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Research Opportunities Compiled by:

Ohio Supercomputer Center
Janet L. Gregory, Grants Manager
1224 Kinnear Road
Columbus, OH 43212-1163
Phone: 614-292-8492
Fax: 614-688-3184
Email: jgregory@osc.edu

Opportunity #1

Short-range Wide-field-of-view Extremely-agile Electronically-steered Photonic Emitter (SWEEPER)
Department of Defense – DARPA Microsystems Technology Office
DARPA-BAA-09-66

Description: DARPA is soliciting innovative research and development (R&D) proposals in the area of short-range wide-field-of-view extremely-agile electronically-steered photonic emitters (SWEEPER). The overall goal is to create a paradigm shift in active optical beam steering and sensing by developing chip-scale integrated photonic coherent beam-forming technologies that overcome the limits of opto- mechanical and electro optical systems while being constrained to small size, weight, and power (SWaP). DARPA envisions that a successful SWEEPER program will establish photonic integrated circuit (PIC) technology that will provide video frame rate beam steering speeds, and emit multiple beams with a total output power of 10 W.

Link to Full Announcement:

<http://www.darpa.mil/mto/solicitations/index.html>

Opportunity #2

Solar America Cities - Technical Outreach
Department of Energy
DE-FOA-0000086

Description: Through this FOA, DOE intends to select one or more partner organizations to provide a maximum number of local governments with actionable information that will enable them to accelerate solar energy deployment. The selected Recipient(s) will proactively address the solar-related information needs of significant local markets, as well as provide a mechanism by which individual local governments can receive and share timely information on solar energy. The goal is to reach multiple levels of local government stakeholders through this activity, such as Mayors and city council members, county officials, sustainability and environmental staff, and planners. Other relevant audiences may include local businesses, utilities, schools, and relevant non-profit organizations. DOE intends to be substantially involved in the activities conducted through this FOA, and will work closely with the awardee(s) to promote the best possible outcomes.

Link to Full Announcement:

<http://apply07.grants.gov/apply/GetGrantFromFedgrants;jsessionid=LP7cKD2LNCCxRsgG1V5SR5hzQmB7vhvMw22Jd8RQzV4Rk2QK2JSj!1215949849?opportunity=DE-FOA-0000086&agencycode=DOE-GFO>

Opportunity #3

**A--AMENDMENT 8: ESSP VENTURE-CLASS SCIENCE INVESTIGATIONS: EARTH VENTURE-1
National Aeronautics and Space Administration – NASA
NNH09ZDA001N-EV1
Notice Type: Pre-solicitation**

Description: NASA Research Announcement: Research Opportunities in Space and Earth Sciences 2009Amendment 8: Earth System Science Pathfinder Venture-class Science Investigations: EarthVenture-1NNH09ZDA001N-EV1Release Date: July 10, 2009Notice of Intent to propose Due: September 2, 2009Proposals Due: November 6, 2009This amendment establishes a new program element in Appendix A.39 entitled Earth System Science Pathfinder Venture-class Science Investigations: Earth Venture-1. The NASA Science Mission Directorate (SMD) Earth Science Divisions Earth Venture (EV) is a new element within the Earth System Science Pathfinder (ESSP) Program. Earth Venture consists of a series of regularly solicited, competitively selected Earth Science investigations as recommended by the recent National Research Council's decadal survey in Earth science, Earth Science and Applications from Space: National Imperatives for the Next Decade and Beyond. This Earth Venture-1 program element within the ROSES-09 NASA Research Announcement solicits proposals for complete suborbital science investigations to conduct innovative, integrated, hypothesis or scientific question-driven approaches to Earth system science, involving temporally sustained data acquisition. For the purpose of this solicitation, a suborbital investigation is one that uses airborne data acquisition systems that may be augmented by surface and/or subsurface facilities. Each suborbital Venture-class investigation must have a life cycle of less than or equal to 5 years and total investigation cost not to exceed \$30 million. Upon the release date, the full text of the solicitation will be available electronically at <http://nspires.nasaprs.com/> . Notices of Intent to propose are due September 2, 2009, and proposals are due November 6, 2009. A pre-proposal workshop for the Earth Venture-1 proposal opportunity will be held in the Washington, DC, area on August 26, 2009. Further details on the EV-1 pre-proposal workshop will be made available on the index page for this EV-1 program element at <http://nspires.nasaprs.com/>

