

BROAD AGENCY ANNOUNCEMENT (BAA)
Amendment 0003

1. Agency Name

United States Air Force Academy (USAFA)
Colorado Springs, CO

2. Funding Opportunity Number

USAFA–BAA-2009-1

3. Funding Opportunity Title

Research Interests of the United States Air Force Academy

4. Types of Instruments Awarded

Research and Development contracts, grants and cooperative agreements

5. Announcement Type

"Amendment 0003 to Initial Announcement"

6. Catalog of Federal Domestic Assistance (CFDA) Numbers

12.800

7. Due Dates

This announcement remains open until superseded. White papers and proposals are reviewed and evaluated as they are received and may be submitted at any time; however, there is an initial preference for white papers over full applications/proposals. The white paper submission process is discussed in sections IV and V of this BAA. Proposals will be due according to specific instructions contained in a separate Request for Proposal (RFP) notice resulting from favorable white paper evaluations or calls issued against this BAA. Calls may be placed against this BAA and specific information related to due dates will be provided in each call. The calls may also include specific terms which apply to the call such as further technical details, cut-off date for white paper and/or proposal submission and any pertinent clauses such as available Government Furnished Property (GFP) or specific Organizational Conflict of Interest (OCI) requirements. Proposals or white papers submitted in response to calls should be submitted according to directions contained within

each individual call and in accordance with this BAA. Late bid and proposal provisions (IAW FAR 52.215-1(c) (3)) will apply to this BAA.

8. Additional Overview

USAFA's Dean of Faculty (DF) is announcing to business and academia the intent to solicit proposals for basic and applied research through this BAA. This strategy provides USAFA/DF an acquisition tool with the flexibility to solicit proposals and make awards to develop technologies to meet present and future Air Force research needs as technology issues are identified. USAFA invites white papers and proposals for research in many broad areas. These areas are described in detail in Section I, Funding Opportunity Description. Additional information regarding USAFA Research Centers, Departments, and Institutes may be found at <http://www.usafa.edu/df/dfe/dfer/?catname=research>.

USAFA is seeking unclassified, fundamental research white papers and proposals that do not contain proprietary information. Requests for white papers/proposals are also transmitted via calls which may be published separately from the BAA at various times during the open period of the BAA (note: the first Call may be published with the BAA).

It is anticipated awards will be made in the form of grants, cooperative agreements or contracts. USAFA reserves the right to select and fund for award all, some, or none of the white papers and/or proposals in response to this announcement. All awards are contingent upon the availability of funding for the program areas identified. Unless specifically indicated in a RFP or a call, cost sharing is permitted but not required. This announcement will remain open until replaced by a successor BAA or until it is cancelled. White papers and proposals may be submitted at any time.

Awards based on responses to this BAA are considered to be the result of full and open competition. Small businesses are encouraged to propose on all of the solicitations. The NAICS code, unless otherwise stated in the BAA amendments shall be: 541711, Research and Development in Biotechnology and 541712, Research and Development in the Physical, Engineering and Life Sciences (except Biotechnology). The size standard for both NAICS codes is 500 employees. White papers and proposals submitted in response to this BAA shall be in accordance with the requirements of this BAA and its appropriate amendment(s).

Interested offerors should be alert for any BAA amendments, calls, or other changes to the requirements of this BAA or its subsequent amendments. Amendments to and/or calls on this BAA will be posted to the [FedBizOpps](http://www.fedbizopps.gov) and/or [Grants.gov](http://www.grants.gov) website and published when they occur. Interested parties are encouraged to periodically check these websites for updates and amendments.

USAFA will not issue paper copies of this announcement. The costs of white papers and/or complete proposals in response to this BAA are not considered an allowable direct

charge to any award resulting from this BAA or any other award. Technical and cost proposals, or any other material, submitted in response to this BAA will not be returned.

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I. Funding Opportunity Description

The Air Force Academy invests in an active research program for three main reasons. First and foremost, research significantly enhances the cadet learning experience. Our research is done by, for and with cadets who work alongside fellow cadets and faculty mentors. Research provides cadets with rich independent learning opportunities as they tackle ill-defined problems and are challenged to apply their knowledge and abilities.

Second, our research program provides opportunities for essential faculty development. Research broadens and deepens the experience base of the faculty. This infuses current, relevant, state-of-the-art and cutting-edge applications and examples into the curriculum. This also helps our faculty remain current in their respective fields.

Third, at USAFA we strive to conduct research to enhance the ability of the Air Force to perform its mission. There are ongoing research projects spanning topics as diverse as super cooled cesium atoms, cyber security, spatial disorientation, and homeland defense.

This BAA is located at the FedBizOpps.gov and Grants.gov website(s). Research areas of interest to the Air Force Academy's Technical Program Managers are described in detail in the sub-sections below.

a. Research Centers

1. Aeronautics (Aeronautics Research Center)

The Aeronautics Research Center (ARC) performs a range of aeronautical research tasks in support of Air Force, Department of Defense (DoD), National Aeronautics and Space Administration (NASA) and other government and commercial sponsors. Making use of the extensive experimental facilities housed in the USAFA Department of Aeronautics, the ARC pursues a range of aeronautic and propulsion research efforts, with equal emphasis on basic and applied research. The research program in this center is geared toward providing all undergraduates with a rich, relevant research experience while answering critical research needs of our highly varied customer base. Researchers may expect extensive access to premier facilities, tremendous latitude of pursuits and single-minded focus on research tasks, but must seek to incorporate student participation in their projects, typically two to four students per semester. Substantial effort in this center is directed

toward the solution of multi-disciplinary problems which may require skills beyond classical aeronautics disciplines, including plasma and laser physics, automatic controls and applied mathematics. The ARC, in partnership with the USAFA Modeling and Simulation Center, is a leader in the complementary employment of experiment and simulation to solve complex fluid, aerodynamic and control problems.

Current research strengths include several complementary thrusts. Closed loop flow control efforts that focus on aero-optic and energy extraction, with extensive effort in the development of automatic control algorithms and techniques, experimental flow control methodologies and computational fluid dynamics (CFD) simulations. Plasma actuator development continues in collaboration with the USAFA Physics Department, investigating basic phenomenology while investigating high-leverage applications for the devices. Well-developed and modern force and moment measurement capabilities in low speed and subsonic (up to Mach 0.6) wind tunnels are employed in the investigation of numerous air vehicle modifications as well as development of new designs. A Mach 6 Ludwig tube will be commissioned in the Fall of 2012, complementing an existing Mach 4.4 blowdown facility for supersonic and hypersonic investigations. Operating engines, including an F-109 turbofan and several internal combustion engines are used for fuels and flow quality investigations, with a current emphasis in ejectors and inlets. Researchers are encouraged to propose topics in these areas and other allied aeronautics subjects.

Currently available facilities, instrumentation and research efforts can be found at http://www.usafa.edu/df/dfan/research_centers/aero_research_center.cfm.

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2. Aeronautics (Modeling and Simulation Research Center)

The Modeling and Simulation Research Center (M&SRC) is a multi-disciplinary center which shares a dual mission of providing high performance computing resources to USAF Academy cadets and research and teaching personnel, as well as conducting modeling and simulation research tasks in support of Air Force, DoD, NASA and other government and commercial sponsors. Making use of distributed/shared memory computing systems and a dedicated research network, the Center pursues a range of computational research efforts, with equal emphasis on basic and applied research. The research program in this center is geared

toward providing undergraduates with scientific computing experience supported by the DoD High Performance Computing Modernization Program and projects which answer critical research needs of our highly varied customer base. Researchers may expect extensive access to premier facilities, tremendous latitude of pursuits and single-minded focus on research tasks, but must seek to incorporate cadet participation in their projects, typically two to four cadets per semester.

The M&SRC, in partnership with the USAFA Aeronautics Research Center, is a leader in the complementary employment of experiment and simulation to solve complex fluid, aerodynamic and control problems. Current fluid/aerodynamic research efforts include: 1) closed loop flow control focused on aero-optic and energy extraction, 2) plasma actuator development, in collaboration with the USAFA Physics Department, 3) Chemical, Oxygen, Iodine Laser operation optimization, 4) fluid-structure interaction as applied to aero-elasticity and cargo airdrop operations, 5) massively-separated flow aerodynamics, including turbulence modeling and 6) electrostatic force enhancement of aerosol processes. The M&SRC, in partnership with the USAFA Center of Innovation, is also a leader in the complementary employment of web 2.0/3.0 experiment and simulation on “intelligent networks” including the Flexible Distributed Control/Coordination (FDC) process. FDC has the desired effect of changing and improving decision making within a Command and Control (C2) hierarchy by adding a collaborative element to the decision making process and it may also be able to align social networking to achieve desired effects. This is a complementary thrust with the Department of Homeland Security (DHS).

Currently available facilities, resources and research efforts can be found at http://www.usafa.edu/df/dfan/research_centers/modeling_and_simulation_center/modeling_and_simulation.cfm

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3. Astronautics (Space Systems Research Center)

The Space Systems Research Center performs a wide range of activities involving the design, assembly, integration, test, launch and flight of small satellites and sounding rockets to conduct research for the Air Force and the Department of Defense. This unique program blends science, technology and organizational skills like none other at the Air Force Academy. The Center is currently analyzing the

spacecraft and payload telemetry of both FalconSAT-3 and FalconSAT-5, evolving the FalconSAT-6 spacecraft bus and DOD Space Experiments Review Board-approved experiments from preliminary design toward critical design, including performing detailed subsystem analysis and vibration/Thermal Vacuum/CGMOI testing at Kirtland AFB, NM. These activities will culminate in the May 2012 FalconSAT-6 critical design review. Meanwhile, the center is also conducting research on sounding rockets. Our recent FalconLAUNCH-7 obtained an apogee altitude of 354,000 feet! Other research areas are nanosatellites (CUBESAT class) and space education. Designing a satellite is a complex, multi-disciplinary undertaking requiring expertise across a number of technical disciplines.

