

FUNDING OPPORTUNITY ANNOUNCEMENT

OVERVIEW INFORMATION

This Funding Opportunity Announcement (FOA) describes the research objectives of the Air Force Research Laboratory's (AFRL) university Center of Excellence (COE) in Intelligent Structures for Morphing High Speed Vehicles, which addresses research objectives of the United States Space Force (USSF) and the United States Air Force (USAF). A university COE is defined as a joint effort among Air Force Office of Scientific Research (AFOSR), Air Force Research Laboratory Technology Directorates (AFRL TDs), and an outstanding university or team of universities to perform high-priority collaborative research. This center is a joint project between AFOSR, the Munitions Directorate (AFRL/RW), Aerospace Systems Directorate (AFRL/RQ), and the Materials and Manufacturing Directorate (AFRL/RX).

AFOSR anticipates making at least one grant award of up to **$1,000,000** per year per award, for a maximum of five years. The base period is for three years, which the AFOSR intends to incrementally fund, followed by an option to extend an additional two years provided the COE passes a midterm "go/no-go" review at the 2.5-year point. All funding decisions are at the Government's discretion and are subject to the availability of funds.

Proposers are highly encouraged to confer with the designated AFOSR program officer as soon as possible. AFOSR will evaluate proposals using a peer review panel and the criteria specified in section E: "Application Review Information." While AFOSR reserves the right to select and fund all, some, or none of the proposals, AFOSR anticipates making one grant award under this announcement. AFOSR will not provide funding for reimbursement of proposal or application costs associated with responding to this FOA.

White Papers briefly summarizing the proposing institution's ideas are highly encouraged. The AFOSR program officer will coordinate with the sponsoring Munitions Directorate (AFRL/RW), the Aerospace Systems Directorate (AFRL/RQ), and Materials and Manufacturing Directorate (AFRL/RX) technical leads to provide feedback to white papers and will share responsibility for ensuring the success of a COE.

Proposals may choose to include a data management plan that outlines how samples and data collected in the program will be stored and managed. This includes, but is not restricted to, issues such as: standards for data and metadata collection, content and format, data archiving, database management, and data sharing within and outside the COE. This is modeled on the National Science Foundation Data Management Plan[1]. This COE will focus on development of basic research foundations within a Sense-Assess-Respond (SAR) feedback control framework to fully exploit performance opportunities from morphing aircraft at high-speed.

Hyperlinks have been embedded within this document and appear as underlined, and or blue-colored words in the midst of paragraphs. The reader may "jump" to the linked section within this document by "clicking" (CTRL + CLICK, or CLICK).

SUMMARY FUNDING OPPORTUNITY INFORMATION

1. FEDERAL AWARDING AGENCY NAME
Air Force Office of Scientific Research
875 North Randolph Street, STE 325, Room 3112
Arlington, VA 22203

2. FUNDING OPPORTUNITY TITLE
CENTER OF EXCELLENCE (COE): Intelligent Structures for Morphing High Speed Vehicles

3. ANNOUNCEMENT TYPE
Initial Announcement

4. ANNOUNCEMENT NUMBER
FOA-AFRL-AFOSR-2023-0006

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

6. KEY DATES

Pre-proposal inquiries and questions must be received in writing by electronic mail not later than **01 March 2023 at 11:59 PM Eastern Time** (ET) to be considered.

White papers are highly encouraged and must be submitted electronically at **https://community.apan.org/wg/afosr/p/submitawhitepaper** by **17 March 2023 at 11:59 PM Eastern Time** to be considered. White paper evaluation is meant to initially assess the capability of a proposed effort and is NOT a selection process. White papers can be up to 8 pages in length plus references. White papers should adequately articulate:

1. An initial list of members of the proposed team with a short bio or CV for each (CVs and/or bios will not count against page limit)
2. The main technical components of the proposed research and how it aligns with the goals of the solicitation.
3. The specific proposed activities to establish a relationship with AFRL/RW, RQ,

RX, and AFOSR.

4. The specific plans to educate students/postdoctoral fellows, expose them to research opportunities with AFRL's Technical Directorates, and ultimately further the interests of the USAF/USSF.

The Government will respond to white papers before COB on **24 March 2023**.

Proposals must be received electronically through Grants.gov by **14 April 2023 at 11:59 PM Eastern Time** to be considered.

We anticipate that we will notify proposers of selection or non-selection for award by **12 May 2023**.

TABLE OF CONTENTS

A. PROGRAM DESCRIPTION 7

1. SUMMARY 7

2. BACKGROUND 7

3. OBJECTIVE AND RESEARCH CONCENTRATION AREAS 9

4. COE- TECHNICAL DETAILS OF PROPOSED RESEARCH 14

B. FEDERAL AWARD INFORMATION 16

C. ELIGIBILITY INFORMATION 17

1. ELIGIBLE APPLICANTS 17

a. Qualified and Responsible United States Educational Institutions 17

b. HBCU/MI, Tribal College and University Applicants Encouraged 17

c. Ineligible Entities 17

2. COST SHARING OR MATCHING 17

3. OTHER 17

a. Research Personnel Facility Access Requirements and Restrictions 17

b. Acknowledgment of Support and Disclaimer Requirements 18

c. Expectation of Public Dissemination of Research Results 18

d. Representation for Tax Delinquency, Felony Conviction and Internal Confidentiality Agreements 18

e. Conflict of Interest 19

D. APPLICATION AND SUBMISSION INFORMATION 19

1. ADDRESS TO REQUEST APPLICATION PACKAGE 19

2. CONTENT AND FORM OF APPLICATION SUBMISSION 19

a. Pre-proposal Inquiries and Questions 19

b. The Application as a Whole 20
c. Proposal Format 21
d. Proposal Length 21
e. No Confidential or Proprietary Information 22
f. Electronic Form and Proposal Attachments 22
3. GRANTS.GOV APPLICATION SUBMISSION AND RECEIPT PROCEDURES 22
a. Electronic Delivery 22
b. How to Register to Apply through Grants.gov 22
c. How to Submit an Application to AFOSR via Grants.gov 24
4. COMPONENT PIECES OF THE APPLICATION 25
a. SF 424 (R&R) Application for Federal Assistance 25
b. Representation for Tax Delinquency, Felony Conviction, and Internal Confidentiality Agreements 26
c. SFLLL Disclosure of Lobbying Activities Form 26
d. Certification Regarding Lobbying Form 27
e. R&R Other Project Information Form 27
f. R&R Publicly Releasable Project Summary / Abstract 28
g. Project Narrative 28
h. Bibliography and References Cited 30
i. R&R Senior / Key Person Profile Form 31
j. R&R Budget Form 31
k. R&R Sub award Budget Form 32
l. Budget Justification 32
m. R&R Project / Performance Site Locations Form 33
n. Data Management Plan (Required) 33
o. R&R Personal Data Form 33
5. INFORMATION YOU MUST SUBMIT IF SELECTED FOR POSSIBLE AWARD 34
6. UNIQUE ENTITY IDENTIFIER (UEI), CAGE, AND SYSTEM FOR AWARD MANAGEMENT (SAM) 34
a. SAM Registration Required 34
b. SAM Exemption or Exceptions Not Available Under This Announcement 34
c. Questions about SAM Registrations and Updates 34
d. Consequences of Non-Compliance with SAM Registration Requirements 34

7. SUBMISSION DATES AND TIMES 35
a. Pre-Proposal Inquiries and Questions Deadline 35
b. How Submission Time for Pre-Proposal Inquiries and Questions is Determined....36
c. Effect of Missing Pre-Proposal Inquiries and Questions Deadline....36
d. Proposal Submission Deadline 36
e. How Proposal Submission Time is Determined 36
f. Grants.gov Tracking Number is Application Receipt....36
g. Effect of Missing the Proposal Submission Deadline 36
8. INTERGOVERNMENTAL REVIEW 36
9. FUNDING RESTRICTIONS....37
a. Proposal Preparation Costs 37
b. Air Force Office of Scientific Research No-cost Extension (NCE) Policy....37
c. Prohibition on Contracting with Entities that Require Certain Internal Confidentiality Agreements or Statements--Representation....37
d. Other Submission Requirements 38
E. APPLICATION REVIEW INFORMATION....38
1. CRITERIA 38
a. Principal Evaluation and Selection Criteria....38
b. Additional Evaluation and Selection Criteria....38
2. REVIEW AND SELECTION PROCESS....39
a. Merit-based, Competitive Procedures....39
b. Cost Analysis for Reasonableness and Realism 39
3. DISCLOSURE OF ADMINISTRATIVE PROCESSING BY CONTRACTOR PERSONNEL 39
4. NO GUARANTEED AWARD....39
F. FEDERAL AWARD ADMINISTRATION INFORMATION....40
1. SELECTION NOTICES 40
a. Electronic Notification....40
b. Selection for Possible Award Does Not Authorize Work 40
2. AWARD NOTICIES....40
a. Federal Award Document....40
b. Electronic Federal Award Distribution....40
3. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS 40

a. Reporting of Matters Related to Recipient Integrity and Performance....40
b. Agency Review of Risk Posed by Applicants....40
c. Cross-Cutting National Policy Requirements....41
d. Acknowledgment of Research Support....41
e. Disclaimer Language for Research Materials and Publications....42
f. Uniform Administrative Requirements, Cost Principles, and Audit Requirements....42
g. DoD Research and Development General Terms and Conditions....42
h. Conditions of Award for Recipients Other Than Individuals....42
i. Minimum Record Retention Requirements....42
4. REPORTING....43
a. Monitoring and Reporting Program Performance....43
b. Technical Performance Report Format....43
c. Department of Defense (DD) Form 882 Report of Inventions and Subcontracts....43
d. Standard Form (SF) 425 Federal Financial Report....44
e. Electronic Payment Requests and Electronic Payment....44
f. Property Reports....44
g. Other Reports....44
h. Electronic Submission of Reports....44
G. AGENCY CONTACTS....45
1. TECHNICAL INQUIRES AND QUESTIONS....45
2. GENERAL INQUIRIES AND QUESTIONS....45
H. OTHER INFORMATION....46
1. OMBUDSMAN....46
2. GRANTS AND CONTRACTING OFFICERS AUTHORITY....46
3. ADDITIONAL FUNDING OPPORTUNITIES....46

A. PROGRAM DESCRIPTION

1. SUMMARY

The Air Force Office of Scientific Research (AFOSR) seeks unclassified proposals from educational institutions in the United States for a University Center of Excellence (CoE) in Intelligent Structures for Morphing High Speed Vehicles.