Link to Full Announcement:

https://www.fbo.gov/index?s=opportunity&mode=form&id=63067cf328bbd3003294bc5a201458f1&tab=core&_cview=0

Opportunity #4

**Biosensing
National Science Foundation
NSF PD 10-7909**

Description: The **Biosensing Program** supports innovative, transformative, and insightful investigations of fundamental problems with broad long term impact and applications that require novel use of bio-inspired engineering principles and sophisticated devices to meet the engineering and technology needs of the nation. The program is targeting research in the area of the monitoring, identification, and/or quantification of biological phenomena and will support potential technological breakthroughs that exist at the intersection of engineering, life science, and information technology. **Projects submitted to the Program must advance both engineering and life sciences.** Projects in the program may range from single investigator to multi-investigator collaborative research efforts.

The development of these novel principles and devices will require highly collaborative interactions between engineers, life scientists, and experts in nanotechnology, biomaterials, bioinformatics, and the chemical and physical sciences. The program recognizes the important role of education and workforce development specifically relevant to the multidisciplinary nature of the area of biosensing. Interdisciplinary teams are essential and must be fostered from discovery to application.

Specific Objectives - The Biosensing program primarily supports innovative fundamental and applied research with applications to the biomedical, food safety, energy, environmental, and security needs:

- New paradigms in the identification and detection of existing or emerging pathogenic micro-organisms, unknown toxins, and viral threat agents
- Highly sensitive and discriminative biosensing
- New approaches in integrated sensor systems, probe development, and actuators
- Novel robust and easy to operate sensor systems with a highly selective response to multiple analytes under variable conditions, with significantly reduced false positives and false negative responses and increased sensitivity
- Original ideas in the development of novel target recognition strategies, including but not limited to: nanoscale structures with variable selectivity, engineered proteins, signaling aptamers, ionophores, natural and artificial ion-channels, bio-designed and molecular-imprinted polymers

- Smart field deployable molecular sentinels for the monitoring of food, water and air quality, environment, community, industrial, and commercial structures
- Cell and tissue-based sensors to monitor environmental, physiological, and genetic responses
- Development of fundamental knowledge for better understanding and processing of multifunctional materials for biosensing applications, with predefined physical, chemical or biological characteristics
- Bio-compatible and Stimuli-responsive materials demonstrating biosensing capabilities
- Novel bio-based cyber approaches
- Examples of innovative research in biosensing technologies:
- Fundamental understanding and study of bio-macromolecules (proteins, peptides, etc.) confinement and orientation at the micro- and nano-interfaces for high-throughput biosensing applications
- Plasmonic nanostructures
- Sensors based on artificial recognition elements and synthetic peptides; new biorecognition strategies and elements
- New molecular sensors capable of monitoring biological structures interaction (protein-protein interactions, cell-to-cell talk, etc.)
- New approaches that allow for highly selective and reversible recognition events (i.e. methods for triggering dissociation of analytes from antibodies) for extending continuous monitoring technologies
- Molecular beacon aptamer probes and quantum-dots for intracellular protein monitoring with improved delivery methods
- Combining of different sensing platforms (electrochemical/optical/mass sensitive, etc.) for enhanced data acquisition in biosensing applications
- mRNA monitoring using molecular beacon DNA probes that bridge biochemical assays and in vivo analyses
- Biocomputing based on bioanalytical processes

The duration of unsolicited awards is generally one to three years. The typical award size for the program is \$100,000 for individual investigators or \$200,000 for multiple investigators per year (including indirect cost). Small equipment proposals of less than \$100,000 will also be considered and may be submitted during these windows. Any proposal received outside the announced dates will be returned without review.

The duration of CAREER awards is five years.

