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Research and Development Directorate (RD)

Enabling Capabilities Department (EC)

Adaptive Signature Discovery University Research Alliance (ASD-URA)

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OVERVIEW INFORMATION

Agency Name:

Defense Threat Reduction Agency (DTRA)
Research and Development (RD) Directorate
Enabling Capabilities Department (EC)
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Fort Belvoir, VA 22060-6201

Funding Opportunity Title: Adaptive Signature Discovery University Research Alliance (ASD-URA) Broad Agency Announcement (BAA)

Announcement Type: This is an initial announcement of this funding opportunity.

Funding Opportunity Number: HDTRA1-19-S-0002

Catalog of Federal Domestic Assistance (CFDA) Number: 12.351

Dates: Applicants must submit a Letter of Intent (LoI) no later than 21 June 2019 to be considered eligible to submit a Phase I pre-proposal. Phase I pre-proposal submissions are due on 17 July 2019.

ADDITIONAL OVERVIEW INFORMATION

Purpose: DTRA is seeking to support research to investigate scientific means to better understand current and emerging Weapons of Mass Destruction (WMD) threats and threat networks, and discover better methods for seeking changing signatures of these networks and the pathways that lead to their development. Findings from this basic research are anticipated to help support future identification of proactive measures to counter WMD threats.

WMD threat detection cannot always be achieved optimally by individual physical methods alone, such as a particular sensor modality. Thus, multiple types of sensors are often employed in harmony to contextualize information from collected data. Research involving scientific areas such as cultural anthropology, mathematical sociology, and physical science using tools like multimodal data fusion, game theory, and machine learning may provide new pathways to explore WMD threat predictions because the sum of physical observation and social interpretation may be stronger than either alone. No verified deterministic general theory of human behavior or social networks exists. For the purposes of this BAA, it is anticipated that an interdisciplinary effort, in which physical and social scientists work together in an integrated team, will yield insights into new measures to defeat WMD.

The overarching goal of the Adaptive Signature Discovery (ASD) University Research Alliance (URA), collectively known as ASD-URA, is to investigate the ability to deduce and be responsive to adversary capability and intent with WMDs and extract actionable information using evolving data from multimodal sensors (including imaging), physical networks, and social networks. The research performed by the URA must utilize active collaboration between the individual disciplines. The intent is to enable a team to model, predict, and discover emerging threats under a framework of broader sensor network theories, namely adaptive networks. Methods supported under this ASD effort should be useful for either strategic peer-competitor

threats or more vague/non-state threat landscape determination.[1] A signature in this effort is a piece of information derived from data correlated to an event or object of interest. This is not a data gathering effort, nor is it solely data fusion. Instead, the project is exploring adaptive approaches to the fusion of information to extract knowledge about adversary capabilities and intents with WMDs. The focus of the ASD-URA is on theory, modeling, and simulation. Proposed efforts should not include the design, development, or fabrication of hardware or extensive experimentation.

DTRA anticipates that the predominance of work conducted by the ASD-URA will be fundamental research as defined in National Security Decision Directive (NSDD) 189, National Policy on the Transfer of Scientific, Technical, and Engineering Information. Initially the research conducted by the ASD-URA will align under Budget Category 6.1 (Basic Research) funding. However, to provide the Government with the most flexibility, the cooperative agreement (CA) will also allow participation from other Government agencies and may result in additional Budget Category 6.1 funding as well as some Budget Category 6.2 funding (Applied Research funding; see discussion of Enhanced Program in Section 1.6). Thus, the research conducted for the ASD-URA will fall within the first four Technology Readiness Levels (TRLs).

DTRA envisions that the results of the ASD-URA research will be efficiently and rapidly transitioned to applied DTRA research and development programs.

Award Instrument and Structure: This Broad Agency Announcement (BAA) is expected to result in the award of a Cooperative Agreement (CA) as defined at 31 United States Code (U.S.C.) 6305 for the execution of the program. The CA will be awarded to an Alliance of organizations that may include U.S. institutions of higher education, DoD-Degree Granting Colleges and Universities, and DoD Service Labs. At this time, performance under the CA is not limited to individuals designated as U.S. Persons; however, individual participation could be limited in the future based on DoD policy changes.

The Alliance must be led by a U.S. institution of higher education charged with spearheading the focused basic research program; this organization will be designated as the Lead Research Organization (LRO). Each Research Area (RA) will be led by a different U.S.-based institution of higher education; these organizations will be designated as the Lead Research Area Organizations (LRAOs). The LRO may act as the LRAO for one RA; however, the same entity cannot be the LRAO for more than one RA. Together the LRO and LRAOs make up the permanent Alliance members, who are responsible for shaping and steering the URA through collaboration with DTRA. Collectively the URA members and DTRA make up the Consortium. Performance under the URA and resulting CA will likely also include organizations beyond the LRAOs as subawardees to the LRO. These subawardees are non-permanent members of the URA.

Alliances are encouraged to include Historically Black Colleges and Universities and Minority Institutions defined in 10 U.S.C. § 2362(e).

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[1] Anticipation of threat landscapes includes but is not limited in scope to current or future potential threats such as EMP (SREMP, HEMP, SGEMP), cyber vulnerability on NC3 and civilian systems, geophysical natural disasters triggered by red team actions, neocortical interface exploits, nanotechnology-based security threats, and 4th gen tailored nuclear weaponry. *Technical Horizon Research Evolution Anticipation Tool (THREAT),* Gallup Gov., June 2018.

While DTRA anticipates that a single award may be made from this BAA, the Government reserves the right to fund all, some, or none of the proposals submitted; may elect to fund only part of any or all proposals; and may incrementally fund any or all awards under this BAA. The Government also reserves the right to request applicants make any changes necessary to documents submitted as part of an application package to increase the feasibility of making the proposal fundable. Applicants may decline to participate in any revisions to application packages requested by DTRA.

Proposal Submission: The BAA will be conducted in two phases; however, applicants must submit a non-binding LoI to be considered eligible to submit a Phase I package. Phase I is for receipt and evaluation of pre-proposal submissions. Phase II is for receipt and evaluation of invited proposal packages. Invitation to submit a Phase II proposal will be based on the evaluation results of the Phase I pre-proposal submission.

The LoI is required; however, it is not legally binding and does not enter into the review of Phase I or Phase II packages. The information in the LoI will allow DTRA to estimate the potential review workload and plan for the review. By 21 June 2019, prospective LROs must submit a LoI to the email address in Section 7 to be eligible to submit a Phase I Pre-Proposal. The LoI should minimally include the following information:

- Identification of the LRO and the LRAOs
- Name, address, and email address of the ASD-URA PM
- Names and associated affiliations of other known key personnel
- A list of participating institutions known at the time of the letter preparation
- Number and title of this BAA

All submissions must be made in accordance with the submission instructions in this BAA through www.grants.gov using the application packages linked with this BAA (under the "Package" tab) on www.grants.gov. Applicants are responsible for ensuring compliant and final submission of all applications. Any submission that does not conform to the requirements outlined in the BAA and in the invitation for Phase II submissions will not be reviewed or considered further.

Period of Performance: Efforts may be proposed for three years with two additional two year options. The total possible period of performance is seven years.

Funding: Estimated funding for the CA is anticipated to be $5M annually (total, including both direct and indirect costs) depending on the nature and the scope of work. This BAA is issued subject to the availability of funds. The funding levels provided are to allow applicants to prepare estimates only. Payments on CAs will be made in advance, subject to the conditions described in 2 Code Federal Regulations (CFR) 200.305.

Profit/Fee: In accordance with 32 CFR §22.205, profit/fee is not permitted under the CA.

Cost Sharing: Cost sharing is not required under this BAA; however, efforts that include cost sharing or in kind contributions are allowed.

Terms and Conditions of Awards: Any CA awarded under this announcement will be governed by the award terms and conditions, which conform to DoD's implementation of The

Office of Management and Budget (OMB) circulars applicable to financial assistance. This includes DoD implementation of OMB guidance in 2 CFR part 200, "Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards."

1. PROGRAM DESCRIPTION

1.1. Introduction

The Defense Threat Reduction Agency (DTRA) safeguards America and its allies from weapons of mass destruction (WMD) and provides capabilities to reduce, eliminate, and counter the threat and effects from chemical, biological, radiological, nuclear, and high yield explosives. DTRA seeks to identify, adopt, and adapt emerging, existing and revolutionary sciences that may demonstrate high payoff potential to Counter-WMD (C-WMD) threats. As a combat support agency, DTRA provides both operational support and specialized capabilities in science and technology (S&T). The Agency is the premier Department of Defense (DoD) source of science-based WMD expertise and a sponsor of basic research focused exclusively on WMD threat reduction.

Overcoming the most difficult technical challenges for combatting WMD requires revolutionary advancements in S&T. Only strategic investment in basic research will lead to the scientific breakthroughs needed for future WMD threat reduction. The strategy for the basic research program is to target unique C-WMD challenges within DTRA's mission space. The program's goals are as follows:

- Train the next-generation workforce;
- Advance the fundamental knowledge and understanding in the sciences;
- Promote university research to support WMD threat reduction; and
- Facilitate transition of research that enables new capabilities for the warfighter.

The program avoids preconceptions about specific applications or solutions in order to preserve the integrity of basic research. However, to maintain the relevance of the program to the larger DTRA mission and to ensure focus on the strategic goal of transitioning the research to enable new capabilities for the warfighter, the applied research requirements across the Agency are used to inform our choices. This approach has successfully attracted outstanding research institutions and a new generation of scientists into the field of WMD threat reduction. It also provides a hedge against the uncertainty of future threats and technology surprise.

To continue and expand on the program's success to date, DTRA is evolving the investment strategy for basic research. DTRA intends to establish a new collaborative venture that seeks to investigate Adaptive Signature Discovery (ASD) in the context of future WMD-relevant operations through a new University Research Alliance (URA) that will consist of United States (U.S.) university researchers working to solve complex problems. The overall objective is to develop a fundamental understanding of the adaptive nature of information correlation with images, sensory data, social networks, and physical networks. Research specialties can involve cultural anthropology, detection sciences, mathematical sociology, machine learning and other artificial intelligence, multimodal data fusion, network analysis, and other techniques. The wide-ranging expertise will support the development of predictive models of an adversary's adapting capability and intent to acquire, proliferate, or use WMDs.

DTRA strongly believes that a joint collaborative approach by a multidisciplinary team of researchers is required to make fundamental advances towards meeting the Adaptive Signature Discovery University Research Alliance (ASD-URA) goals. DTRA has identified three interrelated Research Areas (RAs) that, when jointly studied, will advance the theoretical

foundations of ASD in the context of future operations. Those three areas are as follows:

- RA1—Image correlation with context enhanced data fusion,
- RA2—Physical network response, and
- RA3—Social networks.

In addition to these three RAs, Understand Adaptive Threat Responses and Counter-Threat Responses is a Cross-Cutting Research Initiative (CCRI) that is inherent in each of the RAs. This modeling must cover feedback loops and control (i.e., observability/data collection, controllability/actuation, and stability/convergence of response and counter-response) as framed within a game theoretic scenario. This predictive modeling involves both adversary and friendly forces.

The ASD-URA is intended to create a collaborative environment that enables the Alliance to advance the state-of-the-art and to take advantage of the diverse scientific capabilities and viewpoints of both the academic sector and government personnel. The ASD-URA will work collaboratively with DTRA Technical Points of Contact (TPOCs) to develop research programs and identify areas where joint, multidisciplinary, collaborative research is advantageous. Continuous collaboration through technical exchanges, site visits, student development, outreach, etc. opportunities will strengthen and improve the ASD-URA research and its relevance to the DoD.

As part of the URA, DTRA Program Managers (PMs)/scientists/engineers may have substantial involvement, including engaging in deep and meaningful collaborative research across the URA team.

1.2. Programmatic Strategy

The Cooperative Agreement (CA) will be awarded to an Alliance of organizations that may include U.S. institutions of higher education, DoD-Degree Granting Colleges and Universities, and DoD Service Labs.