This center is a joint project between AFOSR and the Air Force Research Laboratory, Munitions Directorate (AFRL/RW), Aerospace Systems Directorate (AFRL/RQ), and Materials and Manufacturing Directorate (AFRL/RX), referred to collectively as "we, our, or us" or "AFRL" in this announcement. This Center of Excellence is anticipated to extend the research interests and capabilities of AFRL in this area. and provide opportunities for a new generation of US scientists and engineers to address United States Space Force (USSF) and United States Air Force (USAF) research needs. Proposals must not contain any proprietary information.

We will consider proposals for up to five (5) years with a three-year (3) base period and a two-year (2) option period.

We will evaluate proposals using peer review panels and the criteria specified in Section E of this FOA (Application Review Information).

We anticipate making at least one award under this competition for a team proposal with no more than two universities.

AFRL invites proposals for research in the areas described in detail below. The schedule for this announcement is given in Section B, Federal Award Information. This research effort will consist of multidisciplinary teams of researchers with the skills needed to address the relevant research challenges necessary to meet the program's goals. Multi- investigator teaming is encouraged. University teaming (up to two) is allowed. Under no circumstances will the Government help to create teams.

2. BACKGROUND

The purpose of this CoE is to develop basic research foundations within a Sense-Assess-Respond (SAR) feedback control framework to fully exploit performance opportunities from morphing aircraft at high-speed[1]. The extent of performance gain holds promise for transformational impact to the USAF and USSF mission areas. Future intelligent aircraft must continuously adapt its shape at high rates while maintaining robust operation through an uncertain and changing atmosphere. Yet, the challenge of rapidly tracking and maintaining morphed configurations in real-world conditions reveals broad scientific gaps in the basic components of current feedback control architectures.

[1] High-speed morphing refers to smooth outer mold line shape change in supersonic or greater flight regimes

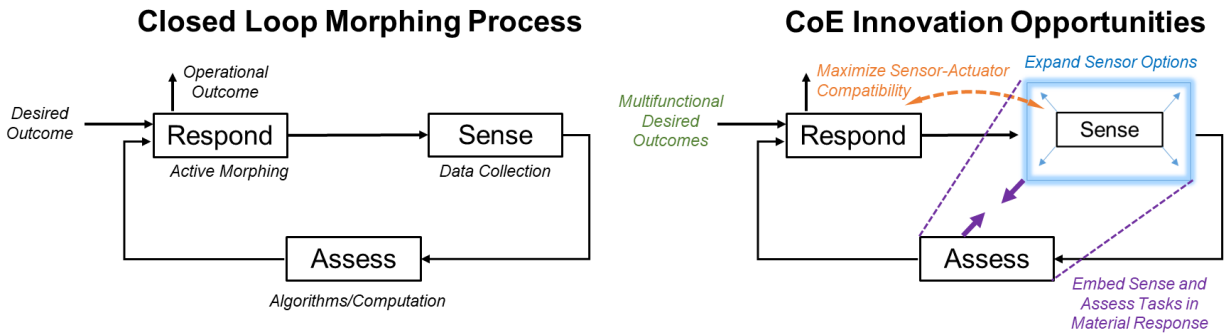


Figure 1 The sense, assess, respond context for morphing actions. **Left:** Representative schematic of essential elements in closed loop feedback process for morphing. **Right:** Innovation opportunities for morphing feedback control: advancing sensing materials, creating sensing motifs that are inherently compatible with adaptive materials, locally embedding assess operations into the sensor material response, and expanding the physical knowledge base of morphing vehicles for multi-objective control.

To access new aircraft performance regimes, a primary objective of a morphing control system is improved aerodynamics. Responsive aerodynamics require active control of near surface flow pressure and velocity fields, which may be unsteady with large spatial gradients. Application of modern flight control technologies leads to the selection of electromagnetic, pneumatic, or hydraulic servomotor actuators for morphing, a set of internally mounted sensors (e.g. inertial measurement units) or embedded sensors on rigid surfaces (e.g. pressure transducers), and a centrally processed digital control law. This approach inherently works with dramatically lower spatial and temporal fidelity than the flow physics that are to be controlled. Therefore, current control outcomes are limited as compared to the true performance opportunity that morphing provides.

Herein, a Sense-Assess-Respond (SAR) feedback loop provides framework for robust and efficient control. The complex dynamic environment of morphing high-speed aircraft presents significant challenges for the collecting and processing of sensor data at sufficient time scales for real-time decision authority. Bottlenecks in sensor transduction and transmission to central processors can generate response lags that preclude the real-time leveraging of local changes in aerodynamic loading and thermal transients. Shortening the sense-to-response time is anticipated to unlock a new level of performance gains and operational benefits for Department of Defense (DoD) systems. For example, recent computational fluid dynamics studies suggest that higher spatial fidelity of local flow information may detect the onset of dynamic stall events, allowing an expansion of the flight envelope to near-stall operation. Similarly, missile vortex shedding and shock wave interactions are other examples of opportunity for local flow information to enable more agile and efficient maneuvering.

Increasing control resolution for morphing aircraft will incur significant cost, size, weight, and power (C-SWaP) tradeoffs that may reduce potential morphing aircraft performance gains. Wiring of a sensor network to a centralized processor (weight), thermal management of conventional electronics (power), and integrating a high-fidelity sensing system within geometric packaging constraints (size) are emblematic of the challenges facing this vision. To locally exploit complex flow physics and other environmental stimuli, fundamentally new approaches must be considered. AFRL requires new algorithms, sensing methods, actuation

schemes, information transmission, and integration strategies to consolidate the sensor-to-actuator decision pathway.

The vision of this CoE is to discover novel feedback concepts for a high-speed morphing structure through a holistic evaluation of synergies and innovations achievable within the SAR framework:

1. **Sense**: exploratory sensor materials and concepts with plausible survivability, power, size, bandwidth, output transmission, and integration within high strain substrates;
2. **Assess**: visionary information processing hardware and algorithms for feedback of sensory data at sufficient time scales to control and leverage novel unsteady flow dynamics, and;
3. **Respond**: novel compact, yet high performance, actuation through adaptive materials, collocated near assessment capabilities with appropriately matched physics to reduce overhead while achieving required morphing states under load.

The local flows associated with the intelligent structure, as opposed to a full aircraft outer mold line, are also a crucial element of this research. Continuous local shape change is an opportunity to study complex or unsteady flows that may hold aerodynamic benefits to future aircraft. Such flows are also relevant to test hypotheses related to the envisioned SAR function.

Competitive proposals will balance integrated and multidisciplinary research among the above SAR topics. A predominant focus on engineering solutions that combines high-performance subcomponents to achieve traditional feedback loop efficiencies in an intelligent structure will be considered non-responsive. Rather, we seek proposals that apply an information-theoretic approach to discover new sensor modalities, new information abstractions, and unconventional processing implementations through a holistic understanding of the SAR feedback loop.

3. OBJECTIVE AND RESEARCH CONCENTRATION AREAS

The overarching goal of this CoE is to develop basic research foundations within a Sense-Assess-Respond (SAR) control framework to fully exploit performance opportunities from morphing aircraft at high speed.

To create a focal point for collaborative and integrated research among the three core research areas below, a geometric abstraction for an intelligent structure, such as a plate, fin, wing, cylinder, cone, or combination body is recommended. Of greatest interest are geometric abstractions motivated from vehicle performance, such as maneuverability, aerodynamic efficiency, or stability augmentation. Morphing actions of interest include bending, twisting, extension, compression, and other relevant shape change actions. The intelligent structure may be predetermined or part of a discovery process worked in parallel to the SAR research.

The SAR framework underlying the intelligent structure must be studied in the context of the flow environment. Flows involving boundary layer unsteadiness, vortex development, or large spatio-temporal variation in properties are of interest, particularity when associated with vehicle performance gains. A detailed vehicle definition is not of interest, although a suitable high-speed vehicle abstraction may be helpful to define a relevant intelligent structure geometry and morphing actions.

Discovery and investigation of flow physics of high-speed morphing actions will enrich and guide research within the SAR framework. Therefore, a component of this CoE should involve continued research to understand and model the flow physics of the proposed morphing abstractions. We pose research questions to prompt the proposer to evaluate whether their ideas address the concepts of interest:

Research Question: How do flow properties change under morphing action at high speed for the proposed intelligent structure abstraction and how are flow changes expected to provide performance gains?

3.1 SENSE: Broaden Sensor Materials Characteristics

Significant challenges exist in sensor materials that require high strength, modulus, and toughness for temperatures and pressures associated with high-speed morphing environments. Silicon-based microelectromechanical designs, silicon carbide, and refractory metals face challenges at elevated temperatures, while ceramics, ceramic matrix composites and single crystals are difficult to machine. We seek research that advances existing sensor materials or identifies new options for integration within the intelligent structure framework.

Research Question: How do the Assess and Response functions affect the desired sensory material and response characteristics?

Sensor integration decisions significantly influence research directions. Here, surface or internally mounted sensor concepts are of interest. Surface embedded materials experience the harshest environment, while allowing a more direct response from surface pressure and shear forces. Robust integration within a high-strain host substrate without jeopardizing surface integrity becomes a challenge with surface integrated concepts. In contrast, internally embedding sensory materials avoids these challenges, yet also couples flow information with morphing component structural response. While typically viewed as a noise source, such coupling is also an opportunity to leverage information contained within the structure.

Research Question: What is the relationship between information quality and sensor survivability as sensors are placed further subsurface?

Surface and internally embedded sensing are not necessarily mutually exclusive. Morphing actions work through local flow changes from environment or the morphed state. Therefore, sensor motifs that incorporate different modalities to observe salient fluid and structural processes relevant to intelligent structure function may be appropriate. We do not seek strategies that focus on optimized layouts. Instead, we seek approaches that address sensor characteristics driven by environment, interdependencies with Assess and Response functions, robust integration, and leveraging information contained within the host structure.

Research Question: Regarding interdependency between Sense and Assess, how may relevant information contained within host structure response improve the quality of information?

3.2 ASSESS: Consolidate Sense and Response Processes

Innovative Algorithms: Efficient transduction, representation, and interpretation of sensor information is critical for viable processing of local information at the spatial, temporal, and frequency resolutions of interest. Opportunities to improve this efficiency exist at all points along the sensor-to-actuator decision pathway.

Research Question: How may the representation of sensory data be most compatible and functionally relevant to requisite computing tasks?

