2-Step Broad Agency Announcement

Overview Information

NAICS Code: The NAICS Codes for this acquisition are **541711** (for Research and Development in Biotechnology) and **541712** (for Research and Development in the Physical, Engineering, and Life Sciences (except Biotechnology), and the small business size standard for both is **1000** employees.

Federal Agency Name: Air Force Research Laboratory, Air Force Research Laboratory, Materials and Manufacturing Directorate, Functional Materials Division, AFRL/RXA

Broad Agency Announcement Title: AFRL/RX Functional Materials Open BAA

Broad Agency Announcement Type: This is the **Initial Announcement.**

Broad Agency Announcement Number: BAA-AFRL-RQKM-2016-0007

Catalog of Federal Domestic Assistance (CFDA) Number(s): 12.800 AIR FORCE DEFENSE RESEARCH SCIENCES

THIS WILL BE A TWO-STEP SOLICITATION:

First Step: WHITE PAPER DUE DATE AND TIME: White Papers may be submitted at any time upon issuance of this BAA until 18 April 2021, Wright-Patterson AFB, OH Local time.

Second Step: PROPOSAL DUE DATE AND TIME: To be provided in response to the Requests for Proposals sent to offerors that submit White Papers considered to meet the needs of the Air Force based upon the review criteria as set forth in Section V.

Solicitation Request: Air Force Research Laboratory, Materials & Manufacturing Directorate, Wright Research Site is soliciting white papers on the research effort described below. White Papers should be addressed to the Contracting Point of Contact (POCs) listed below. This is an unrestricted solicitation. Small businesses are encouraged to propose on all or any part of this solicitation. The NAICS Codes for this acquisition are 541711 and 541712, and the small business size standard for both is 1000 employees. White Papers/Proposals submitted shall be in accordance with this announcement. *There will be no other solicitation issued in regard to this requirement*. Yearly updates will be issued for updates to this Open BAA.

Submission: White papers shall be submitted to the Contracting Point of Contact (POC): Gary R. Victor, Contract Negotiator, or Whitney L. Foxbower,

Contracting Officer, AFRL/RQKMA, Building 45, 2130 8th St., Wright-Patterson AFB, OH 45433-7541.

Annual Updates: It is noted that for ease of reference this BAA will be republished at yearly intervals for updates.

Type of Contract/Instrument: The Air Force reserves the right to award the instrument best suited to the nature of research proposed. Accordingly, the Government may award any appropriate contract type under the FAR or Other Transaction (OT) for Prototype, grant, cooperative agreement, or OT for Research. The Air Force may also consider award of an appropriate technology transfer mechanism if applicable. It is anticipated that awards under this BAA will generally be Cost Plus Fixed Fee (CPFF). Cost reimbursement contracts require successful offerors to have an accounting system considered adequate for tracking costs applicable to the contract.

Estimated Program Cost: $42,500,000

Anticipated Number of Awards: The Air Force anticipates awarding multiple awards for this announcement. Individual awards are anticipated to be in the range of $100,000 to $5,000,000 per contract. However, the Air Force reserves the right to award larger or smaller contracts or assistance instruments based upon the white papers received.

Brief Program Summary: Air Force Research Laboratory, Materials & Manufacturing Directorate is soliciting white papers and potentially technical and cost proposals under this announcement that support the needs of the Functional Materials and Applications mission. Functional Materials technologies range from materials and scientific discovery through technology development and transition are of interest. Descriptors of Materials and Manufacturing Directorate technology interests are presented in the context of functional materials core technical competencies and applications.

Communication Between Prospective Offerors and Government Representatives: Dialogue between prospective offerors and Government representatives is encouraged. Parties interested in submitting a white paper may contact the technical POC. Open discussion is encouraged to obtain the best technical solutions. Full proposals will be requested by the Procuring Contracting Officer only. After receipt of full proposals and evaluation, all communication will be conducted by the Contracting POCs. For those white papers not selected to provide a full proposal, notification and feedback will be managed by the Contracting POCs. 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 Contracting Officers are legally authorized to commit the Government.

Address technical questions to: George Orzel, AFRL/RXAS, 2941 Hobson Way, Building 654, Wright-Patterson AFB, OH. 45433, e-mail george.orzel@us.af.mil, telephone 937-904-4354.

Address contracting questions to the Contracting POC: Gary Victor, Contract Negotiator, AFRL/RQKMA, 2130 8th Street, Building 45, Wright Patterson AFB, OH 45433-7541, e-mail: gary.victor@us.af.mil, telephone (937) 713-9887, or Whitney Foxbower, Contracting Officer, AFRL /RQKMA, e-mail: whitney.foxbower@us.af.mil or telephone (937) 713-9877.

Full Text Announcement

I. Program Description: Air Force Research Laboratory, Materials & Manufacturing Directorate is soliciting white papers (and later technical and cost proposals if after the Government's review of the white paper it is determined that the white paper has the potential to best meet the Air Force's needs).

1. **Statement of Objective/Description of Technical Area(s)**: Functional Materials technologies that range from materials and scientific discovery through technology development and transition are of interest. Descriptors of Materials and Manufacturing Directorate technology interests are presented below in the context of functional materials core technical competencies and applications which focus on enabling innovative solutions, methods and understanding in the development and application of new materials devices and concepts to meet specific performance goals. The following research areas are of interest.

a. Nanoelectronic Materials Core Competencies:

(i) Agile Radio Frequency (RF) Electronic Materials (ARFEM)

Research: The ARFEM research area develops, explores, improves and matures nanoscale transport materials and their synthesis processes for use in a variety of electronics-based Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) applications. These applications are currently limited by low carrier concentration, low mobility, size, weight, and thermal management issues. The materials and processes competencies of electronic materials design, processing characterization and failure prediction are leveraged to achieve nanoscale engineered electron and phonon transport in radio frequency (RF) devices, conformal and flexible electronics and sensors. Research and development projects that leverage the materials and processes competencies of nanostructured material synthesis, processing, integration and characterization and energy devices fabrication and characterization to enable the development of high performance, lightweight, low cost energy conversion and storage devices and advanced flexible device concepts are also of interest within this core competency. These materials would

be developed and evaluated for a variety of potential applications, including but not limited to RF, optical, and power generation and storage (NAICS Code 541712).

