

**FUNDING OPPORTUNITY ANNOUNCEMENT**

**US Army Research Laboratory**



**Collaborative Research for Enhanced Academic-TTCP  
Engagement (CREATE)  
Fiscal Year 2017**

**W911NF-16-R-0027**

**Issued by:  
U.S. Army Contracting Command-Aberdeen Proving Ground  
Research Triangle Park Division  
on behalf of the Army Research Laboratory**

**Issued: 22 July 2016  
Applications Due: 15 September 2016**

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## **I. OVERVIEW OF THE FUNDING OPPORTUNITY**

### **A. Required Overview Content**

#### **Federal Awarding Agency Name(s)**

This research program is coordinated through The Technical Cooperation Program (TTCP). This program will be funded and administered by the Army Research Laboratory (ARL).

#### **Funding Opportunity Title**

Fiscal Year 2017 Collaborative Research for Enhanced Academic-TTCP Engagement (CREATE)

#### **Announcement Type**

This is the initial announcement.

#### **Funding Opportunity Number**

W911NF-16-R-0027

#### **Catalog of Federal Domestic Assistance (CFDA) Number**

12.630, Basic, Applied, and Advanced Research in Science and Engineering

#### **Key Dates**

Applications must be received by 4:00 p.m. Eastern Standard Time, September 15, 2016

### **B. Additional Overview Information**

Under authority of 10 U.S.C. § 2362 and pending the availability of funds for Fiscal Year (FY) 2017, ARL announces this funding opportunity for fundamental research to be conducted by institutions of higher education (IHEs) within the United States. The output of the project must be original and novel technology readiness level (TRL) 1-3 research. A test of this novelty and originality is that it is suitable for publication in academic journals and at academic conferences.

The CREATE Program aims to develop a coherent fundamental research program across the five TTCP nations (USA, Canada, United Kingdom, Australia, and New Zealand) that demonstrates enhanced mutual reliance (EMR) by leveraging unique research capabilities in the five international partner nations through collaboration. As such the other four other

international partner nations and the US Air Force are issuing parallel calls for research at commensurate funding levels.

Research proposals are requested that address one (or at most two) of the challenges enumerated in Section IIa. While the research will be fundamental in nature, it is expected that the problems addressed will focus on information fusion issues specific to Army scenarios.

### **International Considerations:**

This call is being released simultaneously in Australia, Canada, New Zealand, UK and USA (the International Partners), and one award will be granted by each call. The assessment and award process will run in parallel in each nation. Proposals should be from a single entity or a consortium wholly based in one of the nations of the International Partners. Only IHEs can propose. Cross-national collaborations will not be funded in this call. However it is expected that there will be significant collaboration between successful performers from different nations after award.

### **US Export Control Considerations**

The effort to be performed under this program is limited to basic research in the public domain and as such is expected not to be subject to the International Traffic In Arms Regulations (ITAR)[22 Code of Federal Regulations (CFR) 120, et. seq.] “Public Domain” is defined in Section 120.11 of the ITAR. The corresponding section of the Export Administration Regulations (EAR) (15 CFR 730, et. seq.) is Section 734.8.

### **Period of performance**

Awards made as a result of this PA are expected to provide for a period of performance of one year (12 Months).

### **Place of Performance**

The potential award(s) are only available for US institutions of higher education (IHEs). While the bulk of the performance is expected to be conducted in the US, it is anticipated the performer will travel to one or more of the four international partner nations to collaborate with the respective performers from those nations. (See section IId2 “Research & Related Budget” for more details)

## **II. DETAILED INFORMATION ABOUT THE FUNDING OPPORTUNITY**

### **A. Program Description**

Information has always yielded tactical advantage on the battlefield. In the recent past this has largely been derived from ‘physics-based’ sensors (e.g. radar, electro-optic cameras).

