

REVISION 02
21 August 2018

ANNOUNCEMENT OVERVIEW

FEDERAL AGENCY NAME: Air Force Research Laboratory (AFRL) Directed Energy (RD) and Space Vehicles (RV) Directorates

FUNDING OPPORTUNITY ANNOUNCEMENT TITLE: AFRL RD/RV University Cooperative Agreement

FUNDING OPPORTUNITY ANNOUNCEMENT TYPE: Initial Announcement

FUNDING OPPORTUNITY ANNOUNCEMENT NUMBER: BAA-RVKV-2015-0003

CATALOG OF FEDERAL DOMESTIC ASSISTANCE (CFDA) NUMBER(S): 12.800 Air Force Defense Research Sciences Program

PROPOSAL DUE DATE AND TIME: This is a 5 year open FOA from the date of publication with an anticipated period of performance ranging from one to five years. Proposals may be submitted at any time during that period. All proposals for Cooperative Agreements (CA) must be submitted electronically through the Grants.gov government-wide electronic portal at <http://www.Grants.gov>. Prior to the submission of any proposal, Offerors are required to contact Technical Point of Contact (TPOC) for this FOA in addition to, the applicable TPOC listed in topic area identified in Section I B. and C. as this procedure is intended to minimize unnecessary efforts in proposal preparation and review. In addition to the on-line submission, two paper copies must be submitted to the applicable TPOC listed in each specific topic area located in Section I B. & C. Applicants must notify the Agreements Specialist immediately upon submitting a proposal electronically.

BRIEF PROGRAM SUMMARY: This is a 5 year, open FOA. The AFRL Directed Energy Directorate (RD) and Space Vehicles Directorate (RV) are interested in receiving proposals under this announcement in order to establish university Cooperative Agreements (CA) to provide funds to students/professors in a timely manner for the purpose of engaging U.S./U.S. territories' colleges and universities in directed energy and space vehicles-related basic, applied, and advanced research projects that are of interest to the Department of Defense (DoD). The scope of the research will include the entire spectrum of RD and RV technology that is applicable to the Air Force, including all peripherally-related RD and RV research.

NOTICE TO OFFEROR(S): Funds are not presently available for this effort. No award will be made under this announcement until funds are available. The Government reserves the right to cancel the announcement, either before or after the closing date. In the event the Government cancels the announcement, the Government has no obligation to reimburse an offeror for any costs.

ESTIMATED PROGRAM COST: Multiple cooperative agreement awards of various values are anticipated with a period of performance ranging from one to five years. All funding is subject to change due to Government discretion and availability. Potential offerors should be aware that, due to unanticipated budget fluctuations, funding in any or all areas may change with little or no notice.

GENERAL INFORMATION: Only U.S./U.S. territory educational institutions are eligible to submit proposals in response to this notice. Proposals submitted in response to this FOA that are selected for award are considered to be in accordance with 32 CFR §22.315 merit-based, competitive procedures to an institution of higher education for the performance of research and development. There will be no other announcement issued for this requirement. Offerors should be alert for any FOA Amendments that may permit extensions to the proposal submission date or make other changes to the announcement.

TYPE OF CONTRACTS/INSTRUMENTS: The Air Force reserves the right to award the instrument best suited to the nature of the research proposed. It is anticipated that awards under this FOA will generally be cost assistance awards, which require the successful offerors to have an accounting system considered adequate for tracking costs applicable to the award.

SYSTEM FOR AWARD MANAGEMENT (SAM): Unless exempted by 2 CFR §25.110 all offerors must (1) Be registered in the System for Award Management (SAM) prior to award; (2) Maintain an active SAM registration with current information at all times during which it has an active Federal award or an application or proposal under consideration by an agency; and (3) Provide its Dun and Bradstreet Data Universal Numbering System (DUNS) number in each application or proposal it submits to the agency.

On-line registration instructions can be accessed from the SAM home page at <http://www.sam.gov>.

ANTICIPATED NUMBER OF AWARDS: The Air Force anticipates multiple awards. However, the Air Force reserves the right to make a single award, more than one award, partial award(s) or no awards pursuant to this FOA.

TECHNICAL POINT OF CONTACT: The technical point of contacts for this FOA is:

Primary: Oscar Martinez; oscar.martinez.16@us.af.mil; phone: (505) 843-3221

CONTRACTING POINT OF CONTACT: The contracting point of contact for this FOA is:

Agreements Specialist: Julian I. Landavazo; julian.landavazo@us.af.mil; phone (505) 853-0071

Agreements Officer: Deborah A. Moyer; deborah.moyer@us.af.mil; phone (505) 853-3306

AMENDMENT 02 - FULL TEXT ANNOUNCEMENT

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There will be no other announcement issued for this requirement. Offerors should be alert for any FOA amendments that may permit extensions to the proposal submission date or make other changes to the announcement.

