

FUNDING OPPORTUNITY ANNOUNCEMENT



DEPARTMENT OF DEFENSE (DoD)

**ARL Historically Black Colleges and Universities
(HBCU)/Minority-Serving Institutions (MI)
Undergraduate Student Design Competition**

Funding Opportunity Announcement W911NF-18-S-0012

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

**Issued: September 2018
Applications Due: November 19, 2018**

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I. OVERVIEW OF THE FUNDING OPPORTUNITY

A. Required Overview Content

Federal Awarding Agency Name(s)

This Department of Defense (DoD) program will be administered through the U.S. Army Research Laboratory (ARL).

Funding Opportunity Title

ARL Historically Black Colleges and Universities (HBCU)/Minority-Serving Institutions (MI) Undergraduate Student Design Competition.

Announcement Type

This is the initial announcement.

Funding Opportunity Number

W911NF-18-S-0012

Assistance Listing (Catalog of Federal Domestic Assistance (CFDA) Number)

12.431 - Basic Scientific Research

Key Dates

18 September 2018: Funding Opportunity Announcement issued

19 November 2018: Deadline for design proposal submissions (4 p.m. ET)

11 January 2019: Awardee teams notified of grant award and competition requirements

1 February 2019: Award of grants to selected finalist teams

23-25 April 2019: Competition/Final Judging Event at The University of Texas at El Paso

30 April 2019: Cash prize payments made to winners

B. Additional Overview Information

Under the ARL HBCU/MI Student Design Competition, travel support, materials and prizes will be provided to HBCU/MI undergraduate student teams to participate in a research design competition in topic areas of Army interest. The grants awarded to the HBCU/MI institutions of higher education under 10 U.S.C. § 2362 will provide travel support and other material costs required for the design competition. All prizes will be provided separately under 10 U.S.C. § 2374a, the prize authority for the Secretary of Defense and will not be a part of the grant.

The goals of the ARL HBCU/MI Undergraduate Student Design Competition are to:

- Introduce HBCU/MI students to Army research and technical challenges and increase student interest in Army science and engineering;
- Engage HBCU/MI students with the Army's technical and operational communities;
- Implement ARL's HBCU/MI engagement strategy; and,
- Stimulate innovation and entrepreneurship.

Science and engineering talent and capability lie at the heart of the Army's ability to field the World's most advanced and capable ground fighting forces. To maintain this combat edge, it is vital that the Army attracts students from a wide variety of academic and personal backgrounds to ensure it stays on the forefront of discovery and innovation.

II. DETAILED INFORMATION ABOUT THE FUNDING OPPORTUNITY

A. Program Description

This funding opportunity announcement is a call for eligible institutions to submit a design proposal expressing their interest to participate in a research design competition in topic areas of Army interest. There are two (2) Army-focused topic areas that applicants can submit a proposal against. An eligible institution must form a team of undergraduate students who will produce a creative solution to one or more of these challenges. Eligible institutions are encouraged to form cross disciplinary (e.g. materials science, mechanical engineering, chemistry, computer science, etc. teams to address the challenge(s). An eligible institution must have a team with a minimum of three (3) and a maximum of eight (8) team members. The team must be made up of undergraduate students currently enrolled in eligible institutions. Team composition may change only once during the competition. If there is a change, the Grants Officer and Grants Officer Representative must be notified in writing in advance of making the proposed change. The Recipient must demonstrate that the qualifications of the proposed team replacement are equal or better than the team member being replaced.

DESCRIPTION OF TWO ARL DESIGN COMPETITION TOPIC AREAS:

Topic 1: Small UAVs

BACKGROUND: Future Army units are expected to operate in complex and dynamic global environments. Mission-tailored small unmanned aerial vehicles (UAVs) offer an innovative solution to rapidly build platforms to enable situational understanding when and where it is needed. However, current tools and processes are inadequate for designing small rotary wing and fixed wing UAVs around mission requirements. The Army Research Laboratory performs research and engineering to address this gap and enable mission-driven architecture selection, real-time design, and forward-deployed fabrication through additive manufacturing (3D-printing). Prototype UAV designs have been generated by Army researchers. Warfighters have assembled and flown these UAVs, and we have collected the feedback: the Warfighter needs UAVs that are more easily assembled, with fewer parts.