The Alliance will work in collaboration with DTRA TPOCs to advance the state-of-the-art in ASD to meet the challenges of future military operations. DTRA and the URA selected for award will establish the Consortium that will work collaboratively to conduct basic research addressing key scientific gaps and barriers critical to ASD. Additionally, other government agencies may participate in the ASD-URA and contribute their technical expertise, personnel, and facilities. This intellectual synergy is also expected to include sharing equipment, personnel, and facilities to promote efficiency and enhance collaboration.

It is anticipated that the predominance of work conducted by the ASD-URA will be fundamental research as defined in National Security Decision Directive (NSDD) 189, National Policy on the Transfer of Scientific, Technical, and Engineering Information. Fundamental research is basic and applied research in science and engineering, the results of which ordinarily are published and shared broadly within the scientific community as distinguished from proprietary research and from industrial development, design, production, and product utilization, the results of which ordinarily are restricted for proprietary or national security reasons. Contracted fundamental research includes research performed that is (a) funded by Budget Category 6.1 (Basic Research), whether performed by universities or industry or (b) funded by Budget Category 6.2

(Applied Research) performed on-campus at a university[2]. Fundamental research provides for science and Technology (S&T) research and early applied development. It seeks to lower performance risk to a manageable level and facilitate transition and funding to capability end-state programs.

Initially the research conducted by the ASD-URA will align under Budget Category 6.1 (Basic Research) funding. However, to provide the Government with the most flexibility, the CA will also allow participation from other Government agencies and may result in additional Budget Category 6.1 funding as well as some Budget Category 6.2 funding (Applied Research funding; see discussion of Enhanced Program below). Thus, the research conducted under the ASD-URA CA will fall within the first four Technology Readiness Levels (TRLs). TRLs provide a systematic metric/measurement system that supports assessments of the maturity of a particular technology and the consistent comparison of maturity between different types of technology.

The research strategy developed by the applicant should adopt a systematic approach to fundamental research focused on understanding how adaptive signatures from image correlation, physical networks, and social networks can be used to uncover evolving adversary capabilities and intents with WMDs. This research should lead to an elucidation of fundamental laws, theories, and theoretically grounded and empirically validated models that enable design of dynamic, adaptive, and goal-driven techniques to predict and discover adversary adaptive intents and capabilities with WMDs. An adaptive adversary is one that responds to their perception of our forces, sensor deployment and tactics, actions and potential courses of action in countering their use or threat to use WMD. Their capabilities include any: (1) WMD weapons and forces, and (2) general purpose forces specifically supporting their use of WMD. Intent and capabilities are considered adaptive when an adversary responds to their situational awareness, for example by a step-up of their postures for use of WMD forces.

Applicants must carefully choose research topics to ensure a critical mass of researchers addressing the challenges proposed. Applicants are expected to apply relatively equal resources to each of the three RAs: image correlation, physical networks, and social networks. Research in each RA must be interdisciplinary in order to inform and be informed by the developments in the other two RAs given the strong inter-dependencies between the three RAs. Applicants should consider that multiple Principle Investigators (PIs) and multiple institutions may have to work together in a matrixed organization to adequately meet the goals and objectives of the RAs. Each institution may participate in research across multiple RAs. Furthermore, the research dedicated to each area must address the CCRI. The CCRI resources are an integral part of the RA efforts.

This BAA aims to solicit the most creative, innovative, and flexible approaches to the ultimate goal of generating and exploiting research to solve pressing research gaps and issues impacting both the military and commercial sectors. This BAA seeks Phase I pre-proposal submissions and invited Phase II submissions; this BAA may result in the award of a single CA. In response to the BAA, applicants will be required to:

- Define the strategy for implementing an approach which synergistically integrates the three RAs and the CCRI and outline the metrics by which success of the program is

[2] Under Secretary of Defense for Acquisition, Technology and Logistics Memorandum, SUBJECT: Contracted Fundamental Research, dated 26 Jun 2008.

expected to be measured.

- Scope and define the research, appropriate to the overall funding of the URA, ensuring all elements of the proposed research are tightly integrated in a way that results of research in one area support and enhance the results in other areas. Applicants should identify the most critical research issues and describe how the set of research efforts meets the goals of this program. Sufficient resources should be allocated to ensure enough critical mass to make fundamental progress.
- Formulate a basic research program which clearly demonstrates innovative, detailed and substantive scientific plans to address each of the three RAs and the CCRI. The proposal should clearly articulate the applicant's vision for the area and the applicant's research goals for the program (the base period and for each additional option).
- Present the experience, qualifications and availability of the scientific staff and the quality and relevance of research facilities.
- Identify approaches to build collaborations within the Alliance and with DTRA, which are essential to the success of the ASD-URA.
- Identify the overall management (business plan) and programmatic and administrative team with the expertise to achieve the stated research goals and to oversee and manage finances, reporting, data, meetings, reviews and intellectual property.

1.3. Research Strategy

1.3.1. Definitions, Scope, and Rationale. For the purposes of this BAA, the following definitions of adaptive, signature, and discovery are used:

- Adaptive: ability to change, understand and respond to changes in an adversary's physical or social network structures
- Signature: a piece of information derived from data correlated to an event or object of interest.
- Discovery: extraction of a WMD adversary's capabilities and intent from correlated signatures.

New pathways should be explored to extract information about WMD capability and intent using evolving data from multimodal sensors and other data sources combined with information about adapting physical and social networks to improve WMD threat and consequence/risk predictions.

The findings of this research have DoD relevance. Image correlation and pattern recognition of people, materials, infrastructure or objects associated with WMD threats or activities moving in space and time may provide an adaptive signature that elucidates adversary intent and behavior. Similarly, adapting physical or social networks may help identify an adversary's intent with WMDs or ability to reconstitute during a dynamic tempo of hostile actions. Social networks can contribute to the discovery of covert networks and identify attempts to assemble military networks or exploit critical war-supporting infrastructure. The warfighter needs to recognize enemy obfuscation and intent in order to respond with appropriate proactive and preventative actions. This would result in adaptive defensive strategies. Methods to identify critical infrastructure based on adaptive signatures from correlated images, physical network detection, and social network studies would contribute to C-WMD threat capabilities.

Figure 1 below illustrates the general structure of the URA and the underlying RAs (RA1-RA3).

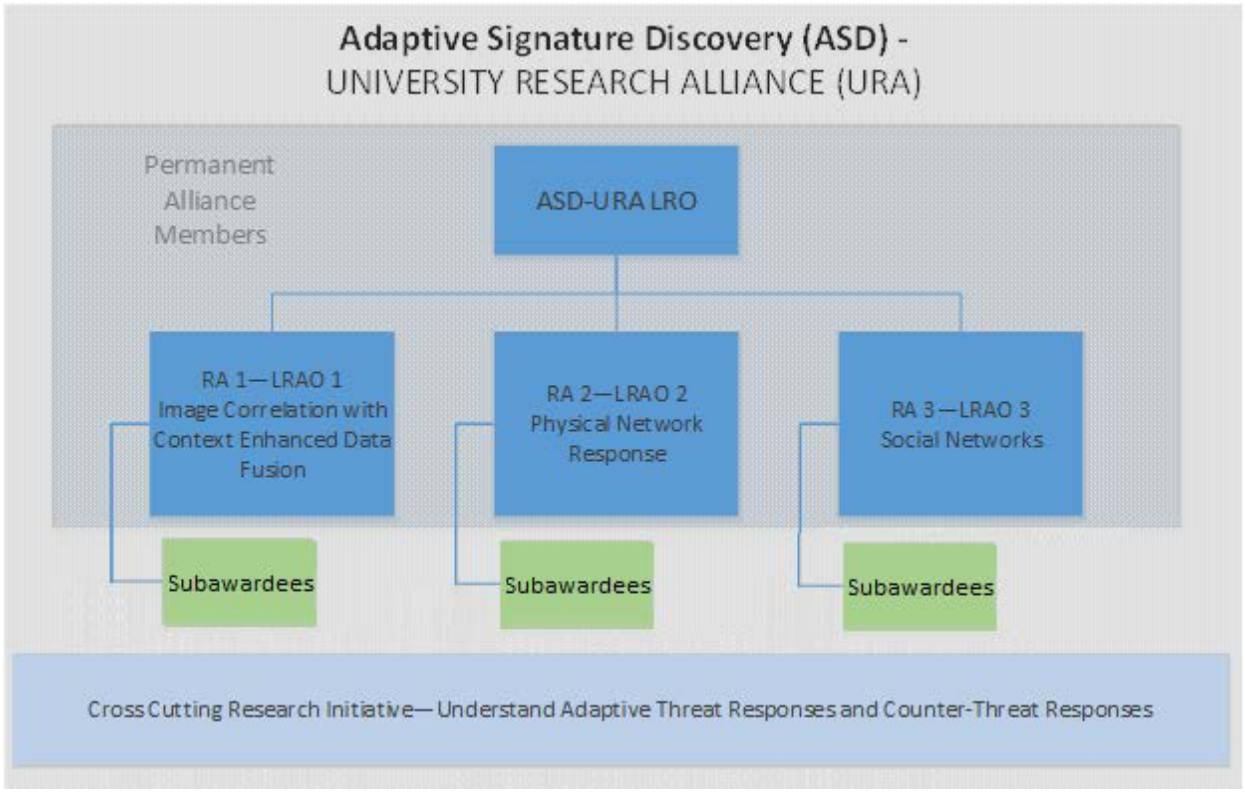


Figure 1: Potential structure of the ASD-URA.

1.3.2. Overview of Research Areas (RAs) and Cross Cutting Research Initiative (CCRI). Research findings from this BAA will help anticipate and understand future WMD threats and the networks and pathways that lead to their development. Future transition of the basic research will support the identification of proactive measures to counter the threats. The three RAs and the CCRI are:

- RA1—Image Correlation with Context Enhanced Data Fusion: Correlation of images with additional sensor information using physical variables, human behavior, and context to support determination of adversarial intent.
- RA2—Physical Network Response: Understand network transient reactive responses in data sparse environments for detection of infrastructure that may be missing from the sensor data, and experiment with physical networks for purposes of detection/actuation[3] leading to control of military C-WMD.
- RA3—Social Signature: Detection of signatures[4] associated with human behavior under duress and use of statistical and deterministic group dynamics to create simple rules describing emergent signatures associated with WMD intent and threat capability.
- CCRI—Understand Adaptive[3] Threat Responses and Counter-Threat Responses: During

[3] *Adaptive Cooperative Systems* – Martin Beckerman, John Wiley and Sons, 1997.

[4] *Social, Cultural, Behavioral Modeling* – 11th Int. Conference Proc., SBP Brims, July 10-13, 2018.

the investigation of the research areas above, the science of complex adaptive systems is explored for three discrete research areas. Each area needs to be studied with continuous awareness of developments as they occur in the other areas. This creates an iterative process in which each of the three research areas contributes to the developments within a coordinated framework for ASD. The body of mathematics and design of experiments associated with adaptive science is the cross cutting focus.

Each RA has its own unique theme, but these must not be conducted as stand-alone research projects. It is expected that the participants will be actively engaged with team members from the other RAs throughout the research. Communication and responsive, iterative research will yield a better integrated result. The RAs will be aided in this by on-going consideration of the CCRI and by active management of the URA.

1.3.3. RA1—Image Correlation with Context Enhanced Data Fusion. There is no shortage of sensor data or images, but there is room to extract more valuable information from these images that leads to actionable information for WMD discovery using contextualized data or multisensor data fusion. Additionally, methods that can handle data gaps or large volumes of data from multiple sensor types to build a WMD threat picture should be investigated. Investigations into pattern recognition in an adapting environment are encouraged and should be investigated as well. Extraction of information about static or immobile objects should be included in the discovery process. Similarly, information about dynamic or mobile objects should be collected and analyzed in order to interpret adversary intent.

The following questions are examples of research issues that may help frame the scope of subareas. Other questions that are relevant to this area may also be proposed by the PIs.