(ii) Integrated Photonics & Opto-electronic Materials & Processing (IPOM&P) Research: The IPOM&P research area explores, develops, and matures materials and processes to advance photonic and opto-electronic technologies for Air Force relevance applications in electronic warfare, communications precision navigation, and intelligence, surveillance and reconnaissance (ISR). Applications for these materials include, but are not limited to, enhanced long-range and multispectral infrared sensing, support information processing and secure communication supporting very long wavelength infrared detection, high resolution mid-infrared detection, hyperspectral imaging, optical communication, secure communications, computational imaging, compressive sensing, conformal RF sensors, phased arrays, RF photonics, quantum information, quantum sensing and integrated photonic systems. Materials and processes are developed to facilitate photonic integration and reductions in system size while increasing functionality, to enable new application environments, higher operating temperatures, for example, and to advance technical capabilities. The range of materials to be investigated in this area includes, but is not limited to: semiconductor materials, optical and electro-optical materials, organic electronic materials, plasmonic materials, ceramics, dielectric materials and their heterostructures, nanomaterials, and quantum materials. Research and Development could include the design, synthesis, material growth, device fabrication/processing, and evaluation of new and/or modified material systems and new/improved laboratory test procedures, analytical, characterization, and modeling techniques to evaluate materials and device performance. Developing theoretical models and computational tools to guide experimental work of materials may cover a broad range of physical lengths from an atomistic level to a macro device level

for integrated computational materials science and engineering (ICMSE) (NAICS Code 541712).

b. Soft Matter Materials Core Competencies:

(i) Flexible Materials and Devices (FM&D) Research: The FM&D research area involves research and development activities needed to enable flexible hybrid electronic applications. It leverages materials and process competencies of soft matter and nanostructured material synthesis, processing, integration and characterization and device fabrication and characterization to enable the development of high performance, lightweight, low cost energy flexible electronic concepts. Specific research thrusts include, but are not limited to, the development of strain tolerant materials and devices, advanced processing approaches for integration of flex devices into robust packages such as for flexible/stretchable electronics, and characterization of such materials and devices for mechanical reliability in AF unique extreme environments. This research is expected to lead to flexible/stretchable electrode materials for extremely high rate energy storage, novel materials for next generation thin film transistors, nanostructured dielectrics for pulse power and wide operating temperature capacitors, ultra-lightweight and flexible photovoltaics, integrated micropower sources, wearable sensors, multifunctional responsive materials systems, flexible batteries and electrodes for human integration and structural power, and novel direct write and 3-D printing approaches to enable integration of multifunctional materials elements onto non-traditional substrates. Computational tools are utilized to guide material and device design and to predict material and device performance in efforts to accelerate or support understanding, development and delivery of flexible and soft matter material solutions to current and future AF systems. Specific projects of interest could include, but are not limited to, the following: 1) Development of printing approaches for thin film transistors, 2) New materials chemistries, device architectures, and mechanical characterization of flexible/stretchable battery concepts, 3) Nanodielectrics for high energy density capacitors, 4) Integration approaches for structural electronics composites, and 5) materials and processing methodologies and structure/property relationships in flexible electronic devices including power, sensing, and communication functions (NAICS Code 541712).

***(ii) Biomaterials Materials and Processes (BM&P) Research*:** The BM&P research area couples experimental and modeling tools to develop solutions by studying and applying biological materials and systems to create bioinspired/derived materials, biofunctionalization of nanostructures, and understanding the effect of biosystems on AF environments. This research leverages the materials and processes competencies of biomimetic materials characterization, bioelectronics/biotronics, microbiology and biochemistry, and bio-functionalization of materials. Specific efforts include the study of 1) Structure-property-processing relationships of biomaterials, 2) Biological-Materiel interactions, 3) Biomimetic and Biofunctionalized sensors and devices, 4) The development of modeling and processing tools to predict and characterize biomaterial performance and 5) The use of biomaterials to enable ease of manufacturing of robust sensitivity selective sensors and devices. 6) Understanding the processes for biofilm formation in extreme environments. This research is expected to lead to the development of thin, flexible, multifunctional sensors, material solutions for stabilization of labile reagents in extreme environments, prevention of destructive microbiological corrosion, increased human centered responsive ISR capabilities and more effective human performance monitoring and human resource management (NAICS Code 541711).

c. Photonic Materials Core Competencies:

***(i) Optical Materials and Processes (OM&P) Research*:** The OM&P research area involves the exploration, development and maturation of optical materials and processing that produce, convert, and move photons to enhance electromagnetic (EM) capabilities with improved size weight and power (SWaP) characteristics. It is of interest to manipulate photons via interaction with bulk, plasmonic, electro-optic and structured optical materials in order to derive new or improved responses in efficiency, power, frequency conversion and modulation speed. This research leverages the materials and processes competencies of photonic materials characterization, active optical materials development, structured novel materials and electromagnetic characterization of thin films, to provide materials solutions to imaging,

sensing, communication and electronic warfare (EW) challenges. Specific research thrusts include, but are not limited to: 1) Additive functional electromagnetic. 2) Dynamic plasmonics and metamaterials 3) Ceramic active optics. Specific projects of interest include: 1) Materials to enable novel distributed sensing schemes 2) Additive manufacturing of photonic systems 3) High rate laser processing of ceramic optical materials 4) Design/Optimization of structured materials through computational electromagnetic and 5) Nano-to-macro optical characterization (NAICS Code 541712).