Physics-based models often inform the type and placement of sensors. Such model-driven sensor strategies offer the advantage of human interpretability of the sensor-to-actuator decision pathway, improving perceived robustness, and potentially a reduced number of required sensors. However, human interpretability can generate inefficiencies as data representations are selected to facilitate human intuition versus representations aligned with machine processing. In addition, models inevitably will not capture all of the complexities of the loading environment for the diverse flight regimes of interest. A single sensor placement strategy comes with inherent tradeoffs between intelligent structure functional requirements driven by operational goals and various associated flight conditions.

New strategies are needed to balance competing demands of human intuition and machine processing efficiency, as well as to guide the design and analysis of the Sense-Assess-Respond feedback loop. Reduced order analysis (e.g., manifold projections) between model-based and data-driven approaches is one potential direction to consider. Comparison between reduced order models derived from computational and experimental models will inform the validity of model assumptions, the requirements of spatial-temporal fidelities, and motivate new directions for sensor attributes.

Research Questions: How may reduced order projections of diverse sensor data streams align with intelligent structure decision making? What high dimensional sensor motifs and placement strategies map into a reduced subspace that is balanced for Assess efficiency and interpretability?

Remote sensing and inverse problem techniques are also research directions of interest to achieve information processing in the challenging thermomechanical environment of high-speed systems.

Innovative Hardware Approaches: Bottlenecks and information loss occur at points of data conversion, such as transduction from mechanical loading to an electronic signal, or analog-to-digital signal. Minimizing the incidence of these conversion points, or strategically placing them in the signal pipeline for efficiency, is an important area for feedback design rule development. Additionally, pre-processing local environmental cues directly in their respective physics would improve data efficiency by consolidating state information before transmitting it to a processing node and further reduce the bandwidth requirements of the data conversion process. Advances in unconventional computing hardware and processing techniques are needed to exploit this opportunity, such as physical reservoir computing. Reservoir computing is a powerful machine learning method based on recurrent neural networks (RNNs) that exploit the topological diversity and nonlinearity in dynamical processes to perform computational

mappings. In the context of this CoE, reservoir computing could be a potential strategy to perform pre-processing of the dynamic loading environment by designing sensor modalities that better promote signal separation between loading profiles.

Research Questions: What material/structural nonlinearities and dynamics can be leveraged for physical computation? How does an unconventional processing approach regulate the type and quality of loading information accessible and the efficient mapping to a morphing response?

Executing computational tasks directly in the physics of the loading signal or through the dynamic response of the aero-structure offers several advantages. Direct physical processing minimizes the bottleneck challenges due to signal conversion, as pre-processing is performed in the physics of the load. It also addresses SWaP by reducing the wiring requirements to a central processor. We anticipate this CoE will push the collection and processing tasks to the edge of the sensor train to stimulate the development of new strategies that consolidate the Sense and Assess tasks of the feedback control process.

3.3 RESPOND: Morphing Actuation and Integration Strategies

It is also expected that 1) appropriate amounts of physical collocation for consolidating the sense and assess tasks or 2) matching the underlying physics with the approaches will realize intelligent structure SWaP and response time benefits. Examination of multiple data sources (flow, structural, sensory, etc.) is expected to identify integration approaches that accomplish complex tasks without centralized control.

Collocating response with assessment: It is also desired to examine how morphing response will realize improved efficiencies by considering how information should be distributed to actuators.

Research Questions: As Sense and Assess become collocated, how does also localizing actuation also benefit overall response time and cost? How can this be interpreted from the perspective of locality of information transmitted to actuators?

Actuation approaches do not necessarily need to be completely localized, but it is presumed that an actuation system that is not completely dependent upon a centralized approach could reduce SWaP and increase metrics, such as half-power bandwidth, by not necessarily being dependent upon a common clock. Additionally, actuators operating over differing timescales for different purposes are expected to benefit from decentralization and collocation. Specifically, reduced overhead for the long-timescale actuation and improved bandwidth for the short-timescale actuators is expected.

Research Question: Integrating with Sense and Response, how may a sensor array support decentralization to reduce overhead while enriching the required information throughput-to nearby actuation?

Selecting novel actuation techniques: Current strategies for outer mold line morphing rely on pneumatic and electromechanical actuation. These approaches are well established, but state of

the art instances lead to SWaP requirements that can outweigh system-level performance gains. Key to future morphing concepts are the relatively lightweight and compact adaptive materials. Shape memory alloys, piezoelectrics, or carbon nanotube (CNT)-doped yarns exhibit some of the desired SWaP properties. However, unlike pneumatic and electromechanical options, adaptive materials alone may lack performance (e.g. maximum rate, stroke, power density, or work density).

The required morphing actions may involve simultaneous high displacement and rates under mechanical and thermal loads. Advancements in adaptive materials may allow direct actuation. However, indirect actuation, where the adaptive material is integrated within a mechanism or structure (e.g., compliant mechanisms) to improve properties as an overall transducer, is also of interest.

Research Question: What is the appropriate combination of novel actuation to reduce sensor train and improve response time when considering the integration of the previous sense and assess tasks?

These practical considerations for realizing novel actuation must also be balanced with the desired SWaP gains that are expected from physics-matching and appropriate collocation of the novel actuation with its sensing and assessment modalities.

4. UNIVERSITY CENTER OF EXCELLENCE

Proposals for this multidisciplinary COE are sought that articulate the technical details of the proposed research and the planned mechanisms to educate a new generation of professionals. This CoE brings together the fields of morphing aerospace science, adaptive and sensing materials, information theory, and feedback control. This CoE is expected to lead to the cross-pollination of the adaptive structures community with the information theory and data fusion communities. As such, multi-investigator teaming across departments and disciplines is highly encouraged. We anticipate the program will be a mix of theory, algorithm and hardware development. Particular emphasis should be placed on transformative concepts, over incremental efficiency gains, to innovate solutions within the Sense-Assess-Respond feedback loop. Developing students with cross-expertise in the areas listed above and the ability to effectively communicate between these technical communities is paramount.

We expect researchers from the CoE to work collaboratively with the AFRL researchers to address critical USAF and USSF challenges. The CoE researchers will coordinate research projects with AFRL researchers, share information and best practices, author joint studies and publications, and provide a number of learning opportunities and applications for students and the defense community overall. Regular interactions, joint conferences, workshops, and other research exchange activities are expected. AFRL is open to leveraging the existing AFRL, AFOSR, and National Research Council (NRC) Summer Faculty Fellowship and Post-Doctoral programs. In this manner, educational institution staff and students with the appropriate credentials can be hosted at AFRL with minimal additional administrative overhead, in a coordinated fashion with the existing visiting faculty and summer research programs. Applicants are encouraged to consider providing personnel exchange opportunities that can foster AFRL activities that parallel graduate research groups at universities, i.e., closely integrated researchers under research advisors geared toward journal and conference paper publication and thesis/dissertation accomplishment.

AFRL is seeking both traditional and innovative approaches that strengthen and result in long term research collaborations with academia.

Described below is what a strong proposal should provide.

4.1 Technical Details of Proposed Research

A strong proposal should outline, as specifically as possible, the technical details of the proposed research. In addition, proposals should articulate how research goals align with the research objectives outlined in the previous section. Proposers can enhance or deviate from these topics if they provide reasonable technical arguments and if they are still addressing the required objectives. Efforts integrating a variety of approaches are preferred to those using a single approach, especially as these may provide increased opportunities for information and technology transfer to AFRL.

4.2 Investigator Qualifications

In line with the basic research vision of this COE, proposals should highlight the following qualifications of the proposed academic collaborators:

1. Strong history of published research that is both principled and foundational in the fields of morphing aerospace science, adaptive and sensing materials, information theory, and feedback control.
2. Expertise within the academic team covering the range of aerospace engineering, materials science, engineering mechanics, computer science and electrical engineering with potential contributions from mathematics and/or physics.
3. Willingness to collaborate on and commit resources to jointly defined projects with AFRL scientists and engineers (S&Es).

4.3 Interactions and Information Exchange
Proposals should address plans for the following interactions between AFRL S&Es and academic collaborators:
1. One or more research projects, jointly defined by the academic collaborators and S&Es at AFRL that are in line with collaborators' expertise, AFRL interest, and the goals of this COE.
2. Commitment from academic collaborators of graduate students and/or post-doctoral associates to work on the aforementioned project(s) both at the academic institutions and embedded with S&Es at AFRL, working on USAF and USSF data and learning tasks.
3. A yearly workshop, independent of annual meetings, where topics are jointly defined by the academic collaborators and AFRL S&Es. Such a workshop would be organized by the academic collaborators, include invited speakers, and be located at an AF/DoD facility.
4. If applicable, how the COE will leverage other institutional resources to expand the participation of students and postdoctoral fellows in the COE, establish dedicated facility and office space, and/or other means of promoting research.

Proposers are encouraged to confer with the designated points of contact as soon as possible. Their contact information can be found at the end of this announcement. Coordination with AFOSR, AFRL/RW, AFRL/RQ, and AFRL/RX prior to proposal submission is encouraged but is not required.

5. ACCESS TO DOD RESOURCES
Proposals may request access to AFRL facilities or DOD high performance computing resources in order to conduct the proposed research. Proposals should make this request in accordance with the instructions given in the D.4.g. Project Narrative section of this announcement. If authorized, there is no cost to the research for these resources.

Applicants are advised that routine access of educational institution researchers to AFRL/RW, RQ, and RX buildings and facilities is limited to U.S. citizens. Individuals eligible for access are subject to background checks. Section C.3.a. Research Personnel Facility Access Requirements and Restrictions provides more information.

Award(s) under this FOA are not restricted to US citizens, but access to DoD facilities is limited for non-US citizens, which could add coordination challenges. An objective of this COE is to establish relationships between researchers at the performing universities and the relevant AFRL Directorates. If relevant, proposals should include information on US and non-US personnel, describing their roles in the research effort.

B. FEDERAL AWARD INFORMATION

AFOSR anticipates making one award under this announcement, through an issued grant. Any award made under this competition will support a University Center of Intelligent Structures for Morphing High Speed Vehicles and is subject to availability of funds. AFOSR executes discretionary research and development funds appropriated to the USAF and the USSF for awards. AFOSR can only make an award if sufficient funds are available.

The anticipated period of performance is a three-year base period, with one two-year option to continue performance. As a result, the total period of performance if all options are exercised is five (5) years.

AFOSR anticipates making at least one grant award of up to $1,000,000 per year per award, for a maximum of five years. The base period is for three years, which the AFOSR intends to incrementally fund, followed by an option to extend an additional two years provided the COE passes a midterm "go/no-go" review at the 2.5-year point. All funding decisions are at the Government's discretion and are subject to the availability of funds.