Additionally, significant battlefield advantage has been derived from the exploitation of information from ‘human-based’ sources (e.g. HUMINT and SIGINT). Human-based sources are typically less precise, more categorical and have richer content than physics-based sensors and therefore are typically analyzed separately from physics based sensors. Established human-based sources are being augmented with new human-based sources of data (e.g. social media, free text, and webpages) and the proliferation of these lead to a large amount of additional information that could potentially be fused with that from physics based sensors. This drives a requirement for automated fusion methods, which can also mitigate the enormous volume of unstructured data which could otherwise overload human analysts. The fusion of human-based and physics-based sources will enhance situation awareness for various tasks, including the following:

- Finding targets
- Discriminating targets
- Reacquiring targets
- Prosecuting targets which are actively trying to deceive or manipulate
- Surveillance of patterns
- Understanding interactions between entities

Examples of physics-based and human-based sources are given in Table 1. Few mature methods for the fusion of human-based and physics-based sources currently exist. Practical methods of fusing data from disparate sources to enable better situation awareness are crucial.

Proposals are sought for research into novel fusion methods to improve situation awareness. These methods must be able to fuse data sourced from physics-based sensors with human-based sources of information.

Proposals can be made to address one or at most two of the challenges listed in this call. Comprehensive coverage of all challenges is not expected.

This call is being released simultaneously in Australia, Canada, New Zealand, UK and USA (the International Partners). The assessment and award process will run in parallel in each nation. Proposals should be from a single entity or a consortium wholly based in one of the nations of the International Partners. Cross-national collaborations will not be funded in this call. However it is expected that there will be significant collaboration between successful performers from different nations after award.

The level of effort and commensurate funding is expected to equate to one person year at the Post-doctoral Research Associate level plus an appropriate level of Principal Investigator oversight per funded project.

This call is intended to procure fundamental research at the lowest Technology Readiness Levels (TRL 1-3). Expected outputs will be of the form of peer-reviewed conference or archival journal papers plus a short summary report. Products, integrated demonstrations and mature technology are outside the scope of this call. Physics-based and human-based sources of data may be available from international partners in order to assist in the demonstration of developed fusion techniques.

Physics-based sources	Human-based sources
Radar	Text in a conversation
Raw video	Analyst's report based on physics-based sensors
IR Imagery	Wikipedia entries
EO/IR fusion	Human-generated report
ES lines of bearing	Facebook posts
Metadata	Twitter tweets

Table 1: Examples of physics-based and human-based sources.

### Background: Fusion in a military context

Fusion of physics-based data from sensors e.g. radars, electronic support measures, electro-optical sensors, imagery and videos, refers to the problem of estimating the state of entities by combining the data from (typically) multiple sensors which are associated with those entities. This is usually done in an effort to produce either a better state estimate than could be obtained from any individual source of sensor data or to allow one sensor to cue another. While the means by which the data are fused may vary from one application to the next, they are always reliant on two key pre-processing steps. The data first needs to be registered which refers to transforming them into a common coordinate system or framework and using common units to quantify them. When there are multiple entities present, a decision also needs to be made about which data are associated with which entity. It is only then that the data associated with each entity may be fused to estimate its state, which is often represented as a vector. While the form of a state vector depends on many factors, in defense applications in which the goal is to enhance the situation awareness of the human end user about a battlespace, the state vectors often hold identification, positional, kinematic and classification information about their associated entities, e.g. ships, aircraft and trucks, in that battlespace. In traditional warfare, this was often adequate because the battlespace was remote from civilian environments. However, modern warfare often plays out in contested urban environments in which the adversaries and their capabilities are difficult to distinguish from regular civilians and the natural features of the environment. For that reason it is desirable to establish an *augmented state* to capture attributes suggested by human-based sources of information such as HUMINT (human intelligence) and social media (e.g. Facebook, Twitter). While this still entails performing registration and association steps before fusion can be achieved, estimating the augmented state introduces a number of issues:

- Data from these human-based sources often take the form of unstructured text instead of numerical quantities. Consequently the techniques for processing the human-based data can be vastly different to the numerical methods which are applied to physics-based sources, and are generally much more demanding.
- Registering all data within a common framework is also challenging because the processing of data from physics-based sources yields an object-oriented representation of entities in the form of estimated state vectors, while the processing of data from human-based sources often yields relations between entities.
- Unlike numerical state estimates which have a clear meaning derived from the model that has been used to generate them, the processing of the human-based data may

need to incorporate a means of endowing the extracted information with semantics that are faithful to the original source.