THIS ANNOUNCEMENT CONSTITUTES THE ONLY SOLICITATION. Offerors MUST monitor <http://www.Grants.gov> in the event this announcement is amended. Offerors must monitor these systems to ensure they receive the maximum proposal preparation time for subsequent amendments as these are the official notification websites to request proposals.

I. FUNDING OPPORTUNITY DESCRIPTION

AFRL RD/RV is soliciting technical and cost proposals on the following research efforts:

A. Statement of Objective/Needs: The objective of this effort is to establish a combined AFRL RD/RV University Cooperative Agreement vehicle to efficiently award research funds to universities. These efforts will investigate new concepts as well as the ancillary supporting technologies for directed energy and space vehicles and to enhance theoretical analyses, exploratory studies, or experiments conducted by educational institutions; important for technological advance and innovative activities in which educational institutions have limited resources.

B. DIRECTED ENERGY TECHNOLOGY AREA DESCRIPTIONS:

a. Laser Systems

Primary POC: Dr. Roy Hamil, Phone: (505) 846-0874; email: roy.hamilton@us.af.mil

Alternate POC: Dr. Timothy Madden, Phone: (505) 846-9076; email: timothy.madden.4@us.af.mil

b. Directed Energy and Electro-Optics for Space Superiority

Primary POC: Dr. David Barnaby, Phone: (505) 853-2294; email: david.barnaby.1@us.af.mil

Alternate POC: Ms. Laura Durr, Phone: (505) 846-0357; email: laura.durr.1@us.af.mil

c. High Power Electromagnetics

Primary POC: Mr. Robert Torres, (505) 846-8054; email: robert.torres.10@us.af.mil

Alternate POC: Dr. Donald Shiffler, Phone: (505) 853-3906; email: donald.shiffler@us.af.mil

d. Weapons Modeling, Simulation and Analysis

Primary POC: Mr Ed Duff, Phone: (505) 846-4062; email: edward.duff@us.af.mil

Alternate POC: Dr William Cooper, Phone: (505) 853-4430; email: william.cooper.10@us.af.mil

1. Lasers: This includes solid state, fiber, semi-conductor, short pulse and advanced chemical, gas, and hybrid laser technology for scalable, high energy laser devices for insertion into airborne tactical and strategic applications and ground-based laser system concepts. To accomplish this, we are soliciting creative ideas especially in the area of new solid state laser materials as well as new manufacturing techniques to create new lasers which are of high energy, high average power and good beam quality while being at new and interesting wavelengths that propagate well in the atmosphere. This also might include new high power diode pumping systems. Of course, being university research, many of the innovative ideas can be demonstrated at lower to intermediate powers as long as the technology is scalable to high power.

2. Aero-effects and Airborne Beam Control: This includes advanced optical and imaging technologies such as optical components, optical coatings, advanced beam control, atmospheric compensation, and pointing and tracking. This includes advanced adaptive optics hardware and algorithms for airborne applications. This would include innovative instrumentation techniques for aero-optic metrology for in flight and for in wind tunnel experiments to characterize speckle and scintillation effects on imaged based airborne tracking and transonic/supersonic flow control methods.

3. High Power Microwaves: This includes generation and transmission of high power electromagnetics/microwaves (HPEM), identification of the susceptibility and vulnerability of electronic systems to HPEM, investigation of materials of specific relevance to HPEM generation and propagation,

HPEM plasma physics theory and simulation algorithm development, and applications of HPM to meet national defense needs. Technologies include HPEM sources, pulsed power, and high energy beam and plasma physics.

4. Weapons Modeling & Simulation: The WM&S CTC routinely assesses DE/KE weapons Planning Capability Concepts' (PCCs') military utility during all Research and Development (R&D) phases and researches & develops state-of-the-art M&S analysis tools; enabling focused investment decisions, accurate reporting to customers and on- time transition of economical, high-performance warfighter solutions. These analyses include constructive simulations (fully-numerical simulations), virtual (operator-in-the- loop), distributed (wargaming), operations research, and cost. On one hand this means that the mission evaluation environment must credibly represent (qualitatively and quantitatively) the mission scenarios, systems, threats, interoperability, etc. in spite of significant or rapid changes. On the other hand, systems are evaluated specifically because they change the status quo. These include DE systems which are expected to cause significant changes in the mission outcomes. These requirements drive state-of- the-art performance requirements from both the Modeling & Simulation systems and the systems being studied and give rise to multiple technical challenges.

Proposals are encouraged which enable the application of academically rigorous analysis, computational, optimization, etc. approaches to the mission and campaign-level analyses.