This plan means proposers should plan on not more than $5,000,000 in funding for the entire five-year duration if all options are exercised; however, the total amount of funding and resources made available to fund a successful proposal may vary based on the quality of proposals received, and funds availability.

AFOSR reserves the right to select and fund for award all, some, part, or none of the proposals received. There is no guarantee of an award.

Our authority for an award under this competition is established at 10 U.S.C. 2192(b)(1)(B) for improvement of education in technical fields, and 10 U.S.C. 4001 for basic and applied research. We discuss regulations, terms, and conditions that generally apply to our awards in Section F. Federal Award Administration Information.

KEY DATES

Schedule of Events		
Event	**Date**	**Eastern Time**
Pre-proposal inquiries and questions regarding eligibility and technical requirements **	01 March 2023	NLT 11:59 PM
Answers to questions posted	03 March 2023	
White Papers Due (highly encouraged)	17 March 2023	NLT 11:59 PM
Notifications of Evaluations of White Papers	24 March 2023	
Proposals due	14 April 2023	NLT 11:59 PM
Notification of Selection for Award	12 May 2023	
Start of Award	26 June 2023*	

*This date is an estimate as of the date of this announcement.
**Questions submitted after the Q&A deadline may not be answered.

C. ELIGIBILITY INFORMATION

1. ELIGIBLE APPLICANTS

a. Qualified and Responsible United States Educational Institutions

You are eligible to submit an application if you are a qualified and responsible educational institution in the United States as defined at 10 U.S.C. 2194, or an entity comprised of such educational institutions. Educational institution means a local educational agency, college, university, or any other nonprofit institution dedicated to improving science, mathematics, and engineering education. No other entities are eligible to submit applications under this competition. Any entities receiving subawards must meet these same criteria. Since the intent of this FOA is to fund a research center with co-located researchers and facilities, at least 40 percent of key personnel (i.e., PIs and co-PIs) for a proposed COE must be primarily employed by the institution submitting the proposal.

AFOSR reviews your application, proposal, and Office of Management and Budget (OMB) designated repositories of government-wide public and non-public data, including comments you have made, as required by 41 U.S.C. 2313 and described in 2 CFR 200.205 and 32 CFR 22.410 to assess risk posed by applicants, and confirm applicants are qualified, responsible, and eligible to receive an award.

b. HBCU/MI, Tribal College and University Applicants Encouraged

Historically Black Colleges and Universities and Minority Serving Institutions (HBCUs/MSIs) and Tribal Colleges and Universities are encouraged to submit research proposals and join others in submitting proposals. However, no funds under this announcement are reserved or otherwise set-aside for any specific entity type. The Air Force will only use the E.1. Criteria for proposal selection.

c. Ineligible Entities

None of the following entity types are eligible to submit proposals as primary award recipients under this announcement:

(1) Federally Funded Research and Development Centers (FFRDCs)
(2) Individual persons or people
(3) Federal agencies (to include Military Educational Institutions)
(4) For-profit institutions

2. COST SHARING OR MATCHING

Cost sharing or matching is neither required nor an evaluation criterion for proposals under this announcement. Leveraging other institutional resources to increase the participation of students and postdoctoral fellows in the COE and/or promote research and relationships with AFRL to benefit the COE would enhance the collaboration plan that will be evaluated as part of the DoD relevance criterion for proposals under this announcement.

3. OTHER

a. Research Personnel Facility Access Requirements and Restrictions

A key aspect of this CoE is workforce development. It is envisioned that students and post-docs working under this CoE be able to collaborate with AFRL personnel at AFRL laboratories and facilities. As such, we require that any students and post-docs funded by this CoE be US citizens or permanent residents. Additionally, AFRL contains facilities and equipment that could be useful to this Center. Access to these facilities is restricted to US citizens or permanent residents.

b. Acknowledgment of Support and Disclaimer Requirements

You must include the F. 3.d. Acknowledgment of Research Support on all materials created or produced under our awards. The F. 3.e. Disclaimer Language must be included on materials as required. The award document may provide additional instructions about specific distribution statements to use when you provide research materials to us. You are not eligible to submit a proposal if you cannot accept these terms.

c. Expectation of Public Dissemination of Research Results

AFOSR expects public dissemination of research results if you receive an award. This is a basic requirement for unclassified research results.

AFOSR intends, to the fullest extent possible, to make available to the public all unclassified, unlimited peer-reviewed scholarly publications and digitally formatted scientific data arising from research and programs funded wholly or in part by the DoD as described in the OUSD, AT&L Memorandum, *"Public Access to Department of Defense-Funded Research"* dated 09 Jul 2014.

AFOSR follows DoD Instruction 5230.24 and DoD Instruction 5230.27 policies and procedures to ensure broad dissemination of unclassified research results to the public and within the Government. The DoD Instruction 5230.27 policy and procedures allowing publication and public presentation of unclassified fundamental research results will apply to all research proposed under this competition unless the Program Officer gives you an explicit, written exclusion to these policies with the Grants Officer's advice and consent. All exclusions must be authorized or required by law and must cite a valid legal authority.

d. Representation for Tax Delinquency, Felony Conviction and Internal Confidentiality Agreements

You must complete the "Representation for Tax Delinquency, Felony Conviction, and Internal Confidentiality Agreements" provided with the Grants.gov package. More specific information about this requirement is provided in section D.4.b.

Your eligibility for funding cannot be determined unless this form is received.

e. Conflict of Interest

(1) General Requirement for Disclosure

You and your organization must disclose any potential or actual scientific or non- scientific conflict of interest(s) to us. You must also disclose any potential or actual conflict(s) of interest for any sub recipient you include in your proposal. You must provide enough information for AFOSR to evaluate your disclosure. AFOSR may have to ask you more questions if more information is needed.

At AFOSR's sole discretion, you may be asked for a conflict of interest mitigation plan after you submit your proposal. Your plan is subject to AFOSR approval.

(2) Scientific Conflict of Interest

Scientific collaborations on research and development projects are generally the result of close collaboration prior to the submission of applications for support. Accordingly, virtually all of these collaborations might be considered to include a potential conflict of interest. The potential conflict is mitigated by the disclosure of these collaborations, and the list of current and pending support you provide for senior and key researchers.

You must provide a copy of all peer-reviewed publications developed or produced from research conducted with Air Force funds to the AFOSR Program Officer.

You are not eligible to submit a proposal if you cannot accept these terms.

D. APPLICATION AND SUBMISSION INFORMATION

1. ADDRESS TO REQUEST APPLICATION PACKAGE

All the application forms you need are available electronically on Grants.gov. From the View Grant Opportunity" page, you can click on the "Application Package" tab to download the application package.

You can find the electronic application package on Grants.gov by searching for the announcement number shown on page one. Paper copies of this announcement will not be issued.

Please contact us at afosr.baa@us.af.mil to request a reasonable accommodation for any accessibility requirements you may have.

2. CONTENT AND FORM OF APPLICATION SUBMISSION

a. Pre-proposal Inquiries and Questions

You are encouraged to contact the Program Officer listed in section G.1. Technical Inquires and Questions before you submit your proposal.

If you need help with general matters, you should contact the individuals listed in G.2. General Inquiries and Questions.

Your pre-proposal inquiries and questions should be submitted not later than **11:59 PM Eastern Time on 1 March 2023.** AFOSR may not be able to answer questions received later. This is discussed more in section D.7. Submission Dates and Times.

The Program Officer does not have the authority to make commitments for the government. Grants and Contracting Officers acting within their warranted capacity are the only people authorized to make commitments for the Government.

b. The Application as a Whole

You must submit your proposal electronically through Grants.gov. AFOSR will not accept or evaluate any proposal submitted by any means other than through Grants.gov. AFOSR must receive your proposal before the D.7.d. Proposal Submission Deadline.

You must use the electronic Standard Form (SF) 424 Research and Related (R&R) Form Family, OMB Number 4040-0001. The SF 424 (R&R) Application for Federal assistance form must be your cover page. No pages may precede the SF 424 (R&R).

You must mark your application with the announcement number.

A summary of what is required for a complete proposal is summarized below:

- The forms and attachments in bold text are required with all applications
- *Some applications* require the attachments in *italic*
- More instructions are provided in <u>D.4. Component Pieces of the Application</u>

R&R FORM, OMB No. 4040-0001	FIELD	ATTACHMENT
SF 424 (R&R) Application for Federal Assistance, including an authorized Signature	**18.**	**Representation for Tax Delinquency, Felony Conviction, and Internal Confidentiality Agreements**
	18.	*SFLLL Disclosure of Lobbying Activities*
R&R Other Project Information Form	**7.**	**Project Summary / Abstract**
	8.	**Project Narrative**
	9.	**Bibliography & References Cited**
	10.	*Facilities and Other Resources*
R&R Other Project Information Form	***11.***	*Equipment*
	12.	*Other Attachments*
R&R Senior / Key Person Profile Form		**Biographical Sketch**

	Current & Pending Support
R&R Budget Form	**Budget Justification**
R&R Sub award Budget Attachments Form	*Sub award Budget Justification*
R&R Project / Performance Site Locations Form	**None**
R&R Personal Data (Optional)	None

The SF 424 (R&R) must include the signature of an authorized representative from your organization. The signature is affixed electronically by Grants.gov upon submission. This signature is considered the signature for the application as a whole.

c. Proposal Format

- Paper Size – 8.5 x 11-inch paper
- Margins – 1 inch
- Spacing – Single, 1.5, or 2.0-line spacing
- Font – Times New Roman or Garamond, 12 point
- Page Limitation – No more than twenty-five (25) single-sided pages. The cover page, table of contents, list of references, letters of support, curriculum vitae and list of on-going and pending research support are excluded from the page limitations. The pages of proposals exceeding the page limit may not be included in the evaluation.
- Attachments – Electronic Portable Document Format (PDF)
- Content – As described below

d. Proposal Length

No more than twenty-five (25) single-sided pages. You must not include elaborate brochures, reprints, or presentations beyond those sufficient to present a complete and effective proposal.

AFOSR will not consider more than the maximum number of pages in its evaluation; however, not all pages are counted. This list below is intended to help you understand how to calculate your page count.

