Vulcan™
The new integrated photonics product line for free-space optics

A semiconductor approach to optical wireless communications. Smaller, lighter, and manufacturable at scale.

Vulcan™

Traditional FSO systems are bulky, costly, and hard to scale. Vulcan™ changes everything, a Silicon Photonics breakthrough that's smaller, lighter, manufacturable at scale, and built for effortless global connectivity.

The Breaktrough

AGPhotonics' Vulcan is a next-generation free-space optical (FSO) terminal that integrates beam steering and optical transceiver functions onto a single silicon photonic chip. This innovation dramatically reduces size, weight, and power (SWaP) requirements, making optical wireless communications possible on platforms that previously couldn't support it.

Vulcan™ demonstrates how integrated photonics can deliver compact, reliable, and precise optical communication systems, paving the way for multi-directional and fully bidirectional configurations.

Key Features

Integrated OPA Beam Steering — Fast electronic beam steering with low electronical complexity.

On-Chip Transceiver Elements — Streamlined architecture for reduced SWaP.

CMOS-Compatible Manufacturing — Scalable production in standard photonic foundries .

Secure & License-Free — Highly directional, inmune to jamming and spoofing.

Multi-Platform Ready — UAVs, CubeSats, high-altitude platforms, and terrestrial backhaul.

The Demonstrator Incorporates:

Integrated Optical Phased Arrays (OPAs) that steer laser beams precisely without moving parts.

Highly-Directive Data Transmission — sending high-speed optical data over an open-air link.

Scanning Capability — the beam can sweep across its field of view to acquire or track a target receiver.
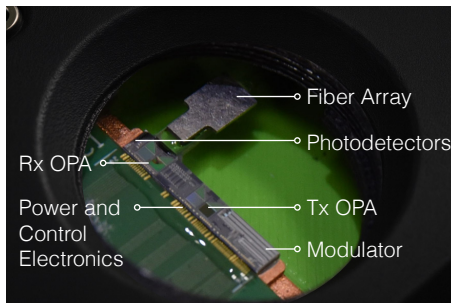
Potential Applications and Industries

Telecom — Extend high-speed wireless links without trenching fiber for backhaul, maritime and private networks.

Defense/Aerospace — Secure, low-detectability links in contested environments.

Disaster recovery — Ensures service continuity during outages and emergencies.

Space — Enable inter-satellite and satellite-to-ground links for small satellites.