

**ONR BAA Announcement #N00014-17-S-B001**

**Amendment 0002**

**February 3, 2017**



**Long Range Broad Agency Announcement (BAA) for Navy  
and Marine Corps Science and Technology**

The purpose of this amendment is to update Section III. Paragraph A on page 37, Form: RESEARCH & RELATED Other Project Information on page 45, Cost Proposal on page 49, and Requirements Concerning Live Organisms on pages 70- 71.

This amendment 0002 hereby replaces all previous postings of N00014-17-S-B001 in its entirety.

**INTRODUCTION:**

This publication constitutes a Broad Agency Announcement (BAA) as contemplated in Federal Acquisition Regulation (FAR) 6.102(d)(2) and 35.016, the Department of Defense Grants and Agreements regulations (DoDGARS) 32 CFR 22.315(a). A formal Request for Proposals (RFP), solicitation, and/or additional information regarding this announcement will not be issued.

The Office of Naval Research (ONR) will not issue paper copies of this announcement. The ONR reserves the right to fund all, some, or none of the proposals received under this BAA. ONR provides no funding for direct reimbursement of proposal development costs. Technical and cost proposals (or any other material) submitted in response to this BAA will not be returned. It is the policy of ONR to treat all proposals submitted under this BAA as sensitive competitive information and to disclose their contents only for the purposes of evaluation.

**For grant proposals submitted through Grants.gov, offerors should include responses to the Representations indicated in Section VII-A iv. and v. of this BAA and located at <http://www.onr.navy.mil/Contracts-Grants/submit-proposal/grants-proposal.aspx>.**

This BAA is intended for proposals related to basic research, applied research, or advanced technology development and that part of development not related to the development of a specific system or hardware procurement. For Navy and Marine Corps Science, Technology, Engineering & Mathematics (STEM) programs, refer to N00014-17-S-F002, which may be found at the ONR Broad Agency Announcement (BAA) webpage- <http://www.onr.navy.mil/Contracts-Grants/Funding-Opportunities/Broad-Agency-Announcements.aspx>.

This announcement replaces BAA N00014-16-R-BA01.

**Hyperlinks have been embedded within this document and appear as underlined, blue-colored words.** The reader may “jump” to the linked section by clicking the hyperlink.

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## **I. GENERAL INFORMATION**

### **A. Agency Name –**

Office of Naval Research  
One Liberty Center  
875 N. Randolph Street  
Arlington, VA 22203-1995

### **B. Research Opportunity Title –**

Long Range Broad Agency Announcement (BAA) for Navy and Marine Corps Science & Technology

### **C. Program Name –**

Not Applicable (N/A)

### **D. Research Opportunity Number –**

N00014-17-S-B001

### **E. Response Date –**

This announcement will remain open until 30 September 2017 or until replaced by a successor BAA, whichever first occurs. Proposals may be submitted at any time during this period.

### **F. Research Opportunity Description –**

The Office of Naval Research (ONR) is interested in receiving proposals for Long-Range Science and Technology (S&T) Projects which offer potential for advancement and improvement of Navy and Marine Corps operations. Readers should note that this is an announcement to declare ONR's broad role in competitive funding of meritorious research across a spectrum of science and engineering disciplines. A brief description of the ONR Program Codes and the science and technology thrusts that ONR is pursuing is provided below. Additional information can be found at the ONR website at <http://www.onr.navy.mil/Science-Technology/Departments.aspx>.

Potential offerors are urged to check the program areas that they are interested in throughout the year for updates to thrust areas and research priorities on the ONR website at <http://www.onr.navy.mil>. Prior to preparing proposals, potential offerors are strongly encouraged to contact the ONR technical point of contact (POC). To identify the POC, follow the link for the appropriate code or division listed below and then click on the link to the thrust or topic area. Each thrust or topic area will provide a POC or e-mail address.

## **List of Departments**

- [Expeditionary Maneuver Warfare & Combating Terrorism Department \(Code 30\)](#)
- [Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance \(C4ISR\) Department \(Code 31\)](#)
- [Ocean Battlespace Sensing Department \(Code 32\)](#)
- [Sea Warfare and Weapons Department \(Code 33\)](#)
- [Warfighter Performance Department \(Code 34\)](#)
- [Naval Air Warfare and Weapons Department \(Code 35\)](#)
- [Marine Corps Warfighting Lab \(MCWL\)](#)
- [Office of Naval Research Global \(ONRG\)](#)

\* Click on the above hyperlinks to navigate directly to your desired section

### **Expeditionary Maneuver Warfare & Combating Terrorism Department (Code 30)**

**Code 30** develops and transitions technologies to enable the Navy-Marine Corps team to win and survive on the battlefield. The department invests primarily in asymmetric and irregular warfare, distributed operations, information dominance, and survivability and self-defense. To achieve the goals of the department, the expertise of a number of technical communities are needed. The department supports applied physics efforts ranging from electromagnetics for C4 to condensed matter physics. The department engages chemistry and materials science to improve structures and efficiencies of our platforms and systems and is interested in emerging opportunities from the computer science community to efficiently control and protect our information and hardware systems. Given the applied nature of some of the department's work, we frequently support ideas and opportunities from the engineering community including electrical, mechanical, and software engineering. The department is interested in engaging with these and other technical communities to identify concepts and technologies that will improve warfighter effectiveness in the thrusts described below.

1) **ONR 30 Command, Control, Computers and Communication (C4)** Technology Area seeks to provide tomorrow's small unit naval expeditionary war fighters with the precise information they need, when they need it, in highly-contested environments. The portfolio seeks to develop and mature those technologies enabling real-time manipulation of the electromagnetic and cyberspace domains, providing both offensive and defensive capabilities. We desire to provide a non-fixed-infrastructure communications, networking, and information architecture that enable expeditionary warfighters to exchange vital information between the sea base and maneuvering forces ashore beyond line of sight. The solutions must enable operations in contested electromagnetic and cyberspace domains.

To fulfill this vision, we are interested in the following science and technology areas, in priority order:

- Spectral coexistence and efficiency techniques that can greatly increase the information capacity per unit spectrum;
- Determining position and synchronizing timing in the absence of GPS;

- Authentication of users and establishing secure communications sessions in an opportunistic (ad hoc) manner without the use of controlled cryptographic items;
- Electromagnetic spectrum (EMS) and cyber-domain situational awareness at the tactical edge;
- Novel approaches for multi-layer mobile device security;
- Offensive cyber, cyber-physical, RF-cyber, and electronic attack (EA) capabilities;
- Real-time determination of unintended friendly EMS and cyber-domain effects, and technologies to mitigate those effects;
- Compact antennas that operate over wide bands including those that can operate both in omnidirectional and highly directional modes;
- Cross-layer approaches to content-based information movement without impacting architectural flexibility;
- Software radio architectures that can quickly change between waveforms and simultaneously transmit and receive more than one waveform;
- Low-size, weight and power, adaptable RF electronics, PAs, filters, etc., that are frequency and bandwidth agile;
- Ability to autonomously extract meaning from information flows;
- Machine understandable representation of commander's intent (high-level instructions) and automatic provision of only needed information, when needed, in user-consumable formats; and
- Architectures of operating in a disconnected, intermittent, low-bandwidth (DIL) environment, for the management of cyber/EW effects.

Potential proposers are encouraged to consider the unique environments in which expeditionary forces operate constrain possible S&T solutions and differ considerably from the commercial environment.

Further information may be found at (<http://www.onr.navy.mil/Science-Technology/Departments/Code-30/All-Programs/C4.aspx>).

2) **ONR 30 Fires'** portfolio seeks to enable warfighters employed in small, distributed units with tools to locate and decisively destroy larger enemy forces by applying timely, reliable, precise, and accurate fires from a myriad of platforms. Research areas are integrated, lightweight optics and sensors to see through all battlefield conditions and lightweight, organic, advanced weapons for the rapid, accurate, effective application of firepower Technology initiatives are:

a) **Targeting and engagement**, to empower warfighters of the future to acquire and apply precision fires against unconventional and hybrid targets, across the full range of military operations and environments by developing targeting technologies (detection, location, identification, designation, and tracking) for faster, more precise engagements, while simplifying tasks for the warfighter.

b) **Advanced ammunition and energetics**, to provide improved lethality and dominance of the individual warfighter within his area of influence through advanced warhead, propulsion, and ammunition technologies, enabling engagement of the enemy from greater distances and with tailorable effects by providing more capable, lighter weight ammunition across the

spectrum of lethality (to include contained collateral damage situations); with increased reliability, effective range, and precision; for direct and indirect fire weapons, small arms through major caliber; with low costs and logistics burden; increased operating, transportation, and storage safety; and increased shelf life with reduced storage maintenance requirements.

c) **Advanced weapons**, to increase capabilities of warfighters with lightweight, reliable, accurate, and affordable weapons systems; enabling engagement of organic and inorganic, scalable lethality; realizing fires as a commodity against diverse unconventional and hybrid threats from ground, air, and naval platforms; and with the ability to escalate from non-lethal to lethal force over the full spectrum of military operations.

Further information may be found at (<http://www.onr.navy.mil/Science-Technology/Departments/Code-30/All-Programs/Fires.aspx>).

3) **ONR 30 Force Protection** seeks to develop and mature technologies that provide protection from myriad modes of enemy attack through the spectrum of warfare, including concepts such as asymmetric and irregular warfare and distributed operations which concentrate on the small unit and individual warfighters. End products will include protective systems expeditionary in nature, lightweight, and capable of providing a far greater degree of performance than any comparable system currently available. Thus, aligned technologies must assist in enabling this vision as well as being novel/new.

The areas of investigation include but are not limited to:

- a) Detection of buried devices from standoff distances utilizing electromagnetic, seismic, acoustic methods for penetration or UV/Vis/IR methods for surface analysis.
- b) Breaching and neutralization of explosive hazards utilizing energetics or electromagnetic energy.
- c) Detection of adversary threat weapons systems (rockets, artillery, mortars, UAVs, etc.) from mobile platforms utilizing Electro-optical, Infrared, LIDAR/LADAR, RADAR, Radio Frequency, Acoustic and other techniques.
- d) Compact High Energy Lasers, Beam Directors, Power, and Cooling sub-system technologies to enable on-the-move capability in a tactically relevant platform (HMMWV/JLTV).

Further information may be found at (<http://www.onr.navy.mil/Science-Technology/Departments/Code-30/All-Programs/Force-Protection.aspx>).

4) **ONR 30 Human Performance Training and Education (HPT&E)** seeks to understand the science of improving human performance in order to prepare warfighters for the complex and chaotic joint operating environment. HPT&E will focus on developing training technologies, knowledge products, architectures, and training systems that accelerate mental, emotional and cognitive decision making skills for Expeditionary Warfighters, who are ready to deploy anywhere in the world on short notice, function as part of an effective team, and assume greater leadership responsibilities. Our priorities for research are to develop more skilled small unit

leaders, small unit teams and individuals through efforts to improve decision making, resiliency and readiness. Technology investment areas include:

- a) Decision making and expertise development;
- b) Mental resiliency and cognitive adaptability; and
- c) Enhanced physical readiness.

Further information may be found at (<http://www.onr.navy.mil/Science-Technology/Departments/Code-30/All-Programs/Human-Performance-Training.aspx>)

5) **ONR 30 Intelligence, Surveillance and Reconnaissance (ISR)** seeks to develop and leverage advanced technologies for future intelligence, surveillance and reconnaissance systems.

Program goals include:

- a) Enhance situational awareness;
- b) Enable real-time tactical decision support tools and systems;
- c) Provide proactive and predictive capabilities for conventional and irregular expeditionary and amphibious mission planning and conduct;
- d) Understand the physical, military and civil terrain;
- e) Understand the human, social, cultural and behavioral factors that influence human behavior and to improve our ability to model these influences and understand their impact on human behavior at the individual, group and society-levels; and
- f) Enhance the integration of ISR with other warfighting functions.

Technology investment areas include:

- a) Data science;
- b) Data fusion;
- c) Machine learning/artificial intelligence;
- d) Advanced sensors; and
- e) Advanced processing methodologies and architectures.

Further information may be found at (<http://www.onr.navy.mil/Science-Technology/Departments/Code-30/All-Programs/Intelligence-Surveillance-ISR.aspx>)

6) **ONR 30 Logistics** research is seeking new technologies along two central themes: new maintenance technologies for expeditionary combat systems and new expeditionary energy technologies that support distributed operations (from the individual Marine to small units).

Program goals include:

- a) enhance the maintainability of current and future warfighting equipment;
- b) reduced fuel consumption to enhance small unit self-sufficiency;
- c) increased energy density for individual Marine power sources; and
- d) modification of Marine behaviors to reduce energy consumption.



Technology investment areas include:

- a) new sensors for ground vehicles to assess health;
- b) new algorithms to perform vehicle health diagnostics / prognostics;
- c) compact, lightweight, quiet, durable, near maintenance-free expeditionary power systems (few kW);
- d) research and technologies to enhance behavior-centered energy initiatives for deployed forces and combat systems;
- e) hybrid, expeditionary, digital manufacturing (additive manufacturing, computer numerical control, cold spray, etc.) approaches to improve maintainability and reduce the logistics tail;
- f) technologies to reduce the weight of power and energy for the individual Marine; and
- g) integration of logistics data into command and control and intelligence systems.

Further information may be found at (<http://www.onr.navy.mil/Science-Technology/Departments/Code-30/All-Programs/Logistics.aspx>)

7) **ONR 30 Maneuver** explores technologies to increase the warfighting capabilities and effectiveness of the Marine Corps Air Ground Task Force. This thrust seeks new and novel technologies and innovative concepts and approaches to: improve off-road mobility through intelligent systems and 3-dimensional movement, vehicle cyber protection, fuel economy and powertrain efficiency, survivability of ground vehicles, assist in moving troops and equipment from shipboard to inland objectives; enhance our vehicle fleet through improvements to modularity and platform architecture; lighten the physical and cognitive load on Marines via affordable autonomous technologies from manned and unmanned ground platforms.

(<http://www.onr.navy.mil/Science-Technology/Departments/Code-30/All-Programs/Maneuver.aspx> ). Technology investment areas are:

- a) **Autonomy** - Research and component technologies to support cooperative autonomy and autonomous navigation for amphibious platforms (surface, surf, and ground domains) including dynamic object tracking and terrain segmentation and classification (including novel perception methods), path planning and navigation over and through complex terrain (ground and surf zones), heterogeneous multi-platform cross-domain mission planning, dynamic resource allocation, and coordinated tactical behaviors.
- b) **Survivability** – Signature control and management, situational awareness and threat prediction, active and adaptive protection technologies, lightweight armor, directed energy protection, underbody blast protection, crew protection technologies, and fire prevention or suppression
- c) **Mobility** - Intelligent off-road mobility, Powertrain Efficiency, Platform Architecture technologies

Further information may be found at (<http://www.onr.navy.mil/Science-Technology/Departments/Code-30/All-Programs/Maneuver.aspx>)

8) **ONR 30 Science Addressing Asymmetric Explosive Threats (SAAET)** seeks basic and applied research topics to pursue fundamental science and innovation that provide promising new approaches and concepts to advance current state-of-art technologies and understanding of phenomenology that will ultimately lead to improving in standoff **detection** and **neutralization** of improvised explosive devices (IED) and their related components from outside of explosive hazard range. Ideal solutions for the **detection** should have potential to provide determination of all types of explosives, sufficient coverage rate enabling detection, classification, and identification all the explosive threats from a moving platform. For the neutralization, SAAET seeks to identify and develop novel RF and microwave sources and their related key components that significantly improve upon existing state-of-the-art performance, size, weight and power.

The current program pursues the following research areas.

1. Detection
  - a. Stand-off spectroscopy (Rapid wide area detection, multi-environment, hidden or obscured items);
  - b. Remote miniature sensors for small ground or airborne moving platforms;
  - c. Canine research; and
  - d. Biological/hybrid detection research.
  
2. Neutralization
  - a. High Power Radio Frequency (HPRF) Compact Source Technology; and
  - b. High Voltage Solid-State Fast Rise-time Switches and Drivers.

Topics that can provide address multiple tasks (orthogonal measurement techniques) that are described above are also pursued. In addition, offerors possessing any additional innovative ideas, concepts, or recommendations that can significantly improve detection and neutralization capabilities beyond the topics listed above are also encouraged to submit proposals.

**Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) (Code 31)**

Code 31 invests in areas of science and their applications such as data science, mathematical and computational science, computer and information sciences, quantum information sciences, cyber security, electronics, command and control and combat systems, communications, cyber operations, electronic warfare, sensing and surveillance, and precision timing and navigation.

Specific thrusts and focused research areas are:

- 1) Mathematics, Computers and Information Sciences, which sponsors basic and applied research, and advanced technology development efforts in mathematics, computer and information sciences that address Navy and Department of Defense needs in computation, information processing, information operation, information assurance and cybersecurity, decision tools, and command and control with specific focus on enabling rapid, accurate decision making

<http://www.onr.navy.mil/Science-Technology/Departments/Code-31/All-Programs/311-Mathematics-Computers-Research.aspx>).

