

Funding Opportunity: AFOSR Releases FY 2021 DOD Space University Research Initiative (SURI)

Lewis-Burke Associates LLC – March 18, 2021

The Air Force Office of Scientific Research (AFOSR) and the Air Force Research Laboratory (AFRL) Chief Technologist Office has issued a funding opportunity announcement (FOA) for the fiscal year (FY) 2021 Department of Defense (DOD) Space University Research Initiative (SURI). The SURI program looks to support research at U.S. Institutions of Higher Education in space-related science and engineering, specifically basic research, that helps address challenges facing the U.S. Space Force (USSF).

As a pilot program, SURI represents DOD's first step toward meeting a congressional mandate, adopted in the FY 2021 *National Defense Authorization Act*, to create a University Consortium for National Space Research. The purpose of the Consortium will be to foster collaboration and connections between DOD and academia around space-related research and transition opportunities, and to more effectively communicate USSF science and technology needs and challenges to Consortium members.

To that end, SURI will support basic research with the aim of transitioning research outcomes to specific applications of interest to USSF. The program is being co-funded with basic (6.1) and applied (6.2) research dollars, and thus represents a scope of work that is expanded to include technology development in addition to basic research products. This is unlike longstanding programs like the Multidisciplinary University Research Initiative which focus exclusively on the latter.

The SURI FOA outlines two broad topics with specific research areas that applicants should address. Applicants can develop a proposal covering one or both topics.

Topic 1: Space Logistics and Mobility

- 1) Robotics for spacecraft: controls and path planning for increasing 'N' degree-of-freedom (DOF) concepts (soft robotics may have up to effectively infinite DOF) and methodologies for end effectors to interact with other robotics or spacecraft;
- 2) Autonomous operations that support human removed or human-on-the-loop operations;
- 3) Augmented reporting and displays for presenting OSAM functions;
- 4) Novel material approaches that enable long term logistic operations in a space environment;
- 5) Effective strategies to quantifiably evaluate State-of-Health and robustly assess remaining lifetime of chemical and/or EP thrusters;
- 6) Modular spacecraft or on-orbit swappable units that can be used to build/repair/upgrade or modify a spacecraft on orbit;
- 7) Development of digital twins to accurately model spacecraft, orbits, controls and task planning for logistics related activities;
- 8) Consideration for other s/c systems that could impact a future space logistics model including: Power, thermal management, structures, electronics and electromagnetic apertures and sensors.

Topic 2: Space Domain Awareness

- 1) Novel sensor phenomenology and algorithms to provide timely comprehensive health, status and capabilities of non-cooperative satellites and their subsystems;

- 2) Characterization techniques that go beyond light curves or standard imagery;
- 3) Sensors and algorithms for XGEO object detection, data association, uncertainty quantification, orbit determination, maneuver detection, or other related topics;
- 4) Sensors that can provide actionable data regardless of environmental conditions;
- 5) Low-cost rapidly fabricated sensors that can provide proliferated, pervasive monitoring;
- 6) Satellite autonomy for monitoring, reporting, and responding as SDA is achieved;
- 7) Constellation level autonomy and construct planning update with SDA;
- 8) Data fusion and decision making tools.

Submission Information: White papers are highly encouraged and should be submitted to https://afosr.gov1.qualtrics.com/jfe/form/SV_0H3VJnX9DV16Bee no later than **April 28, 2021 at 11:59 PM ET**. Applicants are also encouraged to confer with the designated AFOSR program officer of the topic(s) being applied for prior to submitting their full proposal through www.grants.gov by **June 16, 2021 at 11:59 PM ET**. Any pre-proposal inquiries must be submitted electronically by **March 31, 2021 at 11:59 PM ET**.

Total Funding and Award Size: AFOSR intends to fund two awards, one per topic, of up to \$5 million in total, including \$1 million annually, for a performance period of up to five years. Awardees will begin with a three-year base period with an option to extend for an additional two-year period following a “go/no-go” assessment at 2.5 years.

Eligibility: Only U.S. educational institutions such as colleges, universities, and other nonprofit institutions are eligible to apply. Historic Black Colleges and Universities (HBCUs) and Minority Institutions (MIs) are encouraged to apply.

Sources and Additional Background:

- The full AFOSR solicitation can be found on www.grants.gov under solicitation number “FOA-AFRL-AFOSR-2021-0004” or [here](#).