CHALLENGE: In current UAVs, power is delivered from the center hub out to each motor via a wire bundle which runs the length of each arm. The goal of this challenge is to eliminate wire bundles in an innovative way, integrating power transfer with the arm structure.

You must acquire or build a prototype quadcopter UAV, then modify it with arm(s) utilizing embedded wiring. The preferred method of manufacture for the envisioned multifunctional structure is 3D-printing. Manufacturing complexity, the degree of automation, and electrical and mechanical performance are likely to be the main challenges to overcome.

CONSTRAINTS:

- Minimize usage of support material to simplify the manufacturing process, acid baths may be unavailable to soldiers in the field
- Minimize usage of mechanical fasteners for assembly, snap fit parts have been identified as preferable by users

As part of your work, you are expected to provide a quantitative description of the tradeoffs between electrical and mechanical performance, as well as design and manufacturing complexity. Some interesting tradeoff elements could include arm mass, material choice, print time, maximum current supported, required equipment, build time, build steps, and part count.

DEMONSTRATION: At the conclusion of this challenge project your prototype UAV arm will be assessed by ARL researchers and then test flown after passing baseline safety testing. ARL will fly the platform through representative mission profiles to assess the form, fit, and function of your solution. By participating in this challenge, you will directly influence UAV assembly/disassembly time and complexity, enabling faster employment of small, mission-tailored UAVs near the point of need with simplified manufacturing and assembly procedures.

SPECIAL REQUIREMENT: For flight operations, university team pilots must have a FAA Remote Pilot certificate (14 CFR Part 107) or alternatively can operate under a university Certificate of Authorization. Additionally, sUAS registration must comply with 14 CFR Part 48.

Topic 2: UAVs from Biologically-Based Material

BACKGROUND: Cellulose is the most abundant polysaccharide on the planet as it is the primary structural component of plants. Some microorganisms, including the bacteria *Gluconacetobacter hansenii* also produce cellulose. Unlike harvesting cellulose from plants which requires extraction and industrial processing, the cellulose produced from bacteria is pure and only needs to be sterilized to remove the bacteria. This is a green, renewable, and sustainable resource that is portable and biocompatible. As a material, cellulose is used in many applications in biomedicine, energy harvesting, biocouture and material enhancement. The ultimate goal of polymer material engineering is for a material that exhibits high transparency and mechanical strength, and this is sought after through intense research by many high caliber institutions at present day.

Unmanned aerial vehicles (UAVs) or drones are used in applications for military, agriculture, scientific, and recreational use. UAVs are a major asset for a variety of military operations. The herein design challenge calls on teams to contribute to state-of-the-art technology supporting the soldiers in the field. Teams are requested to use cellulose produced from bacteria to assemble UAVs with onboard functions required to fulfill a military mission. Growing conformal polymer materials as a forward-deployed fabrication technique will supply the demand for tools under resource limited conditions.

ARMY RELEVANCE: Manufacturing materials at the point of need is a major obstacle for soldiers in the field. The replacement and repair of tools and parts is vital for the survival and success of missions. Biology offers renewable, sustainable, and seed-able solutions to the production of chemicals and polymers. Utilize biology to create materials for engineering solutions.

CHALLENGE: Replace as many parts as possible on the given UAV kit with cellulose produced from the bacteria *Gluconacetobacter hansenii*. Cellulose mats can be infused with various fillers and/or resins during bacterial growth or post-production. These chemicals/materials may be necessary for imparting the final cellulose-based product with the desired flexibility and mechanical strength to hold up to the molding process and assembly into the final UAV. The processing and molding of the cellulose is a major part of this material engineering challenge.

DEMONSTRATION: At the end of this challenge, the drone must be fully functional. All participant drones will be judged for flight capabilities on a standard course. The chemical processing of cellulose will be assessed for simplicity, the least number of toxic chemicals, and an emphasis on the use of biodegradable materials. Innovation will be judged on the most inspiring use of cellulose itself and on the approach to molding/forming. This challenge highlights the use of biological, natural resources for the manufacturing and replacement of military relevant parts at the point of need.

