UNITED STATES MILITARY ACADEMY

BROAD AGENCY ANNOUNCEMENT

W911NF-20-S-0008
01 April 2020 – 31 March 2027

ISSUED BY:

U.S. Army Contracting
Command Aberdeen
Proving Ground
Research Triangle Park Division P.O. Box 12211

Research Triangle Park, NC 27709-2211

Special Notes

1. Formatting of the Announcement

The following table provides an overview of the outline structure of this announcement:

I.							
	A.						
		1.					
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2. See Appendix 1 for a Table of Acronyms used in this announcement.

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I. OVERVIEW OF THE FUNDING OPPORTUNITY

The U.S. Military Academy at West Point's mission is "to educate, train, and inspire the Corps of Cadets so that each graduate is a commissioned leader of character committed to the values of Duty, Honor, Country and prepared for a career of professional excellence and service to the Nation as an officer in the United States Army." The United States Military Academy is located at West Point, New York. USMA executes research to enhance the education of cadets, develop the faculty professionally, and address important issues facing the Army and the Nation. In addition, the Academy conducts research and analysis in emerging fields that may realize novel or vastly improved Army capabilities.

At West Point, research is organized and administered through centers and institutes, most of which reside within academic departments. These centers and institutes, affiliated with each other through the West Point Werx Innovation Hub and coordinated by the Office of Research provide the infrastructure necessary to tackle the Nation’s and the world’s most challenging problems. Our research centers and institutes bring context to the classroom, are central to our vibrant and pioneering faculty, and are one way West Point connects to the Army and to the Nation. Our students are driven, our faculty is world-class, and through our centers, scholars and scientists thrive and produce their best work. Cadets regularly win Best Paper Awards at national and international graduate-level conferences, our faculty hold fellowships and chairmanships in their discipline's national organizations, and our products are deployed to the Soldier. In addition to applied research, there are centers and institutes at West Point that focus on other aspects of the USMA mission.

The USMA BAA identifies topics of interest to the USMA departments, directorates, and research centers and institutes. These groups focus on executing in-house research programs, with significant emphasis on collaborative research with other organizations. The groups fund a modest amount of extramural research in certain specific areas, and those areas are described in this BAA.

The USMA BAA seeks proposals from institutions of higher education, nonprofit organizations, state and local governments, foreign organizations, foreign public entities, and for-profit organizations (i.e., large and small businesses) for research based on the following campaigns: Ballistics, Weapons, and Protections; Infrastructure, Energy, Resilience and Sustainability (ES); Materials, Measurements, and Experiments; Unmanned Systems and Space; Human Support Systems; Emerging Technologies (ET); Life Sciences; USMA Special Programs; Social and Behavioral Sciences; Combating Terrorism; Simulations Modernization; Curriculum and Outreach; Resilient Supply Chains; and Advancing Military Music Research and Innovation. Proposals are sought for cutting-edge innovative research that could produce discoveries with a significant impact to enable new and improved Army technologies and related operational capabilities and related technologies. The specific research areas and topics of interest described in this document should be viewed as suggestive, rather than limiting.

Prospective applicants contemplating submission of a whitepaper or proposal are strongly encouraged to contact the appropriate Technical Point of Contact (TPOC). The TPOCs’ names and email addresses are listed immediately after each research area of interest. If requested by the TPOC, a whitepaper should be prepared in accordance with the instructions contained in this BAA. Upon receipt, a whitepaper will be evaluated, and the applicant will be advised of the results. Applicants whose whitepapers receive a favorable evaluation may be encouraged to prepare a proposal in accordance with instructions contained in this BAA. The costs of whitepapers and/or proposals in response to this BAA are not considered an allowable direct charge to any award resulting from this BAA or any other award. It may be an allowable expense to the normal bid and proposal indirect costs specified in FAR 31.205-18. Proposals may be submitted at any time during the announcement period.

In accordance with federal statutes, regulations, and Department of Defense (DoD) and Army policies, no person on grounds of race, color, age, sex, national origin, or disability shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving financial assistance from the Army.

Applicants submitting proposals are cautioned that only a Contracting or Grants Officer can obligate the Government to any legal instrument involving expenditure of Government funds.

All administrative inquiries regarding this BAA shall be submitted via email to: Brandon.s.hill24.civ@army.mil. Scientific and technical questions should be referred to the TPOCs shown following each research area of interest. Interested parties are encouraged to periodically check any of the following websites for updates and amendments to this BAA: www.grants.gov, www.fbo.gov, and the USMA website, https://westpoint.edu/centers-and-research.

Colonel Brad McCoy, PhD
Associated Dean for Research
United States Military Academy

A. Required Overview Content

1. Agency Name:
United States Military Academy

2. Issuing Acquisition Office:
U.S. Army Contracting Command-Aberdeen Proving Ground, Research Triangle Park (ACC- APG-RTP) Division

3. Research Opportunity Title:
USMA Broad Agency Announcement (BAA)

4. Announcement Type: Initial Announcement

5. Research Opportunity Number: W911NF-20-S-0008

6. Catalog of Federal Domestic Assistance (CFDA) Number and Title:
12.431 – Basic Scientific Research

7. Response Dates:
This BAA is a continuously open announcement valid throughout the period from 01 April 2020 through 31 March 2027, unless announced otherwise.

B. Additional Overview Information

This BAA sets forth research areas of interest to the United States Military Academy. This BAA is issued under paragraph 6.102(d)(2) of the Federal Acquisition Regulation (FAR), which provides for the competitive selection of basic and applied research proposals, and 10 U.S.C. 2358, 10 U.S.C. 2371, and 10 U.S.C. 2371b, which provide the authorities for issuing awards under this announcement for basic and applied research. The definitions of basic and applied research may be found at 32 Code of Federal Regulations (CFR) 22.105.

Proposals submitted in response to this BAA and selected for award are considered to be the result of full and open competition and in full compliance with the provision of Public Law 98369, "The Competition in Contracting Act of 1984" and subsequent amendments.

The DoD agencies involved in this program reserve the right to select for award all, some, or none of the proposals submitted in response to this announcement. Due to Government budget uncertainties, no specific dollars have been reserved for awards under this BAA. The participating DoD agencies will provide no funding for direct reimbursement of whitepaper or proposal development costs.

Whitepapers and technical and cost proposals (or any other material) submitted in response to this BAA will not be returned to the applicant. Unless noted in an applicant's proposal to the contrary, unsuccessful proposals will be retained for six (6) months from declination and then properly destroyed. It is the policy of participating DoD agencies to treat all proposals as sensitive, competitive information and to disclose their contents only for the purposes of evaluation.

An applicant may withdraw a proposal at any time before award by written notice or by email sent to the government point of contact identified in Section G of this BAA.

II. DETAILED INFORMATION ABOUT THE FUNDING OPPORTUNITY

A. Program Description

1. Ballistics, Weapons, and Protections (BWT) Campaign

a. Blast Protection of Structures and Vehicles.

The blast imparted on a structure from close indirect fire or from improvised-explosive-devices (IEDs), while short in duration, may be orders of magnitude larger pressure than ordinary service loads. Mines and buried IEDs are an increasingly deadly threat to our vehicles and the soldiers inside, and increasing the thickness of conventional armor has traditionally been the response, which adversely affects vehicle performance. More effective measures of protection require carefully chosen materials and geometries tailored for each specific situation. This line of effort explores advances in high-performance materials, novel geometric structures, as well as recent advances in additive manufacturing technologies to greatly increase the resilience of our structural and armor systems. The work examines structural optimization *via* field tests in conjunction with cutting-edge high-fidelity computer simulations that use high-performance computers. The resulting engineering solutions inform both next-generation designs and retrofit of existing systems and structures.

TPOC: Dr. Joe Hanus, 845-938-4099, CMEcie_director@westpoint.edu

b. Future Aviation Capabilities Research and Development.

This research area informs future technologies for improving the efficiency, performance, lethality, interoperability, and survivability of Army Aviation manned and unmanned platforms. Key technologies, concepts, and capabilities include additive manufacturing of aviation components and repair parts, air-launched effects, integration of manned and unmanned systems, vibration isolation and reduction, noise reduction, drag reduction of exposed bodies, active flow control, morphing structures, and pilot-vehicle interface technologies, hardening of the fuel system, fuel system analyses, structural health monitoring, predictive maintenance, model based systems engineering environments, and rotor blade erosion analysis and prevention. Further tasks include analyzing the impact of aerodynamic interference between rotors in multi-copter configurations, analyzing and assessing reliability and maintainability of Future Vertical Lift (FVL) proposals, and conducting manned and unmanned aircraft analysis using modeling, simulation and surrogate vehicles. These technologies are sought to reduce vehicle weight, improve performance, reliability, maintainability, reduce the auditory, visual, and EO/radar signature of Army aircraft, improve pilot situational awareness, facilitate operations in degraded visual environments, facilitate optional vehicle autonomy, allow for manned-unmanned teaming, and increase battlefield effectiveness.

TPOC: Dr. Todd Davidson, CMEcie_director@westpoint.edu

c. Next Generation Combat Vehicle Research and Development.

This research will inform future mobility, lethality, and survivability tradeoffs within the Army's suite of ground combat platforms from light tactical vehicle to heavy combat systems. The research includes, but is not limited to, the modeling and testing of future active suspension technologies for increased platform trafficability and stability, future energy-absorbing armor concepts that will simultaneously reduce vehicle weight and increase Soldier protection, design of auxiliary power range extenders for electric vehicles, design and development of modular strap-on equipment that can interface with a future vehicle's power, structure, command and control systems, vehicle autonomy implementation that will allow for optional manning and future powertrain development that will decrease vehicle auditory signature and increase vehicle operating range. Topics may also include research and analysis of the electrification of combat vehicles or the use of novel power plants that are independent of carbon-based fossil fuels.

TPOC: Dr. Todd Davidson, CMEcie_director@westpoint.edu

d. Ballistics and Weapons Engineering Research and Development.

This research area will enlighten future ballistics and weapons engineering design pursuits across the range of Army combat power generation systems from small caliber, individual and crew-served weapons to large caliber, ground combat systems. The research and development is associated with the theory, modeling and experimental analysis of future weapon systems as related to terminal, exterior and interior ballistic performance and metrics.

The work includes but is not limited to signature reduction, weapon system sensors, non-lethal technologies, novel cargo projectiles, electromagnetic launch, gun mounts, heat dissipation, drone defeat, accuracy and precision enhancement, insensitive munitions, extended range, hypervelocity impact physics, experimental research, and guidance technologies.

TPOC: Dr. Todd Davidson, CMEcie_director@westpoint.edu

e. Next Generation Soldier Systems Research and Development.

This research area will inform future Soldier lethality and sustainment through the design of future non-weapons related Soldier equipment. The research is not limited to the ideation and prototype of future Soldier systems in the areas of mobile command posts, aerial delivery systems, Soldier load carrying systems, future camouflage and deception/concealment systems, future force projection and force sustainment concepts, advanced in individual body armor and protective technology, and future Soldier sensor systems.

TPOC: Dr. Todd Davidson, CMEcie_director@westpoint.edu

2. Infrastructure, Energy, Resilience and Sustainability (IERS) Campaign.

This campaign focuses on research that contributes to securing critical infrastructure, designing and building resilient infrastructure, and designing and building sustainable infrastructure. The goal is to improve the critical infrastructure resilience of communities and military installations. Our research explores energy, water, human factors, organizational structure, networks, cyber psychology, cyber ranges, and cyber education as related to any and all of the critical infrastructure sectors, defined by Department of Homeland Security (DHS) Cybersecurity & Infrastructure Security Agency (CISA) as well as those of military bases and military communities.

Our research aims to provide new capabilities to:

- Understand gaps in critical infrastructure research
- Explore information sharing (what is shared, to whom, how quickly, how much information)
- Determine what aspects of critical resilience exercise planning can be automated
- Understand the needs of communities and installations in developing critical infrastructure resilience
- Better emulate operational technology for improved cyber range support
- Explore decision-making when there is a critical infrastructure cyber event
- Explore the impacts of critical infrastructure disruption events on other sectors and/or military movement

Our research has the potential to:

- Automate portions of the exercise planning process
- Integrate existing frameworks and knowledge bases into a scalable, repeatable critical infrastructure resilience framework
- Develop a rich picture of readiness using a mixture of qualitative and quantitative data
- Provide communities and military installations with a road map to critical infrastructure resilience
- Model and simulate impacts of critical infrastructure disruptions
- Standardize metrics for measuring impacts of disruptions, information sharing, organizational planning, and/or other difficult to measure factors in incident response
- Determine regional and local trends in critical infrastructure incident response and preparedness

a. Sustainability and Energy Resilience Research.

This research area will inform the development of sustainable defense and civilian public infrastructure and energy systems both at home station and on the battlefield. Research areas include the design and analysis of

technologies associated with sustainable infrastructure and hardware for the Army such as resilient energy delivery, storage and consumption systems, assessment of alternative and synthetic fuel production, renewable energy use in industrial processes, utilization of waste products to improve system efficiency; sustainable maintenance and structural health monitoring of public facilities and infrastructure to include buildings, roads, bridges, tunnels, locks, dams, harbors, and similar infrastructure from natural threats such as wear and corrosion, as well as man-made physical, cyber, RF and emerging threats; analysis of future trends associated with environmental and geo-political changes and their effect on defense and civilian infrastructure, energy resilience, and operational flexibility. Research can include material degradation from corrosion and other forms of wear that are unique to DoD applications as well as novel applications of concrete technology in support of both vertical and horizontal construction as well as blast resilient structures. Research can also address novel construction materials, including but not limited to cross laminated timber, structural insulated panels, or advanced/enhanced sustainability concrete materials to determine the defense-application benefits of these materials as well as the potential risks associated with using them in defense applications such as blast response, thermal signatures, RF transparency, etc. Analysis of both home station / installation applications of various technologies and deployed / operational applications is of interest. Deployed applications of energy and sustainability can include, but are not limited to, electrification of combat vehicles, energy support of future weapons such as directed energy systems, and mobile or micro-nuclear power technology, the survivability, distribution, and logistics considerations of novel or alternative fuel sources and analysis of renewable energy options for operational energy consumption and usage.

TPOC: Dr. Todd Davidson, -4694, CMEcie_director@westpoint.edu

b. Critical Infrastructure Resilience

The Government relies on civilian critical infrastructure to support military installations and military movement. Research is needed in the following areas:

i. Developing a scalable, repeatable framework for communities and installations to use
ii. Understanding interdependencies between civilian critical infrastructure and military installations and military movement
iii. Understanding the concerns of communities pertaining to critical infrastructure protection and resilience
iv. Determining the impacts of critical infrastructure disruption events
v. Expanding the number of locations that can participate in Jack Voltaic™ events
vi. Studying how much critical infrastructure resilience planning can be automated
vii. Improving standardization of data collection for a more meaningful analysis
viii. Using data collected to model and simulate impacts of critical infrastructure events on military installations and military movement
ix. Emulating operational technology to allow for its inclusion in cyber range events
x. Sharing information gained from Jack Voltaic™ events with stakeholders and those who may benefit
xi. Visualizing critical infrastructure interdependency and impact data
xii. Any other topics that can improve critical infrastructure protection or resilience

TPOC: Dr. Karen Guttieri, karen.guttieri@westpoint.edu

3. Materials, Measurements, and Experiments (MME) Campaign.

a. Research and Development for Combating Corrosion and Improving Materiel Readiness.

The Center for Innovation and Engineering (CIE) is interested in researching and developing solutions to mitigate and prevent the corrosion of Army assets. Current research projects in the CIE are focused on designing detection systems for corrosion on structures and researching new corrosion resistant metal alloys; however future research projects are not limited to metals as all materials currently utilized by the Army are subject to degradation by their surrounding environment. Additionally, the CIE is interested in research on curricular development for promoting corrosion education to the future workforce of the Army through multi-disciplinary collaborations in order to increase the overall awareness and interest in combating corrosion.

TPOC: Dr. Todd Davidson, CMEcie_director@westpoint.edu

b. Advanced MRI Measurements for Data Analysis and Model Validation.

This research involves leveraging advanced measurement diagnostics in water tunnel studies to research technological flows in a variety of capacities and fields related to aerodynamics, heat transfer, fluid mechanics, and environmental flows. Three basic modalities of experiments are envisioned and used interchangeably – time averaged, three-dimensional, three-component velocity field measurements in turbulent flows at isotropic resolutions approaching 0.5mm in each direction; three-dimensional measurements of concentrations of a passive scalar in turbulent flows at isotropic resolutions of 0.7 mm to 0.5% full scale in scaled versions of complex terrain features subjected to steady or periodic releases of a contaminant; and time averaged three-dimensional temperature fields at similar resolutions for a thermally stratified turbulent flow field in complex geometries. The techniques envisioned, termed Magnetic Resonance Velocimetry (MRV), Magnetic Resonance Concentration (MRC), and Magnetic Resonance Thermometry (MRT) respectively as described, leverage developing diagnostic techniques based on magnetic resonance imaging to rapidly acquire large, time-averaged, velocity, concentration, and temperature data sets that are of great practical utility for validation of computational models, model improvements, detailed physical analysis, and for understanding fundamental features of these important classes of flows. Current primary applications for these studies involve exterior ballistics analysis for projectiles, mass transport and thermal studies within advanced gas turbine blades, and environmental flows involving contaminant dispersion within both urban areas and rugged rural terrain. The experimental analysis is supported by computational comparisons using advanced numerical simulations that leverage in-situ boundary condition measurements and geometry files as initial conditions, and the data are available for comparison with other computational models, experimental data sets, and analyses.

TPOC: Dr. Todd Davidson, CMEcie_director@westpoint.edu

c. Material Science and Rapid Prototyping Research.

This research area seeks to determine new insights into new materials and new fabrication techniques to provide enhanced performance of materials, structures, and energetics with a focus on defense related applications. This research can include novel methods of 3D printing, including 3D printing ceramics, metals, biological material, soils, concrete, energetic material, or recycled materials; the sustainment challenges associated with 3D Printing; 3D Printing at the edge (such as on a Forward Operating Base), the challenges associated with materials degradation from 3D printed parts including corrosion and fatigue; and topology optimization of 3D Printing parts and components associated with defense systems. Material Science topics can include research into the material properties of novel materials with defense applications to include nano-scale fabrication of materials, energetic material, smart materials and smart structures, bio-templating, advanced composites and polymers as well as rapid prototyping techniques.

TPOC: Dr. Todd Davidson, CMEcie_director@westpoint.edu

4. Unmanned Systems and Space (USS) Campaign

a. Next Generation Unmanned Systems Research and Development

This research area will inform future technologies for improving the efficiency, performance, lethality, interoperability, survivability of and protection from unmanned aerial and ground systems. Key technologies, concepts, and capabilities include vehicle design and fabrication, sensor integration and processing, actuation, event-driven autonomy and decision making, multi-agent swarm control, manned-unmanned teaming, path planning, wireless communications, operator-vehicle interface, rapid and airborne deployment, field recovery systems, various counter-unmanned systems capabilities including the development of both cyber, physical, directed energy, or radio frequency-based techniques to neutralize, degrade, defeat, or destroy threat UAS, and

agile field and flight testing of the above (UAS or Counter UAS systems). These technologies are sought to maintain the Army and its future leaders on the leading edge of the rapidly evolving field of unmanned systems, as well as provide innovative and effective solutions to support the Soldier.