- Can imaging be used to predict or identify enemy obfuscation?
- Can image correlation be used to create preventative and proactive measures?
- Given that images alone are less valuable than the coupling of images to other sparsely collected measurements, how can multiple types of separate measurements be coupled (i.e., fused) to discover adversary capability, potential, or intent?
- Is it necessary to effectively couple physical observations with individual human behavior and group intent or potential for action; what are the significant sets of multimodality detections that best provide opportunity for C-WMD?
- Given that physical, social, and image information frequently needs to be considered and understood together with an emphasis on multimodal sensor analysis, what information techniques can be used to fuse data from different sensors for quick analysis and actionable information?
- How can evolving classification/clustering approaches or other methods facilitate adaptive pattern recognition?

1.3.4. RA2—Physical Network Response. Physical networks provide a dual opportunity to discover adaptive signatures. Physical networks can be used to understand adversary military capability. Study of the adaptive game for physical networks can also provide solutions for improving our network capabilities. For example, examining transient reactive response can help to recognize changes in infrastructure and identify missing components. Data sparse methods and experimentation with physical networks should be studied as potential techniques to

control, identify, or counter adversary WMD capabilities.

The following questions are examples of research issues that may help frame the scope of subareas. Other questions that are relevant to this area may also be proposed by the PIs.

- What techniques can help with transient/harmonic analysis of nonlinear dynamic systems?
- Can strong perturbative approaches be created for characterization of transients in potential WMD-threat data?
- How can the limits of data sparse environments be quantified and categorized, and how do these environments resolve as new modalities are introduced?
- What experiments and control variables within physical networks lead to detection/actuation effects for control of individual and group (social) response?
- Can we anticipate intent by identification of new infrastructure components during the construction phase?

1.3.5. RA3—Social Signature. Social networks should be investigated and used to develop methods to detect and understand signatures associated with adaptive human behavior under duress.[4] Statistical and deterministic emergent group dynamics should be investigated to learn about adversary capability and intent with WMDs. Social networks should be leveraged to provide information about civilian or military physical infrastructure and determine when further actuations are valuable (e.g. theft of plans). Social networks should be used to discover covert networks and identify attempts to move toward assembly of military networks. Social network information from image processing can be built using case studies as WMD analogues. Adaptive social network intelligence can be used to guide wide area search for WMD. Another very important subarea for this research is to recognize development pathways that are leading to distinctly novel forms of WMD threat capability.

The following questions are examples of research issues that may help frame the scope of subareas. Other questions that are relevant to this area may also be proposed by the PIs.

- How can signatures associated with adaptive human behavior under conditions that may be applicable to WMD social networks be identified?
- What patterns of activity are strong dynamic signatures for adversary WMD activity (e.g. production, transportation, preparation for launch, etc.)? Can the signatures of adapting social networks be used to determine if an adversary is preparing to attack?
- What statistical or deterministic methods can be used to identify emergent group dynamics of interest for discovery of threats?
- Are there discernible “simple rules” that explain emergent, apparently-complex behavior and corresponding signatures associated with WMD intent and threat capability?
- Can social information be combined with imaging to recognize what is physically happening, with an emphasis on visual aspects augmented with other sensor modalities to “see” the activity?
- How does one discover if an adversary is using fundamental science and/or technology surprise to create completely new types of WMDs? What are the corresponding

signatures?

1.3.6. CCRI—Understand Adaptive Threat Responses and Counter-Threat Responses. The novel approach underlying this URA is the adaptive game of discovering signatures in a rapidly changing environment and being able to flexibly adapt our sensing strategies, for both physical and human behavior variables, to compensate for changes in the adversary's game. The research framework leans on the mathematics associated with uncertain programming and emergence that occurs from non-synchrony and non-cooperative systems. Most of what has been studied has been alignment from cooperating systems, such as the Ising model in multiple dimensions, for example. When we impose non-cooperation, cloaking, hidden information, and adaptive red teams we expect emergence of insights for real-time adaptation of our sensor network of networks. We seek to explore this adaptive phenomena.[3]

1.4. Structure and Management

It is critical that the ASD-URA be structured and managed to create and foster an open, collaborative research environment. This section describes a framework for the organization of the ASD-URA. The lightweight framework is flexible to minimize overhead, yet ensure research relevance and proper oversight. Applicants can suggest additional management tools and mechanisms as part of the proposal, but in doing so they must also justify and demonstrate the benefit and cost effectiveness of these additional management activities.

DTRA and the ASD-URA will collectively be referred to as the ASD-Consortium. Other Government agencies may be invited to join the ASD-Consortium and to contribute, as appropriate, their technical expertise, personnel, access to research facilities, and funding. Given that the research program may be enhanced during the lifetime of the CA, applicants should suggest a procedure for how the enhanced program may be considered and incorporated by the ASD-URA.

The ASD-URA will strive for a focused, yet flexible research environment. The ASD-URA will be led by a single U.S. institution of higher education that will be designated as the Lead Research Organization (LRO). The LRO will be charged with spearheading the focused basic research program and must have the ability to integrate the broad palette of research required to realize the goals of the ASD-URA. Each RA will be led by a different Lead Research Area Organization (LRAO); each LRAO will be a U.S. institution of higher education. One of the LRAOs could also be the LRO; however, the same entity cannot be the LRAO for more than one RA. Together the LRO and LRAOs make up the permanent members of the ASD-URA, who together are responsible for shaping and steering the Alliance through collaboration with DTRA. Collectively, the URA members and DTRA make up the ASD-Consortium.

Performance under the CA should also include additional organizations (over and above the LRO and LRAOs) as subawardees to round out the technical expertise and research tasks in a given RA. Any such organizations are expected to be subawardees to the LRO and will be considered as non-permanent members of the ASD-URA. The non-permanent members of the URA may consist of U.S. institutions of higher education, DoD Service Laboratories, and DoD Degree-Granting Colleges and Universities possessing the required expertise. Given the likelihood that the non-permanent members will change over the lifetime of the CA, applicants may suggest potential subawardees as part of their proposed team; however, full details on subawardees are not required in the full proposal. Applicants should also suggest a process for consideration and incorporation of new organizations into the research program.

Alliances are encouraged to include Historically Black Colleges and Universities and Minority Institutions defined 10 U.S.C. § 2362(e).

1.4.1. Technical Guidance and Oversight. The following framework is required for the management and oversight of the ASD-Consortium. Applicants may propose additional plans or mechanisms for management; however, applicants are cautioned to ensure that any such plans or mechanisms are: (1) not duplicative of the requirements and (2) not overly burdensome to the Alliance. A description of each component of the ASD-Consortium management follows:

- Cooperative Agreement Manager (CAM). The integrated scientific management and fiscal responsibility for the URA will reside with the DTRA Basic Research Manager, who will be designated the CAM for the ASD-URA under the CA. The Grants Officer will receive recommendations from the CAM and will be the ultimate legal authority empowered to make formal modifications to the CA.
- Technical Points of Contact (TPOCs). The TPOCs are the government subject matter experts (SMEs) that are charged with the scientific stewardship of the RAs and CCRI. Each RA will have a DTRA TPOC. The TPOCs will work collaboratively to lead the CCRI efforts. The TPOCs will be heavily involved in the scientific management and review of the ASD-Consortium. The TPOCs will have significant responsibilities in the development of the Initial and Biennial Program Plans (IPP/BPP), fostering deep and persistent multidisciplinary research across the RAs, and performing day-to-day administrative duties associated with the RAs. The TPOCs will be the advisors to the CAM.
- Lead Research Organization (LRO). The LRO provides the overall research leadership for the Consortium. This responsibility includes the day-to-day management of the ASD-URA; oversight of the development of the IPP/BPP; participation in the research; promoting collaboration and technology transition; distributing Government funding to permanent and non-permanent members of the Alliance; and maintaining proper research invoicing. The LRO will designate an ASD-URA Program Manager (PM) from their organization who will be the Alliance's scientific and programmatic representative charged with providing management and guidance of the CA.
- Program Manager (PM). The ASD-URA PM is the LRO's scientific representative charged with the Alliance's overall responsibility for management and guidance of the CA. The PM is required to be an eminent scholar and have the stature, experience, and leadership skills to successfully execute the ASD-URA. It is also recognized that the PM may require support to manage and execute the CA, and this support should be included in the proposal submission.
- Lead Research Area Organizations (LRAOs). The LRAOs provide research leadership for a specific Research Area (RA). This responsibility includes supporting the PM in the development of the IPP/BPP, creating and fostering deep and persistent multidisciplinary research across the RAs, performing day-to-day administrative duties associated with the RAs, and conducting fundamental research in support of the ASD-URA. Each LRAO will identify a specific Research Area Lead (RAL) to represent the LRAO in Consortium planning and execution and to serve as a member in support of the PM and CAM during TMG meetings. If the LRO is also a LRAO, the PM and the RAL must be different individuals.

- Technical Management Group (TMG). The TMG is chaired by the CAM and consists of the PM, the three RALs, the corresponding RA Government TPOCs, and other senior DTRA scientific personnel as deemed appropriate by the CAM. The TMG will collaboratively lead the Consortium and assist the CAM and the PM in carrying out their duties concerning the ASD-URA. The RALs and the corresponding RA Government TPOCs will collaboratively lead the RAs through the TMG. The TMG will be responsible for the management and integration of the Alliance's efforts including programmatic, technical, reporting, financial, and administrative matters. In matters where a consensus cannot be reached amongst the TMG, the CAM will have final decision-making authority. The TMG makes recommendations that concern the membership of the Alliance, the definition of the tasks and goals of the participants, and the relative distribution of funding to the members and non-permanent subawardees. Quarterly meetings will be conducted by the TMG.
- Research Management Board (RMB). The RMB will be established by the CAM to identify and develop collaborative opportunities, advise and assist the CAM in setting research goals by providing advice into the BPP planning process, provide recommendations to the CAM for the option year execution, and facilitate transition of URA research to basic and applied research programs. The RMB will be chaired by the CAM and may include other senior DTRA scientific personnel as deemed appropriate by the CAM, the TPOCs, and other representatives from DTRA, as appropriate. Other service organizations and other Government agencies with interest and expertise in the technologies related to the ASD-URA may also be included at the discretion of the CAM. The RMB will be invited to the Technical Review and appropriate workshops. The RMB will also be invited to review the IPP and BPP.

1.4.2. Articles of Collaboration (AoC). The AoC define the operational structure and governance within the Alliance including:

- Membership and management
- Changes to Alliance membership
- Financial, personnel, facilities, and reporting requirements
- Intellectual property
- Information exchange guidelines
- Modifications to the AoC

Applicants invited to submit a proposal will be provided with a model AoC as part of their invitation to submit a proposal. The model AoC represents appropriate and necessary terms and conditions that the Government finds acceptable for operation of the ASD-URA. Applicants must submit the AoC with the proposal signed by a duly authorized representative for each proposed member of the Alliance. The model AoC can be executed by the proposed members of the Alliance "as is" or changes can be proposed. If changes are proposed, applicants are hereby informed that justification of any changes should be included with the proposal and such changes must be acceptable to the Government for the applicant to be eligible for award.

1.4.3. Initial Program Plan (IPP). Within 90 days after award, the PM will prepare an IPP through the TMG to cover the following nine-12 months of performance. The IPP will be based

substantially on the draft IPP submitted as part of the proposal from the Alliance. The IPP should provide a detailed description of well-coordinated research activities. The IPP will include a detailed description of the projects proposed to be undertaken by any non-permanent subawardees. The IPP will contain the Data Management Plan as an appendix.

The IPP should be accompanied by a seven-year roadmap that describes the overarching goals and objectives to be accomplished by the Alliance within the Consortium structure. This roadmap should provide the vision for goals to be addressed during the first three years of the Alliance and similar for the two additional two year option periods. It should provide approximate timelines for research activities to facilitate potential future basic research transitions.

The IPP and the roadmap will be submitted to the CAM for review and approval. The final, approved IPP will be submitted to the Grants Officer for incorporation into the CA.