MATERIALS SUPPLIED: *G.hansenii* culture and baseline protocol, cellulose pellicles for concept testing, and the UAV catalog #.

CONSTRAINTS: *G.hansenii* growth will be the rate limiting aspect of the challenge. Therefore, sterilized cellulose pellicles will be provided to practice molding/forming concepts as well as post-

production material engineering ideas. Successful teams will demonstrate excellent time management and planning for execution.

B. Federal Award Information

Awards will be in the form of grants, and all awards 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. A grant is a legal instrument that is used to enter into a relationship for the following:

- a. The principal purpose of which is to transfer a thing of value to the recipient to carry out a public purpose of support or stimulation authorized by a law or the United States, rather than to acquire property or services for the Federal Government's direct benefit or use.
- b. In which substantial involvement is not expected between the Federal Government and the recipient when carrying out the activity contemplated by the grant.
- c. No fee or profit is allowed.

Team awards will be issued for no more than \$8,000.00. All awards will have a performance period of 6 months. Award decisions will be based on the results of a merit review by ARL subject matter experts.

C. Eligibility Information

1. Eligible Applicants

As provided in 10 U.S.C. § 2362, eligibility for this competition is open only to "covered educational institutions," which are defined as:

- a. institutions of higher education eligible for assistance under Title III or V of the Higher Education Act of 1965 (20 U.S.C. 1051 *et seq.*); or
- b. accredited post-secondary minority institutions.

Eligible applicants include community colleges or other 2-year degree granting institutions meeting the definition of a "covered educational institution."

Enrollments, accreditation, and other factors may affect an institution's eligibility in any given year. With the exception of HBCUs and Tribal Colleges and Universities (TCUs), in order to meet the eligibility criterion, an institution must apply to the Department of Education (DoEd) each year for Title III or Title V eligibility. A copy of the DoEd letter dated November 2017 or later certifying eligibility for Title III or Title V assistance must

be included with each application submitted under this FOA. The eligibility letter will not be included in the page limit.

If the DoEd eligibility letter is not submitted with the design proposal, the submission will be deemed ineligible and will not be evaluated or considered for award.

No more than one (1) design proposal is allowed per eligible institution. If more than one otherwise eligible design proposal is received from an eligible institution, the institution will be contacted and required to withdraw all but one.

2. Cost Sharing or Matching

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

D. Application and Submission Information

1. Grants.gov Application Submission and Receipt Procedures

This section provides the application submission and receipt instructions for DoD program applications. Please read the following instructions carefully and completely.

DoD is participating in the Grants.gov initiative to provide the grant community with a single site to find and apply for grant funding opportunities. For this funding opportunity, DoD requires applicants to submit their applications online through Grants.gov. This funding opportunity may be found on Grants.gov by going to the Grants.gov Search Grants screen and entering the funding opportunity number for this FOA, W911NF-18-S-0012, in the Funding Opportunity search box. You can also search for the CFDA Number 12.431, Basic Scientific Research.

2. How to Register to Apply through Grants.gov

- a. *Instructions:* Read the instructions below about registering to apply for DoD funds. Applicants should read the registration instructions carefully and prepare the information requested before beginning the registration process. Reviewing and assembling the required information before beginning the registration process will alleviate last-minute searches for required information.

Organizations must have a Data Universal Numbering System (DUNS) Number, active System for Award Management (SAM) registration, and Grants.gov account to apply for grants.

Creating a Grants.gov account can be completed online in minutes, but DUNS and SAM registrations may take several weeks. Therefore, an organization's registration should be done in sufficient time to ensure it does not impact the entity's ability to meet required application submission deadlines.