TPOC: Dr. Todd Davidson, CMEcie_director@westpoint.edu

b. Robotic Systems Research and Development.

This research area will inform the development and scoping of future robotic systems in defense-related environments to include unmanned or optionally manned ground and air systems, robotic drive systems, robotic control systems, unique robotic actuators, particularly with defense-related applications, robotic tethering and powering systems and methods, methods of developing autonomous behaviors and self-organizing (swarming) behaviors of groups of robots, methods of state estimation and control, particularly in GPS denied environments (including indoor or subterranean), methods for obstacle detection and avoidance, the terramechanics of ground vehicles, flight dynamics of novel air vehicles including quad rotors, flapping wing micro air vehicles, hybrid air vehicles, and air-launched vehicles. The research can address multiple phases of the design process from ideation to the realization of testable prototypes.

TPOC: Dr. Todd Davidson, CMEcie_director@westpoint.edu

c. Space Engineering and Rocket Technology Research.

This research area seeks to analyze, design, develop and test new technology associated with small, multi-stage rocket capability to achieve low earth orbit of small payloads (less than 50 lbs) or to enable the development and realization of a hypersonic air vehicle. The research focus areas include on-board technology including rocket hardware analysis and development, rocket and flight path modeling, aerodynamic analysis, energetic development, development of state estimation, control and/or telemetry systems; design, development and implementation of safety hardware, and the analysis, development and design of alternative rocket fuels. Research areas can additionally include any technology or study that facilitates the development or employment of this technology including usage cases, concept of the operation development, integration of the technology within the existing space infrastructure and policy landscape, technology to support the creation of a mobile space-launch capability or hypersonic-capable air vehicle.

TPOC: Dr. Todd Davidson, CMEcie_director@westpoint.edu

5. Human Support Systems (HSS) Campaign

a. Biomechanical Engineering.

This research area will inform the Department of Defense on biomechanical strategies to enhance soldier readiness. This includes human performance optimization, injury prediction and prevention, physical and cognitive augmentation, analysis of Return to Duty metrics, the influence of various powered prosthetics or exo-skeleton devices on human physical, metabolic, or cognitive functioning. This work may include human subject testing, injury tracking, device design, literature reviews, code development, and simulation.

TPOC: Dr. Todd Davidson, CMEcie_director@westpoint.edu

b. Wearable Technologies and Sensors

This research area will inform the Department of Defense on the science of wearable technologies and cloud-based data collection, archiving, and analyses. The work can include research into the effect of wearable technology and the potential for wearable technology to inform decision relating to Soldier performance. This work may include human subject testing, health tracking, activity monitoring, device design, advanced modelling and simulation. It can include monitoring and assessing soldier performance in various conditions utilizing approaches associated

with biomechanics, load carriage performance nutrition, equipment use, injury prevention, and recovery times.

TPOC: Dr. Todd Davidson, CMEcie_director@westpoint.edu

c. Design for Future Combat Leaders.

This research area will inform the way design is taught and practiced at West Point and the ways deeper experience with design might not only make better engineers but also more adaptive and agile leaders. The research includes work on novel curricular structures and new pedagogical techniques. Through a thorough investigation of design across a wide variety of contexts and various disciplines, the research will serve to improve the way design is taught and practiced in academic and field environments in an engineering context and to inform the way engineering design is connected to design as it is taught in the operational Army. These efforts will serve to enhance the broader aim of producing more innovative leaders.

TPOC: Dr. Joe Hanus, 845-938-4099, CMEcie_director@westpoint.edu

d. Health, Nutrition, and Artificial Intelligence

With rapid advances in nutrition research, new and large multi-modal data sources are being collected requiring novel computational and data science approaches and tools to advance our understanding in a way that accounts for the complex systems involved. Developing data science and machine learning approaches and tools that help better understand and address the systems both within individuals and their environment could not only transform nutritional research and guidance, but also provide new data science methods to inform other areas of health such as infectious disease modeling, reproductive health, obesity research, and public health community based interventions.

This research will focus on

- Distilling large multi-modal data sets for use in AI/ML algorithms
- Identifying causal pathways in nutrition related outcomes
- Predicting individual health outcomes resulting from changes in nutrition.
- Establishing software development procedures and processes for tool integrations into a third-party application, to include a testing environment
- Design and implementation of a large scale cloud based data repository to support machine learning research
- Design and implement tools to import data into cloud based repository to include pre-processing functions in a secure manner

Additionally, we are interested in developing new methods for storing, accessing, and modeling in the aforementioned areas. The Center for Data Analysis and Statistics seeks to:

- Generate new biomedical and public health data sets that are ethically sourced, trustworthy, well-defined, and accessible
- Develop architecture and interfaces that to unify attributes across wide ranging data sources and types
- Create tools that collapse and combine data sources so that they are FAIR (Findable, Accessible, Interoperable, and Reusable), transparent (explainable AI), representative of the population, and free from error and bias.
- Provide novel resources to disseminate data, ethical principles, tools, and best practices
- Create training materials and activities that bridges the gap between biomedical, data science education, and AI research communities.

TPOC: Dr. Diana Thomas, (845) 938-5619, diana.thomas@westpoint.edu and math.reseawrch@westpoin.edu
COL Chris Morrell, (845-768-3980), chris.morrell@westpoint.edu

6. Emerging Technologies (ET) Campaign

In February of 2022, the White House released the list of Critical and Emerging Technologies that are potentially significant to U.S. National Security. This ET Campaign focuses on the understanding, design, development, experimentation, and operationalization of emerging disruptive technologies such as Artificial Intelligence, Machine Learning, Cyber, Advanced Computing, Autonomous Robotics, Communication & Networking Technologies, and Quantum Information Technologies. One goal of this campaign is to create techniques and

tools that enable autonomous cyber operations and that ensure the security of Army systems and data. Another goal of this campaign is to understand how these emerging technologies (either singularly or in combination with each other) will affect future military operations in different geographies, geo-political climates, organizational structures, and against different adversaries.

Our research aims to provide the Army Cyber Enterprise new capabilities to:

- Shift emphasis from sensing to information awareness
- Understand the underpinning of cyber autonomy
- Relieve human cybersecurity analyst cognitive overload in dealing with the data deluge problem
- Enhance human-machine interface in information processing
- Protect data and systems using advance cryptography techniques
- Operate in real-time to handle the pace of modern operations

Our research has the potential to:

- Cope with various complex disparate data/information types
- Integrate a diversity of unique reasoning and learning components collaborating simultaneously
- Bridge correlational with causal discovery
- Determine solutions or obstructions to local-to-global data fusion problems
- Mechanize reasoning/learning and computing in the same computational environment
- Yield provably efficient procedures to enable or facilitate cyber data analytics
- Deal with high-dimensional and massive cyber datasets with provably guaranteed performance

a. Artificial Intelligence and Machine Learning for Cyber Security

The Government networks currently channel more data than its security analysts can meaningfully process. Analysts are overwhelmed with numerous alerts and are vulnerable to alert fatigue. The vast scale of data collection challenges human- driven/human-only solutions to collection and processing.

The goals of this work are to increase the government's capacity to process that data by assisting and augmenting analysts through the application of artificial intelligence (AI) and machine learning (ML) algorithms, to include deep learning algorithms. Research will focus on experimental investigation and prototype development of AI/ML algorithms and capabilities. In addition, this research program will focus on helping analysts perceive and understand dynamic and unknown environments.

Elements of this research effort include new frameworks and tools for the creation of algorithms; tailored algorithms to perform discrete tasks, particularly in the fields of intrusion detection; resilience against adversarial attacks; new labeling techniques to generate massive scale annotated data for supervised deep learning techniques; new methods of edge computation to bring deep learning algorithms to constrained computational environments; methods to evaluate and determine the effectiveness of algorithmic approaches; interfaces for the display, search, and interaction with algorithmically derived metadata and tabular structured algorithmic output; new techniques, hardware, software, and tools for the training, testing, and validating of algorithms; and storage and indexing capabilities for local algorithmically-produced data.

TPOC: MAJ Nathaniel Bastian, (845) 938-3287, nathaniel.bastian@westpoint.edu
Elie Alhajjar, (845) 938-5865, elie.alhajjar@westpoint.edu

b. Quantum Sciences

The Army needs to better employ quantum sciences in a number of areas to improve the performance and security of its future systems. Research is needed in the following areas:

- Quantum computing to solve highly complex problems in real time

- Quantum sensing to achieve highly sensitive sensors and enable highly accurate navigation
- Quantum communications, and networking to enable highly secure and efficient information flow
- Cryptographic algorithms that are secure against Quantum computing attacks

TPOC: Lubjana Beshaj, (845) 938-0564, lubjana.beshaj@westpoint.edu

c. Internet of Things (IOT) –

The Army is integrating a wide range of capabilities and equipment from the Internet of Things domain. The Army's interest is driven in part by the fact that the amount of usable communication bandwidth on the battlefield will be dynamic, and as such automated reallocation of communication resources and information sharing strategies are more challenging than commercial ones. Research is needed to improve Army IOT in the following areas:

- New concepts, quantitative models and technical approaches enabling automated security and management of IoT devices.
- New machine learning techniques that accelerate decision making are needed to address the scale/volume of IoT security information and advance the science.
- New approaches, low-complexity algorithms, and methods to enable IoT to be secure, resilient, and to automatically manage and affect risk and uncertainty in a highly deceptive, mixed cooperative/adversarial, information-centric environment.
- Novel approaches to enable improved training on securing IoT.

TPOC: LTC Nathaniel Bastian, (845) 938-3287, nathaniel.bastian@westpoint.edu

d. AI for Human-robot and human-AI interaction:

The development of Artificial Intelligence (AI), Machine Learning (ML), autonomy, and automation approaches that may be integrated with the human (e.g. wearable and/or portable devices), the robot (e.g. autonomous or semi-autonomous unmanned vehicle in the undersea/surface/ground/aerial/space domain), with any component of the human-system interface (e.g. front-end display), with services across the manned-unmanned team (e.g. cloud), and/or across the command-and- control decision matrix. Solutions can include (but are not limited to) classical approaches to AI/ML, autonomy, automation, and learning (e.g. supervised, unsupervised, reinforcement, rule-based, life-long, etc.).

The AI for Human-Robot interaction research necessarily addresses four possible communication failure modes among peer-to-peer communication interactions:

- Human-Human state estimation and intent understanding
- Human-robot state estimation and intent understanding (including cyber bot understanding)
- Robot-human state estimation and intent understanding (including cyber bot understanding)
- Robot-robot state estimation and intent understanding (including cyber bot understanding)

Topic Areas Include:

- Robot sense, think, act loop – perception including localization and mapping, planning/control for motion, obstacle avoidance, task, missions (e.g. aided threat recognition (ATR) and threat confirming and queuing for small-unit combat operations).

- Perception – computer vision (object detection, terrain analysis) leveraging sensors such as cameras/lidar/radar etc., human physiology monitoring for health and intervention (e.g. dynamic scene understanding for robotic assistance in search and rescue missions for humanitarian assistance/disaster recovery (HADR) missions or downed airman search and rescue missions).

- Collaboration/Cooperation- Collaborative/Cooperative AI in adversarial environments, trust and transparency, reduction of cognitive load. Metrics and Measures of collaboration. Human-robot teaming (e.g. algorithms supporting dynamic re-planning of tasks based upon application of computable models of command intent to automatically generate altered plans and recommending actions for human decision to better meet command intent for a given mission).

- Decision aids- triage tools, task management, explainable AI (e.g. use of computable models of command intent/human intent to support visualization of recommended actions to meet human intent for a given task/subtask).

- Command and Control- capturing command intent, mission planning, execution,
- and after-action reporting. Linking assets together faster. Transfer of control between AI assets and humans. (e.g. assistance in visualization of logical event streams and physical evolution of continuous system parameters such as target engagements associated with complex activities for human-robot teaming such as transfer of tactical control associated with application of rules of engagement when moving from WEAPONS HOLD to WEAPONS TIGHT to WEAPONS FREE in a given combat environment).

- Interaction/Communication–human-machine interfaces including speech/ gesture/ haptics/ visual/mobile devices and advanced data visualization. Efficient communication between AI assets and humans. (e.g. use of voice or hand and gestures to support robotic execution of evacuation of wounded combatants).

- Validation of AI: area of research such as verification and validation, test and evaluation in simulation and real-world testbeds (e.g. support for visualizations and data collection and VV&A for virtual, live, and constructive simulations such that the AIs generated in virtual environments can be used in live environments and constructive environments to validate use of the AIs in physical environments to meet command intent/human Intent).

TPOC: Michael Novitzky, (845) 938-6193, michael.novitzky@westpoint.edu
Robert Thomson, robert.thomson@westpoint.edu

e. Data Science Campaign

The Data Science campaign looks to create holistic and integrated solutions leveraging novel approaches for all aspects of data science, to include data management, data engineering, data discovery, data fusion, data visualization, and data analytics. The goal is promote and encourage integrated research projects that create, develop and apply novel computational, mathematical and statistical methods, algorithms, software, data curation, analysis, visualization and mining tools to address large-scale simulations and analysis of large and heterogeneous collections of data. In addition, we seek key developments that would improve the modeling of systems under dynamic conditions, achieve effective instrumentation management and architect control of dynamic and heterogeneous resources. Our research explores new ways of conceiving of and executing Army data science capabilities with greater reliability, performance, and scalability.
Our research aims to provide the Army and the Army Cyber Enterprise new capabilities to:

- Address challenges in the Army's capability to rapidly collect and analyze operational data, then securely distribute results and information to operational decision makers.
- Determine appropriate high-throughput applications and large-scale data storage and processing that support the Army's requirement to operate in multiple environments (both cyber and physical) and meet performance and energy objectives for applications ranging from very low-power sensors to high-performance computing systems.
- Generate data that will improve algorithms overall performance and their resistance to adversarial training techniques.
- Securely collect, store, manage, and share various complex disparate data and information types.

- Work with massive high-dimensional datasets in a secure, efficient, and accurate manner with provable performance.

Our research has the potential to:

- Cope with various complex disparate data/information types
- Bridge correlational with causal discovery
- Determine solutions or obstructions to local-to-global data fusion problems
- Yield provably efficient procedures to enable or facilitate data analytics

TPOC: LTC Nathaniel Bastian, (845) 938-3287, nathaniel.bastian@westpoint.edu
LTC Mathew Fukuzawa, Mathew.Fukuzawa@westpoint.edu; math.research@westpoint.edu

f. Strategic Foresight on Emerging Technologies

Many of the interesting Emerging Technologies will not be available to the U.S. military for decades. However, once they are available - they can radically change DOTMLPF-P (doctrine, organization, training, material, leadership, personnel, facilities, policy) requirements for the U.S. military. These DOTMLPF-P processes also take time to change. Therefore, we are interested in strategic foresight and trends research that will help us understand the impacts that these technologies can have on military operations throughout the continuum of conflict along with recommended solutions to disrupt or mitigate the associated vulnerabilities. We are also interested in how these emerging technologies will affect military operations if both sides adopt them and/or if only one side adopts them. We are also interested in understanding if these technologies will have a different impact on military operations depending on which region of the world it is occurring in.

TPOC: COL Natalie Vanatta, ACIThreatcasting@westpoint.edu, 845-938-8983

7. Life Sciences Campaign

The Life Science Program supports basic and applied research to advance

scientific knowledge and understanding of the fundamental properties, principles, and processes governing biomolecules, cells, as well as multi-species communities, biofilms, individual humans, and groups of humans. Research investments are driven by exploiting new scientific opportunities with anticipated long-term payoffs, including maintaining U.S. technological superiority and developing new Army capabilities.

The interests of the Life Science Program are primarily in the following areas: synthetic biology, biochemistry, neuroscience, microbiology, molecular biology, genetics, genomics, proteomics, metabolomics, natural products chemistry, clinical science, epigenetics, systems biology, bioinformatics, biomaterials, and environmental biology. The results of fundamental and applied research supported by this Program are expected to enable the creation of new technologies for improving warfighters' physical and cognitive performance capabilities, for protecting warfighters, and for creating new Army capabilities in the areas of biomaterials, energy, biosensors, additive manufacturing, and health- and performance-related data.

The Program's research thrusts are currently focused on five research areas. The titles, scopes and points of contact for these programs, each of which address general aspects of basic research in life sciences, are listed in the following subsections. A small number of symposia, conferences and workshops are also supported in part or in whole to provide an exchange of ideas in areas of Army interest.

a. Biochemistry

This research thrust emphasizes basic research focused on understanding and controlling the activity and assembly of biomolecules. Scientific advances supported by this Program are anticipated to enable the development of novel systems, materials and processes that enhance Soldier protection and performance. An overarching goal of the Program is to provide the scientific foundations to support biological activity outside of the natural biological context, including

integration of biological systems with synthetic systems.

The Biomolecular Specificity and Regulation thrust is focused on elucidating the mechanisms by which biomolecules recognize and interact with their targets, as well as the regulatory mechanisms utilized to activate or inhibit biomolecular activity. This research thrust also includes novel engineered approaches to modulate and control biomolecular activity.

The Biomolecular Assembly and Organization thrust is focused on understanding the molecular interactions and design rules that govern self-assembly of biomolecules into both naturally occurring biomolecular structures and designed architectures. This research thrust also includes novel approaches to control biomolecular assembly and approaches to utilize biomolecular architectures to organize biomolecular activity and/or achieve specialized properties.

TPOC: Dr. Kevin O'Donovan, kevin.odonovan@westpoint.edu, 845-938-7293

b. Clinical Studies and Genetics

This research thrust supports basic and applied research in genetics, molecular biology, genomics, epigenetics, and systems biology in areas that may enable the optimization of the Soldier's cognitive and physical performance capabilities, increase Soldier survivability, and improve Army capabilities in areas such as biomaterials, sensing, energy, and intelligence. This Program emphasizes innovative high-risk fundamental research in areas such as identification and characterization of gene function, gene regulation, genetic interactions, gene pathways, gene expression patterns, epigenetics, mitochondrial regulation and biogenesis, and nuclear and mitochondrial DNA replication, mutagenesis, oxidative stress, and DNA repair.

The Clinical Studies thrust is focused on identifying and characterizing the genetic and metabolic pathways that affect warfighter survival and performance. This Program is interested in identifying and understanding the molecular factors that affect human physical and cognitive performance capabilities as well as human survival and protection under normal conditions and when affected by a variety of stressors likely to be encountered in battlefield situations, such as dehydration, heat, cold, sleep deprivation, fatigue, caloric insufficiency, pathogens, and physical and psychological stress. Biomarkers of performance and injury and microbiome interaction with the warfighter are of particular interest.

The Genetics thrust is focused on understanding genetic change at a population level. Areas of interest include mechanisms of prokaryotic adaptation, social insects, modeling species distributions, plant genetics, biological components of social instability, and biological systems for sensing and detection.

TPOC: Dr. Kevin O'Donovan, kevin.odonovan@westpoint.edu, 845-938-7293

c. Microbiology

This research thrust supports basic research in fundamental microbiology that can help advance needs in Soldier protection and performance. There are two primary research thrusts within this program: (i) Microbial Survival Mechanisms, (ii) Analysis and Engineering of Microbial Communities, and (iii) Microbial Therapeutics and Remediation.

