**Docket #:** S25-308

# System for Optical Interconnects

Stanford researchers have developed a low-power optical interconnect system that can reduce the energy required to move data within and between advanced computer chips. As AI, machine learning, large language models, and data center workloads continue to scale, chips increasingly spend more power on communication than computation, creating a major barrier to energy-efficient computing. This technology uses optical communication channels to transfer information within and between chips, reducing reliance on conventional electrical interconnects and supporting more efficient integration with optical computing accelerators. The approach may enable next-generation AI and high-performance computing hardware with lower power consumption, improved scalability, and simplified connections between electronic and optical computing systems.

**Stage of Development:** *Proof of Concept*

## Applications

- AI and machine learning hardware
- Large language model computing infrastructure
- High-performance computing systems
- Optical interconnects for integrated circuits
- Chip-to-chip optical communication
- Optical computing accelerators

## Advantages

- Reduces power consumption from data communication in advanced chips
- Supports more energy-efficient AI and machine learning hardware
- Enables optical communication within and between integrated circuits

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