Complete organization instructions can be found on Grants.gov here:

<https://www.grants.gov/web/grants/applicants/organization-registration.html>

- 1) *Obtain a DUNS Number:* All entities applying for funding, including renewal funding, must have a DUNS Number from Dun & Bradstreet (D&B). Applicants must enter the DUNS Number in the data entry field labeled "Organizational DUNS" on the Standard Form (SF)-424 form. For more detailed instructions for obtaining a DUNS Number, refer to:
<https://www.grants.gov/web/grants/applicants/organization-registration/step-1-obtain-duns-number.html>
- 2) *Register with SAM:* All organizations applying online through Grants.gov must register with the System for Award Management (SAM). Failure to register with SAM will prevent your organization from applying through Grants.gov. SAM registration must be renewed annually. For more detailed instructions for registering with SAM, refer to:
<https://www.grants.gov/web/grants/applicants/organization-registration/step-2-register-with-sam.html>
- 3) *Create a Grants.gov Account:* The next step is to register an account with Grants.gov. Follow the on-screen instructions or refer to the detailed instructions here:
<https://www.grants.gov/web/grants/applicants/registration.html>
- 4) *Add a Profile to a Grants.gov Account:* A profile in Grants.gov corresponds to a single applicant organization the user represents (i.e., an applicant) or an individual applicant. If you work for or consult with multiple organizations and have a profile for each, you may log in to one Grants.gov account to access all of your grant applications. To add an organizational profile to your Grants.gov account, enter the DUNS Number for the organization in the DUNS field while adding a profile. For more detailed instructions about creating a profile on Grants.gov, refer to:
<https://www.grants.gov/web/grants/applicants/registration/add-profile.html>
- 5) *EBiz POC Authorized Profile Roles:* After you register with Grants.gov and create an Organization Applicant Profile, the organization applicant's request for Grants.gov roles and access is sent to the EBiz POC. The EBiz POC will then log in to Grants.gov and authorize the appropriate roles, which may include the Authorized Organization Representative (AOR) role, thereby giving you permission to complete and submit applications on behalf of the organization. You will be able to submit your application online any time after

you have been assigned the AOR role. For more detailed instructions about creating a profile on Grants.gov, refer to:

<https://www.grants.gov/web/grants/applicants/registration/authorize-roles.html>

6) *Track Role Status*: To track your role request, refer to:

<https://www.grants.gov/web/grants/applicants/registration/track-role-status.html>

b. *Electronic Signature*: When applications are submitted through Grants.gov, the name of the organization applicant with the AOR role that submitted the application is inserted into the signature line of the application, serving as the electronic signature. The EBiz POC **must** authorize people who are able to make legally binding commitments on behalf of the organization as a user with the AOR role; **this step is often missed, and it is crucial for valid and timely submissions.**

3. How to Submit an Application to DoD via Grants.gov

Grants.gov applicants can apply online using Workspace. Workspace is a shared, online environment where members of a grant team may simultaneously access and edit different webforms within an application. For each funding opportunity announcement (FOA), you can create individual instances of a workspace.

Below is an overview of applying on Grants.gov. For access to complete instructions on how to apply for opportunities, refer to:

<https://www.grants.gov/web/grants/applicants/workspace-overview.html>

a. *Create a Workspace*: Creating a workspace allows you to complete it online and route it through your organization for review before submitting.

b. *Complete a Workspace*: Add participants to the workspace to work on the application together, complete all the required forms online or by downloading PDF versions, and check for errors before submission. The Workspace progress bar will display the state of your application process as you apply. As you apply using Workspace, you may click the blue question mark icon near the upper-right corner of each page to access context-sensitive help.

1) *Adobe Reader*: If you decide not to apply by filling out webforms you can download individual PDF forms in Workspace. The individual PDF forms can be downloaded and saved to your local device storage, network drive(s), or external drives, then accessed through Adobe Reader.

NOTE: Visit the Adobe Software Compatibility page on Grants.gov to download the appropriate version of the software at:

<https://www.grants.gov/web/grants/applicants/adobe-software-compatibility.html>

- 2) *Mandatory Fields in Forms:* In the forms, you will note fields marked with an asterisk and a different background color. These fields are mandatory fields that must be completed to successfully submit your application.
 - 3) *Complete SF-424 Fields First:* The forms are designed to fill in common required fields across other forms, such as the applicant name, address, and DUNS Number. Once it is completed, the information will transfer to the other forms.
- c. *Submit a Workspace:* An application may be submitted through workspace by clicking the Sign and Submit button on the Manage Workspace page, under the Forms tab. Grants.gov recommends submitting your application package at least 24-48 hours prior to the close date to provide you with time to correct any potential technical issues that may disrupt the application submission.
 - d. *Track a Workspace Submission:* After successfully submitting a workspace application, a Grants.gov Tracking Number (GRANTXXXXXXXX) is automatically assigned to the application. The number will be listed on the Confirmation page that is generated after submission. Using the tracking number, access the Track My Application page under the Applicants tab or the Details tab in the submitted workspace.