The Microbial Survival Mechanisms thrust focuses on the study of the cellular and genetic mechanisms and responses that underlie microbial survival in the face of environmental stress. These stressors include extremes in temperature, pH, or salinity; the presence of toxins including metals and toxic organic molecules; oxidative stress; and cellular starvation and the depletion of specific nutrients. Research approaches can include fundamental studies of microbial physiology and metabolism, cell biology, and molecular genetics that examine key cellular networks linked to survival, microbial cell membrane structure and the dissection of relevant critical signal transduction

pathways and other sense-and-respond mechanisms.

The Analysis and Engineering of Microbial Communities thrust supports basic research that addresses the fundamental principles that drive the formation, proliferation, sustenance and robustness of microbial communities through reductionist, systems-level, ecological and evolutionary approaches. Bottom-up analysis of information exchange, signaling interactions and structure-function relationships for single and multi-species communities within the context of planktonic and biofilm architectures is considered.

The Microbial Therapeutics and Remediation thrust focuses on alternatives to classic antibiotics as methods to control the growth and replication of microbes. Particular areas of interests are bacteriophage, ex vivo antibody production, and natural products such as short chain fatty acids. Research is conducted to identify promising candidates and to determine their effectiveness in isolation as well as a component in combination therapy.

TPOC: LTC Andrew Kick, Andrew.kick@westpoint.edu, 845-938-3918

d. Neurophysiology of Cognition

The Neurophysiology of Cognition research thrust supports non-medically oriented basic research in neuroscience, the behavioral sciences, physiology and neuro- engineering that might enable the optimization of Soldier's cognitive and physical performance capabilities. An overarching goal of the program is to provide foundational knowledge of molecular, cellular and systems-level neural codes underlying cognition and performance across multiple length and time scales. Research in this program can include a broad range of methodological and theoretical approaches applied to animal and human experimental systems including electrophysiology, neuroimaging and computational neurobiology. This includes the study of the psycho-physiological implications of brain-machine interfaces, the measurement and modeling of individual cognitive dynamics and decision making during real-world activity, and identifying how neuronal circuits generate desirable computations. In the long term, research in this area may enable the development of interfaces enabling humans to more efficiently control machines, new training methods and devices to predict and optimize individual performance, and the potential restoration from injury at the neural level. Basic research opportunities are sought in two primary research thrusts: (i) Multisensory Synthesis and (ii) Neuronal Computation.

Multisensory Synthesis. The Multisensory Synthesis thrust aims to understand how the human brain functions in relation to the interaction of sensory, cognitive and motor processes during its performance of real-world tasks. Research focuses on mapping, quantifying and modeling distributed neural processes, physiological processes and mind- body interfaces that mediate these features to ultimately develop better understanding of cognition for eventual application to Soldier performance.

Neuronal Computation. The Neuronal Computation thrust is focused on understanding how living neuronal circuits generate desirable computations, affect how information is represented, show robustness to damage, incorporate learning and facilitate evolutionary change. Research focuses on determining how brains structure, process and refine inputs into efficient decisions and behaviors, and how these multiscale features are altered under stresses. Cell culture, brain slice and in vivo models are used to develop better understanding of small and large-scale living neural networks for eventual application in Army systems.

TPOC: Dr. Kevin O'Donovan, kevin.odonovan@westpoint.edu, 845-938-7293

e. Biomaterials and Additive Manufacturing Thrust

The Biomaterials and Additive Manufacturing thrust is focused on developing technologies and procedures for on-demand production of needed items and materials in austere environments as well as producing materials that provide electrochemical communication with cells and tissues at

biotic/abiotic interfaces. A key outcome of this research is to enhance soldier protection and survivability with the production of sensors for both environmental conditions as well as sensors to detect the health and wellness of soldiers. Additionally, the additive manufacturing component of this trust will focus on enhancing prolonged field care and developing advanced experimental models using human derived cells.

TPOC: LTC Andrew Kick, Andrew.kick@westpoint.edu, 845-938-3918

8. USMA Special Programs

a. Conference and Symposia Grants

Introduction. The United States Military Academy supports conferences and symposia (as defined in the DoD Travel Regulations) in areas of policy, humanities, social science, natural science, technology, and engineering that bring experts together to discuss recent research or educational findings or to expose other researchers or advanced graduate students to new research and educational techniques. USMA encourages the convening in the United States of major international conferences, symposia, and assemblies of international alliances.

Eligibility. Notwithstanding the Army's authority to provide grant support for such events, only non-commercial policy, humanities, social science, scientific, technical, or professional organizations that qualify for tax exemption may receive a conference grant/symposia grant. Those who meet this requirement should also be aware that the DoD does not permit "co-sponsorship" (as defined in DoD 5500.07-R) absent additional high level staffing and approval. In other words, the conference grant support identified in this BAA is NOT DoD sponsorship or co-sponsorship since USMA is neither an organizer, nor provider, of any substantial logistical support for the conferences addressed in this section.

Conference Support. Conference support proposals should be submitted a minimum of six (6) months prior to the date of the conference.

Technical Proposal Preparation. The technical portion of a proposal for support of a conference or symposium should include:

(1) A one page or less summary indicating the objectives of the project.
(2) The topics to be covered.
(3) The location and probable date(s) and why the conference is considered appropriate at the time specified.
(4) An explanation of how the conference will relate to the educational, research, and professional development mission and interests of USMA and how it will contribute to the enhancement and improvement of scientific, engineering, and/or educational in general and activities as outlined earlier in the research areas of this BAA.
(5) The name of chairperson(s)/(PI)(s) and his/her biographical information.
(6) A list of proposed participants and the methods of announcement or invitation.
(7) A summary of how the results of the meeting will be disseminated.
(8) A signed cover page.

Cost Proposal Preparation. The cost portion of the proposal shouldshow:

(1) Total project conferencecosts by major cost elements.
(2) Anticipated sources of conference income and amount from each.
(3) Anticipated use of funds requested.
(4) A signed budget.

Participant Support. Funds provided cannot be used for payment to any federal government employee for support, subsistence, or services in connection with the proposed conference or symposium.

Cognizant USMA TPOC/ Program Manager. It is highly recommended that potential applicants contact the appropriate TPOC/ Program Manager identified earlier in the research areas of this BAA for advice and assistance before preparation of a conference/symposia proposal.

9. Social and Behavioral Sciences Campaign

a. Military Force Structure and the Use of Force Research

This research area seeks to understand the different ways militaries recruit and organize people for combat and the effects these policies have both on and off the battlefield. Diverse identities and skillsets, as well as command structures and civil- military authorities, can all affect the types of tasks Army soldiers are required to complete, and their ability to achieve them effectively. Research here examines the relationship between sociopolitical conditions, who joins militaries, and how states use them. Examples of these sociopolitical factors can include, but are not limited to, traits of civilian political leaders, domestic public opinion about foreign policy and civil-military relations, and perceptions of national threats. Research may also examine how these factors affect and are affected by foreign policy outcomes like military effectiveness, conflict outcomes, and the use of force abroad, as well as other similar aspects of military behavior. This research will include, but is not limited

to, the use of opinion surveys, survey experimental design, structured and semi- structured interviews, historical analysis and archival research, and econometric methods, to include occasional research assistance and travel to conduct, present, and workshop these activities. The resulting analyses will better inform strategic decision makers and military professionals about how to recruit, organize, and use the Army's human capital to optimize results for appropriate missions. The research objective is to understand the social and political constraints on policymakers' decisions and how to change incentives to expand policy options. A more complete understanding about these relationships will help senior military advisors craft their best military advice and will help avoid the adoption of sub-optimal uses of human capital in the Army.

TPOC: Dr. Max Margulies, 845-938-5878, max.margulies@westpoint.edu

b. Civil Affairs (CA) Solutions

Our research seeks to assist the DoD and Army leadership to coordinate military activities with other USG departments and agencies, civilian agencies of other governments, host nation military and NGO to support stability operations to include activities that establish civil security, provide support to governance, provide essential services, support economic development and infrastructure, and establish civil control for civilian populations in occupied or liberated areas until such control can be returned to civilian or non-U.S. military authority. We welcome proposals that seek to utilize existing and emerging technologies, coupled with novel and innovative methodologies to determine successful strategies, plans, and processes.

The research for Civil Affairs should focus on several critical areas to include:

1) Usability and workflow metrics that highlight how emerging technologies (i.e. - artificial intelligence and machine learning (AI/ML)) meet the challenges of multi- domain operations by addressing warfighter challenges such as, but not limited to, reducing cognitive burden and enhancing situational understanding.

2) Enhanced presentation techniques and technologies that enable warfighters to overcome cognitive burden challenges that result from attempting to sense-make in a complex and dynamic environment governed by gray zone activities. The focus of this presentation layer will be to present complex and dynamic human element insights as actionable information/knowledge to the operational user.

3) System-of-systems model development for a range of multi-domain environments with a particular focus, but not limited to, food systems, power & energy systems, transportation systems, banking & economic systems. The ultimate objective would be to create a set of interoperable models where edge relationships between entities expressed in terms of strategic or operational military variables that can support planning activities and non-kinetic course of action development.

4) General application of emerging technologies to address capability gaps within the Civil Affairs Branch for both existing and future analytical needs. The primary objective being to bring relevant and salient aspects of the human element to the

awareness of a commander and their staff that will provide insight into non-kinetic courses of action development.

TPOC: John M. Melkon, 845-938-5126, John.Melkon@westpoint.edu

c. Law and Policy of Cyber Operations Campaign

We seek novel research to increase knowledge of critical law and policy aspects of U.S. cyber operations, to include information operations and countering foreign malign influence operations. We seek research proposals that seeks to identify legal and policy frameworks that improve the effectiveness of U.S. cyber activities.

Of note, we are interested in the following topics:

- Methods to address current legal and practical challenges to public/private cybersecurity partnerships and facilitate increased cooperation between the government and private sector in cybersecurity. This research could include, but is not limited to: (1) identification of legal and policy structures that hamper effective partnerships; (2) proposals for legal or policy frameworks that would allow for increased partnerships; (3) examination of ways to mitigate private entities' objections/concerns with partnership activities with government organizations.
-Methods to address the so-called "gray zones" in current legal frameworks as they relate to cyber and to mitigate adversary attempts to exploit legal "gray zones" against the United States.
-Other legal and policy research, not otherwise defined above, that has the potential to address challenges which have the potential to hinder effective U.S. cyber operations.

TPOC: Lieutenant Colonel Mark Visger, (845) 938-4164, mark.visger@westpoint.edu

d. Cultural Causes and Consequences of the Surveillance Economy

The Army is looking to better understand the role of culture in information warfare through the intersection of data science and digital humanities. Successful proposals will seek to integrate deep qualitative methodologies with quantitative methodologies, applying new methods to deep sociological and cultural questions. These questions should be focused on the social processes that bring society together or break it apart and should look to integrate micro, meso and macro social processes. Further, proposals should look at what can be gleaned at the universal level i.e. what are the processes that happen within all cultures as well as the particular, focusing on the unique expressions of processes within individuals and culture. Last, proposals should consider the impact of microtargeting and seeking to duplicate digital inferences gleaned from the surveillance economy – what data are necessary to turn individuals into malleable and moveable pieces of a larger culture? The list of topics includes, but is not limited to:

1) New concepts, models, and technical approaches enabling analysis, visualization and understanding of the information domain, particularly focused on helping non-technical decision makers understand the historical consequences of a mis- or disinformation campaign. For example, what are the consequences of long-term erosion of social trust in the United States and how has the online environment impacted this. Can causal links be inferred from online information campaigns to the erosion of social trust? What data would be needed to be able to develop a causal inference related to these social processes?

2) Develop quantitative measures and models for qualitative work. The best data science combines deep cultural understanding with digital techniques. For example, how do you develop a model that can understand the different cultural contexts in the way a single word such as freedom is used?

3) Research that helps the Army understand the impact of influence operations on individuals and communities (virtual and real world) as well as proposes solutions for inoculation of populations against hostile influence operations meant to degrade cohesion and readiness

4) Tools and methodologies that help the Army understand when an influence operation event is occurring and how to detect ongoing campaigns in order to counter them, as well as how to help commanders/decision makers understand the impact and what resources they need to formulate response.

5) Research that helps the Army understand and assess the impact of digital privacy or its lack as it relates to influence operations, particularly associated with socio/cultural vulnerabilities in the military/DoD workforce and/or the ability of foreign adversaries to exploit known data sources

6) Open-source analysis tools that can help identify critical nodes in influence operations, whether foreign or domestic, particularly focused on narratives and individuals central to spreading/propagating those narratives

7) Using interdisciplinary approaches to understanding the aims/goals of influence operations particularly targeted at populations vulnerable to mass radicalization/extremism and/or quantify the impact of influence operations, particularly focused on recognizing them before they reach critical mass

8) New approaches that combine the social processes of understanding of events in order to better understand and combat existing social divisions and to enable detection of possible future threats enabled by shifting/changing technology and social conditions.

9) Novel approaches to enable improved training/education to defend all aspects of the information warfare space that include (but aren't limited to) the social, cognitive, legal, and technological aspects of information warfare.

TPOC: MAJ Jessica Dawson, jessica.dawson@westpoint.edu

10. Combating Terrorism Campaign

The Combating Terrorism research program supports objective, rigorous, and policy-relevant research that applies theory to practice, informs strategic counterterrorism thinking, and moves the boundaries of academic knowledge on terrorism and combating terrorism topics. The goal of the program is to enhance global understanding of complex terrorism-related challenges and provide useful information regarding these threats and how to combat them to policymakers and practitioners.

This program is currently focused on the following research areas:

a. Jihadist Terrorism

This research focuses on analyzing jihadi terror groups to better understand goals, ideologies, threats, and how to combat them. It will involve studies assessing all aspects of key jihadi terrorist groups, to include organizational structure, leadership, use of media/propaganda, operational trends, strategic objectives, and other key aspects of each group. It will also include regional studies, examining jihadist activity in locations to include the Middle East, Africa, South Asia, and Southeast Asia. This research will involve analysis of primary source materials, as well as the creation of unique datasets.

TPOC: Brian Dodwell, 845-938-0372, brian.dodwell@westpoint.edu

b. Domestic Violent Extremism

The landscape of U.S. domestic violent extremism has evolved significantly in recent years. This research program will focus on assessing various aspects of the domestic threat environment and potential responses. Topics will likely include:

- Extremism in the military
- Comparative examination of key characteristics of jihadi terrorists and domestic violent extremists
- Assessment of efforts to combat domestic threats, in particular examining the role of state and local law enforcement

TPOC: Brian Dodwell, 845-938-0372, brian.dodwell@westpoint.edu

c. Technology and Terrorism

Violent extremist organizations (VEOs) and illicit networks regularly use information and communications technologies to facilitate activities such as engaging with like-minded individuals, producing and disseminating information, gathering intelligence, moving money, and planning operations. As technologies become a more integral part of daily life in communities around the world, publicly available information (PAI) is an increasingly important puzzle piece counter-terrorism practitioners can use to develop a clearer picture of the problem. Although propaganda receives the lion's share of attention from researchers, policymakers, and the media, likely because it is relatively easy to access online, a variety of publicly available sources can help enhance understanding of how VEOs use information and communications technologies. In addition to social media, tools warranting further analysis include secure messengers, financial technologies (including crowdfunding), and security applications. This research area will produce original research that uses PAI to survey past, present, and prospective trends concerning the platforms VEOs exploit, and their standard operating procedures for using these tools.

TPOC: Brian Dodwell, 845-938-0372, brian.dodwell@westpoint.edu

d. Counterterrorism Assessment

This research area focuses on evaluating the evolution, challenges, and effectiveness of U.S. efforts to combat terrorism. This is a huge need in the field, as the vast majority of terrorism research is and has been focused on studying the actions and make-up of our enemies. While that remains important work, there is a critical gap in academic research that provides actionable assessments of counterterrorism initiatives and programs. While it is tempting to turn the counterterrorism page, there is still a need for research to identify what has worked when it comes to counterterrorism over the past twenty years, and where there is room for improvement. Now, during this period of transition, is the time to identify those key lessons so we can maintain focus and investments where things are working and recalibrate or offset where they are not.

TPOC: Brian Dodwell, 845-938-0372, brian.dodwell@westpoint.edu

11. Simulations Modernization Campaign

a. Market Research about Simulations for training and education

The West Point Simulation center seeks to understand the current state of the art and emerging capabilities related to application of simulations to cadet training and education. Examples of cadet education and training, include (but not limited to): individual soldier tasks; officer tasks; leader skills; military planning; combat simulations at the tactical, operational, or strategic level; terrain visualization; classroom education; learner feedback; and adaptive teaching technology. We seek information from industry and academia about products or capabilities related to virtual reality, augmented reality, serious gaming, military simulations, artificial intelligence for simulated soldier behavior, computer generated forces and semi-automated forces, immersive visualization, marksmanship training, improved user interfaces with simulations such as speech recognition and gaze tracking. Vendors are invited to submit proposals to present demonstrations to the West Point Simulation Center and faculty in the Department of Military Instruction at their own cost, on the understanding that there is no commitment on behalf of the government to make a purchase. Also seeking proposals from partners that can conduct market research.

TPOC: Dr. Gordon Cooke, West Point Simulation Center, +1 (845) 938-7960, gordon.cooke@westpoint.edu

b. Applied research about modeling and simulation for training and education

The research area seeks to understand the efficacy of modeling and simulation tools for meeting training and education goals. Seeking proposals and partners to study the relationship between use of modeling or simulations and achievement of learner outcomes. Also seeking research proposals to better understand when different types of simulations will be most beneficial and what characteristics of a simulation lead to better task performance or retention of knowledge. Such work may include human research and access to the cadet population may be available for research projects that align with academy needs.

TPOC: Dr. Gordon Cooke, West Point Simulation Center, +1 (845) 938-7960, gordon.cooke@westpoint.edu

c. Simulated Small Unit Combat Research and Development
This research area seeks to develop a new capability for trainees to conduct virtual training at the small unit level in an immersive, simulated, environment where trainees can move through the space and interact with simulated enemies augmented into their current space, or while visualizing an environment different from the space they are in. Seeking cooperative partners and proposals to assist with developing new Virtual Reality and Augmented Reality capabilities that can integrate with weapons simulators for training. This includes hardware, software, and systems. Areas of interest include virtual and augmented reality headsets, location and weapon aiming tracking, rapid mapping of the real world space and rapid overlay of a virtual environment, intuitive user interfaces for operation of the system and scenario creation, and automated assessment or coaching capabilities. Proposals for development efforts as well as research efforts to enable development are invited.

TPOC: Dr. Gordon Cooke, West Point Simulation Center, +1 (845) 938-7960, gordon.cooke@westpoint.edu

d. Automated Tactical Exercise Simulation for Military Science

The US Military Academy trains all cadets to become officers and typical tactical scenarios are at the platoon level. Cadets require a simulated, computer generated, platoon of soldiers that can execute the cadet's plan so cadets can observe how well their plan may have worked and learn from the experience. This effort seeks to develop artificial soldiers that have realistic behaviors that match a well trained platoon. This means going beyond attack, defend, support by fire and instead understanding the differences between doctrinal tactical tasks and behave accordingly (for example, the difference between fix and destroy while attacking). We also require user interfaces that mimic how officers communicate plans and orders to subordinates; i.e. through standard military graphics and verbal orders. We seek partnerships and proposals for research and development to meet these needs, particularly in the following areas. Artificial platoon members that have realistic individual behaviors, that can follow doctrine without specific orders, and can operate as a unit at squad and team levels. Voice control for providing orders to subordinate simulated units/soldiers while simulations are running in real time. Capability to interpret hand drawn military graphics and accurately ingest into machine formats. Use of standard military graphics as the input to set up a scenario that automated forces then execute. User interfaces that easy to use without specialist training. Intuitive built in mechanisms for sharing training scenarios.