Currently available facilities, instrumentation and research efforts can be found at <http://www.usafa.edu/df/dfas/Research/research.cfm?catname=dfas>

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4. Bioenergy and Biomimetics (Life Sciences Research Center)

The Life Sciences Research Center's (LSRC) primary mission is to support the Air Force's research program (Air Force Office of Scientific Research/AFOSR and Air Force Research Laboratories/AFRL) through faculty and cadet research efforts. The United States Air Force Academy (USAFA) has a long-term vision to establish a multi-year alternative energy program of planning, research and infrastructure investment. The vision involves a mix of research and alternative energy production facilities in solar electric, biofuels, waste-to-methane and other multiple conservation efforts. Given the recent high interest in the use of microalgae in alternative fuels production, our Life Sciences Research Center within the Department of Biology has developed a growing biofuels research program. To this end we are seeking research partnerships in developing the photosynthetic, growth and biomass properties of certain microalgae for the purposes of optimizing algal oils (lipids) production. Ultimately, our goal is to have these oils converted to liquid transportation fuels.

Research efforts will focus on strain selection/cultivation/manipulation to improve the overall yield of oils in microalgae mass cultures, in concert with developing novel extraction processes to increase oil harvest yields. A proposed solution would include a commercial or academic partner with experience in conducting and participating in R&D relating to the production of lipids in microalgae for conversion

to biofuels. Ideally, this arrangement would include placing an exceptional research scientist at USAFA with a background in applied algal biochemistry, physiology and lipid biosynthesis to investigate/integrate a variety of approaches to increase oil yields in microalgae.

This scientist would provide leadership and guidance for a team of laboratory technicians/students, produce reports and other materials to disseminate research efforts, assist other partner scientists and possess a superb working knowledge of laboratory analytical equipment. Given the need to develop renewable energy sources vital to this nation's security and defense, "the primary objectives are to understand and improve the facility of certain photosynthetic microbes to produce biofuels—specifically from algal lipids - for ground and aviation purposes."

Additionally, our center is also interested in advancing partnerships which develop sensor technology, which provides innovative, timely, and affordable surveillance and threat detection capabilities in air. More specifically, there is considerable interest in understanding the biological systems in natural flying organisms, which enable agile maneuvering and successful spatial navigation. For example, research emulating insect sensory and sensorimotor systems that could be used to control small, automated air vehicles is of particular interest. As such, we are looking to expand our Biomimetics research area in the development of novel sensors for threat discrimination, location and identification. Current investigations have resulted in the creation of sensory silicon chips, based on the compound eye of the fly. However, additional assistance in furthering the evaluation of a successful first generation model is required. Under some initial computer modeling, this first generation version showed vastly improved detection capability. To this end, the LSRC is seeking technical support towards building an actual physical model, for evaluation under laboratory or operationally relevant environments.

Because of our USAFA mission to prepare young men and women for leadership positions within the Air Force, cadet participation with researchers is expected as part of our independent study projects (499s) and cadet summer research program (visiting partner labs). Additionally, there is potential for cross disciplinary involvement from a number of academic departments aside from Biology such as Chemistry (biochemistry), Engineering (model production), Management (project analysis) and Aeronautics (testing). Development of this research thrust may also result in potential collaboration opportunities with other academia, private companies and our Air Force research agencies.

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5. Chemistry (Chemistry Research Center)

The Chemistry Research Center (CRC) engages in a broad range of basic and applied research topics in support of the Air Force and DoD technology base. An essential feature of the projects chosen for study is the active participation of cadets who are chemistry, biochemistry and materials chemistry majors. The cadet research efforts are mentored and guided by Academy military and civilian faculty members, with significant collaboration by contractors and academic partners. The expertise, knowledge and creativity of scientists who are from outside of the Air Force Academy are an important part of the research efforts.

Some current topics of interest in the CRC are renewable energy materials and processes (e.g. ionic liquid thermal fluids and photoelectrochemical materials), polymer materials chemistry, energetic materials (e.g. coatings for nanoenergetic particles), organometallic chemistry of fulvenes, carbon aerogels.

Research may take place on site using the laboratories and analytical instrumentation located in the Department of Chemistry at the US Air Force Academy (USAFA). A short description of the chemistry research facilities and equipment is available at <http://www.usafa.edu/df/dfc/research.cfm?catname=dfc>

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6. Computer Science (Academy Center for Cyberspace Research)

The Academy Center for Cyberspace Research (ACCR) conducts research in a wide range of basic and applied areas within the field of Computer Science in support of the Air Force, DoD and other government and commercial sponsors. The primary mission of the center is to enhance cadet education through participation in and exposure to research projects in the domain of cyberspace. All cadets in the Computer Science major receive a research experience through independent studies, course projects and summer research opportunities. Current research focus areas for ACCR include cyberspace education and training, offensive and defensive cyber-warfare and information assurance. State of the art computing facilities are available to students and researchers for conducting studies in an isolated network environment running virtual machine (VM) software for rapid

reconfiguration and testing. Parallel architectures are also available for studies using neural networks and parallel algorithms. ACCR is especially interested in multi-disciplinary efforts that apply underlying computer science principles and theory to complex problems and applications. Examples include: the application of concurrent coding theory to the development of jam resistant communications without requiring a shared secret, ad hoc network routing algorithms for robust communication in autonomous vehicles, and the application of visualization principles to discover system vulnerabilities. Researchers are encouraged to propose topics in these areas as well as other cyberspace topics.

Currently available facilities, publications and research efforts can be found at <http://www.usafa.edu/df/dfe/dfer/centers/accr/>.

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7. Engineering Mechanics (Center for Aircraft Structural Life Extension)

The Center for Aircraft Structural Life Extension (CAStLE) performs a range of structural integrity research tasks in support of Air Force, DoD, Department of Homeland Security (DHS), NASA and other government, academic and commercial sponsors. Making use of the extensive experimental and computational facilities housed in the USAFA Department of Engineering Mechanics, CAStLE pursues a range of engineering mechanics, mechanical engineering, aerospace engineering, corrosion engineering and material science research efforts, with more emphasis on applied, advanced development and technology transition than basic research. The research program in this center is geared toward providing all undergraduates with a rich, relevant research experience while answering critical research needs of our highly varied customer base. Researchers may expect extensive access to premier facilities, tremendous latitude of pursuits and single-minded focus on research tasks, but must seek to incorporate student participation in their projects. CAStLE, in partnership with the USAFA Modeling and Simulation Center, is a leader in the complementary employment of experiment and simulation to solve complex static stability, static strength, and fracture mechanics problems. Current research strengths include: high temperature materials development; advanced barrier coatings; static strength, static stability design, corrosion modeling, prevention and control; validation testing, analysis and methods development, computational structural and fracture mechanics; failure analysis, flight data acquisition system development, installation, maintenance and data analysis; structural risk analysis;

and USAF Aircraft Structural Integrity Program (ASIP). The interaction between corrosion and cracking damage mechanisms and their effect on the structural integrity has been a long standing interest of CASTLE. There is DoD level interest in material degradation in structures—to include corrosion, cracking and other service related damage mechanisms. Researchers are encouraged to propose topics in these areas and other allied integrity subjects.

Currently available facilities, instrumentation and research efforts can be found at <http://www.usafa.edu/df/dfe/dfer/centers/castle/>

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8. Laser and Optical Physics (Laser & Optics Research Center)

The Laser and Optics Research Center (LORC) performs a range of research tasks in support of the Air Force, Department of Defense, Department of Energy, National Science Foundation and other government and commercial sponsors. Making use of the extensive experimental facilities housed in the USAFA Department of Physics, the Center pursues a range of research efforts, with an emphasis on basic research. The research programs in this center are geared toward providing all undergraduates with a rich, relevant research experience while answering critical research needs of our highly varied customer base. Researchers may expect extensive access to premier facilities, tremendous latitude of pursuits and single-minded focus on research tasks, but must seek to incorporate student participation in their projects, typically two to four students per semester.

Current research areas of emphasis comprise five broad areas. In the atomic physics area, precision measurements of atomic properties are a primary focus of investigation. These include measurements of atomic state lifetimes and branching ratios in alkalis such as cesium, sodium, potassium and rubidium along with alkaline-earth elements such as strontium which have atomic clock applications. Also the interaction of alkali atoms with inert gases is being studied for their collisional excitation transfer properties which are important to the operation of alkali lasers. This area is closely related to our second area of emphasis: the study of diode-pumped alkali lasers (DPAL). Key objectives of the DPAL research program are investigating their potential for scaling to high average power, investigating various amplifier and resonator configurations and improving the spectral and spatial output characteristics of high power semiconductor diode pump sources.

Applications such as second harmonic generation and sum frequency generation are also part of this effort. Other gas lasers such as carbon monoxide lasers operating infrared wavelengths are also investigated.

Fiber laser research involves novel fiber designs including photonic crystal fibers and acoustically-engineered fibers for the suppression of non-linear effects in high-power fiber lasers, fiber components necessary for coherent beam combining, fiber laser and amplifier characterization, novel fiber manufacturing and processing methods, high-brightness, efficient, wavelength-stabilized pump sources, modeling and simulation of fiber lasers and amplifiers and fiber laser applications including but not limited to remote sensing, tracking, directed energy weapons and communications.

High-performance imaging research is focused on novel wavefront measurement and manipulation techniques including holographic wavefront sensing and correction and photon sieve telescopes. Key objectives include developing and demonstrating imaging technology suitable for integration into rugged compact devices and aerospace platforms.

Nanomaterials research includes the application of novel materials structures for the manipulation of light including negative index materials, phonon-photon superlattices, tunable dielectrics, ferro-electric and ferro-magnetic oxides, surface plasmonics and black silicon for photo-detector and solar cell applications.

Researchers are encouraged to propose topics in these areas and other related subjects.