(ii) ***Hardened Materials and Processing (HM&P) Research*****:** The HM&P research area involves the development of new and improved materials by scientific investigation, fabrication, understanding, prediction (through experiments and modeling) and laser characterization. The research leverages materials and processes competencies for controlling/manipulating light that include electro-optic materials, nonlinear optical materials, thin film optical coatings, structural hardening materials, laser characterization/interaction with materials and coupled theoretical/experimental materials design to develop new and improved materials and technologies. The incorporation of a multiscale integrated computation materials science and engineering approach, using Schrodinger's (atomistic approaches) and Maxwell's equations (Beam Propagation Methods) enables an understanding of the interaction of light with materials on micro- and macroscopic levels and enables assistance in materials design. Specific projects of interest include: 1) Investigation of structure property relationships of photonic material systems, 2) Fabrication, modeling and characterization of materials for development of fixed wavelength filters that utilize refractive and absorption interactions, 3) Development of responsive liquid crystal spectral filters, 4) Development, fabrication, characterization and testing of materials for thermal mitigation and, 5) Development of improved organic and inorganic nonlinear optical materials (NAICS Code 541712).

(iii) ***Photonic Materials Applied Research:*** Research to advance the current state-of-the-art in photonic materials technologies, interactions, and applications using unique and innovative solutions for improved survivability of sensors, structures, systems, and aircrew members. Some of the key technical areas of interest include Optical Materials and Processing, Hardening Materials and Processing, Electro-Optic/Infrared (EO/IR) Sensor Protection, Warfighter Protection, Structural Protection, Optical Technology, Computational and Theoretical Studies on Functional Materials, and Materials Technology for Airborne Lasers. This research may involve structural material testing, IR materials research, high energy laser materials interactive, sensor component characterization and testing, and space environment testing on sensors, components and structures in a wide variety of configurations and materials which are designed for many different applications and performance parameters to include laboratory conditions, field or range conditions external to the laboratory, and simulated atmospheric, flight and space environments. The interaction of materials, structures, and sensor components and configurations of interest to the Air Force and DoD with external sources and environments is integral to the development of materials technologies appropriate for these applications. Materials of interest may include existing or newly developed materials for structures, integrated optics and detector technologies, as well as materials and component configurations for sensing or imaging applications (NAICS Code 541712).

d. Rapid Research and Development for Warfighter Needs Core Competency:

(i) ***Rapid Research and Development for Warfighter Needs:*** This research area seeks to provide rapid research and development for warfighter needs through the synthesis, fabrication, modeling, processing, development, characterization, and evaluation of new materials and prototypes that will utilize advanced materials to increase lifetime, reduce weight, reduce

procurement and sustainment costs, enhance or provide new capabilities, or solve an urgent operational need. Focus on the discovery, characterization, development and ultimately the creation and characterization of devices utilizing unique and novel materials to be used in Air Force applications. Expected Air Force applications could include, but are not limited to, the execution of specialized missions including rescue of personnel, medical monitoring and treatment of injured personnel, and recovery of casualties and sensitive materiel (NAICS Code of 541712).

e. OPSEC: All contractors shall participate in all activities associated with the disciplines of the organization's Industrial Security, Information Security, Personnel Security, Operations Security (OPSEC), Antiterrorism, and Program Protection programs, following appropriate measures in each program as required for this particular contract. These are required in an effort to reduce program vulnerability from successful adversary collection, exploitation of critical information, and violations of export control requirements. The prime contractor will ensure that all subcontractors, if required, conform to these requirements as required by the prime contractor. Guidance can be provided by AFRL/RX Security as needed.

2. **Within Scope Modifications:** Potential offerors are advised that due to the inherent uncertainty of research and development efforts, awards resulting from this announcement may be modified during performance to make within scope changes.

3. **Deliverable Items:** Data Items, Software, Hardware, or Other as determined for each award.

a. Data Items: Data Items: See Attached Contract Data Requirements List (CDRL) (Attachment 5)

b. Software: Computational/modeling code, Data management plan, materials and processing digital data package as required.

c. Hardware: Prototypes and demonstration components/systems as required; UIDs will be required if the hardware acquisition cost exceeds $5,000.

d. Other: Material and chemical samples as required.

4. **Schedule:** Each award is anticipated to be between 12 to 60 months; however Period of Performance will be tailored to each award.

5. Other Requirements:

a. This announcement incorporates FAR and supplement provisions and clauses by reference. The full text of provisions and clauses can be found at http://farsite.hill.af.mil/

b. Program security classification: Up to and including SECRET shall be required depending on the white papers received A solicitation-ready DD254 (Contract Security Classification Specification) is included as Attachment 4. If a DD254 is applicable, offerors must verify their Cognizant Security Office information is current with Defense Security Service (DSS) at www.dss.mil.

c. OPSEC: See Statement of Objectives

d. Export Control: Information involved in this research effort maybe subject to Export Control (International Traffic in Arms Regulation (ITAR) 22 CFR 120-131, or Export Administration Regulations (EAR) 15 CFR 710-774). If effort may be subject to export control, then a Certified DD Form 2345, Militarily Critical Technical Data Agreement, will be required to be submitted with proposal.

e. Export-Controlled Items: As prescribed by DFARS 225.7901-4, DFARS 252.225-7048, "Export-Controlled Item (JUN 2013)" is contained in this solicitation. This clause shall be contained in ALL resulting contracts.