Specific scientific and technical areas include:

- a) Applied and computational analysis;
  - b) Command and control;
  - c) Computational methods for decisions making;
  - d) Cyber security and complex software systems;
  - e) Machine learning, reasoning, and intelligence;
  - f) Mathematical data science;
  - g) Mathematical optimization and operations research; and
  - h) Quantum information sciences.
- 2) Electronics, Sensors and Network Research, which conducts an integrated program of basic and applied research and advanced technology development into technologies that enable new and innovative uses of the electromagnetic spectrum in areas of surface and aerospace surveillance, communications, electronic combat, and navigation. All of these areas are supported by a broad research program in electronics which is focused on the reduction of the cost, weight and size of transmit and receive systems. Two overarching goals are the development of technologies and techniques to support adaptive persistent surveillance, and the development of digital/radio frequency technologies and techniques to support active aperture phased arrays capable of performing multiple functions simultaneously  
<http://www.onr.navy.mil/Science-Technology/Departments/Code-31/All-Programs/312-Electronics-Sensors.aspx>).

Specific scientific and technical areas include:

- a) Active aperture array;
- b) Atomic, molecular and quantum physics;
- c) Communications and networking;
- d) Electromagnetic materials;
- e) Electronic warfare;
- f) EO/IR sensors and sensor processing;
- g) Nanoscale computing devices and systems;
- h) Precision, Navigation and timekeeping;
- i) RF surveillance and signal processing;
- j) Mixed signal (radio frequency and digital) processing devices, circuits and architecture;
- k) Radio frequency superconducting technologies; and
- l) Radio frequency semiconductors, radio frequency solid state amplifiers; and wide bandgap materials.

### **Ocean Battlespace Sensing (Code 32)**

Code 32 explores science and technology in the areas of oceanographic and meteorological observations, modeling and prediction in the battlespace environment; submarine detection and classifications (anti-submarine warfare); and mine warfare applications for detecting and neutralizing mines in both the ocean and littoral environment. Specific thrusts and focused research areas are:

- 1) Ocean Sensing and Systems Application, which conducts an extensive program of scientific inquiry and technology development in maritime sensing, ocean engineering and marine systems, and undersea signal processing (<http://www.onr.navy.mil/Science-Technology/Departments/Code-32/All-Programs/Ocean-Systems-321.aspx>). Specific technical areas are:
  - a) Maritime sensing;
  - b) Ocean engineering & marine systems; and
  - c) Undersea signal processing.
  
- 2) Ocean, Atmosphere and Space Research, which concentrates on improving Navy and Marine Corps understanding of environmental evolution, assimilation of data, and the limits of predictability by planning, fostering and encouraging scientific inquiry and technological development in fields ranging from littoral geosciences to high latitude dynamics (<http://www.onr.navy.mil/Science-Technology/Departments/Code-32/All-Programs/Atmosphere-Research-322.aspx>). Specific technical areas are:
  - a) Arctic and Global Protection;
  - b) Littoral Geosciences and Optics;
  - c) Marine Mammals and Biology;
  - d) Marine Meteorology
  - e) Ocean acoustics;
  - f) Physical oceanography; and
  - g) Space environment.

### **Sea Warfare and Weapons Department (Code 33)**

Code 33 develops and delivers technology to enable superior warfighting capabilities for surface and sub-surface naval platforms and undersea weaponry. Code 33 also develops and delivers technology to reduce total life cycle cost of naval platforms, to minimize the energy footprint of Naval forces, and to develop new scientists and engineers for Navy-unique technological areas. Specific thrusts and focused research areas are:

- 1) Ship Systems and Engineering Research: Focused on providing technologically superior warfighting capabilities at reduced total ownership costs for surface and subsurface platforms through investments in basic and applied research and advanced technology development of programs in: a) hydrodynamics, b) survivability c) electrical and thermal systems d) platform structures and e) autonomy for unmanned

surface vehicles (USV). The division is also responsible for the National Naval Responsibility in Naval Engineering (NNR-NE). The NNR-NE supports fundamental and early applied research in the areas of propulsion, platform structures, hydrodynamics, automation control and system engineering, design tools, naval power systems and ensuring a strong and healthy academic infrastructure. Specific research themes are:

- a. **Hydrodynamics:** Surface ship hydrodynamics is focused on the theory, computation, and lab and at-sea experimentation to develop understanding and prediction capabilities for all hydrodynamic phenomena associated with surface ships and small craft, their effects on vessel performance, and concepts for modification. Propulsor hydrodynamics is focused on understanding the physics of flow around propulsors and their interactions to improve propulsor performance, mobility, efficiency, and affordability, as well as prediction and control of various types of cavitation on propulsors and appendages. This also includes predictive capability of cavitation inception, thrust breakdown, and erosion phenomenon and scaling laws. Science and technology efforts in the area of Subsurface Hydrodynamics include identifying, understanding, predicting, and controlling flow physics, as well as turbulence and stratified wakes. This is further applied to Subsurface Maneuvering Technologies, and understanding the Dynamics of Interacting Platforms.
- b. **Survivability:** Investigate and understand electromagnetic (EM) sources (including major ferro and non-ferromagnetic sources, eddy currents, and Corrosion Related Magnetic Fields (CRM)) that are associated with naval platforms. Develop understanding of EM field propagation relationships and analysis aids, and technologies to predict the electromagnetic properties of a naval platform. Advance physics based understanding of platform acoustics. Discover and develop algorithms and methods that will enable the development of improved design, analysis, and prediction tools for enhanced acoustic performance. Understand, design and develop optical and acoustic metamaterials to control light and sound propagation over a large frequency range. New architectures to overcome challenges associated with loss, bandwidth, and scalability are being explored. Design and develop models, algorithms, and integrated development environments for simulation and control of complex, interdependent, distributed shipboard machinery systems to enable integrated, autonomous operation and reconfiguration of shipboard machinery systems.
- c. **Electrical and Thermal Systems:** Provide a scientific foundation for a reconfigurable electric warship including physical properties, control laws, stability criteria, modeling and simulation, advanced design and development methods. Develop new machinery integration concepts. Develop simulation based Verification, Validation and Accreditation (VV&A) methods and technologies. Contribute to system reconfiguration. Design a ship electrical system architecture based on a main bus that distributes “rough” DC power throughout the ship at nominally 10 KV. Conduct fundamental research necessary for enabling scientific

progress and breakthroughs in shipboard and expeditionary power & energy technology. Development of macro- and atomic-scale multi-physics models is being pursued to enhance understanding of materials processing & performance, energy conversion mechanisms, cyber-physical energy concepts, and power management. Advanced magnetics, material surface science, and solid-state conversion concepts are of interest, and alternative energy approaches for powering Navy equipment of the future are being investigated. Advance thermal science and technology through fundamental studies of multi-phase heat transfer, fluid dynamics, and nanostructured materials in order to efficiently acquire, transport and reject heat and enable higher power density electronic systems associated with Advanced Naval Power Systems. System-level studies focus on the scalability and reliability of component technologies. Another thrust is the development of tools to model heat transfer at multiple length scales allowing for simulation of heat flow through the ship in order to evaluate the impact of power conversion electronics, sensors, and weapons on the overall thermal balance of the vessel.

- d. Platform Structures: Focused on time-varying, structural reliability analysis and prediction for a ship structural system with uncertainty quantification and propagation. Specific topics include novel structural configurations across composite and metallic materials and prediction methods for advanced global hull strength, local panel and component strength, fatigue and fracture strength, and seaway loads and load effects for high-speed/high-performance ships and vessels.
- e. Unmanned Surface Vehicles (USV): Autonomy for USVs and related mission functions.

<http://www.onr.navy.mil/Science-Technology/Departments/Code-33/All-Programs/331-ship-systems-engineering.aspx>).

- 2) Naval Materials Science and Technology: Focused on a full spectrum of activities from long-range, fundamental scientific and engineering research in the design and realization of new materials and systems to fulfilling the unique requirements of marine and military applications. Experimental work is closely coupled with the development of models and predictive capabilities for materials properties and behavior. Specific research areas include:
  - a. Functional Materials (Electrochemical power sources, Dielectric materials and films for pulsed power applications, Electronic and optical ceramics, and Functional polymeric organic materials)
  - b. Structural Materials (Bulk nanostructured materials, Composite materials development and processing; Fracture and fatigue damage of Naval structural materials: (1) fatigue of structural materials and (2) deformation/fracture in nanostructured materials; High temperature turbine materials, Ultra-high temperature materials, Solid Mechanics, Structural cellular materials, Structural Metals, Highly-rate sensitive polymers to improve survivability to blast and ballistic penetration,

- and Non-Destructive Evaluation, Structural Health Monitoring, Prognostics)
- c. Environmental Quality (Environmentally benign marine antifouling coatings and Environmental quality waste treatment/reduction)
  - d. Pervasive Materials S&T (Computer Aided Materials Design and Integrated Computational Materials Engineering)

<http://www.onr.navy.mil/Science-Technology/Departments/Code-33/All-Programs/332- naval-materials.aspx>).

- 3) Sea Platforms and Weapons: Focused on coordinating the transition of technologically superior systems and equipment that will enhance warfighting capabilities.
  - a. Sea Weapons Program: Accomplished through the Naval Undersea Research Program, which was established in part to increase the number of engineers and scientists in Navy laboratories and University Affiliated Research Centers that conduct research and development of undersea weapon technology. Core technology areas for applied research and technology development include: guidance, control and autonomy; sensors; signal processing; planning and control algorithms; signal management for undersea distributed network systems (UDNS); weapon energy conversion; batteries, air-independent fuel cells and hybrids; motors; otto fuel replacements; vehicle technology; liquid fuels for “gas and go” concepts; corrosion and anti-fouling coatings; hydrodynamics; control surfaces; propulsors; drag and noise reduction; projectiles; warheads; explosives; detonators; and fuses .
  - b. Sea Platforms Program: Focused on corrosion control and prevention S&T and other S&T challenges for platform affordability.

<http://www.onr.navy.mil/Science-Technology/Departments/Code-33/All-Programs/333- sea-platforms-weapons.aspx>).

- 4) Naval Energy Resiliency and Sustainability: Focused on, but not limited to, alternative energy research; microgrid analysis and testing; integration of renewable energy resources into energy systems; advanced materials research and testing; and energy efficiency. Research addresses energy challenges ashore, as well as advances energy systems for sea warfare.

### **Warfighter Performance (Code 34)**

Code 34 enhances warfighter effectiveness and efficiency through bioengineered and biorobotic systems, medical technologies, improved manpower, personnel, training and system design. There are two divisions: Human & Bioengineered Systems and Warfighter Protection & Applications.

1) Human and Bioengineered Systems covers cognitive science, computational neuroscience, bioscience and bio-mimetic technology, social/organizational science, training, human factors, and decision making. The goals are: sustained and improved warfighter performance and enhanced decision making in all environments through training; creating options for future (perhaps unanticipated) naval decisions, based upon fundamental understanding gained from cognitive and neuroscience; supporting integrated interdisciplinary research program; and cultivating transition of findings to government and industry via advanced technology development, small business and acquisition projects (<http://www.onr.navy.mil/Science-Technology/Departments/Code-34/All-Programs/human-bioengineered-systems-341.aspx>). Specific thrusts and focused research are:

- a) Affordable human behavior modeling;
- b) Agile and reconfigurable organizational structures for command and control;
- c) Applied instructional research;
- d) Biometrics in the maritime domain;
- e) Biorobotics;
- f) Cognitive science of learning;
- g) Computational neuroscience;
- h) Human activity recognition;
- i) Human robot interaction;
- j) Multi-echelon command decision making;
- k) Perception, metacognition and cognitive control;
- l) Representing and reasoning about uncertainty;
- m) Skill acquisition;
- n) Social network analysis for combating terrorist networks;
- o) Theoretical foundations for socio-cognitive architectures; and
- p) Virtual technologies and environments.

2) Warfighter Protection and Applications covers bioscience and bio-mimetic technology; biomaterials; biomedical technologies; expeditionary and undersea medicine; physiology and biophysics; immunology; applied manpower, personnel, training, and education; marine mammal health; and noise induced hearing loss. The division conducts research and technology demonstration programs directed at maintaining the survival, health and performance of Navy and Marine Corps personnel during training, routine and special operations, and in time of war. The goals are to: increase the survival of casualties through intermediate, life-saving treatment and stabilization; prevent personnel injury caused by the stresses of demanding Naval occupations and environments; enhance cognitive and physiological performance of Navy and Marine Corps personnel in military environments; prepare Sailors and Marines to fight and win in an information rich, distributed battlespace; get the right warfighters into the right job, at the right time with the right tools; and provide a 21st century learning environment designed to deliver the right training (<http://www.onr.navy.mil/Science-Technology/Departments/Code-34/All-Programs/warfighter-protection-applications-342.aspx>).



Specific thrusts and topics of interest are:

- a) Basic biomedical science;
- b) Bio-energy harvesting;
- c) Biomaterials and bionanotechnology;
- d) Biomedical technologies;
- e) Biophysics;
- f) Bioscience and bio-mimetic technology;
- g) Casualty care and management;
- h) Casualty prevention;
- i) Gut microbiology and response to stressors
- j) Human systems integration (HSI);
- k) Manpower and personnel;
- l) Marine biofouling control;
- m) Marine mammal health;
- n) Noise induced hearing loss;
- o) Stress physiology;
- p) Synthetic biology; and
- q) Undersea medicine.

### **Naval Air Warfare and Weapons (Code 35)**

The Naval Air Warfare and Weapons (Code 35) Department supports the Navy and Marine Corps needs, fostering basic, applied and advanced research in support of the Sea-Based Aviation National Naval Responsibility as well as directed energy, energetic materials, autonomy, electromagnetic launch, and high speed conventional air and surface weapons. For more information visit the ONR Code 35 webpage at:

<http://www.onr.navy.mil/Home/Science-Technology/Departments/Code-35.aspx>

1) The Aerospace Sciences Research Division focuses on fundamental advancements in underlying and fundamental knowledge to enable transformational capabilities for Sea-Based Aviation and strike technology. Basic and applied research projects include aerodynamics and aeromechanics for fixed wing and rotary-wing aircraft, advanced power, propulsion, and thermal management for naval air platforms and weapons, advanced materials, coatings, and structures, instrumentation, navigation, guidance and control of air vehicles, autonomous and remotely piloted vehicles and groups of such vehicles, science of autonomy, hypersonic aerodynamics, energetic materials, directed energy, counter-directed energy, new concepts and fundamental methods in the design, analysis, and systems engineering of naval air platforms and weapons.

#### a) Sea-Based Aviation National Naval Responsibility – Air Vehicle Technology

The Navy and Marine Corps rely on fixed-wing, rotary-wing, and V/STOL aircraft to perform and support a wide variety of missions such as close air support, air defense, logistics, expeditionary operations, anti-submarine and anti-mine warfare, and search and rescue. The unique requirement to operate from ships at night and in bad weather and high sea states leads to a number of S&T challenges. Shipboard landings require

precise relative navigation and ability to maneuver in highly unsteady ship airwakes to land on pitching and rolling decks in high sea states. Shipboard operations also require unique designs to accommodate limited space and safe operations and support in densely packed areas. The Marine Corps depends on fast, agile air vehicles to execute its Ship-to-Objective Maneuver and distributed operations. This program is reviewing white papers and proposals in the following areas:

- i. Computationally efficient analytical tools for coupled ship/aircraft dynamic interface modeling and simulation
- ii. Computational methods for aerodynamics of aircraft maneuvering in an unsteady atmosphere, including large control surface motions
- iii. Well-designed experiments providing data for canonical problems in support of verification and validation of computational methods
- iv. Advanced control systems for carefree shipboard landings in challenging operating conditions
- v. Automated shipboard landings and deck operations
- vi. Efficient, high-speed V/STOL concepts for sea-based operations
- vii. Flow control for improved air vehicle aerodynamics
- viii. Innovative experimental methods for ship airwake measurement

b) Sea-Based Aviation National Naval Responsibility - Airframe Structures and Materials

Naval Aviation airframes are a core capability for the Navy power projection mission, including our ability to successfully meet development, operational performance, readiness, and affordability requirements. This program is reviewing white papers and proposals in the following areas:

- i. Metallic Structures – Topics in combined loading mechanics, SCC, corrosion fatigue, EAC test methods, environmental material damage, electrochemical stress, localized damage evolution, structural protection and maintenance, protective coatings, and structural remediation.
- ii. Composite Structures – Topics in characterization and failure analysis, damage initiation and progression, environmental effects, constituent materials development for resins, fibers, 3D strength, nanocomposites, handling-processing-property relationships, CMC's, inspection, durability and repair of bonded joints and load-bearing repairs for composite life extension.
- iii. Advanced Concepts – Topics in adaptive, reconfigurable structures, multifunctional surfaces, thermal durability, electrical functionality, EMI shielding, protective coatings for IR optical apertures, lightweight armor materials, additive manufacturing for repair and life extension.

c) Sea-Based Aviation National Naval Responsibility – Power and Propulsion

Naval aviation creates several unique demands on aircraft power and propulsion systems. The maritime environment subjects engine and related structures to a corrosive

environment. The operation from a carrier or other ships requires higher thrust to weight and airflow engines in highly integrated inlet and exhaust systems along with greater variability in throttle settings as well as the need for more rapid throttle excursions for landing, wave-off, and bolter events. This program is reviewing white papers and proposals in the following areas:

- i. Propulsion and combined power-propulsion concepts, thermodynamics cycles, and aero-thermodynamics of components for aircraft and weapons for high speed, long endurance, and responsiveness
- ii. Advanced high stage-loading and efficient turbomachinery, including distortion tolerant fans and advanced methods in blade-disk aeromechanics
- iii. Advanced cooling and thermal management for engines and auxiliary systems, including new concepts of heat collection, distribution, and rejection
- iv. Advanced materials, coatings, and manufacturing science for hot and cold section engine components for naval environments
- v. Jet noise reduction for tactical aircraft (TACAIR)
- vi. Engine diagnostics, prognostics, and control of variable cycle and adaptive engines, including multiple-input, multiple output (MIMO) advanced control methods and systems architectures
- vii. Component interactions in steady and transient operations
- viii. Detonation science and rotating detonation combustors
- ix. Power and/or propulsion for small, unmanned air-vehicles, including small combustors, micro-heat transfer, bearings, and other small gas turbine and reciprocating engine components critical for such applications
- x. Other areas leading to more power dense, efficient, responsive, reliable, integrated, power, propulsion, and thermal management systems

d) Hypersonics Aerodynamics

Hypersonic flight provides an unprecedented capability by simultaneously extending range and reducing transit time – enabling rapid reach and global targeting. Future high-speed vehicles will demand efficient aerodynamic designs that deploy light-weight, durable control surfaces, and are capable of enduring the extreme exposure associated with hypersonic flight across a wide range of conditions. This program is reviewing white papers and proposals in the following areas:

- i. Boundary layer physics in shock-wave dominated flows around highly-swept or slender bodies
- ii. Aero-thermo-elastic and/or aero-servo-elastic effects arising from control surface actuation at high speeds
- iii. Descriptions of high-speed boundary layer transition that unify theories across disparate external conditions
- iv. Novel strategies for extending regions of laminar flow
- v. Advanced hypersonic aerodynamic design tools that incorporate modern predictions of transition pathways, freestream noise contributions, time/heating-dependent surface finish effects, and unsteady aerodynamics

e) Intelligent autonomy for safe, reliable, and scalable control of heterogeneous unmanned air systems based on high-level mission tasking

This includes collaborative and shared use of unmanned systems by a variety of types of operators and users of unmanned system services in complex and cluttered environments. Note that the focus is on autonomy methods and not on new platform, sensor, or communications hardware. This program is reviewing white papers and proposals in the following areas:

- i. Distributed control of large numbers of heterogeneous unmanned systems in complex airspaces
- ii. Safe, perception-based control in complex, unstructured, and cluttered environments
- iii. Verification and Validation of advanced autonomy including biologically inspired methods, nondeterministic algorithms, decentralized control, organic perception within control/decision-making loops, and complex human interactions for both safety & mission competence
- iv. Autonomous systems teaming with manned systems and units
- v. Safe autonomous operations in the maritime environment

f) Science of Autonomy

This involves different autonomous system domains that have traditionally been somewhat separated (air, sea, undersea, ground), control theory, computational intelligence, human factors and related fields such as biology/animal behavior/cognition, economics/management theory, cognitive science/psychology and neuroscience. This program is reviewing white papers and proposals in the following areas:

- i. Scalable, self-organizing, survivable, organizational structure/hierarchy of heterogeneous unmanned vehicles appropriate to naval mission domains
- ii. Autonomous learning, reasoning, and decision-making in unstructured, dynamic, and uncertain environments
- iii. Human interaction/collaboration including understanding intent and actions of human team members, adversaries, and bystanders
- iv. Organic perception/understanding to support decision-making, reasoning, and actions in a complex, dynamic world

g) Energetic Materials

Energetic Materials (EM) weapon systems can be a "game changer" by increasing warfighters' lethality and area of dominance. EM is the pillar which establishes future advanced warhead (explosives) and solid rocket motor (propellants) performance and characteristics. Catastrophic damage improves battlefield damage assessment and reduces sorties. Equally powerful, but smaller weapons optimize internal carry and facilitate higher weapon load outs. Improved propellant ingredients and design concepts

will provide the extended ranges needed in volume limited ordnance systems. Future new ordnance must be adaptable in size to fit a family of delivery systems, contain sufficient energy to defeat the target, have the capability to fly further and faster, while being safe and affordable. To this end, our program is reviewing white papers and proposals in the following areas:

- i. New approaches to novel materials that maximize molecular design, synthesis efficiencies, predicted stabilities to achieve performance goals
- ii. Develop a new class of ingredients that can surpass the oxygen content of Ammonium Perchlorate (AP)
- iii. Development of macroscopic mechanical and chemical models; an understanding of molecule dynamics; strength/reactivity correlations
- iv. Consistent processing and performance results; process research and development (commonly referred to as "scale-up"); areas of concern are safety and remote operations, critical thermal management, batch to batch reproducibility, standardized process for the chemistry, and conditions and product quality and purity
- v. Explore the chemistry and physics of non-traditional energy space between chemical and nuclear bonding energies (disruptive energetic concepts)
- vi. Combat Safe Insensitive Munitions: The Navy has concerns over conventional munitions and propellant systems, since all munitions are stored on maritime platforms. It is critical that conventional munitions display maximum insensitivity when stowed, handled, carried or otherwise exposed to friendly forces and environments, but have sufficient energy/lethality to perform mission expectations reliably
  - a. Establish the connectivity between molecular structure, crystal morphology prediction and synthesis chemistry to provide IM compliant energetic ingredients shock and thermal sensitivity
  - b. Focus modeling and simulation to predict stable crystal structures/crystal morphology
  - c. Establish methodologies to model, measure and predict molecular and crystal energetic material response to external shock and thermal modeling
  - d. Validate design criteria for molecular stability as a function of insensitivity
  - e. Push the boundaries of traditional theory and experimentation to provide energy concepts that are beyond traditional chemistry and physics energy release regimes

h) Counter Directed Energy Weapons

The Counter-Directed Energy Weapons (CDEW) Program was initiated in response to the rapid development of high energy laser (HEL) and high-power microwave (HPM)/high-power radio frequency (HPRF) threats. Directed energy weapons (DEWs) for the purposes here are systems that radiate energy from a source and deliver that energy to a

target in a manner and/or quantity which causes target damage, disruption or neutralization. Directed energy weapons technology advancements, particularly in high energy lasers and high power radio frequency sources, and the resultant decrease in acquisition costs has raised the urgency of developing techniques and technologies for defense of Navy assets from the expected DEW proliferation. Thus, ONR is considering research topics which propose means or novel methodologies for countering the efficacy of directed energy weapons systems. The CDEW program addresses directed energy threats in an operational space containing three layers of defense: detection, mitigation, and protection. Within this operational space are seven technology thrust areas of research and development of counter DEW technologies:

- i. Advanced materials including nano- and/or nonlinear materials for enhanced HEL protection to platform integrity, electronic/optical subsystem -including navigation and sensor systems, and occupants
- ii. Metamaterial structures for the control and mitigation of HEL and HPRF irradiation
- iii. HEL and HPRF mitigation and protection utilizing material obscurants or techniques to synthetically degrade the atmosphere for directed energy propagation
- iv. Modeling and sensing of low level laser irradiation for off-axis (off-target directed) detection and source geo-location
- v. Novel instrumentation for detection of HEL and HPRF irradiation
- vi. Active/Passive circuit protection and limiters for HPRF
- vii. Modeling of HPRF and HEL effects to materials, electronics and sensors as applied to CDEW objectives

The CDEW program seeks white papers and proposals for innovative research and development within or closely related to this portfolio of topic areas. For research topics, the objective of any theoretical studies must be clearly stated. Development efforts should include illustrative examples or targets for the application of innovation to an existing system, or system of systems, with potential improvement to resist threats, methods of use; or change to the underlying principles of construction and fabrication at either the platform or subsystem (weapon, sensor, etc.) level are requested, but not required. Proposals for development efforts should provide milestone oriented timelines for potential or notional insertion or transition points, inside or outside the FYDP. Additionally, research studies related to Tactics, Techniques, and Procedures (TTPs) and Concept of Operations (CONOPS) associated with these or other defensive methods are sought relative to Counter-Directed Energy Weapons (C-DEW).

i) Directed Energy Weapons - High Energy Laser Technologies

The Directed Energy Weapons (DEW) program is investigating the ability to respond to emerging system level needs through the development of high power, high energy laser (HEL) weapon technologies. Specifically, HEL technologies that improve component, subsystem and system level capabilities, in the maritime environment, to deliver that energy to a target in a manner which causes target damage, disruption or neutralization is the focus of interest. HEL technology advancements, particularly in advanced design and

integrative technologies that include innovative technologies in beam director and fire control architectures, or lighter weight beam directors, or higher power optics and coatings, are of interest. Additionally, improvements that lead to novel lethality and vulnerability mechanisms which can be demonstrated against naval targets are of interest. Specific interests are in efforts which could lead to specific updates for assessments that could be included in the Joint Munitions Effectiveness Manuals (JMEM). However, any technology applications for components, subsystems, and HEL weapons systems should remain focused and suitable for naval platforms of interest within the current naval warfare domain and potentially include surface combatant, carrier, amphibious, naval aviation, or submarine based weapon systems. Within this topic technology thrust areas of research and development of HEL technologies of interest include:

- i. HEL Beam Director and Fire Control Architectures, including
  - a. Novel HEL beam director configurations and components
  - b. HEL fire control architecture and components
  - c. Sensor and illuminator technologies, including tracking development
  - d. Automated Target Recognition, including those occurring with or without HEL illumination, leading to automated HEL aim-point selection and maintenance
  - e. Rapid tracking and pose/trajectory estimation, including ability to track through limited or intermittent viewing conditions including intermittent obscuration
- ii. HEL Optics and Coatings, including those which offer
  - a. increases in high peak/average power performance
  - b. advanced materials and gratings, including novel processing
  - c. Electro-magnetic interference (EMI) shielding of optics or optical components through coatings or novel materials
  - d. improved corrosion and aging effects, including resistance to maritime exposure or partial and complete sea water immersion
- iii. HEL Lethality/Vulnerability studies, including
  - a. Material studies leading to structural defeat, subsystem degradation, or adverse target effects and interactions
  - b. High fidelity modeling and experimentation to characterize effects during dynamic engagements
  - c. Target damage assessment methodologies
  - d. Complex aero-thermal and aero-optic interactions
  - e. Novel/alternative kill mechanisms
- iv. Advanced Design and Integrative Technologies, including
  - a. Novel power architectures for low-duty cycle applications
  - b. Micro-channel component cooling for thermal distortion

Component and subsystem technology developments that lead to novel approaches and improve the efficacy of HEL based weapons through increased “power in the bucket” (PitB) or increased “irradiance at range” (IaR) is a near term priority. Current interest also exists for HEL operational capabilities that support “line of sight” precision attack or defenses against threats, including those which are agile-maneuvering or swarming.

- i. Ultra Short Pulse Laser (USPL) Program
  - a. Characterization of USPL-matter interaction, induced RF and spectral emissions
  - b. Study HPRF and spectral effects on target components/systems
  - c. Study synergistic effects of USPL and HEL
  - d. Investigate novel laser sources in MWIR-LWIR (4-12 microns)
  - e. Investigate USPL propagation, filamentation, and beam control
- ii. Advanced lasers and scalable architectures
  - a. Spectral stability and control
  - b. Electrical to optical efficiency improvements
  - c. Eye-safer sources
  - d. Spectral and phase combined systems
  - e. Solid state and gas-phase media
- iii. Atmospheric Characterization and Modeling
  - a. Study the lower atmosphere over the littoral water
  - b. Robust tracking algorithms, compensated imaging, Target ID
  - c. Tracking and aimpoint designation and maintenance
  - d. Active Illumination for active tracking
  - e. White-light super-continuum generation for imaging, and filament-target interaction effects for aim pointing, tracking, and adaptive optics
  - f. Wave front sensing / atmospheric compensation
    - i. Adaptive target loop
    - ii. Adaptive local loop
  - g. Compensate for distributed turbulence, platform disturbances
  - h. Compensate for thermal blooming
  - i. Real-time and predictive characterization of atmospheric conditions relevant to laser weapon performance
  - j. Tools to enhance understanding and mitigation of weather and turbulence induced beam effects
- iv. Adaptive Optics and Jitter Control
  - a. Jitter control: Deployment of a directed energy beam on a tactical naval platform will result in additional challenges as compared to fixed ground or high altitude, large aircraft platforms
  - b. Resolution needed for target ID and aim point selection?
    - i. Short ranges (<10 km) for UAV
    - ii. Long ranges (>10 km) for supersonic sea-skimmers
    - iii. Compensated imaging to ID and select aim point on incoming target
    - iv. How do HEL effects (thermal blooming and aerosol interactions) affect aim point maintenance?
- v. Adaptive optics techniques and components that enable designs that have
  - a. Low weight
  - b. Immunity to distortion
  - c. Large amplitude correction capabilities
  - d. High power handling



e. Reduced complexity

The HEL Technology program seeks white papers and proposals for innovative research and development within or closely related to this portfolio of topic areas. For research topics, the objective of any theoretical studies must be clearly stated. Development efforts should include objectives for the application of technologies to an existing HEL demonstrator or subsystem. Initially, focus is expected to be at the component level, with potential expansion to the subsystem level for an HEL weapon leading to higher power levels (hundreds to mega-watts of HEL power). Proposals for development efforts should provide an estimated timelines (in months) required to reach specific technology readiness levels, milestone for potential or notional demonstrations, leading to insertion or transition points, inside or outside the FYDP.

j) Design and System Level Analysis Tools

Sea Based Aviation has several unique features that impose additional system and system-of-system level constraints and non-traditional design options that lead to alternative architectures and naval specific configurations. New and novel techniques and analyses are sought for naval aircraft and aircraft-ship combinations and design and optimization methodologies for systems or systems-of-systems to perform naval aviation missions and understand the operational effectiveness of such systems. This program is reviewing white papers and proposals in the following areas:

- i. New and novel analytical or computational methods for air combat and campaign analyses
- ii. New analytical methods in air operations, including air-traffic control for large systems that may include manned, unmanned and autonomous systems
- iii. Aircraft susceptibility and vulnerability reduction including analytical tools, concepts, and component demonstrations in a range of categories including active and passive damage suppression

2. The Applications Division undertakes Naval unique or essential projects involved with applied research and advanced technology aligned with current and future naval capability gaps and innovative naval prototypes.

a) Autonomous Aerial Cargo/Utility System Program

The Autonomous Aerial Cargo/Utility System (AACUS) is an Innovative Naval Prototype. The AACUS program explores advanced autonomous capabilities for reliable resupply/retrograde by an unmanned air vehicle under adverse conditions. Key features of AACUS include a vehicle autonomously avoiding obstacles while finding and landing at an unprepared landing site in dynamic conditions, with goal-directed supervisory control by a field operator with no special training. Areas of special interest in this program include the following areas:

- i. User interfaces (software and/or hardware) for supervision of single or multiple autonomous rotary wing aircraft
- ii. Sensors and algorithms for obstacle detection and landing zone evaluation in degraded visual environments

- iii. Sensors and algorithms for terrain classification, especially in degraded visual environments
- iv. Sensors and algorithms for wind velocity estimation in flight and in the landing zone
- v. Test & evaluation and verification & validation methods for complex autonomous systems operating in unstructured outdoor environments
- vi. Robotic devices for autonomous offloading of cargo from a helicopter in an unstructured field environment

b) Electromagnetic Railgun

The Electromagnetic Railgun is an Innovative Naval Prototype. Development through 2019 is focused on thermal management and achieving operation at a high repetition rate of fire. The launch energy of this system stresses many components. Areas of special interest in this program include the following areas:

- i. Advanced thermal management techniques for long slender metal rail structures
- ii. Extended service life for materials and components in harsh environment
- iii. High-strength, dielectric, structural materials
- iv. High-speed, high-current metal-on-metal sliding electrical contact
- v. System interfaces between high-power loads and platform power distribution
- vi. Compact pulsed power systems and power electronics
- vii. High-conductivity, high-strength, low-density conductors
- vi. Repetitive rate switches and control technologies
- vii. High pulsed current transfer slip ring technologies

c) Hypervelocity Projectile

The Hypervelocity Projectile (HVP) is a next-generation, common, low drag, guided projectile capable of completing multiple missions for gun systems such as the Navy 5-Inch, 155-mm, and future railguns. Types of missions performed will depend on gun system and platform. The program goal is to address mission requirements in the areas of Naval Surface Fire Support, Cruise Missile Defense, Anti-Surface Warfare and other future Naval mission areas. Mission performance will vary from gun system, launcher or ship. HVP's low drag aerodynamic design enables high-velocity, maneuverability and decreased time-to-target. These attributes coupled with accurate guidance electronics provide low-cost mission effectiveness against current threats and the ability to adapt to air and surface threats of the future. Areas of special interest in this program include the following areas:

- i. Compact, high acceleration tolerant control actuation systems
- ii. High-acceleration tolerant electronic components
- iii. Light-weight, high-strength structural composites
- iv. Miniature, high-density electronic components
- v. Safe high-energy propellants compatible with shipboard operations
- vi. Aerothermal protection systems for flight vehicles

d) Laser Weapons System Technologies

These technologies support full threat kill-chain engagement from target detection to engagement and damage assessment. These technologies must be suitable for operations in the maritime environment and integration with air, surface and submarine platforms. Priorities include the ability to engage asymmetric, small boat, and air platforms as well as to counter Intelligence, Surveillance, and Reconnaissance (ISR) systems. Areas of special interest in this program include the following areas:

- i. High-efficiency laser generation technology
- ii. Beam forming and control technologies
- iii. Ruggedized, high-energy, power density-tolerant, optical path components
- iv. Light-weight, rechargeable, high-energy generation and storage devices
- v. Modeling & Simulation of laser weapons system and subsystems to quantify system performance and atmospheric propagation in a maritime environment
- vi. System Performance, Test & Evaluation

e) Sea-Based Automated Launch and Recovery System

The Navy and Marine Corps will increasingly need to operate highly capable unmanned air vehicles (UAVs) from ships at sea. The MQ-8 Fire Scout is the first naval UAV of this type, operating from small deck ships, using the UCARS radar-based recovery system to provide precision ship-relative navigation (PS-RN) for its fully automated landings. The Unmanned Combat Air System Demonstration (UCAS-D) program has demonstrated the capability for an advanced UAV (represented by the X-47 demonstration aircraft) to operate from aircraft carriers, using a GPS-based PS-RN system for its automated launch and recovery capability. Analyses of and experience with both of these PS-RN approaches indicate that backup or alternative system options are desirable in order to ensure that highly reliable UAV operations can be conducted under demanding at-sea conditions. Areas of special interest in this program include the following areas: Non-GPS PS-RN systems performance related to:

- i. Degraded weather
- ii. High deck motion
- iii. Electro Magnetic Interference / multipath/jamming
- iv. Alternate missions (e.g., landings ashore, landings on non-surveyed ships, etc.)
- v. Ship reference displays, and aircraft cockpit displays for manned aircraft
- vi. Automated aircraft carrier air traffic control

f) Variable Cycle Advanced Technology

The Variable Cycle Advanced Technology (VCAT) program develops and matures gas turbine engine technologies to improve power, propulsion, and thermal management for next generation fighter and strike aircraft. Technology challenges include aerodynamics,

aeromechanics, instrumentation, control, mechanical durability, and turbine heat transfer of variable geometry engines. Areas of interest in adaptive engines include:

- i. Low speed thrust response for approach, wave-off, and bolter
- ii. Maximum efficiency and specific thrust over a wide range of engine operating conditions
- iii. Environmental and corrosion resistance in a marine environment
- iv. Takeoff water/steam ingestion tolerance
- v. Dimension and weight constraints to meet aircraft/ship integration requirements

g) Future Naval Capabilities

Air Warfare and Weapons Future Naval Capabilities (FNC) seek to provide enhancements to capabilities identified as needs in the FNC technology gaps.