1.4.4. Biennial Program Plan (BPP). Nine to 12 months after award, the PM will prepare a proposed BPP through the TMG for the next two fiscal years. The BPP will enable integration and execution of multidisciplinary, collaborative research that strives to achieve URA objectives.

The BPP will provide a detailed plan of research activities (including research goals, key personnel, collaboration opportunities, staff and student development opportunities, facilities, experiments and budget) that commits the Alliance to use their best efforts to meet specific research objectives. The BPP will also describe the collaborative efforts with the Government. The BPP will include a detailed description of the projects proposed to be undertaken by any non-permanent subawardees, including new non-permanent subawardees. The BPP will contain the Data Management Plan as an appendix.

The BPP will be submitted to the CAM for review and approval. The final, approved BPP will be submitted to the Grants Officer for incorporation into the CA. This process will continue through the life of the CA. Each BPP will cover a two-year timeframe, but may be altered, with the approval of the CAM and the Grants Officer, if research work requirements change.

During the course of performance, if it appears that research goals will not be met, the TMG will provide a proposed adjustment to the BPP for approval by the CAM. In addition, the CAM may from time to time request that additional research be added to the BPP within the scope of the CA. The Alliance, as an entity, will not solicit or accept funding from outside sources other than DTRA without the approval of the CAM and the Grants Officer.

During the course of performance, the Grants Officer, in coordination with the CAM, will have approval authority for certain specific changes to the IPP/BPP including but not limited to:

- Changes in the scope or the objective of the program, IPP/BPP, or research milestones;
- Change in the key personnel specified in the IPP/BPP;
- The absence for more than three months, or a 25% reduction in time devoted to the project, by the PM;
- The need for additional Federal funding; and
- Any subaward, transfer, or contracting out of substantive program performance under an award, unless described in the IPP/BPP.

1.4.5. Annual Technical Review Meeting. Each year, the ASD-URA must conduct a Technical Review that is open to the scientific community at-large where the research portfolio is presented by the PIs. Such a review is intended to allow the Alliance researchers to engage in face-to-face technical discussions as well as garner input on the technical achievements of the Alliance from the broader community. One goal of this meeting is to foster interactions and collaborations among researchers and allow Consortium research leadership to assess research progress. The emphasis for the review is on collaborations (especially multi-disciplinary, cross-RA collaborations), experimentation/validation plans, and possible transition opportunities.

Planning for the annual Technical Review Meeting will be conducted by the TMG. The annual Technical Review Meeting will be executed by the Alliance. A hosting will be agreed upon among the permanent Alliance members in the Washington, D.C. area.

DTRA strongly encourages student and post-doctoral fellow participation in the annual technical review meetings. It is, however, recognized that such participation must be balanced with the associated costs. Thus, DTRA anticipates that a significant number of the students and post-doctoral fellows will participate in each review. DTRA also anticipates the inclusion of more advanced research in selection of student and post-doctoral fellows for review participation. To ensure development of student and post-doctoral fellows the review must include targeted avenues for them to explore collaboration and networking opportunities and share their research, e.g., through poster presentations or oral sessions.

Applicants should suggest how they can aid in the planning of a technical review in the Washington, D.C. area, including a model with an associated cost for the conduct of annual reviews of the research program that meet the intent of what is described herein.

1.4.6. Additional Information. It is anticipated that the Alliance will participate in other DTRA program reviews. The ASD-URA, as an entity, will not solicit or accept funding from outside sources without the approval of the CAM and the Grants Officer.

The CAM, in coordination with the RMB and DTRA leadership, will be responsible for integrating the IPP/BPP into the overall Government research and technology programs. During the course of performance, the Grants Officer, in coordination with the CAM, will have approval authority for certain specific changes to the CA including, but not limited to:

- Changes to the AoC if such changes substantially alter the relationship of the parties as originally agreed upon;
- Solicitation or acceptance of funding under the agreement from sources other than DTRA; and
- Changes in non-permanent Alliance membership, if not documented in the IPP/BPP.

1.5. Collaboration and Workforce Development

A close collaborative relationship between DTRA and the Alliance will be necessary to accomplish the research for the ASD-URA. Persistent collaboration across the ASD-URA will enhance innovation and have a high return on investment. It is DTRA's strong belief that work conducted under the ASD-URA cannot be successful either in whole or in part without collaboration. DTRA intends for the collaboration to provide avenues to promote growth and development of staff across the ASD-Consortium, including Government personnel. Particularly of interest to DTRA is training the “next-generation” of SMEs. DTRA also views the

collaboration as a means to foster a community with both high-value technical expertise and insight into DTRA challenges. Therefore, collaboration between the Alliance and the Government is integral to the execution and success of the ASD-URA. Creation of an environment that is conducive to collaboration is a critical element in establishing the Alliance. In the proposal, applicants should outline the range of opportunities foreseen for collaboration and the mechanisms that will be put into place to foster the collaborative activities.

1.5.1. General Activities. The URA is encouraged to hold regularly-scheduled scientific lectures, conduct short courses, convene RA-focused technical meetings, and technical workshops on mutually agreed upon topics throughout the period of performance. Additionally, the ASD-URA is expected to hold regular, periodic research reviews that will permit and encourage the free exchange of ideas and research results, especially those impacting any crosscutting research themes. Alliance PIs may be invited to give a seminar at DTRA up to four times a year for the duration of the CA. Likewise, DTRA personnel may give seminars at Alliance locations. Importantly, these activities may include opportunities for junior Alliance investigators, students, and post-doctoral research fellows to participate in a meaningful way. The activities will: serve as educational opportunities for all Alliance members, including students and post-doctoral research fellows; provide additional collaboration opportunities; and provide a mechanism for inclusion of the broader community of interest. Thus, consideration should be given to involvement of participants outside the Alliance when appropriate.

1.5.2. Staff Rotations. A potentially useful element of the ASD-Consortium collaboration is the advancement, education, and rotation of technical staff through short- and long-term temporary assignments across the Alliance. Staff rotations may include DTRA personnel rotating to Alliance facilities with the agreement of the DTRA TPOC and the Alliance. The scope of this collaboration may range from regular, periodic short-term visits to sabbaticals lasting as long as a year. Staff rotations will be undertaken to foster and facilitate collaborative research where face-to-face interaction is advantageous, to enable a researcher to utilize unique facilities, to enable Alliance personnel to obtain specialized training or experience, and to facilitate the exchange of research results. Student and post-doctoral research fellow participation in staff rotations is encouraged.

In addition, this exchange of personnel may provide Alliance personnel with insight into DTRA-unique requirements and may provide Government personnel with insight into ASD research and/or the opportunity to pursue fundamental research with researchers.

All salary and travel costs associated with a rotation of Government personnel will be borne by the Government. All salary and travel costs associated with staff rotations of Alliance members will be funded under the CA or may be provided by the Alliance member as a cost share; it is anticipated that some portion of the Alliance's scientific labor-years will be in staff rotations.

1.5.3. Electronic Resources. The Alliance is expected to host a web-based repository of information from the ASD-URA that is accessible by Consortium stakeholders for the duration of the ASD-URA CA. This repository will include programmatic and review material. It will also serve as a vehicle for software and dataset sharing. As such, applicants should note the requirement for a Data Management Plan to be developed as part of the IPP process, and revisited through the BPP process. Upon completion of the CA, it is expected that end-to-end documentation will be delivered to the Government for record keeping, e.g., technical review materials, meeting minutes, reports, etc. Applicants should also consider other electronic and

web-based avenues to promote the Alliance to the larger community of interest. Minimally, DTRA anticipates that the Alliance will publish and distribute a newsletter at least annually detailing research results, technical impacts, and collaboration activities.

1.5.4. Other. While primary paths for the collaboration with DTRA will be through the TMG, the IPP/BPP process, the annual technical review meeting, and activities suggested herein, applicants are strongly encouraged to suggest additional new and innovative avenues for fostering collaboration within and external to the Consortium. The costs associated with these activities will be funded under the CA.

1.6. Enhanced Program

Should the ASD-URA be of interest for DTRA Budget Category 6.2 funding (Applied Research funding) or to other funding agencies, an unfunded Enhanced Program is included in this BAA. This is intended to provide a mechanism for growth and enhancement within the URA. DTRA and/or other Government agencies may choose to support the program with basic and/or applied research dollars in areas of specific interest to their basic and applied mission programs. This enhanced program will leverage parallel and/or transition the research, technology and capabilities that are the core of the DTRA funded URA. Applicants are not to include the Enhanced Program discussion in the Phase I pre-proposal submission. Applicants invited to submit a Phase II proposal should include a general discussion of possible ways to develop and source Enhanced Program projects.

1.7. Program Metrics

DTRA anticipates that the ASD-URA performance metrics will include items like the following: technical accomplishments, the number and quality of refereed journal and conference articles, invited presentations, patents, relevance of the work to DTRA, collaborations, student development, and staff rotations. The success of the interactive and collaborative portion will be assessed by DTRA TPOCs and Annual Technical Reviews.

2. FEDERAL AWARD INFORMATION

2.1. Award Types

DTRA anticipates that a single CA may be made from this BAA. The Government actions under this BAA shall adhere to the requirements of 2 CFR Part 200, as modified and supplemented by DoD's interim implementation found at 2 CFR Part 1103 and the DoD Grant and Agreement Regulations (DoDGARs).

The Government reserves the right to fund all, some, or none of the proposals submitted, may elect to fund only part of any or all proposals, and may incrementally fund any or all awards under this BAA. An award may be made to the Alliance that offers the best value to the Government. Applicants must recognize and understand that there are no guarantees any award will be made or, if an award is made, that it will be for the levels of funding detailed in Table 1. The Government also reserves the right to request applicants make any changes necessary to submitted full proposals to increase the feasibility of making the proposal fundable. Applicants may decline to participate in any revisions to application packages requested by DTRA. Alliance members may be expected to compromise and sacrifice anticipated funding to their organization as necessary and appropriate to meet the goals and objectives of the ASD-URA as established through the collaborative planning process.

2.2. Subawards

Subawards are an integral part of the Alliance. The LRAOs will be subawardees to the LRO. This permanent Alliance membership will be augmented with non-permanent subawardees to meet the research objectives of the ASD-URA, especially for the conduct of new and highly innovative research for which they are particularly qualified. Non-permanent subawardees are organizations that (1) are not expected to provide strategic input concerning the goals and direction of the ASD-URA and (2) may have a short- or long-term relationship with the Consortium, as guided by the IPP/BPP. The non-permanent subawardees may change over the lifetime of the CA.

The LRO will distribute the funding to each LRAOs and non-permanent subawardees.

2.3. Award Values

The CA may be $5M annually (total, including both direct and indirect costs) depending on the nature and the scope of work. The funding includes all known costs associated with the CA, i.e. the costs for research, program management, experimentation, travel, outreach, etc.

All awards are subject to the availability of funds. Additional guidance regarding award values may be provided in invitations to submit a Phase II application package. Any specific guidance provided to an applicant supersedes the information provided herein. Funding for participation in this program is highly competitive and the cost of proposed research should strictly be maintained as detailed herein or as indicated in the invitation instructions.

2.4. Period of Performance and Award Structure

Any CA resulting from this BAA will be awarded for a three-year base period. There will be two options to extend the CA for an additional two years each. The total potential period of performance under the CA will be seven years.

Prior to the end of the third year, a comprehensive program review will be conducted as directed by DTRA. This review will consider cumulative performance metrics, the Consortium's vision for each of the option periods of performance (to be submitted by the Consortium prior to the end of the third year), funding availability, and the current research needs and goals of DTRA. The decision as to whether to exercise the first option is expected to be based on the results of the base period review and evaluation described above. A similar process will be followed for the second option period.

2.5. Hardware and Software

The Government does not anticipate the need to provide any hardware or software to execute the proposed research.