6. Other Information:

a. Government Furnished Property (GFP) availability: GFP is not anticipated to be provided on any resulting contract award. Should GFP be requested in a white paper, in accordance with FAR 45.201(b), the contractor is responsible for all costs related to making the property available for use, such as payment of all transportation, installation or rehabilitation costs.

b. Base Support/ Network Access: Base Support is not anticipated to be made available under any resulting contract/assistance instrument. However, it may be considered on a case-by-case basis.

c. Multiple awards subject to Fair Opportunity are **not anticipated**.

d. Data Rights Desired:

(1) Technical Data: Unlimited Rights
(2) Non-Commercial Software (NCS): Unrestricted Rights
(3) NCS Documentation: Unlimited Rights
(4) Commercial Computer Software Rights: Customary License

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 contract 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.

Offerors that propose delivery of technical data, NCS, or NCS documentation subject to Limited Rights, Restricted Rights, or Specifically Negotiated License Rights will be considered. Proposals 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 and how the incorporation will benefit the program and whether those portions or processes are segregable.

Offerors are reminded that the Identification and Assertion of Restrictions on the Government's Use, Release, or Disclosure of

Technical Data or Computer Software (the assertions list), required under DFARS 252.227-7013 and DFARS 252.227-7014, is included in Section K and due at time of proposals. Assertions must be completed with specificity with regard to each item, component, or process listed. Nonconforming assertions lists will be rejected.

Note that DFARS 252.227-7014(d) describes requirements for incorporation of third party computer software (commercial and noncommercial). Any commercial software to be incorporated into a deliverable must be clearly identified in the proposal. Because many commercial software licenses are not transferrable or may not be acceptable to the Government, commercial software licenses proposed for delivery to the Government must be approved by the contracting officer prior to award.

As used in this subparagraph, the terms Unlimited Rights, Government Purpose Rights, Specifically Negotiated License Rights, and Limited Rights in technical data are as defined in DFARS 252.227-7013. The terms Unlimited Rights, Government Purpose Rights, Specifically Negotiated License Rights, and Restricted Rights in noncommercial computer software and noncommercial software documentation are as defined in DFARS 252.227-7014. The term Commercial Computer Software is as defined in DFARS 252.227-7014.

II. Award Information

This BAA is open and effective until **18 April 2021.** Total funding for this BAA is approximately $42.5M. The anticipated funding to be obligated under this BAA is broken out by fiscal year as follows: FY 16 approximately $8M; FY 17 approximately $9M; FY 18 approximately $9M; FY 19 approximately $9M; FY 20 approximately $7.5M. *This funding profile is an estimate only and will not be a contractual obligation for funding as 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.* Individual awards may range from 12 to 60 months in duration and should normally range between $100K and $5M per contract or assistance instrument. Awards of efforts as a result of this announcement will be in the form of contracts, assistance instruments, or other transactions depending upon the nature of the work proposed.

III. Eligibility Information

1. **Eligible Offeror**: This is an unrestricted solicitation. Small businesses are encouraged to propose.
2. **Cost Sharing or Matching**: Cost Sharing is not required.
3. **Federally Funded Research and Development Centers**: The following guidance is provided for Federally Funded Research and Development Centers (FFRDCs) contemplating submitting a proposal, as either a prime or subcontractor. FAR 35.017-1(c)(4) prohibits an FFRDC from competing with any non-FFRDC concern in response to a Federal agency request for proposal for other than the operation of an FFRDC (with exceptions stated in DFARS 235.017-1(c)(4)). There is no regulation prohibiting an FFRDC from responding to a solicitation. However, the FFRDC's sponsoring agency must first make a determination that the effort being proposed falls within the purpose, mission, general scope of effort, or special competency of the FFRDC, and that determination must be included in the FFRDC's proposal. In addition, AFRL must make a determination that the work proposed would not place the FFRDC in direct competition with domestic private industry. Only after these determinations are made, would a determination be made concerning the FFRDC's eligibility to receive an award.
4. **Government Agencies**: If a Government agency is interested in performing work, contact the Program Manager identified in the BAA. If those discussions result in a mutual interest to pursue your agency's participation, the effort will be pursued independent of this announcement.
5. **Other**:
   - **a.** Foreign participation: Foreign Disclosure Review will be accomplished on each white paper submission selected for funding; therefore foreign participation may or may not be allowed.
   - **b.** Notice to Foreign-Owned Firms: Such firms are asked to immediately notify the Contracting Officer before deciding to respond to this announcement. Foreign contractors should be aware that restrictions might apply which could preclude their participation in this acquisition.
   - **c.** There are no limits on the number of white papers an offeror may submit.
   - **d.** You may be ineligible for award if all requirements of this solicitation are not met on the white paper (and later proposal).

IV. White Paper/Proposal and Submission Information

1. **Overview**: This Announcement consists of a Two-Step Process described in detail below. White Papers/Proposals submitted shall be in accordance with this announcement. *There will be no other solicitation issued in regard to this requirement*. The Government intends to review white papers/proposals and award some, all, or none of the proposals received without negotiation/discussion; however, the Government reserves to right to negotiate with those offeror(s) whose proposal is selected for funding. **ONLY WHITE PAPERS ARE BEING SOLICITED AT THIS TIME.** Offerors should be alert for any BAA amendments.

2. For additional information, a copy of the Broad Agency Announcement (BAA) guide for industry is located at http://www.wpafb.af.mil/shared/media/document/afd-150518-026.pdf.