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9. Physics (Space Physics & Atmospheric Research Center)

The Space Physics and Atmospheric Research Center (SPARC) studies the natural environment from the troposphere to the sun in support of Air Force, DoD, NASA, National Science Foundation (NSF) and other government and commercial sponsors. Making use of the extensive experimental facilities housed in the USAFA Department of Physics, the SPARC pursues a range of efforts, with equal emphasis on basic and applied research. The research program in this center is geared toward providing all undergraduates with a rich, relevant research experience while

answering critical research needs of our highly varied customer base. Researchers may expect extensive access to premier facilities, tremendous latitude of pursuits and single-minded focus on research tasks, but must seek to incorporate student participation in their projects, typically two to four students per semester. Substantial effort in this center is directed toward the solution of multi-disciplinary problems which may require skills beyond classical physics disciplines, including plasma and laser physics, advanced miniaturization techniques, use of MicroElectroMechanical Systems (MEMS), development of miniaturized automated satellite constellations and advanced data mining techniques for large data systems. The SPARC, in partnership with the USAFA Space Systems Research Center, is a leader in the development of miniaturized payloads for small satellites.

Current research strengths include several complementary thrusts. Space physics and space weather study the relationship of the space environment and the effects this environment have on mankind. Topics in space weather can range from experimental, such as developing new instrumentation to measure the space environment, to theoretical, such as developing assimilative models which can be used to predict the space environment into the future. Linked with space physics and space weather, the micro and nano satellite thrust develops aggressively miniaturized spacecraft for use in small inexpensive constellations devoted to exploiting the entire range of space activities of interest to sponsors. The applied physics thrust considers all applications of physics to the practical applications of technology to sponsors and in the past has included studies of plasma actuators, high speed spectroscopy in support of brief duration phenomena in the troposphere, mesosphere and the ionosphere, studies of the aurora and applications of weather modeling to highly dynamic small scale areas such as the Air Force Academy. Finally, we support a wide range of basic research in astronomy and astrophysics in support of the Academy observatory.

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10. Center for Physics Education Research (CPER)

The Center for Physics Education Research (CPER) was founded in 1994 to build a USAFA center of gravity providing impetus, opportunities and tools for physics faculty at USAFA and nationwide, as well as engage in and apply Scholarship of Teaching and Learning-like (SoTL) research activities within the Department of

Physics. The CPER maintains extensive ties and collaborations with similar research programs nationwide.

The primary goals of the CPER are to:

- Engage in research initiatives that quantify gains in student understanding and appreciation of physics. Efforts in this category leverage the random assignment of students within Core Physics sections to categorize and assess gains in performance of students within a single semester and across multiple semesters. In addition to analyzing performance on standardized assessments, there is considerable interest in analyzing student response patterns, developing assessment rubrics and understanding prior student knowledge and correlating learning gains with other metrics such as instruction techniques and student engagement.
- Develop and share tools for enhancing teaching and student learning in physics. Of particular interest is the development of pedagogical techniques and supporting tools for the Just-in-Time Teaching (JiTT) initiative, the signature CPER effort. This effort includes the extension of JiTT to develop student Self-Explanations under a Worked Example model of instruction. Additional efforts include development of tutorials (to include computer simulations) for both beginning and intermediate physics students.
- Maintain a connection between course and curriculum development (content, assessment methods, pedagogical approach) and physics education research. CPER is actively and intimately involved with several national level efforts to engage in collaborative education research and bring the research results into the classrooms, both nationally and USAFA, as soon as warranted by the assessment results. Current research in this area includes Do-It-Yourself Modeling (DIY), examination of concept visualization techniques in eight disciplines ranging from Astronomy to Sociology, development of classroom lessons based on the group's prior work and developing and testing mobile technology techniques for monitoring student engagement. These topics (and supporting grants) are in the NSF TUES (Transforming Undergraduate Education in Science) category.
- Proliferate lessons learned on a national level by disseminating research results through conference presentations, workshops and publications.
- In addition to disseminating results and lessons learned in Goals 1-3 on a national level, CPER personnel are also developing tutorials, annotating JiTT content for national distribution and authoring a first-ever undergraduate textbook in the Physics of Space Weather.

Researchers are encouraged to propose topics in these areas and other related subjects.

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11. Academy Center for Unmanned Aircraft Systems Research (UAS)

The Academy Center for UAS Research educates our cadets as they prepare to become Air Force Officers, develops premiere UAS research capabilities and faculty, and provides world-class UAS research facilities, supporting a real-world experience for our cadets and producing needed research solutions for our military partners and sponsors. The research in support of this Center focuses on providing autonomous, decentralized solutions for systems of UAS that may also incorporate the use of land and water assets. Researchers may expect access to premier facilities, including lightweight UAS vehicles with supporting command and control infrastructure and test and development equipment.

Current research areas support the Center's goals. These include control system algorithms to direct autonomous vehicles; robotic control and navigation; robust communication systems that meet the challenges of dynamic and unpredictable network topology changes; inexpensive sensor network designs that incorporate fusion techniques for target identification, localization, and tracking; and event-driven, multithreaded software architectures. Researchers are encouraged to propose topics in these areas or in areas they feel will complement the Center's work.

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12. Center for Innovation (COI)

The USAFA COI performs a wide range of cadet focused research and innovation tasks, projects and programs in support of DHS Science and Technology (S&T),

Office of the Secretary of Defense (OSD), DoD, and Intelligence Agencies. The COI also focuses on cadet research and innovations that support a Title III Section 313 DHS S&T program called “Technology Clearinghouse to Encourage and Support Innovative Solutions to Enhance Homeland Security.” The innovation program places equal emphasis on basic and applied research as well as prototyping and field testing novel technologies for use by warfighters and first responders. The COI focuses on creating novel linkages between old and new technologies that can lead to game changing process innovations. The COI research program is geared toward providing all undergraduates with a rich, relevant research and innovation experience while answering critical needs of our highly varied customer base. Researchers may expect extensive access to premier facilities, tremendous latitude of pursuits and single-minded focus on research and innovation tasks, but must incorporate student participation in their projects, typically two to four students per semester. Substantial effort in this center is focused on how cadets would employ web 2.0/3.0 collaborative tools to enhance the ability of warfighters and first responders to achieve desired effects; as well as how cadets conduct distributed collaboration using 3D Worlds. Specifically, the COI is interested in championing innovations in the cyber area that blend the cadet’s collaborative social networking skills with the state-of-the art networks, computational nodes, trusted enclaves and delayed tolerant networks.

The COI is also interested in research to achieve a disruptive process innovation called Flexible Distributed Control/Coordination (FDC). FDC has the desired effect of changing and improving decision making within a Command and Control (C^2) hierarchy adding a collaborative element to the decision making process. It is believed FDC can achieve what is referred to as 3rd to 6th degree effects that cannot be accomplished within a traditional hierarchical organization. FDC may also be able to align social networking to achieve desired effects. Prototyping an intelligent networking infrastructure facilitates collaboration, with more socialized networking constructs, we hope can ultimately achieve a FDC capability. The improvements come as a result of improved information flow between hierarchies and throughout the layers of a hierarchy, much the same way as human interactions are guided today.

Current research strengths include several complementary thrusts. Crowdsourcing in a DoD/DHS environment; Virtual SCIFs capability; Silicon Photonics; Silicon Energy Storage; Core Routing & Switching; ad hoc encrypted mobility; IP and digital communications; virtualization; media and content and network management. Immersive connected innovations interest include real-time ray tracing (3D water and 3D display); 3-D Internet and data visualization; Co-Processor Memory Sharing for Visual Computing; Confrontational Computing: Socializing Around Arguments on the Web; Human-Centric Vision of Consumer Applications; 2D Interconnect for Tera-scale Processors; Collaborative Visual Analytics in Virtual Worlds; Parallel Programming Tools: Enhancing Computer Vision; Bringing Mobility to Virtual

Worlds; Everyday Sensing and Perception; Clone Cloud: Augmented Smartphone Applications Through Cloud Execution; Distributed Applications with Adaptable Security; Router Bricks: Enabling General-Purpose Network Infrastructure; Cloud Computing - near term platform approaches, security federation, enterprise collaboration and scalable data storage; internet-scale general-purpose information exchange service facilitates, controls and monitors the secure borderless delivery of messages among a wide range of internet-connected devices and enterprise applications; Collaborative Data Management - Automatic assignment of semantics to data. Researchers are encouraged to propose topics in these areas and other allied COI subjects.

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13. Electrical and Computer Engineering Research

The Department of Electrical and Computer Engineering (DFEC) conducts research to produce needed solutions for our military partners and sponsors while providing real-world engineering experience for our cadets and aiding in the professional development of our faculty. Research in the areas of energy security and smart grid technology are sought to include concepts associated with effective demand management, integration of multiple generation sources and communication of energy events.

The DFEC research program currently includes investigations in the following areas:

- RF measurement and systems development,
- Micro-Electro-Mechanical Systems (MEMS) applications,
- circuit development,
- robotics and
- renewable energy.

Researchers may expect access to fully equipped facilities, including a state-of-the-art Anechoic Chamber and RF laboratory, MEMs design and test capabilities, various robotics platforms and test and development equipment as well as printed circuit board prototyping support. Examples of existing research include improvised explosive device (IED) detection, radar cross section (RCS) analysis, MEMs-based antenna design, portable wind power generation and autonomous robot algorithms.

Researchers are encouraged to propose topics in these areas or in areas they feel will complement the department's work.

Research Director, USAFA/DFEC
USAF Academy, CO 80840
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14. K-12 STEM (Science, Technology, Engineering & Math) Outreach & Research

The Academy's research centers and Air Force research institutes are described at <http://www.usafa.edu/df/dfe/dfer/index.cfm?catname=research>. Most of these serve the Academy's STEM mission directly, which in turn addresses the nation's impending shortfall in the STEM workforce. Academy faculty members have individually performed a wide a variety of STEM research and outreach tasks at both local and national levels as part of their professional commitments to the community for many years. In 2010, the Academy created the K-12 STEM Outreach & Research Center to sustain and expand STEM outreach. The Center's goal is to address Air Force and DoD goals to enhance the quality of K-12 STEM education and encourage greater numbers of US citizen high school graduates to pursue college degrees and careers in STEM.