Full Proposal Window: August 15, 2009 - September 17, 2009

Full Proposal Window: February 1, 2010 - March 3, 2010

Link to Full Announcement:

http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503353&govDel=USNSF_25

Opportunity #5

Cutting-Edge Basic Research Awards (CEBRA) (R21)

DHHS – NIH

PAR-09-222

Description: The National Institute on Drug Abuse (NIDA) Cutting-Edge Basic Research Award (CEBRA) is designed to foster highly innovative or conceptually creative research related to drug abuse and addiction and how to prevent and treat them. It supports research that is high-risk and potentially high-impact that is underrepresented or not included in NIDA's current portfolio. The proposed research should:

- (1) test a highly novel and significant hypothesis for which there is scant precedent or preliminary data and which, if confirmed, would have a substantial impact on current thinking; and/or
- (2) develop or adapt innovative techniques or methods for addiction research, or that have promising applicability to drug abuse research.

This FOA will use the NIH Exploratory/Developmental (R21) grant mechanism with modifications. The total anticipated amount to be awarded is \$2.5 M per year, for approximately 14 awards, contingent upon the availability of funds and the submission of a sufficient number of meritorious applications.

Link to Full Announcement:

<http://grants.nih.gov/grants/guide/pa-files/PAR-09-222.html>

Opportunity #6**Partnerships for Biodefense Viral Pathogens (R01)
DHHS – NIH
RFA AI-09-028**

Description: This Funding Opportunity Announcement (FOA) issued by the National Institute of Allergy and Infectious Diseases (NIAID), National Institutes of Health (NIH) invites research applications for projects that support development of new therapeutics, immunotherapeutics or medical diagnostics for NIAID Category A, B, or C viral pathogens. This FOA will utilize the R01 grant mechanism. The NIAID intends to commit \$7.3 million in total costs in FY2010 to fund five to ten applications in response to this FOA. Awards issued under this FOA are contingent upon the availability of funds and the submission of a sufficient number of meritorious applications. Because the nature and scope of the proposed research will vary from application to application, it is anticipated that the size and duration of each award will also vary. The annual direct costs that can be requested may not exceed \$750,000 without prior approval by program staff. Requested budgets must be justified by the proposed research and will be evaluated by the review panel and program staff. The total project period for an application submitted in response to this funding opportunity may not exceed 5 years. More than one PD/PI (i.e., multiple PDs/Pis), may be designated on the application. Applicants may submit more than one application, provided that each application is scientifically distinct. Resubmission applications are not permitted in response to this FOA. Renewal applications are not permitted in response to this FOA.

Link to Full Announcement:

<http://grants1.nih.gov/grants/guide/rfa-files/RFA-AI-09-028.html>

Opportunity #7**Partnerships for Biodefense Food- and Water-borne Diseases (R01)
DHHS – NIH
RFA-AI-09-027**

Description: This Funding Opportunity Announcement (FOA) issued by the National Institute of Allergy and Infectious Diseases (NIAID), National Institutes of Health (NIH) invites research applications for projects that support development of therapeutics, immunotherapeutics, medical diagnostics and broad-spectrum vaccines for NIAID Category B food- and water-borne priority pathogens and toxins (<http://www3.niaid.nih.gov/topics/BiodefenseRelated/Biodefense/research/CatA.htm>). This FOA will utilize the R01 grant mechanism. The NIAID intends to commit \$7.3 million in total costs in FY2010 to fund five to ten applications in response to this FOA. Awards issued under this FOA are contingent upon the availability of funds and the submission of a sufficient number of meritorious applications. Because the nature and scope of the proposed research will vary from application to application, it is anticipated that the size and duration of each award will also vary. The annual direct costs that can be requested may not exceed \$750,000 without prior approval by program staff. Requested budgets must be justified by the proposed research and will be evaluated by the review panel and program staff. The total project period for an application submitted in response to this funding opportunity may not exceed 5 years. More than one PD/PI (i.e., multiple PDs/Pis), may be designated on the application. Applicants may submit more than one application, provided that each application is scientifically distinct. Resubmission applications are not permitted in response to this FOA. Renewal applications are not permitted in response to this FOA.