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3. ELIGIBILITY INFORMATION

3.1. Lead Research Organization (LRO)

With the requisite Letter of Intent (LoI), Phase I and Phase II application packages submitted in response to this BAA will be considered from accredited U.S. degree-granting colleges, universities, and academic institutions. The URA must be led by a U.S. institution of higher education with doctoral-level courses of study in scientific and research areas related to

computer science, mathematics, social science, cultural anthropology, electrical engineering, nuclear science, nuclear policy, physics, and other related areas that can result in the granting of a doctoral degree. This organization will be designated as the LRO and will have specific leadership and management responsibilities, including but not limited to the following:

- The LRO is expected to articulate a vision for the ASD-URA, promote collaboration among Consortium members, and coordinate the crosscutting research theme.
- The LRO is required to administer the ASD-URA, participate in the research, and promote the transition of research and technologies resulting from the research program.
- The LRO is responsible for distribution of Government funding to Alliance members and non-permanent subawardees in accordance with the approved IPP/BPP. The LRO is also responsible for timely billing (invoicing) of executed research for itself and the other Alliance members to ensure proper disbursement of Government funds.

3.2. Lead Research Area Organization (LRAO)

Each RA will be led by a different LRAO, one of which may also be the LRO; the same entity cannot be the LRAO for more than one RA. Each LRAO must be an accredited U.S. degree-granting college, university, or academic institution. Each must possess substantial experience and expertise in the associated RA. Institutions of higher education are expected to have doctoral level courses of study in scientific and research areas related to this URA that can result in the granting of a doctoral degree.

3.3. Non-Permanent Subawardees

U.S. institution of higher education, DoD-Degree Granting Colleges and Universities, and DoD Service Laboratories may be considered as subawardees.

3.4. Limits to Alliance Membership

Together the LRO and LRAOs make up the permanent members of the ASD-URA. Permanent alliance members are expected to have significant involvement and input over the lifetime of the CA. DTRA anticipates that at least 40% of the total dollar value of the effort annually will be maintained at the LRO and LRAOs for administrative and research activities. The remaining funds will go to the non-permanent subawardees.

DTRA anticipates that an optimally sized Alliance, to include the non-permanent subawardees, would be approximately 13 organizations, but this should not be considered a hard limit. Phase I and Phase II application packages that include significantly more or less than 13 organizations must provide a rationale for the difference. Applicants should note that delineation of all non-permanent subawardees is not required for Phase I and Phase II application packages.

DTRA anticipates that no more than 20% of the total value of the effort annually will be maintained at the LRO. DTRA also anticipates that if the LRO is not also a LRAO, a minimum of 10% of the total dollar value of the effort annually will be maintained for the conduct of research at the LRO. DTRA anticipates that researchers from the LRO and LRAOs will participate in the research undertaken across the RAs.

Applicants should note that DTRA expects that a minimum of 80% of the total dollar value of the effort annually must be dedicated to participation of accredited U.S. degree-granting colleges, universities, and academic institutions. Thus, applicants are expected to consider

carefully the construct of their proposed Alliance and effectively engage the appropriate membership and non-permanent subawardee performance to achieve the goals of the Alliance as detailed in this BAA.

Allocation of any funds received via the enhanced program will be considered on a case-by-case basis.

3.5. Cost Sharing or Matching

Cost sharing is not required under this BAA; however, efforts that include cost sharing or in kind contributions from the non-degree granting partners are encouraged. During the evaluation of proposals, any cost sharing or in kind contributions will be evaluated as it relates to the evaluation factors listed in the BAA, based on the degree to which the proposed cost sharing or in kind contributions enhance the proposal to result in added benefits to the ASD-URA. To allow for evaluation of a proposed cost sharing or in kind contributions, a proposal should express a firm commitment to provide such cost share or in kind contributions and evidence a process for integrating the same into the collaborative research program.

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4. APPLICATION AND SUBMISSION INFORMATION

4.1. Address to Request Application Package

This announcement contains all information required to submit a LoI, Phase I pre-proposal package, and an invited Phase II proposal package. The required application packages for Phase I and invited Phase II submissions are posted with this announcement. The application packages posted to www.grants.gov consist of the forms as detailed in Table 1.

Form Name	Phase I Pre-Proposal Application Package	Invited Phase II Proposal Application Package
SF-424 (R&R) Application for Federal Assistance Form	Required	Required
RR Budget Form	N/A	Required
R&R Subaward Budget Attachment(s) Form(s)	N/A	Required
Research & Related Senior/Key Person Profile Form (Expanded)	Required	Required
RR Personal Data	N/A	Required
Research & Related Other Project Information	N/A	Required
Disclosure of Lobbying Activities (SF-LLL)	N/A	If Applicable
Attachments Form	Required	Required

Table 1: List of forms in the Phase I and Phase II application packages. The instructions for completing each of these forms may be found online at the following web link: http://www.grants.gov/web/grants/form-instructions.html.

4.2. Content and Form of Application Submission

Submissions for this BAA will be conducted in two phases; however, applicants must submit a non-binding LoI to be considered eligible to submit a Phase I package. Phase I is for receipt of pre-proposal submissions. Phase II is for receipt of invited proposal packages. Invitation to submit a Phase II proposal will be based on the evaluation results of the Phase I pre-proposal submission.

The LoI is required; however, it is not legally binding and does not enter into the review of Phase I or Phase II packages. The information in the LoI will allow DTRA to estimate the potential review workload and plan for the review. Prospective LROs must submit a LoI to the email address in Section 7 (only the LRO should submit the LoI, and it should cover the whole of the team). The LoI should minimally include the following information:

- Identification of the LRO and the LRAOs
- Name, address, and email address of the ASD-URA PM
- Names and associated affiliations of other known key personnel
- A list of participating institutions known at the time of the letter preparation
- Number and title of this BAA.

4.2.1. Electronic Submissions. Phase I and Phase II packages and attachments **must be** submitted electronically using www.grants.gov and the corresponding application packages linked with this BAA on www.grants.gov (under the "Packages" tab). All applications, including all supporting documents, must be submitted in the English language.

Applicants are responsible for ensuring compliant and final submission of their Phase I and invited Phase II packages. Note that this also applies to applicants using third party systems to submit application packages and attachments. Pre-proposal and proposal submissions that are not compliant will not be further evaluated.

4.2.2. Phase I Pre-Proposal Submission. Each Phase I application package contains the forms detailed in Table 2.

Form	Attachment	Action
SF-424 (R&R) Application for Federal Assistance Form	N/A	Enter the appropriate information in data fields
Research & Related Senior/Key Person Profile Form (Expanded)	PM Biographical Sketch	Attach to Biographical Sketch field
	PM Current/Pending Support	Attach to Current & Pending Support field
	Key Personnel Biographical Sketch(es)	Attach to Biographical Sketch field for each senior/key person
	Key Personnel Current/Pending Support	Attach to Current & Pending Support field for each senior/key person
Attachments Form	Attachment 1 – Project Summary/Abstract	Upload as Attachment 1
	Attachment 2 – Technical Narrative	Upload as Attachment 2

	Attachment 3 – Structure and Management Plan	Upload as Attachment 3
	Attachment 4 – Collaboration and Workforce Development Plan	Upload as Attachment 4
	Attachment 5 – Quad Chart	Upload as Attachment 5
	Attachment 6 – Cost Summary Tables	Upload as Attachment 6

Table 2: Phase I Application Package Forms and Attachments.

SF 424 (R&R) Application for Federal Assistance: DTRA-specific instructions for completing the SF 424 (R&R) are below. General application instructions can be found on www.grants.gov:

- Block 1 – Type of Submission. Applicants should indicate the Phase I submission is a "Pre-Application."
- Block 2.1 – Applicant Identifier. Not applicable.
- Block 3 – Date Received by State. Not applicable.
- Block 3.1 – State Application Identifier. Not applicable.
- Block 5 – Applicant Information. You must provide a Business Office Point of Contact (BPOC) with an e-mail address.
- Block 19 – Authorized Representative. The "signature of AOR" is not an actual signature and is automatically completed upon submission of the electronic application package. Hard copies or email attachments of applications will not be accepted.

Research and Related Senior/Key Person Profile Form (Expanded): The Research and Related Senior/Key Person Profile Form (Expanded) should be completed in its entirety for each of the individuals who will be involved in a significant way in the research and management of the Alliance, e.g., ASD-URA PM, RALs, PIs, and Co-PIs.

DTRA does not have a preference for the format of the biographical sketch. Biographical sketches shall be limited to three pages for the key leadership personnel, i.e., the ASD-URA PM and the RALs. DTRA anticipates that for the ASD-URA PM the submitted information will provide evidence of successful leadership of collaborative research.

Submission of biographical sketches for additional key personnel, e.g., additional PIs and Co-PIs, is required, but they must be limited to two pages per individual. Applicants should take care to only submit biographical sketches for participating individuals and including any known subawardee PIs/Co-PIs.

Credentials, as documented on the biographical sketches, must include, among others, a record of seminal publications in the scientific literature with a citation index and a record of successful research in areas relevant to the ASD-URA. Collectively, the biographical sketches must demonstrate how the aggregate of skills/expertise across the Alliance provides the required breadth and depth to effectively carry out the proposed program of research.

Additionally, a statement of current and pending support must be provided for each of the key personnel. This statement should include a summary of the current and pending support of related work and requires disclosure of all grants and contracts through which each ASD-URA PM, PIs, and Co-PIs is currently receiving or may potentially receive financial support.

Attachments Form: The attachments form should be used to include the following six items with the application:

Attachment 1 – Project Summary/Abstract. The uploaded project summary should be less than three pages and provide a summary of the URA team, research program and collaboration plans. The abstract should not contain any proprietary data or markings.

Attachment 2 – Technical Narrative (limit 25 pages, including references). The technical narrative should include an overview of the research strategy to be employed to advance the state-of-the-art in ASD; a short description and justification of the research goals for the proposed effort (for the base period and for each additional option); and a short technical discussion stating the background and objectives of the proposed research, the overall technical approaches to be pursued, the potential techniques to be used to validate the models and theories developed in this URA. This technical discussion should include a proposed breakdown of research tasks and short description of the technical approaches for each task. A discussion on the relevance of the research, strategy for validation of models, and linkages between research in the RAs and CCRI should be included. Where the technical narrative proposes research topics outside the scope described in this BAA, justification for such variance is required. The technical narrative should clearly identify specific scientific challenges and research barriers that relate to fundamental understanding of the difficulties associated with the integration of physical and social science disciplines to solve problems in ASD. The technical narrative should clearly highlight the innovations proposed and how they may lead to substantial advances in foundational understanding of network phenomena and highlight how the proposed research is expected to feed, be fed by, or in some other way link with, research being performed elsewhere within the Alliance. This only covers the core research program and its funding—no discussion of the enhanced program should be included.

Attachment 3 – Structure and Management Plan (limit 5 pages). The Structure and Management Plan must include a summary of the overall plan for leadership and management of the consortium. The plan must include the identification of the PM, LRAOs (including RALs), and key leadership personnel with an overall plan for leadership detailing efficient management of the ASD-URA Program. The Structure and Management Plan may also detail subawardees, but identification of all non-permanent subawardees at the Phase I pre-proposal stage is not required. Applicants may propose a process for the identification and incorporation of non-permanent subawardees into the Alliance. The Structure and Management Plan should demonstrate how the proposed URA will create an effective collaborative environment. The Structure and Management Plan must describe an overall strategy for adjusting the research plans in response to research insights gained, advances in the state of the art, and new collaboration opportunities.

Attachment 4 – Collaboration and Workforce Development Plan (limit 5 pages). The Collaboration and Workforce Development Plan must include general information on previous successful relevant collaborations and general plans for how researchers will collaborate within each RA and between RAs and how this collaboration will result in outcomes and further the goals of the URA. The Collaboration and Workforce Development Plan must include a summary of collaboration plans (processes and supporting toolsets), synergies gained from these collaborations, and examples of how researchers have successfully collaborated in the past and the outcomes.

Attachment 5 – Quad Chart. The quad chart must be presented on one (1) page. The quad chart must not contain any proprietary data or markings. The quad chart must be provided in landscape layout.

