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BRIEFING FOR INDUSTRY

FOR

Amplitude Interferometer Research for Geosynchronous Earth Orbit (GEO) Space Situational Awareness (SSA)

FOA-RVKV-2014-0001

PURPOSE

TO PROVIDE INDUSTRY WITH INFORMATION ON AND A CHANCE TO ASK QUESTIONS FOR

Amplitude Interferometer Research for Geosynchronous Earth Orbit (GEO) Space Situational Awareness (SSA)

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AGENDA

- Team
- Project Information
  - Overview
  - Objectives & Requirements
- Business

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ASSISTANCE TEAM

- **Program Manager:** Capt Tim Shuck, AFRL/RVES
- **Agreements Officer:** Sarah Hammond, AFRL Det 8/RVKVI
- **Agreements Negotiator:** Kevin Price, AFRL Det 8/RVKVI

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PROJECT INFORMATION
Overview

- **Type of Effort:**

  Cooperative agreement to facilitate advanced research and development for Interferometer Telescope applications for space situational awareness

- **Technical Directorate:**

  Space Vehicles Directorate (AFRL/RV)

- **Period of Performance:**

  Start of Technical Period of Performance:04 Feb 2015

  End of Technical Period of Performance: 03 Feb 2020

  Basic Effort: Start of Technical PoP: 04 Feb 2015

  End of Technical PoP: 03 Feb 2016

  4 Periods of Additional Effort--Each period is estimated at one year

  Can run concurrently or sequentially depending on funding

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PROJECT INFORMATION
Project Objectives & Requirements

- **Program Objective:**
  - Explore the capabilities of current and develop future interferometer telescope array technology in regards to its application to Space Situational Awareness (SSA) at Geosynchronous Earth Orbit (GEO) for public purpose and military mission application (SSA to assets in GEO to include: GPS satellites, Commercial and Military communication satellites and Collision risk reduction).

  - Continue to encourage science, technology, engineering and mathematics (STEM) advancement for the next generation of researchers, while also answering a number of key overarching technology questions regarding the suitability of interferometry for Department of Defense and Air Force SSA.

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PROJECT INFORMATION
Project Objectives & Requirements

Technical Requirements: The envisioned concept for this effort is to answer the following questions:

- What is the effective optical resolution on GEO objects as a function of:
  - Object brightness?
  - Object extent and structure?
  - Data processing techniques, including bootstrapping methods with a single dish telescope?
- How can the optical data be combined with Radio Frequency (RF) interferometry data to create fused SSA products?
- Can the products be sufficiently accurate and timely to support for spacecraft operator decisions?

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PROJECT INFORMATION
Project Objectives & Requirements

- **Critical Design Objectives desired by Government:**
  - **Provide proof of principal demonstration of ground-based amplitude interferometer technique to inform a space-based GEO imaging concept.**
    - Technology implementation should be transitionable to a multi-spacecraft or deployable space-based system.
    - Proof of principal demonstration to include a <2m resolution image of a GEO object.

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PROJECT INFORMATION
Project Objectives & Requirements

- **Critical Design Objectives desired by Government:**
  - **Demonstration of full ground-based capability to include a 25 cm resolution image of a GEO object with an minimum integration time of less than 8 hours (less than 1 hour is optimal)**
    - Using observational data, determine the relationship between resolution and:
      - Integration time
      - Visual magnitude
      - Target shape and extent
    - Determine the ability to resolve two close objects that are of significantly different visual magnitude.
    - Determine if optical data can be combined with Radio Frequency (RF) interferometry data and/or single dish optical telescope data to create fused SSA products.
    - Optimize the image reconstruction technique for observing objects at GEO.

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PROJECT INFORMATION
Project Objectives & Requirements

- **Anticipated Impacts include the following:**
  - SSA to operators of commercial and military assets in GEO
  - Unprecedented images of celestial bodies
  - Possibility for Science, Technology, Engineering, and Mathematics (STEM) research

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BUSINESS
Competitive Procedures

- IAW 31 U.S.C. 6301(3) and 32 CFR 22.315, the Government will use merit-based competition in awarding this cooperative agreement.
  - An impartial peer review evaluation will be accomplished by the technical team.

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BUSINESS
Competitive Procedures

- **All proposals will be evaluated under the following two primary criteria, of equal importance, as follows:**
    1. Technical merits of the proposed research and development;
    2. Potential relationship of the proposed research and development to Department of Defense missions.

- **Other evaluation criteria, which are of lesser importance than the primary criteria and of equal importance to each other, are:**
    1. The likelihood of the proposed effort to develop new research capabilities and broaden the research base in support of U.S. national defense; and
    2. Funds Availability

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QUESTIONS

Questions can be asked during the BFI or at individual sessions

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