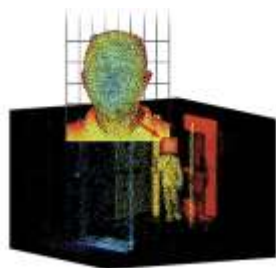
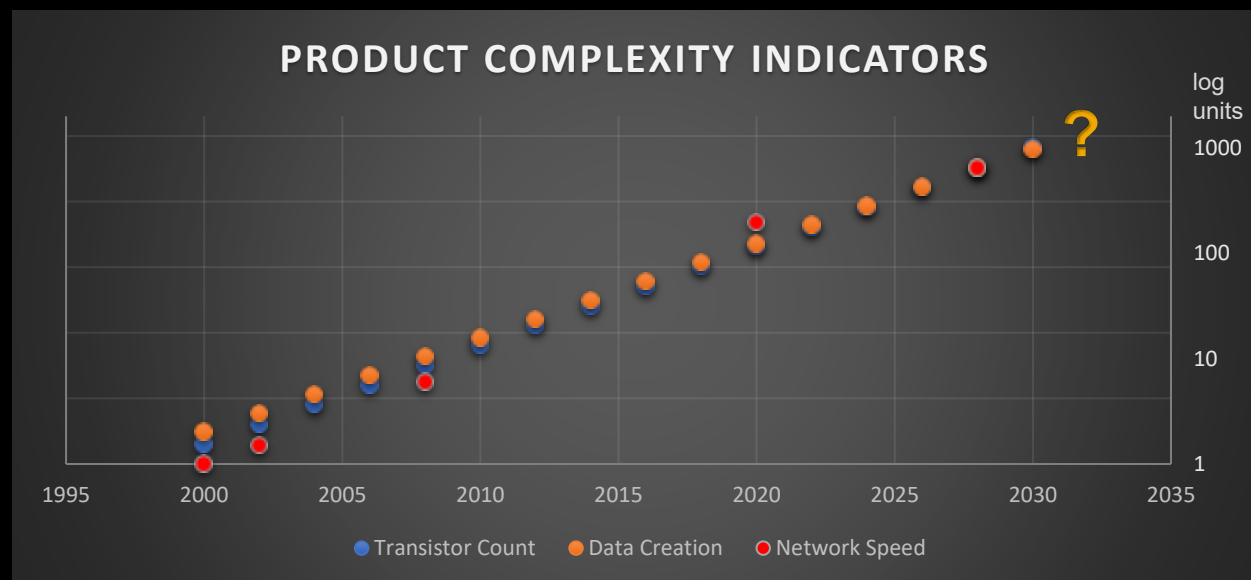


Silicon Photonics (SiPh) Trend and Solutions for workforce development for Thailand

NECTEC-ACE 2026

Photonic Applications Five Years From Now



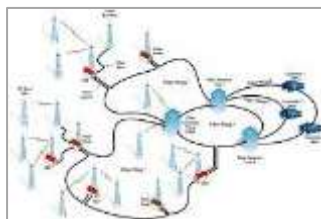
Advanced Lidar

- Pervasive in electronics
- Integral part of AI solutions



Secure Comms

- Satcom
- Mil-Comm networks
- “Opticalization” of electronics to reduce emissions



Backhaul Overhaul

- Elimination of pt-pt mmWave links
- Free-space optical OTA



Datacenter

- >800 Gbps Shannon limit push (~2030)
- New higher capacity optical transceiver architectures



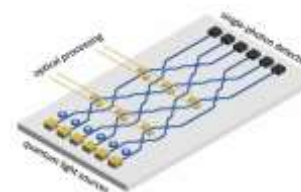
Optical Computing I/O

- Hardwire bus speeds are limiting
- Traditional bus goes optical
- External computer I/O



Optical CPUs

- Faster speeds to keep up with demand
- Photonic gates are 1000X faster!
- Elimination of traditional on-chip bus
- AI optical computing



Quantum

- Quantum communications revolutionizes capacity/speed
- Quantum computing is mature
- Integrated readouts

AI Infrastructure Investment Is Driving Digital Instruments Demand

Semiconductor, interconnect, and networking roadmaps are accelerating, creating recurring validation cycles



MARKET SIGNALS



\$843B

Data center semiconductor revenue by 2030

AI buildout is pulling accelerators, memory, I/O, and associated silicon.