- i. Naval Needs
  - a. Tactical Missile Enhancements, Offensive and Defensive Capabilities
  - b. Survivable, Standoff, All Weather ASuW Capabilities
  - c. High Threat Time-Critical Strike
  - d. Countermeasures to Advanced Seekers and Hostile Fire
  - e. Air Vehicle Performance Enhancements
  - f. Air Platform Survivability, Total Ownership Cost, and Operational Availability
  - g. Hypersonic Missile Defense
  - h. Naval Fires Enhancements
  - i. Non-Kinetic Warfare Capabilities
  - j. Unmanned Naval Aviation
- ii. Technology Areas
  - a. Energetics – Warhead and Propulsion
  - b. Warhead Design Improvements
  - c. G&C Navigation/Autonomy
  - d. Airframe Technology
  - e. Power and Energy Enhancement
  - f. Propulsion Design Improvements
  - g. Sensor, Seeker and Targeting
  - h. Directed Energy Offensive and Defensive
  - i. Collaborative Operations, System of Systems Improvements
  - j. Advanced Manufacturing Technologies
  - k. Reduced Maintenance Concepts

- iii. Additional Focus Areas of Interest
  - a. Life-Cycle Cost
  - b. Kill-Web Enhancements
  - c. Flight Performance Enhancements

### **The Marine Corps Warfighting Lab**

The Marine Corps Warfighting Lab (MCWL) utilizes concept-based experimentation as a primary means to explore both material and non-material solutions enabling warfighting concepts. The concept-based experimentation process provides the unique opportunity to assess the utility of experimental technologies employed in operational scenarios and environments. MCWL leverages ONR's science and technology efforts to inform and support the concept-based experimentation process.

ONR Code 30 thrusts and technology investment areas support MCWL science and technology interests. Because ONR and MCWL focus on technologies of different maturity levels (TRL), offerors responding to ONR Code 30 thrusts and research areas are encouraged to submit white papers to both organizations for wider consideration. Amplifying instructions on White Paper submissions to MCWL can be found at <http://www.mcwl.marines.mil/Divisions/Science-and-Technology/Future-Technology-Office/TISO/>.

Focus areas for MCWL experimentation include:

- 1) Expeditionary Logistics. Technologies to sustain distributed operations in austere and remote environments.
  - a. Efficient generation of energy and purified water at points of consumption.
  - b. Reduced consumption of energy.
  - c. Demand and resupply visibility and efficiency.
  - d. Autonomous/unmanned support and resupply capabilities.
  - e. Secure resupply in urban environments.
  - f. Operations from a sea base comprised of either US Navy amphibious shipping or alternate platforms.
- 2) Interoperable C2 Systems. Technologies that enhance information sharing within the MAGTF and among Joint and Coalition forces.
  - a. Efficient data sharing in a multi-level classification/security environment.
  - b. Common Operational Picture accessible and tailorable to command needs.
- 3) C2 Afloat. Technologies to improve ship-to-shore communications and enhance the ability to command and control distributed operations from sea-based platforms.
  - a. Modular systems that enable rapid installation of communications and networking capabilities aboard ships that can quickly transition from a sea based platform to a land based configuration.

- 4) Communications and Networking. Technologies to improve secure information exchange over the horizon and on the move.
  - a. Self-forming/self-healing secure, high bandwidth voice and data mesh networks.
  - b. Network management tools to improve efficiency and maximize reliability.
  
- 5) Lightening the Load. Technologies that reduce the size and weight of the total load of the MAGTF as well as the individual Marine.
  - a. Reduced weight/size of equipment embarked on amphibious shipping.
  - b. Reduced weight/size of equipment carried/worn by individual Marines.
  - c. Autonomous/unmanned systems used for small unit logistic enablers or armed surveillance roles.
  
- 6) Counter IED/Mine. Technologies that enhance IED/mine detection, neutralization or pre-detonation.
  - a. IED detection, neutralization or pre-detonation from standoff distances, to include explosive hazards on unmanned platforms.
  - b. Detection and neutralization of suicide bombers and vehicular bombs.
  
- 7) Persistent ISR. Technologies that enhance sensor acquisition, fusion and data distribution, Technologies to maximize payload flexibility and endurance of unmanned systems.
  - a. Unmanned airborne systems that can be launched from ship or land to provide over the horizon, long endurance surveillance capabilities.
  - b. Unmanned systems (air or ground) that can be launched from larger unmanned systems to extend operational reach.
  - c. Technologies that can fuse data and provide scalable information to the end user (small unit leader to commander).
  
- 8) Urban Operations. Technologies that enable the ability to operate in densely populated cities.
  - a. Sensors to improve surveillance in an urban environment.
  - b. Technologies that enable secure, inter-squad communications in high rise buildings.
  - c. Technologies that provide rapid, stealth ingress/egress of urban centers.
  - d. Technologies that enable urban mobility in vertical, subterranean, or ground level environments.
  
- 9) Amphibious Operations Enablers. Technologies that enhance the ability to operate from ship to shore.
  - a. Technologies to assess maneuverability of the shallows, beach and shore with respect to obstacles, mines, enemy presence, landing and driving conditions.
  - b. Sea wall breaching technologies.
  - c. Technologies that reduce or eliminate ship to shore signature of surface craft.
  
- 10) Precision Fires. Technologies that reduce target location error and extend the reach of ship-to-shore fires.
  - a. Increase the range and timeliness of air, ground and naval fires.
  - b. Improve the ability to provide all weather fire support among distributed forces.
  - c. Technologies to counter adversary unmanned systems (air, ground and sea surface).

d. Technologies to maintain precision in a GPS denied environment.

11) Cyberspace Operations. Technologies to defend networks, evade/react to attacks and counter or exploit enemy networks.

- a. Protection of networks and detection of intrusion/disruption.
- b. Secure hand-held devices.
- c. Capabilities to exploit network activities, attacks and threats.

12) Simulation, Training & Human Performance. Adaptable and deployable training systems and technologies that enhance the speed and effectiveness of training.

- a. Integration of live, virtual and simulated training through networked venues.
- b. Simulation systems that immerse individuals in operationally realistic training scenarios.

13) Medical Technologies. Technologies to improve the medical care for Marines through prevention, protection and casualty response.

- a. Networked, hand held real-time health assessment devices.
- b. Technologies to increase casualty survivability through improved forward care and speed of casualty transport.
- c. Containerized Medical Systems for Alternative Shipping: Ability to utilize ship power and water, to load on/off alternative shipping with capability modules for emergency rooms, operating rooms, wards, burn care, labs, communications, and pharmacy.
- d. Blood Storage: Ruggedized ability to store blood with redundant power, constant monitoring, and Marine aircraft compatible.
- e. Patient Warming: Uninterrupted warming throughout evacuation chain with ability to raise and maintain patient temperature. Flexible power sources (solar, batteries, etc) and near silent operation.
- f. Mobile Power: Technologies capable of providing power for medical equipment while maneuvering with ground forces, and is internally transportable by all Marine aircraft.
- g. Energy Efficient Medical Shelter: Hybrid material shelters that require low energy/small footprint heating for forward surgery.
- h. Mobile loading systems for Medical Operations: Ability to move medical supplies autonomously on/off Marine aircraft with a mobile pallet that has organic medical life support (power, heating, water purification).

14) Counter Shooter/Counter Surveillance. Situational awareness and options to counter enemy surveillance and direct fire targeting.

- a. Pre-shot identification of shooters and enemy observation/surveillance.
- b. Detection of optics used for observation and recording.

15) Other Supporting Missions

- a. Scalable, flexible-range non-lethal weapons.
- b. Automated, hand held language translation systems.
- c. Systems to improve boarding of vessels for search and seizures.
- d. Technologies that can detect and/or neutralize small unmanned aerial systems.
- e. Technologies that enable operations in a GPS denied environment.

f. Technologies that enable ‘swarming’ of unmanned systems.

### **Office of Naval Research Global (Code 600)**

ONR Global (ONRG) brings the Department of the Navy Science & Technology (S&T) connectivity between the international S&T community, the Fleet/Force, and the Naval Research Enterprise (NRE). ONRG does not fund investigators from the United States. ONRG serves as an external network facilitator for ONR headquarters and the NRE by ensuring connections are maintained between the international S&T community, the NRE and the Navy-Marine Corps team regarding the execution and development of long range, strategic basic research efforts. ONRG fields a team of internationally located scientists and engineers (Associate Directors) seeking out and engaging international researchers.

Associate Directors (ADs) are subject matter experts and/or regional specialists whose primary mission is to provide access to international experts in fields of interest to the Naval S&T community and to provide them opportunities to connect to their multiple technology counterparts at ONR HQ in Arlington, VA and/or other organizations in the NRE. In addition, ONRG's AD's assess international S&T innovation while conducting liaison visits to international scientists, renowned universities and international organizations. AD's can be reached through the following link: <http://www.onr.navy.mil/Science-Technology/ONR-Global/associate-directors/~media/Files/ONRG/Associate-Director-Contacts-FY15.ashx>

ONRG supports basic and applied research and sponsors exchange visits, conferences, and workshops that fosters collaboration between the U.S. Navy and international scientists and technologists around the world which identify new technologies, promote and address the needs of the Navy and Marine Corps and enhance the S&T priorities of ONR and the NRE.

- The Collaborative Science Program (CSP) supports international workshops, conferences, and seminars of naval interest held outside of the United States.
- The Naval International Cooperative Opportunities in Science and Technology Program (NICOP) provides direct research support to international scientists to help address naval S&T challenges. NICOPs support the insertion of innovative, international S&T into core ONR and Naval Research Enterprise (NRE) Programs.

Funding Opportunities: <http://www.onr.navy.mil/en/Science-Technology/ONR-Global/funding-opportunities.aspx>



**G. Point(s) of Contact (POC) –**

i. Questions of a Technical nature:

Questions of a Technical nature should be submitted to the ONR POC whose program best matches the offeror's field of interest. Explore ONR's website at <http://www.onr.navy.mil/Science-Technology/Contacts.aspx>, where you can navigate the various directorates and departments within the ONR umbrella. Embedded within the specific exploratory threads should be the relevant POC information for the cognizant ONR Program Office that you seek.

ii. Questions of a Technical nature related to Marine Corps Warfare Lab (MCWL) topics:

Contact the MCWL Future Technology Officer at [john.e.moore4@usmc.mil](mailto:john.e.moore4@usmc.mil).

iii. Questions of a Technical nature related to the Office of Naval Research Global (ONRG) topics:

Contact the ONRG Grants Team at [ONRG.GrantProposals@mail.mil](mailto:ONRG.GrantProposals@mail.mil)

iv. Questions of a Business nature, and suggestions for improvement, should be submitted to:

One Liberty Center  
875 N. Randolph Street  
Arlington, VA 22203-1995  
Email Address: [michelle.parrott@navy.mil](mailto:michelle.parrott@navy.mil)  
Email Subject Line: "RE: Long Range BAA"

v. Questions of a Security nature should be submitted to:

Torri Woodfolk  
Information Security Specialist  
Office of Naval Research  
Security Department, Code 43  
One Liberty Center  
875 N. Randolph Street  
Arlington, VA 22203-1995  
Email Address: [torri.powell@navy.mil](mailto:torri.powell@navy.mil)

Note:

All UNCLASSIFIED communications shall be submitted via e-mail to the Technical Point of Contact (POC), with a copy to the designated Business POC.

CLASSIFIED questions shall be handled through the ONR Security POC. Specifically, any entity wanting to ask a CLASSIFIED question shall send an UNCLASSIFIED email to the ONR Security POC with a copy to both the Technical POC and the Business POC stating that the entity would like to ask a CLASSIFIED question. DO NOT EMAIL ANY CLASSIFIED QUESTIONS. The Security POC will contact the entity and arrange for the CLASSIFIED question to be asked through a secure method of communication.

Amendments to this BAA will be posted to one or more of the following web pages:

- Federal Business Opportunities (FedBizOpps) – <https://www.fbo.gov/>
- Grants.gov – <http://www.grants.gov/>
- ONR Broad Agency Announcement (BAA) - <http://www.onr.navy.mil/en/Contracts-Grants/Funding-Opportunities/Broad-Agency-Announcements.aspx>

**H. Instrument Type(s) –**

Awards may take the form of contracts, grants, cooperative agreements, basic agreements, and other transaction agreements, as appropriate.

For information on the substantial involvement ONR expects to have in cooperative agreements, prospective offerors should contact the Technical Point of Contact identified in Part I, Section G, of this BAA.

**Any contract awards resulting from this BAA will incorporate the most current FAR, DFARS, NMCARS and ONR clauses.**

Any assistance instrument awarded under this announcement will be governed by the award terms and conditions that conform to DoD implementation of OMB circulars applicable to financial assistance. Terms and conditions of new awards made after December 26, 2014, may include revisions to reflect DoD implementation of new OMB guidance in 2 CFR Part 200, “Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards.” The DoD Terms and Conditions is located at <http://www.onr.navy.mil/Contracts-Grants/submit-proposal/grants-proposal/grants-terms-conditions.aspx>.

Examples of model contracts can be found on the ONR website at the following link: <http://www.onr.navy.mil/Contracts-Grants/submit-proposal/contracts-proposal/contract-model-awards.aspx> . ONR Contract specific representations and certifications can be accessed on the following page of the ONR website: <http://www.onr.navy.mil/en/Contracts-Grants/submit-proposal/contracts-proposal.aspx>.

Examples of model grants can be found on the ONR website at the following link:  
<http://www.onr.navy.mil/en/Contracts-Grants/submit-proposal/grants-proposal.aspx> .

The model contracts and grants at the links above are only provided as examples. In the event of any conflict between these examples and current FAR, DFARS, NMCARS, or ONR clauses, current FAR, DFARS, NMCARS, or ONR clauses will govern.

**I. Catalog of Federal Domestic Assistance (CFDA) Numbers -**

12.300

**J. Catalog of Federal Domestic Assistance (CFDA) Titles –**

Department of Defense (DoD), Department of the Navy, Office of Chief of Naval Research,  
Basic and Applied Scientific Research

**K. Other Information –**

This BAA is intended for proposals related to basic research, applied research, or advanced technology development and that part of development not related to the development of a specific system or hardware procurement. With regard to any restrictions on the conduct or outcome of work funded under this BAA, ONR will follow the guidance on and definition of “contracted fundamental research” as provided in the Under Secretary of Defense (Acquisition, Technology and Logistics) Memorandum of 24 May 2010.

As defined therein, the definition of “contracted fundamental research,” in a DoD grant or contractual context, includes research performed under grants and contracts that are (a) funded by Research, Development, Test and Evaluation Budget Activity 1 (Basic Research), whether performed by universities or industry or (b) funded by Budget Activity 2 (Applied Research) and performed on campus at a university. The research shall not be considered fundamental in those rare and exceptional circumstances where the applied research effort presents a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense, and where agreement on restrictions have been recorded in the contract or grant.

Pursuant to DoD policy, research performed under grants and contracts that are a) funded by Budget Activity 2 (Applied Research) and NOT performed on-campus at a university or b) funded by Budget Activity 3 (Advanced Technology Development) does not meet the definition of “contracted fundamental research.” In conformance with the USD (AT&L) guidance and National Security Decision Directive 189, ONR will place no restriction on the conduct or reporting of unclassified “contracted fundamental research,” except as otherwise required by applicable federal statute, regulation or executive order. For certain research projects, it may be possible that although the research being performed by the prime contractor is restricted research, a subcontractor may be conducting “contracted fundamental research.” In those cases, it is the

*prime contractor's responsibility* in the proposal to identify and describe the subcontracted unclassified research and include a statement confirming that the work has been scoped, negotiated, and determined to be fundamental research according to the prime contractor and research performer.