NOT INCLUDED IN PAGE COUNT

- SF 424 (R&R) Application for Federal Assistance and all attachments except field 18 representations or disclosures
- R&R Budget and Budget Justification attachments, R&R Other Project Information Form, and all attachments
- R&R Sub award and Budget Justification attachments, R&R Senior / Key Person Profile Form, and all attachments for the personnel
- Documents that support the budget or particular items of cost R&R Project / Performance Site Locations Form
- Optional R&R Personal Data Form

- Budget related information is not included in the page count because AFOSR cannot make an award unless it can determine the cost of your proposal is reasonable and realistic and complies with 2 CFR 200 Subpart E - Cost Principles.
- *Not having enough information in your proposal to understand if your costs are reasonable and realistic is the most common reason awards are delayed.*

e. No Confidential or Proprietary Information

You must not include confidential or proprietary information in your proposal. This was also discussed earlier in section A. Program Description.

AFOSR will not consider your proposal if you include confidential or proprietary information or place restrictive markings on any part of your proposal.

f. Electronic Form and Proposal Attachments

Your application and proposal attachments must be in electronic file formats. You should use the Portable Document Format (PDF) for your attachments.

DO NOT password protect any attachments.

The website http://www.grants.gov/help/download_software.jsp offers a list of file convertors available to convert your documents to the PDF format.

3. GRANTS.GOV APPLICATION SUBMISSION AND RECEIPT PROCEDURES

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

a. Electronic Delivery

AFOSR is participating in the Grants.gov initiative to provide the grant community with a single site to find and apply for grant funding opportunities. AFOSR encourages applicants to submit their applications online through Grants.gov.

b. How to Register to Apply through Grants.gov

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

The registration process can take up to four weeks to complete. Therefore, registration should be done in sufficient time to ensure it does not impact your ability to meet required application submission deadlines.

If individual applicants are eligible to apply for this grant funding opportunity, refer to: https://www.grants.gov/help/html/help/index.htm#t=Register%2FGrantsgovVariationsForIndivi

dualApplicants.html

Organization applicants can find complete instructions here:
https://www.grants.gov/grants/applicants/organization-registration.html

1) ***Obtain a UEI Number***: All entities applying for funding, including renewal funding, must have a Unique Entity (UEI). Applicants must enter the UEI number in the data entry field labeled "UEI" on the SF-424 form. Transition to the Unique Entity Identifier (UEI) from DUNS is underway; grants.gov has deployed forms compatible with the UEI. In April 2022, DUNS numbers were depreciated, the UEI is required.

> The federal government stopped using DUNS number to uniquely identify entities registered in the System for Award Management (SAM). At the point, entities doing business with the federal government will use a Unique Entity Identifier (UEI) created in SAM.gov. They will no longer have to go to a third-party website to obtain their identifier. Active registrants will have their UEI assigned and viewable within SAM.gov; there is no action for registered entities to take at this time.

For more detailed instructions for obtaining a UEI number, refer to:
https://sam.gov/content/entity-registration

2) ***Register with SAM***: In addition to having a UEI number, organizations applying online through Grants.gov must register with the System for Award Management (SAM). All organizations must register with SAM in order to apply online. Failure to register with SAM will prevent your organization from applying through Grants.gov.

For more detailed instructions for registering with SAM, refer to:
https://www.grants.gov/web/grants/applicants/organization-registration/step-2-register-with-sam.html

3) ***Create a Grants.gov Account***: The next step in the registration process is to create an account with Grants.gov. Applicants must know their organization's UEI number to complete this process. Completing this process automatically triggers an email request for applicant roles to the organization's E-Business Point of Contact (EBiz POC) for review. The EBiz POC is a representative from your organization who is the contact listed for SAM. To apply for grants on behalf of your organization, you will need the Authorized Organizational Representative (AOR) role.

For more detailed instructions about creating a profile on Grants.gov, refer to:
https://www.grants.gov/help/html/help/index.html#t=LoginAndweb%2FAddProfile.htm

4) ***Authorize Grants.gov Roles***: After creating an account on Grants.gov, the EBiz POC receives an email notifying them of your registration and request for roles. The EBiz POC will then log in to Grants.gov and authorize the appropriate roles, which may include the AOR role, thereby giving you permission to complete and submit applications on behalf of the organization. You will be able to submit your application online any time after you have been approved as an AOR.

For more detailed instructions about creating a profile on Grants.gov, refer to:

https://www.grants.gov/help/html/Register/AddProfile.htm

5) ***Track Role Status***: To track your role request, refer to: https://www.grants.gov/applicants/registration/track-role-status.htm

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

c. How to Submit an Application to AFOSR via Grants.gov

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

Below is an overview of applying on Grants.gov. For access to complete instructions on how to apply for opportunities, refer to: https://www.grants.gov/web/grants/applicants/apply-for-grants.htm

Create a Workspace

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

Complete a Workspace

Add participants to the workspace, complete all the required forms, and check for errors before submission.

(1) Adobe Reader: If you decide not to apply by filling out web forms you can download individual PDF forms in Workspace so that they will appear similar to other Standard or administering agency forms. The individual PDF forms can be downloaded and saved to your local device storage, network drive(s), or external drives, then accessed through Adobe Reader.

NOTE: Visit the Adobe Software Compatibility page on Grants.gov to download the appropriate version of the software at: https://www.grants.gov/web/grants//applicants/adobe-software-compatibility-html

(2) Mandatory Fields in Forms: In the forms, you will note fields marked with an asterisk and a different background color. These fields are mandatory fields that must be completed to successfully submit your application.

(3) Complete SF-424 Fields First: The forms are designed to fill in common required fields across other forms, such as the applicant name, address, and UEI number. To trigger this feature, an applicant must complete the SF-424 information first. Once it is completed, the information will transfer to the other forms.

Submit a Workspace

An application may be submitted through workspace by clicking the Sign and Submit button on the Manage Workspace page, under the Forms tab. Grants.gov recommends submitting your application package at least 24-48 hours prior to the close date to provide you with time to correct any potential technical issues that may disrupt the application submission.

Track a Workspace

After successfully submitting a workspace package, a Grants.gov Tracking Number (GRANTXXXXXXXX) is automatically assigned to the package. The number will be listed on the Confirmation page that is generated after submission.

https://www.grants.gov/web/grants/applicants/applicants/applicant-training.htm

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

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

4. COMPONENT PIECES OF THE APPLICATION

a. SF 424 (R&R) Application for Federal Assistance

The SF 424 (R&R) Application for Federal assistance form must be your cover page. No pages may precede the SF 424 (R&R).

Complete all required fields in accordance with the "pop-up" instructions on the SF 424 (R&R) form. The completion of most fields is self-explanatory. You can turn on Grants.gov "Help Mode" to provide additional instructions for forms. "Help Mode" is turned on by the icon with the pointer and question mark at the top of the form.

Below are AFOSR special instructions for completion of several SF 424 (R&R) form fields in your application:

FIELD	INSTRUCTION
2.	You may leave "Applicant Identifier" blank

3.	You may leave "Date Received by State" and "State Application Identifier" blank
9.	You must list Air Force Office of Scientific Research as the reviewing agency if Grants.gov has not pre-populated this answer
16.	You should check "No." and "Program is Not Covered by Executive Order 12372"
17.	Select "I Agree" to certify that all statements in the proposal, your Representation for Tax Delinquency, Felony Conviction, and Internal Confidentiality Agreements are true, complete, and accurate to the best of your knowledge. *See section F.3. Administrative and National Policy Requirements for more information and links to the full text of these items.*
18.	You must attach the completed D.4.b. Representation for Tax Delinquency, Felony Conviction, and Internal Confidentiality Agreements. You must attach the completed lobbying certification as described in section D.4.c. Lobbying Certification and SFLL Disclosure of Lobbying Activities. You may have to attach the completed SFLLL Disclosure of Lobbying Activities if you have lobbying activity that you must disclose.

b. Representation for Tax Delinquency, Felony Conviction, and Internal Confidentiality Agreements

You must attach this representation to field 18 of the SF 424 (R&R). This attachment is not included in your page count.

You must complete and attach the "Representation for Tax Delinquency, Felony Conviction, and Internal Confidentiality Agreements" provided with the Grants.gov package. AFOSR cannot make an award if this information is not provided.

(1) If you answer "is" a corporation with a felony conviction and/or "is" a corporation with a felony conviction on this representation, you may not be eligible for an award if your proposal is selected. You should contact us right away to discuss your situation to find out if you can submit your application.
(2) If you do not attach this form to the SF 424, AFOSR may request the representation after you submit your application, but we are not required to do so. AFOSR may deem your application ineligible for selection by citing an authority listed or referenced in DoD Class Deviation (CD) 2016-O0002 or CD 2015-O0005 and make an award to someone else.

c. SFLLL Disclosure of Lobbying Activities Form

When required, attach this disclosure to field 18 of the R&R Other Project Information Form. This attachment is not included in your page count.

If you have lobbying activity that you must disclose under 31 U.S.C. 1352

as implemented by the DoD at 32 CFR Part 28, you must attach the completed SFLLL Disclosure of Lobbying Activities.

You can find instructions for completing this form at https://www.gsa.gov/forms-library/disclosure-lobbying-activities

d. Certification Regarding Lobbying Form

Grant awards require a certification of compliance with a national policy mandate concerning lobbying. Grant applicants shall provide this certification by electronic submission of SF424 (R&R) as a part of the electronic proposal.

e. R&R Other Project Information Form

Complete this form as indicated. You must include all necessary attachments described below. This form is included in your page count.

FIELD INSTRUCTION
1, 1a. You must address all prospective human subject involvement by answering these questions. Additional documentation pursuant to National Policy and U.S. Air Force standards is required for all proposals with human research or involvement.
2, 2a. You must address all prospective animal subject and/or recombinant deoxyribonucleic acid (rDNA) involvement by answering these questions. Additional documentation pursuant to National Policy and U.S. Air Force standards is required for all proposals with animal or rDNA research or involvement.
4a. For any proposal that has an actual or potential impact on the environment, answer yes and provide the answers and attachments required for fields 4b, 4c, and 4d. Additional documentation in accordance with National Policy and U.S. Air Force standards is required for any proposal with an actual or potential impact on the environment.
7. Attach your D.4.f. Publicly Releasable Abstract
8. Attach your D.4.g. Project Narrative
9. Attach your D.4.h. Bibliography and References Cited

10.	Attach a Facilities and Other Resources description document here if you need to supplement your D.3.f. Proposal Narrative facilities and resources section.
11.	You may supplement your D.4.1. Budget Justification by attaching an Equipment Justification here. Do not duplicate information included on your budget justification. If you attach an Equipment Justification, make sure you reference the attachment in your budget justification.