- Time-aligning physics-based data is relatively straightforward because timestamps for physics-based data are recorded by the sensor, while the timestamps that record when the human-based data are created may not reflect the time associated with the report. For example, a Facebook entry posted today may refer to the past (e.g. “I caught up with friends yesterday”) or to the future (e.g. “I am going overseas tomorrow”).

## **Challenges**

In the defense context, algorithm outputs are required in a timely fashion at sufficient accuracy to provide analysts with the information they need to enable effective decisions. Timescales may range from seconds to several hours depending on the time validity of the fusion product. Therefore, it is important that the solutions to the challenges take into account computational cost, convergence rate and robustness. The trade-offs between these measures may depend upon the application, including, but not limited to, detection, tracking, classification, prediction, pattern of life or finding multi-entity relationships.

We expect proposals to address one or two of the following challenges in depth. Multiple proposals addressing a variety of challenges are welcome.

### **Challenge 1: General Method for Fusing Data from any Source**

Performing inference on physics-based numerical data has to date used methodologies that are different from those required for performing inference on human-based symbolic data. A general method for fusing data from any source would enable reasoning (for example, abduction, deduction and induction) regarding the augmented state of the set of entities/situations.

The challenge is to formulate a new general theorem for fusing data from any sources to improve reasoning about the entities, and prove rigorously that this works for any data types.

### **Challenge 2: Intersection between the data spaces of physics based sensors and human-based sources**

Each information source can be thought of as operating in a multidimensional hypercube that contains the state space of possible information that source can provide. For example some radars may operate in a state space of range/bearing/Doppler/time/target cross section. One of the challenges of fusing physics-based sources with human-based sources is understanding the intersections between the state spaces of the hypercubes of each information source. For example it is clear that there is some intersection between the state space of the radar described above and geo/time-tagged photographs of moving vehicles, but the intersection may be low and/or difficult to fully characterize without additional knowledge about the vehicle. The challenge is to develop techniques that allow mapping of one information source’s state space to another while coping with the uncertainty present in each.

### **Challenge 3: Data and information space dimensional mismatch**

In this context of fusion of physics-based and human-based sources, the multi-dimensional data space is large. The inherent information space, however, is often much smaller. The mapping from the high dimension data space to the smaller dimension information space is currently very much an art form, with no simple, best, and unique solution. Additionally, this is replete with a plethora of ill-posed inverse problems, demanding regularization. The challenge is to develop methods for determining an appropriate augmented state for the inherent information space.

### **Challenge 4: How to assign uncertainty / probability**

Information going into a target knowledge base can come from a wide range of disparate sources. Usually human analysts will read reports and add entities, attributes and links directly into the knowledge base using a data entry interface. But the source information can be inaccurate, uncertain, incomplete, biased, conflicting or ambiguous.

The challenge is to determine how observations with different types of associated uncertainty can be combined:

- So that uncertainty is suitably assigned numerically to evidence and/or prior information
- So that the level of trust in or reliance on a given data source or piece of data is adequately represented

### **Challenge 5: Incorporating the augmented state into current fusion schemes**

While there is maturity in fusion schemes for physics-based sources, they do not accommodate human-based sources, or accommodate them only in a limited fashion. Methods for estimating and predicting the relationships between the states of individual objects are required given inputs from both physics-based and human-based sources. The developed methods would allow the incorporation of these new data into extant fusion schemes and so enable state prediction, update, data association, filtering and smoothing. The challenge is to develop methods of estimating and predicting the augmented state of an entity and the relationship between entities, which allow for the incorporation of human-based observations from novel and underexploited data sources.

### **Challenge 6: Fusion level trade space**

Fusion from physics-based sources can take place at various levels (for example, the data, feature, object or decision levels) resulting in a trade-off between accuracies and efficiencies. Incorporating human-based sources adds to the complexity of the trade-off. The challenge is to characterize the trade space for the augmented state for fusion at varying levels. This would lead to methods for identifying an appropriate fusion level given a set of physics-based and human-based sources and a desired accuracy or efficiency requirement.

### **Challenge 7: Context**

‘Context’ covers the setting in which the data are collected and the purpose for which the data are exploited. Knowledge of the context in which data is being collected and processed can enhance the tasks of data association, data fusion, the verification of data sources, and the scheduling of resources. Challenges are:

1. To represent contextual information and use it to perform these tasks for physics-based and human-based sources.
2. To understand a changing context and develop fusion algorithms that are robust to it.