Normally, fundamental research is awarded under grants with universities and under contracts with industry. Non-fundamental research is normally awarded under contracts and may require restrictions during the conduct of the research and DoD pre-publication review of such research results due to subject matter sensitivity. Potential offerors should consult with the appropriate ONR Technical POCs to determine whether the proposed effort would constitute basic research, applied research or advanced research.

FAR Part 35 restricts the use of Broad Agency Announcements (BAAs), such as this, to the acquisition of basic and applied research and that portion of advanced technology development not related to the development of a specific system or hardware procurement. Contracts and grants and other assistance agreements made under BAAs are for scientific study and experimentation directed towards advancing the state of the art and increasing knowledge or understanding.

**THIS ANNOUNCEMENT IS NOT FOR THE ACQUISITION OF TECHNICAL, ENGINEERING AND OTHER TYPES OF SUPPORT SERVICES.**

## **II. AWARD INFORMATION**

### **A. Funding Amount and Period of Performance-**

The funded amount and period of performance of each proposal selected for award may vary depending on the research area and the technical approach to be pursued by the offeror selected.

### **B. Peer Reviews-**

In the case of proposals funded as basic research, ONR may utilize peer reviewers from academia, industry, and Government agencies to assist in the periodic appraisal of performance under the awards, as outlined in ONR Instruction 3966.1A. Such periodic program reviews monitor the cost, schedule and technical performance of funded basic research efforts. The reviews are used in part to determine which basic research projects will receive continued ONR funding. Peer reviewers who are not U.S. Government employees must sign nondisclosure agreements before receiving full or partial copies of proposals and reports submitted by the basic research performers. Offerors may include travel costs for the Principal Investigator (PI) to attend the peer review.

### **C. Production and Testing of Prototypes-**

ONR may modify a contract awarded under this BAA to add a contract line item or contract option for the provision of advanced component development or for the delivery of an initial or additional prototype units. However, such a contract addition shall be subject to the limitations contained in Section 819 of the National Defense Authorization Act (NDAA) for Fiscal Year 2010, as modified in Section 811 of the NDAA for Fiscal Year 2015.

### **III. ELIGIBILITY INFORMATION**

**A.** All responsible sources from academia, industry, and the research community may submit proposals under this BAA. Historically Black Colleges and Universities (HBCUs) and Minority Institutions (MIs) are encouraged to submit proposals and join others in submitting proposals. However, no portion of this BAA will be set aside for Small Business or other socio-economic participation. All businesses both small and large are encouraged to submit proposals and compete for funding consideration.

**B.** Federally Funded Research & Development Centers (FFRDCs), including Department of Energy National Laboratories, **are not** eligible to receive awards under this BAA. However, teaming arrangements between FFRDCs and eligible principal Offerors are allowed so long as such arrangements are permitted under the sponsoring agreement between the Government and the specific FFRDC.

**C.** Navy laboratories, military universities, and warfare centers as well as other Department of Defense and civilian agency laboratories are also not eligible to receive awards under this BAA and should not directly submit either white papers or full proposals in response to this BAA. If any such organization is interested in one or more of the programs described herein, the organization should contact an appropriate ONR Technical POC to discuss its area of interest. The various scientific divisions of ONR are identified at <http://www.onr.navy.mil/>. As with FFRDCs, these types of federal organizations may team with other eligible sources from academia and industry that are submitting proposals under this BAA.

**D.** University Affiliated Research Centers (UARCs) are eligible to submit proposals under this BAA unless precluded from doing so by their Department of Defense UARC contract.

**E.** Teams are also encouraged and may submit proposals in any and all areas. However, Offerors must be willing to cooperate and exchange software, data and other information in an integrated program with other contractors, as well as with system integrators, selected by ONR.

**F.** Offerors should be aware of recent changes in export control laws. Offerors are responsible for ensuring compliance with all International Traffic in Arms Regulation (ITAR)(22 CFR §120 *et. seq.*) requirements, as applicable. In some cases, developmental items funded by the Department of Defense are now included on the United States Munition List (USML) and are therefore subject to ITAR jurisdiction. Offerors should address in their proposals whether ITAR restrictions apply or do not apply, such as in the case when research products would have both civil and military application, to the work they are proposing to perform for ONR. The USML is available online at <http://www.ecfr.gov/cgi-bin/text-idx?node=pt22.1.121> . Additional information regarding the President's Export Control Reform Initiative can be found at <http://export.gov/ecr/index.asp>.

**G.** Cost sharing is not expected and will not be used as a factor during the merit review of any proposal hereunder. However, the Government may consider voluntary cost sharing if proposed.

#### **IV. APPLICATION AND SUBMISSION INFORMATION**

##### **A. Application and Submission Process -**

Full proposals are required for submission. "White Papers" are frequently desired by ONR Program Officers. Offerors should consult the cognizant ONR Program Officer regarding the desirability of "White Paper" submissions or Oral Presentations. ONR departments are identified at <http://www.onr.navy.mil/en/Science-Technology/Contacts.aspx>.

##### **B. Content and Format of White Papers/Full Proposals -**

White Papers and Full Proposals submitted under this BAA are expected to be unclassified; however, classified proposals are permitted. If a classified proposal is submitted and selected for award, the resultant contract will be unclassified. An 'unclassified' Statement of Work (SOW) must accompany any classified proposal.

For both classified and unclassified proposals, a non-proprietary version of the Statement of Work must also be submitted. Do not put proprietary data or markings in or on the Statement of Work. For proposals containing data that the offeror does not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, the contractor shall mark the title page with the following legend:

“This proposal includes data that shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed--in whole or in part--for any purpose other than to evaluate the proposal. If, however, a contract is awarded to this offeror as a result of--or in connection with-- the submission of this data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract. This restriction does not limit the Government’s right to use information contained in this data if is obtained from another source without restriction. The data subject to this restriction are contained in (insert numbers

or other identification of sheets).”

Also, mark each sheet of data that the offeror wishes to restrict with the following legend:

“Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal.”

Titles given to the White Papers/Full Proposals should be descriptive of the work they cover and should not be merely a copy of the title of this solicitation.

1. Unclassified Proposal Instructions:  
Unclassified proposals shall be submitted in accordance with this Section.
  
2. Special Instructions for Classified White Papers and Proposal:  
Classified proposals shall be submitted directly to the attention of ONR’s Document Control Unit at the following address and marked in the following manner:

**OUTSIDE ENVELOPE  
(no classification marking):**

“Office of Naval Research  
Attn: Document Control Unit  
ONR Code 43  
875 North Randolph Street  
Arlington, VA 22203-1995”

The inner wrapper of the classified White Paper and/or Full Proposal should be addressed to the attention of the cognizant Technical POC, ONR Code XX and marked in the following manner:

**INNER ENVELOPE  
(stamped with the overall classification of the material)**

“Program Name:  
Office of Naval Research  
ATTN: ONR Program Officer Name  
ONR Code: ONR Program Officer Code  
875 North Randolph Street  
Arlington, VA 22203-1995”

All proposal submissions will be protected from unauthorized disclosure in accordance with FAR Subpart 15.207, applicable law, and DoD/DoN regulations. Offerors are expected to appropriately mark each page of their submission that contains proprietary information.

## i. White Papers

- a. White Papers Format
  - Paper Size: 8.5 x 11 inch paper
  - Margins: 1 inch
  - Spacing: single-spaced
  - Font: Times New Roman, 12 point
  - Page limit: 4–5 pages. Consult with cognizant technical POC if unable to comply.
  
- b. White Papers Submission

### **For ONR:**

Electronic (email) submissions should be sent to the attention of the Technical POC at: Email Address of the Technical POC, e.g. [Jane.Doe@navy.mil](mailto:Jane.Doe@navy.mil). The subject line of the email shall read “N00014-17-S-B001 White Paper Submission”. The white paper must be a Microsoft Word 2010 compatible, or PDF format attachment to the email. There is an email size limit of 5MB per email.

### **NOTE: Do not send:**

- 1) Hardcopies of White Papers (including Facsimiles). Only electronic submissions will be accepted and reviewed;**
- 2) ZIP files; and**
- 3) Password protected files.**

### **For ONRG:**

Electronic submissions of white papers for grants to ONRG may be submitted directly at [ONRG.GrantProposals@mail.mil](mailto:ONRG.GrantProposals@mail.mil). **Only electronic submissions will be accepted and reviewed.** The most current information on ONRG funding opportunities is listed on the ONRG website: (<http://www.onr.navy.mil/Science-Technology/ONR-Global.funding-opportunities.aspx> ).

### **NOTE: Do not send:**

- 1) Hardcopies of White Papers (including Facsimiles). Only electronic submissions will be accepted and reviewed;**
- 2) ZIP files; and**
- 3) Password protected files.**

### **For MCWL:**

MCWL Topics of Interest Only - White Papers addressing MCWL topics of interest should be sent to the following address:



Marine Corps Warfighting Lab  
Attn: Future Technology Officer  
3255 Meyers Ave.  
Quantico, VA 22134

c. White Paper Content

- **Cover Page:** The Cover Page shall be labeled “WHITE PAPER” and shall include the BAA Number N00014-17-S-B001, proposed title, technical points of contact, telephone number, facsimile number, and E-mail address.
- **Technical Concept:** A description of the technology innovation and technical risk areas.

*For Basic Research*

- **Future Naval Relevance (where applicable):** A description of potential Naval relevance and contributions of the effort to the agency’s specific mission.
- **Rough Order of Magnitude (ROM).**

*For Applied Research and Advanced Technology Development*

- **Operational Naval Concept (where applicable):** A description of the project objectives, the concept of operation for the new capabilities to be delivered, and the expected operational performance improvements.
- **Operational Utility Assessment Plan (where applicable):** A plan for demonstrating and evaluating the operational effectiveness of the Offeror’s proposed products or processes in field experiments and/or tests in a simulated environment.
- **Rough Order of Magnitude (ROM).**

**ii. Full Proposals**

NOTE: If page limits are not specified, then consult with your cognizant Technical POC.

**a. INSTRUCTIONS FOR CONTRACTS, COOPERATIVE AGREEMENTS AND OTHER TRANSACTION AGREEMENTS (Does not include Grants)**

Proposal Package:

The following five documents with attachments comprise a complete proposal package:

- (1) Proposal Checklist (.pdf)
- (2) Technical Proposal Template (.pdf)

- (3) Cost Proposal Spreadsheet (Excel)
- (4) Adequacy Checklist for Pre Award Audit (SF 1408) (as applicable)
- (5) Stand-alone non-proprietary Statement of Work (SOW) in Word

**NOTE: The electronic file name for all documents submitted under this BAA must not exceed 68 characters in length, including file name extension.**

Items 1 – 5 above are located at: <http://www.onr.navy.mil/Contracts-Grants/submit-proposal/contracts-proposal/>. All have instructions imbedded into them that will assist in completing the documents. Also, both the Proposal Checklist and the Cost Proposal Spreadsheet require completion of cost-related information. Please note that attachments can be incorporated into the Proposal Checklist.

The format requirements for attachments are as follows:

- Paper Size: 8.5 x 11 inch paper
- Margins: 1 inch
- Spacing: single or double spaced
- Font: Times New Roman, 12 point

Offerors responding to this BAA must submit a separate list of all technical data or computer software that will be furnished to the Government with other than unlimited rights. The Government will assume unlimited rights if offerors fail to identify any intellectual property restrictions in their proposals. Include all proprietary claims to results, prototypes, and/or deliverables. If no restrictions are intended, then the offeror should state “NONE.”

For proposals below the simplified acquisition threshold (less than or equal to \$150K), the Technical Proposal Template and Proposal Checklist documents, and the Cost Proposal Spreadsheet are required. Purchase orders can also contain options, as long as the total amount of the base and all options does not exceed \$150K.

For proposed subcontracts or interorganizational transfers over \$150,000, Offerors must provide a separate fully completed Cost Proposal Spreadsheet in support of the proposed costs. This spreadsheet, along with supporting documentation, must be provided either in a sealed envelope with the prime’s proposal or via e-mail directly to both the Program Officer and the Business Point of Contact at the same time the prime proposal is submitted. The e-mail should identify the proposal title, the prime Offeror and that the attached proposal is a subcontract, and should include a description of the effort to be performed by the subcontractor.

Offerors should submit an appropriate number of hard copies as discussed with the cognizant Program Officer of their proposal package.

The electronic copy should be submitted in a secure, pdf-compatible format, except for the electronic file of the Cost Proposal Spreadsheet which must be submitted in a Microsoft Excel 2010 compatible format and the Statement of Work Template which must be submitted in Microsoft Word format. All attachments to any required proposal documents should be submitted in a secure, pdf-compatible format.

The secure pdf-compatible format is intended to prevent unauthorized editing of the proposal prior to any award. A password should not be required for opening the proposal document, but the Government must have the ability to print and copy text, images, and other content. Should an Offeror amend its proposal, the amended proposal should be submitted following the same hard and electronic copy guidance applicable to the original proposal.

Any proposed options that are identified in the Technical Proposal Template or Proposal Checklist documents, but are not fully priced out in the Cost Proposal Spreadsheet, will not be included in any resulting contract, cooperative agreement, or other transaction agreement. If proposing options, they **must** be separately priced and separate spreadsheets should be provided for the base period and each option. In addition to providing summary by period of performance (base and any options), the Contractor is also responsible for providing a breakdown of cost for each task identified in the Statement of Work. The sum of all costs by task worksheets **MUST** equal the total cost summary.

The electronic submission of the Excel spreadsheet should be in a “useable condition” to aid the Government with its evaluation. The term “useable condition” indicates that the spreadsheet should visibly include and separately identify within each appropriate cell any and all inputs, formulas, calculations, etc. The Offeror should not provide “value only spreadsheets” similar to a hard copy.

Fixed Fees on ONR Contracts: The Government objective is set in accordance with the DFARS 215.404-71. See the below table for range and normal values:

<b>Contract Risk Factor</b>	<b>Contract Type</b>	<b>Assigned Value (Normal range)</b>	<b>Normal Value</b>
Technical <sup>(1)</sup>		3% - 7% <sup>(2)</sup>	5%
Management/ Cost Control <sup>(1)</sup>		3% - 7% <sup>(2)</sup>	5%
Contract Type Risk	Firm Fixed Price	2% - 6% <sup>(3)</sup>	3% - 5% <sup>(4)</sup>

Contract Type Risk	Cost Plus Fixed Fee	0% - 1% <sup>(2)</sup>	0.5%
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(1) Assign a weight (percentage) to each element according to its input to the total performance risk. The total of the two weights equal 100%

(2) Assign a weighting score relative to the Risk Factor.

(3) Depends on the specific Contract Type (With/without financing, performance-based payments, and/or progress payments).

(4) Depends on the specific Contract Type.

Technology Incentive (TI) is rarely utilized at ONR, because the contracts issued by ONR typically are not eligible for TI (See DFARS 215.404-71-2(c) (2)). Any consideration of TI requires strong and convincing justification in the proposal, which are then subject to negotiation and determination of a fair and reasonable fee, within the context of the specific award.

Typically the range of fee is 5% to 7.5% on an ONR awarded contract.

For submission instructions, see Part IV, Section F. [Submission of Full Proposals for Contracts, Cooperative Agreements, and Other Transaction Agreements.](#)

**b. INSTRUCTIONS FOR GRANTS** (Does not include contracts, cooperative agreements and other transaction agreements)

**Content and Form of Application:**

Prospective offerors must complete the mandatory forms in accordance with the instructions provided on the forms and the additional instructions below. Files that are attached to the forms must be in Adobe Portable Document Format (.PDF) unless otherwise specified in this announcement.

**NOTE: The electronic file name for all documents submitted under this BAA must not exceed 68 characters in length, including file name extension.**

Form: SF 424 (RESEARCH & RELATED)

Complete all the required fields in accordance with the pop-up instructions on the form. To activate the instructions, turn on the “Help Mode” (icon with the pointer and question mark at the top of the form). The following information must be completed in the SF 424 located on Grants.gov to ensure that the application is directed to the correct individual for review and to be considered for award, Offerors must fill out Block 4 of the SF 424 R&R as follows:

- Block 4a “Federal Identifier”: If the application is not a renewal or

expansion of an existing award, enter the previous ONR award number, or N00014.

- Block 4b “Agency Routing Identifier”: Enter the three (3) digit Program Office Code and the Program Officer’s name, last name first, in brackets (e.g., 331 [Smith, John]).
  - Where the Program Office Code only has two digits, add a “0” directly after the Code (e.g., Code 30 would be entered as 300)
  - Use Code 600 for ONRG

Applicants who fail to provide a Program Officer Code identifier may receive a notice that their proposal is rejected.

- Block 4c, Previous Grants.gov Tracking ID: If this submission is for a Changed/Corrected Application, enter the Grants.gov tracking number of the previous proposal submission; otherwise, leave blank.

#### Form: Project Abstract

Abstracts of all funded research projects will be posted on a DTIC website, <https://dodgrantawards.dtic.mil/grants/index.html#/home>. Do not include proprietary or confidential information. Use only characters available on a standard QWERTY keyboard. Spell out all Greek letters, other non-English letters and symbols. Graphics are not allowed and there is a 4,000 character limit.