FIELD	INSTRUCTION
12.	Attach the D.3.k R&R Subaward Budget Attachments Form if applicable and not attached elsewhere. You should have budgets for all subawards proposed attached within this form before attachment. Attach all D.3.l Subaward Budget Justifications as applicable Attach your D.3.o Data Management Plan here if applicable

f. R&R Publicly Releasable Project Summary / Abstract

You must attach the Project Summary / Abstract to field 7 of the R&R Other Project Information form. This attachment is included in your page count.

(1) You must provide a concise abstract of 300 words or less with your proposal. You must mark this abstract **publicly releasable**. Your abstract should use terms the public can understand to describe the research objective, technical approach, anticipated outcome, and potential impact of the specific research.
(2) Your abstract header should include the Program Officer's name and office symbol from section G.1. Technical Inquiries and Questions below.
(3) If you receive an award, AFOSR must publish your abstract to a searchable website available to the general public in accordance with Public Law 113-235. The website address is https://dodgrantawards.dtic.mil/grants.

g. Project Narrative

You must attach the Project Narrative to field 8 of the R&R Other Project Information Form. The narrative must be complete and self-contained to qualify for review. This attachment is included in your page count.

You must clearly describe the research, including the research objective and approach. Your project narrative will be evaluated using the criteria listed in section E.1. Criteria. You should show strength in as many of the evaluation and selection areas as practicable to demonstrate maximum competitiveness.

You shall describe any environmental impacts of your research outside the laboratory in any appropriate narrative section, including how you will ensure compliance with environmental statutes and regulations.

Your narrative shall include the following elements:

(1) **Statement of Objectives**

You must your proposed research on a single page titled "Statement of Objectives." AFOSR may decide to incorporate your statement of objectives into the award instead of incorporating the whole technical proposal.

You should use active verbs when you prepare the statement of objectives, e.g., "conduct" research in a subject area, "investigate" a problem, "determine" to test a hypothesis.

(2) **Research Effort**

(a) You should describe the research you plan in detail. State the research objectives and approach, and the relationship and comparable objectives to research progress elsewhere. Describe your research team's knowledge in the field and provide a bibliography and list of literature citations. Discuss the nature of the expected results.
(b) The adequacy of this information will influence the overall evaluation in accordance with the criteria and procedures specified in section E. Application Review Requirements.

(3) **Principal Investigator (PI) and Senior Personnel Time**

(a) You must provide estimate of time the principal investigator and other senior professional personnel will devote to the research. Your estimate must include information pertaining to the proportion of time anticipated devoted to this research, to other research, and to other commitments of time such as sabbatical, extended leave, and teaching duties.
(b) State the number of graduate students for whom each senior staff member is responsible.
(c) If your principal investigator or other key personnel have current, pending, or expected research supported by other sponsors or agencies during the period you seek our support, state the title of the other research, the proportion of time to be devoted to it, the amount of support, name of agency, dates, etc.

You must attach a list of Current and Pending Support for each person listed on the D.4.i. R&R Senior / Key Person Profile Form. Each abstract should include research title, objectives, approach, and budget for both present and pending research projects.

Send any changes to this information to us as those changes become known.

(4) **Your Facilities**

(a) Describe the facilities available for performing the proposed research, and any additional facilities or equipment the organization proposes to acquire at its own expense for the work.
(b) Indicate any government-owned facilities that will be used. Indicate any government-owned equipment possessed presently that will be used. The facilities contract number, or in absence of a facilities contract, the specifics of the facilities or equipment, and the number of the award under which they are accountable are required.

(5) **Government Furnished Equipment**

You may list any special Government-owned property or test equipment required to complete the research. When possible and practicable, give a description or title for each item, the current location, and an estimated cost as applicable. If you do not have information about individual items, group items you require by class and provide an estimate of values.

(6) **High-Performance Computing Requirements**

You may be eligible to use DOD high-performance computing resources at no cost to your research. You should address utilization of this program if you need high-performance computing cycles to meet the needs of your research. This program provides access to a range of state-of-the-art high-performance computing assets and user training opportunities that can be used in some of our awards; special terms and conditions apply. You can review the details, capabilities, and requirements of the program at http://www.hpc.mil.

AFOSR Program Officers will help you establish an account if your proposal is selected for an award and can answer questions before you submit your proposal.

(7) **Disclosure of Foreign National and Dual Citizenship Personnel**

As described in section C.3.a. Research Personnel Facility Access Requirements and Restrictions, you must identify any planned foreign national personnel, including information to support permanent resident status with work authorization. The following foreign national personal data must be included:

(1) Full name and any other names used;
(2) Country or countries of citizenship;
(3) Date and place of birth;
(4) Permanent Resident Card (Green Card) type; and
(5) Green Card issue and expiration date.

h. Bibliography and References Cited

You must attach your narrative Bibliography and References to field 9 of the R&R Other Project Information Form. This attachment is included in your page count.

i. R&R Senior / Key Person Profile Form

You must attach a short biographical sketch and list of significant publications (vitae) for each Senior / Key Person. You must also attach a list of current and pending support as discussed in Principal Investigator (PI) and Senior Personnel Time. This form is not included in your page count.

You must list all key persons proposed for the research on the R&R Senior/Key Person Profile Form. Key persons are generally the PI, any Co-PIs, and senior staff. This information is used to evaluate the qualifications of you and your research team.

To evaluate compliance with Title IX of the Education Amendments of 1972 (20 U.S.C. A subsection 1681 Et. Seq.), the DoD 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. In addition, the National Defense Authorization (NDAA) for FY2019, Section 1286, directs the Secretary of Defense to protect intellectual property, controlled information, key personnel, and information about critical technologies relevant to national security and limit undue influence, including foreign talent programs by countries that desire to exploit United States' technology within the DoD research, science and technology, and innovation enterprise. To enable this assessment, each applicant must include this form completed as indicated.

The Degree Type and Degree Year Fields 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.

j. R&R Budget Form

This form is not included in your page count.

You shall provide all information requested. You must estimate the total research project cost.

You must categorize funds by year and provide separate annual budgets for projects lasting more than one year.

A budget justification must be attached.

You must include enough budget related information in your proposal to support your costs as reasonable and realistic, and in compliance with 2 CFR 200 Subpart E - Cost Principles.

Not having enough information in your proposal to understand if your costs are reasonable and realistic is the most common reason awards are delayed.

k. R&R Sub award Budget Form

This form is not included in your page count. Attachments to this form are not included in your page count.

If you plan any sub award(s), you must provide a budget and budget justification using the same requirements established for your prime budget and budget justification.

AFOSR cannot make an award to you unless we can determine the sub award cost is reasonable and realistic and complies with 2 CFR 200 Subpart E – Cost Principles.

Not having enough information in your sub award budget(s) or budget justification(s) can cause significant delays for awards.

l. Budget Justification

This attachment is not included in your page count.

You must provide a detailed budget justification for each year that clearly explains the need for each item. The entire budget justification and supporting documentation must be combined into a single file and attached to field K of the R&R Budget Form.

(1) You should itemize travel. State the purpose of each trip proposed, the number of trips, the number of travelers, the destination, the duration, and the basis for calculating costs such as airlines and hotels.

Below is a sample of the travel portion:

TRAVEL	Unit	Trips	Travelers	Nights	Days	Unit Cost	Total Travel
Airfare	roundtrip	1	1			$900.00	$900.00
Lodging	day	1	1	3		$75.00	$225.00
Per Diem	day	1	1		3	$40.00	$120.00
Automobile Rental	day	1	1		3	$45.00	$135.00
Subtotal Travel		**4**	**4**	**3**		**$1,060**	**$1,380.00**

(2) You should itemize materials, supplies, and equipment. List all material/equipment by type and kind with associated costs. Indicate what your costs are based on, such as vendor quotes, historical data and/or engineering estimates. **You should include vendor quotes and/or catalog pricing data.**

(3) If you have any sub award(s), you should describe how you determined sub award costs were determined fair and reasonable. Your business office usually makes this

determination.

DHHS/ONR Rate Agreement:

(4) If you use a Government rate agreement to propose indirect cost rates and/or fringe benefit rates, you should attach a copy of the agreement you used.
(5) Helpful Cost Principle Reference Information
  (a) 2 CFR 200, Subpart E – Cost Principles
  (b) General Provisions for Selected Items of Cost in 2 CFR 200.420 through 2 CFR 200.475

m. R&R Project / Performance Site Locations Form

This form is included in your page count.

You shall complete all information as requested. You must include the ZIP+4 for each performance location you list.

n. Data Management Plan (Optional)

You can decide if you want to include a Data Management Plan with your application. If you do, attach your Data Management Plan to field 12 of the R&R Other Project Information Form.

Your "Data Management Plan" should be two (2) pages or less in length and discuss:

(a) The types of data, software, and other materials to be produced in the course of the project, and include a notation marking items that are publicly releasable;
(b) How the data will be acquired;
(c) Time and location of data acquisition if they are scientifically pertinent;
(d) How the data will be processed;
(e) The file formats and the naming conventions that will be used;
(f) A description of the quality assurance and quality control measures during collection, analysis, and processing;
(g) If existing data are to be used, a description of their origins;
(h) A description of the standards to be used for data and metadata format and content;
(i) Plans and justifications for archiving the data;
(j) The timeframe for preservation; and
(k) If for legitimate reasons the data cannot be preserved, the plan must include a justification citing such reasons.

o. R&R Personal Data Form

This attachment is not included in your page count.

To evaluate compliance with Title IX of the Education Amendments of 1972 (20 U.S.C. A subsection 1681 Et. Seq.), The DoD 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 applicant must include this form completed as indicated.

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, provisions 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 this information should check or select the "Do not wish to provide" option.

5. INFORMATION YOU MUST SUBMIT IF SELECTED FOR POSSIBLE AWARD

The AFOSR Grants Officer may request additional necessary information from you during negotiations, or as required to inform their consideration for award.

"You must respond promptly".

If you do not fully comply with our information requests by the time AFOSR is ready to make an award, AFOSR may determine that you are not qualified to receive an award and use that determination as a basis for making an award to another applicant.

Foreign national personnel may be asked to provide a copy of the front and back of their green card by secure means such as https://safe.amrdec.army.mil/safe/.

If your proposal includes human, animal, or rDNA use or involvement, you must submit all documentation requested during negotiations or you may not receive an award.