The Center brings the extensive facilities at the Academy, the business and technical talents of its faculty, and its leadership role in the community and Nation to partnerships with universities, K-12 school systems, non-profit foundations, professional and industry societies, and other agencies in southern Colorado (loosely defined as south of the Palmer Divide). Those partnerships provide K-12 teachers and students in southern Colorado with rich and wide experiences in STEM, including:

- Training of K-12 educators, with emphasis on improved methods of organizing and providing coherent curriculum packages from national providers (e.g., NASA, American Institute of Aeronautics & Astronautics, American Chemical Society, Civil Air Patrol).
- "Kindle the fire of curiosity" experiences for younger K-12 students and teachers and "sustainment of interest" experiences for older K-12 students and teachers.

Researchers may expect seasonal (i.e., summer) access to premier classroom and laboratory facilities, tremendous latitude in defining pursuits, and single-minded focus on STEM education, but they must seek to incorporate K-12 faculty and student participation in all their projects. Researchers are encouraged to submit

science-based proposals in these and associated STEM outreach areas which develop and implement coordinated programs that lend themselves to longitudinal studies of their efficacy.

Currently available facilities, instrumentation and research efforts can be found at <http://www.usafa.edu/?catname=Dean%20of%20Faculty>

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15. Center for Space Situational Awareness Research(Department of Physics)

The Center for Space Situational Awareness Research (CSSAR) in the Department of Physics (DFP) conducts research across a variety of areas in support of the Air Force, DoD, NASA and other government and commercial sponsors. Making use of USAFA's extensive experimental facilities housed in several academic departments, DFP pursues a range of research efforts, with an emphasis on basic and applied research. The Space Situational Awareness (SSA) relevant research programs are geared toward providing all undergraduates with a rich, relevant research experience while answering critical research needs of our highly varied customer base. Researchers may expect extensive access to premier facilities, tremendous latitude of pursuits and single-minded focus on research tasks, but must seek to incorporate cadet participation in their projects, typically one to two cadets per semester.

With more nations building and launching satellites, space has become more congested, contested, and competitive. SSA is a vital component of U.S. national security due to the role space and cyberspace play in our military operations. CSSAR is developing world-class SSA capabilities and facilities at USAFA to include the 2-meter Fast-Tracking Telescope (FTT), the Falcon Telescope Network (FTN), the Falcon Radar Fence (FRF) and the Cadet Space Operations Center (CSOC). The FTN is a global network of small aperture robotic optical telescopes

focused on satellite characterization through simultaneous observations from multiple illumination geometries. It will also be used for testing handoff and cueing techniques as well as smart network and resource management. The CSOC will be the hub in which all of USAFA sensors are operated and controlled. The CSOC will be a test bed for new SSA algorithms that allow for improved capability in maintaining SSA leading to predictive analysis and assessment.

Current research areas of emphasis include space object characterization via resolvable and non-resolvable imaging using both passive and active optical and radar observations, improvements to satellite orbit determination and prediction (methodology, algorithms and processing), modeling of space surveillance sensors to enhance algorithm development and fusion of disparate data sources to maximize the situational awareness. Researchers are encouraged to propose topics in these areas and other related subjects.

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16. Human Performance Lab

The body of the airman is as important to mission success as technology and weapons. The USAF Academy's Human Performance Lab (HPL) is a key element to identifying how the Air Force can keep our airmen physically safe as they complete their missions in a wide variety of terrains and environments. Under the direction of the USAFA Athletic Department, the HPL applies sports science principles to improve Academy athletic teams and individual cadet performance. Coaches, cadet athletes, and cadets receive specific physiological information by way of testing, research, training, and education. The lab also provides subject matter expertise on the Air Force fitness program and battlefield airman human performance issues, offering scientific data through research and exercise science principles. As a result, the HPL offers a venue for cadet researchers and qualified exercise physiology interns to complete independent study research in the fields of exercise physiology, strength and conditioning, biology, biochemistry, and biomechanics.

The HPL tests and trains more than 1,000 cadets and approximately 100 faculty and staff members annually. Some of the projects undertaken by the HPL are joint efforts with the Air Force Research Lab (AFRL), Air Force Special Operations

Personnel, Air Force Security Forces, the Injury Prevention Research Laboratory, and the Academy's Life Sciences Research Center. Most HPL projects offer cadet research components as well as direct Air Force or Department of Defense field applications.

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b. Research Institute

1. Institute for Information Technology Applications

The Warfighter's Edge Team (a Rapid Application Development team, under the Institute for Information Technology Applications) performs a myriad of cutting edge software development with research necessary for interaction with legacy software solutions. The team is primarily focused on the needs of unit level warfighters. Development projects range from interface development using plug in technologies to direct database calls to web service requests. The development team is geared toward interfaces with Air Force programs such as Portable Flight Planning System (PFPS) [and its 5.0 follow on], FalconView, Joint Mission Planning System (JMPS), Patriot Excalibur, TaskView, Theater Battle Management Core System (TBMCS) – Unit and force level and other common warfighter programs. Development is conducted with Team Foundation Server in the .NET programming language (C# or VB) with unit tests covering code. Agile development, specifically SCRUM is performed by the Warfighter's Edge Team.

Code is produced on the Defense Research and Engineering Network (DREN), is compliant with DoD regulations including Standard Technical Implementation Guides (STIGs), ASACoE certifications, AFNIC (EITDR) processes and requirements. Software is used on NIPR (Unclassified but Sensitive Internet Protocol Router), SIPR (Secret Internet Protocol Router) and JWICS (Joint Worldwide Intelligence Communications System) networks, therefore appropriate security clearances must be held. Research agreements with outside agencies are common.

Strengths are a self-contained sustainment capability including subject matter experts on staff with real world operational aircrew, C&A and testing.

Overview of some products can be found at <http://wedge.hpc.mil>

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c. Other

1. Department of Behavioral Sciences and Leadership

The Department of Behavioral Sciences and Leadership is involved in multiple basic and applied research efforts that span the domains of human behavior. Specifically, we have expertise in areas such as human factors, leadership, sociology, social psychology, clinical psychology, social work, general psychology, biopsychology and cognition. The research program in the department is designed to leverage the expertise of the diverse faculty while at the same time provide undergraduates with relevant, applied experience in research through independent study projects, summer research programs and working alongside faculty on ongoing projects. This is accomplished through research conducted locally and also through numerous collaborations with other DoD agencies and academic institutions.

Current topics of interest range across the behavioral sciences and include:

- Psychosocial resiliency among soldiers who have deployed during Operation Iraqi Freedom and Operation Enduring Freedom.
- The examination of leaders' decision making and performance in complex socio-cultural and technological contexts. The goal is to enhance flexible and adaptive decision making and consequent behavior in military and interagency individuals and teams across the spectrum of current and potential military and civil-military (interagency and coalition) operations.
- Remotely Piloted Aircraft (RPA) pilot selection.
- Impact of the repeal of DoD Don't Ask Don't Tell policies.
- Implications of sleep patterns and sleep disturbances on academic performance and military operations.
- Teaching and accessing 'respect for human dignity'.
- Reframing the discussion and DoD's approach to suicide prevention.

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2. Department of Foreign Languages and the Office of International Programs

Our ever-expanding global Air Force mission demands increasing foreign language capability and intercultural competence in our officer corps to support national security strategies. Foreign language programs at USAFA seek to expand the opportunities for USAFA cadets to enhance their foreign language skills and their understanding of world cultures in Arabic, Chinese, French, German, Japanese, Russian, Portuguese or Spanish. Beyond the classroom, language acquisition and cultural understanding is enhanced through study abroad opportunities for cadets such as the Cadet Summer Foreign Language Immersion Program, the Cadet Cultural Immersion Program, the Semester Exchange Abroad Program, the Semester Study Abroad Program, and the Cadet International Academy Visits Program. Research and assessment tools within these programs and in-classroom curricula, are essential to produce officers with some level of foreign language proficiency and intercultural competence. Research interests in foreign language and international programs include but are not limited to the following areas:

- Methods to assess foreign language proficiency of students in different levels
- Methods to assess foreign language proficiency in various modalities
- The impact of language and/or cultural immersions on language and intercultural competence development of students
- The use and effectiveness of various technologies in teaching and assessing foreign languages

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3. Interdepartmental Program of Operations Research and Analytics

This interdepartmental program leverages the talents of faculty members across multiple departments in the disciplines of operations research, systems engineering, management, and others. These individuals provide exceptional educational opportunities for cadets primarily supporting capstone projects in operations research. In addition, the program supports cadet projects such as new venture analyses, systems engineering process improvements, as well as a

number of independent study projects and summer research programs. This is accomplished through numerous collaborations with other governmental and non-profit agencies. The program supports local organizations as our students work with real clients in real agencies addressing real issues. While local organizations provide Air Force Academy cadets an opportunity to experience organizational dynamics, the program also supports defense and homeland security agencies worldwide.

Each year cadets enrolled in Mathematical Sciences, Operations Research, Management, and Systems Engineering Management Capstone courses develop projects that solve real world problems for client organizations with tools they have learned at the Academy. Faculty and staff directly support these initiatives through both mentorship and research. While mathematics and management are well known fields, the operations research and analytics disciplines have developed within the advent of computer technology. Operations research and analytics methods focus on analyses that combine mathematical, econometric, computer systems and managerial concepts to improve operations and processes. Current topics of interest range across operations research and the management sciences and include, but are not limited to:

- Scheduling, routing, assignment, and resource allocation issues
- Modeling and simulation of organizational operations and processes
- Statistical analysis of organizational processes and business functions
- Decision models supporting both strategic and tactical decisions

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II. Award Information

- a. The Government anticipates the award of grants, cooperative agreements or contracts under this BAA. It is anticipated that the cumulative amount for awards under this BAA will not exceed ninety million dollars.
- b. The amount of resources made available to this BAA will depend on the quality of the proposals received and the availability of funds.
- c. Awards may start any time during the fiscal year.