### **Challenge 8: Unmatched data rates and latencies**

Many physics based sensors operate on relatively short timelines (e.g. seconds to minutes). Many human-based sources build over longer timeframes, are asynchronous, and can refer to the past or future. These unmatched timelines cause problems for traditional fusion approaches. The challenge is to develop methods to accommodate unmatched data rates and latencies which derive from physics-based and human-based sources.

### **Challenge 9: Pattern of life**

Analysts are required to produce intelligence products from increasingly large and disparate data sets. As these sources increase and diversify, the job of making sense of them is becoming beyond the abilities of single individuals. Methods of pattern recognition and classification are required that enable a representation of normality (a pattern of life) to be developed from both physics-based and human-based sources of data. These patterns should enable an analyst to readily address specific intelligence questions. It is anticipated that data sets will be very large, diverse and dynamic. Developed methods are required to cope with these aspects and so deliver timely, interpretable results. Classification of behavior, and detection of anomalies, should emerge as a natural consequence of this pattern recognition activity. Because of the size of the data and operator constraints, unsupervised or very lightly-supervised methods are required. **The challenge is to form a pattern of life and detect anomalies using data from both physics-based and human-based sources.**

### **Challenge 10: Sensor/information-source management and control**

The term sensor management is widely understood to involve on-line optimization of future observations of sensors to minimize uncertainty / maximize information gain in a resource constrained scenario. Processing of human-based sources is resource constrained in terms of the processing resources required to make sense of the data collected. Therefore similar sensor management principles could apply within these resource constraints to improve the augmented state estimate. This could apply equally in centralized or distributed architectures. The challenges are:

1. To develop universal sensor management principles that could equally apply to physics-based and human-based sources and show how these could be used for optimization of control, cueing and decision support.
2. To develop techniques for control in a distributed network of sources for the purpose of estimating the augmented state.

## Challenge 11: Distributed Fusion

The soldier at the tactical edge needs situational awareness to conduct his/her mission. They also act as human-based information sources; their observations contribute to overall situation awareness. Furthermore, many physics-based sensors are operating at the tactical edge. These soldiers and sensors have access to limited computational resources and battery supplies, and are connected to information networks via spurious, latent and low bandwidth links. In addition, not all nodes on the network have equal computational and network resources. For example, there may be nodes with high computational capabilities. Distributed fusion methods provide robustness compared with centralized fusion, but present challenges associated with data reuse, statistical independence and convergence. **The challenge is to develop novel distributed fusion methods to operate over such asymmetric computing and networking resources that accommodate physics-based and human-based sources.**

### B. Federal Award Information

ARL intends to issue one award of no more than \$200,000 under this FOA, subject to the availability of funds. An award will be in the form of a grant, and any award will be made by the U.S. Army Contracting Command-Aberdeen Proving Ground Research Triangle Park Division (ACC-APG-RTP Division) on behalf of ARL. The award will have a performance period of 12 months. An award decision will be based on the results of a merit review by scientists and engineers of the participating Agencies.

### C. Eligibility Information

#### 1. Eligible Applicants

As provided in 10 U.S.C. § 2362, eligibility for this competition is open only US institutions of higher education.

#### 2. Cost Sharing or Matching

Cost sharing or matching is not required under this FOA, and is not an evaluation factor.

#### 3. Other

- a. Multiple proposals from the same Applicant are welcome.
- b. Collaboration with researchers in other nations who are beneficiaries of the associated calls is encouraged.
- c. The TTCP ISTAR TP1 panel is developing an open source Tracking and Fusion Framework for the development and evaluation of fusion algorithms. Successful proposers will be given information about this project and are expected to interact with the development team to, at the very least, have cognizance of the effort. Where possible, software outputs should be compatible with this framework.