For additional training resources, including video tutorials, refer to:

<https://www.grants.gov/web/grants/applicants/applicant-training.html>

Applicant Support: Grants.gov provides applicants 24/7 support via the toll-free number 1-800-518-4726 and email at support@grants.gov. For questions related to the specific grant opportunity, contact the number listed in the application package of the grant you are applying for.

If you are experiencing difficulties with your submission, it is best to call the Grants.gov Support Center and get a ticket number. The Support Center ticket number will assist the DoD] with tracking your issue and understanding background information on the issue.

4. Timely Receipt Requirements and Proof of Timely Submission

Online Submission. All applications must be received by 4:00 p.m. Eastern Daylight time on November 19, 2018. Proof of timely submission is automatically recorded by Grants.gov. An electronic date/time stamp is generated within the system when the application is successfully received by Grants.gov. The applicant with the AOR role who submitted the application will receive an acknowledgement of receipt and a tracking number (GRANTXXXXXXXX) from Grants.gov with the successful transmission of their application. This applicant with the AOR role will also receive the official date/time stamp and Grants.gov Tracking number in an email serving as proof of their timely submission.

When DoD successfully retrieves the application from Grants.gov, and acknowledges the download of submissions, Grants.gov will provide an electronic acknowledgment of receipt of the application to the email address of the applicant with the AOR role who submitted the application. Again, proof of timely submission shall be the official date and time that Grants.gov receives your application. **Applications received by Grants.gov after the established due date for the program will be considered late and will not be considered for funding by DoD.**

Applicants using slow internet, such as dial-up connections, should be aware that transmission can take some time before Grants.gov receives your application. Again, Grants.gov will provide either an error or a successfully received transmission in the form of an email sent to the applicant with the AOR role attempting to submit the application. The Grants.gov Support Center reports that some applicants end the transmission because they think that nothing is occurring during the transmission process. Please be patient and give the system time to process the application.

5. Content and Form of Application Submission

Design proposals should not exceed a total of five (5) pages. Included in the 5 page submission should be a 3-page Project Summary/Abstract that provides a concise description of the research design project and the Army-focused technical area under which the submission should be considered. An additional page should identify the key personnel/team members, summarizing research credentials (name/contact info, field of study, year of study – freshman, sophomore, junior, senior) and also name any faculty advisors. A final page should include a budget outline for travel/lodging costs to participate in-person at the competition judging site of (El Paso, Texas) in April 2019. The budget outline should include any related travel and material costs.

NOTE: Items also due with your submission but are NOT counted in the 5 page submission limit are: the Department of Education Eligibility letter (per above mentioned eligibility criteria), a one (1) page Project Summary/Abstract (per field 7-Mandatory information for SF-424) and any institutional letters of support.

The design proposal should provide sufficient information on the prototype being proposed (*e.g.*, hypothesis, scientific or engineering theories, design concepts, construction approaches, data measurements and analysis, etc.) to allow for a technical assessment by Army SMEs. A letter from the institution (with an official institutional signature) is required indicating the student team will officially represent the institution in this design competition.

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). 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, which may have other font requirements)

• **Number of pages:** The 5 page limit applies to the 3-page Project Summary/Abstract that provides a concise description of the research design project and the Army-focused technical area under which the submission should be considered. An additional page should identify the key personnel/team members, summarizing research credentials (name/contact info, field of study, year of study – freshman, sophomore, junior, senior) and also name any faculty advisors. A final page should include a budget outline. Pages exceeding this limit will not be considered in the application evaluation.