Specific areas of interest include:

- **Battle Management:** In modern warfighting systems, operators can choose between a variety of effects. Such decisions frequently have to be made faster than is practical for operators and must not enable success in an individual engagement, but rather enable success in multiple engagements that enable complete mission success. Optimization approaches which enable effective resource use and mission success are needed.
- **Multi-Scale Methods:** Classically, analysts have to choose between the use of fast engineering models or high-fidelity physics models. Multi-scale methods which obtain the best balance of fidelity and speed are needed.
- **Optimization:** Optimization is frequently used to determine the "best case" for a particular system or design. However, optimization convergence and refinement can cause unacceptably long run times. Future computational algorithms which accelerate optimization performance at mission level to real-time or faster are needed.
- **Weather:** Efficient weather models are needed to inform mission-level simulations and enable real-time or faster simulation execution. Such models would predict/diagnose volume extinction and beam degradation effects for single laser beams and for broad bands of sensing as a function of quantified atmospheric conditions, leading to temporally and spatially-correlated weather predictions indicative of weather patterns at specific points on the globe.
- **Uncertainty Quantification:** In contemporary simulations, the statistical variation of an input parameter is frequently known and can be specified as the parameter's "uncertainty." This leads to a need to quantify simulation output uncertainty as function of input parameter probability density functions (PDFs). Classical Monte Carlo methods are too slow, even with advanced optimization algorithms. Computational algorithms which utilize parameters' specified uncertainty directly in the mathematics and do not require slow, iterative optimization convergence are needed.
- **Far-from-Equilibrium Systems, Data Mining:** The whole point to new conceptual systems is that they change the status quo. Systematic simulation approaches which data mine for game-changing

system configurations are needed.

5. **Space Domain Awareness:** Novel techniques for monitoring space objects and predicting intent are needed to address the challenges associated with increasing use of and reliance on space assets. AFRL/RD is looking for new techniques that improve on current ground based monitoring and characterization of space objects. Particular technology needs are space object detection of dim objects including those at long range and closely spaced objects with significantly different visual magnitudes; methodologies for tracking and imaging with a particular emphasis on daylight techniques; space signature fingerprinting using spectroscopic or other non-imaging techniques; and non- traditional modalities including passive RF sensors; sparse apertures; and active techniques. Non-traditional applications of conventional technologies are also of interest. Research and development in mitigating atmospheric turbulence are desired particularly atmospheric computational methods to study combined atmospheric turbulence and refractive effects in space at low elevation angles.
6. **Optics and Beam Control:** This includes advanced optical and imaging technologies such as optical components, optical coatings, advanced beam control, adaptive optics, atmospheric compensation, and pointing and tracking. Also included are wide field optics for Space Situational Awareness.
7. **Laser Guide Stars:** This Includes lasers and systems designed to serve as laser guide stars for adaptive optics systems. Laser guidestar technologies of interest are those which would enable either an increase in return photon flux or Strehl ratio from existing laser guidestar systems or would represent a novel approach to delivering a less expensive system, a more reliable system, or a system with greater return photon flux or Strehl ratio compared to current generation guidestars. Suggested topics for laser guidestars would include: idealizing the launching of multiple guidestar beams, idealizing the overlap of multiple laser guidestar beams in the atmosphere, integrated Vertical External Cavity Surface Emitting Laser (VECSEL) guidestars systems, increasing the total return photon flux of current Sum Frequency Generation (SFG) and Raman Fiber Amplifier (RFA) guidestars systems, utilization of Rayleigh guidestar systems to achieve AO corrections appreciable to sodium laser guidestars, and development of guidestar systems with multiple excitation or scattering wavelengths to achieve AO correction across the visible spectrum.
8. **Sensors:** This includes both fast, quiet focal planes for visible and near IR beam control as well as wide field of view sensors for Space Situational Awareness(SSA).
9. **Optical System Modeling and Simulation:** This includes software systems designed to model optical systems, including adaptive optics and other varieties of beam control, using wave optics, scattering, and other optical design codes.
10. **Quantum Computer Technology:** This includes advanced quantum devices and methods that exploit quantum entanglement to achieve reliable and efficient operation, such as (A) quantum sensors for efficient surveillance for space situational awareness, (B) quantum algorithms for computational plasma dynamics (including plasma dynamics ranging from the solar dynamo to space weather modeling and non-Abelian fluid dynamics ranging from spinor superfluid to high-temperature superconductor quantum simulation), and (C) quantum computers, involving long-lived protected quantum memories or topological processing modes, offering a light-weight platform for efficient information processing with a low-power space- deployable architecture. Only quantum information devices and methods that require a full quantum theory treatment for the basis of an efficient space-related application will be considered viable candidates.

C. SPACE VEHICLES TECHNOLOGY AREA DESCRIPTIONS:

a. Space Environment

Primary POC: Todd Pederson, Phone: (505) 853-3792; email: todd.pedersen@us.af.mil

Alternate POC: Leonard Berman, Phone (505) 846-6026; email: leonard.berman.1@us.af.mil

b. Space Electronics Technology

Primary: Brian Engberg (505) 853-2349; email: brian.engberg@us.af.mil

Alternate: David Cardimona (505) 846-5807; email: david.cardimona@us.af.mil

c. Space Platform Technology Space Platforms and Electronics Technologies

Primary POC: John Merrill, Phone (505) 853-3427; email: john.merrill.1@us.af.mil

Alternate POC: Paul Hausgen, Phone (505) 846-9219; email: paul.hausgen@us.af.mil

d. Space Experiments

Primary POC: Frank Chavez, Phone: (505) 846-6066; email: frank.chavez.1@us.af.mil

Alternate POC: Mark Scherbarth, Phone: (505) 853-7878; email: mark.scherbarth.1@us.af.mil

1. Structures: This includes structural design for spacecraft and launch vehicle structural subsystem including advanced designs for spacecraft and launch vehicle structural subsystems and synergistic effect of structural components upon all primary spacecraft or launch vehicle in addition to satellite dispensers, inflatable optical structures, temperature critical structures, and vibration isolation and control and advanced manufacturing.