\$100B+

AI back-end and switch spending by 2030

AI clusters require higher-speed, higher-density network fabrics, and interoperability.



400G → 800G → 1.6T → 3.2T

Network speed roadmap is accelerating

Each speed transition creates a new test cycle across silicon, links, protocols, and systems.

AI infrastructure growth creates recurring demand for digital validation across silicon, high-speed interfaces, protocols, systems, and production.

AI: A Technical Inflection Point

Bandwidth issues are often met by increasing bandwidth, but optimizing efficiency is equally crucial

	Today	Next 3+ Years
Ethernet	400G / 800G	1.6 / 3.2T (4X)
Memory	DDR5, 8.4 GT/s	DDR6 / HBM3, 12.8 GT/s (1.5X)
Copper / Optical	112 Gb/s	224 / 448 Gb/s (4X)
PCIe® & CXL	PCIe® 5.0, 32 GT/s	PCIe® 7.0, 128 GT/s (4X)
Wireless	5G, 10 Gbit/s	6G, 100+ Gbit/s (10X)

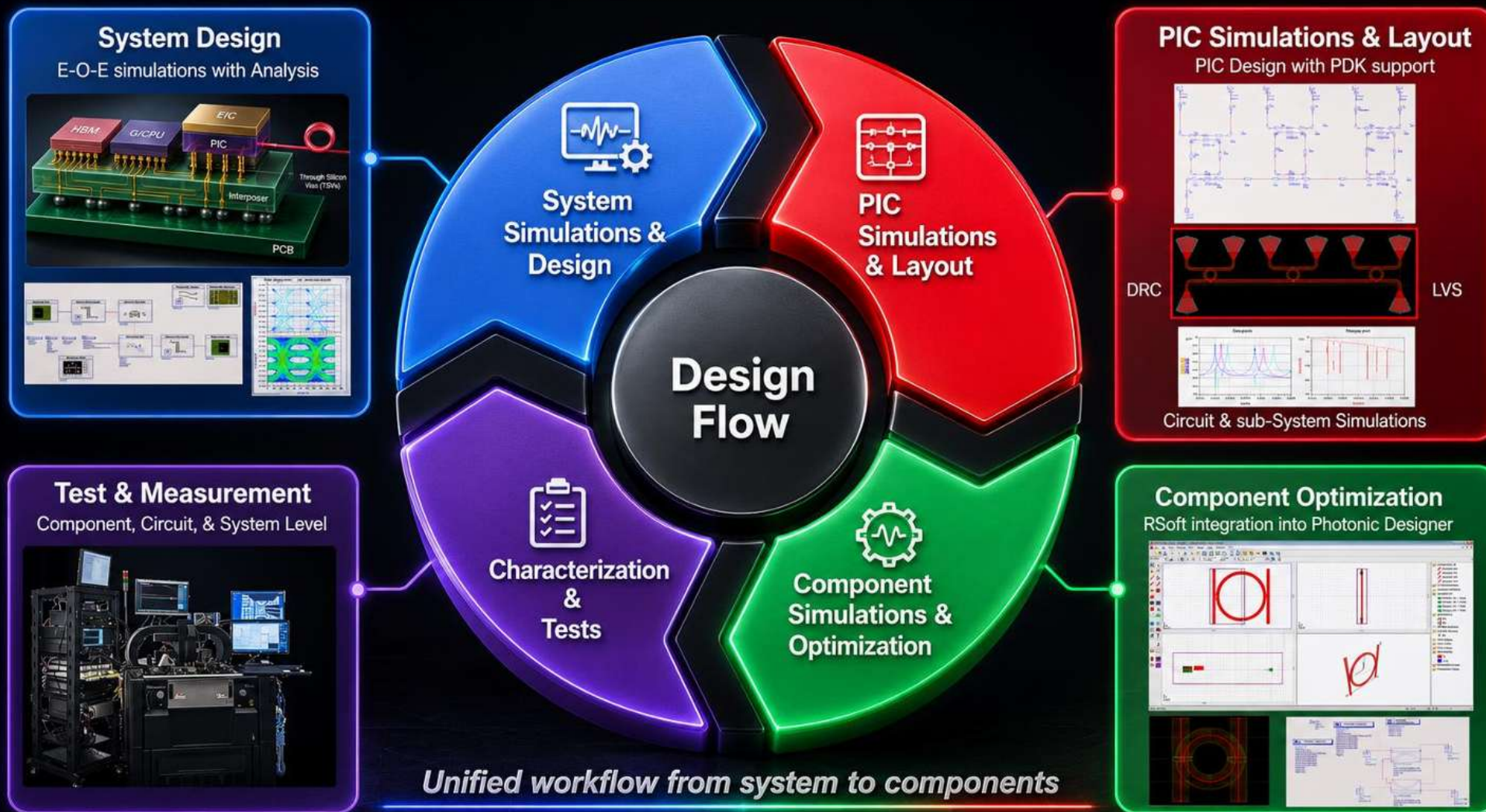
AI Infrastructure Multiplies Digital Testing Complexity



