letter of Intent. In fiscal year 2013, INSPIRE provides support through the following three pilot grant mechanisms:

- **INSPIRE Track 1.** This is essentially a continuation of the pilot CREATIV mechanism from FY 2012, which was detailed for 2012 in Dear Colleague Letter NSF 12-011.
- **INSPIRE Track 2.** These are "mid-scale" research awards at a larger scale than Track 1, allowing for requests of up to $3,000,000 over a duration of up to five years. Expectations for cross-cutting advances and for broader impacts are greater than in Track 1, and the review process includes external review.
- **Director's INSPIRE Awards.** These are prestigious individual awards to single-investigator proposals that present ideas for interdisciplinary advances with unusually strong, exciting transformative potential.

All NSF directorates and programmatic offices participated in INSPIRE in FY 2012 and are continuing their participation in FY 2013.

Catalyzing New International Collaborations (CNIC) – NSF 12-573

Full Proposal Deadline(s): Proposals Accepted Anytime
Anticipated Type of Award: Standard Grant
Estimated Number of Awards: 30 to 40 per year

Anticipated Funding Amount: $2,000,000 per year
The CNIC program will support U.S. researchers' participation in activities intended to catalyze new international collaborations designed to open up new scientific directions for the proposer. These include, but are not limited to: research planning visits, initial data gathering activities, proof-of-concept, and single or multiple research visits within a maximum 12-month time period. The community is invited to propose innovative mechanisms and strategies for catalyzing new international collaborations with the goal of reaching the stage that competitive, full research proposals can be submitted to relevant NSF programs for continuing support of the project. Other well-justified activities that fulfill the goal of the program will be considered. Creative use of technology in promoting international research collaboration is encouraged. Of particular interest are projects which represent new, previously unfunded scientific areas for the principal investigator, or areas in which preliminary data is needed for establishing a proof-of-concept. This mechanism is not intended to provide support for continuation of established collaborations.

Critical Zone Observatories (CZO) – NSF 12-575

Full Proposal Deadline Date: February 5, 2013
Earth observations are a critical ingredient for understanding and predicting the sustainability or disruption of natural services that support basic human needs including water, food, energy, mineral resources, and safe habitation. One pressing challenge is to develop terrestrial observatories that could document and inform prediction of the multi-scale and less visible transport of energy and material, and evolution of the Earth's **critical zone**. This zone -the thin veneer of Earth that extends from the top of the vegetation to the base of weathered bedrock- is critical because it is where fresh water flows, soils are formed from rocks, and terrestrial life flourishes. NSF seeks proposals to establish a networked set of Critical Zone Observatories (CZOs) that will address pressing interdisciplinary scientific questions concerning geological, physical, chemical, and biological processes and their couplings that govern critical zone system dynamics. The CZOs are expected, collectively, to 1) measure and quantify the significant processes of the critical zone on appropriate time and space scales; 2) develop a unifying theoretical framework that integrates new understanding of coupled hydrological, geochemical, geomorphological, sedimentological and biological processes; and 3) develop, couple and validate system-level models to predict how the critical zone responds to external forces such as anthropogenic, climatic, and/or tectonic processes.

Environmental Health and Safety of Nanotechnology – NSF PD 13-1179

Full Proposal Window: January 15 - February 19, 2013
The **Environmental Health and Safety of Nanotechnology** (**Nano EHS**) program provides support to examine and mitigate the environmental effects of nanotechnologies. Fundamental research is sought to understand, evaluate, and lessen the impact of nanotechnology on the environment and biological systems. The program emphasizes engineering principles underlying the environmental health and safety impacts of nanotechnology. Innovative methods related to clean

nanomaterials production processes, waste reduction, recycling, and industrial ecology of nanotechnology are also of interest. Current areas of support include:

- Understanding, measuring, mitigating, and preventing adverse effects of nanotechnology on the environment and biological systems
- Nanotechnology environmental health and safety impacts
- Predictive methodology for the interaction of nanoparticles with the environment and with the human body, including predictive approaches for toxicity
- Fate and transport of engineered nanoparticles and their by-products
- Risk assessment and management of the effect of nanomaterials in the environment

Major Research Instrumentation Program (MRI) – NSF 13-517

Full Proposal Deadline Date: February 21, 2013

The Major Research Instrumentation Program (MRI) serves to increase access to shared scientific and engineering instruments for research and research training in our Nation's institutions of higher education, and not-for-profit museums, science centers and scientific/engineering research organizations. This program especially seeks to improve the quality and expand the scope of research and research training in science and engineering, by supporting proposals for shared instrumentation that fosters the integration of research and education in research-intensive learning environments. Each MRI proposal may request support for the acquisition (Track 1) or development (Track 2) of a single research instrument for shared inter- and/or intra-organizational use; development efforts that leverage the strengths of private sector partners to build instrument development capacity at MRI submission-eligible organizations are encouraged.

Sociology

Sociology - NSF PD 98-1331

Full Proposal Target Date: August 15, 2013

The Sociology Program supports basic research on all forms of human social organization -- societies, institutions, groups and demography -- and processes of individual and institutional change. The Program encourages theoretically focused empirical investigations aimed at improving the explanation of fundamental social processes. Included is research on organizations and organizational behavior, population dynamics, social movements, social groups, labor force participation, stratification and mobility, family, social networks, socialization, gender roles, and the sociology of science and technology. The Program supports both original data collections and secondary data analysis that use the full range of quantitative and qualitative methodological tools. Theoretically grounded projects that offer methodological innovations and improvements for data collection and analysis are also welcomed.

Water

Hydrologic Sciences – NSF 13-531

Full Proposal Deadline Date: June 03, 2013

The Hydrologic Sciences Program focuses on the fluxes of water in the environment that constitute the water cycle as well as the mass and energy transport function of the water cycle in the environment. The Program supports studying processes from rainfall to runoff to infiltration and streamflow; evaporation and transpiration; as well as the flow of water in soils and aquifers and the transport of suspended, dissolved and colloidal components. Water is seen as the mode of coupling among various components of the environment and emphasis is placed on how the coupling is enabled by the water cycle and how it functions as a process. The Hydrologic Sciences Program retains a strong focus on linking the fluxes of water and the components carried by water across the boundaries between various interacting components of the terrestrial system and the mechanisms by which these fluxes co-organize over a variety of timescales and/or alter the fundamentals of the interacting components. The Program is also interested in how water interacts with the solid phase, the landscape and the ecosystem as well as how such interactions and couplings are altered by land use and climate change.