

## **PROJECT ABSTRACT** for N00014-19-S-F006 **Approved for Public Release**

The Department of Defense precision optical systems supply chain is facing a crisis. Manufacturing innovation in the sector is lagging in the face of increased competition from overseas and a shortage of research and development investment. Major technical innovations that enable our nation to maintain its advantage in this industry come from small companies in an increasingly fragile market. Monroe Community College (MCC), the nation's only community college awarding associate degrees in precision optics, does not produce enough precision optics graduates to meet the annual demand. In 2019, 12 MCC graduates entered the optics industry to fill an annual demand of 574 technicians in the Finger Lakes area. This leaves 98% of Upstate New York skilled optics technician job openings unfilled. Coupled with industry reports that 20% of experienced technicians and engineers are approaching retirement, the need for skilled optics technicians is vast. And the demand for precision optics technicians is far greater when the entire United States optics industry is taken into account. To meet the growing demand for skilled optics technicians, MCC's Optical Systems Technology program needs the *Defense Engineering Education Program in Optics (DEEP OPS)* to increase the national optics workforce.

The *DEEP OPS* program will strengthen and expand the national precision optics workforce to ensure technological superiority for the Department of Defense. This project will: 1) Extensively enhance precision optics technician training with innovative approaches that meet the needs of the optics industry and students; 2) Increase the number and diversity of optics technicians nationwide; and 3) Establish opportunities for student and faculty engagement with the optics industry. Innovative approaches for technician training include: adapted course delivery models, enriched curriculum, apprenticeship opportunities, and improved access for high school students. Recruitment and outreach activities will target historically underrepresented populations, specifically women, members of minority groups, veterans, and individuals with disabilities. By expanding awareness of optics through presentations to high school students, teachers, guidance counselors, and parents, more students will recognize the opportunities to join an exciting, growing field and upon completion of the precision optics program will help fill the technician-level workforce gap that currently exists. Student and faculty engagement with the optics industry will include: tours of optics companies, workshops and networking opportunities with alumni and optics industry professionals, visits from optics companies to MCC and high schools, an industry-linked professional development program for MCC faculty and high school teachers, expansion of the dual enrollment program, and broadened faculty and high school representation at national conferences.

The *DEEP OPS* program will increase the national optics workforce through innovative training programs, expanded enrollment, retention, and graduation of underrepresented populations, and strengthened alliances with the optics network, pre-collegiate educators, and industry partners. During its initial three-year period, this program will impact a minimum of 3,000 high school students, college students, apprentices, and incumbent workers and will provide professional development to 35 high school teachers and six (6) MCC faculty. *DEEP OPS* will establish 150 apprenticeships and 30 industry sponsors. This will be sustained through increased enrollment, establishing apprenticeships, and broadening networks of industry partners. Greater community awareness will promote precision optics technology as a vibrant profession with diverse career paths. The *DEEP OPS* program will provide strategic solutions to defense challenges.