3. First Step (White Paper) Instructions

a. General: The *FIRST STEP* requests a White Paper (to include a Quad Chart) and a rough order of magnitude (ROM) cost. The White Paper shall include a discussion of the nature and scope of the research and the offeror's proposed technical approach. The Government will review the White Papers in accordance with the FIRST STEP review criteria, set forth in Section V. below. Based on this review, the Government will determine which of them have the potential to best meet the Air Force's needs. Offerors will be notified of the disposition of their White Paper. It is anticipated that Government review of the White Papers submitted will take 30 working days. Those offerors submitting White Papers assessed as meeting Air Force needs will be asked to submit a technical and cost proposal. Those offerors not requested to submit a technical and cost proposal will be notified but may, however, still elect to submit a technical and cost proposal. An offeror submitting a proposal without first submitting a White Paper will not be eligible for an award. The cost of preparing White Papers in response to this BAA is not considered an allowable direct charge to any resulting or any other contract; however, it may be an allowable expense to the normal bid and proposal indirect cost as specified in FAR 31.205-18.

b. Page Limitation: The White Paper shall be limited to 4 pages plus 1 page for the Quad Chart for a total submission of 5 pages. The White Paper shall be prepared and submitted in Word format and be in the standard 10-point business font Arial. Character spacing must be "normal," not condensed in any manner. Pages shall be double-spaced (must use

standard double-space function in Microsoft Word), double-sided (each side counts as one page), 8.5 by 11 inches, with at least one-inch margins on both sides, top and bottom. Lines between text lines must also be 10-point. All text, including text in tables and charts, must adhere to all font size and line spacing requirements listed herein. Font and line spacing requirements do not have to be followed for illustrations, flowcharts, drawings, and diagrams. These exceptions shall not be used to circumvent formatting requirements and page count limitations by including lengthy narratives in such items. Pages associated with the White Paper shall be numbered starting with the cover page being Page 1, and the last page being Page 5. The page limitation covers all information including indices, photographs, foldouts (counted as 1 page for each 8.5 by 11 portion) tables, charts, appendices, attachments, resumes, etc. (except the Quad Chart, which is treated separately, and is limited to one page). The Government will not consider pages in excess of these limitations. Offerors should submit 1 original and 2 hard copies of the White Paper via mail to the Contracting POC, identified in Section VII. A CD with the WORD version of your White Paper must be submitted with the hard copies of the White Paper, and must match the hard copy.

c. Format: The White Paper will be formatted as follows: (1) Section A: Title of Program, Name of Company, Company's Commercial and Government Entity (CAGE) number, Dun & Bradstreet (D&B) Data Universal Numbering System (DUNS) number, Contracting POC and Technical POC with appropriate telephone numbers, fax numbers, and email addresses for the POCs; (2) Section B: Period of Performance and Task Objectives; (3) Section C: Technical Summary; (4) Section D: Quad Chart and (5) Section E: Cost of Task (Rough Order of Magnitude (ROM)).

d. Technical Portion: The technical portion of the White Paper shall include a discussion of the nature and scope of the research and the offeror's proposed technical approach/solution. It may also include any proposed deliverables. Resumes, descriptions of facilities and equipment, and a proposed Statement of Work are not required at this point. Following is the instructions for populating the Quad Chart template (Attachment 2) is attached to the BAA:

i. Enter Project Title (use Arial 24 point), Principal Investigator (PI), intended functional material competency need and intended Air Force application need at the top center of the Quad Chart.

ii. Complete **all** the sections of the Quad Chart.

iii. Upper Left: Objective, Description of Effort

iv. Lower Left: Program/Technical Approach, Challenges, Benefits of Proposed Technology

v. Upper Right: List accomplishments, research efforts and contracts related to the proposed effort

vi. Lower Right: Major Goals/Milestones by FY, Cost by FY, Contact Information (PI name, organization, phone & e-mail address)

vii. Provide an estimate of annual cost in thousands of dollars ($K) per proposed year of effort. Programs/Projects can range from 1 to 5 years.

viii. Except for the title, all text should be Arial 12 point.

ix. Submit the Quad Chart with the White Paper. If the White Paper is selected for a full proposal, you will be asked to modify the Quad Chart to better reflect the proposal content.

e. Cost Portion: The cost portion of the White Paper shall include a ROM cost estimate. No detailed price or cost support information should be forwarded; only a time-phased bottom line figure should be provided.

f. Other Information: Multiple White Papers within the purview of this announcement may be submitted by each offeror. If the offeror wishes to restrict its White Papers, they must be marked with the restrictive language stated in FAR 15.609(a) and (b).

g. White Paper/Proposal Content Summary: You may be ineligible for award if all requirements of this solicitation are not met on the proposal due date. Reference Section VIII for a checklist of the requirements.

h. White Paper Due Date and Time**:** See Overview Information at the beginning of the Solicitation.

4. Assistance Instruments - For information regarding how to submit a proposal for a grant or a cooperative agreement, please refer to Attachment #1 of the Announcement.

5. Second Step - Proposal for Contracts Instructions:

a. The ***SECOND STEP*** consists of offerors submitting a technical and cost proposal. Upon notification from the government of interest in the submitted white paper, the offeror should submit a technical and cost proposal within 30 working days of the proposal request. Up to 60 days can be allowed for larger value proposals. After receipt, proposals will be evaluated in accordance with the award criteria in Section V. below. Proposals submitted shall be in accordance with this announcement. *There will be no other solicitation issued in regard to this requirement*. The Government intends to evaluate proposals and award some, all, or none of the proposals received without negotiation/discussion; however, the Government reserves the right to negotiate with those offeror(s) whose proposal is selected for funding.

b. Technical/Management Proposal:

(1) Page Limitations: The following describes proposal page limitations:

a) The Technical/Management Proposal shall be limited to 20 pages plus 1 page for the Quad Chart (for a total limit of 21 pages). Technical/Management proposals and Statements of Work must be provided in Microsoft Word. Signed pages may be submitted in Adobe.

b) Font shall be standard 10-point business font Arial.

c) Character spacing must be "normal," not condensed in any manner.

d) Pages shall be double-spaced (must use standard double-space function in Microsoft Word), double sided (each side counts as one page), 8.5 by 11 inches, with at least one-inch margins on both sides, top and bottom.