- d. Deliverables must include source code and data (both where applicable) that permit the reproduction of reported results.
- e. Research products (including source code) will be shared across international partners.
- f. It is anticipated that there will be no limitations on conducting or reporting this research resulting from export control regulations. Proposals which appear to contravene national export control regulations at the national assessment phase will not be evaluated.
- g. If an award is made, the Recipient will own any intellectual property (IP) developed under this award, but the US Government will have rights as specified in the award.
- h. Government subject matter experts from international partners will be involved in periodic project review and research assessment and may provide non-binding technical guidance and feedback during the project.

## **D. Application and Submission Information**

### **1. Address to Request Application Package**

All applications must be submitted electronically through Grants.gov in the format specified below. Application forms and instructions are available at Grants.gov. To access these materials, go to <http://www.grants.gov>, select “Apply for Grants,” and then follow the instructions. In the Grants.gov search function, enter the funding opportunity number for this FOA W911NF-16-R-0027. You can also search for the CFDA Number 12.630, Basic, Applied, and Advanced Research in Science and Engineering. On the Selected Grant Applications for Download page, click on 'download' under the heading 'Instructions and Applications' to download the application package.

In order to submit applications through Grants.gov, recipients must obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number and register in SAM (see Section D.3 below), register with the credential provider, register with Grants.gov, and obtain approval for an Authorized Representative (AR) to submit applications on behalf of the organization. Registration in Grants.gov must be accomplished prior to submitting an application. Go to <http://www.grants.gov/web/grants/grantors/grantor-registration.html> for further information. Use the Grants.gov Organization Registration Checklist, which may be accessed at <http://www.grants.gov/web/grants/applicants/organization-registration.html> to guide you through the process.

**VERY IMPORTANT:** In order to view, complete, and submit an application package, you may need to download the appropriate software packages. Go to [http://www.Grants.gov/applicants/apply\\_for\\_grants.jsp](http://www.Grants.gov/applicants/apply_for_grants.jsp) for further information. Use the Grants.gov Organization Registration Checklist, which may be accessed to guide you through the process.

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

## 2. Content and Form of Application Submission

Applicants must complete all mandatory forms and any optional forms (e.g., SF-LLL Disclosure of Lobbying Activities) in accordance with the instructions on the forms and the additional instructions below. The required fields should be completed in accordance with the “pop-up” instructions on the forms. To activate the instructions, turn on the “Help Mode” (icon with the pointer and question mark at the top of the form). All attachments to Grants.gov forms must be in PDF format (Adobe Portable Document Format). To convert attachments into PDF format, Grants.gov provides a list of PDF file converters at <http://www.grants.gov/web/grants/applicants/adobe-software-compatibility.html>. Please ensure that your attachments are not password protected.

The following formatting rules apply for the file attachments except as indicated below:

- Paper size when printed – 8.5 x 11-inch white paper, one-sided
- Margins – 1 inch
- Spacing – single
- Font – No smaller than Times New Roman, 12 point font (excluding mandatory forms)
- **Number of pages – 5.5: The 5.5-page limit applies to the technical portion of the application, which consists of the following: Project Summary/Abstract (0.5) and Project Narrative (5 page limit), as described below, as well as any letters of support that an applicant chooses to submit. Pages exceeding this limit will not be considered in the application evaluation. Note: Letters of support should be addressed to the PI, not to DoD.**

**The following SF 424 (R&R) forms and, as applicable, attachments are required for all applications:**

**FORM: The SF 424 (R&R) (Mandatory)** - The SF 424 (R&R) form is to be used as the cover page. Complete this form first to populate data in other forms. By submitting an application through Grants.gov, the AR (identified by username and password) is providing an “electronic signature.” By “signing” the SF 424 (R&R), an applicant is providing the certification required by 32 CFR Part 28 regarding lobbying as contained in Section II.F.2 of this FOA, and the appropriate representation on tax delinquency and felony convictions (see below regarding “Other Attachments,” Field 12). If you encounter problems, contact customer support at 1-800-518-4726 or at [support@grants.gov](mailto:support@grants.gov). If you forget your user name or password, follow the instructions provided in the Credential Provider tutorial. Tutorials may be printed by right-clicking on the tutorial and selecting “Print.”

**FORM: Research & Related Senior/Key Person Profile** – Biographical sketches are required for the PI and for other key personnel (not to exceed three (3) pages each). It is highly desirable to include the biological sketches of any doctoral Research Associate level performer. The biological sketches will not be included in the page count. Be sure to include education and the year in which each degree was received.