Attachment 6 – Cost Summary Tables. For the Phase I pre-proposal only, two cost estimate tables shall be provided to communicate a broad idea of the participant's relative level-of-effort for the core program funding only. This information will be used in the evaluation of the research program. The first table should list the estimated **first year** funding by organization for each RA (see Table 3). A column for "Other" can be used for management or other costs. The final line is to be used for an estimate of costs across the RAs addressing the CCRI. The second, should list the estimated funding per organization for each of the five years (see Table 4).

Organization	RA1	RA2	RA(N)	Other	Total
LRO					
LRAO-A					
LRAO-B					
LRAO-C					
LRAO-N					
Subawardees					
CCRI Portion					

Table 3: Year 1 Budget Estimates by RA/CCRI ($K).

Organization	Year 1	Year 2	Year 3	Year 4	Year 5	Total
LRO						
LRAO-A						
LRAO-B						
LRAO-C						
LRAO-N						
Subawardees						
CCRI Portion						
Total						

Table 4: Five Year Budget Estimates ($K).

4.2.3. Phase II Proposal Submission. Each Phase II application package contains the forms detailed in Table 5.

Form	Attachment	Action
SF-424 (R&R) Application for Federal Assistance Form	N/A	Enter the appropriate information in data fields
RR Budget Form	Budget Justification for each base and option performance period	Attach to Section K "Budget Justification" in budget period one
RR Subaward Budget Attachment(s) Form	Individual subaward budgets	Attach a separate budget with justification for each subaward
Research & Related Senior/Key Person Profile Form (Expanded)	PI Biographical Sketch	Attach to Biographical Sketch field
	PI Current/Pending Support	Attach to Current & Pending Support field
	Key Personnel Biographical Sketch(es)	Attach to Biographical Sketch field for each senior/key person
	Key Personnel Current/Pending Support	Attach to Current & Pending Support field for each senior/key person
RR Personal Data Form	N/A	Enter the appropriate information in data fields for all PIs/Co-PIs
Research & Related Other Project Information Form	Publically Releasable Proposal Summary/Abstract	Attach to Block 7 "Project Summary/ Abstract"
	Project Narrative/Technical Proposal	Attach to Block 8 "Project Narrative"
	Bibliography	Attach to Block 9 "Bibliography"
	Facilities and Other Resources	Attach to Block 10 "Facilities and Other Resources"
	Equipment	Attach to Block 11 "Equipment"
Disclosure of Lobbying Activities (SF-LLL) *(if applicable)*	N/A	N/A
Attachments Form	Attachment 1 – Draft IPP	Upload as Attachment 1
	Attachment 2 – Structure and Management Plan	Upload as Attachment 2
	Attachment 3 – Signed AoC	Upload as Attachment 3
	Attachment 4 – Collaboration and Workforce Development Plan	Upload as Attachment 4
	Attachment 5 – Quad Chart	Upload as Attachment 5

Table 5: Phase II Package Forms and Attachments.

SF 424 (R&R) Application for Federal Assistance: DTRA-specific instructions for completing the SF 424 (R&R) are below. General application instructions can be found on www.grants.gov:

- Block 1 – Type of Submission. Applicants should indicate the Phase II submission is an "Application."
- Block 2.1 – Applicant Identifier. Not applicable.

- Block 3 – Date Received by State. Not applicable.
- Block 3.1 – State Application Identifier. Not applicable.
- Block 4b – Agency Routing Identifier. Enter the corresponding Phase I Grant ID. If resubmissions were involved, enter the Grant ID for the last submission.
- Block 5 – Applicant Information. You must provide a Business Office Point of Contact (BPOC) with an e-mail address.
- Block 19 – Authorized Representative. The "signature of AOR" is not an actual signature and is automatically completed upon submission of the electronic application package.

RR Budget Form: The Research and Related Budget Form provided as part of the application package for the Phase II submission should be filled out in its entirety for each potential project year. Applicants are responsible for ensuring appropriate, approved rates are used in their budget forms. When notified of selection applicants will be requested to provide their current rate agreement and the rate agreement of their known subawardees, as applicable. Applicants should note that in accordance with 32 CFR 22.205(b), CAs shall not provide for the payment of fee or profit to the recipient.

Applicants are required to submit a budget justification. The budget justification should be prepared as outlined in the instructions for the Research and Related Budget and uploaded as an attachment to Section K "Budget Justification" of the Research and Related Budget Form. The budget justification does not have a page limit, but should include sufficiently detailed information for meaningful evaluation to include but not limited to the following:

- The basis for the direct labor hours or percentage of effort (e.g., historical hours or estimates);
- 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;
- The portion of time to be devoted to the proposed research, management activities, divided between academic and non-academic (summer) terms, when applicable;
- The total annual salary charged to the URA;
- Any details that may affect the salary during the project, such as plans for leave and/or remuneration while on leave.
- Amounts or percentages of cost share, expected benefits to the URA as a result, and institutional parameters for providing cost share.

In addition, the budget justification must specifically address identified subaward costs and type to include the portion of work to be subawarded with a supporting rationale. The budget justification should include a discussion of how the subawardee(s) cost was determined to be fair and reasonable.

RR Subaward Budget Attachment(s) Form: Detailed cost estimates are required for each proposed subaward (e.g., LRAOs and known subawardees). The cost estimate for the subawards should include sufficiently detailed information for meaningful evaluation, including all those items listed for the LRO, as well as travel for the required meetings. However, it is recognized that some entities may choose to submit their proprietary rate information directly to the Government in lieu of providing such information to the LRO for inclusion in the cost proposal submitted through www.grants.gov. In such a case, a separate submission can be made directly to the Government via email to DTRA-URA-Program@mail.mil.

Research and Related Senior/Key Person Profile Form (Expanded): The Research and Related Senior/Key Person Profile Form (Expanded) should be completed in its entirety for each of the individuals who will be involved in a significant way in the research and management of the Alliance, e.g., the ASD-URA PM, RALs, PIs, Co-PIs, etc. This includes any known non-permanent subawardee PIs and Co-PIs.

DTRA does not have a preference for the format of the biographical sketch. Biographical sketches shall be limited to three pages for the key leadership personnel, i.e., the ASD-URA PM and the RALs. DTRA anticipates that for the ASD-URA PM the submitted information will provide evidence of successful leadership of collaborative research.

Submission of biographical sketches for additional key personnel, e.g., additional PIs and Co-PIs, is required, but they must be limited to two pages per individual. Applicants should take care to only submit biographical sketches for participating individuals and including any known non-permanent subawardee PIs/Co-PIs.

Credentials, as documented on the biographical sketches, must include, among others, a record of seminal publications in the scientific literature with a citation index and a record of successful research in areas relevant to the ASD-URA. Collectively, the biographical sketches must demonstrate how the aggregate of skills/expertise across the Alliance provides the required breadth and depth to effectively carry out the proposed program of research.

Additionally, a statement of current and pending support must be provided for each of the key personnel. This statement must include the following items and requires disclosure of all grants and contracts through which the ASD-URA PM, each RAL, each PI, and each Co-PI is currently receiving or may potentially receive financial support:

- A list of all current projects the individual is working on, in addition to any future support the individual has applied to receive, regardless of the source.
- Title and objectives of the other research projects.
- The percentage per year to be devoted to the other projects.
- The total amount of support the individual is receiving in connection to each of the other research projects or will receive if other proposals are awarded.
- Name and address of the agencies and/or other parties supporting the other research projects.
- Period of performance for the other research projects.

RR Personal Data Form: The Government Accountability Office, in its report GAO-16-14, WOMEN IN STEM RESEARCH: Better Data and Information Sharing Could Improve Oversight of Federal Grant-making and Title IX Compliance, December 3, 2015, recommended that the DoD collect certain demographic and career information to be able to assess the success rates of women who are proposed for key roles in applications in science, technology, engineering, or mathematics disciplines. To enable this assessment, DTRA is including the OPTIONAL form titled, "Research and Related Personal Data" for proposal submissions. The Research and Related Personal Data Form provided as part of the application package for the Phase II submission should be filled out in its entirety for the PM, RALs, PIs and Co-PIs on the proposal, including any known non-permanent subawardee PIs and Co-PIs.

Research and Related Other Project Information Form:

- Block 7 – Project Summary/Abstract. The uploaded project summary should be less than five pages and provide a summary of the basic research in the proposal. The abstract absolutely must not contain any proprietary data or markings.
- Block 8 – Project Narrative (Technical Proposal). The uploaded technical proposal must not exceed 40 pages (excluding references).

  The project narrative (technical proposal) should include a discussion of the research strategy to be employed to advance the state-of-the-art in ASD, a detailed description and justification for the seven-year research goals of the proposed effort, and a detailed technical discussion. The technical discussion should include the background and objectives of the proposed research, the technical approaches to be pursued, the validation techniques and metrics to be used to validate the models and theories developed in this URA, and the lead parties involved and the level of effort to be employed (demonstrating that researchers are collaborating and substantially and meaningfully engaged in the research efforts). Where the project narrative includes research questions to answer that are not listed in this BAA a rationale must be provided. The project narrative should also clearly:

  - Identify specific scientific challenges and research barriers that relate to fundamental understanding of the root cause of difficult multidisciplinary adaptive discovery-related problems and should provide evidence that the proposed technical approaches can address these challenges in a measured approach across the near- and far-term. This should include description of how physical and social science based tasks are expected to advance together to answer the research questions proposed for study.
  - Explain in substantial detail the specific scientific plans that will be employed, and provide ample evidence that the approaches are likely to substantially advance the underlying science. A risk management plan should be described that will maximize the scientific value given potential challenges and research barriers identified.
  - Highlight the innovations proposed and how they may lead to an understanding of multidisciplinary adaptive discovery-related phenomena, particularly fundamental laws, theories, and validated models. Provide details of proposed use of existing models or expected characteristics of models to be developed. Identify the underlying scientific principles to be explored in such models and expected types of outputs.

- Show how proposed research areas are expected to feed, be fed by, or in some other way link with, research being performed elsewhere within the Alliance. Identify the interdependencies and cooperation expected among the disciplines.

Protection of Human Subjects. DTRA does not anticipate human use in the ASD-URA.

Animal Use. DTRA does not anticipate animal use in the ASD-URA.

- Block 9 – Bibliography. Attach a list of the applicable references for the proposal.
- Block 10 – Facilities and Other Resources. The applicant is to include a listing of facilities and other resources available to support the proposal, including a description of the facilities to be used for the research and experiments, a description of who will have access to these facilities, and how these facilities will enhance the research efforts proposed. Where new research facilities are to be created for the purposes of the ASD-URA, the development and verification plans are to be described.
- Block 11 – Equipment. The applicant is to include a listing of specialized equipment available to support the proposal, including a description of specialized equipment to be used for the research and experiments, a description of who will have access to the specialized equipment, and how the specialized equipment will enhance the research efforts proposed.

Disclosure of Lobbying Activities (SF-LLL) Form: The Disclosure of Lobbying Activities Standard Form-LLL, if applicable, should be completed.

Attachments Form: The attachments form should be used to include the following five items with the application:

Attachment 1 – Draft IPP. The draft IPP does not have a suggested format or a page limit. The draft IPP may suggest potential subawardees; however, identification of all subawardees is not required for proposal submission. The Data Management Plan is not required as part of the draft IPP.

Attachment 2 – Structure and Management Plan. The Structure and Management Plan for the proposal shall not exceed 10 pages. The plan must include a detailed plan for leadership and efficient management of the ASD-URA and organizational structures. The LRO, the LRAOs, known non-permanent subawardees, and all known PIs should be identified. Applicants may propose a process for the identification and incorporation of non-permanent subawardees into the Alliance. The plan must identify metrics for success, how they will be used, and how they will further the goals of the program. Where available, evidence for the success of these strategies is to be described. The plan must describe approaches to adjusting the research plans in response to research insights gained, evolving research needs, advances in the state of the art, and new collaboration opportunities.

Attachment 3 – AoC. Applicants must submit the AoC signed by a duly authorized representative for each proposed permanent member of the Alliance. Any changes with justification should be detailed in a cover letter to the signed AoC.