e) All text, including text in tables and charts, must adhere to all font size and line spacing requirements listed herein. Font and line spacing requirements do not have to be followed for illustrations, flowcharts, drawings, and diagrams. These exceptions shall not be used to circumvent formatting requirements and page count limitations by including lengthy narratives in such items.

f) Pages associated with the Technical/Management Proposal shall be numbered starting with the cover page being Page 1, and the last page being no greater than Page **20**. The page limitation covers all information including indices, photographs, foldouts (counted as 1 page for each 8.5 by 11 portion) tables, charts, appendices, attachments, resumes,

etc. appendices, attachments, resumes, etc. (except the Quad Chart, which is treated separately, and is limited to one page).

g) The proposal page limit does not include the offeror's **proposed Statement of Work (SOW); however, the** same formatting rules apply to the SOW, which is limited to **10** pages.

h) **Please Note: The Government will check the proposal and SOW for conformance to the stated requirements. Any pages in excess of the stated page limitation after the format check will not be considered for evaluation purposes.**

(2) The Technical/Management 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, use of base support (if desired), 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 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 SOW.*** Refer to the BAA Guide for Industry referenced above to assist in SOW preparation.

(3) Any questions concerning the technical proposal or SOW preparation shall be referred to the Technical POC.

c. Cost/Business Proposal:

(1) Separate the proposal into a business section and cost section.

a) The business section should contain all business aspects to the proposed contract, such as type of contract, any exceptions to terms and conditions of the announcement including the model contract, any information not technically related, etc. Provide rationale for exceptions.

b) Associate Contractor Agreements: Associate Contractor Agreements (ACAs) are agreements between contractors working on Government contracts that require them to share information, data, technical knowledge, expertise, or resources. The contracting officer may require ACAs when

contractors working on separate Government contracts must cooperate, share resources or otherwise jointly participate in working on contracts or projects. Prime contractor to subcontractor relationships do not constitute ACAs. For each award, the contracting officer will identify associate contractors with whom agreements are required.

c) Identify any technical data that will be delivered with less than unlimited rights.

d) Subcontracting Plans: For efforts to exceed $700,000, Subcontracting Plans shall be submitted in the cost/business proposal. Reference FAR 19.704, DFARS 219.704, and AFFARS 5319.704(a)(1) for subcontracting plan requirements. Small business concerns are exempt from this requirement. If an IDIQ contract arrangement is anticipated, the basis for the subcontracting plan should reflect the entire ceiling amount.

e) Limitations on Pass-Through Charges: As prescribed in FAR 15.408(n)(1) & 15.408(n)(2), provisions 52.215-22, "Limitations on Pass Through Charges- Identification of Subcontract Effort (Oct 2009)," apply.

f) Completed Certifications and Representations (Section K) are due with the full technical and cost proposal. Certifications and Representations (Section K) will be provided to offerors requested to submit a full technical and cost proposal. Offerors may also be required to submit updated or supplemental Certifications and Representations based on the specifics of their proposal.

g) If an offeror proposes the use of Government Furnished Property (GFP), other than GFP identified in the BAA, the offer must specifically identify each piece of GFP in the Cost/Business Proposal, and propose and substantiate a rental cost for evaluation purposes in accordance with FAR 45.202. Include the following information in the proposal:

   (i) A list describing all Government property that the offeror or its subcontractors propose to use on a rent-free basis. The list shall identify the accountable contract under which the property is held and the authorization for its use (from the contracting officer having cognizance of the property);

   (ii) The dates during which the property will be used and, for any property that will be used concurrently in performing two or more contracts, the amounts of the respective uses in sufficient detail to support prorating the rent;

(iii) The amount of rent that would otherwise be charged in accordance with FAR 52.245-9, Use and Charges; and
(iv) 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.

ii **Cost Element Breakdown:** Clear, concise, and accurate cost proposals reflect the offeror's financial plan for accomplishing the effort contained in the technical proposal. As a part of its cost proposal, the offeror shall submit the information outlined below, together with supporting breakdowns. All direct costs (labor, material, travel, computer, etc.) as well as labor and overhead rates should be provided by contractor fiscal year (CFY). Detailed cost element breakdowns by Government Fiscal Year or calendar year are not required. The supporting schedules may include summary level estimating rationale used to generate the proposed costs. The cost element breakdown(s) should include the following if applicable.

a) Direct Labor: Direct labor should be detailed by number of labor hours by category of labor.

b) Labor and Overhead Rates: Direct labor hours, with their applicable rates, must be broken out and the bases used clearly identified. The source of labor and overhead rates and all pricing factors should be identified. For instance, if a Forward Pricing Rate Agreement (FPRA) is in existence, that should be noted, along with the Administrative Contracting Officer's (ACO's) name and telephone number. If the rates are based on current experience in your organization, provide the historical base used and clearly identify all escalation, by year, applied to derive the proposed rates. If computer usage is determined by a rate, identify the basis used and rationale used to derive the rate.

c) Material/Equipment: List all material/equipment items by type and kind with associated costs, and advise if the costs are based on vendor quotes, data and/or engineering estimates; provide copies of vendor quotes and/or catalog pricing data.

d) Subcontractor Costs: Submit all subcontractor proposals and analyses with your cost proposal (See FAR 15.404-3(b)). If the subcontractor will not submit cost and pricing information to the offeror, this information must be submitted directly to the Government for analysis. On all subcontracts and interdivisional

transfers, provide the method of selection used to determine the subcontractor and the proposed contract type of each subcontract. An explanation shall be provided if the offeror proposes a different amount than that quoted by the subcontractor. The offeror's proposal must:

(i) Identify principal items/services to be subcontracted.

(ii) Identify prospective subcontractors and the basis on which they were selected. If non-competitive, provide selected source justification

(iii) Identify the type of contractual business arrangement contemplated for the subcontract and provide rationale

(iv) Identify the basis for the subcontract costs (e.g., firm quote or engineering estimate, etc.).