TPOC: Dr. Gordon Cooke, West Point Simulation Center, +1 (845) 938-7960, gordon.cooke@westpoint.edu

e. Content Creation

Simulations require engaging content and a variety of scenarios. We seek proposals from partners that can assist with content creation. This includes: creation of simulation assets such as 3d models; creation of terrain and virtual environments; integration of scenarios into game levels; creation of menus and displays for ease of use; optimization and export of games/simulations for various platforms (PC, mobile, VR headsets, etc). Example platforms include Unity, Unreal Engine, WebXR, and Virtual Battle Space, but any platform/framework is invited.

TPOC: Dr. Gordon Cooke, West Point Simulation Center, +1 (845) 938-7960, gordon.cooke@westpoint.edu

f. Simulation for Training Cooperation

We seek to create a network of academia, industry, and government partners that have shared interest in the advancement of simulations for military education and training. Partners interested in participating are invited to reply with information about their area of interest and proposed cooperation. This may lead to the creation of a consortium, a multilateral CRADA, or multiple CRADAs, based on responses and the interests of the partners.

The USMA Sim Center seeks to build an academic consortium to expand the use of Virtual and Augmented Reality technology for enhancing education and training for US, NATO, and other international military personnel. As part of the consortium, we will selectively pursue Cooperative Research and Development Agreements (CRADAs) with civilian academic institutions in order to boost technological development in key areas. As the academic consortium expands, we also expect to pursue Other Transaction Authorities (OTA) with private industry leaders in the field. Military educational institutions will be at the core of this initiative, building strong ties with civilian academic institutions, and eventually expand to the inclusion of private industry during the envisioned 8-10 year time horizon for the initiative. The goal is not to acquire the technology of today, but to foster development of the technology of tomorrow in the critical field of VR/AR enhancement of military education.

TPOC: Dr. Gordon Cooke, West Point Simulation Center, +1 (845) 938-7960, gordon.cooke@westpoint.edu

12. Curriculum and Outreach Campaign

a. Education and Outreach

USMA has a long history of successful outreach, engagement and education programs with K-12, post-secondary, and graduate-level programs to include mobile workshops, camps, internships, student exchanges, faculty /professional mentorship programs, and supporting design or technical competitions (including science fairs, shark-tank pitch sessions, etc.). The purposes of USMA's outreach mission include the following:

1. Inspire students to pursue a course of study and/or career relevant to the defense of the nation including
    i. Science, technology, engineering and math (STEM)
    ii. international relations, diplomacy, and policy,
    iii. defense and strategic studies,
    iv. leadership and psychology
    v. history, geography and foreign languages
    vi. new fields such as cyber security, data science, autonomy, space science, and artificial intelligence / machine learning, synthetic biology, quantum sciences, and hypersonics
2. Inspire students to consider a career in the Army, the federal government or other branch of military service
3. Inform and educate students about the possible pathways to career success in one of the previously mentioned fields
4. Help to equip students with life skills that will lead them to success in their academic or professional careers.

USMA seeks proposals from potential collaborators to maximize the effectiveness of our outreach programs. Proposals can include planning, facilitating and executing mobile workshops, camps, internships, student exchanges, faculty /professional mentorship programs, and supporting design or technical competitions. Proposals can include a concept of how each task will be done either independently by the collaborator or in conjunction with cadets and faculty from West Point. Proposals can include per-event plans (e.g. for a conference) or a holistic approach given an academic year's worth of effort. For planning purposes, in a typical academic year, West Point may execute 20-25 1-day or 2-day mobile workshops, two multi-day (4-6 day) summer camps at West Point, and seek to employ 2-6 summer interns with duty at West Point. Proposals that include existing or new innovative modules for use at a mobile workshop or conference are encouraged.

TPOC: Ms. Lori Sheetz, lori.sheetz@westpoint.edu

b. Character of Future Warfare

The character of future warfare is likely to involve advanced technologies such as robotics, artificial intelligence and machine learning, and autonomous systems. USMA seeks proposals from potential collaborators to research the implications of such technology and its implementation into armed conflict military operations for international law generally and the law of armed conflict in particular. Proposals will produce original research in the technological and legal aspects of these developments. Proposals that include new innovative curriculum modules are encouraged.

TPOC: Robert.Lawless@westpoint.edu, 845-938-3510

c. Honor, Ethics, and Character Development

USMA educates, trains, and inspires leaders of character. The Army and the Nation deserve and demand West Point graduates committed to the ideals of Duty, Honor, Country and the Army Ethic. The desired end state is for

graduating cadets and rotating faculty members to depart West Point with the character, competence, and commitment to build and lead resilient teams that thrive in complex security environments. USMA seeks proposals from potential collaborators to research frameworks for honor and character development that inform, empower, and inspire people to live honorably and lead honorably. Proposals that include new innovative curriculum modules are encouraged.

TPOC: Peter.Kilner@westpoint.edu, 845-938-0877

d. Performance Workshops Supporting Education Initiatives

USMA seeks proposals from potential collaborators to enhance classical literature education for military professionals. Proposals should include a plan to include cadets and faculty as participants in a performance workshop and host visits by professional actors and literature experts as required to support education initiatives. Proposals should also include a plan to assist USMA in assessing the effectiveness of these materials.

TPOC: LTC Brad McCoy, assoc.dean.research@westpoint.edu

e. Creating Sports Analytics Content to Promote the Growth of Data Science

In a world increasingly reliant on STEM innovation, the United States faces a critical challenge: While the demand for data professionals skyrockets, the supply struggles to keep pace, compounded by demographic disparities. We hope to address this gap by leveraging the growing interest in sports analytics to inspire a diverse pool of students towards data science and STEM fields.

Project Goals:
1. Establish a Sustainable National Network: Forge partnerships among academia, industry, and government to build a platform ensuring the sustainability of efforts to enhance data science education, particularly among underrepresented populations and minorities.
2. Develop and Implement Educational Framework: Design, implement, evaluate, and disseminate an educational framework based on Case-based Learning, focusing on real-world sports-related problems and applications.
3. Support Educational Research: Support and conduct research on various data science education delivery modalities (in-person, virtual, hybrid) across different student and instructor demographics nationwide.

Proposals should include plans to develop and disseminate educational modules through workshops, expanding delivery modes to include hybrid (in-person and virtual) formats, plans to conduct training workshops for educators to replicate and extend these efforts locally, and plans to publish a repository of topic-based modules with data, catering to different educational levels and interests.

TPOC: COL Andrew Lee, andrew.lee@westpoint.edu, 845-938-5988

13. Resilient Supply Chains

The Department of Defense (DoD) has a critical need to secure its sources of materiel against both intentional (including adversarial) & unintentional disruptions, including the creation of alternative skeleton networks representative of global materiel flows. Extensive global networks of private-sector vendors, commonly called supply chains, collaborate to provide these key resources, including precursor components and materials. There is a need to model such supply chains & improve the resiliency of these Supply and Demand Networks (SDNs). This research will explore the creation of skeleton networks for several application areas like food, pharmaceuticals, and metals. The use of roundtables and other methods will be used to gather information from experts in many fields. This research will analyze and visualize industry and government sector datasets to represent optimal supply chain capabilities in contested & non-contested environments.

Topic Areas:
-Systems Design
-Supply Chain Management
-Data visualization

-Contested logistics

TPOC: Dr. Isabella Sanders, isabella.sanders@westpoint.edu

14. Advancing Military Music Research and Innovation
1. Purpose

The West Point Music Research Center (WPMRC) seeks proposals for collaborative research that advance scientific understanding and operational applications in three priority thrusts, each of which are described in further detail below:

- Institutional History & Organizational Analysis — data driven studies of the evolution, leadership, innovation, and organizational practices within military music organizations, leveraging primary source collections to inform comparative institutional analysis and doctrine relevant insights.
- Directional Acoustic Technologies — basic and applied research in beamforming, parametric/ultrasonic arrays, and controlled acoustic field generation to enable precision communication and information delivery in training and operational contexts.
- Human Factors in Auditory Engagement — development of sensing, modeling, and evaluation methods to quantify individual and collective human responses to structured auditory stimuli, with implications for cohesion, morale, and readiness.

2. Campaigns of Interest

A. Campaign 1: Institutional History & Analysis
a. Areas of Interest:
i. Archival science and digital preservation: discovery, recovery, preservation, and digitization of primary source materials (e.g., recordings, manuscripts, correspondence, operational documents) using standards based metadata, ontologies, and persistent identifiers.
ii. Oral history at scale: structured collection, transcription, and analysis of oral histories from stakeholders (e.g., cadets, faculty, leaders, practitioners), employing reproducible protocols and secure data stewardship.
iii. Organizational research: empirical analyses of culture, leadership, innovation diffusion, training practices, and performance management within military organizations; identification of factors influencing effectiveness and change.
iv. Comparative institutional analysis: cross service, national, and international comparisons of military organizations that employ auditory signaling or cultural capabilities, focusing on governance, mission alignment, and outcomes.
v. Computational humanities methods: text and audio mining, knowledge graphs, and network analysis applied to institutional corpora to derive measurable insights relevant to strategy, education, and policy.

b. Deliverables and Outcomes
i. Deliverables: peer reviewed publications; digitized and cataloged collections with metadata/ontologies; reproducible curation and analysis workflows; data dictionaries and documentation; comparative case studies; policy relevant briefs.
ii. Outcomes: improved access to and analysis of institutional primary sources; validated methods for organizational assessment; evidence based insights for leadership, training, and policy.

B. Campaign 2: Directional Acoustic Technologies
a. Areas of Interest:
i. Beamforming and parametric arrays: design, modeling, and experimental validation of highly directional acoustic sources (including ultrasonic carrier and demodulation methods), with attention to safety and exposure guidelines.
ii. Perception and cognition: psychoacoustic and human systems studies of detectability, intelligibility, localization, and cognitive load in directional fields under varied environmental conditions.
iii. Systems integration: interoperability with digital simulation, C2/training systems, and autonomous platforms; latency, synchronization, and control interfaces for deployable use.
iv. Complex environment performance: computational acoustics (e.g., FEM/BEM), laboratory and field trials in indoor/outdoor, reverberant, and cluttered spaces; robustness to weather, terrain, and urban canyons.
v. Metrics and test methods: standardized measurement protocols, calibration procedures, and acceptance criteria for precision communication and controlled auditory effects.

b. Deliverables and Outcomes
i. Deliverables: prototype transducers/arrays and control software; modeling/simulation toolchains; calibration standards and test reports; performance datasets and benchmarks; scholarly publications.
ii. Outcomes: demonstrated gains in precision communication and controlled auditory effects; validated metrics and

protocols for evaluation in complex environments; paths to transition and scale.

C. Campaign 3: Human Factors in Auditory Engagement
a. Areas of Interest
i. Real time multimodal sensing: development and validation of physiological, behavioral, and environmental sensing pipelines (e.g., HRV, EDA, motion, gaze, audio context) to estimate affect and attention in real time.
ii. Computational modeling of affect dynamics: algorithms and tools (e.g., Bayesian/ML, state space models) for time aligned modeling of valence/arousal trajectories and cognitive state transitions during exposure to structured auditory stimuli.
iii. Collective outcomes and team level measures: rigorous methods to assess unit relevant constructs (e.g., cohesion, trust, morale, shared understanding) and their relationship to auditory interventions.
iv. Narrative capture and analysis: secure, privacy preserving platforms for post exposure narrative capture (audio/text/video) and NLP based analysis to complement quantitative measures.
v. Human centered and experimental design: iterative design, preregistered studies, and usability/validation frameworks to determine when, how, and for whom auditory interventions support readiness and resilience.

b. Deliverables and Outcomes
i. Deliverables: sensor suites and data processing pipelines; validated metrics and survey instruments; preregistered study protocols; de identified datasets and analysis code (as permitted); visualization dashboards; scholarly publications.
ii. Outcomes: reliable, generalizable measures of individual and team responses to auditory stimuli; decision quality evidence connecting auditory interventions to cohesion, morale, and readiness; guidance for deployment and training.

TPOC: Jeremy Schlegel, jeremy.schlegel@westpoint.edu

B. Federal Award Information

The ACC-APG-RTP Division has the authority to award a variety of instruments on behalf of USMA. Anticipated awards will be made in the form of contracts, grants, cooperative agreements, technology investment agreements (TIAs), or other transactions for prototypes (OTAs). The ACC-APG-RTP Division reserves the right to select the type of instrument most appropriate for the effort proposed. Applicants should familiarize themselves with these instrument types and the applicable regulations before submitting a proposal. Following are brief descriptions of the possible award instruments:

1. Procurement Contract. A legal instrument, consistent with 31 U.S.C. 6303, which reflects a relationship between the Federal Government and a state government, a local government, or other entity/contractor when the principal purpose of the instrument is to acquire property or services for the direct benefit or use of the Federal Government.

Contracts are primarily governed by the following regulations:

a. Federal Acquisition Regulation (FAR)
b. Defense Federal Acquisition Regulation Supplement (DFARS)
c. Army Federal Acquisition Regulation Supplement (AFARS)

2. Grant. A legal instrument that, consistent with 31 U.S.C. 6304, is used to enter into a relationship:

a. The principal purpose of which is to transfer a thing of value to the recipient to carry out a public purpose of support or stimulation authorized by a law or the United States, rather than to acquire property or services for the Federal Government's direct benefit or use.

b. In which substantial involvement is not expected between the Federal Government and the recipient when carrying out the activity contemplated by the grant.

c. No fee or profit is allowed.

3. Cooperative Agreement. A legal instrument which, consistent with 31 U.S.C. 6305, is used to enter into the same kind of relationship as a grant (see definition "grant"), except that substantial involvement is expected between the Federal Government and the recipient when carrying out the activity contemplated by the cooperative agreement. The term does not include "cooperative R&D agreements" as defined in 15 U.S.C. 3710a. No fee or profit is allowed.

4. Technology Investment Agreement (TIA). Assistance transaction other than a Grant or Cooperative Agreement (see 32 CFR Part 37). A legal instrument, consistent with 10 U.S.C. 2371, which may be used when the use of a contract, grant, or cooperative agreement is not feasible or appropriate for basic, applied, and advanced research projects. The research covered under a TIA shall not be duplicative of research being conducted under an existing DoD program. To the maximum extent practicable, TIA's shall provide for a 50/50 cost share between the government and the applicant. An

applicant's cost share may take the form of cash, independent research and development (IR&D), foregone intellectual property rights, equipment, access to unique facilities, and/or other means. Due to the extent of cost share, and the fact that a TIA does not qualify as a "funding agreement" as defined at 37 CFR 401.2(a), the intellectual property provisions of a TIA can be negotiated to provide expanded protection to an applicant's intellectual property. No fee or profit is allowed on TIAs.

5. Other Transaction for Prototype (OTA). A legal instrument, consistent with 10 U.S.C. 2371b., which may be used when the use of a contract, grant, or cooperative agreement is not feasible or appropriate for prototype projects directly relevant to enhancing the mission effectiveness of military personnel and the supporting platforms, systems, components, or materials proposed to be acquired or developed by the DoD, or to improvement of platforms, systems, components, or materials in use by the armed forces. The effort covered under an OTA shall not be duplicative of effort being conducted under an existing DoD program (please refer to the “Other Transactions” OT Guide for Prototype Projects dated January 2017 (Version 1.2.0)). This document, along with other OTA resources, may be accessed at the following link: http://www.acq.osd.mil/dpap/cpic/cp/10USC2371bOTs.html.

6. Grants and cooperative agreements for institutions of higher education, nonprofit organizations, foreign organizations, and foreign public entities are primarily governed by the following:
   a. Federal statutes
   b. Federal regulations
   c. 2 CFR Part 200, as modified and supplemented by DoD's interim implementation found at 2 CFR Part 1103
   d. 32 CFR Parts 21, 22, 26, and 28
   e. DoD Research and Development General Terms and Conditions
   f. Agency-specific Research Terms and Conditions

7. Grants and cooperative agreements for for-profit and nonprofit organizations exempted from Subpart E—Cost Principles of 2 CFR Part 200, are primarily governed by the following:
   a. Federal statutes
   b. Federal regulations
   c. 32 CFR Part 34 - Administrative Requirements for Grants and Agreementswith For-Profit Organizations
   d. 32 CFR Parts 21, 22, 26, and 28
   e. DoD Research and Development General Terms and Conditions
   f. Agency-specific Research Terms and Conditions

8. TIAs are primarily governed by the following:
   a. Federal statutes
   b. Federal regulations
   c. 32 CFR Part 37 – Technology Investment Agreements
   d. DoD Research and Development General Terms and Conditions
   e. Agency-specific Research Terms and Conditions

9. OTAs are primarily governed by the following:

a. Federal statutes
b. Federal regulations
c. Office of Secretary of Defense implementation guidance titled Other Transactions (OT) Guide for Prototype Projects

10. The following websites may be accessed to obtain an electronic copy of the governing regulations and terms and conditions:

a. FAR, DFARS, and AFARS: https://www.acquisition.gov/content/regulations
b. Code of Federal Regulations: http://www.ecfr.gov
c. DoD Research and Development General Terms and Conditions: https://www.onr.navy.mil/work-with-us/manage-your-award/manage-grant- award/grants-terms-conditions
d. Agency-specific Research Terms and Conditions: https://westpoint.edu/centers-and- research

C. Eligibility Information

1. Eligible Applicants

Eligible applicants under this BAA include institutions of higher education, nonprofit organizations, state and local governments, foreign organizations, foreign public entities, and for-profit organizations (i.e. large and small businesses) for scientific, technology, engineering, mathematics, education, policy development, ethics, culture, history, and economic analyses projects and proposals. Whitepapers and proposals will be evaluated only if they are for novel study and experimentation directed toward advancing the state of the art or increasing basic knowledge and understanding. Whitepapers and proposals focused on specific devices or components are beyond the scope of this BAA.

For foreign public entities or foreign organizations, see Section II.C.3.a below for further information. There is no restriction on the place of performance for awards issued under this BAA.

2. Cost Sharing or Matching

Generally, there is no requirement for cost sharing, matching, or cost participation to be eligible for award under this BAA. Cost sharing and matching is not an evaluation factor used under this BAA. Exceptions may exist if the applicant is proposing the use of a TIA or an OTA as an award instrument. Cost-sharing requirements may be found at 32 CFR 37 for TIAs. Cost-sharing requirements for OTAs may be found at Section C2.16 COST SHARING in the January 2017 document titled “Other Transactions” OT Guide for Prototype Projects.

In addition, if cost sharing is proposed on a grant or cooperative agreement proposal submitted by a nonprofit or institution of higher education, the award will be subject to the restrictions at 2 CFR 200.306. If cost sharing is proposed on a contract proposal, the award will be subject to the restrictions at FAR 35.003.

3. Other

a. Foreign public entities or foreign organizations are advised that security restrictions may apply that could preclude their participation under this BAA.

b. Pursuant to the policy of FAR 35.017 and supplements, selected Federally Funded Research and Development Centers (FFRDC) may propose under this BAA as allowed by their sponsoring agency and in accordance with their sponsoring agency policy.

