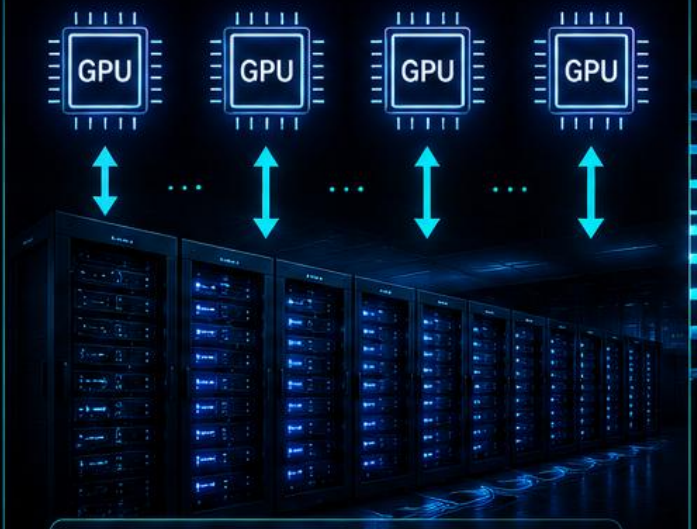
WHY PHOTONICS?

AI NEEDS TO MOVE MASSIVE AMOUNTS OF DATA

The challenge is not only computing — but moving data efficiently.

AI COMPUTE IS GROWING

GPU จำนวนมาก

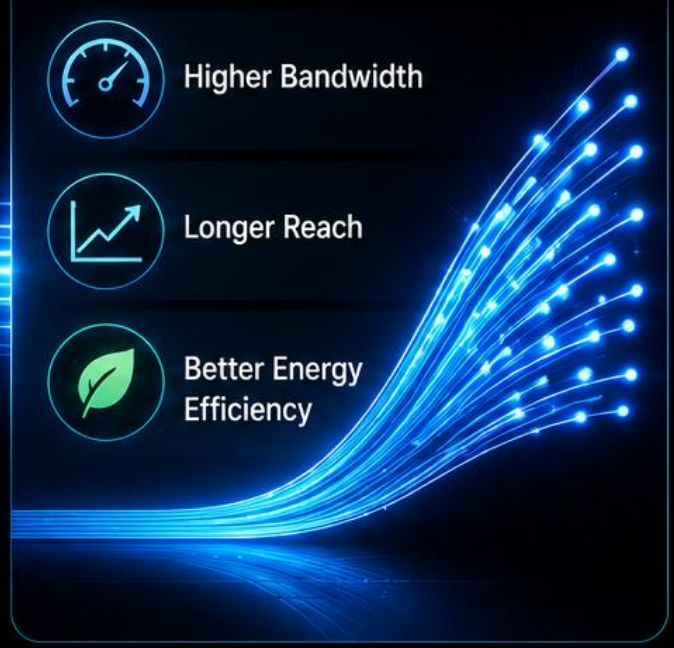


ต้องส่งข้อมูลระหว่างกันมหาศาล

ELECTRICAL INTERCONNECT

Bandwidth ↑ → Challenge ↑

MOVE DATA WITH LIGHT



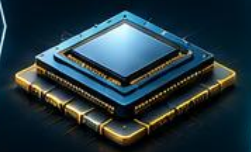
COPPER / ELECTRICAL → **OPTICAL / PHOTONICS**

As AI grows, Photonics becomes essential for moving more data efficiently.

Thailand's Strategic Position in the Photonics Value Chain

THAILAND
CONNECTING
TALENT
TECHNOLOGY
OPPORTUNITIES
TO A BRIGHTER
TOMORROW

LIGHT
PEOPLE
INDUSTRY
A BRIGHTER
THAILAND

UPSTREAM		MIDSTREAM			DOWNSTREAM	
1. R&D / DESIGN	2. MATERIALS & COMPONENTS	3. MANUFACTURING (WAFER / CHIP)	4. PACKAGING & ASSEMBLY	5. MODULES & SYSTEMS	6. END PRODUCTS & APPLICATIONS	7. SERVICES & SOLUTIONS
						
Photonic IC design, Optical system design, simulation & IP	Wafers, Optical glass, Laser, Detector, Passive & Active components	Wafers fabrication, Epitaxy, EUV-lithography, Etching	Die attach, Alignment, Packaging, Characterization & testing	Optical transceivers, Optical modules, Photonic system, Calibration & Standardization	Data Centers/AI, Telecom & 5G/6G, LiDAR, Medical/Imaging, Industrial laser, Sensor	System Integration, Software/AI, Maintenance, Cloud Service
Thailand's Industrial Capability						
Limited	Developing	No Capability	Strong	Strong	Strong	Developing
		(No Industrial-Scale Wafer Fabrication)	(Thailand Core)	(Global Competitiveness)	(Global Market)	

Thailand's Strengths

- World-class manufacturing ecosystem
- Precision optical manufacturing
- Skilled workforce and growing talent base
- Strategic location in ASEAN
- Strong market drivers: AI, Data Centers, Cloud, Optical Networking

Strategic Gaps

- Photonic IC Design
- Silicon Photonics Wafer Fabrication
- Advanced Optical Materials
- International Testing & Certification
- Highly Specialized Photonics Workforce

Thailand is emerging as ASEAN's Photonics Manufacturing Hub

for AI, Data Centers, and Optical Communications

WHY CPO?