2. Space power: This includes development of thinned-film solar cells, advanced multi-junction, and quantum leap concepts to entail next generation technologies with potential to qualitatively and quantitatively enhance advanced space power technologies and their metrics such as novel concept thinned-film multijunction devices, multijunction solar cells, and other complimentary technologies such as storage devices, space power components, and power and data distribution systems.

3. Communications Guidance Navigation and Control: This includes advanced technologies in the areas of optical communications, reconfigurable communications, and advanced RF communications; precision satellite guidance, navigation, control, and autonomy; GNC system modeling and simulation, constellation development and precision formation flying.

4. Space Sensors: This includes modeling, design, growth, processing, and characterization of space-based detectors that cover portions or the entire visible to long wave infrared band, read-out integrated circuit (ROIC) technologies that illustrate low read noise reflective of the needs for space applications, and radiation/optical hardening of detector/ROIC technologies as well as monolithic devices.

5. Multisensory Information Fusion: This includes development and implementation of methodologies and systems for fusion of space related information. This includes accounting for uncertainty in information sources through confidence level estimation.

6. Thermal management: This includes advancing payload thermal management technology to include thermal component efficiency improvements through physics based experimentation, theory,

modeling and simulation. Creating tools to automate data extraction/insertion among various thermal software programs is also of interest.

7. Electronics/Radiation Effects/Protection: This includes improving performance of space electronics, reduce / eliminate the gap between space/terrestrial electronics through breakthroughs in materials, devices, processes, packaging, and architecture, make high-performance space electronics more affordable and available and simplify the implementation of complex systems using breakthroughs in reconfigurable concepts, electronic devices, and architecture. This includes studying space radiation effects on various electronics components and providing space electronics components maximum failure tolerance for such effects.

8. Space Environment: This includes research to attribute and mitigate space environment impacts to space vehicles and the radio signals through which they provide services to their users, the specification and forecast of relevant space environmental parameters to enable those tasks, and supporting technologies. It includes the influence of the space environment on satellite detection, tracking, identification and characterization.

9. Space System Modeling and Simulation: This includes war gaming, cloud computing solutions for M&S, and technology assessment in addition to space systems modeling and analysis.

10. Quantum Technologies: This includes laser cooling techniques, Bose-Einstein condensate production, atom interferometry, atom-optics, atom accelerometers/gravimeters, atom gyroscopes, atom magnetometers, and atomic trapping techniques to support these technologies. This subject also includes atomic clocks and frequency standards, frequency combs to support atomic clock RF generation or dissemination and spectroscopy grade lasers and photonic technology to support these research areas. This should include theory, modeling and simulation as well as hardware development and testing for these research areas.

II. Deliverable Items:

1. Interim Performance Reports: Quarterly or Semi-Annual
2. Annual Performance Reports
3. Financial (Reimbursement) Reports: Quarterly
4. Final Scientific and Technical Report: at technical completion
5. Other: None anticipated

III. Schedule:

1. Overall effort: Specified on individual award
2. Deliverable Items: Specified on individual award
3. Software: None anticipated
4. Hardware: None anticipated

IV. Other Requirements:

1. Program security classification: Unclassified
2. TEMPEST Requirements: Not Applicable
3. Export Control: None anticipated

V. Other Information:

1. Government Furnished Property (GFP) availability: TBD (proposal specific)
2. Base Support/ Network Access: TBD (proposal specific)
4. Minimum Data Rights Desired:
 - a. Technical Data Government Purpose Rights
 - b. Non-Commercial Software (NCS): Government Purpose Rights
 - c. NCS Documentation: None anticipated
 - d. Commercial Computer Software Rights: None anticipated

The Air Force Research Laboratory is engaged in the discovery, development, and integration of warfighting technologies for our air, space, and cyberspace forces. As such, rights in technical data and NCS developed or delivered under this award are of significant concern to the Government. The Government will therefore carefully consider any restrictions on the use of technical data, NCS, and NCS documentation which could result in transition difficulty or less-than full and open competition for subsequent development of this technology.

In exchange for paying for development of the data, the Government expects technical data, NCS, and NCS documentation developed entirely at Government expense to be delivered with Unlimited Rights.