D. Application and Submission Information

1. Address to View Broad Agency Announcement This BAA

may be accessed via the followingwebsites:

a. Grants.gov (www.grants.gov)
b. Federal Business Opportunities (https://beta.sam.gov)
c. USMA website https://www.westpoint.edu/centers-and-research/academic-research- division/research-overview

Amendments to this BAA, if any, will be posted to these websites when they occur. Interested parties are encouraged to periodically check these websites for updates and amendments.

The following information is for those wishing to respond to the BAA:

2. Content and Form of Application Submission

a. General Information

i. Preliminary Inquiries: The USMA receives numerous proposals annually. Because of financial constraints, we are able to provide support for only a limited number of the proposals received. We realize the preparation of a research proposal often represents a substantial investment of time and effort by the applicant. Therefore, in an attempt to minimize this burden, we strongly encourage applicants interested in submitting proposals to make preliminary inquiries as to the general need for the type of research effort contemplated, before expending extensive effort in preparing a whitepaper and/or detailed proposal or submitting proprietary information. The TPOC names, telephone numbers, and email addresses are listed immediately after each research area of interest and they should be contacted, as appropriate, prior to the submission of whitepapers or proposals.

*NOTE: The Government will not be obligated by any discussion that arises out of preliminary inquiries.

ii. Classified Submissions: Classified proposals are not expected. However, in an unusual circumstance the applicant may be notified that access to classified information and/or controlled unclassified information will occur under the work proposed. In those instances where a contract is awarded requiring access to classified information and/or controlled unclassified information, clause FAR 52.204-2 shall be in effect, as well as a DD254, if issued. For questions regarding the potential for access to classified information and/or controlled unclassified information, please coordinate with the TPOC for that topic area prior to proposal submission.

iii. Use of Color in Proposals: All proposals received will be stored as electronic images. Electronic color images require a significantly larger amount of storage space than black-and white images. As a result, applicants' use of color in proposals should be minimal and used only when necessary for details. Do notuse

color if it is not necessary.

iv. Post-Employment Conflict of Interest: There are certain post-employment restrictions on former federal employees, including special government employees (18 U.S.C. 207). If a prospective applicant believes a conflict of interest may exist, the situation should be discussed with the TPOC listed in the BAA for their area of scientific research who will then coordinate with appropriate USMA legal counsel prior to the applicant expending time and effort in preparing a proposal.

v. Statement of Disclosure Preference: In accordance with Section II.D.2.e.iii of this BAA, Form 52 or 52A shall be completed stating your preference for release of information contained in your proposal. Copies of these forms may be downloaded from the USMA web site at: https://www.westpoint.edu/centers-and- research/academic-research-division/research-overview under "For the Researcher" (Forms, USMA BAA Forms).

NOTE: Proposals may be handled for administrative purposes by support contractors. These support contractors are prohibited from submitting proposals under this BAA and are bound by non-disclosure and/or conflict of interest requirements as deemed appropriate.

vi. Equipment (see instrument-specific regulations provided in Section II.B of this BAA): Normally, title to equipment or other tangible property purchased with Government funds vests with nonprofit institutions of higher education or with nonprofit organizations whose primary purpose is conducting scientific research if vesting will facilitate scientific research performed for the Government. For-profit organizations are expected to possess the necessary plant and equipment to conduct the proposed research. Deviations may be made on a case-by-case basis to allow for-profit organizations to purchase equipment but regulatory disposition instructions must be followed.

b. The Application Process

The application process is in three stages as follows:

i. Stage 1- Verify the accuracy of your Unique Entity Identifier (formerly DUNS) at the Dun and Bradstreet (D&B) website http://fedgov.dnb.com/webform before registering with the System for Award Management System (SAM) at https://www.sam.gov. Prospective applicants must be registered in SAM prior to submitting an application or plan. The SAM obtains Legal Business Name, Doing Business Name (DBA), Physical Address, and Postal Code/ Zip+4 data fields from D&B. If corrections are required, registrants will not be able to enter/modify these fields in SAM; they will be pre-populated using D&B Unique Entity Identifier record data. When D&B confirms the correction has been made, the registrant must then re- visit sam.gov and click a “yes”' to D&B's changes. Only at this point will the D&B data be accepted into the SAM record. Allow a minimum of two (2) business days for D&B to send the modified data to SAM.

ii. Stage 2 - Prospective proposers are requested to submit whitepapers prior to the submission of a complete, more detailed proposal. The purpose of whitepapers is to minimize the labor and cost associated with the production of detailed proposals that have very little chance of being selected for funding. Based on assessment of the whitepapers, feedback will be provided to the proposers to encourage or discourage them from submitting proposals. Whitepapers should present the effort in sufficient detail to allow evaluation of the concept's scientific merit and its potential contributions of the effort to the Army mission.

iii. Stage 3 - Interested applicants are required to submit proposals. All proposals submitted under the terms and conditions cited in this BAA will be reviewed regardless of the feedback on, or lack of submission of, a whitepaper. If applicants have not submitted whitepapers, proposals may still be submitted for funding consideration. Proposals must be submitted for the applicant to be considered for funding.

All proposals for Assistance Instruments and Contracts must be submitted electronically through Grants.gov using Workspace. See Section II.D.f of this BAA for information on the proposal submission process.

All required forms for proposals may be downloaded from the USMA web site at: https://www.westpoint.edu/centers-and-research/academic-research-division/research- overview, under "For the Researcher" (Forms, USMA BAA Forms).

c. Whitepaper Preparation

i. Whitepapers should focus on describing details of the proposed research, including how it is innovative, how it could substantially increase the scientific state of the art, Army relevance, and potential impact.

ii. Whitepapers are limited to seven (7) total pages; five (5) pages for whitepaper technical content, one (1) cover page and a one (1) page addendum as discussed below. Evaluators will only review the whitepaper cover page, up to five whitepaper technical content pages, and the one-page addendum.

Whitepapers must be in the following format but do not require any special forms:

- Page Size: 8 ½ x 11 inches
- Margins – 1 inch
- Spacing – single
- Font – Times New Roman, 12 point

iii. Combine all files and forms into a single PDF before submitting.

iv. Format and content of whitepapers:

(1) COVER PAGE (not to exceed one page):

The whitepaper cover page shall include at a minimum: Title of the whitepaper, name of the individual and organization submitting the whitepaper, the research area and number against which the whitepaper is submitted, and the TPOC name.

(2) TECHNICAL CONTENT (not to exceed five pages):

(a) A detailed discussion of the effort's scientific research objective, approach, relationship to similar research, and level of effort shall be submitted. Also include the nature and extent of the anticipated results and, if known, the manner in which the work will contribute to the accomplishment of the Army's mission and how this contribution would be demonstrated.

(b) The type of support, if any, the applicant requests of the Government, such as facilities, equipment, demonstration sites, test ranges, software, personnel or materials, shall be identified as government furnished equipment (GFE), government furnished information (GFI), government furnished property (GFP), or government furnished data (GFD). Applicants shall indicate any Government coordination that may be required for obtaining equipment or facilities necessary to perform any simulations or exercises that would demonstrate the proposed capability.

(c) The cost portion of the whitepaper shall contain a brief cost estimate revealing all the component parts of the proposal, including research hours, burden, material costs, travel, etc.

(3) ADDENDUM (not to exceed one page):

Include biographical sketches of the key personnel who will perform the research, highlighting their qualifications and experience.

v. RESTRICTIVE MARKINGS ON WHITEPAPERS:

(1) Any proprietary data that the applicant intends to be used only by the Government for evaluation purposes must be clearly marked. The applicant must also identify any technical data or computer software contained in the whitepaper that is to be treated by the Government as limited rights in technical data and restricted rights in computer software. In the absence of such identification, the Government will conclude there are no limitations or restrictions on technical data or computer software included in the whitepaper. Records or data bearing a restrictive legend may be included in the whitepaper. It is the intent of the Army to treat all whitepapers as procurement sensitive before award and to disclose their contents only for the purpose of evaluation.

Care must be exercised to ensure that classified, sensitive, and critical technologies

are not included in a whitepaper. If such information is required, appropriate restrictive markings and procedures should be applied prior to submission of the whitepaper.

(2) Applicants are cautioned, however, that portions of the whitepapers may be subject to release under terms of the Freedom of Information Act, 5U.S.C. 552, as amended.

vi. EVALUATION AND DISPOSITION OF WHITEPAPERS:

(1) Evaluation Process: Applicants are advised that invitations for proposals will be made based on the whitepaper submission and the availability of funding. The whitepaper will be evaluated for the concept's scientific merit and potential contributions of the effort to the Army mission. Applicants whose whitepapers are evaluated as having significant scientific merit may be invited to submit a proposal. However, an applicant may submit a proposal despite not submitting a whitepaper or receiving a proposal invite from the Government.

(2) Disposition Process: The applicant will be notified in writingafter completion ofthe evaluation. Whitepapers will not be returned to applicants.

d. **Whitepaper Submission**. All whitepapers must be emailed directly to the TPOC. In the email subject line, include the phrase “Whitepaper Submission,” the BAA number W911NF-20-S-0008, and the research topic number from Section II.A of this BAA. Whitepapers submitted via email must be in a single PDF formatted file as an email attachment.

e. Preparation of Proposals

i. COVER PAGE:

(1) A Cover Page is required. For contract proposals submitted by email, use USMA Form 51. For all Assistance instruments and contract proposalssubmitted via Grants.gov, use the Standard Form (SF) 424 (Research and Related (R&R)) Form. Proposals will not be processed without either: (1) a signed Cover Page, and
(2) a SF 424 (R&R) Form.

(2) Should the project be carried out at a branch campus or other component of the applicant, that branch campus or component should be identified in the space provided (Block 12 on the SF 424 (R&R) Form).

(3) The title of the proposed project should be brief, scientifically representative, intelligible to a discipline-literate reader, and suitable for use in the public domain.

(4) The proposed duration for which support is requested should be

consistent with the nature and complexity of the proposed activity. Applicants shall discuss the preferred performance period with the TPOC.

(5) Specification of a desired starting date for the project is important and helpful; however, requested effective dates cannot be guaranteed.

(6) Pursuant to 31 U.S.C. 7701, as amended by the Debt Collection Improvement Act of 1996 [Section 31001(I)(1), Public Law 104-134] and implemented by 32 CFR 22.420(d), federal agencies shall obtain each awardees' Taxpayer Identification Number (TIN). The TIN is being obtained for purposes of collecting and reporting on any delinquent amounts that may arise out of an awardees' relationship with the Government.

(7) Applicants shall provide their organization's Unique Entity Identifier (formerly DUNS). This number is a nine-digit number assigned by D&B Information Services. See Section
II.D.3 of this BAA for requirements pertaining to the Unique Entity Identifier.

(8) Applicants shall provide their assigned Commercial and Government Entity (CAGE) Code. The CAGE Code is a 5-character code assigned and maintained by the Defense Logistics Service Center (DLSC) to identify a commercial plant or establishment.

ii. TABLE OF CONTENTS:

Use the following format for the Table of Contents. Forms are available at https://www.westpoint.edu/centers-and-research/academic-research- division/research-overview under "For the Researcher" (Forms, USMA BAA Forms).

Facilities, Equipment, and Other Resources H-1 - H-

Proposal Budget I-1 - I-

Contract Facilities Capital Cost of Money(FCCM) (DD Form 1861)J-1 Appendices

K-

List Appendix Items: _____

This format applies to all proposals submitted via email and via Grants.gov. Applicants' should show the location of each section of the proposal, as well as major subdivisions of the projectdescription.

iii. STATEMENT OF DISCLOSURE PREFERENCE (FORM 52 OR 52A): Complete and sign USMA Form 52 (Industrial Contractors) or USMA Form 52A (Educational and Nonprofit Organizations).

iv. RESEARCH AND RELATED OTHER PROJECT INFORMATION: Must be completed and signed by all applicants.

v. PROJECT ABSTRACT:

(1) The project abstract shall be completed on a form entitled “Publicly Releasable Project Abstract”.

(2) Unless otherwise instructed in this BAA, the project abstract shall include a concise statement of work and basic approaches to be used in the proposed effort. The abstract should include a statement of scientific objectives, methods to be employed, and the significance of the proposed effort to the advancement of scientific knowledge.

(3) The abstract should be no longer than one (1) page (maximum 4,000 characters).

(4) The project abstract shall be marked by the applicant as publicly releasable. By submission of the project abstract, the applicant confirms that the abstract is releasable to the public. For a proposal that results in a grant award, the project abstract will be posted to a searchable website available to the general public to meet the requirements of Section 8123 of the DoD Appropriations Act, 2015. The website address is: https://dodgrantawards.dtic.mil/grants.

vi. PROJECT DESCRIPTION (TECHNICAL PROPOSAL): The technical portion of the proposal shall contain the following:

(1) A complete discussion stating the background and objectives of the proposed work, the scientific approaches to be considered, the relationship to competing or related research, and the level of effort to be employed. Include also the nature and extent of the anticipated results and how they will significantly advance the scientific state-of-the-

art. Also, if known, include the manner in which the work will contribute to the accomplishment of the Army's mission. Ensure the proposal identifies any scientific uncertainties and describes specific approaches for the resolution or mitigation of the uncertainties.

(2) A brief description of your organization. If the applicant has extensive government contracting experience and has previously provided the information to the USMA, the information need not be provided again. A statement setting forth this condition should be made.

(3) The names of other federal, state, local agencies, or other parties receiving the proposal and/or funding the proposed effort. If none, state so. Concurrent or later submission of the proposal to other organizations will not prejudice its review by the USMA if we are kept informed of the situation.

(4) A statement regarding possible impact, if any, of the proposed effort on the environment, considering as a minimum its effect upon water, atmosphere, natural resources, human resources, and any other values.

(5) A statement regarding the use of Class I and Class II ozone- depleting substances. Ozone depleting substances are any substance designated as Class I by EPA, including but not limited to chlorofluorocarbons, halons, carbon tetrachloride, and methyl chloroform, and any substance designated as Class II by EPA, including but not limited to hydro chlorofluorocarbons. See 40 CFR Part 82 for detailed information. If Class I or II substances are to be utilized, a list shall be provided as part of the applicant's proposal. If none, state so.

(6) The type of support, if any, requested by the applicant (e.g., facilities, equipment, and materials).

vii. BIOGRAPHICAL SKETCH:

(1) This section shall contain the biographical sketches for key personnel only.

(a) Primary Principal Investigator (PI): The Primary PI provides a single or initial point of communication between the USMA and the awardee organization(s) about scientific matters. If not otherwise designated, the first PI listed will serve as the Primary PI. This individual can be changed with notification to USMA. USMA does not infer any additional scientific stature to this role among collaborating investigators.

(b) Co-Principal Investigators: The individual(s) a research organization designates as having an appropriate level of authority and responsibility for the proper conduct of the research and submission of required reports to USMA. When an organization designates more than one PI, it identifies them as individuals who share the authority and responsibility for leading and directing the research, intellectually and logistically. USMA does not infer any distinction among multiple PIs.

(2) The following information is required:

(a) Relevant experience and employment history including a description ofany prior Federal employment within one year preceding the date of proposal submission.

(b) List of up to five publications most closely related to the proposed project and up to five other significant publications, including those being printed. Patents, copyrights, or software systems developed may be substituted forpublications.

(c) List of persons, other than those cited in the publications list, who have collaborated on a project or a book, article, report or paper within the last four years. Include pending publications and submissions. Otherwise, state "None."

(d) Names of each investigator's own graduate or post-graduate advisorsand advisees.

(3) NOTE: The information provided in (c) and (d) is used to help identify potential conflicts or For the personnel categories of postdoctoral associates, other professionals, and students (research assistants), the proposal may include information on exceptional qualifications of these individuals that merit consideration in the evaluation of the proposal.

The biographical bias in the selection of reviewers.

(4) sketches are limited to three (3) pages per investigator and otherindividuals that merit consideration.

viii. BIBLIOGRAPHY: A bibliography of pertinent literature is required. Citations must be complete (including full name of author(s), title, and location in theliterature).

ix. CURRENT AND PENDING SUPPORT:

(1) All project support from whatever source must be listed. The list must include all projects requiring a portion of the PI's and other key personnel's time, even if they receive no salary support from the project(s).

(2) The information should include, as a minimum: (i) theproject/proposal title and brief description, (ii) the name and location of the organization or agency presently funding the work or requested to fund such work, (iii) the award amount or annual dollar volume of the effort, (iv) the period of performance, and (v) a breakdown of the time required of the PI and/or other key personnel.

x. FACILITIES, EQUIPMENT, and OTHER RESOURCES: The applicant should include in the proposal a listing of facilities, equipment, and other resources already available to perform the research proposed.

xi. PROPOSAL BUDGET (including DD Form 1861):

(1) Each proposal must contain a budget for each year of support requested and a cumulative budget for the full term of requested support. Each budget year and the cumulative budget for the full term must be documented on USMA Form 99. USMA Form 99 may be reproduced, but you may not make substitutions in prescribed budget categories nor alter or rearrange the cost categories as they appear on the form. The proposal may request funds under any of the categories listed so long as the item is considered necessary to perform the proposed work and is not precluded by applicable cost principles. In addition to the forms, the budget proposal should include budget justification for each year.

(2) A signed summary budget page must be included. The documentation pages should be titled "Budget Explanation Page" and numbered chronologically starting with the budget form. The need for each item should be explained clearly.

(3) All cost data must be current and complete. Costs proposed must conform to the following principles and procedures:

Institutions of Higher Education: 2 CFR Part 200 Nonprofit Organizations: 2 CFR Part 200
For-Profit/Commercial Organizations: FAR Part 31, DFARS Part 231, FAR Subsection 15.403-5, and DFARS Subsection 215.403-5.

* For those nonprofit organizations specifically exempt from the provisions of Subpart E of 2 CFR Part 200 (see 2 CFR 200.401(c)), FAR Part 31 and DFARS Part 231 shall apply.

(4) Sample itemized budgets and the information they must include for a contract and for grants and cooperative agreements can be found at Section II.H of this BAA (Other Information). Before award of a cost-type contract or assistance instrument it must be established that an approved accounting system and financial management system exist.

xii. APPENDICES: Some situations require that special information and supporting documents be included in the proposal before funding can be approved. Such information and documentation should be included by appendix to the proposal.

(1) To evaluate compliance with Title IX of the Education Amendments of 1972 (20 U.S.C. A Section 1681 Et. Seq.), the Department of Defense is collecting certain demographic and career information to be able to assess the success rates of women who are proposed for key roles in applications in STEM disciplines. To enable this assessment, each application must include the following forms completed as indicated.

(A) Research and Related Senior/Key Person Profile (Expanded) form:

The Degree Type and Degree Year fields on the Research and Related Senior/Key Person Profile (Expanded) form will be used by DoD as the source for career information. In addition to the required fields on the form, applicants must complete these two fields for all individuals that are identified as having the project role of PD/PI or Co-PD/PI on the form. Additional senior/key persons can be added by selecting the "Next Person" button.