- d. Since this BAA was published in October 2009, USAFA has awarded 71 grants, cooperative agreements, and contracts, totaling approximately \$44 million, to over 62 different recipients.

USAFA-BAA-2009-1 AWARD STATISTICS			
Section	Research Center, Institute, Department	Number of Awards	Average Award Value
I.a.1.	Aeronautics - Aeronautics Research	10	\$ 273,067.52
I.a.2.	Aeronautics - Modeling and Simulation Research	2	\$ 290,194.00
I.a.3.	Astronautics - Space Systems Research	3	\$ 446,953.78
I.a.4.	Bioenergy and Biomimetics	2	\$ 74,042.50
I.a.5.	Chemistry	3	\$ 185,226.30
I.a.6.	Computer Science	2	\$ 99,305.95
I.a.7.	Engineering Mechanics	12	\$ 1,965,547.63
I.a.8.	Laser and Optical Physics	15	\$ 245,152.96
I.a.9.	Physics	10	\$ 281,071.56
I.a.10.	Center for Physics Education Research	1	\$ 169,506.76
I.a.11.	Academy Center for Unmanned Aircraft Systems Research	3	\$ 638,023.86
I.a.12.	Center of Innovation	2	\$ 1,870,216.46
I.a.14.	Science, Technology, Engineering and Math Outreach and Research	1	\$ 665,167.80
I.a.15.	Center for Space Situational Awareness Research	3	\$ 450,340.41
I.b.1.	Institute for Information Technology Applications	1	\$ 40,000.00
I.c.1.	Behavioral Sciences and Leadership	1	\$ 140,000.00

III. Eligibility Information

All responsible, potential applicants from academia and industry are eligible to submit proposals. USAFA particularly encourages proposals from small businesses, historically black colleges and universities, minority institutions and minority researchers. However, no portion of this BAA is set aside for a specific group.

Proposals from Federal Agencies, including subcontracting/sub-recipient efforts will not be evaluated under this BAA. Federal agencies should contact the Technical Program Manager associated with the technical area listed in Section I of the BAA to discuss funding through the internal Government procedures. Cost sharing is encouraged but not required.

IV. Application and Submission Information

- a. Internet Address to Request Announcement Package** – This announcement may be accessed from the Internet at Grants.gov. See 'For Electronic Submission' below. A copy of this BAA is also posted on FedBizOpps.
- b. Marking of White Papers and Proposals** - As previously stated, USAFA is seeking white papers which do not contain proprietary information. If proprietary information is submitted, USAFA will make every effort to protect the confidentiality of the proposal and any evaluations. However, under the Freedom of Information Act (FOIA) requirements, such information (or portions thereof) may potentially be subject to release. If protection is desired for proprietary or confidential information, the proposer must mark the white paper and/or proposal with a protective legend found in FAR 52.215-1(e), Instructions to Offerors – Competitive Acquisition (Jan 2004), (modified to permit release to outside evaluators retained by USAFA). Since the Government anticipates the award of grants, cooperative agreements, or contracts, this statement is applicable to proposals for all three of these potential instruments.
- c. Content and Form of Application Submission (White Paper or Proposal)–**
- 1. White Papers** - Before submitting a proposal, you may wish to further explore potential proposal opportunities. You can do this by contacting the appropriate USAFA Technical Program Manager who can provide greater detail about a particular opportunity; the Technical Program Manager may then ask for a white paper. The initial preference is for white papers over full applications/proposals. However, in your conversations with a Government official, be aware only warranted contracting and grants officers are authorized to commit the Government.

If you prefer, or the Technical Program Manager requests, you may submit a white paper, which must briefly describe the proposed research projects:

- objective,
- general/technical approach,
- rough-order of magnitude cost,
- anticipated outcome,
- impact of specific research,
- government/cadet involvement and
- public purpose

The white paper may also contain any unique capabilities or experience you may have (e.g., collaborative research activities involving Air Force, DoD, or other Federal laboratory.) The Technical Program Manager may have additional guidelines regarding form and content of preliminary white papers or proposals.

For additional information regarding white papers and for your ease and consistency, please see the AFRL BAA Guide for Industry at: www.wpafb.af.mil/library/factsheets/factsheet.asp?id=6790.%20.

White Paper Format

- Paper Size – 8.5 x 11 inch paper
- Margins – 1 inch
- Spacing – single or double spaced
- Font – Times New Roman, 10 or 12 point
- Page Limitation – None, although unnecessarily elaborate White Papers are not desirable.
- Copies – as discussed with the Technical Program Manager
- Content – as described above

White papers must be submitted to 10MSG.LGCC@us.af.mil; they should NOT be submitted directly to the Technical Program Manager or to Grants.gov.

- 2. Full Proposals** – All proposals should be submitted electronically and must include the SF 424 (R & R) form from www.grants.gov/agencies/aforms_repository_information.jsp as the cover page. Proposals must also include all other forms listed in Grants.gov as “mandatory forms.” Unnecessarily elaborate brochures, reprints or presentations beyond those sufficient to present a complete and effective proposal are not desired. To convert attachments into PDF format, Grants.gov provides a list of PDF file converters at www.grants.gov/help/download_software.jsp

Full Proposal Format

- Paper Size - 8.5 x 11 inch paper
- Margins – 1 inch
- Spacing – single or double spaced
- Font – Times New Roman, 10 or 12 point
- Page Limitation – None, although unnecessarily elaborate proposals are not desirable
- Attachments – submit in **PDF** format (Adobe Portable Document Format)
- Content – as described below

Required Advance Preparation: Proposals For Electronic Submission -

Electronic proposals must be submitted through Grants.gov. There are several one-time actions your organization must have completed before it will be able to submit applications through Grants.gov. Well before the submission deadline, you should verify the persons authorized to submit proposals for your

organization have completed those actions. If not, it may take them up to 21 days to complete the actions before they will be able to submit applications.

The process your organization must complete includes obtaining a Dun and Bradstreet Data Universal Numbering System (DUNS) number, registering with the Central Contract Registry (CCR), registering with the credential provider and registering with Grants.gov. (Designating an E-Business Point of Contact (EBiz POC) and obtaining a special password called MPIN are important steps in the CCR registration process.) Go to www.grants.gov/applicants/get_registered.jsp. Use the Grants.gov Organization Registration Checklist at the same site to guide you through the process. To submit a proposal through Grants.gov, applicants will need to download Adobe Reader. This small, free program will allow you to access complete and submit applications electronically and securely. To download a free version of the software, visit the following web site: www.grants.gov/help/download_software.jsp. Consult Grants.gov to ensure you have the required version of Adobe Reader installed.

Should you have questions relating to the registration process, system requirements, how an application form works, the submittal process or Adobe Reader forms, call Grants.gov at 1-800-518-4726 or support@grants.gov for updated information.

d. Submitting the Application (Steps to Formally Submitting a Proposal)

- 1. For Electronic Submission – Application forms and instructions are available** at Grants.gov. To access these materials, go to www.grants.gov, select “Apply for Grants” and then follow the instructions. In the “Download a Grant application Package” section, enter the funding opportunity number for this announcement (USAFA-BAA-2009-1). You can also search for the Catalog of Federal Domestic Assistance (CFDA) Number 12.800, Research Interests of the US Air Force Academy. On the Selected Grant Applications for Download page, click on 'download' under the heading 'Instructions and Applications' to download the application package.

All required forms to be submitted as part of the proposal will be listed as a “mandatory form” in the ‘Instructions and Applications’ section on Grants.gov. Individual calls may have additional requirements; these requirements will be specified in the applicable call.

Note: All attachments to all forms must be submitted in PDF format (Adobe Portable Document Format). Grants.gov provides links to PDF file converters at this site: www.grants.gov/help/download_software.jsp.

2. **SF 424 Research and Related Form (R & R)**- The SF 424 (R&R) form can be downloaded from the following website: www.grants.gov/agencies/aforms_repository_information.jsp and must be used as the cover page for all electronic proposals. Complete all the required fields and the following instructions for the specified fields. Mandatory fields will have an asterisk marking the field and will appear yellow on most computers. In grants.gov, some fields will self-populate based on the BAA selected. Please fill out the SF 424 first, as some fields on the SF 424 are used to auto populate fields in other forms. The completion of most fields is self-explanatory except for the following special instructions:
- **Field 2:**The Applicant Identifier may be left blank.
 - **Field 3:**The Date Received by State and the State Application Identified are not applicable to research.
 - **Field 7:**Complete as indicated. If Small Business is selected, please note if the organization is Woman-owned and/or Socially and Economically Disadvantaged. If the organization is a Minority Institution, select "Other" and under "Other Specify)" note you are a Minority Institution (MI).
 - **Field 9:**List USAFA as the reviewing agency. This field is pre-populated in grants.gov.
 - **Field 17:** Choose 'No' and check 'Program is Not Covered By Executive Order 12372'.
 - **Attachments:** All attachments to all Grants.gov forms must be submitted in PDF format (Adobe Portable Document Format). To convert attachments into PDF format, Grants.gov provides a list of PDF file converters at www.grants.gov/help/download_software.jsp
3. **Certification:** All awards require some form of certification of compliance with national policy requirements. For assistance awards, i.e., grants and Cooperative agreements, proposers using the SF 424 (R&R) are providing the certification required by 32 CFR Part 28 regarding lobbying, by completing block 17 of the form. (The full text of this certification may be found on the Wright-Patterson Air Force Base path: <http://www.wpafb.af.mil/search/generalsearch.asp?q=lobbying+certification&site=WrightPatt> as a pdf file entitled "http://www.wpafb.af.mil/shared/media/document/ AFD-070817-127.pdf". If you have lobbying activities to disclose, you must complete the optional form SF-LLL, Standard Form – LLL, 'Disclosure of Lobbying Activities' in the downloaded PureEdge forms package.
4. **R&R Other Forms:** The following other forms must be used for all electronic proposals: R&R Senior/Key Person Profile form, R&R Project/Performance Site Locations form, R&R Other Project Information form, the R&R Budget form, and any other forms listed in the "Mandatory Forms" portion of Grants.gov. The R&R Subaward Budget Attachment Form is required when sub-awardees are

involved in the effort. The SF-LLL form is required when applicants have lobbying activities to disclose. PDF copies of all forms may be obtained at the Grants.gov website.