6. UNIQUE ENTITY IDENTIFIER (UEI), CAGE, AND SYSTEM FOR AWARD MANAGEMENT (SAM)

a. SAM Registration Required

As required in 2 CFR 25.110 all applicants, unless exempted, must:

(1) Be registered in SAM.gov before submitting its application;

(2) Provide a valid unique entity identifier; and

(3) Continue to maintain an active SAM registration with current information at all times any Federal award is active, or any application is under consideration by a Federal awarding agency.

A Commercial and Government Entity (CAGE) code is obtained or specified as part of the SAM registration process. A CAGE code is required.

b. SAM Exemption or Exceptions Not Available Under This Announcement

AFOSR will not issue an Agency level exemption to SAM registration under 2 CFR 25.110(d)(1) for applicants under this announcement.

You must comply with SAM registration requirements and include a UEI and CAGE code on your application or AFOSR cannot make an award.

c. Questions about SAM Registrations and Updates

You can get questions about SAM registration and entity updates answered by live chat at https://www.fsd.gov/fsd-gov/home.do telephone at (866) 606-8220 or (324) 206-7828. Top help topics for SAM.gov are available at https://www.fsd.gov/fsd-gov/learning-center-system.do?sysparm_system=SAM.

d. Consequences of Non-Compliance with SAM Registration Requirements

AFOSR cannot make an award to you unless you comply with SAM requirements. If you are non-compliant, AFOSR may determine you are not qualified to receive an award and use that determination to make an award to someone else as authorized by 2 CFR 25.205(b). You cannot receive payments without an active SAM record and CAGE code.

7. SUBMISSION DATES AND TIMES

a. Pre-Proposal Inquiries and Questions Deadline

You must submit all pre-proposal inquiries and questions not later than **01 March 2023 at 11:59 PM Eastern Time**. Responses will be posted/emailed by **03 March 2023 at 11:59 PM Time**.

b. How Submission Time for Pre-Proposal Inquiries and Questions is Determined
AFOSR uses the date and time stamp on your email to determine when you submitted pre-proposal correspondence. These emails should be directed to the contact listed at the end of this FOA for general inquiries and questions (elaine.ubas@us.af.mil, howard.england@us.af.mil)

c. Effect of Missing Pre-Proposal Inquiries and Questions Deadline
AFOSR may not be able to provide responses or answers to late inquires or questions.

d. Proposal Submission Deadline
AFOSR must receive your white paper by **17 March 2023 at 11:59 PM Eastern Time** for it to be considered.

AFOSR must receive your proposal electronically through Grants.gov not later than **14 April 2023 at 11:59 PM Eastern Time** to be considered for selection. This is the final due date. AFOSR recommends that you submit applications early.

You are responsible for making sure your application is submitted, received, and validated by Grants.gov before the application deadline. If you submit your application late, your proposal is not eligible for consideration.

e. How Proposal Submission Time is Determined
AFOSR uses the system-generated Grants.gov time stamp to determine when you submitted your successfully validated proposal. Grants.gov policies and procedures for application submission and processing apply. ***AFOSR will only accept applications submitted electronically through Grants.gov.***

f. Grants.gov Tracking Number is Application Receipt
Grant.gov generates a confirmation page when you submit your application. A second confirmation is provided by email when your application has passed Grants.gov validations and the status is updated from received to validated.

The confirmation page includes a system-generated Grants.gov tracking number; this serves as your receipt. You should keep a copy of all confirmations.

You can verify the submission time and application status with your tracking number through Grants.gov at https://grants.gov/applicants/track-my-application.html.

g. Effect of Missing the Proposal Submission Deadline
Grants.gov will not accept your proposal after the submission deadline. AFOSR will not accept proposals submitted other than electronically through Grants.gov.

8. INTERGOVERNMENTAL REVIEW
N/A - This program is excluded from coverage under Executive Order (E.O.) 12372.

9. FUNDING RESTRICTIONS

a. Proposal Preparation Costs

AFOSR will not reimburse proposal or application costs under this FOA. Your proposal or application preparation costs are not considered an allowable direct charge to any award under this announcement.

b. Air Force Office of Scientific Research No-cost Extension (NCE) Policy

AFOSR grants NCE's only in situations in which the extension is truly warranted and properly documented. AFOSR requires prior written approval to extend the period of performance, without additional funds, beyond the expiration date of the grant. For an extension to be granted recipients are to provide notice in writing, and with the supporting reasons, and revised expiration date, at least **thirty (30)** days prior to the expiration of the award, and Standard Form (SF) 425 Federal Financial Report with amount of remaining funds. In no event will the period of performance be extended merely for the purpose of using unobligated balances. Institutions should make every effort to ensure work is completed on time. If an institution deems an NCE is truly warranted, it should submit its request for an extension and supporting reasons to the relevant Program Officer. You should make every effort to ensure work is completed on time.

c. Prohibition on Contracting with Entities that Require Certain Internal Confidentiality Agreements or Statements--Representation

(a) *Definition*. As used in this provision--

"Internal confidentiality agreement or statement", "subcontract", and "subcontractor", are defined in the clause at 52.203-19, Prohibition on Requiring Certain Internal Confidentiality Agreements or Statements.

(b) In accordance with section 743 of Division E, Title VII, of the Consolidated and Further Continuing Appropriations Act, 2015 (Pub. L. 113-235) and its successor provisions in subsequent appropriations acts (and as extended in continuing resolutions), Government agencies are not permitted to use funds appropriated (or otherwise made available) for agreements with an entity that requires employees or sub recipients of such entity seeking to report waste, fraud, or abuse to sign internal confidentiality agreements or statements prohibiting or otherwise restricting such employees or sub recipients from lawfully reporting such waste, fraud, or abuse to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information.

(c) The prohibition in paragraph (b) of this provision does not contravene requirements applicable to Standard Form 312, (Classified Information Nondisclosure Agreement), Form 4414 (Sensitive Compartmented Information Nondisclosure Agreement), or any other form issued by a Federal department or agency governing the nondisclosure of classified information.

(d) Representation. By submission of its offer, the Grantor represents that it will not require its employees or sub recipients to sign or comply with internal confidentiality

agreements or statements prohibiting or otherwise restricting such employees or sub recipients from lawfully reporting waste, fraud, or abuse related to the performance of a Government agreement to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information (e.g., agency Office of the Inspector General).

(e) Agreement with the representation above will be affirmed by checking the "I agree" box in block 17 of the SF424 as part of the electronic proposal submitted via Grants.gov.

d. Other Submission Requirements

If Grants.gov rejects your electronic application submission for any reason, you must correct all errors and resubmit your application before the D.7.d. Proposal submission deadline.

E. APPLICATION REVIEW INFORMATION

1. CRITERIA

You should show strength in as many of the evaluation and selection areas as practicable to demonstrate maximum competitiveness.

a. Principal Evaluation and Selection Criteria

The two (2) principal selection criteria are specified in 32 CFR 22.315(c). The principal selection criteria are of equal importance to each other. The combined principal selection criteria are more important than the additional evaluation and selection criterion. The principal selection criteria are:

(1) The technical merits of the proposed research.
(2) Potential relationship of the proposed research and development to Department of Defense missions. This will be assessed based on the merits of the proposed collaboration plan and the potential for transition to AFRL development efforts.

b. Additional Evaluation and Selection Criteria

An additional evaluation criterion is shown below. This criterion is less important than the combined principal selection criteria.

(1) The applicant, principal investigator, team leader, and key personnel qualifications, capabilities, related experience, facilities, and research techniques considered individually and in combination that are integral to achieving DoD objectives for this program.

No further criteria or criterion will be used for proposal selection

2. REVIEW AND SELECTION PROCESS

a. Merit-based, Competitive Procedures

Proposals will be subjected to a peer or programmatic review. The peer review will use internal and external reviewers to assess technical merit and Air Force relevance of the proposal.

The programmatic review assesses the technical quality of the proposal, relevance of the proposed research to the portfolio descriptions in this FOA, relevance of the work to Air Force and DoD needs, and the potential of the research balanced against the available funding resources of a given portfolio. Selection for award consideration will be made based on the outcome of these reviews.

AFOSR anticipates selecting one proposal for possible funding on a competitive basis according to 10 USC 4141, and 10 USC 2374 using the merit-based, competitive procedures described in 32 CFR 22.315, incorporated here by reference.

You should show strength in as many of the evaluation and selection areas as practicable to demonstrate maximum competitiveness.

b. Cost Analysis for Reasonableness and Realism

If your proposal is selected for possible award, AFOSR will analyze the cost of the work for realism and reasonableness. The cost of your proposal is considered but is not an evaluation factor or criterion.

AFOSR must make sure the costs you propose are reasonable, realistic, and allocable to this work before AFOSR can make an award. All costs must be allowable to be reasonable. AFOSR may analyze your technical and cost information at the same time.

3. DISCLOSURE OF ADMINISTRATIVE PROCESSING BY CONTRACTOR PERSONNEL

AFOSR uses support contractor personnel to help it with administrative proposal processing. The contractor personnel are employees of commercial firms that have a contract with AFOSR. AFOSR makes sure all of its support contracts include nondisclosure agreements that prohibit disclosure of any information you submit to other parties.

4. NO GUARANTEED AWARD

AFOSR does not guarantee that any award will be made under this competition.

F. FEDERAL AWARD ADMINISTRATION INFORMATION

1. SELECTION NOTICES

a. Electronic Notification
If your proposal is selected for possible award, an email will be sent to the principal investigator.

b. Selection for Possible Award Does Not Authorize Work
Our selection notice **is not** an authorization to start work and **is not** an award guarantee. AFOSR will contact your business office to get answers to any questions it has about your proposal and negotiate specific award terms. Negotiations may result in funding levels that are less than those in the proposal.

2. AWARD NOTICES

a. Federal Award Document
A grant or contract signed by a warranted Grants or Contracting Officer is the only official notice that an award has been made.

b. Electronic Federal Award Distribution
AFOSR sends award documents to your business office by email. This is called award distribution. AFOSR always ask your business office to forward the award to the Principal Investigator indicated on the award document.

3. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

a. Reporting of Matters Related to Recipient Integrity and Performance
You must report recipient integrity and performance information as required by Appendix XII to 2 CFR Part 200 – Award Term and Condition for Recipient Integrity and Performance Matters, incorporated here by reference. You should read the full text of this award term now using the link above to make sure you understand our requirements. You can also find this term at http://www.ecfr.gov.

b. Agency Review of Risk Posed by Applicants

(1) AFOSR must review information available about you and entities included in your proposal through the Office of Management and Budget (OMB) designated repositories of government- wide eligibility qualification and financial integrity information. Our risk review is required by 41 U.S.C. 2313 and includes both public and non-public information. You must be qualified as described at 32 CFR 22.415 Standards to receive an award.