(B) Research and Related Personal Data form:

This form will be used by DoD as the source of demographic information, such as gender, race, ethnicity, and disability information for the Project Director/Principal Investigator and all other persons identified as Co-Project Director(s)/Co-Principal Investigator(s). Each application must include this form with the name fields of the Project Director/Principal Investigator or any Co-Project Director(s)/Co-Principal Investigator(s) completed; however, provision of the demographic information in the form is voluntary. If completing the form for multiple individuals, each Co-Project Director/Co-Principal Investigator can be added by selecting the "Next Person" button. The demographic information, if provided, will be used for statistical purposed only and will not be made available to merit reviewers. Applicants who do not wish to provide some or all of the information should check or select the "Do not wish to provide" option.

f. Submission of Proposals

Proposals must be submitted through Grants.gov or by email (only when a contract is requested). Proposals must be submitted through the applicant's organizational office having responsibility for Government business relations. All signatures must be that of an official authorized to commit the organization in business and financial affairs.

Proposal content requirements remain the same for both email and Grants.gov submission.

i. EMAIL SUBMISSION (only when a **Contract is the requested form of agreement**):

(1) Proposals requesting a Contract may be emailed directly to usarmy.rtp.aro.mbx.baa@mail.mil. Do not email full proposals to the TPOC. All emailed proposals must adhere to the format requirements and contain the information outlined in Section II.D.2.e of this BAA.

(2) The applicant must include with its proposal submission the representations required by Section II.F.2.a.i of this BAA. The representations must include applicant point of contact (POC) information and be signed by an authorized representative. Note: If the applicant's SAM Representations and Certifications include its response to the representations a hard copy representation is not required with proposal submission.

(3) All forms requiring signature must be completed, printed, signed,and scanned into a PDF document. All documents must be combined into a single PDF formatted file to be attached to the email.

(4) Proposal documents (excluding required forms) must use the following format:

- Page Size – 8 ½ x 11 inches
- Margins – 1 inch
- Spacing – single
- Font – Times New Roman, 12 point, single-sided pages

ii. GRANTS.GOV SUBMISSION (**For all proposals requesting Assistance agreements**. Proposals requesting a Contract may be submitted either via Grants.gov or email):

(1) Grants.gov Registration (See Section II.D.2.g below) must be accomplished prior to application submission in Grants.gov.

NOTE: All web links referenced in this section are subject to change by Grants.gov and may not be updated here.

(2) Specific forms are required for submission of a proposal. The forms are contained in the Application Package available through the Grants.gov application process. To access these materials, go to http://www.grants.gov, select "Apply for Grants," and then select "Get Application Package." A Grant Application Package and Application Instructions are available through the Grants.Gov Apply portal under CFDA Number 12.431/Funding Opportunity Number W911NF-20-S-0008. Select "Apply" and then "Apply Now Using Workspace."

The following documents are mandatory: (1) Application for Federal Assistance (R&R) (SF 424 (R&R)), and (4) Attachments form.

(3) The SF 424 (R&R) form is to be used as the cover page for all proposals submitted via Grants.gov. The SF 424 (R&R) must be fully completed. Authorized Organization Representative (AOR) usernames and passwords serve as "electronic signatures" when your organization submits applications through Grants.gov. By using the SF 424 (R&R), proposers are providing the certification required by 32 CFR Part 28 regarding lobbying (see Section II.F.2.a.ii of this BAA). Block 11, "Descriptive Title of Applicant's Project," must reference the research topic area being addressed in the effort by identifying the specific paragraph from Section II.A of this BAA.

(4) The Attachments form must contain the documents outlined in Section II.D.2.e.ii entitled "Table of Contents". All documents must be combined into separate and single PDF formatted files using the Table of Contents names. Include "W911NF-20-S- 0008" in the title so the proposal will be distinguished from other BAA submissions and upload each document to the mandatory Attachments form.

(5) The applicant must include with its proposal submission the representations required by Section II.F.2.a.ii of this BAA. The representations must include applicant POC information and be signed by an authorized representative. Attach the representations document to an available field within the Attachments form. Note: If the applicant's SAM Representations and Certifications include its response to the representations a hard copy representation is not required with proposal submission.

(6) The Grants.gov User Guide at: https://grants.gov/web/grants/support.html will assist AORs in the application process. Remember that you must open and complete the Application for Federal Assistance (R&R) (SF 424 (R&R)) first, as this form will automatically populate data fields in other forms. If you encounter any problems, contact customer support at 1-800-518-4726 or at support@grants.gov. If you forget your user

name or password, follow the instructions provided in the Credential Provider tutorial. Tutorials may be printed by right-clicking on the tutorial and selecting “Print”.

(7) As it is possible for Grants.gov to reject the proposal during this process, it is strongly recommended that proposals be uploaded at least two days before any established deadline in the BAA so that they will not be received late and be ineligible for award consideration. It is also recommended to start uploading proposals at least two days before the deadline to plan ahead for any potential technical and/or input problems involving the applicant’s own equipment.

g. Grants.gov Registration

i. Each organization that desires to submit applications via Grants.Gov must complete a one-time registration. There are several one-time actions your organization must complete in order to submit applications through Grants.gov (e.g., obtain a Unique Entity Identifier, register with the SAM, register with the credential provider, register with Grants.gov and obtain approval for an AOR to submit applications on behalf of the organization). To register please see: http://www.grants.gov/web/grants/applicants/organization-registration.html

ii. Please note the registration process for an Organization or an Individual can take between three to five business days or as long as four weeks if all steps are not completed in a timely manner.

iii. Questions relating to the registration process, system requirements, how an application form works, or the submittal process should be directed to Grants.gov at 1-800- 518-4726 or support@grants.gov.

3. Unique Entity Identifier and System for Award Management (SAM)

a. Each applicant (unless the applicant is an individual or Federal awarding agency that is exempt from those requirements under 2 CFR 25.110(b) or (c), or has an exemption approved by the Federal awarding agency under 2 CFR 25.110(d)) is required to:

i. Be registered in SAM prior to submitting its application; ii. Provide a valid unique entity identifier (formerly DUNS) in its application; and iii.

ii. Maintain an active SAM registration with current information at all times during which it has an active Federal award or an application or plan under consideration by a Federal awarding agency.

b. The Federal awarding agency may not make a Federal award to an applicant until the applicant has complied with all applicable unique entity identifier and SAM requirements. If an applicant has not fully complied with the requirements by the time the Federal awarding agency is ready to make a Federal award, the Federal awarding agency may determine that the applicant is not qualified to receive a Federal award and use that determination as a basis for making a Federal award to another applicant.

4. Submission Dates and Times

a. Proposals

Proposals will be considered until and including the closing date of this announcement (see cover page of this announcement for opening/closing dates), except for special programs identified in this BAA that may announce specific opening/closing dates. Proposals submitted after the closing date will not be considered by the Government.

b. Proposal Receipt Notices

i. Grants.gov: After a proposal is submitted to Grants.gov, the AOR will receive a series of three emails from Grants.gov. The first two emails will be received within 24 to 48 hours after submission. The first email will confirm time of receipt of the proposal by the Grants.gov system and the second will indicate that the proposal has either been successfully validated by the system prior to transmission to the grantor agency or has been rejected due to errors. A third email will be received once the grantor agency has confirmed receipt of the proposal. Reference the Grants.gov User Guide at: http://www.grants.gov/help/html/help/index.htm?callingApp=custom#t=Get_Started%2FG et_Started.htm for information on how to track your application package.

For the purposes of this BAA, an applicant's proposal is not considered received by USMA until the AOR receives email #3.

ii. Email Submission: After a proposal is submitted to usarmy.rtp.aro.mbx.baa@mail.mil, the AOR will receive an email confirming time of receipt of the proposal by the grantor agency. For the purposes of this BAA, an applicant's proposal is not considered received by the grantor agency until the AOR receives the email confirming receipt of the proposal.

5. Intergovernmental Review Not

Applicable

6. Funding Restrictions

There are no specific funding restrictions associated with this BAA (e.g. direct costs, indirect costs, etc.).

7. Other Submission Requirements

a. Information to Be Requested from Successful Applicants: Applicants whose proposals are accepted for funding will be contacted before award to provide additional information required for award. The required information may include requests to clarifying budget explanations, representations, certifications, and some technical aspects.

b. For Contracts Only: Performance Work Statements (PWS). Prior to award the Contracting Officer may request that the contractor submit a PWS for the effort to be performed, which will be incorporated into the contract at the time of award.

E. Application Review Information

1. Criteria

Proposals submitted in response to this BAA will be evaluated using the factors listed below (in descending order of importance):

a. The overall scientific and/or technical merits of the proposal.

b. The potential contributions of the effort to the Army mission and the extent to which the research effort will contribute to balancing the overall USMA research program.

c. The applicant's capabilities, related experience, facilities, techniques, or unique combinations of these, which are integral factors for achieving the proposed objectives.

d. The qualifications, capabilities, and experience of the proposed PI, team leader, or other key personnel who are critical to achievement of the proposed objectives.

e. The applicant's record of past performance.

**NOTE: Cost sharing will not be considered in the evaluation.

2. Review and Selection Process

a. Upon receipt of a proposal, the USMA staff will perform an initial review of its scientific merit and potential contribution to the Army mission, and also determine if funds are expected to be available for the effort. Proposals not considered having sufficient scientific merit or relevance to the Army's needs, or those in areas for which funds are not expected to be available, may not receive further review.

b. All proposals are treated as procurement sensitive and are disclosed only for the purpose of evaluation. Proposals not declined as a result of an initial review will be subject to a peer review by highly qualified scientists. While the applicant may restrict the evaluation to scientists from within the Government, to do so may prevent review of the proposal by those most qualified in the field of research covered by the proposal. The applicant must indicate on the appropriate proposal form (Form 52 or 52A) any limitation to be placed on disclosure of information contained in the proposal.

c. Each proposal will be evaluated based on all the evaluation criteria in Section II.E.1 of this BAA rather than against other proposals for research in the same general area.

d. Upon completion of an evaluation against the criteria in Section II.E.1, a proposal selected for possible award will be analyzed for the realism and reasonableness of costs.

Proposal costs must be determined reasonable and realistic before the Government can make an award.

3. Recipient Qualification

a. Grant, Cooperative Agreement, and TIA Proposals:

i. The Grants Officer is responsible for determining a recipient's qualification prior to award. In general, a Grants Officer will award grants or cooperative agreements only to qualified recipients that meet the standards at 32 CFR 22.415. To be qualified, a potential recipient must:

(1) Have the management capability and adequate financial and technical resources, given those that would be made available through the grant or cooperative agreement, to execute the program of activities envisioned under the grant or cooperative agreement;

(2) Have a satisfactory record of executing such programs or activities (if a prior recipient of an award);

(3) Have a satisfactory record of integrity and business ethics; and

(4) Be otherwise qualified and eligible to receive a grant or cooperative agreement under applicable laws and regulations.

Applicants are requested to provide information with proposal submissions to assist the Grants Officer's evaluation of recipient qualification.

ii. In accordance with Office of Management and Budget (OMB) guidance in parts 180 and 200 of Title 2, CFR, it is DoD policy that DoD Components must report and use integrity and performance information in the Federal Awardee Performance and Integrity Information System (FAPIIS), or any successor system designated by OMB, concerning grants, cooperative agreements, and TIAs as follows:

If the total Federal share will be greater than the simplified acquisition threshold on any Federal award under a notice of funding opportunity (see 2 CFR 200.88 Simplified Acquisition Threshold):

(1) The Federal awarding agency, prior to making a Federal award with a total amount of Federal share greater than the simplified acquisition threshold, will review and consider any information about the applicant that is in the designated integrity and performance system accessible through SAM (currently FAPIIS) (see 41 U.S.C. 2313);

(2) An 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;

(3) The Federal awarding agency 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 applicants as described in 2 CFR 200.205 Federal awarding agency review of risk posed by applicants.

b. Contract Proposals:

i. Contracts shall be awarded to responsible prospective contractors only. See FAR 9.104-1 for a listing of the general standards against which an applicant will be assessed to determine responsibility.

Applicants are requested to provide information with proposal submission to assist the Contracting Officer's evaluation of responsibility.

ii. FAPIIS will be checked prior to making an award. The web address is: https://www.fapiis.gov/fapiis/index.action. The applicant representing the entity may comment in this system on any information about the entity that a federal government official entered. The information in FAPIIS will be used in making a judgment about the entity's integrity, business ethics, and record of performance under Federal awards that may affect the official's determination that the applicant is qualified to receive an award.

F. Award Administration Information

1. Award Notices

Applicants whose proposals are recommended for award may be contacted by a Contract/Grant Specialist to discuss additional information required for award. This may include representations and certifications, revised budgets or budget explanations, certificate of current cost or pricing data, subcontracting plan for small businesses, and/or other information as applicable to the proposed award. The anticipated start date will be determined at that time.

The notification email must not be regarded as an authorization to commit or expend funds. The Government is not obligated to provide any funding until a Government Contracting/ Grants Officer signs the award document.

The award document signed by the Government Contracting/Grants Officer is the official and authorizing award instrument. The authorizing award instrument, signed by the Contracting/ Grants Officer, will be emailed to the PI and AOR.

2. Administrative and National Policy Requirements

a. Required Representations and Certifications:

i. Contract Proposals:

(1) Representations and certifications shall be completed by successful applicants prior to award. FAR Online Representations and Certifications are to be completed through SAM at https://www.SAM.gov. As appropriate, DFARS and contract- specific certification packages will be provided to the contractor for completion prior to award.

(2) FAR 52.203-18, PROHIBITION ON CONTRACTING WITH ENTITIES THAT REQUIRE CERTAIN CONFIDENTIALITY AGREEMENTS OR STATEMENTS— REPRESENTATION (JAN 2017)

(a) Definition. As used in this provision--

"Internal confidentiality agreement or statement", "subcontract", and "subcontractor", are defined in the clause at 52.203-19, Prohibition on Requiring Certain Internal Confidentiality Agreements or Statements.

(b) In accordance with section 743 of Division E, Title VII, of the Consolidated and Further Continuing Appropriations Act, 2015 (Pub. L. 113-235) and its successor provisions in subsequent appropriations acts (and as extended in continuing resolutions), Government agencies are not permitted to use funds appropriated (or otherwise made available) for contracts with an entity that requires employees or

subcontractors of such entity seeking to report waste, fraud, or abuse to sign internal confidentiality agreements or statements prohibiting or otherwise restricting such employees or subcontractors from lawfully reporting such waste, fraud, or abuse to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information.

(c) The prohibition in paragraph (b) of this provision does not contravene requirements applicable to SF 312, (Classified Information Nondisclosure Agreement), Form 4414(Sensitive Compartmented Information Nondisclosure Agreement), or any other form issued by a Federal department or agency governing the nondisclosure of classified information.

(d) Representation. By submission of its offer, the applicant represents that it will not require its employees or subcontractors to sign or comply with internal confidentiality agreements or statements prohibiting or otherwise restricting such employees or subcontractors from lawfully reporting waste, fraud, or abuse related to the performance of a Government contract to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information (e.g., agency Office of the Inspector General).

(3) FAR 52.209-11, REPRESENTATION BY CORPORATIONS REGARDING DELINQUENT TAX LIABILITY OR A FELONY CONVICTION UNDER FEDERAL LAW (FEB 2016)

As required by sections 744 and 745 of Division E of the Consolidated and Further Continuing Appropriations Act, 2015 (Pub. L 113-235), and similar provisions, if contained in subsequent appropriations acts, the Government will not enter into a contract with any 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 a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability, where the awarding agency is aware of the unpaid tax liability, unless an agency has considered suspension or debarment of the corporation and made a determination that suspension or debarment is not necessary to protect the interests of the Government; or

Was convicted of a felony criminal violation under any Federal law within the preceding 24 months, where the awarding agency is aware of the conviction, unless an agency has considered suspension or debarment of the corporation and made a determination that this action is not necessary to protect the interests of the Government.

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 a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability; and

It is [ ] is not [ ] a corporation that was convicted of a felony criminal violation under a Federal law within the preceding 24 months.

ii. Grant and Cooperative Agreement Proposals:

(1) To apply for grants and other funding opportunities the applicant entity must be registered in the System for Award Management (SAM). Proposals will not be accepted through Grants.gov or other methods unless the entity is registered in SAM. Registration in SAM now includes the acceptance of Certifications and Assurances. SAM may be accessed at: https://sam.gov.

The Federal Assistance Certifications Report is an attestation that the entity will abide by the requirements of the various laws and regulations; therefore, as applicable, you are still required to submit any documentation, including the SF LLL Disclosure of Lobbying Activities (if applicable), and informing DoD of unpaid delinquent tax liability or a felony conviction under any Federal law. (*Note: grant offices should include any other requirements, such as IRB certifications*)

b. Policy Requirements:

The following list provides notable national policy requirements that may be applicable to an award. NOTE: The following is not an all-inclusive list of policy requirements. For assistance awards, refer to the DoD Research and Development General Terms and Conditions at https://www.onr.navy.mil/work-with-us/manage-your-award/manage-grant-award/grants- terms-conditions for additional national policy requirements that may apply. For contract awards, appropriate clauses will be added to award documents.

i. PROTECTION OF HUMAN SUBJECTS:

(1) Assistance Instruments:

(a) The recipient must protect the rights and welfare of individuals who participate as human subjects in research under this award and comply with the requirements at 32 CFR part 219, Department of Defense Instruction (DoDI) 3216.02, 10 U.S.C. 980, and when applicable, Food and Drug Administration (FDA) regulations.

(b) The recipient must not begin performance of research involving human subjects, also known as human subjects research (HSR), that is covered under 32 CFR part 219, or that meets exemption criteria under 32 CFR 219.101(b), until you receive a formal notification of approval from a DoD Human Research Protection Official (HRPO). Approval to perform HSR under this award is received after the HRPO has performed a review of the recipient's documentation of planned HSR activities and has officially furnished a concurrence with the recipient's determination as presented in the documentation.

(c) In order for the HRPO to accomplish this concurrence review, the recipient must provide sufficient documentation to enable his or her assessment as follows:

(i) If the HSR meets an exemption criteria under 32 CFR 219.101(b), the documentation must include a citation of the exemption category under 32 CFR 219.101(b) and a rationale statement.

(ii) If the recipient's activity is determined as "non-exempt research involving human subjects", the documentation must include:

- Assurance of Compliance (i.e., Department of Health and Human Services Office for Human Research Protections (OHRP) Federal Wide Assurance (FWA)) appropriate for the scope of work or program plan; and

- Institutional Review Board (IRB) approval, as well as all documentation reviewed by the IRB to make their determination.

(d) The HRPO retains final judgment on what activities constitute HSR, whether an exempt category applies, whether the risk determination is appropriate, and whether the planned HSR activities comply with the requirements in paragraph (a) of this section.

(e) The recipient must notify the HRPO immediately of any suspensions or terminations of the Assurance of Compliance.

(f) DoD staff, consultants, and advisory groups may independently review and inspect the recipient's research and research procedures involving human subjects and, based on such findings, DoD may prohibit research that presents unacceptable hazards or otherwise fails to comply with DoD requirements.

(g) Definitions for terms used in this article are found in DoDI 3216.02.

(2) Contracts: The appropriate clauses shall be added to the award.

ii. ANIMAL USE:

(1) Assistance Instruments:

(a) Prior to initiating any animal work under the award, the recipient must:

(i) Register the recipient's research, development, test, and evaluation or training facility with the Secretary of Agriculture in accordance with 7 U.S.C. 2136 and 9 CFR section 2.30, unless otherwise exempt from this requirement by meeting the conditions in 7 U.S.C. 2136 and 9 CFR parts 1-4 for the duration of the activity.