More devices + faster lanes + more vendors + more standards = more validation needed

Photonics Design and Simulation

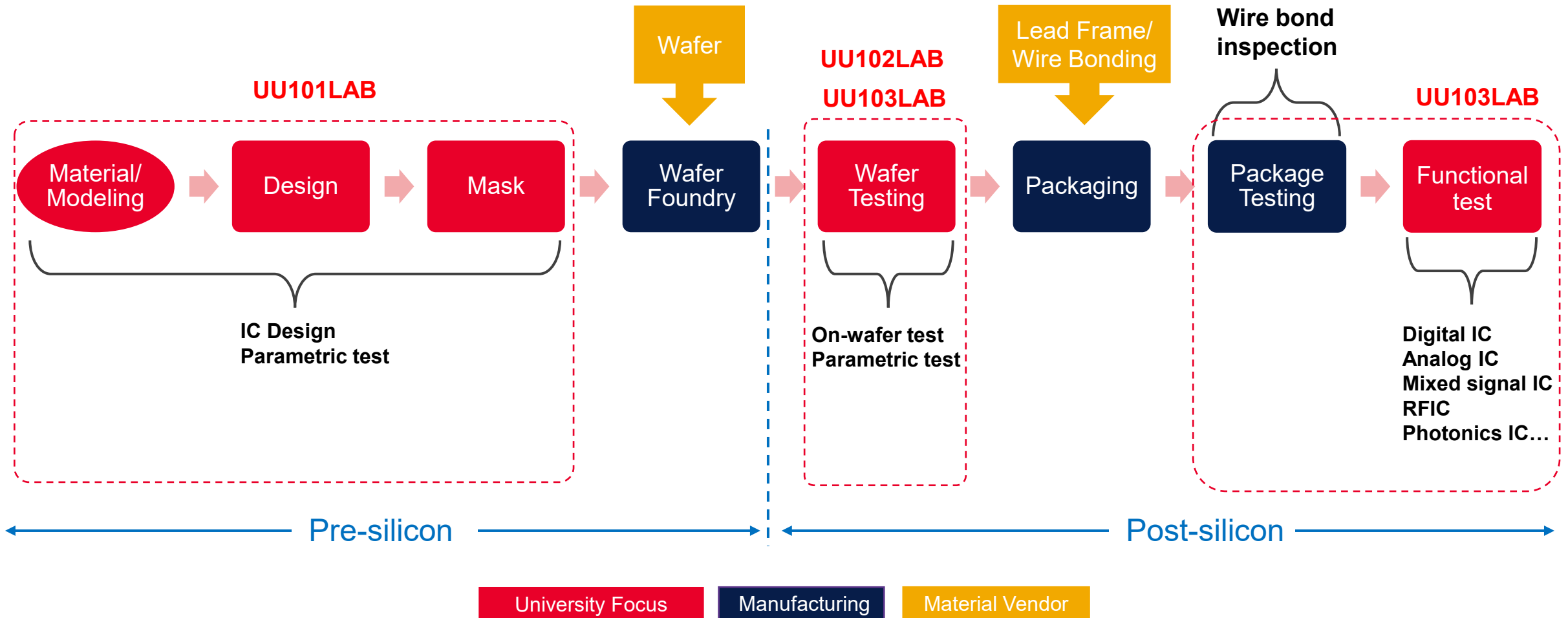
Our Approach



Closing the Talent Gap in Photonics Engineering, Upskill & Reskill for Workforces

IC Product Lifecycle – From Design to Manufacturing

How Keysight Semiconductor Teaching Solutions UU101/2/3LAB Fits



Semiconductor Teaching Solutions

Developing Semiconductor Workforce

Trusted by Professors in leading Univ. and
Top-tier Players in Industry across the Globe