(v) Identify the cost or pricing data submitted by the subcontractor.

(vi) Provide an analysis of the proposed subcontract in accordance with FAR 15.404-3(b). Provide an analysis concerning the reasonableness, realism and completeness of each subcontractor's proposal. If the analysis is based on comparison with prior prices, identify the basis on which the prior prices were determined to be reasonable. The analysis should include, but not be limited to, an analysis of: materials, labor, travel, other direct costs and proposed profit or fee rates.

e) Special Tooling or Test Equipment: When special tooling, and/or test equipment is proposed, attach a brief description of items and indicate if they are solely for the performance of this particular contract or project and if they are or are not already available in the offeror's existing facilities. Indicate quantities, unit prices, whether items are to be purchased or fabricated, whether items are of a severable nature and the basis of the price. These items may be included under Direct Material in the summary format.

f) Consultants: When consultants are proposed to be used in the performance of the contract, indicate the specific project or area in which such services are to be used. Identify each consultant, number of hours or days to be used and the consultant's rate per hour or day. State the basis of said rate and give your analysis of the acceptability of the consultant's rate.

g) Travel: Travel costs must be justified and related to the needs of the project. Identify the number of trips, the destination and purpose. Travel costs should be broken out by trip with number of travelers, airfare, per diem, lodging, etc.

h) Computer Use: Detail the amount and kind of computer usage, the cost, and how the costs were derived.

i) Facilities Capital Cost of Money: If Facilities Capital Cost of Money is proposed, a properly executed DD Form 1861 is required.

j) Project Funding Profile: Offerors should include a project funding profile by Government Fiscal Year (GFY) (1 Oct through 30 Sept) for budgetary purposes. This will enable the Government to easily identify program funding needs by GFY.

k) If an offeror takes exceptions to the requirements called out in the announcement (e.g., base support, Government-furnished property (GFP), CDRLs), the exceptions should be clearly stated in the cost proposal.

l) Forward Pricing Rate Agreements: Offerors who have forward pricing rate agreements (FPRA's) and forward pricing rate recommendations (FPRR's) should submit them with their proposal.

m) Cost/Business proposals have no page limitations.

iii. General Instructions:

a) Offerors should apply the restrictive notice prescribed in FAR 52.215-1(e) Instructions to Offerors—Competitive Acquisition. Offerors should consider proposal instructions contained in the Broad Agency Announcement (BAA) Guide for Industry, which can be accessed on line at http://www.wpafb.af.mil/shared/media/document/AFD-150518-026.pdf. This guide is specifically designed to assist the offeror in understanding the BAA proposal process.

b) Technical/management and cost/business volumes should be submitted in separate volumes and must be valid for 180 days.

c) Proposals must reference the announcement number BAA-AFRL-RQKM-2016-0007. Offerors must submit one-original and 2 hard copies of their proposals to the Contracting POC.

d) Offerors must include 2 CDs in Microsoft Office or Adobe format containing all electronic versions of required submittals. All electronic versions must match the hard copies.

e) The cost file(s) spreadsheets must be in Microsoft Excel and include the formulas for calculating cost element bases (i.e., G&A, O/H, etc.)

f) The CDs should be labeled with the company name and proposal title.

g) Offerors are advised that only Contracting Officers are legally authorized to contractually bind or otherwise commit the Government.

h) The cost of preparing proposals in response to this BAA is not considered an allowable direct charge to any resulting or any other contract; however, it may be an allowable expense to the normal bid and proposal indirect cost as specified in FAR 31.205-18.

i) No classified technical proposals or cost volumes are expected. Offerors are encouraged to keep all elements of the proposal package unclassified. In the rare case where an offeror has a need to submit a classified appendix, please contact the technical POC for delivery instructions.

j) Offerors should be alert for any BAA amendments that may change proposal requirements or permit extensions to the proposal submission date.

d. **Please Note:** If you intend to submit a grant or assistance instrument, go on to Attachment 1 which discusses the cover page and process for electronic submission of proposals for grants and cooperative agreements.

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

6. Funding Restrictions: None Anticipated. The cost of preparing proposals in response to this announcement is not considered to be an allowable direct charge to any resulting contract or any other contract, but may be an allowable expense to the normal bid and proposal indirect cost specified in FAR 31.205-18. Incurring pre-award costs for ASSISTANCE INSTRUMENTS ONLY is regulated by the DoD Grant and Agreements Regulations (DoDGARS).

7. Other Submission Requirements: White papers shall be submitted via postal mail or hand delivery to: AFRL/RQKMA; Attn: Whitney L. Foxbower, Contracting Officer or Gary Victor, Contract Negotiator, 2130

8th Street, Building 45, Area B, Wright Patterson AFB, OH 45433-7541. E-mail submittals are not acceptable. Proposals shall be submitted in accordance with the instructions provided in the Request for Proposal letter issued by the Contracting Officer after white paper evaluation.

V. White Paper / Proposal Review Information

1. FIRST STEP – White Paper Review Criteria: The Government will review White Papers to determine which of them have the potential to best meet the Air Force's needs based on the following criteria, which are listed in (equal) order of importance:

a. Is the technical approach consistent with the technologies listed in the BAA?

b. Is the research of interest to the Government?

c. Is appropriate funding available?

2. SECOND STEP – Proposal Evaluation Criteria: Proposals will be evaluated against the criteria listed below. The technical aspect, which is ranked as the first order of priority, shall be evaluated based on the following criteria that are of (descending) order of importance.

a. Technical:

(1) Unique and innovative approach proposed to accomplish the technical objectives. New and creative solutions and/or advances in knowledge, understanding, technology, and the state of the art.

