BROAD AGENCY ANNOUNCEMENT
USAFA-BAA-2021-0003
Research Interests of the United States Air Force Academy (USAFA)

TWO-STEP CALL ANNOUNCEMENT (CALL) 0003

FEDERAL AGENCY NAME: United States Air Force Academy, Department of Physics

BROAD AGENCY ANNOUNCEMENT TITLE: Research Interests of the United States Air Force Academy

BROAD AGENCY ANNOUNCEMENT NUMBER: USAFA-BAA-2021

BROAD AGENCY ANNOUNCEMENT TYPE: This is an initial announcement.

CATALOG OF FEDERAL DOMESTIC ASSISTANCE (CFDA) NUMBER: 12.800

CALL ANNOUCEMENT TITLE: Space Domain Awareness Grand Challenge – in situ Plasma and Event-Based Satellite Data

CALL ANNOUNCEMENT (CALL) NUMBER: 0003

TECHNICAL POINT OF CONTACT: The technical point of contact for this CALL as outlined in the baseline BAA, Section 1 - Funding Opportunity Description (a)(10), ***Physics (Space Physics & Atmospheric Research Center)*** is:

Dr. Matthew G. McHarg, Director, Space Physics and Atmospheric Research Center
USAF Academy Department of Physics
United States Air Force Academy, CO
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Email: matthew.mcharg@afacademy.af.edu

CONTRACTING POINTS OF CONTACT: The contracting points of contact for this CALL are:

Grants/Agreements Specialist**:**

Austin Walsh, 10 CONS/PKC
United States Air Force Academy, CO
Email: austin.walsh.1@us.af.mil

Grants/Agreements Officer:

Christian Cornell, 10 CONS/PKC
United States Air Force Academy, CO
Email: christian.cornell@us.af.mil

BACKGROUND: The overall goal of this call is to research the potential for a database of measurements, remote and *in situ*, that enable solutions to grand challenge problems in space domain awareness. Since space domain awareness involves an interdisciplinary approach, the research objectives addressed in this CALL cover aspects within three Air Force Office of Scientific Research (AFOSR) program portfolios: 1) Computational Cognition and Machine Intelligence, 2) Remote Sensing, and 3) Space Science.

1. Computational Cognition and Machine Intelligence supports innovative basic research on the fundamental principles and methodologies needed to enable intelligent machine behavior, particularly in support of mixed-initiative (i.e., human-machine teaming) systems. The overall vision of this program is that future computational systems will achieve high levels of performance, adaptation, flexibility, self-repair, and other forms of intelligent behavior in the complex, uncertain, adversarial, and highly dynamic environments faced by the U.S. Air Force.

2. Remote Sensing addresses fundamental research in remote sensing with applications to space situational awareness and combat identification. This includes, but is not limited to, theoretical and experimental approaches to expand the basic physical understanding in propagation of electromagnetic radiation, the interaction of radiation with matter, image formation, smart sensor tasking, data fusion, remote target detection and identification, and the effect of the atmosphere or space environment on sensing systems. Technological advances are driving the requirement for innovative methods to detect, identify, and predict trajectories of smaller and/or more distant objects in space at further standoff distances and under both day and night conditions.

3. Space Science supports basic research on the solar-terrestrial environment extending from the Sun through the Earth's magnetosphere and radiation belts to the mesosphere and lower thermosphere region. This geospace system is subject to solar radiation, particles, and eruptive events, variable interplanetary magnetic fields, and cosmic rays. Perturbations to the system can disrupt the detection and tracking of aircraft, missiles, satellites, and other targets; distort communications and navigation signals; interfere with global command, control, and surveillance operations; and negatively impact the performance and longevity of U.S. Air Force space assets.

Fundamental research focused on improving understanding of the physical processes in the geospace environment is encouraged. Particular goals are to improve operational forecasting and specification of solar activity, thermospheric neutral densities, and ionospheric irregularities and scintillations. Activities that support these goals may include validating, enhancing, or extending solar, ionospheric, or thermospheric models; investigating or applying data assimilation techniques; and developing or extending statistical or empirical models.

The researcher is expected to complete the research on-site at the United States Air Force Academy and to incorporate cadet participation in the projects, typically one to two cadets per semester.

REQUIREMENT DESCRIPTION: The United States Air Force Academy is soliciting white papers for research under **Section l - Funding Opportunity Description (a)(10), *Physics (Space Physics & Atmospheric Research Center)* the Broad Agency Announcement USAFA-BAA-2021 posted on 2 December 2020** specifically for Space Domain Awareness Grand Challenge – in situ Plasma and Event-Based Satellite Data.