Ready to Teach, Structured Curriculum

Bridges Theory to Real Engineering Practice

Develops Workforce-Ready Skills



University Student
Certification Program

UU101LAB

Basic Design and Measurement

- IV curve of LEDs, BJTs, MOSFETs
- Mixer and amplifier design

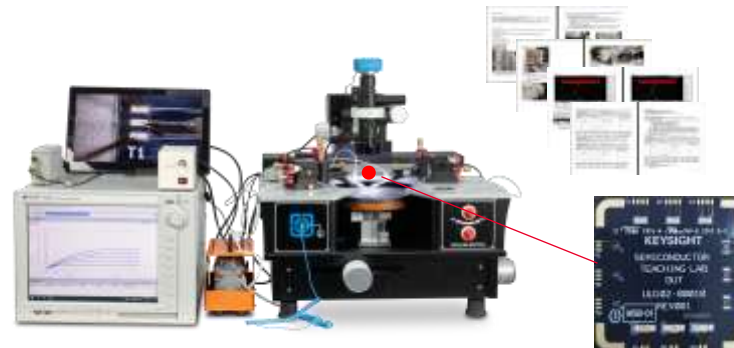


B2902C SMU, Digital Learning Suite,
ADS, Lab sheet

UU102LAB

Parametric Test & On-Wafer Measurement

- I/V, C-V, Low current, Sampling measurement
- Probe station operation

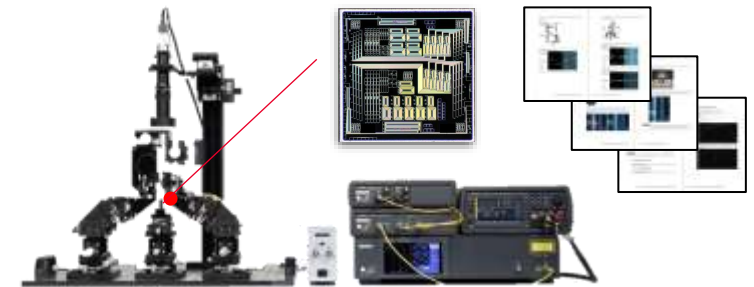


B1500A, Probe station, DUT, Lab sheet

UU103LAB

Photonics IC Measurement

- IL, PDL, O/E Responsivity
- Photonic probe station operation

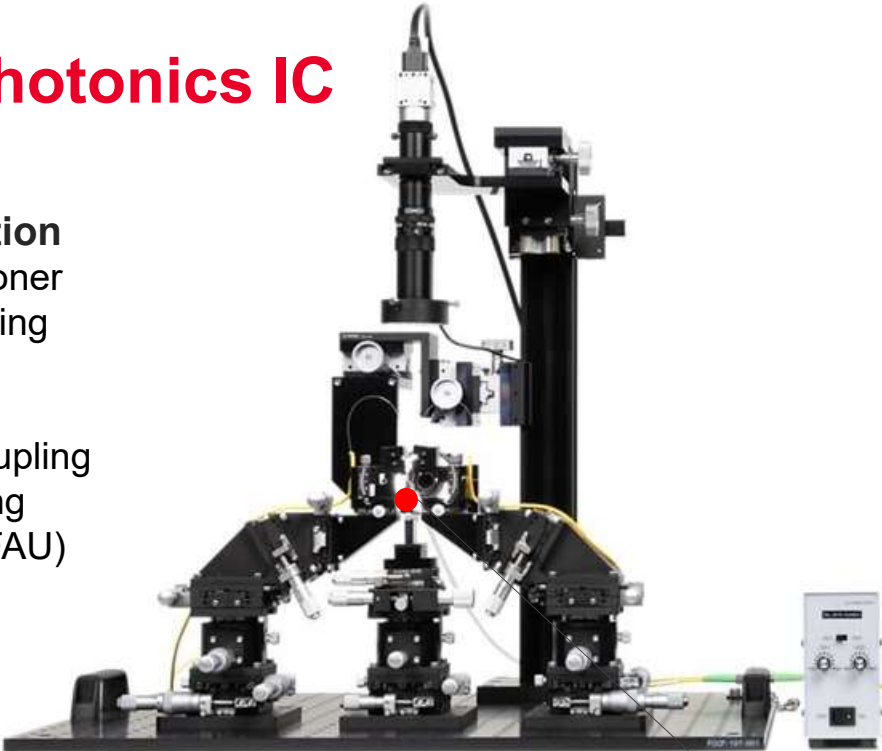


N7778C TLS, N7742C Optical Power Meter, N7786C
Polarization Controller, B2901CL SMU, Measurement
Software Package, Probe station, DUT, Lab sheet