#### Form: RESEARCH & RELATED Other Project Information

Attach the Technical Proposal as follows:

- Download the application package;
- Click on "Research and Related Other Project Information";
- Click on "Move form to Submission List";
- Click on "Open Form";
- A new PDF entitled "Research & Related Other Project Information" will appear;
- Locate Field 8 entitled, “Project Narrative;”
- Click on “Add Attachment;” and
- Attach the technical proposal.

Field 7 of the SF-424 Other Project Information entitled, “Project Summary/Abstract” may be left blank if the Project Abstract is already attached.

**NOTE: Ensure the attachment is a single PDF file with File name: “Technical Proposal.”**

## Full Proposal Format:

- Paper Size: 8.5 x 11 inch paper
- Margins: 1 inch
- Spacing: single spaced
- Font: Times New Roman, 12 point
- Discuss the limit on the number of pages for Technical Proposal with the cognizant Program Officer. There are no page limitations to the Cost Proposal.
- The full proposal should be submitted electronically at <http://www.grants.gov/> as delineated in paragraph E below.

## Technical Proposal:

- **Cover Page:** This should include the words “Technical Proposal” and the following:
  - 1) BAA Number: N00014-17-S-B001;
  - 2) Title of Proposal;
  - 3) Identity of prime Offeror and complete list of subawards, if applicable;
  - 4) Technical contact (name, address, phone/fax, electronic mail address)
  - 5) Administrative/business contact (name, address, phone/fax, electronic mail address) and;
  - 6) Proposed period of performance (identify both the base period and any options, if included).
- **Table of Contents:** An alphabetical/numerical listing of the sections within the proposal, including corresponding page numbers.
- **Technical Approach and Justification:** The major portion of the proposal should consist of a clear description of the technical approach being proposed. This discussion should provide the technical foundation/justification for pursuing this particular approach/direction and why one would expect it to enable the objectives of the proposal to be met.

*Include for Basic Research, if it applies.*

- **Future Naval Relevance (where applicable):** A description of potential Naval relevance and contributions of the effort to the agency’s specific mission.

*For Applied Research and Advanced Technology Development, if it applies.*

- **Operational Naval Concept (where applicable):** A description of the project objectives, the concept of operation for the new capabilities to be delivered, and the expected operational performance improvements.
- **Operational Utility Assessment Plan (where applicable):** A plan for demonstrating and evaluating the operational effectiveness of the

Offeror's proposed products or processes in field experiments and/or tests in a simulated environment.

- **Project Schedule and Milestones:** A summary of the schedule of events and milestones:

- **Reports:** The following are sample reports that are typically required under a research effort:

- Technical and Financial Progress Reports
- Final Report

Grants do not include the delivery of software, prototypes, and other hardware deliverables.

- **Management Approach:** Identify which personnel and subcontractors/subrecipients (if any) will be involved. Include a description of the facilities that are required for the proposed effort, along with a description of any Government Furnished Equipment/Hardware/ Software/Information required, by version and/or configuration.
- **Current and Pending Project and Proposal Submissions:** Offerors are required to provide information on all current and pending support for ongoing projects and proposals, including subsequent funding in the case of continuing contracts, grants, and other assistance agreements. Offerors shall provide the following information of any related or complementary proposal submissions to whatever sources (e.g., ONR, Federal, State, local or foreign government agencies, public or private foundations, industrial or other commercial organizations).

Concurrent submission of a proposal to other organizations will not prejudice its review by ONR:

- 1) Title of Proposal and Summary;
- 2) Source and amount of funding (annual direct costs; provide contract and/or grant numbers for current contracts/grants);
- 3) Percentage effort devoted to each project;
- 4) Identity of prime Offeror and complete list of subwards, if applicable;
- 5) Technical contact (name, address, phone/fax, electronic mail address)
- 6) Administrative/business contact (name, address, phone/fax, electronic mail address);
- 7) Period of performance (differentiate basic effort);
- 8) The proposed project and all other projects or activities requiring a portion of time of the Principal Investigator and other senior personnel must be included, even if they receive no salary support from the project(s);
- 9) The total award amount for the entire award period covered (including indirect costs) must be shown as well as the number of person-months or labor hours per year to be devoted to the project, regardless of source of support; and
- 10) State how projects are related to the proposed effort and indicate degree

of overlap.

- **Qualifications:** A discussion of the qualifications of the proposed Principal Investigator and any other key personnel. Include resumes or curricula vitae for the Principal Investigator, other key personnel and consultants. The resumes/curricula vitae shall be attached to the proposal.

Offerors are requested to provide the following information to ONR in order to assist in ONR's evaluation of the offeror's responsibility:

- a. Describe how you have adequate resources or the ability to obtain such research as required to complete the activities proposed.
- b. Describe how you have the ability to comply with the grant conditions, taking into account all existing and currently prospective commitments of the applicant, nongovernmental and governmental.
- c. Describe your performance history, specifically your record in managing Federal awards and the extent to which any previously awarded amounts will be expended prior to future awards.
- d. Describe your record of integrity and business ethics.
- e. Describe qualifications and eligibility to receive an award under applicable laws and regulations.
- f. Describe your organization, experience, accounting, and operational controls and technical skills, or the ability to obtain them (including as appropriate such elements as property control systems, quality assurance measures, and safety programs applicable to the services to be performed)

## Cost Proposal

The offeror must use the Grants.gov forms (including the Standard Form (SF) Research and Related (R&R) Budget Form) from the application package template associated with the BAA on the Grants.gov web site located at <http://www.grants.gov/>. If options are proposed, the cost proposal must provide the pricing information for the option periods; failure to include the proposed costs for the option periods will result in the options not being included in the award.

Use the following notional schedule to determine proposed period of performance and associated budget.

<b>Grant proposals submitted</b>	<b>Use this start date</b>
October 1 through December 31, 2016	March 1, 2017
January 1 through March 31, 2017	July 1, 2017
April 1 through June 30, 2017	September 1, 2017
July 1 through September 30, 2017	January 1, 2018



A separate Adobe .pdf document should be included in the application that provides appropriate justification and/or supporting documentation for each element of cost proposed. [This document shall be attached under Section K. "Budget Justification" of the Research and Related Budget form. Click "Add Attachment" to attach.](#)

The itemized budget should include the following:

- Direct Labor – Individual labor categories or persons, with associated labor hours and unburdened direct labor rates. Provide escalation rates for out years.
- Administrative and Clerical Labor – Salaries of administrative and clerical staff are normally indirect costs (and included in an indirect cost rate). Direct charging of these costs may be appropriate when a major project requires an extensive amount of administrative or clerical support significantly greater than normal and routine levels of support. Budgets proposing direct charging of administrative or clerical salaries must be supported with a budget justification which adequately describes the major project and the administrative and/or clerical work to be performed.
- Fringe Benefits and Indirect Costs (F&A, Overhead, G&A, etc.) – The proposal should show the rates and calculation of the costs for each rate category. If the rates have been approved/negotiated by a Government agency, provide a copy of the memorandum/agreement. If the rates have not been approved/negotiated, provide sufficient detail to enable a determination of allowability, allocability and reasonableness of the allocation bases, and how the rates are calculated. Additional information may be requested, if needed. If composite rates are used, provide the calculations used in deriving the composite rates.
- Travel – The proposed travel cost must include the following for each trip: the purpose of the trip, origin and destination if known, approximate duration, the number of travelers, and the estimated cost per trip must be justified based on the organizations historical average cost per trip or other reasonable basis for estimation. Such estimates and the resultant costs claimed must conform to the applicable Federal cost principals. Offerors may include travel costs for the Principal Investigator to attend the peer reviews described in Section II of this BAA.
- Subawards/Subcontracts – Provide a description of the work to be performed by the subrecipient/subcontractor. For each subaward, a detailed cost proposal is required to be submitted by the subrecipient(s). A proposal and any supporting documentation must be received and reviewed before the Government can complete its cost analysis of the proposal and enter negotiations. ONR's preferred method of receiving subcontract information is for this information to be included with the Prime's proposal. However, a

subcontractor's cost proposal can be provided in a sealed envelope with the recipient's cost proposal or via e-mail directly to the Program Officer at the same time the prime proposal is submitted. The e-mail should identify the proposal title, the prime Offeror and that the attached proposal is a subcontract.

- Consultants – Provide a breakdown of the consultant's hours, the hourly rate proposed, any other proposed consultant costs, a copy of the signed Consulting Agreement or other documentation supporting the proposed consultant rate/cost, and a copy of the consultant's proposed statement of work if it is not already separately identified in the prime contractor's proposal.
- Materials & Supplies – Provide an itemized list of all proposed materials and supplies including quantities, unit prices, and the basis for the estimate (e.g., quotes, prior purchases, catalog price lists).
- Recipient Acquired Equipment or Facilities – Equipment and/or facilities are normally furnished by the Recipient. If acquisition of equipment and/or facilities is proposed, a justification for the purchase of the items must be provided. Provide an itemized list of all equipment and/or facilities costs and the basis for the estimate (e.g., quotes, prior purchases, catalog price lists). Allowable items normally are limited to research equipment not already available for the project. General purpose equipment (i.e., equipment not used exclusively for research, scientific or other technical activities, such as personal computers, laptops, office equipment) should not be requested unless they will be used primarily or exclusively for the project. For computer/laptop purchases and other general purpose equipment, if proposed, include a statement indicating how each item of equipment will be integrated into the program or used as an integral part of the research effort.
- Other Direct Costs – Provide an itemized list of all other proposed other direct costs such as Graduate Assistant tuition, laboratory fees, report and publication costs, and the basis for the estimate (e.g., quotes, prior purchases, catalog price lists).

NOTE: *If the grant proposal requests funds for a conference, workshop or symposium:*

1. *ONR (including ONRG) will not sponsor an ONR, Navy, or DoD event. Provide a list of other sponsors and the requested amounts to be funded by all sponsors.*
2. *The funds provided by ONR (including ONRG) may be used to pay for food or beverages as a direct cost only in exceptional circumstances. The funds shall not be used for food or beverages unless:*
  - a. *the grant proposal contains a request for such funding that is*

*fully supported factually in accordance with the cost principles of the relevant OMB Circular, and*

*b. the Grants Officer determines that the funding is a reasonable, allocable, allowable expense under the relevant cost principles.*

*3. Specify in your proposal how the event and related outcomes will directly and programmatically relate to the US Naval or Marine Corps Science & Technology Plan and identify specific focus areas that will be addressed. The proposal must provide the technical and scientific objectives of the program or event and clearly state the desired outcomes (e.g. conference proceedings, journal articles, algorithms, tools, additional research, etc.).*

- Fee/Profit – Fee/profit is unallowable under assistance agreements at either the prime or subaward level but may be permitted on subcontracts issued by the prime awardee.

### **C. Significant Dates and Times –**

This announcement will remain open until 30 September 2017 or until replaced by a successor BAA, whichever occurs first. Proposals may be submitted any time during this period.

### **D. Submission of Late Proposals –**

The Government reserves the right to not review proposals submitted after 30 September 2017, or after a successor to this Long Range BAA is issued, whichever occurs first.

### **E. Submission of Grant Proposals through Grants.gov**

(NOT APPLICABLE TO PROPOSALS FOR CONTRACTS, COOPERATIVE AGREEMENTS, AND OTHER TRANSACTION AGREEMENTS)

Detailed instructions entitled “Grants.Gov Electronic Application and Submission Information” on how to submit a Grant proposal through Grants.gov are under the Contracts and Grants — Submitting Proposals section of the ONR website at <http://www.onr.navy.mil/Contracts-Grants/submit-proposal/grants-proposal/grants-gov.aspx>.

White Papers must not be submitted through the Grants.gov application process. White paper submissions should be e-mailed directly to the appropriate ONR Program Officer/Program Manager. White paper format requirements are found in Part IV, Section B (a) above.

For electronic submission of full proposals for grants, there are several one-time actions that must be completed in order to submit an application through Grants.gov. These include obtaining a Dun and Bradstreet Data Universal Numbering System (DUNS) number, registering

with System for Award Management (SAM), registering with the credential provider, and registering with Grants.gov. See <http://www.grants.gov>.

Use the Grants.gov Organization Registration Checklist at <http://www.grants.gov/web/grants/applicants/organization-registration.html> which will provide guidance through the process. Designating an E-Business Point of Contact (E-Biz POC) and obtaining a special password called 'MPIN' are important steps in the SAM registration process. Applicants who are not registered with SAM.gov and Grants.gov should allow at least 21 days to complete these requirements. The process should be started as soon as possible. Any questions relating to the registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 (1-606-545-5035 for foreign applicants) or [support@grants.gov](mailto:support@grants.gov).

### **Special Notices Relative to Grant Applications to be submitted through Grants.Gov:**

All attachments to grant applications submitted through Grants.Gov must be in Adobe Portable Document Format. Proposals with attachments submitted in word processing, spreadsheet, or any format other than Adobe Portable Document Format will not be considered for award.

#### Proposal Receipt Notices:

After a full proposal is submitted through Grants.gov, the Authorized Organization Representative (AOR) will receive a series of three e-mails. It is extremely important that the AOR watch for and save each of the e-mails. You will know that your proposal has reached ONR when the AOR receives e-mail Number 3. You will need the Submission Receipt Number (e-mail Number 1) to track a submission.

The three e-mails are:

Number 1 – The applicant 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.

Number 2 – The applicant will receive an e-mail indicating that the proposal has been validated by Grants.gov within two days of submission (This means that all of the required fields have been completed). 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.

Number 3 – The third notice is an acknowledgment of receipt in e-mail form from ONR within ten days from the proposal due date, if applicable. The e-mail is sent to the authorized representative for the institution. The e-mail for proposals notes that the proposal has been received and provides the assigned tracking number.

#### **F. Submission of Full Proposals for Contracts, Cooperative Agreements, and Other Transaction Agreements.**

For ONR, contact the Program Officer for electronic submission information for full proposals.

For MCWL, full proposals should be sent to the following address:

Marine Corps Warfighting Lab  
Attn: Future Technology Officer  
3255 Meyers Ave.  
Quantico, VA 22134

### **V. EVALUATION INFORMATION**

#### **A. Evaluation Criteria –**

Awards under this BAA will be made in accordance with FAR 35.016(e). The primary basis for selecting proposals for acceptance will be technical, importance to agency programs, and fund availability. Cost realism and reasonableness will also be considered when selecting proposals. ONR reserves the right to request and require any additional information and documentation after it makes the award instrument determination. ONR reserves the right to remove Offerors from award consideration when the parties fail to reach agreement on award terms, conditions, and cost/price within a reasonable time, or when the Offeror fails to timely provide requested or required additional information.

Offerors' proposals will be evaluated against the following criteria:

- 1) Overall scientific and technical merits of the proposal and responsiveness to the topic (i.e., the degree of innovation, soundness of technical concept, Offeror's awareness of the state of the art and understanding of the scope of the problem, significance and originality of the technical approach and effort needed to address/solve the problem, and anticipated scientific impact within the field. The following areas will also be considered: (1) the Offeror's capabilities, related experience, facilities, techniques or unique combinations of these which are integral factors for achieving the proposal objectives, and (2) the qualifications, capabilities and experience of the proposed Principal Investigator (PI), team leader and key personnel who are critical to achieving the proposal objectives.
- 2) Potential Naval relevance and contribution to the ONR and Department of Navy mission.
- 3) The availability of funds.

Criteria 1, 2, and 3 are equally important.

Proposals will not be evaluated against each other since they are not submitted in accordance with a common work statement. ONR's intent is to review proposals as soon as possible after they arrive; however, proposals may be reviewed periodically for administrative reasons.

The ultimate recommendation for award of proposals is made by ONR's scientific/technical community. Recommended proposals will then be forwarded to the ONR Contracts and Grant Awards Management office. Any notification received from ONR that indicates that the Offeror's full proposal has been recommended does not ultimately guarantee an award will be made. This notice indicates that the proposal has been selected in accordance with the evaluation criteria stated above and has been sent to the Contracting Department to conduct cost analysis, determine the offeror's responsibility, to confirm whether funds are available, and to take other relevant steps necessary prior to commencing negotiations with the offeror.

Industry-Academia Partnering – ONR highly encourages partnering among industry and academia with a view toward speeding the incorporation of new S&T into fielded systems. Proposals that utilize industry-academic partnering which enhances the development of novel S&T advances will be given favorable consideration.

Industry-Government Partnering – ONR highly encourages partnering among industry and Government with a view toward speeding the incorporation of new S&T into fielded systems. Proposals that utilize industry-Government partnering which enhances the development of novel S&T advances will be given favorable consideration.

### **B. Commitment to Small Business and Other Socioeconomic Concerns- (For Contract Awards Only)**

The Office of Naval Research is strongly committed to providing meaningful prime and subcontracting opportunities for small businesses, small disadvantaged businesses (SDBs), woman-owned small businesses (WOSBs), historically underutilized business zone (HUBZone) small businesses, veteran-owned small business (VOSBs), service disabled veteran-owned small businesses (SDVOSBs), historically black colleges and universities, and minority institutions, and other concerns subject to socioeconomic considerations through its awards.

Businesses unfamiliar with doing business with the government and that require assistance may contact the state-specific Department of Defense (DoD) Procurement Technical Assistance Center (PTAC). DoD PTACs serve as a resource for businesses pursuing and performing under contracts with DoD, other federal agencies, state and local governments and with government prime contractors. Assistance provided by the PTACs is usually free of charge. PTAC support includes registration in systems such as SAM, identification of contract opportunities, understanding requirements and preparing and submitting proposals. The PTACs have a presence in each state, Puerto Rico and Guam. To locate a local PTAC visit: <http://www.dla.mil/SmallBusiness/Pages/ProcurementTechnicalAssistanceCenters.aspx> or <http://www.aptac-us.org/new/>.