Technical data, NCS, and NCS documentation developed with mixed funding are expected to be delivered with at least Government Purpose Rights. Offers that propose delivery of technical data, NCS, or NCS documentation subject to Government Purpose Rights should fully explain what technical data, NCS, or NCS documentation developed with costs charged to indirect cost pools and/or costs not allocated to a Government contract will be incorporated, how the incorporation will benefit the program, and address whether those portions or processes are segregable. The Government expects that delivery of technical data, NCS, and NCS documentation subject to Government Purpose Rights will fully meet program needs.

Offers that propose delivery of technical data, NCS, or NCS documentation subject to less than Government Purpose Rights (Limited Rights, Restricted Rights, or Specifically Negotiated License Rights), the proposal must explain what technical data, NCS, or NCS documentation developed with costs charged to indirect cost pools and/or costs not allocated to a Government award will be delivered/incorporated and how the incorporation will benefit the program.

Assertions must be completed with specificity with regard to each item, component, or process listed. Nonconforming assertions lists will be rejected.

5. Protection of Human Subjects: None anticipated

VI. AWARD INFORMATION

A. Anticipated Funding: Multiple cooperative agreement awards of various values are anticipated with a period of performance ranging from one to three years. All funding is subject to change due to Government discretion and availability. Potential offerors should be aware that due to unanticipated budget fluctuations funding in any or all areas may change with little or no notice.

B. Anticipated Number of Awards: The Air Force anticipates multiple awards. However, the Air Force reserves the right to make a single award, more than one award, partial award(s), or no awards pursuant to this FOA.

C. Anticipated Award Date: A typical award is 115 business days after receipt of a proposal(s). This FOA will remain open for 5 years (18 Dec 2020) or until the ceiling value is expended (whichever occurs first).

VII. ELIGIBILITY INFORMATION

A. Eligible Offeror/Applicants: U.S and U.S. territory educational institutions are eligible to submit proposals in response to this announcement.

B. All proposed grants must meet criteria for public purpose in accordance with 31 C.F.R. §6305.

C. Cost Sharing or Matching: Cost sharing is not anticipated

D. Other:

1. Foreign participation: A foreign disclosure review will be accomplished on a proposal specific basis. Foreign national participation should not reach a level of technology where it would be difficult to proceed to the next phase of the program without foreign national involvement. In the absence of an approved export license, foreign national participation is limited to those aspects of the project that can be considered fundamental research, e.g. public
2. You may be ineligible for award if all requirements of this announcement and any amendments are not met as identified above.

VIII. PROPOSAL/APPLICATION AND SUBMISSION INFORMATION:

A. Application Package:

Proposals submitted shall be in accordance with this announcement. There will be no other announcement issued in regard to this requirement. The Government intends to evaluate proposals and may award all, part, or none of the proposal(s) received without negotiation/discussion; however, the Government reserves the right to negotiate with those offeror(s) whose proposal is selected for funding.

Offerors should be alert for any FOA amendments that may permit extensions to the proposal submission date or make other changes. There is no additional information to be provided.

Please Note: If you intend to propose a grant or assistance instrument, Section VIIIB. below discusses how to find the grant opportunity, prepare the cover page, and complete the certification. This section also describes the process for electronic submission of proposals for grants and cooperative agreements.

B. Proposals for Cooperative Agreements

1. Grant Opportunity: Go to <http://Grants.Gov> to find the grant opportunity (See "Find Grant Opportunities" section. The initial screen will provide the synopsis for that specific grant opportunity. To view the entire opportunity open the "Full Announcement" box in the upper center of the synopsis page and select from the documents available under "Announcement Group." NOTE: <http://Grants.Gov> has tools and guiding documents in the left margin under "Applicant Resources" to help you find and apply for grant opportunities.
2. Proposal Cover Page – SF 424 (R&R) Form: All proposals for grants or assistance, whether submitted electronically or in hard copy must include an SF 424 (R&R) as the cover page. The SF 424 (R&R) should be downloaded from the "Application" box in the upper right hand corner of the synopsis page. Click on "download" under the column "Instructions and Application." Select "Download Application Package" and complete the SF 424 (R&R).
3. DoD Women in Science, Technology, Engineering, and Mathematics Data Collection Implementation: 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 STEM disciplines. To enable this assessment, each application must include the following forms completed as indicated.

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

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

Research and Related Personal Data Form:

This form will be used by DoD as the source of demographic information, such as gender, race, ethnicity, and disability information for the Project Director/Principal Investigator and all other persons identified as Co-Project Director(s)/Co-Principal Investigator(s). Each application must include this form with the name fields of the Project Director/Principal Investigator 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.

4. Certifications: To access the requisite Certifications, select the “Application” box in upper right hand corner of the synopsis page. Click on “Instructions and Application” and select “Download Application Instructions” to view the Certifications. To complete the Certifications you must check Block 18 of the SF 424 (R&R) and by signing it (either by pressing the “submit” button for Grants.gov or by hand if submitting it in hard copy), you are certifying that you have read and agree to abide by the terms in the Certifications. You do not need to submit any additional documentation unless you have lobbying activities to disclose on an SF–LLL.