To attach biographical sketches, click “Add Attachment.”

**FORM: Research & Related Other Project Information (Mandatory)** – Complete questions 1 through 6 and attach a file for items 7, 8, and, as applicable, 12. Under this FOA, applicants are not required to provide attachments for items 9, 10, and 11. The files **must** comply with the following instructions:

**Project Summary/Abstract (Field 7 on the form) (Mandatory)** – The Project Summary/Abstract must be no longer than 0.5 pages. The abstract must be marked that it is publicly releasable, as abstracts for all awarded applications will be placed on a DoD website(s) searchable by the public. The abstract should provide a concise description of the research to be conducted. The header of the abstract should identify the PI, the institution, and the proposal title.

To attach a project summary/abstract, click “Add Attachment.”

**Project Narrative (Field 8 on the form)** – The project narrative must address the following:

1. Indicate the one or two technical challenge(s) (see Section IIa) to which the proposed research is relevant. To focus the research, proposals cannot address more than two challenges. If additional challenges (*i.e.*, more than two) are included in a proposal, only the first two challenges presented in the proposal will be evaluated.
2. An overview for the technical challenge(s) being addressed including the current state-of-the-art.
3. A description and justification for the proposed research to address the challenge(s) and advance the state-of-the-art. Must specify which physics-based and human-based sources are considered for fusion. Note at least one physics-based and one human-based source must be considered for the one or two challenges addressed in the proposal.
4. A description of potential techniques to be used to validate the research.

To attach the project narrative, click “Add Attachment.”

**Other Attachments (Field 12 on the form)** – To include any other relevant attachments, all of which must be in PDF format, click “Add Attachment.” This must include a completed representation on tax delinquency and felony convictions (included as part of the application package for this FOA) and, as applicable, a completed SF-LLL, Lobbying. This form is applicable if any funds other than federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of

Congress, or an employee of a Member of Congress in connection with the application for a grant under this FOA.

**FORM: SF 424 (R&R) Research & Related Budget (Mandatory)** – Complete Sections A through I and attach a budget justification in Section K. The budget must be consistent with a 12-month period of performance (assume a proposed start date of January 1, 2017) and include the total amount requested and a breakdown by cost element. The budget justification should provide additional data (not included in Sections A through I) by element of cost, sufficient to meet the guidance provided below and ensure meaningful evaluation.

The labor costs must be commensurate with one person year at the Research Associate or Post-doctoral Fellow level plus an appropriate level of Principal Investigator oversight and government technical partnering.

Collaborations with researchers in other nations who are beneficiaries of the associate calls under this CREATE Program is encouraged. To this end, one international review meeting for all participants within the CREATE Program is expected. Furthermore, at least one other international trip to engage with one of the other participants is expected. Finally, it is expected that the participants disseminate and engage with the appropriate research community as part of normal business. Thus, the travel costs must include: (a) attendance at one international review meeting hosted by one of the international partners, (b) collaboration visits with researchers in other nations, and (c) peer review conference attendance and other activities expected of the recipient. Regarding the trips for items (a) and (b), one can assume that one trip requires travel to Australia or New Zealand, and the other trip requires travel to the United Kingdom.

To attach the budget justification at Section K, click “Add Attachment.”

**Note: Be sure that the total amount requested in the budget agrees with the amount entered in Block #15 of the Cover Page (Form SF 424 (R&R)).**

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

Each eligible applicant under this FOA is required to (a) be registered in SAM prior to submitting its application; (b) provide a valid Dun and Bradstreet Universal Numbering System (DUNS) number in its application; and (c) 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 an agency.

ACC-APG-RTP Division on behalf of the ARO, as the awarding office for awards under this FOA, will not make an award to an applicant until the applicant has complied with all applicable DUNS and SAM requirements. If an applicant has not fully complied with the requirements by the time ACC-APG-RTP Division is ready to make an award, the

evaluation panel will determine that the applicant is not qualified to receive an award and use that determination as a basis for making an award to another applicant.

#### 4. Submission Dates and Times

- a. Applications must be received by 4:00 p.m. Eastern Standard Time, September 15, 2016.