5. **R&R Senior/Key Person Profile Form** – Complete the R&R Senior/Key Person Profile Form for those key persons who will be performing the research. The principal purpose and routine use of the requested information are for evaluation of the qualifications of those persons who will perform the proposed research. For the principal investigator and each of the senior staff, provide a short biographical sketch and a list of significant publications (vitae) and attach it to the R&R Senior/Key Person Profile Form.
6. **R&R Project/Performance Site Locations Form** – Complete all information as requested.
7. **R&R Other Project Information Form - Human Subject/Animal Use and Environmental Compliance.**

Human Subject Use. Each proposal must address human subject involvement in the research by addressing Field 1 and 1a of the R&R Other Project Information Form. If Field 1 indicates “Yes”, the Air Force must receive a completed OMB No. 0990-0263 form before a contract, grant, or cooperative agreement may be awarded to support research involving the use of human subjects. Attach the document to the R&R Other Project Information Form. If using Grants.gov, a completed OMB No. 0990-0263 form shall be attached in field 11 of the R&R Other Project Information Form. The OMB No. 0990-0263 is available electronically at:

www.wpafb.af.mil/library/factsheets/factsheet.asp?id=9388.

Refer any questions regarding human subjects to Gail Rosado of the Plans and Programs Directorate, Institutional Review Board (IRB) at: (719) 333-6593 or via email at: gail.rosado@usafa.edu.

Animal Use. Each proposal must address animal use protocols by addressing Field 2 and 2a of the R&R Other Project Information Form. If selected for award, additional documentation in accordance with Air Force standards will be required. For ease of offerors and consistency, additional proposal guidance may be found at the following web site:

www.wpafb.af.mil/library/factsheets/factsheet.asp?id=9388.

Refer any questions regarding animal subjects to Dr. George Mastroianni, Chair of the USAFA Institutional Animal Care and Use Committee (IACUC) at: (719) 333-6035 or via e-mail at: george.mastroianni@usafa.edu.

Environmental Compliance. Federal agencies making contract, grant or cooperative agreement awards and recipients of such awards must comply with various environmental requirements. The National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. Sections 4321-4370 (a), requires agencies consider the environmental impact of “major Federal actions” prior to any final agency decision. With respect to those awards which constitute “major Federal actions,” as defined in 40 CFR 1508.18, federal agencies may be required to comply with NEPA and prepare an environmental impact statement (EIS) even if the agency does no more than provide grant funds to the recipient. Questions regarding NEPA compliance should be referred to the applicable USAFA Technical Program Manager. Most research efforts funded by USAFA will, however, qualify for a categorical exclusion from the need to prepare an EIS. Air Force instructions/regulations provide for a categorical exclusion for basic and applied scientific research usually confined to the laboratory, if the research complies with all other applicable safety, environmental and natural resource conservation laws. Each proposal shall address environmental impact by filling in fields 4a through 4d of the R&R Other Project Information Form. This information will be used by USAFA to make a determination if the proposed research effort qualifies for categorical exclusion.

8. **Abstract** - Include a concise (not to exceed 300 words) abstract that describes the research objective, technical approaches, anticipated outcome and impact of the specific research. In the header of the abstract, include the Technical Program Manager’s name who should receive the proposal for consideration and evaluation. Attach the Abstract to the R & R Other Project Information form in field 6.

9. **R&R Other Project Information Form - Project Narrative Instructions**

Project Narrative – Describe clearly the research including the objective and approach to be performed, keeping in mind the evaluation criteria listed in Section V of this announcement. This section may describe the anticipated involvement by the Government including USAFA Cadets, as well as the potential public benefit(s) which may result from the research. Also briefly indicate whether the intended research will result in environmental impacts outside the laboratory and how the proposer will ensure compliance with environmental statutes and regulations. Attach the proposal narrative to R&R Other Project Information form in field 7.

Project Narrative - Statement of Objectives – This narrative should not contain proprietary information. Describe the actual research to be completed, including goals and objectives, on one page titled Statement of Objectives. This statement of objectives may be incorporated into the award instead of incorporating the entire technical proposal. Active verbs should be used in this

statement (for example, “conduct” research into a topic, “investigate” a problem, “determine” to test a hypothesis).

Project Narrative - Research Effort – Describe in detail the research to be performed. State the objectives and approach and their relationship and comparable objectives in progress elsewhere. Additionally, state knowledge in the field and include a bibliography and a list of literature citations. Discuss the nature of the expected results. The adequacy of this information will influence the overall evaluation. Proposals for renewal of existing support must include a description of progress if the proposed objectives are related.

Project Narrative – Principal Investigator (PI) Time. PI time is required. List the estimate of time the principal investigator and other senior professional personnel will devote to the research. This shall include information pertaining to other commitments of time, such as sabbatical or extended leave and proportion of time to be devoted to this research and to other research. Awards may be terminated when the principal investigator severs connections with the organization or is unable to continue active participation in the research. State the number of graduate students for whom each senior staff member is responsible. If the principal investigator or other key personnel are currently engaged in research under other auspices, or expect to receive support from other agencies for research during the time proposed for USAFA support, state the title of the other research, the proportion of time to be devoted to it, the amount of support, name of agency, dates, etc. Send any changes in this information as soon as they are known. Submit a short abstract (including title, objectives and approach) of research and a copy of the budget for both present and pending research projects.

Project Narrative – Facilities. When applicable, describe facilities available for performing the proposed research and any additional facilities or equipment the organization proposes to acquire at its own expense. If applicable, indicate how and when government-owned facilities or equipment already possessed will be used. Reference the facilities contract number or, in the absence of a facilities contract, the specific facilities or equipment and the number of the award under which they are accountable.

Project Narrative – Special Test Equipment. List special test equipment or other property required to perform the proposed research. Segregate items to be acquired with award funds from those to be furnished by the Government. When possible and practicable, give a description or title and estimated cost of each item. When information on individual items is unknown or not available, group the items by class and estimate the values. In addition, state why it is necessary to acquire the property with award funds.

Project Narrative – Equipment. Justify the need for each equipment item. Additional facilities and equipment will not be provided unless the research cannot be completed by any other practical means. Include the proposed life expectancy of the equipment and whether it will be integrated with a larger assemblage or apparatus. If so, state who owns the existing apparatus.

Project Narrative – High Performance Computing Availability. Researchers are supported under a USAFA grant, contract or cooperative agreement and meet certain restrictions, are eligible to apply for special accounts and participation in a full-spectrum of activities within the DOD high performance computing modernization program. This program provides, at no cost to the user, access to a range of state-of-the-art high performance computing assets and training opportunities that will allow the user to fully exploit these assets. Details of the capabilities of the program can be found at the following Internet address: www.hpcmo.hpc.mil. Researchers needing high performance cycles should address the utilization of this program to meet their required needs. USAFA Technical Program Managers will facilitate the establishment of accounts awarded.

- 10. R&R Budget Form** - Estimate the total research project cost(s). Categorize funds by year and provide annualized budgets for projects lasting more than one year. Each budget year cannot exceed 12 months. In addition to the R&R Budget forms available on Grants.gov, the budget proposal should include a budget justification for each year, clearly explaining the need for each item. The following cost element categories listed below must be included in the budget form (when the category is a component of the budget):
- i. **Direct Labor:** Direct labor should be detailed by number of labor hours to be worked by proposed person within each budget year by the hourly rate of that person.
 - ii. **Labor and Overhead Rates:** Direct labor hours, with their applicable rates must be broken out by each budget year and the bases used clearly identified. The source of labor and overhead rates and all pricing factors should be identified. For instance, if a Forward Pricing Rate Agreement (FPRA) is in existence, it should be noted, along with the Administrative Contracting Officer's (ACO's) name and telephone number. If the rates are based on current experience in your organization, provide the history base used and clearly identify all escalation, by year, applied to derive the proposed rates. If computer usage is determined by a rate, identify the basis used and rationale used to derive the rate.
 - iii. **Material/Equipment:** List all material/equipment items by type and kind with associated costs and advise if the costs are based on vendor quotes, data and/or engineering estimates; provide copies of vendor quotes and/or catalog pricing data.