5. Proposals for Grants or Assistance Instruments: Proposals for grants or assistance instruments may be submitted electronically through the Grants.gov government- wide electronic portal. **You must notify your Technical Point of Contact before proposal submission.**

6. For Electronic Submission:

a. Advance Preparation – Electronic proposals must be submitted through Grants.gov. There are several one-time actions your organization must have completed. Long before the proposal submission deadline, you should verify that the persons authorized to submit proposals for your organization have completed these actions. If not, it may take them up to **21 days** to complete the actions before they will be able to submit proposals.

b. Electronic Submission Process: The process your organization must complete includes obtaining a Dun and Bradstreet Data Universal Numbering System (DUNS) number (<http://fedgov.dnb.com/webform>) and registering with SAM (<http://www.sam.gov>). For more details, go to <http://www.grants.gov/web/grants/applicants/organization-registration.html>.

c. Your organization’s E-Business POC, identified during SAM Registration, must authorize someone to become an Authorized Organization Representative (AOR). This safeguards your organization from individuals who may attempt to submit proposals without permission. *Note: In some organizations, a person may serve as both an E- Business POC and an AOR.*

d. The Grants.gov Organization Registration Checklist is located at <http://www.grants.gov/documents/19/18243/GrantsgovOrganizationRegistrationGuide.pdf/be70525d-59aa-45ee-b196-5e8951faca0a> to guide you through the process.

e. Grants.gov supports Adobe Reader version 9.0.0. Learn more about Adobe software compatibility with Grants.gov and ensure that your version of Adobe Reader or Adobe Acrobat can be used to download, complete, and submit grant applications. Follow the following link for instructions on how to obtain a free version of the software <http://www.grants.gov/web/grants/applicants/adobe-software-compatibility.html>. **All attachments to all Grants.gov forms must be submitted 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/help/download_software.jsp.

f. Should you have questions relating to the registration process, system requirements, how an application form works or the submittal process, call Grants.gov at 1-800-518-4726 or support@Grants.gov.

7. Submitting the Electronic Proposal:

a. Application forms and instructions are available at Grants.gov. To access these materials, go to <http://Grants.gov>. Select “Apply for Grant”, and then select “Download Application Package”. Enter the CFDA number (typically 12.800). You should also enter the FOA number, and then follow the prompts to download the application package.

b. The applicant will receive a confirmation page upon completing the submission to Grants.gov. This confirmation page is a record of the time and date stamp that is used to determine whether the proposal was submitted by the deadline. A proposal received after the deadline is “late” and will not be considered for an award.

C. Content and Form of Submissions for Full Proposals:

1. Technical/Management Proposal:

a. Page Limitation: The technical proposal including a non-proprietary Contractor Statement of Work (C-SOW) shall be limited to 20 pages single spaced, double-sided, 8.5 by 11-inch pages. Select, an easy to read font no smaller than 12 pitch fixed or proportional font size 10 or larger. Smaller type may be used in figures and tables as long as it is clearly legible. The page limitation includes all information i.e., indices, photographs, foldouts (2 page), appendices, attachments, resumes, C-SOW, etc. Each printed side counts as one page. Blank pages, title pages, tables of content, lists, tabs or cover sheets, Representations and Certifications, and the Air Force Proposal Adequacy Checklist are not included in the page count. The Government will not consider pages in excess of this limitation. Please note: The Government will check the proposal and C- SOW for conformance to the stated requirements. Any pages in excess of the stated page limitation after the format check will not be considered.

b. The proposal shall include a discussion of the nature and scope of the research and the technical approach. Additional information on prior work in this area, descriptions of available equipment, data and facilities and resumes of personnel who will be participating in this effort should also be included as attachments to the technical proposal. This volume shall include a C-SOW detailing the technical tasks proposed to be accomplished under the proposed effort and suitable for contract incorporation. **Do not include any proprietary information in the C-SOW.** If Government Furnished Property is requested you are required to submit the following information with your offer—

(1) A list or description of all Government property that the offeror or its subcontractors propose to use. The list shall identify the accountable contract/award under which the

property is held and the authorization for its use (from the contracting/awards officer having cognizance of the property);

(2) The dates during which the property will be required for use (including the first, last, and all intervening months) and, for any property that will be used concurrently in performing two or more contracts/awards, the amounts of the respective uses in sufficient detail to support prorating the rent;

(3) The voluntary consensus standard or industry leading practices and standards to be used in the management of Government property, or existing property management plans, methods, practices, or procedures for accounting for property.

c. Any questions concerning the technical/management proposal or C-SOW preparation shall be referred to the Technical POC.

2. Cost/Business Proposal:

Separate the proposal into a cost section and business section. The business section should contain all business aspects to the proposed contract, such as type of contractual instrument, any exceptions to terms and conditions of the announcement, any information not technically related, etc. Provide rationale for exceptions. Identify any technical data that will be delivered with less than unlimited rights. Cost proposals have no page limitations; however, offerors are requested to keep cost proposals under 50 pages as a goal. The proposal shall be furnished with supporting schedules and shall contain a labor hour breakdown per task.

