New launch providers and the proliferation of small satellites have significantly lowered the barrier for market and orbit entry. Satellite launches have tripled in the past decade for communication, entertainment, observation, and space exploration. The ability to track and identify objects on orbit could soon be a regulatory requirement for space traffic management - yet no worldwide tracking solution currently exists in the market. The Lab’s Extremely Low Resource Optical Identifier (ELROI™) system was designed to provide such a solution. This system is composed of several components such as a Space Object Tracking Unit (SOTU).

Los Alamos National Laboratory is seeking a qualified industry partner, in an applicable market, to develop a cooperative research and development agreement (CRADA) to further mature and miniaturize this SOTU technology. The ideal partner would also have an interest in licensing the miniaturized SOTU anticipated to be developed during the potential CRADA.

SUMMARY

Los Alamos National Laboratory has developed the ELROI™ system to address the growing problem of space traffic management. The ELROI™ system leverages several subsystems and processes, including, for example, an innovative and autonomous SOTU that can be readily attached to a space object as a means for identification. SOTU transmits a unique light sequence that enables identification of the tagged object.

POTENTIAL AREAS FOR PARTNERSHIP

Los Alamos National Laboratory has developed the ELROI™ system to address the growing problem of space traffic management. The ELROI™ system leverages several subsystems and processes, including, for example, an innovative and autonomous SOTU that can be readily attached to a space object as a means for identification. SOTU transmits a unique light sequence that enables identification of the tagged object.

POTENTIAL BENEFITS

The SOTU is accessible, affordable, and provides an optical means for identifying a space object anywhere, anytime - without necessarily waiting for complicated orbit measurements and regardless of proximity to other space vehicles.

- Solar Powered – SOTU maintains autonomy even if the host loses power
- Compact – SOTU is designed to take up minimal satellite real estate
- Lightweight – SOTU’s lean design is appropriate to fly on large and small vehicles
- Enables Identification – SOTU enables proactive identification of on-orbit objects
- Less Interference – SOTU is less likely to interfere with existing communications
WHAT IS UNIQUE ABOUT THE TECHNOLOGY
There are estimated to be 20,000+ man-made objects already in orbit, however, there is no standardized means to proactively track these objects. Correct identification and tracking of space objects is essential in preventing devastating collisions and in maintaining effective operations. The ELROI™ system is a new paradigm in space situational awareness. The ELROI™ system’s SOTU, which is the subject of this commercial call, helps to solve these problems by providing an optical means for identifying a space object. This means of identification functions akin to a “license plate” bolted onto a space object.

WHAT’S BEHIND OUR TECHNOLOGY
SOTU uses optical instead of radio frequency transmission as a means for identifying a space object. SOTU’s design enables transmission of a unique light sequence back to Earth with power consumption similar to that of a laser pointer, and with electronics about as simple as a common digital wristwatch.

OUR COMPETITIVE ADVANTAGES
Radio transmitters are the most developed competing technology for the SOTU – but they tend to be heavy, power hungry, and pollute space with radio frequency interference. SOTU is relatively inexpensive, small, lightweight, low-power, and is less likely to interfere with communications. A solar powered design of SOTU provides a capability for tracking even if ground-to-orbit communication is offline or if host power is unavailable.

OUR TECHNOLOGY STATUS
The ELROI™ system’s SOTU has been tested on the ground at significant distance and a bus-powered SOTU prototype was launched in 2018. Solar powered SOTUs are being developed for near-term launch opportunities. A miniaturized SOTU design has been conceptualized and it is believed that successful miniaturization of SOTU could lead to ubiquitous adoption of SOTU, and may eventually enable the global deployment of the ELROI™ system. Future plans include additional on-orbit testing, research, and development.

PREFERRED PARTNER ATTRIBUTES
- Desire, ability, and capital to engage in collaborative development efforts under a CRADA to support technology maturation and technology transition
- Well-formed and articulated technology commercialization strategy and business plan (e.g., in-house development, partnering with industry leaders, service model, etc.)
To respond to this call, please submit a letter of interest for this technology. The Lab will acknowledge receipt of this written response and will then send a commercial plan template for consideration as a way to provide additional information on respondent’s strategy for engaging the Lab. All information requested from respondents is due no later than 5pm Mountain Time on Tuesday, June 30th, 2020. This information will be used in the evaluation process and will inform further engagement with respondents. A selected company, or companies, will be notified by Monday, August 10, 2020. Non-selected companies may not receive a response.

Please send all correspondence to commercialcall@lanl.gov with “SOTU – Commercial Interest – Company Name” in the subject line.

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PREFERRED PARTNER ATTRIBUTES

- Ample in-house technical expertise in microelectronics, optics, miniaturization, or other engineering disciplines (electrical, mechanical, systems, or aerospace)
- Familiarity with space commerce policy, or orbital traffic management policy
- Financial and human resources to be dedicated to this commercialization effort
- Established relationships within the U.S. government and aerospace community
- No foreign ownership, control or influence
- One or more U.S. executives with whom Triad business personnel may interact
- Ability and willingness to ensure compliance with U.S. Export Control law

CRITERIA OF EVALUATION

Respondents will be evaluated against the preferred partner attributes outlined above, completeness of responses, technical acumen, and their overall strategy for engaging the Lab. In order to be eligible for consideration, respondents must adhere to deadlines provided by the Lab. The Lab reserves the right to update timeline and deadlines.

INTERESTED? HERE ARE YOUR NEXT STEPS

To respond to this call, please submit a letter of interest for this technology. The Lab will acknowledge receipt of this written response and will then send a commercial plan template for consideration as a way to provide additional information on respondent’s strategy for engaging the Lab. All information requested from respondents is due no later than 5pm Mountain Time on Tuesday, June 30th, 2020. This information will be used in the evaluation process and will inform further engagement with respondents. A selected company, or companies, will be notified by Monday, August 10, 2020. Non-selected companies may not receive a response.

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REFERENCES AND DISCLAIMERS

Intellectual Property

The ELROITM system has various components, and capabilities, which are subject to different intellectual property protections. Additional intellectual property protection is currently being developed and pursued. In order to support the larger ELROITM system, additional intellectual property will continue to be developed and pursued in parallel with this commercial call and any future development work. Existing and future intellectual property, originating from the Lab independently of any technology transfer contract, may or may not be available for licensing.

This commercial call is an opportunity to engage with the Lab to miniaturize SOTU, and to potentially license the intellectual property arising from a potential CRADA opportunity.

References

- Article: “Electronic license plates for space” (published in National Security Science magazine, July 2019)