

Department of the Navy SBIR/STTR Transition Program

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ONR Approval #43-4388-18

Topic # N152-121

Compact Air-cooled Laser Modulate-able Source (CALMS)

Forward Photonics LLC

WHO

SYSCOM: ONR

Sponsoring Program: PMA272
ATAPS PE 064272N

Transition Target: TAIRCM

TPOC:

Mr. Kevin Leonard
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Other transition opportunities:

Notes: 3 Band UV Laser Concept Design



Image Provided by Forward Photonics LLC, 2018

WHAT

Operational Need and Improvement: Compact UV laser sources are not currently available with high output power and flexible pulsing requirements.

Specifications Required: Output power > 3 W

3 or more lines in the UVA band

Quick switching between waveforms (DC through 10 kHz)

100 micron core fiber output

System size < 75 cubic inches

Air-cooled

Technology Developed: Forward Photonics' proprietary technology of wavelength beam combining (WBC) effectively solves the poor beam quality problems of direct diode lasers and is a truly scalable approach. This allows for the combination of hundreds of lower power lasers into a single output that has the beam quality identical to one of the emitters itself. Forward Photonics is able to leverage the small size and large energy density of diode bars using WBC to construct a compact UV laser system with a nearly diffraction limited output at a power level of 3-10 W. With the inherent scalability of WBC, this laser can readily be increased to power levels of >100 W in the future.

Warfighter Value: Higher power and higher brightness lasers affords critical defense applications that have longer distance propagation and higher power on target.

WHEN

Contract Number: N68335-17-C-0292 **Ending on:** June 18, 2019

Milestone	Risk Level	Measure of Success	Ending TRL	Date
First Growth UV Material Characterized	Med	Lasing Achieved with Good output power	3	2nd QTR FY18
TO Can Risk Reduction Module Tested	Med	WBC Achieved	3	3rd QTR FY18
AWG Experiments Completed	High	WBC achieved on chip level scale	2	2nd QTR FY19
Second Growth UV Material Characterized	Low	Facet generation solved with competitive output power	4	2nd QTR FY19
Final Module Characterized	Low	Deliverable meets program specs	4	3rd QTR FY19

HOW

Projected Business Model: Our goal is to design and manufacture the lasers, which will be used by Prime contractors in their laser propagation systems.

Company Objectives: Forward Photonics is looking to expand awareness of the utility of WBC lasers for defense and commercial uses. Such lasers offer high brightness output, an order of magnitude or higher brightness that can be achieved with non WBC direct diode systems. Direct diode systems offer some of the highest efficiency, lowest cost lasers available. Forward Photonics is eager to speak with laser integrators for both defense and commercial laser systems for defense platforms and materials processing.

Potential Commercial Applications: Potential commercial applications for UV high brightness WBC lasers are numerous and include micromachining, spectroscopy, metal cutting and welding, and lithography.

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