3. Proposal Content Summary: You may be ineligible for award if all requirements of this announcement are not met on the proposal due date.

4. Proposal Submission Dates and Times: This FOA will remain open 5 years or until the ceiling value is expended (whichever occurs first). Proposals may be submitted at any time during the open period. However, prospective offerors/applicants must contact the technology points of contacts (TPOCs) to confirm funding is available for the technology area of consideration before submitting a proposal.

5. Funding Restrictions: The cost of preparing proposals in response to this announcement is not considered an allowable direct charge to any resulting award or any other award, but may be an allowable expense to the normal bid and proposal indirect cost specified in 2 CFR § 200.400 - 415. Incurring pre-award costs for ASSISTANCE INSTRUMENTS ONLY is as codified in 32 CFR Parts 21-37, respectively.

IX. PROPOSAL/APPLICATION REVIEW INFORMATION:

Evaluation Criteria: Proposals submitted under this FOA will be evaluated using the evaluation criteria below:

1. Technical merits of the proposed research and development.
2. Primary public purpose/Potential relationship of the proposed Research and Development to DoD
3. Funds availability

Cost realism and reasonableness shall also be considered to the extent appropriate as per 2 CFR 200, Subpart E, Cost Principles. No further evaluation criteria will be used to evaluate the proposals. The technical and budget proposals will be evaluated at the same time. The Government reserves the right to award all, part, or none of the technical/CSOW proposals received.

Review and Selection Process: The technical/management and cost/business proposals will be evaluated utilizing a peer or scientific review and categorized as follows:

Selectable: Proposals are recommended for acceptance if they demonstrate technical merit, primary public purpose, potential relationship of the proposed research and Development to DoD and sufficient funding is available, and normally are displaced only by other Highly Recommended proposals

Not Selectable: Proposal does not demonstrate technical merit, does not meet Air Force needs, or sufficient funding is not available.

X. AWARD ADMINISTRATION INFORMATION:

A. Award Notices:

Offerors will be notified whether their proposal is recommended for award, by letter or e- mail within 65 business days. The notification is not an issuance of award.

B. Administrative and National Policy Requirements:

Federal statutes or Executive Orders that apply to Federal or DoD assistance awards include, but are not limited to:

1. Nondiscrimination (e.g, Title VI of the Civil Rights Act, Title IX of the Educational Amendments of 1972, Age Discrimination Act of 1975, Section 504 of the Rehabilitation Act of 1973, EO 11246, 42 USC4151);
2. Debarment and Suspension (Subpart C of the OMB guidance in 2 CFR part 180);
3. Environmental Standards (e.g.,42 USC 7401, Clean Air Act and 33 USC 1251 Clean Water Act, EO 11738 and EPA rules as Subparts J of 40 CFR part 32);
4. Drug Free Workplace (Drug Free Workplace Act of 1988);
5. Officials Not to Benefit (41 USC 22);
6. Preference for US Flag Carriers (49 USC 41102 and 49 USC40118);
7. Military Recruiters (32 CFR § 22.520)
8. Unpaid Delinquent Tax Liability Or A Felony Conviction (Sections 744 and 745 of Division E, Title VII, of the Consolidated and Further Continuing Appropriations Act, 2015 (Pub. L. 113-235))
9. Prohibition On Contracting With Entities That Require Certain Internal Confidentiality Agreements (Section 743 of Division E, Title VII, of the Consolidated and Further Continuing Resolution Appropriations Act, 2015 (Pub. L. 113-235))

XI. AGENCY CONTACTS

A. Questions of a technical nature shall be directed to the technical point of contact, as specified below:

Oscar Martinez, AFRL/RDMX
3550 Aberdeen Ave SE Kirtland AFB, NM
87117-5776
Telephone: (505) 843-3221
Email: oscar.martinez.16@us.af.mil

B. Questions of a contractual/business nature shall be directed to the Agreements Specialist, as specified below:

Julian I. Landavazo, Agreement Specialist AFRL Det
8/RVKVE
3550 Aberdeen Ave SE Kirtland AFB, NM
87117-5776
Telephone: (505) 853-0071
Email: julian.landavazo@us.af.mil

C. Ombudsman: An ombudsman has been appointed to hear and facilitate the resolution of concerns from recipients, potential recipients, and others for this requirement. When requested, the ombudsman will maintain strict confidentiality as to the source of the concern. The existence of the ombudsman does not affect the authority of the Program Officer, Grants Officer, or Approving Official. Further, the ombudsman does not participate in the evaluation of proposals, the award process, or the adjudication of protests or formal grant disputes. The ombudsman may refer the party to another official who can resolve the dispute. Before consulting with an ombudsman, interested parties must first address their concerns, issues, disagreements, and/or recommendations to the Grants Officer for resolution. Consulting an ombudsman does not alter or postpone the timelines for any other processes (e.g., agency level grant protests, GAO grant protests, requests for debriefings, employee- employer actions, contests of OMB Circular A-76 competition performance decisions)

If resolution cannot be made by the Grants Officer, concerned parties may contact the AFRL ombudsmen: AFRL Ombudsman is Lisette K. Leduc, Director of Contracting, AFRL/PK, 1864 4th Street, Bldg 15, Room 225, Wright-Patterson AFB, OH, 45433-7130, (937) 904-4407, email: lisette.leduc@us.af.mil.