Link to Full Announcement:

<http://grants1.nih.gov/grants/guide/rfa-files/RFA-AI-09-027.html>

Opportunity #8**Convener of Active Medical Product Surveillance Discussions (U13)
DHHS – FDA
RFA-FD-09-012**

Description: This FOA, issued by the Office of Critical Path Programs (OCPP), Office of the Commissioner, Food and Drug Administration, solicits grant applications from neutral, independent institutions and/or organizations that propose methods for convening a broad range of stakeholders, to include those with relevant expertise, and that would support conferences and meetings to explore and address methodological, data development, technical, and communication issues related to active medical product surveillance and that would synthesize, summarize, and communicate findings from these conferences and meetings to a broad range of organizations and individuals that have the capability to use the information to further develop and create active medical product surveillance methods and systems.

Link to Full Announcement:

<http://www07.grants.gov/search/search.do;jsessionid=ptKJKD7dv04TZL1PThMVM3LVTvds02VHmnPG6Jq02X74yQyHsQVD!1215949849?opId=48115&flag2006=false&mode=VIEW>

Opportunity #9**Medical Rehabilitation Research Resource (R24)
DHHS – NIH
RFA-HD-09-013**

Description: This Funding Opportunity Announcement (FOA), issued by NICHD, NINDS, and NIBIB, National Institutes of Health, solicits grant applications from institutions/organizations that propose to build research infrastructure for medical rehabilitation. The aim of this FOA is to create a national network of research cores that provide access to collateral expertise in biomedical, behavioral, and/or psychosocial fields that are particularly relevant to medical rehabilitation research. Applicants should propose a program of research resources and collaborative opportunities in a specific content area. This may be accomplished through a combination of didactic interactions (workshops, courses, written material, and websites), consultations, and pilot funding. In addition, the research core may support intramural activities related to technique development, adaptation, and validation. Although examples of relevant expertise and content are provided below, additional areas may be proposed provided they have potential for promoting medical rehabilitation research and improving outcomes for people with disabilities. This FOA will utilize the Resource-Related Research Projects (R24) grant award mechanism. The NICHD, NINDS, and NIBIB intend to commit \$6.05 million in total costs [Direct plus Facilities and Administrative (F & A) costs] in FY 2010 to support four to six new and/or competing continuation grants in response to this FOA. An applicant may request a project period of up to five years and a budget for direct costs of up to \$700,000 per year. More than one PD/PI (i.e., multiple PDs/PIs), may be designated on the application. Applicants may submit more than one application, provided they are scientifically distinct. Resubmission applications are not permitted in response to this FOA. Renewal applications are permitted in response to this FOA.

Link to Full Announcement:

<http://grants1.nih.gov/grants/guide/rfa-files/RFA-HD-09-013.html>

Opportunity #10

DOD Peer Reviewed Cancer Research Program Idea Award Department of Defense W81XWH-09-PRCRP-IDEA

Description: The PRCRP Idea Award is intended to promote the exploration of ideas that are still in the early stages of development yet have the potential to yield high-impact results and open new avenues of investigation in genetic cancer research and its relation to exposure to the various environments that are unique to a military lifestyle. This mechanism supports conceptually innovative, high-risk/high-reward research that could ultimately lead to critical discoveries or major advancements. No other topic areas will be allowed. Proposals must not address breast, prostate, or ovarian cancer research. Preliminary data are not required. However, research projects should include a well formulated, testable hypothesis based on a strong scientific rationale. For FY09, the PRCRP Idea Award will support applications that address one or more of the Focus Areas below. Applications to the FY09 PRCRP Idea Award will be rated on their responsiveness to these Focus Areas. Focus Areas: 61623; Identification and characterization of changes in gene structure and/or expression resulting from physical, biological, chemical or psychological exposures, and stressful environments that, alone or in concert, are known or suspected to increase cancer risk. Although not all inclusive, hazards encountered by the military population include: o Radiation (UV and other radiation sources) o Biological Agents o Chemicals o Physical and/or Psychological Stress o Other Environmental Conditions (e.g., noise, heat, altitude) 61623; Investigation of biological pathways involved in carcinogenic mechanisms which are affected by military exposures 61623; Investigation of the trans-generational cancer risk of military exposures 61623; Evaluation of differences in genetic susceptibility to cancer among ethnic groups affected by military exposures It is the responsibility of the applicant to clearly and explicitly articulate the project's military relevance.