Attachment 4 – Collaboration and Workforce Development Plan. The Collaboration and Workforce Development Plan for the proposal shall not exceed 10 pages. The plan must include details for how researchers will collaborate within each RA and across the RAs and describe how

this collaboration will further the goals of the program. The plan must describe the processes and toolsets to facilitate collaboration and the document/information controls to be employed. The plan must describe the strategy for collaborating with DTRA and propose collaborative opportunities with DTRA personnel. The plan must include examples of how researchers have successfully collaborated previously in similar programs. The plan must address the general activities, student sandbox, staff rotations, electronic resources, etc. detailed in Section 1.5. The plan must include a strategy for identifying, establishing, and exploiting collaborations with other related research programs. The plan must describe processes for external communication of research outputs.

Attachment 5 – Quad Chart. The quad chart must be presented on one (1) page. The quad chart must not contain any proprietary data or markings. The quad chart must be provided in landscape layout.

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

DTRA uses the SAM to exclude recipients ineligible to receive Federal awards. SAM can be accessed online at http://sam.gov (Reference 2 CFR 1125).

Each applicant is required to: (i) Be registered in SAM before submitting its application; (ii) provide a valid unique entity identifier in its application; and (iii) continue to 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.

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

4.4. Submission Dates and Times

Applicants must submit a Letter of Intent (LoI) no later than 21 June 2019 to be considered eligible to submit a Phase I pre-proposal. Phase I pre-proposal submissions are due on 17 July 2019. The due date for the Phase II invited proposal submissions will be provided in the letter of invitation. The applicant will not be allowed less than 30 days to prepare a full proposal submission; there is no penalty for early submissions.

Applicants are responsible for submitting all materials to www.grants.gov. When sending electronic files, the applicant should allow for potential delays in file transfer from the originator's computer server to the www.grants.gov website/computer server, as well as the delay associated with the www.grants.gov validation of applications, which may be up to 48 hours. Applicants are encouraged to submit their proposals early to avoid issues with file transfers, rejection of applications by www.grants.gov, and delays due to high website demand.

Acceptable evidence to establish the time of receipt and acceptance at www.grants.gov includes documentary and electronic evidence of receipt maintained by DTRA. Applicants should also print, and maintain for their records, the three emails that will serve as the electronic receipt following submission of a Phase I pre-proposal or an invited Phase II proposal to www.grants.gov.

Applicants should note that DTRA uses a system that pulls applications from www.grants.gov en

masse, but this system does not mark applications as “retrieved” on www.grants.gov. As a result, when applicants check the status on www.grants.gov the applications will always look like they have not been retrieved by DTRA. Should you require confirmation of receipt by the Agency, you may request such via the administrative email address provided in Section 7. Note that such requests will generally be treated with low priority by the Agency.

Please note 15 U.S.C. 260a establishes daylight saving time as the standard time during the daylight saving period.

If the application package and required attachments are submitted to www.grants.gov after the exact time and date specified in this announcement or in any written communications provided by DTRA, the application will be considered "late" and will not be reviewed.

If an emergency or unanticipated event interrupts normal Government processes so that proposals cannot be submitted to www.grants.gov by the exact time specified by DTRA correspondence, the time specified for receipt of applications will be deemed to be extended to the same time of day specified in the BAA or in the letter of invitation on the first work day on which normal Government processes resume.

4.5. Intergovernmental Review

Not Applicable.

4.6. Funding Restrictions

Applicants must be advised that DTRA will not allow reimbursement of pre-award costs.

4.7. Other Submission Requirements

4.7.1. Registration with www.grants.gov. Applicants should note that each organization must complete a one-time registration in order to submit its Phase I pre-proposal(s) and invited Phase II proposal(s) through www.grants.gov. Please see the following web link on information about registering with www.grants.gov: http://www07.grants.gov/applicants/applicants.jsp. If your organization is already registered in www.grants.gov, no further action should be required.

The registration process may take up to **four (4) weeks** to complete depending on your organization and requires multiple steps, some of which are detailed below.

- Identifying the Data Universal Number Systems (DUNS) number or registering for one with Dun & Bradstreet at http://fedgov.dnb.com/webform/displayHomePage.do if your organization does not have a DUNS number.
- Registering with the System for Award Management (SAM) by calling the SAM Assistance Center at 1-866-606-8220, or you may register online at www.sam.gov. You will NOT be able to complete your SAM registration until SAM has confirmed your Employer Identification Number (EIN) or Taxpayer Identification Number (TIN) with the Internal Revenue Service (IRS).

4.7.2. Page Definition. Documents must not exceed provided page limits. A page is defined as 8 ½ x 11 inches, single-spaced, with one-inch margins in type not smaller than 12 point Times New Roman font. All documents must be provided in portrait layout unless otherwise noted. In instances where page limits are exceeded, only the pages up to the limit will be reviewed. Exceptions WILL NOT be made under any circumstances.

4.7.3. File Format. Documents should be uploaded as a Portable Document File (PDF) format. Perform a virus check before uploading any files to www.grants.gov as part of your application package. If a virus is detected, it will cause rejection of the file.

Do not lock or encrypt any files you upload to www.grants.gov as part of your application package. Movie and sound file attachments will not be accepted.

4.7.4. Withdrawal of Submissions. Phase I pre-proposals and invited Phase II proposals may be withdrawn by written notice. Withdrawals are effective upon receipt of notice by the Grants/Contracting Officer via the e-mail address listed in Section 7.

4.7.5. English Language Requirement. All documents must be submitted in the English language. DTRA will not review any documents that are not submitted in the English language. Exceptions WILL NOT be made under any circumstances.

4.7.6. Incomplete Applications and Requests for Additional Information. Pre-proposal and proposal submissions that are not compliant will not be further evaluated. DTRA reserves the right to request any additional information via email. Should the applicant fail to respond to email requests from DTRA, DTRA will not consider the proposal further.

4.7.7. Compliance with Appendix A to 32 CFR 28. All awards require certifications of compliance with Appendix A to 32 CFR 28 regarding lobbying. Proposers are certifying compliance with this regulation by submitting the invited proposal. It is not necessary to include the certification text with your invited proposal. If applicable, proposers should submit the Disclosure of Lobbying Activities (SF-LLL) Form in accordance with Section 4.2.3.

4.7.8. Marking Guidance and Disclosure of Proprietary Information other than to the Government. Submissions in response to this BAA may contain technical and other data that the applicant does not want disclosed to the public or used by the Government for any purpose other than application evaluation. Public release of information will be subject to existing statutory and regulatory requirements.

If proprietary information which constitutes a trade secret, proprietary commercial or financial information, confidential personal information, or data affecting national security, is provided by an applicant, it will be treated in confidence, to the extent permitted by law, provided that the following legend is included on the front page of the attachment:

> *"For any purpose other than to evaluate this submission, this data shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed in whole or in part, provided that if an award is made to the applicant as a result of or in connection with the submission of this data, the Government shall have the right to duplicate, use or disclose the data to the extent provided in the agreement. This restriction does not limit the right of the Government to use information contained in the data if it is obtained from another source without restriction. The data subject to this restriction is contained in page(s) _____ of this document."*

Any other legend may be unacceptable to the Government and may constitute grounds for removing the submission from further consideration without assuming any liability for inadvertent disclosure.

The Government will limit dissemination of properly marked information to within official

channels. In addition, the pages indicated as restricted must be marked with the following legend:

> *"Use or disclosure of the data on lines specifically identified by asterisk (*) are subject to the restriction on the front page of this document."*

The Government assumes no liability for disclosure or use of unmarked data and may use or disclose such data for any purpose.

In the event that properly marked data contained in a submission made in response to this BAA is requested pursuant to the Freedom of Information Act (FOIA), 5 U.S.C. § 552, the applicant will be advised of such request and prior to such release of information, will be requested to expeditiously submit to DTRA a detailed listing of all information in the pre-proposal and/or invited proposal which the applicant believes to be exempt from disclosure under the Act. Such action and cooperation on the part of the applicant will ensure that any information released by DTRA pursuant to the Act is properly identified.

By submission of a Phase I pre-proposal and/or invited Phase II proposal, the applicant understands that proprietary information may be disclosed outside the Government for the sole purpose of technical evaluation. DTRA will obtain a non-disclosure agreement from the evaluator that proprietary information in the submission will only be used for evaluation purposes and will not be further disclosed or utilized.

4.7.9. Security Information. All submissions must be completely UNRESTRICTED and UNCLASSIFIED; submissions must not contain For Official Use Only (FOUO) or Official Use Only (OUO) information or be marked as such.

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5. APPLICATION REVIEW INFORMATION

5.1. Evaluation Criteria

5.1.1. Phase I Pre-Proposal Evaluation Criteria. The three evaluation criteria to be used for pre-proposal evaluations are as follows:

1. Scientific Merit and Relevance. Evaluation of this factor will concentrate on the overall scientific and technical merit, relevance to the articulated challenges, and innovation of the proposed research in light of the state-of the-art. Evaluation of this factor will also concentrate on the long term relevance of the proposed research and the likelihood this proposed research will address scientific challenges and research barriers facing DTRA.
2. Collaboration and Program Management. Evaluation of this factor will concentrate on the applicant's strategies, plans and experience in fostering collaborative research, managing collaborative research programs, and workforce development. Evaluation of this factor will be based on evidence of previous successful relevant efforts and the applicant's commitment and plans for collaboration and workforce development. Evaluation of this factor will focus on the PM's technical leadership and experience in managing large collaborative research programs and the applicant's plans to meet the requirements of the overall management concept. The extent to which applicants identify and commit to representation of HBCUs/MIs in the Alliance will also be considered. This factor includes plans for an environment to foster collaboration and efforts to bring

about a unity of vision for the consortium and drive for results and benefits.

3. Experience and Qualifications of Scientific Staff. Evaluation of this factor will concentrate on the relevant qualifications, capabilities, availability, accomplishments, and experience of the applicant's proposed research personnel as an indication of their ability to achieve the proposed technical objectives. Consideration will also be given to the overall professional growth potential of the team as an indication of commitment to highly innovative and impactful research from junior scientists.

5.1.2. Phase II Invited Proposal Evaluation Criteria. The five evaluation criteria to be used for Phase II invited proposal evaluations are as follows:

1. Scientific Merit and Relevance. Evaluation of this factor will concentrate on the overall scientific and technical merit, relevance to the articulated challenges, and innovation of the proposed research in light of the state-of the-art. Evaluation of this factor will also concentrate on the long term relevance of the proposed research and the likelihood this proposed research will address scientific challenges and research barriers facing DTRA.
2. Collaboration and Workforce Development. Evaluation of this factor will concentrate on the applicant's strategies, plans and experience in fostering collaborative research, managing collaborative research programs, and workforce development. Evaluation of this factor will be based on evidence of previous successful relevant efforts and the applicant's commitment and plans for collaboration and workforce development. This factor includes plans for an environment to foster collaboration and develop the workforce. The extent to which applicants identify and commit to representation of HBCUs/MIs in the Alliance will also be considered. This factor also includes efforts to bring about a unity of vision for the consortium and drive for results and benefits.
3. Experience and Qualifications of Scientific Staff and Quality of Research Facilities. Evaluation of this factor will concentrate on the relevant qualifications, capabilities, availability, accomplishments, and experience of the applicant's proposed research personnel as an indication of their ability to achieve the proposed technical objectives related to the proposed efforts. Key personnel are expected to be substantially and meaningfully engaged in the research and the proposed level of effort for key personnel should be commensurate with and demonstrate such. Consideration will also be given to the overall professional growth potential of the team as an indication of commitment to highly innovative and impactful research from junior scientists. The extent to which the applicant's proposed facilities and equipment will contribute to the accomplishment of the proposed research will be evaluated including the nature, quality, relevance, availability, and access to state-of-the art research facilities and equipment.
4. Program Management. Evaluation of this factor will include the adequacy of the overall management plan, internal team structures, and composition with respect to achieving the research goals of the program. These approaches should be lightweight and will be evaluated for their flexibility to minimize overhead, yet ensure research relevance and proper oversight. Where available, evidence for the success of these strategies is to be described. Evaluation of this factor will include a focus on the Program Manager's technical leadership and experience in managing large collaborative research programs and the applicant's plans to meet the requirements of the overall management concept included in the BAA.