Do not contact the ombudsman to request copies of the solicitation, verify offer due date, or clarify technical requirements. Such inquiries shall be directed to the Grants Officer.

XII. OTHER INFORMATION

A. Support Contractors: Only Government employees will evaluate the proposals for selection. Offerors are advised that employees of commercial firms under contract to the Government may be used to administratively process proposals, monitor contract performance, or perform other administrative duties requiring access to other contractors' proprietary information. These support contracts include nondisclosure agreements prohibiting their contractor employees from disclosing any information submitted by other contractors or using such information for any purpose other than that for which it was furnished. Any objection to administrative access must be in writing to the Contracting/Grants Officer and shall include a detailed statement of the basis for the objection.

B. Communication: Dialogue between prospective offerors and Government representatives is encouraged until submission of proposals. Discussions with any of the points of contact shall not constitute a commitment by the Government to subsequently fund or award any proposed effort. Only Agreements Officers are legally authorized to commit the Government.

C. Wide Area Work Flow Notice: Wide Area Work Flow (WAWF) has been designated as the Department of Defense standard for electronic invoicing and payment. To facilitate this effort for Universities and Nonprofit Organizations with awards administered by the Office of Naval Research (ONR) Regional Offices, DoD has established the ONR Electronic Payment System (PayWeb) <https://onronline.onr.navy.mil/payweb/>, as an initial entry point to WAWF. If the Grantee participates in the PayWeb system, the Grantee shall submit an electronic request for payment to the Administrative Grants Officer (AGO) at the Administrative Office in Block 12 of the award, using the standard PayWeb processes.

Participation in the PayWeb system requires the Grantee to obtain an External Certificate Authority (ECA) certificate from an approved Certificate Authority for access. Operational Research Consultants (ORC) (<http://www.eca.orc.com>) and VeriSign (<http://www.verisign.com/gov/ieca>) are approved ECA Authorities. If you have questions or require technical assistance in implementing your certificate, contact the Navy PKI Help Desk at 1-800-304-4636. The Grantee shall Contact the AGO at the Administrative Office in Block 12 of the award for instructions on how to register and use WAWF and PayWeb

Electronic submission of payment requests requires the Grantee to register in WAWF and have the appropriate CAGE code activated. Please note that each Grantee must be registered in SAM and have an Electronic Business Point of Contact (EBPOC) set up to approve new registrations within their Institution. Electronic Business Point of Contact (EBPOC) is responsible for activating the CAGE code in WAWF by calling 1-866-618-5988. Once the Grantee's CAGE Code is activated, the CCR EBPOC will self-register in WAWF (<https://wawf.eb.mil>) and follow the instructions for a group administrator. The ONR Regional Offices will assist in this process. The ONR Regional Office is listed as the Administrative Office in Block 12 of the award.

D. Property: Any award resulting from this announcement may contain articles for governing management and disposition of property as contained 2 CFR § 200.310 -316

F. Standards for Final Management Systems: 2 CFR §200.300-309 is hereby incorporated by reference.

G. Proposal Content Checklist: You may be ineligible for award if all requirements of this announcement are not met.

1. Proposals are due to the specified point of contact. See Section I B & C
2. Proposal page limits are strictly enforced. See Section VIII C.
3. Completed Representations and Certifications. See Attachment B.
4. The Technical Proposal must be submitted in the format specified in Section VIII C1.
5. The Cost/Business Proposal must contain all information described in the Content and Form of Submission for Full Proposals. See Section VIII C. 2. and Attachment C.
6. For any subcontracts proposed, the Cost/Business Proposal must contain a subcontractor analysis IAW §200.317-326.
7. The Cost/Business Proposal must contain any exceptions to the sample Model Cooperative Agreement Terms and Conditions. See Attachment A for model cooperative agreement. However, be advised that the document awarded may include articles in addition to those in the models, and/or some of articles in the models may be deleted, depending on the specific circumstances of the

individual program. Any additions or deletions will be discussed with the offeror prior to award of the document. In the interest of streamlining and in order to be in position to award within days of completion of the technical evaluation, it is imperative that you review the model contract appropriate for your business type and provide with your proposal any exceptions to terms and conditions.

XIII. ATTACHMENTS

Attachment A – Model Grant

Attachment B - Representations and Certifications

Attachment C - RVK Assistance Budget Proposal Instructions