(ii) Have the recipient's proposed animal use approved in accordance with DoDI 3216.01, Use of Animals in DoD Programs by a DoD Component Headquarters

Oversight Office.

(iii) Furnish evidence of such registration and approval to the grants officer.

(b) The recipient must make the animals on which the research is being conducted, and all premises, facilities, vehicles, equipment, and records that support animal care and use available during business hours and at other times mutually agreeable to the recipient, the United States Department of Agriculture Office of Animal and Plant Health Inspection Service (USDA/APHIS) representative, personnel representing the DoD component oversight offices, as well as the grants officer, to ascertain that the recipient is compliant with 7 U.S.C. 2131 et seq., 9 CFR parts 1-4, and DoDI 3216.01.

(c) The recipient's care and use of animals must conform with the pertinent laws of the United States, regulations of the Department of Agriculture, and regulations, policies, and procedures of the DoD (see 7 U.S.C. 2131 et seq., 9 CFR parts 1-4, and DoDI 3216.01).

(d) The recipient must acquire animals in accordance with DoDI 3216.01.

(2) Contracts: The appropriate clauses shall be added to the award.

iii. BIOLOGICAL SAFETY PROGRAM REQUIREMENTS:

(1) Assistance Instruments and Contracts: Awards may be subject to biological safety program requirements IAW:

(a) Army Regulation (AR) 385-10, Chapter 20 http://armypubs.army.mil/epubs/DR_pubs/DR_a/pdf/web/r385_10.pdf

(b) Department of Army (DA) PAM 385-69 http://armypubs.army.mil/epubs/DR_pubs/DR_a/pdf/web/p385_69.pdf

(c) DoD Manual 6055.18-M, Enclosure 4, Section 13 http://www.dtic.mil/whs/directives/corres/pdf/605518m.pdf

(d) DoD Executive Agent List (see item) http://www.oaa.army.mil/aea_functions.aspx

iv. MILITARY RECRUITING:

(1) Assistance Instruments: This is to notify potential applicants that each grant or cooperative agreement awarded under this announcement to an institution of higher education must include the following term and condition:

(a) As a condition for receiving funds available to the DoD under this award, you agree that you are not an institution of higher education (as defined in 32 CFR part 216) that has a policy or practice that either prohibits, or in effect prevents:

(i) The Secretary of a Military Department from maintaining, establishing, or operating a unit of the Senior Reserve Officers Training Corps (ROTC)—-in accordance with 10 U.S.C. 654 and other applicable Federal laws—-at that institution (or any sub-element of that institution);

(ii) Any student at that institution (or any sub-element of that institution) from enrolling in a unit of the Senior ROTC at another institution of highereducation.

(iii) The Secretary of a Military Department or Secretary of HomelandSecurity from gaining access to campuses, or access to students (who are 17 years of age or older) on campuses, for purposes of military recruiting in a manner that is at least equal in quality and scope to the access to campuses and to students that is provided to any other employer; or

(iv) Access by military recruiters for purposes of military recruiting to the names of students (who are 17 years of age or older and enrolled at that institution or any sub- element of that institution); their addresses, telephone listings, dates and places of birth, levels of education, academic majors, and degrees received; and the most recent educational institutions in which they were enrolled.

(b) If you are determined, using the procedures in 32 CFR part 216, to besuch an institution of higher education during the period of performance of this award,we:

(i) Will cease all payments to you of DoD funds under this award and allother DoD grants and cooperative agreements; and

(ii) May suspend or terminate those awards unilaterally for material failure to comply with the award terms and conditions.

(2) Contracts: Each contract awarded under this announcement to an institution of higher education shall include the following clause: DFARS 252.209-7005, Military Recruiting on Campus.

v. SUBCONTRACTING:

(1) Assistance Instruments: N/A

(2) Contracts: Pursuant to Section 8(d) of the Small Business Act (15 U.S.C. § 637(d)), it is the policy of the Government to enable small business and small disadvantaged business (SDB) concerns to be considered fairly as subcontractors. All other than U.S. small businesses proposing contracts expected to exceed $700,000 and that have subcontracting possibilities are required to submit a subcontracting plan IAW FAR 19.702(a), and shall do so with their proposal.

Subcontracting plans are determined to be acceptable or unacceptable based on the criteria established at FAR 19.705-4, DFARS 219.705-4, and AFARS 5119.705-4. Goals are established on an individual contract basis and should result in realistic, challenging and attainable goals that, to the greatest extent possible, maximize small business participation in subcontracting for Small Business, SDB, Woman-Owned Small Business (WOSB), Economically-Disadvantaged Woman-Owned Small Business (EDWOSB), Service-Disabled Veteran-Owned Small Business (SDVOSB), Veteran-Owned Small Business (VOSB), and Historically Underutilized Business Zone (HUBZone) Small Business consistent with applicants' make-or-buy policy, the pool of and availability of qualified and capable small business subcontractors, their performance on subcontracts, and existing relationships with suppliers.

Subcontracting goals should result in efficient contract performance in terms of cost, schedule, and performance and should not result in increased costs to the government or undue administrative burden to the prime contractor. For reference, DoD Small Business Subcontracting Goals may be found at: http://www.acq.osd.mil/osbp/statistics/sbProgramGoals.shtml.

vi. EXPORT CONTROL LAWS:

(1) Assistance Instruments: N/A

(2) Contracts: Applicants should be aware of current export control laws and 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 DoD are now included on the United States Munition List (USML) and are therefore subject to ITAR jurisdiction. Applicants 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 the DoD. 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.

vii. DRUG-FREE WORKPLACE:

(1) Assistance Instruments: The recipient must comply with drug-freeworkplace requirements in Subpart B of 2 CFR part 26, which is the DoD implementation of 41 U.S.C. chapter 81, "Drug Free Workplace."

(2) Contracts: The appropriate clause(s) shall be added to the award.

viii. DEBARMENT AND SUSPENSION:

(1) Assistance Instruments: The recipient must comply with requirements regarding debarment and suspension in Subpart C of 2 CFR part 180, as adopted by DoD

at 2 CFR part 1125. This includes requirements concerning the recipient's principals under an award, as well as requirements concerning the recipient's procurement transactions and sub-awards that are implemented in DoD Research and Development General Terms and Conditions PROC Articles I through III and SUB Article II.

(2) Contracts: The appropriate clause(s) shall be added to the award.

ix. REPORTING SUBAWARDS AND EXECUTIVE COMPENSATION:

(1) Assistance Instruments: The recipient must report information about sub- awards and executive compensation as specified in the award term in Appendix A to 2 CFR part 170, "Reporting sub-award and executive compensation information," modified as follows:

(a) To accommodate any future designation of a different Government wide Web site for reporting sub-award information, the Web site "http://www.fsrs.gov" cited in paragraphs a.2.i. and a.3 of the award provision is replaced by the phrase "http://www.fsrs.gov or successor OMB designated Web site for reporting sub-award information";

(b) To accommodate any future designation of a different Government wide Web site for reporting executive compensation information, the Web site "http://www.sam.gov" cited in paragraph b.2.i. of the award provision is replaced by the phrase "https://www.sam.gov or successor OMB-designated Web site for reporting information on total compensation"; and (c) The reference to "Sec. _.210 of the attachment to OMB Circular A-133, "Audits of States, Local Governments, and Non-Profit Organizations" in paragraph e.3.ii of the award term is replaced by "2 CFR 200.330, as implemented in DoD Research and Development General Terms and Conditions SUB Article I of this award."

(2) Contracts: The appropriate clause(s) shall be added to the award.

3. Reporting

a. Additional reports including number and types will be specified in the award document, but will include as a minimum monthly financial status reports. The reports shall be prepared and submitted in accordance with the procedures contained in the award document and mutually agreed upon before award. Reports and briefing material will also be required as appropriate to document progress in accomplishing program metrics. A final report that summarizes the project and tasks will be required at the conclusion of the performance period for the award.

b. ARMY MANPOWER CONTRACTOR REPORTING: For Contracts Only. The Office of the Assistant Secretary of the Army (Manpower & Reserve Affairs) operates and maintains a secure Army data collection site where the contractor will report ALL contractor manpower (including subcontractor6 manpower) required for performance of this contract. The contractor is required to completely fill in all the information in the format using the following web address: https://ecmra.army.mil. The required information includes:

(1) Contracting Office, Contracting Officer, Contracting Officer's Technical

Representative;

(2) Contract number, including task and delivery order number;

(3) Beginning and ending dates covered by reporting period;

(4) Contractor name, address, phone number, email address, identity of contractor employee entering data;

(5) Estimated direct labor hours (including sub-contractors);

(6) Estimated direct labor dollars paid this reporting period (including sub- contractors);

(7) Total payments (including sub-contractors);

(8) Predominate Federal Service Code (FSC) reflecting services provided by contractor (and separate predominant FSC for each sub-contractor if different);

(9) Estimated data collection cost;

(10) Organizational title associated with the Unit Identification Code (UIC) for the Army Requiring Activity (the Army Requiring Activity is responsible for providing the contractor with its UIC for the purposes of reporting this information);

(11) Locations where contractor and sub-contractors perform the work (specified by zip code in the United States and nearest city, country, when in an overseas location, using standardized nomenclature provided on website);

(12) Presence of deployment or contingency contract language; and

(13) Number of contractor and sub-contractor employees deployed in theater this reporting period (by country).

As part of its submission, the contractor will also provide the estimated total cost (if any) incurred to comply with this reporting requirement. Reporting period will be the period of performance not to exceed 12 months ending 30 September of each government FY and must be reported by 31 October of each calendar year. Contractors may use a direct XML data transfer to the database server or fill in the fields on the website. The XML direct transfer is a format for transferring files from a contractor's systems to the secure web site without the need for separate data entries for each required data element at the web site. The specific formats for the XML direct transfer may be downloaded from the web site.

c. If the total Federal share exceeds $500,000 on any Federal award under a notice of funding opportunity, the post-award reporting requirements reflected in Appendix XII to 2 CFR 200 will be included in the award document. This requirement also applies to modifications of awards that: 1) increase the scope of the award, 2) are issued on or after January 1, 2016, and 3) increase the federal share of the award's total value to an amount that exceeds $500,000.

G. Agency Contacts

1. Questions of a technical or programmatic nature shall be directed to the TPOC for each research area of interest. The TPOC information may be found in the description of each research area of interest in Section II.A of this BAA.

2. Questions of a business or administrative nature are to be directed to the following email:

Brandon.s.hill24.civ@army.mil

3. Comments or questions submitted should be concise and to the point, eliminating any unnecessary verbiage. In addition, the relevant part and paragraph of the announcement should be referenced.

4. Requests to withdraw a proposal shall be directed to Brandon.s.hill24.civ@army.mil

H. Other Information

Below are two separate outlines of the informational requirements for a sample cost proposal. Section H.1 is for a procurement contract and Section H.2 is for grants and cooperative agreements.

1. CONTRACT Proposals Cost

Proposal – {No Page Limit}

Cover sheet to include:

1	BAA number
2	Technical area
3	Lead organization submitting proposal
4	Type of business, selected among the following categories: "LARGE BUSINESS", "SDB", "OTHER SMALL BUSINESS", "HBCU", "MI", "OTHER EDUCATIONAL", OR "OTHER NONPROFIT"
5	Contractor's reference number (if any)
6	Other team members (if applicable) and type of business for each
7	Proposal title
8	TPOC to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax (if available), electronic mail (if available)
9	Administrative point of contact to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax (if available), and electronic mail (if available)
10	Award instrument requested: cost plus fixed fee (CPFF), cost-contract—no fee, cost sharing contract – no fee, or other type of procurement contract (specify)
11	Place(s) and period(s) of performance
12	Total proposed cost separated by basic award and option(s) (if any)
13	Name, address, and telephone number of the proposer's cognizant Defense Contract Management Agency (DCMA) administration office (if known)
14	Name, address, and telephone number of the proposer's cognizant Defense Contract Audit Agency (DCAA) audit office (if known)
15	Date proposal was prepared
16	DUNS number

17	TIN number
18	CAGE code
19	Subcontractor information
20	Proposal validity period
21	Any Forward Pricing Rate Agreement, other such approved rate information, or such other documentation that may assist in expediting negotiations (if available)

a. Reasoning for Submitting a Strong Cost Proposal

The ultimate responsibility of the Contracting Officer is to ensure that all prices offered in a proposal are fair and reasonable before contract award. To establish the reasonableness of the offered prices, the Contracting Officer may ask the applicant to provide supporting documentation that assists in this determination. The applicant's ability to be responsive to the Contracting Officer's requests can expedite contract award. As specified in Section 808 of Public Law 105-261, an applicant who does not comply with a requirement to submit information for a contract or subcontract in accordance with paragraph (a)(1) of FAR 15.403- 3 may be ineligible for award.

b. DCAA-Accepted Accounting System

i. Before a cost-type contract can be awarded, the Contracting Officer must confirm that the applicant has a DCAA-accepted accounting system in place for accumulating and billing costs under Government contracts [FAR 53.209-1(f)]. If the applicant has DCAA correspondence, which documents the acceptance of its accounting system, this should be provided to the Contracting Officer (i.e. attached or referenced in the proposal). Otherwise, the Contracting Officer will submit an inquiry directly to the appropriate DCAA office and request a review of the applicant's accounting system.

ii. If an applicant does not have a DCAA-accepted accounting system in place, the DCAA review process can take several months depending upon the availability of the DCAA auditors and the applicant's internal processes. This will delay contract award.

iii. For more information about cost proposals and accounting standards, view the link titled "Information for Contractors" on the main menu of the DCAA website.

c. Field Pricing Assistance

During the pre-award cost audit process, the Contracting Officer may solicit support from DCAA to determine commerciality and price reasonableness of the proposal [FAR 15.404-2]. Any proprietary information or reports obtained from DCAA field audits will be appropriately identified and protected within the Government.

d. Sample Cost Proposal – "Piece by Piece"

To help guide applicant s through the pre-award cost audit process, a sample cost proposal is detailed below. This sample allows the applicant to see exactly what the Government is looking for so that all cost and pricing back-up data can be provided to the Government in the first cost proposal submission. Review each cost element within the proposal, and take note of the types of documentation that the Contracting Officer will require from the applicant.

i. *Direct Labor*: The first cost element included in the cost proposal is Direct Labor. Each proposed employee must be listed by name and labor category.

Below is the Direct Labor as proposed by our sample applicant:

DIRECT LABOR		YEAR 1			YEAR 2		
Employee Name	**Labor Category**	**Direct Hourly Rate**	**Hours**	**Total Direct Labor**	**Direct Hourly Rate**	**Hours**	**Total Direct Labor**
Andy Smith	Program Manager	$55.00	720.00	$39,600.00	$56.65	720.00	$40,788.00
Bryan Andrews	Senior Engineer	$40.00	672.00	$26,880.00	$41.20	672.00	$27,686.40
Cindy Thomas	Principal Engineer	$50.00	512.00	$25,600.00	$51.50	512.00	$26,368.00
David Porter	Entry Level Engineer	$10.00	400.00	$4,000.00	$10.30	400.00	$4,120.00
Edward Bean	Project Administrator	$25.00	48.00	$1,200.00	$25.75	48.00	$1,236.00
Subtotal Direct Labor (DL)				$97,280.00			$100,198.40

i. For this cost element, the Contracting Officer requires the applicant to provide adequate documentation in order to determine that the labor rate for each employee/labor category is fair and reasonable. The documentation must explain how these labor rates were derived. For example, if the rates are DCAA-approved labor rates, provide the Contracting Officer with copies of the DCAA documents stating the approval. This is the most acceptable means of documentation to determine the rates fair and reasonable. Other types of supporting documentation may include General Service Administration (GSA) contract price lists, actual payroll journals, or Salary.com research. If an employee listed in a cost proposal is not a current employee (maybe a new employee, or one contingent upon the award of this contract), a copy of the offer letter stating the hourly rate, signed and accepted by the employee, may be provided as adequate documentation.

Sometimes the hourly rates listed in a proposal are derived through subjective processes, i.e., blending of multiple employees in one labor category, or averaged over the

course of the year to include scheduled payroll increases, etc. These situations should be cleACIy documented for the Contracting Officer.

ii. Another cost element in Direct Labor is labor escalation, or the increase in labor rates from year to year. In the example above, the proposed labor escalation is 3% (ex., Andy Smith's direct labor rate increased by 3% from $55.00/hour in Year 1 to $56.65/hour in Year 2). Often times, an applicant may not propose escalation on labor rates during a 24- month period. Whatever the proposed escalation rate is, please be prepared to explain why it is fair and reasonable. For example, a sufficient explanation for our sample escalation rate would be "The Government's General Schedule Increase and Locality Pay for the same time period (name FY) in the same location (name location) was published as 3.5%; therefore a 3% increase is fair and reasonable". ii. *Other Direct Costs (ODCs)*: This section of the cost proposal includes all other directly related costs required in support of the effort (i.e., materials, subcontractors, consultants, travel, etc.). Any cost element that includes various items must be detailed in a cost breakdown.

ii. Direct Material Costs: This subsection of the cost proposal will include any special tooling, test equipment, and material costs necessary to perform the project. Items included in this section must be carefully reviewed relative to need and appropriateness for the work proposed, and must, in the opinion of the Contracting Officer, be advantageous to the Government and directly related to the specific topic.

The Contracting Officer will require adequate documentation from the applicant to determine the cost reasonableness for each material cost proposed. The following methods are ways in which the Contracting Officer can determine this [FAR 15.403-1]:

(a) Adequate Price Competition. A price is based on adequate price competition when the applicant solicits and receives quotes from two or more responsible vendors for the same or similar items or services. Based on these quotes, the applicant selects the vendor who represents the best value to the Government. The applicant will be required to provide to the Contracting Officer copies of all vendor quotes received.

*NOTE: Price competition is not required for items at or below the micro-purchase threshold ($10,000) [FAR 15.403-1]. If an item's unit cost is less than or equal to $10,000, price competition is not necessary. However, if an item's total cost over the period of performance (unit cost x quantity) is higher than $10,000, two or more quotes must be obtained by the applicant.

(b) Commercial Prices. Commercial prices are those published on current price lists, catalogs, or market prices. This includes vendors who have prices published on a GSA schedule contract. The applicant will be required to provide copies of such price lists to the Contracting Officer.

(c) Prices set by law or regulation. If a price is mandated by the Government (i.e. pronouncements in the form of periodic rulings, reviews, or similar actions of a governmental body, or embodied in the laws) that is sufficient to set price.

Below is the list of Direct Material costs included in our sample proposal:

DIRECT MATERIAL COSTS	YEAR 1	YEAR 2
Raw Materials	$35,000.00	$12,000.00
Computer for experiments	$4,215.00	$0.00
Cable (item #12-3657, 300 ft.)	$1,275.00	$0.00
Software	$1,825.00	$8,825.00

Subtotal Direct Materials Costs	$42,315.00	$13,825.00

“Raw Materials”: This is a generic label used to group many material items into one cost item within the proposal. The Contracting Officer will require a detailed breakout of all the items that make up this cost. For each separate item over $3,000 (total for Year 1 + Year 2), the applicant must be able to provide either competitive quotes received, or show that published pricing was used.

