

WORKSHOP

Quantum Integrated Photonics – Opportunities and Challenges

2023 ERI SUMMIT



PROGRAM MANAGERS: Dr. Justin Cohen, Dr. Gordon Keeler, Dr. Jonathan Hoffman / MTO

DATE: Thursday, August 24, 2023	TIME: 8:30am-3:30pm
ROOM NAME: Columbia C – 3 rd Floor	

DESCRIPTION

Optics are central to the quantum technologies that promise to transform computing, communications, and precision sensing. Given the diversity of quantum applications and architectures, the role of optics in these systems varies dramatically, ranging from laser interfaces with quantum matter, to generators and processors for non-classical states of light. With mounting interest in the potential for photonic integration to miniaturize and scale quantum technologies, it is imperative to identify the disparate ensuing challenges at hand for photonic materials, components, and circuits. This workshop will bring together experts in the fields of quantum sensing and quantum information to present the opportunities and underlying device needs for specific applications, followed by a panel discussion response from innovators in the integrated photonics community. The event will close with a “lightning round” session, wherein any attendee may hold the floor for one minute to provide their perspective.

AGENDA

8:30am	Introduction: Integrated Photonics for Quantum Light and Matter Justin Cohen / Program Manager / DARPA MTO
8:45am	Keynote: Photonics for, with, and between Quantum John Burke / Principal Director for Quantum Technologies / OUSD(R&E)
9:15am	Special Topic Keynote - The quantum side of gravitational-wave detectors Lisa Barsotti / Senior Research Scientist / MIT LIGO Lab
Morning Break: 9:45am-10:15am	
10:15am	Demo Keynote: Title to be updated Tom Kornack / Chief Scientist / Twinleaf
10:50am	Quantum, Photonics, and Atomtronics Chris Wood / CTO / Infleqtion
11:10am	Opportunities & challenges for quantum integrated photonics in quantum sensing Quntao Zhuang / Professor / University of Southern California
Lunch Break: 11:30am-12:30pm	
12:30pm	Fault tolerant quantum computing with integrated photonics Mercedes Gimeno-Segovia / VP / PsiQuantum
12:50pm	A scalable infrastructure for strontium optical clocks with integrated photonics Scott Papp / Group Leader / NIST
1:10pm	Photonic-Field Quantum Computing Olivier Pfister / Professor / University of Virginia
1:30pm	Paths to Quantum Advantage in SWaP with Integrated Nonlinear Photonics Amir Safavi-Naeini / Professor / Stanford University

Afternoon Break: 1:45pm-2:15pm

2:15pm

Panel: Photonics Response to Quantum Challenge
Gordon Keeler (facilitator) / Program Manager / DARPA MTO
Matt Eichenfield (panelist) / Professor / University of Arizona & Sandia
Michael Fanto (panelist) / Senior Research Physicist / AFRL
Galan Moody (panelist) / Professor / UCSB
Marko Loncar (panelist) / Professor / Harvard

2:50pm

Lightning Round: Photonics Response to Quantum Challenge
Justin Cohen (facilitator) / Program Manager / DARPA MTO
1-minute remarks around the room

Workshops Conclude at 3:30pm