BRINGING OPTICS CLOSER TO THE CHIP

From Pluggable Optics → Co-Packaged Optics

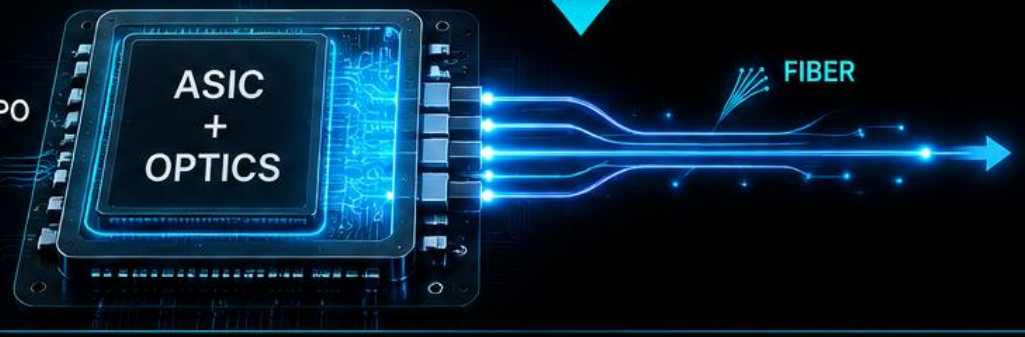
TODAY — PLUGGABLE OPTICS

⚠ Bandwidth ↑ → Power & Signal Challenges ↑

MOVE OPTICS CLOSER

NEXT — CPO

CO-PACKAGED OPTICS — CPO



- SHORTER ELECTRICAL PATH
- HIGHER BANDWIDTH
- LOWER POWER

CPO BRINGS OPTICS CLOSER TO COMPUTE.

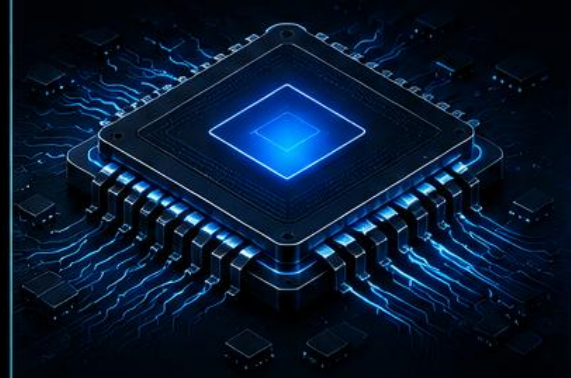
To scale AI, optics is moving closer to the chip — enabled by integrated photonics.

SILICON PHOTONICS & PIC

Bringing the Power of Light onto a Chip

ELECTRONIC IC

Moves & processes electrons



Compute → Logic → Memory

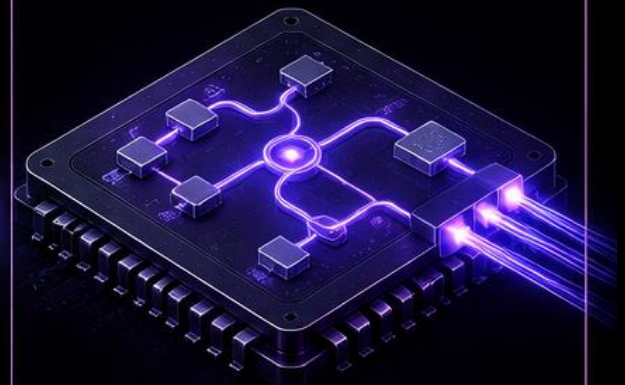
PIC

Photonic Integrated Circuit

LASER → MODULATE → GUIDE → PROCESS → DETECT

PHOTONIC IC — PIC

Guides & processes light



Transmit → Process → Sense

PIC = "Integrated Circuit for Light"

Silicon Photonics brings photonics into the semiconductor manufacturing ecosystem.

THE NEXT 5–10 YEARS

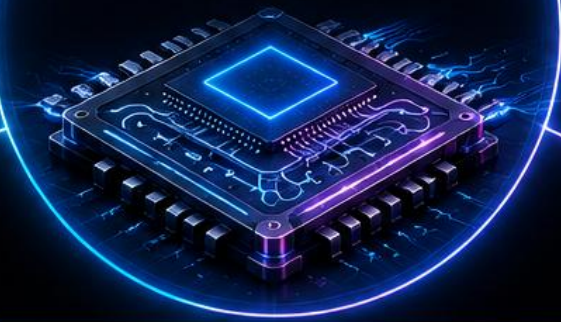
FROM OPTICAL CONNECTIVITY ⟶ PHOTONIC PLATFORM TECHNOLOGY

AI & DATA CENTER

- CPO • Optical I/O
- High-Speed Interconnect

SILICON PHOTONICS / PIC

A PLATFORM TECHNOLOGY
POWERED BY LIGHT



MEDICAL & HEALTH

- Biosensing • Diagnostics
- Lab-on-Chip

SENSING

- LiDAR • Environmental
- Industrial Sensors

QUANTUM

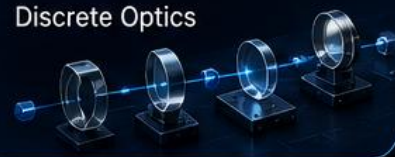
- Quantum Photonics
- Photon Generation & Control

6G / THz / RF

- Microwave Photonics
- Communication & Sensing

TODAY

Discrete Optics



NOW

PIC / Silicon Photonics

NEXT

Photonics + Electronics

FUTURE

Integrated Optical–Electronic Systems

KEY MESSAGE

Photonics is moving closer to the chip, closer to compute, and into more industries.

The opportunity is shifting from using photonics ⟶ to designing, integrating and manufacturing photonic technologies.