“Computer for experiments”: This item is most likely a grouping of several components that make up one system. The Contracting Officer will require a detailed breakout of all the items that make up this cost. For each separate item over $10,000 (total for Year 1 + Year 2), the applicant must be able to provide either competitive quotes received, or show that published pricing was used.

“Cable”: Since this item is under the micro-purchase threshold of $10,000, competitive quotes or published pricing are not required. Simply provide documentation to show the Contracting Officer where this price came from.

“Software”: This cost item could include either one software product, or multiple products. If this includes a price for multiple items, please provide the detailed cost breakdown. Note: The price for Year 1 ($1,825) is below the micro-purchase threshold; however, in total (Year 1 + Year 2) the price is over $10,000, so competitive quotes or published pricing documentation must be provided.

Due to the specialized types of products and services necessary to perform these projects, it may not always be possible to obtain competitive quotes from more than one reliable source. Each cost element over the micro-purchase threshold ($10,000) must be substantiated.
There is always an explanation for how the cost of an item was derived; document how you came up with that price.

When it is not possible for an applicant to obtain a vendor price through competitive quotes or published price lists, the Contracting Officer may accept other methods to determine cost reasonableness. Below are some examples of other documentation, which the Contracting Officer may accept to substantiate costs:

(d) Evidence that a vendor/supplier charged another applicant a similar price for similar services. Has the vendor charged someone else for the same product? Two (2) to three (3) invoices from that vendor to different customers may be used as evidence.

(e) Previous contract prices. Has the applicant charged the Government a similar price under another Government contract for similar services? If the Government has already paid a certain price for services, then that price may already be considered fair and reasonable. Provide the contract number, and billing rates for reference.

(f) DCAA approved. Has DCAA already accepted or verified specific cost items included in your proposal? Provide a copy of DCAA correspondence that addressed these costs.

(2) ODCs: Below is the remaining ODC portion of our proposal including equipment, subcontractors, consultants, and travel. Assume in this scenario that competitive quotes or catalog prices were not available for these items:

ODCs	YEAR 1	YEAR 2
Equipment Rental for Analysis	$10,500.00	$10,600.00
Subcontractor – Widget, Inc.	$25,000.00	$0.00
Consultant: John Bowers	$0.00	$12,000.00
Travel	$1,250.00	$1,250.00

Subtotal: ODCs	$31,750.00	$18,850.00

“Equipment Rental for Analysis”: The applicant explains that the Year 1 cost of $10,500 is based upon 250 hours of equipment rental at an hourly rate of $42.00/hr. One (1) invoice from the vendor charging another vendor the same price for the same service is provided to the Contracting Officer as evidence. Since this cost is over the micro-purchase threshold, further documentation to determine cost reasonableness is required. The applicant is able to furnish another invoice charging a second vendor the same price for the same service.

“Subcontractor – Widget, Inc.”: The applicant provides a copy of the subcontractor quote to the Contracting Officer in support of the $25,000 cost. This subcontractor quote must include sufficient detailed information (equivalent to the data included in the prime’s proposal to the Government), so that the Contracting Officer can make a determination of cost reasonableness.

(a) As stated in Section 3.5(c)(6) of the DoD Cost Proposal guidance, “All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regards to labor, travel, equipment, etc. Provide detailed substantiation of subcontractor costs in your cost proposal.”

(b) In accordance with FAR 15.404-3, “the Contracting Officer is responsible for the determination of price reasonableness for the prime contract, including subcontracting costs”. This means that the subcontractor’s quote/proposal may be subject to the same scrutiny by the Contracting Officer as the cost proposal submitted by the prime. The Contracting Officer will need to determine whether the subcontractor has an accepted purchasing system in place and/or conduct appropriate cost or price analyses to establish the reasonableness of proposed subcontract prices. Due to the proprietary nature of cost data, the subcontractor may choose to submit their pricing information directly to the Contracting Officer and not through the prime. This is understood and encouraged.

(c) When a subcontractor is selected to provide support under the prime contract due to its specialized experience, the Contracting Officer may request sole source justification from the applicant.

“Consultant – John Bowers”: The applicant shall provide a copy of the consultant’s quote to the Contracting Officer as evidence. In this example, the consultant will be charging an hourly rate of $125 an hour for 96 hours of support. The applicant indicates to the Contracting Officer that this particular consultant was used on a previous contract with the Government (provide contract number), and will be charging the same rate. A copy of the consultant’s invoice to the applicant under the prior contract is available as supporting evidence. Since the Government has paid this price for the same services in the past, determination has already been made that the price is fair. “Travel”: The Contracting Officer will require a detailed cost breakdown for travel expenses to determine whether the total cost is reasonable based on Government per diem and mileage rates. This breakdown shall include the number of trips, the destinations, and the number of travelers. It will also need to include the estimated airfare per round trip, estimated car rental, lodging rate per trip, tax on lodging, and per diem rate per trip. The lodging and per diem rates must comply with the Joint Travel Regulations. Please see the following website to determine the appropriate lodging and per diem rates: http://www.defensetravel.dod.mil. Additionally, the applicant must provide why the airfare is fair and reasonable as well. Sufficient back up for both airfare and car rental would include print outs of online research at the various travel search engines (Expedia, Travelocity, etc.), documenting the prices for airfare and car rentals are fair and reasonable.

Below is a sample of the travel portion:

TRAVEL	Unit	Trips	Travelers	Nights	Days	Unit Cost	Total Travel
Airfare	roundtrip	1	1			$996.00	$996.00
Lodging	day	1	1	1		$75.00	$75.00

Tax on Lodging (12%)	day	1	1	1		$9.00	$9.00
Per Diem	day	1	1		2	$44.00	$88.00
Automobile Rental	day	1	1		2	$41.00	$82.00
Subtotal Travel							$1,250.00

Indirect Costs: Indirect costs include elements such as fringe benefits, general and administrative (G&A), overhead, and material handling costs. The applicant shall indicate in the cost proposal both the indirect rates (as a percentage) as well as how those rates are allocated to the costs in the proposal.

Below is the indirect portion of our sample proposal:

INDIRECTS	YEAR 1	YEAR 2
Subtotal Direct Labor (DL):	$97,280.00	$100,198.40
Fringe Benefits, if not included in Overhead, rate (15.0000 %) X DL =	$14,592.00	$15,029.76
Labor Overhead (rate 45.0000 %) X (DL + Fringe) =	$50,342.40	$51,852.67
Total Direct Labor (TDL):	$162,214.40	$167,080.83

In this example, the applicant includes a fringe benefit rate of 15.00% that it allocated to the direct labor costs. The applicant also proposes a labor overhead rate of 45.00% that is allocated to the direct labor costs plus the fringe benefits.

All indirect rates and the allocation methods of those rates must be verified by the Contracting Officer. In most cases, DCAA documentation supporting the indirect rates and allocation methods can be obtained through a DCAA field audit or proposal review. Many applicants have already completed such reviews and have this documentation readily available. If an applicant is unable to participate in a DCAA review to substantiate indirect rates, the Contracting Officer may request other accounting data from the applicant to make a determination.

iii. *FCCM:* Cost of money is an imputed cost that is not a form of interest on borrowings (see FAR 31.205-20). FCCM is an “incurred cost” for cost-reimbursement purposes under applicable cost-reimbursement contracts and for progress payment purposes under fixed-price contracts. It refers to (1) FCCM (48 CFR 9904.414) and (2) cost of money as an element of the cost of capital assets under construction (48 CFR 9904.417). If costof

money is proposed in accordance with FAR 31.205-10, a DD Form 1861 is required to be completed and submitted with the applicant's proposal.

iv. *Fee/Profit*: The proposed fee percentage will be analyzed in accordancewith DFARS 215.404, the Weighted Guidelines Method.

v. *Subcontracting Plan*: If the total amount of the proposal exceeds $700,000 and the applicant is a large business or an institute of higher education (other than HBCU/MI) and the resultant award is a contract, the applicant shall be prepared to submit a subcontracting plan for small business and SDB concerns. A mutually agreeable plan will be included in and made a part of the contract (see Section II.F.2.b.v).

2. GRANT and COOPERATIVE AGREEMENT Proposals

Before award it must be established that an approved accounting system and financial management system exist.

a. *Direct Labor*: Show the current and projected salary amounts in terms of man- hours, man-months, or annual salary to be charged by the PI(s), faculty, research associates, postdoctoral associates, graduate and undergraduate students, secretarial, clerical, and other technical personnel either by personnel or position. State the number of man-hours used to calculate a man-month or man-year. For proposals from universities, research during the academic term is deemed part of regular academic duties, not an extra function for which additional compensation or compensation at a higher rate is warranted. Consequently, academic term salaries shall not be augmented either in rate or in total amount for research performed during the academic term. Rates of compensation for research conducted during non-academic (summer) terms shall not exceed the rate for the academic terms. When part or all of a person's services are to be charged as project costs, it is expected that the person will be relieved of an equal part or all of his or her regular teaching or other obligations. For each person or position, provide the following information:

i. The basis for the direct labor hours or percentage of effort (e.g., historicalhours or estimates);

ii. The basis for the direct labor rates or salaries. Labor costs should be predicted upon current labor rates or salaries. These rates may be adjusted upward for forecast salary or wage cost-of-living increases that will occur during the agreement period. The cost proposal should separately identify the rationale applied to base salary/wage for cost-of living adjustments and merit increases. Each must be fully explained;

iii. The portion of time to be devoted to the proposed research, divided between academic and non-academic (summer) terms, when applicable;

iv. The total annual salary charged to the research project; and any details that may affect the salary during the project, such as plans for leave and/or remuneration while on leave.

Note: There is no page limitation for budget proposals or budget justifications.

b. *Fringe Benefits and Indirect Costs (Overhead, G&A, and Other)*: The most recent rates, dates of negotiation, the base(s) and periods to which the rates apply must be disclosed and a statement included identifying whether the proposed rates are provisional or fixed. If the rates have been negotiated by a Government agency, state when and by which agency. A copy of the negotiation memorandum should be provided. If negotiated forecast rates do not exist, applicants must provide sufficient detail to enable a determination to be made that the costs included in the forecast rate are allocable according to applicable cost provisions. Applicants' disclosure should be sufficient to permit a full understanding of the content of the rate(s) and how it was established. As a minimum, the submission should identify:

i. All individual cost elements included in the forecast rate(s);

ii. Basis used to prorate indirect expenses to cost pools, if any;

iii. How the rate(s) was calculated;

iv. Distribution basis of the developed rate(s);

v. Basis on which the overhead rate is calculated, such as "salaries and wages" or "total costs;" and

vi. The period of the applicant's FY.

c. *Permanent Equipment*: If facilities or equipment are required, a justification why this property should be furnished by the Government must be submitted. State the organization's inability or unwillingness to furnish the facilities or equipment. Applicants must provide an itemized list of permanent equipment showing the cost for each item. Permanent equipment is any article or tangible nonexpendable property having a useful life of more than one year and an acquisition cost of $5,000 or more per unit. The basis for the cost of each item of permanent equipment included in the budget must be disclosed, such as:

i. Vendor Quote: Show name of vendor, number of quotes received and justification, if intended award is to other than lowest bidder.

ii. Historical Cost: Identify vendor, date of purchase, and whether or not cost represents lowest bid. Include reason(s) for not soliciting current quotes.

iii. Engineering Estimate: Include rationale for quote and reason for not soliciting current quotes.

If applicable, the following additional information shall be disclosed in the applicant’s cost proposal:

iv. Special test equipment to be fabricated by the awardee for specific research purposes and its cost.

v. Standard equipment to be acquired and modified to meet specificrequirements, including acquisition and modification costs, listed separately.

vi. Existing equipment to be modified to meet specific research requirements, including modification costs. Do not include equipment the organization will purchase with its funds if the equipment will be capitalized for Federal income tax purposes. Proposed permanent equipment purchases during the final year of an award shall be limited and fully justified.

vii. Grants and cooperative agreements may convey title to an institution for equipment purchased with project funds. At the discretion of the Contracting/Grants Officer, the agreement may provide for retention of the title by the Government or may impose conditions governing the equipment conveyed to the organization per the governing laws and regulations.

d. *Travel*: Forecasts of travel expenditures (domestic and foreign) that identify the destination and the various cost elements (airfare, mileage, per diem rates, etc.) must be submitted. The costs should be in sufficient detail to determine the reasonableness of such costs. Allowance for air travel normally will not exceed the cost of round-trip, economy air accommodations. Specify the type of travel and its relationship to the research project. Requests for domestic travel must not exceed $3,000 per year per PI. Separate, prior approval by the USMA is required for all foreign travel (i.e., travel outside the continental U.S., its possessions and Canada). Foreign travel requests must not exceed $1,800 each per year per PI. Special justification will be required for travel requests in excess of the amounts stated above and for travel by individuals other than the PI(s). Individuals other than the PI(s) are considered postdoctoral associates, research associates, graduate and undergraduate students, secretarial, clerical, and other technical personnel.

Additional travel may be requested for travel to Army laboratories and facilities to enhance agreement objectives and to achieve technology transfer.

i. *Participant Support Costs*: This budget category refers to costs of transportation, per diem, stipends, and other related costs for participants or trainees (but not employees) in connection with USMA-sponsored conferences, meetings, symposia, training activities, apprenticeships and workshops (see the "Other Programs" section as described eAClier in this BAA). Generally, indirect costs are not allowed on participant support costs. The number of participants to be supported should be entered in the parentheses on the budget form. These costs should also be justified in the budget justification page(s) attached to the costproposal.

ii. *Materials, Supplies, and Consumables*: A general description and total estimated cost of expendable equipment and supplies are required. The basis for developing the cost estimate (vendor quotes, invoice prices, engineering estimate, purchase order history, etc.) must be included. If possible, provide a materiallist.

iii. *Publication, Documentation, and Dissemination*: The budget may request funds for the costs of preparing, publishing, or otherwise making available to others the findings and products of the work conducted under an agreement, including costs of reports, reprints, page charges, or other journal costs (except costs for prior or eACIy publication); necessary illustrations, cleanup, documentation, storage, and indexing of data and databases; and development, documentation, and debugging of software.

iv. *Consultant Costs*: Applicants normally are expected to utilize the services of their own staff to the maximum extent possible in managing and performing the project's effort. If the need for consultant services is anticipated, the nature of proposed consultant services should be justified and included in the technical proposal narrative. The cost proposal should include the names of consultant(s), primary organizational affiliation, each individual's expertise, daily compensation rate, number of days of expected service, and estimated travel and per diem costs.

v. *Computer Services*: The cost of computer services, including computer-based retrieval of scientific, technical, and educational information, may be requested. A justification/explanation based on the established computer service rates at the proposing organization should be included. The budget also may request costs, which must be shown to be reasonable, for leasing automatic data processing equipment. The purchase of computers or associated hardware and software should be requested as items of equipment.

vi. *Sub-awards (Subcontracts or Sub-grants)*: A precise description of services or materials that are to be awarded by a sub-award must be provided. For sub-awards totaling $10,000 or more, provide the following specific information:

- A clear description of the work to be performed;

- If known, the identification of the proposed sub-awardee and an explanation of why and how the sub-awardee was selected or will be selected;

(1) The identification of the type of award to be used (cost reimbursement, fixed price, etc.);

(2) Whether or not the award will be competitive and, ifnoncompetitive, rationale to justify the absence of competition; and

(3) A detailed cost summary.

e. *ODCs*: Itemize and provide the basis for proposed costs for other anticipated direct costs such as communications, transportation, insurance, and rental of equipment other than computer related items. Unusual or expensive items must be fully explained and justified.

f. *Profit/ Fee*: Profit/fee is not allowed for the recipient of or sub-award to an assistance instrument, where the principal purpose of the activity to be carried out is to stimulate or support a public purpose (i.e., to provide assistance), rather than

acquisition (i.e., to acquire goods and services for the direct benefit of the Government). A sub-award is an award of financial assistance in the form of money, or property in lieu of money, made under a DoD grant or cooperative agreement by a recipient to an eligible sub-recipient. The term includes financial assistance for substantive program performance by the sub-recipient of a portion of the program for which the DoD grant or cooperative agreement was made. It does not include the recipient's procurement of goods and services needed to carry out the program.

g. *Subcontracting Plan*: Subcontracting plans do not apply to assistance instruments.

h. *FCCM*: If cost of money is proposed, a completed FCCM (DD Form 1861) is required.

APPENDIX 1: TABLE OF ACRONYMS

AA	Assessment and Analysis
ACC	Army Contracting Command
AFARS	Army Federal Acquisition Regulation Supplement
AOR	Authorized Organization Representative
APG	Aberdeen Proving Ground
AR	Army Regulation
ACI	Army Cyber Institute
ARO	Army Research Office
ASA(ALT)	Assistant Secretary of the Army for Acquisition, Logistics, and Technology
BAA	Broad Agency Announcement
CAGE	Commercial and Government Entity
CCE	Core Campaign Enablers
CFR	Code of Federal Regulations
CFDA	Catalog of Federal Domestic Assistance
COTS	Commercial Off the Shelf
CPFF	Cost Plus Fixed Fee
CSA	Chief of Staff of the Army
DA	Department of Army
D&B	Dun and Bradstreet
DBA	Doing Business Name
DCAA	Defense Contract Audit Agency
DCMA	Defense Contract Management Agency
DFARS	Defense Federal Acquisition Regulation Supplement
DLSC	Defense Logistics Service Center
DoD	Department of Defense
DoDI	Department of Defense Instruction
EDWOSB	Economically-Disadvantaged Woman-Owned Small Business
FAPIIS	Federal Awardee Performance and Integrity Information System
FAR	Federal Acquisition Regulation
FCCM	Facilities Capital Cost of Money
FFRDC	Federally Funded Research and Development Center
FSC	Federal Service Code
FWA	Federal Wide Assurance
FY	Fiscal Year
G&A	General and Administrative
GFD	Government Furnished Data
GFE	Government Furnished Equipment
GFI	Government Furnished Information
GFP	Government Furnished Property

GSA	General Service Administration
HBCU/MI	Historically Black Colleges and Universities and Minority-Serving Institutions
HRPO	Human Research Protection Official
HSR	Human Subjects Research
HUBZone	Historically Underutilized Business Zone
IR&D	Independent Research and Development
IRB	Institutional Review Board
IS	Information Sciences
IT	Information Technology
ITAR	International Traffic in Arms Regulation
KCI	Key Campaign Initiative
ODC	Other Direct Cost
OMB	Office of Management and Budget
OHRP	Office for Human Research Protections
OTA	Other Transaction for Prototype
PAM	Pamphlet
PDF	Portable Document Format
PI	Principal Investigator
POC	Point of Contact
PWS	Performance Work Statement
R&D	Research and Development
ROTC	Reserve Officer Training Corps
R&R	Research and Related
RTP	Research Triangle Park
SAM	System for Award Management
SDB	Small Disadvantaged Business
SDO	Suspension and Debarment Official
SDVOSB	Service-Disabled Veteran-Owned Small Business
SF	Standard Form
TIA	Technology Investment Agreement
TIN	Taxpayer Identification Number
TPOC	Technical Point of Contact
UIC	Unit Identification Code
U.S.C.	United States Code
USDA/APHIS	Department of Agriculture Office of Animal and Plant Health Inspection Service
USMA	United States Military Academy
VOSB	Veteran-Owned Small Business
WOSB	Woman-Owned Small Business