- iv.** Subcontractor Costs: Submit all subcontractor proposals and analysis with your cost proposal (See FAR 15.404-3(b)). If the subcontractor will not submit cost and pricing information to the offeror, the subcontractor must submit this information directly to the Government for analysis. On all subcontracts and interdivisional transfers, provide the method of selection used to determine the subcontractor and the proposed contract type of each subcontract. An explanation shall be provided if the offeror proposes a different amount than that quoted by the subcontractor. The offeror's proposal must also:
- Identify principal items/services to be subcontracted. Identify prospective subcontractors and the basis on which they were selected. If non-competitive, provide selected source justification
 - Identify the type of contractual business arrangement contemplated for the subcontract and provide a rationale for same.
 - Identify the basis for the subcontract costs (e.g., firm quote or engineering estimate, etc).
 - Identify the cost or pricing data or information other than cost or pricing data submitted by the subcontractor.
 - Provide an analysis of the proposed subcontract in accordance with FAR 15.404-3(b). Provide an analysis concerning the reasonableness, realism and completeness of each subcontractor's proposal. If the analysis is based on comparison with prior prices, identify the basis on which the prior prices were determined to be reasonable. The analysis should include, but not be limited to, an analysis of: materials, labor, travel, other direct costs and proposed profit or fee rates.
- v.** Special Tooling or Test Equipment: When special tooling, and/or test equipment is proposed, attach a brief description of said items and indicate if they are solely for the performance of this particular contract or project and if they are or are not already available in the offeror's existing facilities. Indicate quantities, unit prices, whether items are to be purchased or fabricated, whether items are of a severable nature and the basis of the price. These items may be included under Direct Material in the summary format.
- vi.** Consultants: When consultants are proposed in the performance of the grant, cooperative agreement or contract, indicate the specific project or area in which such services are to be used. Identify each consultant, number of hours or days proposed and the consultant's rate per hour or day. State the basis of said rate and provide an analysis of the acceptability of the consultant's rate based upon the scope of work/research to be accomplished.
- vii.** Travel: Travel costs must be justified and related to the needs of the project. Identify the number of trips, location/destination and purpose. Travel costs should be broken out by trip, to include the number of travelers, airfare, per diem, lodging, etc.

viii. Conferences and Workshops: USAFA understands it is essential for the scientific community to maintain clear lines of communication for thorough and well-reasoned research to be accomplished. Support for conferences and workshops are an extremely valuable tool for USAFA. It allows our technical managers the opportunity to receive current information in their respective disciplines. It also allows USAFA the opportunity to inform the research community of the current thrust of USAFA's programs. Conferences and workshops constitute a key forum for research and technology interchange. USAFA accepts proposals from all recognized scientific, technical or professional organizations who qualify for federal tax-exempt status. USAFA's financial support through appropriate financing vehicles for conferences and workshops is dependent on the availability of funds, Technical Program Manager's discretion and certain other restrictions including:

- USAFA support for a workshop or conference is not to be considered as an endorsement of any co-sponsoring organization, profit or non-profit.
- The subject matter of the conference or workshop is scientific, technical, or involves professional issues that are relevant to USAFAs mission of managing the Air Force's Basic and Applied Research Programs.
- The purpose of our support is to transfer federally developed technology to the private sector or to stimulate wider interest and inquiry into the relevant scientific, technical, or professional issues relevant to USAFAs mission of managing the Air Force's Basic and Applied Research Programs.
- Proposals for conference or workshop support should be submitted with the original proposal; in some instances, a minimum of six months prior to the date of the conference is necessary. Proposals should include the following:
 - (A) Summary indicating the objective(s) of the conference/workshop
 - (B) Topic(s) to be covered and how they are relevant to USAFA's mission of managing the Air Force's Basic and Applied Research Programs
 - (C) Title, location and date(s) of the conference/workshop
 - (D) Explanation of how the conference/workshop will relate to the research interests of USAFA
 - (E) Chairperson or principal investigator and his/her biographical information
 - (F) List of proposed participants and method (or copies) of announcement or invitation
 - (G) A note whether foreign nationals will be present

Evaluation Criteria For Conference Support: Anticipated use of funds requested from USAFA proposals for conferences and workshops will be evaluated using the following criteria. All factors are of equal importance:

- Technical merits of the proposed research and development
 - Potential relationship of the proposed research and development to the Department of Defense
 - The qualifications of the principal investigator(s) or conference chair(s)
 - The realism and reasonableness of cost including proposed cost sharing and availability of funds. Cost Information (In addition to information required on SF 424 Research and Related (R & R) Budget forms):
 - (A) Total project costs by major cost elements
 - (B) Anticipated sources of conference/workshop income and amount from each source
- ix.** Fee: Applicants who enter a fee on Part J of the budget will not be eligible to receive a grant or cooperative agreement.
- x.** Attachment: Educational and non-profit organizations should submit a spending profile which aligns itself with DoDGARs 32.22, as an attachment to the cost proposal. Attach the budget justification and/or spending profile to Section K of the R&R Budget form.

e. Grants.gov Application Receipt Notices

For Electronic Submission - The applicant's approved account holder for Grants.gov will receive a confirmation page upon completing the submission to Grants.gov. This confirmation page is a record of the time and date stamp that is used to determine whether the proposal was submitted by the deadline. After an institution submits an application, Grants.gov generates a submission receipt via email and also sets the application status to "Received". This receipt verifies the Application has been successfully delivered to the Grants.gov system. Next, Grants.gov verifies: the submission is valid by ensuring it does not contain viruses, the opportunity is still open, and the applicant login and applicant DUNS number match. If the submission is valid, Grants.gov generates a submission validation receipt via email and sets the application status to "Validated". If the application is not validated, the application status is set to "Rejected". The system sends a rejection email notification to the institution and the institution must resubmit the application package. Applicants can track the status of their application by logging in to Grants.gov.

- f. Submission Due Dates and Times.** This announcement remains open until superseded or cancelled. White papers and proposals may be submitted at any time. Again, there is an initial preference for white papers over full applications/proposals. For additional information regarding the BAA process and for ease of offerors and consistency, USAFA has adopted the procedures

used in the ARFL BAA Guide for Industry at
www.wpafb.af.mil/library/factsheets/factsheet.asp?id=6790.

V. Application Review Information

- a. **White Papers** - White papers submitted under this BAA are evaluated through a peer or scientific review process. White papers will be evaluated by the appropriate USAFA Technological Program Manager. Additionally, white papers may be evaluated by outside evaluators retained by USAFA which may include other Government personnel with subject matter expertise or support contractor personnel. Employees of commercial firms under contract to the Government may be used to administratively process white papers. These support contracts include nondisclosure agreements prohibiting their contractor employees from disclosing any information submitted by other contractors. White papers submitted for a particular research area listed in Section I shall be evaluated under criteria as specified in their description in addition to the following four primary criteria. Subject to funding availability, all other white papers will be evaluated under the following four primary criteria, of equal importance, as follows:

1. Technical merits of the proposed research.
2. Potential relationship of the proposed research to the Department of Defense and/or US Air Force Academy.
3. Potential for cadet involvement in the proposed research.
4. The proposer's, principal investigator's, team leader's, or key personnel's qualifications, capabilities, related experience, facilities, or techniques or a combination of these factors are integral to achieving USAF objectives.

Upon completion of the review, white papers will be placed in one of three categories. Category I papers will be funded as possible, Category II papers would only be funded following those in Category I and papers considered to be Category III will not receive funding. A breakdown of the criteria for each category follows:

Category I

- White Paper is well conceived
- Scientifically & technically sound
- Pertinent to program goals and objective
- Offered by a responsible offeror
- Competent staff
- Supporting resources

Category II

- Scientifically or technically sound but requires further development

Category III

- Not scientifically or technically sound or does not meet agency needs

White Papers may be submitted for one or more topics or for a specific portion of one topic. A proposer may submit separate white papers on different topics or different proposals on the same topic. The U.S. Government does not guarantee an award in each topic area.

Further, be advised as funds are limited, otherwise meritorious white papers may not be funded. Therefore, it is important that white papers show strength in as many of the evaluation areas as practicable for maximum competitiveness.

White papers must be submitted to 10MSG.LGCC@us.af.mil; they should NOT be submitted directly to the Technical Program Manager. Unless otherwise stated in a call, all white papers will be evaluated as stated above and if selected for funding, a formal Request for Proposal will be sent to the recipient.

- b. Proposals** – Proposals submitted under this BAA are evaluated through a peer or scientific review process. If selected for contract award, the requirements of the Federal Acquisition Regulation will apply. Proposals will be evaluated by the appropriate USAFA Technological Program Manager. Additionally, proposals may be evaluated by outside evaluators retained by USAFA which may include support contractor personnel. Employees of commercial firms under contract to the Government may be used to administratively process proposals. These support contracts include nondisclosure agreements prohibiting their contractor employees from disclosing any information submitted by other contractors. Proposals submitted for a particular research area listed in Section I shall be evaluated under criteria as specified in their description in addition to the following six primary criteria and the realism and reasonableness of proposed costs. Subject to funding availability, all other proposals will be evaluated under the following six primary criteria, of equal importance, as follows:

1. Technical merits of the proposed research.
2. Potential relationship of the proposed research to the Department of Defense and/or US Air Force Academy.
3. Potential for cadet involvement in the proposed research.
4. The proposer's, principal investigator's, team leader's, or key personnel's qualifications, capabilities, related experience, facilities, or techniques or a combination of these factors are integral to achieving USAF objectives.
5. The likelihood of the proposed effort to develop new research capabilities and broaden the research base in support of U.S. national defense.
6. The proposer's and associated personnel's record of past performance.

In addition, proposal risk for technical, cost and schedule will be assessed as part of the evaluation of the above criteria. Following the evaluation, proposals will be placed in one of 3 categories. Category I proposals will be funded as possible, Category II proposals would only be funded following those in Category I and proposals considered to be Category III will not receive funding.

Category I

- Proposal is well conceived
- Scientifically & technically sound
- Pertinent to program goals and objective
- Offered by a responsible offeror
- Competent staff
- Supporting resources

Category II

- Scientifically or technically sound but requires further development

Category III

- Not scientifically or technically sound or does not meet agency needs

Offerors must indicate in their proposal, unless a match is required, if they are “not willing or able to cost share” or “able to cost share and/or offer these facilities/equipment/etc.”

Further, be advised as funds are limited, otherwise meritorious proposals may not be funded. Therefore, it is important that proposals show strength in as many of the evaluation areas as practicable for maximum competitiveness.

Additional administrative information regarding submission of applications is contained in Section VIII. The technical and cost information will be analyzed simultaneously during the evaluation process.

VI. **Award Administration Information**

- a. **Award Notices.** Should your proposal be selected for award, the contracting or grants/agreements officer will receive a letter from the Technical Program Manager stating this information. This is not an authorization to begin work. Your business office will be contacted by the grant/agreements or contracting officer to negotiate the terms of your award.

- b. **Reporting Requirements.** Grants and cooperative agreements typically require quarterly and/or annual and final technical reports, financial reports, final patent reports and closeout activities/documents. Contracts typically require annual and final technical and patent reports. Additional deliverables may be required based on the research being conducted. Additional reporting requirements associated with certain awards will be based on the nature and source of funding.