UU103LAB: Photonics IC Measurement

Manual Probe Station

- 12 axis fiber positioner
- 5 axis PIC positioning
- 2x camera units
- Edge coupling
- Surface grating coupling
- Single fiber coupling
- Fiber array units (FAU) coupling



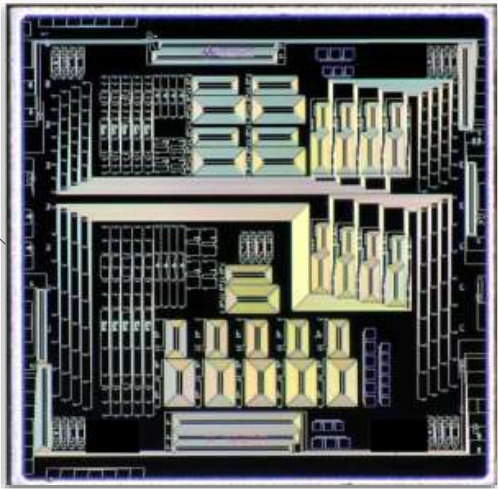
Instrument Bundle Industry-leading Photonic Instruments

- Tunable Laser
- Polarization Controller
- Power Meter
- Source Measure Unit (SMU)



Swept Wavelength Passive/Active Device Characterization Labs

Lab 1	Probe Station Setup & Die Handling
Lab 2	Optical Power and Insertion Loss (IL) Measurements - Fixed Wavelength
Lab 3	Swept Wavelength Passive Device - Insertion Loss (IL)
Lab 4	Polarization Control and Measurement – Fixed Wavelength
Lab 5	Swept Wavelength Passive Device - Insertion Loss (IL) and Polarization Dependent Loss (PDL)
Lab 6	Swept Wavelength O/E Responsivity

