

Department of the Navy SBIR/STTR Transition Program

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ONR Approval #43-8600-21

Topic # N18A-T021

Triton: Active Imaging through Fog

SA Photonics, Inc.

WHO

SYSCOM: ONR

Sponsoring Program: PEO IWS 2, PEO IWS 3

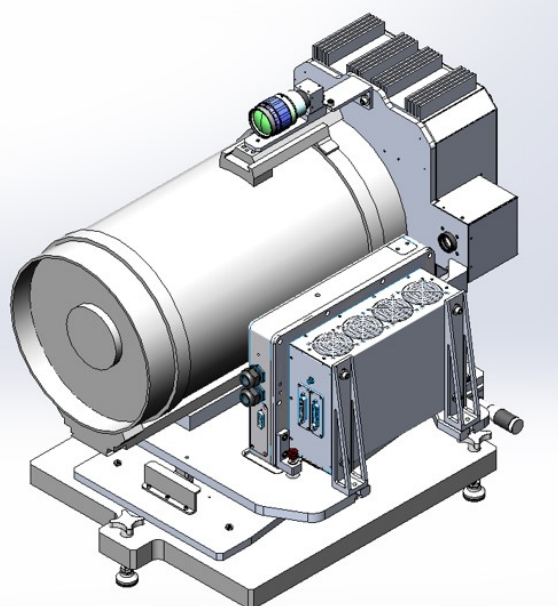
Transition Target: SEWIP; SPIER

TPOC:

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Other transition opportunities: In addition to USN ships needing active imaging, this technology has potential to transition to other DOD platforms in need of improved target identification and imaging in adverse visibility conditions.

Notes: The image at right shows Triton™, SA Photonics' active imaging system.



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WHAT

Operational Need and Improvement: The U.S. naval fleet is often present in congested waterways throughout the world for a variety of humanitarian and military purposes. EO/IR imaging systems are often employed in such settings to maintain SA as well as for target recognition, tracking, and identification. However, EO/IR imagery is highly susceptible to degradation caused by scattering from ubiquitous, water-based aerosols. Imaging through dense fog is the quintessential hard problem, as strong scattering generates a large, uninformative background, while information-carrying ballistic photons are severely attenuated. The goal of active imaging is to augment target illumination intensity, while selectively detecting returned ballistic photons against extraneous background.

Specifications Required: The primary requirement of this program is to increase the range of imaging through dense fog by 10X or greater. A design with minimized SWaP and mechanical robustness against shock and vibration is also necessary.

Technology Developed: SA Photonics' Triton™ system will enhance the ability to see through highly attenuated, highly scattering environments. Triton utilizes new eyesafe, hybrid fiber-bulk laser technology capable of high pulse energy at high repetition rate to produce a scanning imaging lidar system capable of enhanced range in fog. In addition, the Triton lidar system will be capable of operation in the midwave infrared spectral region by frequency conversion of the laser using new nonlinear materials, allowing the system to operate at wavelengths with reduced scattering by fog.

Warfighter Value: Triton improves the ability to detect and identify approaching, highly mobile maritime threats, greatly improving Warfighter safety. In addition, the laser technology to be developed may be applied in a range of applications requiring increased range transmission through the atmosphere, including standoff chemical detection and infrared countermeasures.

WHEN

Contract Number: N68335-20-C-0251 **Ending on:** March 4, 2022

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Preliminary Design Review	Low	Completed review	3	4th QTR FY20
1640 nm System Integration and Test	Low	Successful integration of all subsystems	4	4th QTR FY21
Naval Field Testing in Dense Fog	Med	Successful tests	5	3rd QTR FY22
MWIR Integration and Test	Med	Successful tests	6	1st QTR FY23

HOW

Projected Business Model: SA Photonics intends to undergo low rate production of Triton systems using our in-house manufacturing capability. The company has a history of successful small-scale production for commercialized SBIR products. For larger quantity manufacturing, we would work with our contract-manufacturing partner currently used for our commercial optical communication system production.

Company Objectives: The Triton system is positioned to be a critical performance- and safety-improving maritime imaging system, with potential application to a variety of platforms. As a result, we are excited to present the product to a range of program offices in the DoD, as well as a number of prime contractors.

Potential Commercial Applications: In addition to defense applications, Triton will have future uses with analogous commercial vessels navigating through fog. Also, Triton has the ability to aid autonomous systems' lidar/ladar hardware when used in dense weather environments.

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