Applicants are responsible for submitting their applications in sufficient time to allow them to reach Grants.gov by the time specified in this FOA. If the application is received by Grants.gov after the exact time and date specified as the deadline for receipt, it will be considered “late” and will not be considered for review. Acceptable evidence to establish the time of receipt by Grants.gov includes documentary evidence of receipt maintained by Grants.gov.

**To avoid the possibility of late receipt, which will render the application ineligible for consideration, it is strongly recommended that applications be uploaded at least 2 days before the deadline established in the FOA. This will help avoid problems caused by high system usage or any potential technical and/or input problems involving the applicant’s own equipment.**

If an emergency or unanticipated event interrupts normal federal government processes so that applications cannot be received by Grants.gov by the exact time specified in this FOA, and the situation precludes amendment of the FOA closing date, the time specified for receipt of applications will be deemed to be extended to the same time of day specified in this FOA on the first work day on which normal federal government processes resume.

- b. **Application Receipt Notices** - After an application is submitted to Grants.gov, the AR (listed in Block #19 of the SF 424) will receive a series of three e-mails from Grants.gov. The first e-mail will confirm receipt of the application by the Grants.gov system, and the second e-mail will indicate that the application has either been successfully validated by the system prior to transmission to ARL or has been rejected due to errors. The second email will also determine if the proposal is late based on the aforementioned receipt time. A third e-mail should be received once ARL has confirmed receipt of the application within 10 days from the application due date. The last e-mail will indicate that the application has been received and provide the assigned tracking number. Applicants can track the status of their applications through at <http://www.grants.gov/web/grants/applicants/track-my-application.html>. Acknowledgement letters will be sent by ARL to proposing institutions by November 4, 2016.

#### 5. Intergovernmental Review

There is no requirement for intergovernmental review under this FOA.

## 6. Funding Restrictions

Funding is capped at \$200,000 for the award. Labor cannot exceed more than two months for faculty and one year for a post-doctoral Research Associate level researcher.

## 7. Other Submission Requirements

An applicant may withdraw an application at any time before award by written notice or by email. Notice of withdrawal shall be sent to the Grants Officer identified in Section II.G, of this FOA. Withdrawals are effective upon receipt of notice by the Grants Officer.

## **E. Application Review Information**

### 1. Criteria

Primary evaluation criteria (of equal importance to each other) are:

- a. Technical Merit – Potential scientific merit for the research to significantly advance the state-of-the-art by addressing one of the technical challenges in Section IIa. The proposal shall be able to demonstrate a suitable level of expertise in the proposed challenge(s).
- b. Military Relevant – Potential for the research to positively impact military operations by transitioning into a product.
- c. Qualifications of the PI and other key personnel to successfully conduct the research. While naming of a doctoral Research Associate level in the proposal is not required, proposals that do identify such post-docs will be rated higher in this category.
- d. Secondary evaluation criterion, of less importance than primary criteria is realism and reasonableness of cost.

### Review and Selection Process

US Army scientists and engineers will evaluate applications according to criteria a-d specified above. The most meritorious applications will be considered for portfolio balancing. Portfolio balancing is designed to encourage mutual reliance across the full multinational program of work. An international panel of subject matter experts having visibility across all proposals within the CREATE program will provide national assessors with advice. The national assessor will then be able to use this information to fund those proposals which will maximize mutual reliance across international partners.

### 2. Anticipated Announcement and Federal Award Dates

Award decisions are expected to be announced by November 4, 2016 by acceptance/declination letters via email. Awards are expected to be made in December, 2016.

#### 4. Recipient Qualification

The Office of Management and Budget (OMB) has issued final guidance implementing section 872 of the Duncan Hunter National Defense Authorization Act for Fiscal Year 2009 as it applies to grants. As required by section 872, OMB and the General Services Administration have established the Federal Awardee Performance and Integrity Information System (FAPIIS) as a repository for government-wide data related to the integrity and performance of entities awarded federal grants and contracts. This final guidance implements reporting requirements for recipients and awarding agencies; requires awarding agencies to consider information in FAPIIS before awarding a grant to a non-federal entity, and addresses how FAPIIS and other information may be used in assessing recipient integrity.