1.) Subcontracting Plan - For proposed contract awards exceeding \$700,000, large businesses and non-profits (including educational institutions) shall provide a Subcontracting Plan (hereafter known as 'the Plan') that contains all elements required by FAR Subpart 19.704, FAR 52.219-9 and as supplemented by DFARS 252.219-7003.

NOTE: Small businesses are exempt from the requirement to submit a subcontracting plan.

The Plan must be submitted as an attachment to the "Proposal Checklist" and will not be included in the page count. If a company has a Master Subcontracting Plan, as described in FAR 19.701 or a Comprehensive Subcontracting Plan, as described in DFARS 219.702, a copy of the Plan shall also be submitted as an attachment to the "Proposal Checklist".

Plans will be reviewed for adequacy, ensuring that the required information, goals, and assurances are included. FAR 19.702 requires the apparent successful offeror to submit an acceptable Plan. If the apparent successful offeror fails to negotiate a Plan acceptable to the contracting officer within the time limit prescribed by the contracting officer, the offeror will be ineligible for award.

Offerors shall propose a plan that ensures small businesses (inclusive of SDBs, WOSBs, HUBZone, VOSBs and SDVOSBs) will have the maximum practicable opportunity to participate in contract performance consistent with efficient performance.

As a baseline, Offerors shall, to the best extent possible, propose realistic goals to ensure small business participation in accordance with the current or most recent fiscal year subcontracting goals found on the DoD Office of Small Business Program website at:

<http://www.acq.osd.mil/osbp/>. If proposed goals are below the statutory requirements, then the offeror shall include in the Plan a viable written explanation as to why small businesses are unable to be utilized and what attempts were taken to ensure that small business were given the opportunity to participate in the effort to the maximum extent practicable.

## 2.) Small Business Participation Statement –

If subcontracting opportunities exist, all prime Offerors shall submit a Small Business Participation Statement regardless of size in accordance with DFARS 215.304 when receiving a contract for more than the simplified acquisition threshold (i.e., \$150,000). All offerors shall provide a statement of the extent of the offeror's commitment in providing meaningful subcontracting opportunities for small businesses and other concerns subject to socioeconomic considerations through its awards and must agree that small businesses, VOSBs, SDVOSBs, HUBZones, SDBs, and WOSBs concerns will have the maximum practicable opportunity to participate in contract performance consistent with efficient performance.

This assertion will be reviewed to ensure that it supports this policy by providing meaningful subcontracting opportunities. The statement should be submitted as an attachment to the "Proposal Checklist" and will not be included in the page count.

## 3.) Subcontracting Resources -

Subcontracting to a prime contractor can be a good way to participate in the contracting process. The following is a list of potential resources that may assist in locating potential subcontracting partners/opportunities/resources:

- \*Companies Participating in DoD Subcontracting Program Report
- \*DAU Small Business Community of Practice (SB COP)
- \*DefenseLink  $\geq$  \$7.0M Award Notices
- \*DoD OSBP Prime Contractors and Subcontractors with Subcontracting Plans
- \*Dynamic Small Business Search
- \*Electronic Subcontracting Reporting System (eSRS)
- \*Federal Business Opportunities (FEDBIZOPPS)
- \*Navy SBIR/STTR Search – Website or Brochure
- \*DoD Procurement Technical Assistance Centers (PTAC)
- \*Small Business Administration (SBA) Subcontracting Opportunities Directory
- \*SBA Subnet

For a description and associated websites visit the ONR Office of Small Business webpage at: <http://www.onr.navy.mil/Contracts-Grants/small-business.aspx>.

In accordance with FAR Subpart 5.206, the following entities may transmit a notice to a Government Point of Entry (GPE) to seek competition for subcontracts, to increase participation by qualified small businesses, VOSBs, SDVOSBs, HUBZones, SDBs, and WOSBs, and to meet established subcontracting plan goal as follows:

- (a) A contractor awarded a contract exceeding \$150,000 that is likely to result in the award of any subcontracts;
- (b) A subcontractor or supplier, at any tier, under a contract exceeding \$150,000 that has a subcontracting opportunity exceeding \$15,000.

The notices must describe—

- (a) The business opportunity;
- (b) Any prequalification requirements; and
- (c) Where to obtain technical data needed to respond to the requirement.

An example of a GPE is the SBA SUB-Net which is a place in which prime contractors may post solicitations or sources sought notices for small business. The SUB-Net database provides a listing of subcontracting solicitations and opportunities posted by large prime contractors and other non-federal agencies.

### **C. Options-**

The Government will evaluate options for award purposes by adding the total cost for all options to the total cost for the basic requirement. Evaluation of options will not obligate the



Government to exercise the options during contract or grant performance.

#### **D. Evaluation Panel -**

Technical and cost proposals submitted under this BAA will be protected from unauthorized disclosure in accordance with FAR 3.104-4 and 15.207. The cognizant Program Officer and other Government scientific experts will perform the evaluation of technical proposals. Restrictive notices notwithstanding, one or more support contractors may be utilized as subject-matter-expert technical consultants. However, proposal selection and award decisions are solely the responsibility of Government personnel. Each support contractor's employee having access to technical and cost proposals submitted in response to this BAA will be required to sign a non-disclosure statement prior to receipt of any proposal submissions.

#### **E. General Information Regarding the Review and Selection Process for Grants –**

- i) Prior to making an award with total amount of Federal share greater than the simplified acquisition threshold, ONR shall review and consider any information about the applicant that is in the designated integrity and performance system accessible through the System for Award Management (SAM) (currently Federal Awardee Performance and Integrity System, FAPIIS).
- ii) The applicant, at its option, may review information in the designated integrity and performance systems accessible through SAM and comment on any information about itself that a Federal awarding agency previously entered and is currently in the designated integrity and performance system accessible through SAM.
- iii) ONR will consider any comments by the applicant, in addition to the other information in the designated integrity and performance system, in making a judgment about the applicant's integrity, business ethics, and record of performance under Federal awards when completing the review of risk posed by the applicant as described in Title 2, Part 200, Subsection 200.205 Federal awarding agency review of risk posed by applicants.

### **VI. AWARD ADMINISTRATION INFORMATION**

A. North American Industry Classification System (NAICS) code – The NAICS code for contracts under this announcement is “541712” with a small business size standard of “1,000 employees”.

B. System for Award Management (SAM): All Offerors submitting proposals or applications must:

- 1) be registered in the SAM prior to submission;
- 2) maintain an active SAM registration with current information at all times during which it has an active Federal award or an application under consideration by any agency; and

3) provide its DUNS number in each application or proposal it submits to the agency.

SAM may be accessed at <https://www.sam.gov/portal/public/SAM/>

C. Access to your Award

Office of Naval Research (ONR) award/modification documents are only available via the Department of Defense (DoD) Electronic Document Access System (EDA) within the Wide Area WorkFlow e-Business Suite (<https://wawf.eb.mil/>).

EDA is a Web-based system that provides secure online access, storage and retrieval of awards and modifications to DoD employees and vendors.

ONR creates an award notification profile for every award.

For grants, the notification profile will use the email addresses from the Application for Federal Assistance, SF424, to notify the recipient of an award. ONR is using the following three email addresses entered by the grantee on the SF424 application to create the EDA notification profile:

- a. Project Director / Principal Investigator (Block 14 - Email)
- b. Applicant Information (Block 5 - Email)
- c. Authorized Representative (Block 19 - Email)

For all other awards, the notification profile will use the email address from the Business Point of Contact to notify the recipient of an award.

**IMPORTANT:** In some cases, EDA notifications are appearing in recipients' Junk Email folder. If you are experiencing issues receiving EDA notifications, please check your junk email. If found, please mark EDA notifications as "not junk."

If you do not currently have access to EDA, you may complete a self-registration request as a "Vendor" via <https://wawf.eb.mil/> following the steps below:

1. Click "Accept"
2. Click "Register" (top right)
3. Click "Agree"
4. In the "What type of user are you?" drop down, select "Vendor"
5. Select the systems you would like to access (iRAPT at a minimum)
6. Complete the User Profile and follow the site instructions

Allow five business days for your registration to be processed. EDA will notify you by email when your account is approved.

To access awards after your registration has been approved, log into <https://wawf.eb.mil/>, select "EDA", select either EDA location, Select "Contracts", select your search preference, enter the Contract Number (or, if applicable, enter the Grant Number in the Contract Number field), and select "View".

Registration questions may be directed to the EDA help desk toll free at 866-618-5988, commercial at 801-605-7095, or via email at [disa.ogden.esd.mbx.cscassig@mail.mil](mailto:disa.ogden.esd.mbx.cscassig@mail.mil) (Subject: EDA Assistance).

## **VII. OTHER INFORMATION**

### **A. Applies to Grant, Cooperative Agreement and Other Transaction Agreement applications only:**

- i. [Federal Funding Accountability and Transparency Act of 2006](#)
- ii. [Certification regarding Restrictions on Lobbying](#)
- iii. [Representation Regarding an Unpaid Delinquent Tax Liability or a Felony Conviction Under any Federal Law - DOD Appropriations](#)
- iv. [Representation Regarding the Prohibition on Using Funds with Entities that Require Certain Internal Confidentiality Agreements](#)
- v. [Codes of Conduct](#)
- vi. [Reporting](#)

\* Click on the above hyperlinks to navigate directly to your desired section

- i. Federal Funding Accountability and Transparency Act of 2006:

The Federal Funding Accountability and Transparency Act of 2006 (Public Law 109-282), as amended by Section 6202 of Public Law 110-252, requires that all agencies establish requirements for recipients reporting information on subawards and executive total compensation as codified in 2 CFR Part 170. Any company, non-profit agency or university that applies for financial assistance (either grants, cooperative agreements or other transaction agreements) as either a prime or sub-recipient under this BAA must provide information in its proposal that describes the necessary processes and systems in place to comply with the reporting requirements identified in 2 CFR Part 170 Appendix A. Entities are required to meet reporting requirements unless an exception or exemption applies. Please refer to 2 CFR Part 170, including Appendix A, for a detailed explanation of the requirements, exceptions, and exemptions.

- ii. Certification regarding Restrictions on Lobbying:

Grant and Cooperative Agreement awards greater than \$100,000, as well as OTAs not under Section 845, require a certification of compliance with a national policy mandate concerning lobbying. Grant applicants shall provide this certification by electronic submission of SF424 (R&R) as a part of the electronic proposal submitted via [Grants.gov](#) (complete Block 17). The following certification applies likewise to each Cooperative Agreement and normal OTA applicant seeking federal assistance funds exceeding \$100,000:

(1) No Federal appropriated funds have been paid or will be paid by or on behalf of the applicant, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the

making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the Federal contract, grant, loan, or cooperative agreement, the applicant shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The applicant shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, title 31, U.S.C. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

iii. Representation Regarding an Unpaid Delinquent Tax Liability or a Felony Conviction Under any Federal Law - DOD Appropriations:

All grant applicants are required to complete the "Representation on Tax Delinquency and Felony Conviction" found at <http://www.onr.navy.mil/Contracts-Grants/submit-proposal/grants-proposal.aspx> by checking the "I agree" box in Block 17 and attaching the representation to Block 18 of the SF424 (R&R) as part of the electronic proposal submitted via Grants.gov. The representation reads as follows:

(1) The applicant represents that it is \_\_\_ is not \_\_\_ a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in timely manner pursuant to an agreement with the authority responsible for collecting the tax liability

(2) The applicant represents that it is \_\_\_ is not \_\_\_ a corporation that was convicted of a felony criminal violation under any Federal law within the preceding 24 months. NOTE: If an applicant responds in the affirmative to either of the above representations, the applicant is ineligible to receive an award unless the agency suspension and debarment official (SDO) has considered suspension or debarment and determined that further action is not required to protect the Government's interests. The applicant therefore should provide information about its tax liability or conviction to the agency's SDO as soon as it can do so, to facilitate completion

of the required consideration before award decisions are made.

iv. Representation Regarding the Prohibition on Using Funds with Entities that Require Certain Internal Confidentiality Agreements

Agreement with the representation below will be affirmed by checking the "I agree" box in block 17 of the SF424 (R&R) as part of the electronic proposal submitted via Grants.gov. The representation reads as follows:

By submission of its proposal or application, the applicant represents that it does not require any of its employees, contractors, or subrecipients seeking to report fraud, waste, or abuse to sign or comply with internal confidentiality agreements or statements prohibiting or otherwise restricting those employees, contractors, subrecipients from lawfully reporting that waste, fraud, or abuse to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information.

Note that, as applicable, the bases for this representation are the prohibition(s) as follow:

- a. Section 743 of the Financial Services and General Government Appropriation Act, 2015 (Division E of the Consolidated and Further Continuing Appropriations Act, 2015, Pub. L. 113-235)
- b. Section 101(a) of the Continuing Appropriation Act, 2016 (Pub. L. 114-53) and any subsequent FY2016 appropriations act that extends to FY2016 the same restrictions as are contained in section 743 of Division E, title VII of the Consolidated and Further Continuing Appropriations Act, 2015 (Pub L. 113-235)
- c. Pub. L. 114-223, Continuing Appropriations Act, 2017, or any other Act that extends to fiscal year 2017 funds the same prohibitions as contained in section 743, Division E, title VII, of the Consolidated Appropriations Act, 2016 (Pub. L. 114-113).
- d. Any successor provision of law on making funds available through grants and cooperative agreements to entities with certain internal confidentiality agreements or statements

The prohibitions stated above do not contravene requirements applicable to Standard Form 312, Form 4414, or any other form issued by a Federal department or agency governing the nondisclosure of classified information.

v. Code of Conduct:

Applicants for grants, cooperative agreements, or other transaction agreements as applicable are required to comply with 2 CFR 200.318(c), Codes of Conduct, to prevent real or apparent conflicts of interest in the award and administration of any contracts supported by federal funds. This provision will be incorporated into all assistance instruments awarded under this BAA.

vi. Reporting:

If the Federal share of any Federal award may include more than \$500,000 over the period of performance, the post award reporting requirements, Award Term and Condition for Recipient Integrity and Performance Matters (2 CFR 200 Appendix XII), is applicable as follows:

A. Reporting of Matters Related to Recipient Integrity and Performance

1. General Reporting Requirement

If the total value of your currently active grants, cooperative agreements, and procurement contracts from all Federal awarding agencies exceeds \$10,000,000 for any period of time during the period of performance of this Federal award, then you as the recipient during that period of time must maintain the currency of information reported to the System for Award Management (SAM) that is made available in the designated integrity and performance system (currently the Federal Awardee Performance and Integrity Information System (FAPIIS)) about civil, criminal, or administrative proceedings described in paragraph 2 of this award term and condition. This is a statutory requirement under section 872 of Public Law 110-417, as amended (41 U.S.C. 2313). As required by section 3010 of Public Law 111-212, all information posted in the designated integrity and performance system on or after April 15, 2011, except past performance reviews required for Federal procurement contracts, will be publicly available.

2. Proceedings About Which You Must Report

Submit the information required about each proceeding that:

- a. Is in connection with the award or performance of a grant, cooperative agreement, or procurement contract from the Federal Government;
- b. Reached its final disposition during the most recent five year period; and
- c. Is one of the following:
  - (1) A criminal proceeding that resulted in a conviction, as defined in paragraph 5 of this award term and condition;
  - (2) A civil proceeding that resulted in a finding of fault and liability and payment of a monetary fine, penalty, reimbursement, restitution, or damages of \$5,000 or more;
  - (3) An administrative proceeding, as defined in paragraph 5. of this award term and condition, that resulted in a finding of fault and liability and your payment of either a monetary fine or penalty of

\$5,000 or more or reimbursement, restitution, or damages in excess of \$100,000; or

(4) Any other criminal, civil, or administrative proceeding if:

(i) It could have led to an outcome described in paragraph 2.c.(1), (2), or (3) of this award term and condition;

(ii) It had a different disposition arrived at by consent or compromise with an acknowledgment of fault on your part; and

(iii) The requirement in this award term and condition to disclose information about the proceeding does not conflict with applicable laws and regulations.

3. Reporting Procedures

Enter in the SAM Entity Management area the information that SAM requires about each proceeding described in paragraph 2 of this award term and condition. You do not need to submit the information a second time under assistance awards that you received if you already provided the information through SAM because you were required to do so under Federal procurement contracts that you were awarded.

4. Reporting Frequency

During any period of time when you are subject to the requirement in paragraph 1 of this award term and condition, you must report proceedings information through SAM for the most recent five year period, either to report new information about any proceeding(s) that you have not reported previously or affirm that there is no new information to report. Recipients that have Federal contract, grant, and cooperative agreement awards with a cumulative total value greater than \$10,000,000 must disclose semiannually any information about the criminal, civil, and administrative proceedings.

5. Definitions

For purposes of this award term and condition:

a. Administrative proceeding means a non-judicial process that is adjudicatory in nature in order to make a determination of fault or liability (e.g., Securities and Exchange Commission Administrative proceedings, Civilian Board of Contract Appeals proceedings, and Armed Services Board of Contract Appeals proceedings). This includes proceedings at the Federal and State level but only in connection with performance of a Federal contract or grant. It does

not include audits, site visits, corrective plans, or inspection of deliverables.

b. Conviction, for purposes of this award term and condition, means a judgment or conviction of a criminal offense by any court of competent jurisdiction, whether entered upon a verdict or a plea, and includes a conviction entered upon a plea of nolo contendere.

c. Total value of currently active grants, cooperative agreements, and procurement contracts includes—

(1) Only the Federal share of the funding under any Federal award with a recipient cost share or match; and

(2) The value of all expected funding increments under a Federal award and options, even if not yet exercised.