Link to Full Announcement:

<http://www07.grants.gov/search/announce.do;jsessionid=ptKJKD7dv04TZL1PThMVM3LVTvds02VHmnPG6Jq02X74yQyHsQVD!1215949849>

Opportunity #11

DOD Peer Reviewed Cancer Research Program Mentor-Predoctoral Fellow Research Award Department of Defense W81XWH-09-PRCRP-MPFR

Description: The FY09 PRCRP Mentor-Predoctoral Fellow Research Award mechanism is designed to promote new ideas that are still in the early stages of development while training outstanding candidates in the topic area of noninvasive cancer ablation treatment research including selective targeting with nanoparticles. The research should have the potential to yield highly impactful data and new avenues of investigation in the PRCRP topic area of noninvasive cancer ablation treatment research including selective targeting with nanoparticles. No other topic areas will be allowed. Proposals must not address breast, prostate, or ovarian cancer research. This mechanism supports conceptually innovative research that could ultimately lead to critical discoveries or major advancements that will accelerate the field of noninvasive cancer ablation treatment including selective targeting with nanoparticles. Research projects should include a well-formulated, testable hypothesis based on strong scientific rationale. Mentored training of an outstanding Predoctoral fellow is an important aspect of this award, and inclusion of a Predoctoral Fellow is a requirement. Preliminary data are not required. However, research projects should include a well formulated, testable hypothesis based on a strong scientific rationale. For FY09, the Mentor-Predoctoral Fellow Research Award will support applications that address one or more of the Focus Areas below. Applications to the FY09 PRCRP Mentor- Predoctoral Fellow Research Award will be rated on their responsiveness to these Focus Areas. Focus Areas: 61623; Development of approaches for deep organ access for ablation technologies 61623; Validation of nanoparticle targeting The PRCRP Mentor-Predoctoral Fellow Research Award supports high-impact, innovative research that will drive the field forward.

Link to Full Announcement:

<http://www07.grants.gov/search/announce.do;jsessionid=ptKJKD7dv04TZL1PThMVM3LVTvds02VHmnPG6Jq02X74yQyHsQVD!1215949849>

Opportunity #12

DOD Peer Reviewed Cancer Research Program New Investigator Award Department of Defense W81XWH-09-PRCRP-NIA

Description: The PRCRP New Investigator Award supports independent Principal Investigators (PIs) in the early stages of their careers, and it strongly encourages a designated collaborator. The PRCRP seeks to support the career transition and/or continued development of promising PIs who have innovative, high-impact ideas or new technologies applicable to genetic cancer research and its relation to exposures to the various environments that are unique to a military lifestyle. No other topic areas will be allowed. Proposals must not address breast, prostate, or ovarian cancer research. Preliminary data are not required. However, research projects should include a well formulated, testable hypothesis based on a strong scientific rationale. For FY09, the PRCRP New Investigator Award will support applications that address one or more of the Focus Areas listed below. Applications to the FY09 PRCRP New Investigator Award will be rated on their responsiveness to these Focus Areas. Focus Areas: 61623; Identification and characterization of changes in gene structure and/or expression resulting from physical, biological, chemical or psychological exposures, and stressful environments that, alone or in concert, are known or suspected to increase cancer risk. Although not all inclusive, hazards encountered by the military population include: o Radiation (UV and other radiation sources) o Biological Agents o Chemicals o Physical and/or Psychological Stress o Other Environmental Conditions (e.g., noise, heat, altitude) 61623; Investigation of biological pathways involved in carcinogenic mechanisms which are affected by military exposures 61623; Investigation of the trans-generational cancer risk of military exposures 61623; Evaluation of differences in genetic susceptibility to cancer among ethnic groups affected by military exposures It is the responsibility of the applicant to clearly and explicitly articulate the project's military relevance.

Link to Full Announcement:

<http://www07.grants.gov/search/announce.do;jsessionid=ptKJKD7dv04TZL1PThMVM3LVTvds02VHmnPG6Jq02X74yQyHsQVD!1215949849>