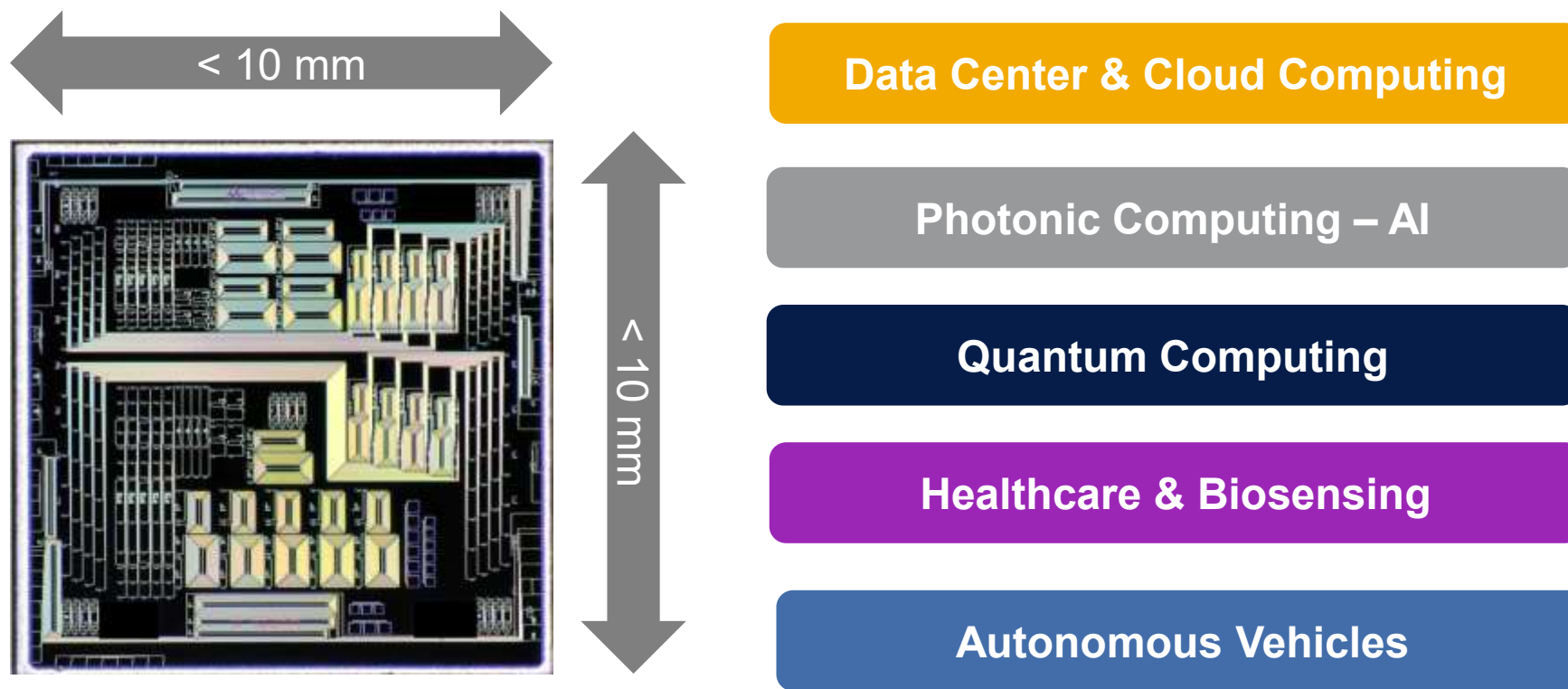


Education Device Passive PIC Test Chip

- Surface grating couplers
- Delay lines
- Edge coupling
- Ring resonators
- Polarization splitters
- Mach Zehnder Interferometer

Photonic Integrated Circuits - PICS

Applications beyond Data Center!!



Thank you