THIS WILL BE A TWO-STEP CALL ANNOUNCEMENT:

FIRST STEP: WHITE PAPERS

WHITE PAPER FORMAT: White papers submitted in response to this call should conform to the requirements found in USAFA-BAA-2021, section IV.c. and also include a brief resume of the principle investigator and a rough order of magnitude of cost.

WHITE PAPER DUE DATE AND TIME: The due date for white papers submitted in response to this CALL is no later than 1630 MST on 11 May 2021. ***White papers received after the due date and time shall be governed by the provisions of FAR 52.215-1(c)(3).***

WHITE PAPERS ARE TO BE E-MAILED:
10 CONS/PKC
Attn: Austin Walsh
Subject Line Should Indicate: USAFA-BAA-2021-CALL 0003
Email: 10MSG.LGCC@usafa.af.mil

WHITE PAPERS EVALUATED AND SELECTED: White papers will be evaluated and full proposals requested in accordance with USAFA-BAA-2021. Offerors whose white papers are determined to be of interest to the Government will be asked to submit full cost and technical proposals in response to this CALL. Offerors whose white papers are not of interest to the Government will be notified via letter that the effort proposed is not of interest to the Government.

SECOND STEP: PROPOSALS

INTENT TO PROPOSE: Potential offerors are requested to advise the Grants/Agreements point of contact (by e-mail) if they intend to submit a proposal after receiving a formal request for proposal. Such notification is merely a courtesy and is not a commitment by the offeror to submit a proposal.

PROPOSAL INSTRUCTIONS: Offerors are requested to follow the instructions within the baseline BAA, USAFA-BAA-2021 for instructions on how to submit a proposal. All proposals must be submitted through Grants.Gov, https://www.grants.gov and include all the required forms specified within the baseline BAA.

REGISTRATION REQUIREMENTS: Prospective Awardees shall be registered in the System for Award Management (SAM) database prior to award, during performance, and through final payment of any award resulting from this announcement. In addition, the representation and certifications for Financial Assistance must be completed in the SAM system prior to application/proposal submissions. Offerors may obtain information on registration and annual confirmation requirements via the Internet at beta.sam.gov or by calling 1-866-606-8220.

ANTICIPATED FUNDING: Anticipated funding for this CALL is approximately $100,000.00 per year for three years. All funding is subject to change due to Government discretion and availability as well as technical needs.

ANTICIPATED TYPE OF CONTRACTS/INSTRUMENTS: The Government anticipates awarding a Cooperative Agreement as a result of this CALL but reserves the right to award the instrument best suited to the nature of research proposed including a Grant, Procurement Contract, or other type of agreement. Potential offerors are reminded that in accordance with DoDGARs 22.205, a fee or profit may not be paid to the recipient of a Cooperative Agreement or Grant.

ANTICIPATED PARTICIPATION: Foreign participation is **not** permitted at the prime/recipient/grantee or the subaward/subgrant level.

The Department of Physics further encourages young scholars and professionals to submit white papers to support individual/team study efforts or partnership with more experienced researchers to help expand the pool of experts within the field.

Additionally, this proposal involves collaboration with universities in Australia, Chile, and the United Kingdom.

PERIOD OF PERFORMANCE: The anticipated period of performance for the award resulting from this CALL is approximately 36 months, depending on the proposed effort.

PROPOSAL DUE DATE AND TIME: The due date for proposals will be 30 days after formal request for proposal has been sent to the submitter of the selected white paper(s). Proposals for any other technology area identified in the baseline BAA will not be accepted under this call. **Proposals received after the due date and time shall be governed by the provisions of FAR 52.215-1(c)(3).**

ANTICIPATED NUMBER OF AWARDS: The Government anticipates awarding one Cooperative Agreement as a result of this CALL. However, the Government reserves the right to make multiple awards, single awards, or no awards pursuant to this CALL.

ANTICIPATED AWARD DATE: 1 August 2021

CALL AMENDMENTS: Offerors should monitor **GRANTS.GOV** http://www.grants.gov for any additional notices to this CALL that may permit extensions to the white paper submission date or otherwise modify this announcement.

APPLICABILITY OF BASELINE BAA: All requirements of USAFA-BAA-2021 apply unless specifically amended and addressed in this CALL. For complete information regarding USAFA-BAA-2021, refer to the initial opened-ended BAA as amended. It contains information applicable to all CALLS issued under the BAA and provides information on the overall program, proposal preparation and submission requirements, proposal review and evaluation criteria,

award administration, agency contacts, etc. Direct questions to the points of contact identified above.