**B. Applies to Contracts only:**

- i. [Government Property/Government Furnished Equipment \(GFE\) and Facilities](#)
- ii. [Use of Arms, Ammunition and Explosives](#)
- iii. [System for Award Management \(SAM\)](#)
- iv. [Employment Eligibility Verification \(E-verify\)](#)
- v. [Conflicts of Interest](#)
- vi. [FAR / DFARS Provisions](#)
- vii. [Combating Trafficking in Person](#)
- viii. [Certification Regarding Trafficking in Persons Compliance Plan](#)
- ix. [Updates of Information regarding Responsibility Matters](#)

\* Click on the above hyperlinks to navigate directly to your desired section

- i. Government Property/Government Furnished Equipment (GFE) and Facilities:  
Government research facilities and operational military units are available and should be considered as potential government-furnished equipment/facilities. These facilities and resources are of high value and some are in constant demand by multiple programs. It is unlikely that all facilities would be used for any one specific program. The use of these facilities and resources will be negotiated as the program unfolds. Offerors should indicate in the Proposal Checklist, Section II, Blocks 8 and 9, which of these facilities are critical for the project's success.

- ii. Use of Arms, Ammunition and Explosives:

Safety

The Offeror is required to be in compliance with DoD manual 4145.26-M, *DoD Contractor's Safety Manual for Ammunition and Explosives* if ammunitions and/or explosives are to be utilized under the proposed research effort. (See DFARS 223.370-5 and DFARS 252.223-7002)



If ammunitions and/or explosives (A&E) are to be utilized under the proposed research effort, the Government requires a preaward safety survey in accordance with DFARS PGI 223.370-4(C)(iv) entitled *Preaward survey*. The Offeror is solely responsible for contacting the cognizant Defense Contract Management Agency (DCMA) office and obtaining a required preaward safety survey before proposal submission. The Offeror should include required preaward safety surveys with proposal submissions.

If the Offeror proposes that the Government provide Government-furnished A&E containing any nitrocellulose-based propellants and/or nitrate ester-based materials (such as nitroglycerin) or other similar A&E with a tendency to become chemically unstable over time, then NMCARS 5252.223-9000 will also apply to a resulting contract award. (See NMCARS 5223.370-5)

#### Security

If arms, ammunition or explosives (AA&E) are to be utilized under the proposed research effort, the Government requires a preaward security survey. The Offeror is solely responsible for contacting the cognizant DCMA office and obtaining a required preaward security survey before proposal submission. The Offeror should include a required preaward security survey with proposal submission. (See DoD manual 5100.76-M, *Physical Security of Sensitive Conventional Arms, Ammunition and Explosives*, paragraph C1.3.1.4)

If AA&E are to be utilized under the proposed research effort, the Government may require the Contractor to have perimeter fencing around the place of performance in accordance with DoD 5100.76-M, Appendix 2.

If AA&E are to be utilized under the proposed research effort, the Offeror is required to provide a written copy of the Offeror's AA&E accountability procedures in accordance with DoD 5100.76-M. If the Offeror is required to provide written AA&E accountability procedures, the Offeror should provide the respective procedures with its proposal submission. See DoD 5100.76-M Appendix 2.12.

iii. System for Award Management (SAM):

FAR 52.204-7 System for Award Management and FAR 52.204-13 System for Award Management Maintenance are incorporated into this BAA, and FAR 52.204-13 will be incorporated in all awards.

iv. Employment Eligibility Verification (E-verify):

As per FAR 22.1802, recipients of FAR-based procurement contracts must enroll as Federal Contractors in E-verify and use E-verify to verify employment eligibility of all employees assigned to the award. All resultant contracts from this solicitation will include FAR 52.222-54, "Employment Eligibility Verification."

v. Conflicts of Interest:

(1) Disclosure. An offeror shall state in its proposal whether it is aware of any information bearing on the existence of any actual or potential organizational conflict of interest (OCI) as defined in FAR 2.101 and as further discussed in FAR Subpart 9.5 as to itself and any proposed subcontractors, partners, consultants or other affiliates. Offerors performing systems engineering and technical assistance (SETA) for ONR are considered to have an OCI that may not be susceptible to mitigation. See ONR's Statement of Policy on OCIs, which can be found at the following address: <http://www.onr.navy.mil/en/About-ONR/compliance-protections/Organizational-Conflicts-Interest.aspx>

The nondisclosure or misrepresentation of an interest creating an OCI may result in the disqualification of an offeror for award, or if such nondisclosure or misrepresentation is discovered after award, the Government may terminate the contract for default, recommend that the contractor be disqualified from subsequent related contracts, or be subject to such other remedial actions as may be permitted or provided by law (see 18 U.S.C. § 1001 and 31 U.S.C. § 3802(a)(2)). Therefore, offerors should interpret the requirements of this section broadly.

An offeror who does not provide support services to ONR or concludes no actual or potential OCI exists shall include the following statement in its proposal: "I [NAME] as an authorized negotiator on behalf of [NAME OF OFFEROR] certify that **NO** actual or potential organizational conflict of interest (OCI) exists under [BAA NUMBER]. I understand that the failure to disclose the existence of actual or potential OCI shall result in the offeror not being considered for award."

An offeror who does provide support services to ONR or is aware circumstances exist that may result in the appearance that it may have an unfair competitive advantage shall submit the following with its proposal:

(a) The name of the entity the offeror, its subcontractors, partners, consultants or affiliates supports.

(b) The number of the contract, subcontract, or agreement that creates the actual or potential OCI. If ONR did not award the contract or agreement, provide a copy of the document. If ONR awarded the contract, provide the name of the technical point of contact.

(c) A description of the actual or potential OCI. The statement must describe in a concise manner all relevant facts concerning any past, present or currently planned interest (financial, contractual, organizational, or otherwise) relating to the work to be performed hereunder and bearing on whether the offeror has a possible organizational conflict of interest with respect to (1) impartial, technically sound, and unbiased assessments, recommendations, or evaluations, or (2) being given an unfair competitive advantage. If relevant, offerors shall address the personal conflicts of their employees.

(d) A Mitigation Plan. Offerors should refer to FAR Subpart 9.5 for policies and procedures for avoiding, neutralizing, or mitigating organizational conflicts of interest.

(e) A concluding statement as follows: “I [NAME] as an authorized negotiator on behalf of [NAME OF OFFEROR] certify that I have, to the best of my knowledge and belief, disclosed all actual or potential organizational conflicts of interest (OCI) under [BAA NUMBER]. I understand that the failure to disclose the existence of an actual or potential OCI shall result in the offeror not being considered for award.”

(2) OCI Mitigation Plan Contents. At a minimum, a Mitigation Plan shall:

(a) Provide organizational charts showing the offeror’s (and, as appropriate, those of its subcontractors, partners, consultants, and affiliates) structure as it relates to performance under the contract awarded under this BAA and all contracts and agreements relevant to the OCI, highlighting those elements that create the actual or apparent OCI.

(b) Demonstrate how the elements that create the actual or apparent OCI will be isolated from the resources that will perform work under the contract awarded under this BAA.

(c) Provide information showing whether the organizational elements that will perform work under the contract awarded under this BAA will be geographically or physically separated from the elements that create the actual or apparent OCI.

(d) For each contract or agreement relevant to the OCI, describe the process for reassigning personnel, including those belonging to subcontractors, partners, consultants, and affiliates, from one organization to another. Include restrictions that apply.

(e) For each contract or agreement relevant to the OCI, describe the any controls, including nondisclosure agreements, that are exercised over the future employment of departing employees as it relates to the OCI.

(f) For each contract or agreement relevant to the OCI, describe any OCI training the employees are offered or required to attend, along with the timing (before or after starting work on a government contract), frequency, length, and content of such training.

(g) Provide evidence of facts and circumstances that the offeror asserts mitigate or address the concerns related to the actual or potential OCI.

(3) Review. The Contracting Officer will review an offeror’s certifications, statements, and OCI Mitigation Plan (if applicable) submitted and may require additional relevant information from an offeror. All such information and any other relevant information will be used by the Contracting Officer to determine whether an award to the offeror may create an OCI. If found to exist, the Government may: (1) impose appropriate conditions which avoid such conflict, (2) disqualify the offeror, (3) determine that it is otherwise in the best interest of the Government to award a contract to the offeror and include appropriate conditions mitigating such conflict in the award, or (4) seek a

waiver. If the Contracting Officer determines that an actual or significant potential conflict of interest exists that cannot reasonably be avoided, neutralized or mitigated, the offeror will be ineligible for award. If accepted, the Mitigation Plan shall become part of the contract.

An offeror who has refused to disclose the information or make the certification required by this BAA concerning an actual or potential OCI shall be disqualified from consideration for award.

vi. FAR / DFARS Provisions:

For purposes of illustration and not of limitation, the following provisions may be applicable to ONR contracts:

#	Provision
52.204-7	System for Award Management
52.204-13	System for Award Management Maintenance (Oct 2016)
52.215-16	Facilities Capital Cost of Money
52.215-22	Limitations on Pass Through Charges - Identification of Subcontract Effort
52.216-1	Type of Contract
52.216-27	Single or Multiple Awards
52.217-4	Evaluation of Options Exercised at time of Contract Award
52.217-5	Evaluation of Options
52.222-24	Preaward On-Site Equal Opportunity Compliance Evaluation (Applies if exceeds \$10M)
52.226-2	Historically Black College or University and Minority Institution Representation
52.230-7	Proposal Disclosure - Cost Accounting Practice Changes
52.232-15	Progress Payments not included
52.233-2	Service of Protest
52.252-1	Solicitation Provisions Incorporated by Reference
52.252-3	Alterations in Solicitation
52.252-5	Authorized Deviations in Provisions
252.203-7005	Representation Relating to Compensation of Former DoD Officials
252.204-7004	Alternate A, System for Award Management
252.204-7008	Compliance with Safeguarding Covered Defense Information Controls (DEC 2015)
252.204-7012	Safeguarding Covered Defense Information and Cyber Incident Reporting (DEC 2015)
252.215-7003	Requirements for Submission of Data Other than Certified Cost or Pricing Data - Canadian Commercial Corporation
252.219-7000	Advancing Small Business Growth

vii. Combating Trafficking in Persons:

Appropriate language from FAR Clause 52.222-50 will be incorporated in all awards.

viii. Certification Regarding Trafficking in Persons Compliance Plan:

Prior to award of a contract, for the portion of the contract that is for supplies, other than commercially available off-the-shelf items, to be acquired outside the United States, or services to be performed outside the United States, and which has an estimated value that exceeds \$500,000, the contractor shall submit the certificate as specified in paragraph (c) of FAR 52.222-56, Certification Regarding Trafficking in Persons Compliance Plan

ix. Updates of Information regarding Responsibility Matters:

FAR clause 52.209-9, Updates of Publicly Available Information Regarding Responsibility Matters, will be included in all contracts valued at \$500,000 where the contractor has current active Federal contracts and grants with total value greater than \$10,000,000.

**C. Applies to Contracts, Grants, Cooperative Agreements and Other Transaction Agreements:**

- i. [Security Classification](#)
- ii. [Requirements Concerning Live Organisms](#)
- iii. [Institutional Dual Use Research of Concern](#)
- iv. [Department of Defense High Performance Computing Program](#)
- v. [Project Meetings and Reviews](#)

\* Click on the above hyperlinks to navigate directly to your desired section

i. Security Classification:

In order to facilitate intra-program collaboration and technology transfer, the Government will attempt to enable technology developers to work at the unclassified level to the maximum extent possible. If access to classified material will be required at any point during performance, the Offeror must clearly identify such need in Section II, Block 11 of the Proposal Checklist.

If it is determined that access to classified information will be required during the performance of an award, a Department of Defense (DD) Form 254, "DoD Contract Security Classification Form," will be attached to the contract, and FAR 52.204-2 - Security Requirements will be incorporated into the contract.

**ONR does not provide access to classified material under grants.**

ii. Requirements Concerning Live Organisms:

(1) Use of Animals:

If animals are to be utilized in the research effort proposed, the Offeror must submit a Full Appendix or Abbreviated Appendix with supporting documentation (copies of IACUC Approval, IACUC Approved Protocol, and most recent USDA Inspection Report) prior to award. For assistance with submission of animal research related documentation, contact the ONR Animal Use Administrator at (703) 696-4046. Guidance: <http://www.onr.navy.mil/en/About-ONR/compliance-protections/Research-Protections/Animal-Recombinant-DNA.aspx>

(2) Use of Human Subjects in Research:

(a) You must protect the rights and welfare of individuals who participate as human subjects in research under this award and comply with the requirements of the Common Rule at 32 CFR part 219 and applicable provisions of DoD Instruction 3216.02, Protection of Human Subjects and Adherence to Ethical Standards in DoD-Supported Research (2011), the DON implementation of the human research protection program contained in SECNAVINST 3900.39D (or its replacement), 10 USC 980 "Limitation on Use of Humans as Experimental Subjects," and when applicable, Food and Drug Administration (FDA) and other federal and state law and regulations.

(b) For proposals containing activities that include or may include "research involving human subjects" as defined in DoDI 3216.02, prior to award, the Offeror must submit documentation of:

(i) Approval from an Institutional Review Board (IRB) (IRB-approved research protocol, IRB- approved informed consent document, and other material they considered); proof of completed human research training (e.g., training certificate or institutional verification of training for the principal investigator, co-investigators); and the Offeror's Department of Health and Human Services (DHHS)-issued Federalwide Assurance (FWA#),

(ii) Any claimed exemption under 32 CFR 219 101(b), including the category of exemption, supporting documentation considered by your institution in making the determination (e.g., protocol, data collection tools, advertisements, etc.). The documentation shall include a short rationale supporting the exemption determination. This documentation should be signed by the IRB Chair or IRB vice Chair, designated IRB administrator or official of the human research protection program.

(iii) Any determinations that the proposal does not contain activities that constitute research involving human subjects, including supporting documentation considered by your institution in making the determination. This documentation should be issued by the IRB Chair or IRB vice Chair, designated IRB administrator or official of the human research protection program.

(c) Documentation must be submitted to the ONR Human Research Protection Official (HRPO), by way of the ONR Program Officer. If the research is determined by the IRB to be greater than minimal risk, you also must provide the name and contact information for the independent research monitor and a written summary of the monitors' duties, authorities, and responsibilities as approved by the IRB. For assistance with submission of human subject research related documentation, contact the ONR Human Research Protection Official (HRPO) at (703) 696-4046.

(d) Contracts, orders, or grant awards and any subawards or modifications will include a statement indicating successful completion of the HRPO review. Research involving human subjects must not be commenced under any contract award or modification or any subcontract or grant subaward or modification until awardee receives notification from the Contracting or Grants Officer that the HRPO has approved the assurance as appropriate for the research under the award or modification and that the HRPO has reviewed the protocol and accepted the IRB approval or determination for compliance with Federal, DoD and DON research protection requirements. See, DFARS 252.235-7004. Guidance: <http://www.onr.navy.mil/About-ONR/compliance-protections/Research-Protections/Human-Subject-Research.aspx>

(3) Use of Recombinant DNA or Synthetic Nucleic Acid Molecules: Proposals which call for experiments using recombinant or synthetic nucleic acid molecules must include documentation of compliance with NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules (NIH Guidelines), approval of the Institutional Biosafety Committee (IBC), and copies of the DHHS Approval of the IBC letter. Guidance: <http://www.onr.navy.mil/About-ONR/compliance-protections/Research-Protections/Animal-Recombinant-DNA.aspx>

iii. Institutional Dual Use Research of Concern:

As of September 24, 2015, all institutions and United States Government (USG) funding agencies subject to the [United States Government Policy for Institutional Oversight of Life Sciences Dual Use Research of Concern](#) must comply with all the requirements listed therein. If your research proposal directly involves certain biological agents or toxins, contact the cognizant Technical Point of Contact.. U.S. Government Science, Safety, Security (S3) guidance may be found at <http://www.phe.gov/s3/dualuse>.

iv. Department of Defense High Performance Computing Program:

The DoD High Performance Computing Program (HPCMP) furnishes the DoD S&T and RDT&E communities with use-access to very powerful high performance computing systems. Awardees of ONR contracts, grants, and other assistance instruments may be eligible to use HPCMP assets in support of their funded activities if ONR Program Officer approval is obtained and if security/screening requirements are favorably completed. Additional information and an application may be found at <http://www.hpcmo.hpc.mil/>.

v. Project Meetings and Reviews:

Individual program reviews between the ONR sponsor and the performer may be held as necessary. Program status reviews may also be held to provide a forum for reviews of the latest results from experiments and any other incremental progress towards the major demonstrations. These meetings will be held at various sites throughout the country. For costing purposes, offerors should assume that 40% of these meetings will be at or near ONR, Arlington VA and 60% at other contractor or government facilities. (This statement does not apply to international offerors submitting proposals to ONRG. International offerors should contact the cognizant ONRG Administrative Director (AD) for guidance prior to submitting a proposal.) Interim meetings are likely, but these will be accomplished via video telephone conferences, telephone conferences, or via web-based collaboration tools.