(2) AFOSR must consider the non-public segment of the Federal Awardee Performance and Integrity Information System (FAPIIS) for all awards exceeding the

current simplified acquisition threshold of $250,000.

(3) At a minimum, the information in the system for a prior Federal award recipient must demonstrate a satisfactory record of executing programs or activities under Federal grants, cooperative agreements, or procurement awards; and integrity and business ethics. We will consider any comments you provide, in addition to the other information in the designated integrity and performance system, when making our risk judgment about your integrity, business ethics, and record of performance under Federal awards.

(a) AFOSR may make an award to a recipient who does not fully meet our standards as described at 2 CFR 200.205(a)(2) if it is determined that the information is not relevant to the current Federal award under consideration or there are specific conditions that can appropriately mitigate the effects of the non- Federal entity's risk in accordance with 2 CFR 200.208 Specific conditions.

(4) AFOSR must comply with the guidelines on government-wide suspension and debarment described in 2 CFR 200.213, and must require you to comply with these provisions for all work AFOSR funds.

These provisions restrict Federal awards, sub-awards and contracts with certain parties that are debarred, suspended or otherwise excluded from or ineligible for participation in Federal programs or activities.

c. Cross-Cutting National Policy Requirements

You must comply with all applicable national policy requirements as a condition of award. Key national policy requirements may be found in the DoD Research and Development General Terms and Conditions (DoD T&C); and Appendix B to 32 CFR Part 22 – Suggested Award Provisions for National Policy Requirements that Often Apply, incorporated here by reference.

d. Acknowledgment of Research Support

You must acknowledge support provided by the Government in all materials based on or developed under our awards. The requirement extends to copyrighted and non-copyrighted materials published or displayed in any medium.

The following language must be used unless the award document provides different instructions:

"This material is based upon work supported by the Air Force Office of Scientific Research under award number FAXXXX-XX-X-XXXX".

You must require any sub-recipients or subcontractors under your award to include this acknowledgment, too.

e. Disclaimer Language for Research Materials and Publications

Some materials based on or developed under our awards must include special disclaimer language. You must include this language in all materials except scientific articles or papers published in scientific journals unless your award document provides different instructions: *"Any opinions, findings and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the U.S. Department of Defense."*

f. Uniform Administrative Requirements, Cost Principles, and Audit Requirements

Our grants are governed by the guidance in Title 2, Code of Federal Regulations (CFR) Part 200, "Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards" as modified and supplemented by the Department of Defense's (DoD) interim implementation in 2 CFR Part 1103 [79 FR 76047, December 19, 2014] and 2 CFR Part 1125. Provisions of Chapter 1, Subchapter C of Title 32, CFR, "DoD Grant and Agreement Regulations" other than parts 32 and 33 continue to be in effect and apply as stated.

These regulations are incorporated by reference into this announcement.

g. DoD Research and Development General Terms and Conditions

Our domestic grants are subject to the current (at time of award) "DoD Research and Development General Terms and Conditions" (DoD T&C) found at DoD Research and Development General Terms and Conditions.

These terms and conditions are incorporated by reference into this announcement. If AFOSR publishes updated terms and conditions, the updated terms and conditions may apply to any award under this announcement.

h. Conditions of Award for Recipients Other Than Individuals

You must agree to comply with the requirements at 2 CFR Part 182, Subpart B "Requirements for Recipients Other Than Individuals" as a condition of award.

i. Minimum Record Retention Requirements

You must keep records related to our awards for at least three years after completion and the final Federal Financial Report is submitted. This requirement is described further in 2 CFR 200.333, incorporated here by reference. The DoD T&C OAR Article II. Records retention and access describes additional requirements.

Sometimes records must be retained for more than three years.

4. REPORTING

a. Monitoring and Reporting Program Performance

All of our awards require at least annual and final technical performance reports as required in 2 CFR 200.328. The DoD T&C REP Article I. Performance reporting will apply to grant or cooperative agreement awards. Some of our awards require more frequent technical reports.

You must provide your reports on time. Our awards include a schedule specifying the latest date for submission of each required report. Failure to provide reports, or providing reports after required due dates, could lead to being considered ineligible for future awards.

b. Technical Performance Report Format

1. ANSI Standard Z39.18-2005

   Use the AFRL Scientific & Technical Reports – Preparation, Presentation and Preservations Format Guidelines (June 2010) for your final report unless your award states different requirements. You can download the AFRL standard guide from the Related Documents tab in Grants.gov for this announcement.

2. Institutional Formats for Thesis and Dissertations

   If your institution has a format for thesis and dissertations, you can use that format unless your award states different requirements.

3. Pending Federal-wide Research Progress Performance Report (RPPR) Format

   AFOSR is working on a Federal-wide Research Progress Performance Report (RPPR) for interim, annual, and final research performance reports. You do not have to use the RPPR right now. DoD plans to use the report in the future.

   AFOSR may issue an award modification that requires you to use the Government- wide RPPR after a final notice is issued in the Federal Register.

c. Department of Defense (DD) Form 882 Report of Inventions and Subcontracts

1. Invention Reports
   a. You must provide at least a final invention report on DD Form 882. AFOSR may ask for annual reports. Our award documents specify the due date. You can get the form at https://www.esd.whs.mil/Portals/54/Documents/DD/forms/dd/dd0882.pdf.
   b. You must submit invention reports even if you do not have a patent to report.
2. Sub-Award and Subcontract Reporting

You must use the DD Form 882 to tell us about any subawards or subcontracts. Your award will provide specific instructions. You can get the form at http://www.dtic.mil/whs/directives/forms/eforms/dd0882.pdf.

d. Standard Form (SF) 425 Federal Financial Report

Our awards require a final SF 425 Federal Financial Report. You can get the form at https://www.grants.gov/forms/post-award-reporting-forms.html.

(1) If you request any advance payment(s) under your award, you must submit quarterly SF 425 reports for the life of the grant. Our awards include specific instructions.

(2) You do not have to submit quarterly SF 425 reports if you only request payments by reimbursement.

e. Electronic Payment Requests and Electronic Payment

You must register to use Wide Area Work Flow (WAWF) for payment. Payment requests shall be made electronically using an SF270 through the WAWF application in the Procurement Integrated Enterprise Environment (PIEE) e-Business Suite at https://piee.eb.mil/. The website includes registration instructions. All payments must be made using the electronic funds transfer (EFT) method.

If you have WAWF or PIEE questions or problems, you can get help by telephone at (866) 618-5988, or by electronic mail at disa.global.servicedesk.mbx.eb-ticket-requests@mail.mil, or via the Internet at: https://piee.eb.mil/xhtml/unauth/web/homepage/vendorCustomerSupport.xhtml

f. Property Reports

If AFOSR furnishes any property owned by the Government under an award, you must submit periodic property status reports as described in 2 CFR 200.329 and further implemented by the DoD T&C REP Article III. Reporting on Property.

g. Other Reports

Our Program Officers may ask for informal technical reports as needed. AFOSR uses these informal reports for program purposes, such as preparation for meetings and other technical purposes. AFOSR highly recommends you provide this information in a timely manner by electronic mail directly to the Program Officer.

h. Electronic Submission of Reports

You must plan on submitting reports electronically. **You can submit most reports through the internet application detailed in the grant award document**. Some reports must be sent using electronic mail. Our award documents provide specific instructions that you must follow.

G. AGENCY CONTACTS

1. TECHNICAL INQUIRES AND QUESTIONS

You should submit all questions in writing by electronic mail. You should include the FOA number in the subject line.

If you submit a question by telephone call, fax message, or other means, you may not receive a response.

You should include the announcement number in the subject line.

DR. GREGG ABATE, AFOSR/RTA
Program Officer, Unsteady Aerodynamics and
Turbulent Flows
Email: gregg.abate@us.af.mil

DR. BENJAMIN DICKINSON, AFRL/RW
Senior Research Engineer
Email: benjamin.dickinson.1@us.af.mil

DR. ALEXANDER PANKONIEN, AFRL/RQ
Research Engineer
Email: alexander.pankonien.1@us.af.mil

DR. PHILIP BUSKOHL, AFRL/RX
Senior Research Engineer
Email: philip.buskohl.1@us.af.mil

2. GENERAL INQUIRIES AND QUESTIONS

You must send all general questions about this announcement to us by email. Your questions will generally be consolidated with other questions and posted on Grants.gov so everyone gets the same information. AFOSR may provide an individual response by email if your question does not apply to anyone else.

Elaine Ubas
Grants and Contracting Officer
Email: elaine.ubas@us.af.mil

Howard England
Contract Specialist
Email: howard.england@us.af.mil

H. OTHER INFORMATION

1. OMBUDSMAN

(a) An ombudsman has been appointed to hear and facilitate the resolution of concerns

from offerors, potential offerors, and others for this acquisition. 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, contracting officer, or source selection official. Further, the ombudsman does not participate in the evaluation of proposals, the source selection process, or the adjudication of protests or formal grant or contract disputes. The ombudsman may refer the party to another official who can resolve the concern.

(b) Before consulting with an ombudsman, interested parties must first address their concerns, issues, disagreements, and/or recommendations to the grants or contracting officer for resolution. Consulting an ombudsman does not alter or postpone the timelines for any other processes (e.g., agency level bid protests, GAO bid protests, requests for debriefings, employee-employer actions, contests of OMB Circular A-76 competition performance decisions).

(c) If resolution cannot be made by the GO, concerned parties may contact the AFRL Ombudsman, Director of Contracting, HQ AFRL/PK. The AFRL Alternate Ombudsman is the Deputy Director of Contracting, HQ AFRL/PK. Please send an email to afrl.pk.workflow@us.af.mil the subject of "Ombudsman".

(d) The ombudsman has no authority to render a decision that binds the agency.

(e) 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 or contracting officer.

2. GRANTS AND CONTRACTING OFFICERS AUTHORITY

Grants and Contracting Officers acting within their warranted capacity are the only individuals legally authorized to make commitments or bind the Government.

No other individuals are authorized to make commitments or otherwise bind us.

3. ADDITIONAL FUNDING OPPORTUNITIES

AFOSR posts new funding opportunities throughout the year looking for today's breakthrough science for tomorrow's Air Force. You can find more information about Air Force Office of Scientific Research interests and funding opportunities on our website at http://www.wpafb.af.mil.

Thank you for your interest in this announcement.