Specifically, effective January 1, 2016, the guidance requires:

- a. Federal awarding agencies to report information to FAPIIS about any termination of an award due to a material failure to comply with the award terms and conditions; any administrative agreement with a non-federal entity to resolve a suspension or debarment proceeding; and any finding that a non-federal entity is not qualified to receive a given award, if the finding is based on criteria related to the entity's integrity or prior performance under federal awards.
- b. Federal awarding agencies, prior to making award to a non-federal entity, to review information in FAPIIS to determine that entity's eligibility to receive the award.
- c. Recipients of federal contracts, grants, and cooperative agreement awards with a cumulative total value exceeding \$10,000,000 to provide to FAPIIS information on certain civil, criminal, and administrative proceedings that reached final disposition within the most recent five year period and that were connected with the award or performance of a federal award; and to disclose semiannually the information about the criminal, civil, and administrative proceedings described in section 872(c).
- d. Notice of funding opportunities and federal award terms and conditions to inform a non-federal entity that it may submit comments to FAPIIS (<https://www.fapiis.gov>) about any information the federal awarding agency had reported to the system about the non-federal entity, for consideration by the awarding agency in making future awards to the non-federal entity.

#### **F. Federal Award Administration Information**

##### 1. Federal Award Notices

Notification of selection of applications will be e-mailed by ARL to successful applicants in November 2016. Unsuccessful applicants will be notified shortly thereafter.

The notification e-mail regarding a successful application must not be regarded as authorization to commit or expend DoD funds. A grant award signed by the DoD Grants Officer is the authorizing document. Applicants whose applications are recommended for negotiation of award will be contacted by a DoD Contract/Grant Specialist to discuss any additional information required for award. This may include representations and certifications, revised budgets or budget explanations, or other information as applicable to the proposed award. The award start date will be determined at this time. The anticipated award date is December, 2016. The research should start in January, 2017 to ensure coordination of the research activities across the international partner nations.

## 2. Administrative and National Policy Requirements

- a. Each grant awarded under this FOA will be governed by award terms and conditions that conform to DoD's implementation of OMB guidance applicable to financial assistance in 2 CFR part 200, "Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards."
- b. In keeping with the provisions of 31 USC 6306 and with the intent of this program to increase university capabilities to conduct DoD-relevant research and research-related education, title to the equipment may be vested with the university without further obligation to the federal government after completion of the award.
- c. Recruitment and selection procedures for students affected by an award under this FOA must comply with Section 2000d of Title 42, United States Code, which provides:

*No person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.*

### d. **Representations Required for Grant Awards**

By electronically signing the SF-424, the applicant affirms its agreement with the following three representations:

#### **Representations on tax delinquency and felony convictions**

Check either "is" or "is not" for each of these two representations, as appropriate for the proposing institution, and attach the representations page to field 18 of the SF-424. The page for these representations is provided with the application materials for the FOA that are available for download at grants.gov.

#### **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 nondisclosure of classified information.

**SF-LLL Form “Disclosure Form to Report Lobbying”** -- If your university has lobbying activities that you are required to disclose under 31 USC 1352, as implemented by the DoD at 32 CFR part 28, you also must complete and attach the SF-LLL form in the downloaded Adobe forms package at Grants.gov.

### 3. Reporting

Recipients must submit a final financial report using the Standard Form (SF)-425, Federal Financial Report, and a final technical report describing the technical achievements of the effort.

#### **G. Federal Awarding Agency Contacts**

For questions concerning programmatic content, potential applicants are advised to contact:

Dr. Lance Kaplan  
Army Research Laboratory  
lance.m.kaplan.civ@mail

The DoD Grants Officer is:

Mr. Brandon Hill  
Grants Officer  
US Army Contracting Command-Aberdeen Proving Ground  
RTP Division  
Brandon.s.hill24.civ@mail.mil

#### **H. Other Information**

Applications must not include any information that has been identified as classified national security information under authorities established in Executive Order 12958, Classified National Security Information.

Applicants are advised that employees of commercial firms under contract to the government may be used to administratively process applications. By submitting an application, an applicant consents to allowing access to its application(s) by support contractors. These support contracts include nondisclosure agreements prohibiting their contractor employees from disclosing any information submitted by applicants.