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

FORM: 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 AOR (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 this FOA, and the representations on tax delinquency and felony convictions and prohibition on using funds under grants and cooperative agreements with entities that require certain internal confidentiality agreements (see below regarding “Other Attachments,” Field 12). If you encounter problems, contact customer support at 1-800-518-4726 or at support@grants.gov. If you forget your user name or password, follow the instructions provided in the Credential Provider tutorial. Tutorials may be printed by right-clicking on the tutorial and selecting “Print.”

FORM: SF-424 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 a single page. 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 equipment/instrumentation requested, using terminology the public can

understand, and the research/research-related education that it will support. The header of the abstract should identify the PI, the institution, and the application title.

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

Project Narrative (Field 8 on the form) – The project narrative must provide a concise description of the research design project and the Army-focused technical area under which the submission should be considered (3 pages). An additional page should identify the key personnel/team members, summarizing research credentials (name/contact info, field of study, year of study – freshman, sophomore, junior, senior) and also name any faculty advisors. A final page should include a budget outline for travel/lodging costs to participate in-person at the competition judging site of (El Paso, Texas) in April 2019. The budget outline should include any other related costs.

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 completed representations on tax delinquency and felony convictions (included as part of the application package for this FOA).

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

FORM: SF-424 Research & Related Senior/Key Person Profile (Expanded) (Mandatory) – The Degree Type and Degree Year fields on the Research and Related Senior/Key Person Profile (Expanded) form will be used by DoD as the source for career information. In addition to the required fields on the form, applicants must complete these two fields for all individuals that are identified as having the project role of PD/PI or Co-PD/PI on the form. Additional senior/key persons can be added by selecting the “Next Person” button.

FORM: SF-424 (R&R) Personal Data (Mandatory) - This form will be used by DoD as the source of demographic information, such as gender, race, ethnicity, and disability information for the Project Director/Principal Investigator and all other persons identified as Co-Project Director(s)/Co-Principal Investigator(s). Each application must include this form with the name fields of the Project Director/Principal Investigator and any Co-Project Director(s)/Co-Principal Investigator(s) completed; however, provision of the demographic information in the form is voluntary. If completing the form for multiple individuals, each Co-Project Director/Co-Principal Investigator can be added by selecting the “Next Person” button. The demographic information, if provided, will be used for statistical purposes only and will not be made available to merit reviewers. Applicants

who do not wish to provide some or all of the information should check or select the “Do not wish to provide” option.

FORM: SF-424 (R&R) Research & Related Budget (Mandatory) – Complete Sections A through H and attach a budget justification in Section L. Do not include any amount for fee under Section J. The budget must be consistent with a six (6) month period of performance (assume a proposed start date of 1 February 2019) and include the total amount requested and a breakdown by cost element.

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)).

FORM: SF-LLL Disclosure of Lobbying Activities (Optional) - 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. If the applicant has lobbying activity to disclose, complete this form and include it with the other Grants.gov forms in the application package. This form is not part of the page count.

6. Unique Entity Identifier and System for Award Management

Each eligible applicant under this FOA is required to (a) be registered in SAM prior to submitting its application; (b) provide a valid 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 a federal 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.

7. Submission Dates and Times

- a. Applications must be received by 4:00 p.m. Eastern Daylight Time, November 19, 2018 via grants.gov. Questions should be submitted to usarmy.rtp.rdecom-aro.mbx.hbcu-mi-programs@mail.mil

Applicants are responsible for submitting their applications in sufficient time to allow them to reach Grants.gov by the specified time. To minimize the possibility of a late submission due to unexpected network or equipment issues, DoD recommends that applications be submitted at least two days prior to the date and time indicated above.

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.

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** - Grants.gov will provide a series of emails to the applicant confirming submission and receipt of the application. Applicants can track the status of their applications at <http://www.grants.gov/web/grants/applicants/track-my-application.html>.

Please note: Pages exceeding the limit specified in this announcement will not be considered or reviewed in the application evaluation.