VII. Agency Contacts

Should you have questions about a technical research area, please contact the Technical Program Manager listed for the research topic areas listed in Section I.

**** Important Notice Regarding Questions of a Business Nature ****

All questions shall be submitted in writing to the Contracting Office by electronic mail (10MSG.LGCC@us.af.mil). Questions presented by telephone call, fax message, or other means will not be responded to.

VIII. Additional Information

- a. The cost of white paper and proposal preparation in response to this Announcement is not considered an allowable direct charge to any resulting award. Such cost is, however, an allowable expense to the normal bid and proposal indirect cost specified in FAR 31.205-18, or OMB Circular A-21, Cost Principles for Educational Institutions or OMB Circular A-122, Cost Principles for Nonprofit Organizations.
- b. Every effort will be made to protect the confidentiality of white papers and proposals and any evaluations. The proposer must mark the proposal with a protective legend in accordance with FAR 52.215-1(e), Instructions to Offerors – Competitive Acquisition (Jan 2004), if protection is desired for proprietary or confidential information. Offerors are reminded: this BAA is seeking unclassified research white papers and proposals that do not contain proprietary information.
- c. Offerors are advised employees of commercial firms under contract to the Government may be used to administratively process white papers and proposals. These support contracts include nondisclosure agreements prohibiting their contractor employees from disclosing any information submitted by other contractors.
- d. Only contracting or grants officers are legally authorized to bind the government.

- e. Responses should reference Broad Agency Announcement USAFA-BAA-2009-1.
- f. USAFA expects the performance of research funded by this announcement to be predominately fundamental. DoD Directive 5230.24 and DoD Instruction 5230.27 define contracted fundamental research in a DoD context as follows:

“Contracted Fundamental Research. Includes [research performed under] grants and contracts are (a) funded by budget Category 6.1 ("Research"), whether performed by universities or industry or (b) funded by budget Category 6.2 ("Exploratory Development") and performed on-campus at a university. The research shall not be considered fundamental in those rare and exceptional circumstances where the 6.2-funded effort presents a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies are unique and critical to defense and where agreement on restrictions have been recorded in the contract or grant.”

- g. Indirect Cost Limitation for Basic Research Awards Notices: The DoD Appropriations Act of 2011 (P.L. 112-10, Div. A) does not carry forward a limitation that the three preceding appropriations acts applied to reimbursement of indirect costs under grants, cooperative agreements, contracts, or similar arrangements. Prior year appropriations acts limited indirect cost reimbursement rates paid using funds made available in those acts for Basic Research; prior year awards remain subject to those limitations.
- h. Federal Awardee Performance and Integrity Information System (FAPIIS) Potential offerors should be aware that as of April 2010 (SAF/AQC Memo, “Contractor Responsibility (EPLS and FAPIIS Requirements) awardees of contracts or recipients of grants have been required to update the information in the Federal Awardee Performance and Integrity Information System (FAPIIS) on a semi-annual basis, throughout the life of the agreement (award), by entering the required information in the Central Contractor Registration database at <http://www.ccr.gov> (see 52.204-7). Contract clauses and Grant articles provide specific information on this requirement.
- i. Additional Subcontract /Subaward Reporting Requirements
The Federal Funding and Transparency Act and 22 September 2010 DDR&E memo, “New Reporting required Under DoD Grant and Cooperative Agreements” require that as of 01 October 2010 awardees of contracts and recipients of grants have been required to report Executive Compensation and First-Tier Subcontract/Subrecipient Awards for any contract or grant valued at \$25,000 or more excluding classified contracts or contracts/grants with

individuals. Two articles have been added to all awards as a consequence of this requirement. See below:

CCR Registration: Unless exempted by 2 CFR 25.110 all offerors must:

- (1) Be registered in the Central Contractor Registration (CCR) prior to submitting an application or proposal;
- (2) Maintain an active CCR registration with current information at all times during which it has an active Federal award or an application or proposal under consideration by an agency; and
- (3) Provide its DUNS number in each application or proposal it submits to the agency.
- (4) Offerors may obtain information on registration and annual confirmation requirements via the Internet at www.ccr.gov or by calling 1-866-606-8220.

Reporting Subawards and Executive Compensation.

a. Reporting of first-tier subawards.

1. *Applicability.* Unless you are exempt as provided in paragraph d. of this award term, you must report each action that obligates \$25,000 or more in Federal funds that does not include Recovery funds (as defined in section 1512(a)(2) of the American Recovery and Reinvestment Act of 2009, Pub. L. 111-5) for a subaward to an entity (see definitions in paragraph e. of this award term).

2. Where and when to report.

i. You must report each obligating action described in paragraph a.1. of this award term to <http://www.fsrs.gov>.

ii. For subaward information, report no later than the end of the month following the month in which the obligation was made. (For example, if the obligation was made on November 7, 2010, the obligation must be reported by no later than December 31, 2010.)

3. *What to report.* You must report the information about each obligating action that the submission instructions posted at <http://www.fsrs.gov> specify.

b. Reporting Total Compensation of Recipient Executives.

1. *Applicability and what to report.* You must report total compensation for each of your five most highly compensated executives for the preceding completed fiscal year, if—

i. the total Federal funding authorized to date under this award is \$25,000 or more;

ii. in the preceding fiscal year, you received—

(A) 80 percent or more of your annual gross revenues from Federal procurement contracts (and subcontracts) and Federal financial assistance subject to the Transparency Act, as defined at 2 CFR 170.320 (and subawards); and

(B) \$25,000,000 or more in annual gross revenues from Federal procurement contracts (and subcontracts) and Federal financial

assistance subject to the Transparency Act, as defined at 2 CFR 170.320 (and subawards); and

iii. The public does not have access to information about the compensation of the executives through periodic reports filed under section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m(a), 78o(d)) or section 6104 of the Internal Revenue Code of 1986. (To determine if the public has access to the compensation information, see the U.S. Security and Exchange Commission total compensation filings at <http://www.sec.gov/answers/execomp.htm>.)

2. *Where and when to report.* You must report executive total compensation described in paragraph b.1. of this award term:

i. As part of your registration profile at <http://www.ccr.gov>.

ii. By the end of the month following the month in which this award is made, and annually thereafter.

c. *Reporting of Total Compensation of Subrecipient Executives.*

1. *Applicability and what to report.* Unless you are exempt as provided in paragraph d. of this award term, for each first-tier subrecipient under this award, you shall report the names and total compensation of each of the subrecipient's five most highly compensated executives for the subrecipient's preceding completed fiscal year, if—

i. in the subrecipient's preceding fiscal year, the subrecipient received—

(A) 80 percent or more of its annual gross revenues from Federal procurement contracts (and subcontracts) and Federal financial assistance subject to the Transparency Act, as defined at 2 CFR 170.320 (and subawards); and

(B) \$25,000,000 or more in annual gross revenues from Federal procurement contracts (and subcontracts), and Federal financial assistance subject to the Transparency Act (and subawards); and

ii. The public does not have access to information about the compensation of the executives through periodic reports filed under section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. 78m(a), 78o(d)) or section 6104 of the Internal Revenue Code of 1986. (To determine if the public has access to the compensation information, see the U.S. Security and Exchange Commission total compensation filings at <http://www.sec.gov/answers/execomp.htm>.)

2. *Where and when to report.* You must report subrecipient executive total compensation described in paragraph c.1. of this award term:

i. To the recipient.

ii. By the end of the month following the month during which you make the subaward. For example, if a subaward is obligated on any date during the month of October of a given year (*i.e.*, between October 1 and 31), you must report any required compensation information of the subrecipient by November 30 of that year.

d. *Exemptions*

If, in the previous tax year, you had gross income, from all sources, under \$300,000, you are exempt from the requirements to report:

- i. Subawards,
and
- ii. The total compensation of the five most highly compensated executives of any subrecipient.

e. *Definitions*. For purposes of this award term:

1. *Entity* means all of the following, as defined in 2 CFR part 25:

- i. A Governmental organization, which is a State, local government, or Indian tribe;
- ii. A foreign public entity;
- iii. A domestic or foreign nonprofit organization;
- iv. A domestic or foreign for-profit organization;
- v. A Federal agency, but only as a subrecipient under an award or subaward to a non-Federal entity.

2. *Executive* means officers, managing partners, or any other employees in management positions.

3. *Subaward*:

- i. This term means a legal instrument to provide support for the performance of any portion of the substantive project or program for which you received this award and that you as the recipient award to an eligible subrecipient.
- ii. The term does not include your procurement of property and services needed to carry out the project or program (for further explanation, see Sec. __ .210 of the attachment to OMB Circular A-133, "Audits of States, Local Governments, and Non-Profit Organizations").
- iii. A subaward may be provided through any legal agreement, including an agreement that you or a subrecipient considers a contract.

4. *Subrecipient* means an entity that:

- i. Receives a subaward from you (the recipient) under this award; and
- ii. Is accountable to you for the use of the Federal funds provided by the subaward.

5. *Total compensation* means the cash and noncash dollar value earned by the executive during the recipient's or subrecipient's preceding fiscal year and includes the following (for more information see 17 CFR 229.402(c)(2)):

- i. *Salary and bonus*.
- ii. *Awards of stock, stock options, and stock appreciation rights*. Use the dollar amount recognized for financial statement reporting purposes with respect to the fiscal year in accordance with the Statement of Financial Accounting Standards No. 123 (Revised 2004) (FAS 123R), Shared Based Payments.

- iii. *Earnings for services under non-equity incentive plans.* This does not include group life, health, hospitalization or medical reimbursement plans that do not discriminate in favor of executives, and are available generally to all salaried employees.
- iv. *Change in pension value.* This is the change in present value of defined benefit and actuarial pension plans.
- v. *Above-market earnings on deferred compensation which is not tax-qualified.*
- vi. Other compensation, if the aggregate value of all such other compensation (e.g. severance, termination payments, value of life insurance paid on behalf of the employee, perquisites or property) for the executive exceeds \$10,000.

*** End of BAA Announcement ***