5. Cost Realism. Evaluation of this area will consider cost realism, cost reasonableness, and affordability within funding constraints. The Government may make adjustments to the cost of the total proposed effort as deemed necessary to reflect what the effort should cost. These adjustments will consider the task undertaken and approach proposed. These adjustments may include upward or downward adjustments to proposed labor hours, labor rates, quantity of materials, price of materials, overhead rates, general and administrative expenses (G&A), etc. The result of the realism evaluation will be a determination of the most probable cost to the Government of performance. The most probable cost may differ from the proposed cost. The most probable cost, rather than the proposed cost, shall be used in the trade-off process to determine selection for funding.

5.2. Review and Selection Process

The Phase I pre-proposal and invited Phase II proposal selection process will be conducted based upon a technical review as described in the DoDGARs (32 CFR 22.315(c)) and may include the use of Government and non-Government peer-reviewers. Phase I pre-proposals and Phase II proposals may be evaluated by a group of qualified scientists and managers from the Government as well as subject matter experts from outside the Government. In all instances when non-Government evaluators will be used, they will be required to sign a non-disclosure agreement and conflict of interest (COI) statement before being provided access to Phase I pre-proposals and invited Phase II proposals. Additional information is included in Section 8.1.

The Phase I pre-proposal evaluation will be based on three criteria listed in decreasing order of importance: 1) Scientific Merit and Relevance, 2) Collaboration and Program Management, and 3) Experience and Qualifications of Scientific Staff. The criteria will be scored as Outstanding (O), Good (G), Acceptable (A), Marginal (M) or Unacceptable (U). Phase I pre-proposals scored as "Unacceptable" in any single category will be deemed "Not Selectable" and will not be considered further.

The invited Phase II proposal evaluation will be based on five criteria; however, only criteria one to four are weighted. They are listed in decreasing order of importance: 1) Scientific Merit and Relevance, 2) Collaboration and Workforce Development, and 3) Experience and Qualifications of Scientific Staff and Quality of Research Facilities, and 4) Program Management. These criteria will be scored as Outstanding (O), Good (G), Acceptable (A), Marginal (M) or Unacceptable (U). The fifth criterion of Cost Realism will be scored as Acceptable (A) or Unacceptable (U). Invited Phase II proposal scored as "Unacceptable" in any single category will be deemed "Not Selectable" and will not be considered further.

Only the most highly rated Phase I pre-proposals will receive an invitation to submit a Phase II proposal. Applicants that do NOT receive an invitation from the Government to submit a Phase II proposal are NOT eligible to submit a Phase II proposal. Applicants not receiving an invitation to submit Phase II proposals will be informed of such via email following the Phase I pre-proposal evaluations.

Prior to award, the Government reserves the right to perform a review of past performance. Sources that may be used for past performance review may include the Past Performance Information Retrieval System (PPIRS) and the Federal Awardee Performance and Integrity Information System (FAPIIS). The Government will also evaluate the impact of any proposed limitations to the use of intellectual property (e.g. asserted technical data/computer software restrictions or patents) during the selection and/or negotiation process, and may request

additional information from the applicant, as may be necessary, to evaluate the applicant's assertions.

The potential relationship of the proposed research and development to the DTRA mission will be considered during the selection process. Other factors that may be considered include duplication with other research, program balance, and budget limitations. Accordingly, proposals may be selected for funding which are not reviewed as highly as others, which are of higher risk and/or which may be of a higher cost.

The Government will not review any submission that is not relevant to this BAA or Phase II proposals that were not invited. The Government reserves the right to select all, some, or none of the proposals, or any part of any proposal received in response to this BAA and to make awards without discussions with applicants; however, the Government reserves the right to conduct discussions if determined necessary.

5.3. Simplified Acquisition Threshold

DTRA anticipates that the total Federal share of awards made under this announcement will be greater than the simplified acquisition threshold over the period of performance (see §200.88 Simplified Acquisition Threshold). Therefore, in accordance with Appendix I to 2 CFR Part 200, Section E.3, this section serves to inform the applicant:

i. That DTRA, prior to making a Federal award with a total amount of Federal share greater than the simplified acquisition threshold, is required to review and consider any information about the applicant that is in the designated integrity and performance system accessible through SAM (currently Federal Awardee Performance and Integrity Information System (FAPIIS)) (see 41 U.S.C. 2313);

ii. That 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;

iii. That DTRA 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 §200.205 Federal awarding agency review of risk posed by applicants.

iv. For awards that exceed $500,000 over the period of performance, DTRA will employ the additional post-award reporting requirements reflected in Appendix XII—Award Term and Condition for Recipient Integrity and Performance Matters of 2 CFR 200.

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6. AWARD ADMINISTRATION INFORMATION

6.1. Award Notices

Applicants will be notified regarding the status of their applications via e-mail to the BPOC listed in Block 5 of the SF-424 and the PI listed in Block 14 of the SF-424 provided at the time of submission.

A notice of selection should not be construed as an obligation on the part of the Government; only duly authorized procurement personnel may commit resources. This will be done by issuing a CA document to the selected applicant. Also, this notification must not be used as a basis for accruing costs to the Government prior to award. Selected applicants are not authorized to begin work, as any award is subject to successful negotiations (if determined necessary by DTRA) between the DTRA contracting division and the selected organization, and to the availability of funds.

All notifications will be made from DTRA-URA-Program@mail.mil.

Applicants must be aware that it is their responsibility to ensure: (1) correct e-mail addresses are provided at the time of submission, (2) this e-mail notification reaches the intended recipient(s), and (3) the e-mail is not blocked by the use of 'spam blocker' software or other means that the recipient's Internet Service Provider may have implemented as a means to block the receipt of certain e-mail messages.

If for any reason there is a delivery failure of these e-mail notices, DTRA will not further attempt to contact the applicants.

6.2. Administrative and National Policy Requirements

Awards from this BAA will be governed by the DoD Research and Development General Terms and Conditions, the most current version as of the date of the award (available for download at website http://www.onr.navy.mil/Contracts-Grants/submit-proposal/grants-proposal/grants-terms-conditions.aspx). DTRA-specific Terms and Conditions governing intellectual property, required reporting, payment information, etc. will be provided at the time of award negotiations. All awards require certifications of compliance with national policy requirements. Statutes and Government-wide regulations require some certifications to be submitted at the time of proposal submission.

This BAA focuses on fundamental research in a DoD contractual context, which was defined in Section 1.2 of this BAA. Per DoD policy[2], "…products of fundamental research are to remain unrestricted to the maximum extent possible." Furthermore, "The DoD will place no other restrictions on the conduct or reporting of unclassified fundamental research, except as otherwise required by statue [sic], regulation, or Executive Order." As such, fundamental research is normally exempt from controls under the International Traffic in Arms Regulation (ITAR) (22 CFR Parts 120-130) and/or the Department of Commerce regarding the Export Administration Regulations (15 CFR Parts 730-774), but the DoD rule recognizes that there are "rare" situations where export-controlled information or technology may be used in fundamental research that may require a license(s) or restrictions on products.

6.2.1. Export Control Notification. Applicants are responsible for ensuring compliance with any export control laws and regulations that may be applicable to the export of and foreign access to their proposed research. Applicants may consult with the Department of State with any questions regarding the International Traffic in Arms Regulation (ITAR) (22 CFR Parts 120-130) and/or the Department of Commerce regarding the Export Administration Regulations (15 CFR Parts 730-774). Please note that the prime awardee is responsible for monitoring ITAR compliance of all subawardees.

6.2.2. Combating Trafficking in Persons. The recipient agrees to comply with the trafficking in persons requirement in Section 106(g) of the Trafficking Victims Protection Act of 2000

(TVPA), as amended (22 U.S.C. 7104(g)).

6.2.3. Reporting Subawards and Executive Compensation. The recipient agrees to ensure they have the necessary processes and systems in place to comply with the reporting requirements of the Transparency Act, as defined at 2 CFR 170.320, unless they meet the exception under 2 CFR 170.110(b).

6.2.4. Representation Regarding the Prohibition on Using Funds under Grants and Cooperative Agreements with Entities that Require Certain Internal Confidentiality Agreements. By submission of its proposal or application, the applicant represents that it does not require any of its employees, contractors, or subrecipients seeking to report fraud, waste, or abuse to sign or comply with internal confidentiality agreements or statements prohibiting or otherwise restricting those employees, contractors, or subrecipients from lawfully reporting that waste, fraud, or abuse to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information. Note that: (1) the basis for this representation is a prohibition in section 743 of the Financial Services and General Government Appropriations Act, 2015 (Division E of the Consolidated and Further Continuing Appropriations Act, 2015, Pub. L. 113-235) and any successor provision of law on making funds available through grants and cooperative agreements to entities with certain internal confidentiality agreements or statements; and (2) section 743 states that it does not contravene requirements applicable to Standard Form 312, Form 4414, or any other form issued by a Federal department or agency governing the non-disclosure of classified information.

6.3. Reporting

General requirements are provided below; however, each awardee should check the award agreement and/or terms and conditions to determine the requirements for that specific award.

6.3.1. Quarterly Technical Reports. Quarterly roll up of technical accomplishments/data, including a listing of patents, publications, and presentations. The quarterly report should also include a listing of projects that have started/ended, financial metrics, and a staffing update of current efforts under the award.

6.3.2. Annual Reports. Annual Reports are due annually on the anniversary of the award. The Annual Report is *not* a cumulative report.

6.3.3. Final Technical Reports. A comprehensive final technical report is required prior to the end of the base period (i.e., Volume I). Comprehensive technical reports are also due at the end of any option periods that cover only the work performed during the option period (i.e., Volume II and Volume III). Collectively, these reports will provide end-to-end documentation of all the work accomplished under the award.

Final Technical Reports are due on the date specified in the terms and conditions of the award document. The purpose of the Final Report is to document the results of the effort. The Final Report *is* a cumulative report. The final report will be sent to the Defense Technical Information Center (DTIC) and reports may be available to the public through the National Technical Information Service (NTIS).

6.3.4. Annual Financial Reports. Federal Financial Reports (SF-425) are due no later than 1 July of each year. Awards effective after 31 January will not require a Federal Financial Report until 1 July of the following year.

7. AGENCY CONTACTS

Questions regarding the content of this BAA must be addressed to the following email address: DTRA-URA-Program@mail.mil .

DTRA will not release employee personal contact information.

8. OTHER INFORMATION

8.1. Technical and Administrative Support by Non-Government Personnel

It is the intent of DTRA to use both Government and non-Government personnel to assist with the review and administration of submittals for this BAA. All Phase I pre-proposals and invited Phase II proposals may be reviewed by subject matter experts, including, but not limited to, peer reviewers from across the academic and industrial community, as applicable to the proposed research.

Further, participation in this BAA requires DTRA support contractors to have access to Phase I pre-proposal and invited Phase II proposal information including information that may be considered proprietary or otherwise marked with restrictive legends. Existing DTRA contractors include but may not be limited to the following: Cherokee Nation Strategic Programs, LLC (contract specialist support); Kent, Campa and Kate, Inc. (contract closeout support); SAIC (advisory and assistance services); Quanterion Solutions, Inc. (DTRIAC); Kforce Government Solutions, Inc. (financial/accounting support); and CACI (contract writing system administration). Each contract contains organizational conflict of interest provisions and/or includes contractual requirements for non-disclosure of proprietary contractor information or data/software marked with restrictive legends. The applicant, by submitting a Phase I pre-proposal and invited Phase II proposal, is deemed to have consented to the disclosure of its information to the aforementioned contractors under the conditions and limitations described herein.

All individuals—including subject matter experts and support contractors—having access to any proposal information shall execute non-disclosure agreements certifying that they do not have conflicts of interest and that they will not disclose any information pertaining to this BAA including any submittal, the identity of any submitters, or any other information relevant to this BAA. All applicants to this BAA consent to the disclosure of their information under these conditions.