The Government will acknowledge receipt of each Design proposal submission via a return email to the eligible institution (i.e., submitter). The eligible institution may be contacted to discuss the design proposal. Once the decision has been made as to which eligible institutions will be offered an award to move to the competition phase for prototype design, the eligible institutions will be informed on or about 11 January 2019 that either: (1) the design proposal is selected for award for the competition phase for prototype design; or (2) the design proposal is not being considered further for award. No further feedback concerning design proposal submissions will be provided to eligible institutions beyond what is described herein.

8. Intergovernmental Review

There is no requirement for intergovernmental review under this FOA.

9. Funding Restrictions

Applicants may not request funding in excess of \$8,000.00 for the design competition. Up to \$7,500.00 is allotted for travel and no more than \$500.00 can be budgeted for materials for the prototype.

10. 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 this FOA. Withdrawals are effective upon receipt of notice by the Grants Officer.

E. Application Review Information

Design proposals are to be submitted to ARL's Army Research Office (ARO) addressing any of the two Army-focused topic areas. No more than one (1) design proposal is allowed per eligible institution.

Design proposals will be reviewed by the Army subject matter experts (SMEs) for each of the two topic areas. The ARL will determine which design proposals will receive an award to support their participation in the design competition to develop a prototype based on the following criteria.

Evaluation criteria (of equal importance to each other) are:

a. The overall scientific and/or technical merits of the proposal: This concerns the degree of innovation – How novel is the idea? Is the idea technically feasible? What is the correctness of theory, validity of reasoning used, and apparent understanding and grasp of the underlying principles? How thoroughly was the idea thought through? Are all major technical factors considered and a reasonably accurate evaluation of these factors presented?

b. Army Relevance: The description of the design/project is a strong factor in judging. Organization of written design, clarity, and inclusion of pertinent information are major factors. Describe how this application will provide contributions to benefit the Army now and into the future. Provide clear description of project goals, concept, existing conditions and expected outcomes. Provide references supporting design concepts, if applicable.

c. Originality: The design proposal should avoid standard textbook information, and should show independence of thinking or a fresh approach to the topic area. Does the method and treatment of the problem show imagination? Does the project have the "wow" effect? Does the approach show an adaptation or creation of a new or different solution?

d. Management Plan: The design proposal should outline university support for participation, and the organization of the team with roles and responsibilities. Student/Faculty biographies should be included here. The Applicant should provide the qualifications, capabilities, and experience of the proposed team or other key personnel who are critical to achievement of the proposed objectives.

e. Realism and Reasonableness of cost: How cost-effective would the implementation be? What risks have to be considered and how can the use of this design be a competitive advantage for the Army into the future?

f. Past Performance: The applicant's record of past performance.

1. Review and Selection Process

Army SMEs will evaluate applications according to the above criteria. The most meritorious applications will be recommended for award and advance to the final judging stage of the competition. Awardees will be matched with an Army “mentor” to consult with their representative teams during the competition phase.

Teams representing the Awardees will attend the competition at The University of Texas at El Paso, 23-25 April 2019. Travel totaling up to \$8,000 will be paid for under the grant for each awardee team. Up to \$500 of the \$8,000 may be budgeted for materials for the prototype.

Each Awardee team will have 20 minutes to present and demonstrate their prototype for a panel of judges from the Army as well as industry and academic partners. For the prize cash awards, teams will be judged on: (1) ability to describe the solution and the details of its design and inspiration; (2) clarity of description of how it addresses one of the Army challenges; (3) success of demonstration; and (4) plan for how it could be commercialized for Army use.

CASH PRIZE AWARDS:

First Place: \$5,000

Second Place: \$4,000

Third Place: \$3,000

Fourth Place: \$2,000

Cash Prize Award funding will be distributed evenly among team members.

NOTE: All awards, both the grant awards and the cash prize awards, are contingent upon the availability of funds.

2. Anticipated Announcement and Federal Award Dates

Applicants submitting a design proposal will be notified on or about 11 January 2019 as to whether they will receive an award and be invited to the competition stage.

F. Federal Award Administration Information

1. Federal Award Notices

The notification e-mail, specified in this FOA, 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 actual award start date will be determined at this time.