(2) The potential for AFRL to transition the research and development deliverables to future Government needs. Any proposed restriction on technical data or computer software will be considered.

(3) The offeror's understanding of the scope of the technical effort.

(4) Soundness of the offeror's technical approach.

(5) Availability of qualified technical personnel and their experience with the applicable technologies.

(6) Availability, from any source, of necessary research, test, laboratory, or shop facilities.

b. Cost/Price: Includes realism of the proposed cost and fee and consideration of proposed budgets and funding profiles. Cost/Price is a substantial factor, but ranked as the second order of priority. For those White Papers selected for full proposals, the submission of certified cost

or pricing data may be required from offerors for awards in excess of the TINA threshold of $750K.

3. SECOND STEP / PROPOSAL - Review and Selection Process

a. Categories: Based on the evaluation, proposals will be categorized as Highly Recommended, Selectable, or Not Selectable (see definitions below). The selection of one or more sources for award will be based on the evaluation, as well as importance to agency programs and funding availability.

(1) Highly Recommended: Proposals are recommended for acceptance if sufficient funding is available, and normally are displaced only by other Highly Recommended proposals.

(2) Selectable: Proposals are recommended for acceptance if sufficient funding is available, but at a lower priority than Highly Recommended Proposals. May require additional development. To ensure a diversity of approaches, a Selectable proposal may be prioritized over a Highly Recommended proposal if the Selectable proposal presents a unique approach unlike any of the Highly Recommended proposals.

(3) Not Selectable: Even if sufficient funding existed, the proposal should not be funded.

Note: The Government reserves the right to award some, all, or none of proposals. When the Government elects to award only a part of a proposal, the selected part may be categorized as Highly Recommended or Selectable, though the proposal as a whole may not merit such a categorization.

b. No other evaluation criteria will be used.

c. Prior to award of a potentially successful offer, the Contracting Officer will make a determination regarding price reasonableness.

VI. Award Administration Information

1. **Award Notices:** Offerors will be notified whether their white paper is recommended to submit a full technical and cost proposal on or about 30 days after receipt of the white paper. The notification is not to be

construed to mean the award of a contract is assured, as availability of funds and successful negotiations are prerequisites to any award.

2. **Administrative and National Policy Requirements**: See Section I.

3. **Reporting:** Please see BAA paragraph I.3.a., Contract Data Requirements List (CDRL).

VII. Other Information

1. **Acquisition of Commercial Items**: Based upon market research, the Government is not using the policies contained in Part 12, Acquisition of Commercial Items, in this solicitation. However, interested offerors may identify to the Contracting Officer their interest and capability to satisfy the Government's requirement with a commercial item within 15 days of this notice.

2. **Support Contractors:** Only Government employees will evaluate 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.

3. **Debriefings:** If a debriefing is requested in accordance with the time guidelines set out in FAR 15.505 and 15.506, a debriefing will be provided, but the debriefing content may vary to be consistent with the procedures that govern BAAs (FAR 35.016).

4. **Item Unique Identification and Valuation.** It is DoD policy that contractors shall be required to identify the Government's unit acquisition cost for all deliverable end items for which Item Unique Identification applies. Therefore, proposals must clearly break out the unit acquisition cost for any deliverable items. See DFARS 211.274-3, Policy for Valuation, for more information. (Per DoD, "fully burdened unit costs" to the Government would include all direct, indirect, G&A costs, and an appropriate portion of fee). For more information, see following website: http://www.acq.osd.mil/dpap/pdi/uid/index.html.

5. **Pre-Award Clearance:** Pursuant to FAR 22.805, a preaward clearance must be obtained from the U.S. Department Of Labor, Employment Standards Administration, Office Of Federal Contract Compliance Program's (OFCCP) prior to award of a contract (or subcontract) of $10,000,000 or more unless the contractor is listed in OFCCP's National Preaward Registry http://www.dol-esa.gov/preaward. Award may be delayed if you are not currently listed in the registry and the contracting officer must request a preaward clearance from the OFCCP.

6. **Updates of Publicly Available Information Regarding Responsibility Matters:** Any contract or assistance award that exceeds $500,000.00; and when offeror checked "has" in paragraph (b) of the provision FAR 52.209-7, shall contain the clause/article, FAR 52.209-9 "Updates of Publicly Available Information Regarding responsibility Matters (JUL 2013)."

7. Offerors are required to submit the completed provision at DFARS 252.215-7009 Proposal Adequacy Checklist with their technical and cost proposal. (See Attachment #3).

8. **White Paper/Proposal Reminders**: You may be ineligible for award if all requirements of this solicitation are not met on the proposal due date.

   a. White Papers are due to the Contracting POC any time until the due date and time specified in this announcement.
   b. White Paper and Proposal Page limits are strictly enforced. See Sections IV.2.b and IV.3.b.2.i of the solicitation for page limits.
   c. Proposals and White Papers must be submitted in the format specified in Section IV.
   d. The Cost/Business Proposal must contain all information described in the Content and Form of Proposal Section.
   e. Offerors other than small businesses must include a subcontracting plan.
   f. Proposals must be submitted in the format specified.
   g. Offerors who have Forward Pricing Rate Agreements (FPRA's) or Forward Pricing Rate Recommendations (FPRR's) should submit them with their proposal.
   h. If a DD254 is applicable, offerors must verify their Cognizant Security Office information is current with Defense Security Service (DSS) at www.dss.mil.

i. If effort is subject to export control, offerors must submit a Certified DD Form 2345, Militarily Critical Technical Data Agreement, with proposal.

ATTACHMENTS

List of Attachments:

1. Supplemental Instructions for Assistance Instruments Proposals
2. Quad Chart
3. Proposal Adequacy Checklist
4. DD 254
5. Contract Data Requirements List (CDRL), DD Form 1423-1