2. Administrative and National Policy Requirements

- a. Each award under this announcement will be governed by the general award terms and conditions in effect at the time of the award 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." The DoD Research and Development General Terms and Conditions (latest version, September 2017) are located at <https://www.onr.navy.mil/Contracts-Grants/submit-proposal/grants-proposal/grants-terms-conditions>.

These terms and conditions are incorporated by reference in this announcement.

- b. You must comply with all applicable national policy requirements. The key national policy requirements that may relate to an award under this FOA are included in the terms and conditions specified in paragraph 2.a above.
- c. By electronically signing the SF-424, the applicant affirms its agreement with the following certification.

Certification Required for Grant and Cooperative Agreement Awards

The certification at Appendix A to 32 CFR Part 28 regarding lobbying is the only certification required at the time of application submission for a grant or cooperative agreement award. The certification is as follows:

“By signing and submitting an application that may result in the award of a grant exceeding \$100,000, the prospective awardee is certifying, to the best of his or her knowledge and belief that:

- (1) No federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employ of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit SF-LLL, “Disclosure of Lobbying Activities” in accordance with its instructions.
- (3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, and loans, or cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, Title 31, U.S. Code. Any person who fails the required certification shall be subject to a civil penalty or not less than \$10,000.00 and not more than \$100,000.00 for each failure.

d. Representations Required for Grant and Cooperative Agreement Awards

Appropriations Provisions on Tax Delinquency and Felony Convictions

Check either “is” or “is not” for each of these two representations, as appropriate for the proposing institution, include the AOR signature and point of contact information, and attach the representation page to Field 12 of the SF-424 Research & Related Other Project Information form. The page for these representations is provided with the application materials that are available for download at Grants.gov.

Representations

The applicant is () is not () a “Corporation” meaning any entity, including any institution of higher education, other nonprofit organization, or for-profit entity that has filed articles of incorporation. If the applicant is a “Corporation” please complete the following representations:

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

(2) The applicant represents that it is () is not () a corporation that was convicted of a criminal violation under any Federal law within the preceding 24 months.

NOTE: If an applicant responds in the affirmative to either of the above representations, the applicant is ineligible to receive an award unless the agency suspension and debarment official (SDO) has considered suspension or debarment and determined that further action is not required to protect the Government’s interests. The applicant therefore should provide information about its tax liability or conviction to the agency’s SDO as soon as it can do so, to facilitate completion of the required considerations before award decisions are made.

OMB CONTROL NUMBER: 0704-0494

OMB EXPIRATION DATE: 11/30/2019

AGENCY DISCLOSURE NOTICE

The public reporting burden for this collection of information is estimated to average 5 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to the Department of Defense, Washington Headquarters Services, Executive Services Directorate, Directives Division, 4800 Mark Center Drive, East Tower, Suite

02G09, Alexandria, VA 22350-3100 [0704-0494]. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

Prohibition on Contracting with Entities that Require Certain Internal Confidentiality Agreements

Agreement with the representation below will be affirmed by checking the “I agree” box in block 17 of the SF-424 (R&R) as part of the electronic application submitted via Grants.gov. The representation reads as follows:

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

Note that: (1) the basis for this representation is a prohibition in Section 743 of the Financial Services and General Government Appropriations Act, 2015, Pub. L. 113-235) on provision of funds 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 SF-312, Form 4414, or any other form issued by a Federal department or agency governing the nondisclosure of classified information.

3. Reporting Requirements

- a. Recipients must submit a final financial report using the SF-425, Federal Financial Report, and a final technical report describing how acquired equipment/instrumentation furthered achievement of the objectives in the approved application.
- b. If the total federal share of the award exceeds \$500,000, the reporting requirements reflected in Appendix II to Part 200 of Title 2 CFR will be included in the terms and conditions of the award.

G. Federal Awarding Agency Contacts

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

Dr. Vallen Emery
Army Research Laboratory
Vallen.l.emery.civ@mail.mil

Questions regarding program execution and administration should be directed to:

Patricia A. Huff
Army Research Office
Patricia.A.Huff26.civ@mail.mil

The DoD Grants Officer is:

Ms. Vonetta G. McNeal
Grants Officer
US Army Contracting Command-Aberdeen Proving Ground
RTP Division
Vonetta.g.mcneal.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.