



# Leveraging Hybrid Integration to Accelerate Photonics Adoption

# Motivation

**K.C. Hsu, TSMC's VP of Integrated Interconnect and Packaging, projects “that the Silicon Photonics market will expand at a compound annual growth rate of 40%, reaching \$500 million by 2028.”**

# Application Drivers

From powering the next generation of 5G networks to enabling smart vehicles, semiconductor integrated photonics drives the technological revolution in datacom and artificial intelligence computing



Information and communications



Biomedical



Automotive and aerospace



Smart factories



Energy and environment



Smart cities and smart living



Agriculture

# The Challenge: One platform does not fit all

<i>Applications</i>		<b>Long haul telecom</b>	<b>DATA CENTER INTERCON-DCI (intra, metro, submarine, long haul)</b>	<b>5G WIRELESS ACCESS NETWORK</b>	<b>Automotive interconnects</b>	<b>Sensors</b>	<b>Medical</b>
<i>Examples of products</i>		Coherent optical transceivers AWG Modulators	Optical transceivers (100G/400G) Embedded optics (200G) Switches Splitters	Optical transceivers (28G)	Optical transceivers for intra car interconnects (antennas to compute / entertainment system)	Lidars Gas sensors	OCT Blood analysis
<i>Typ. wavelength</i>		1310 – 1550 nm	1310 – 1550 nm	1310 – 1550 nm	700nm+	900 – 7000+nm	400 – 1500 nm
<i>Main PIC platforms</i>	<i>SiPh</i>						
	<i>InP</i>						
	<i>SiN</i>						
	<i>Polymer</i>						
	<i>Glass</i>						
	<i>Silica</i>						
	<i>LiNbO3</i>						

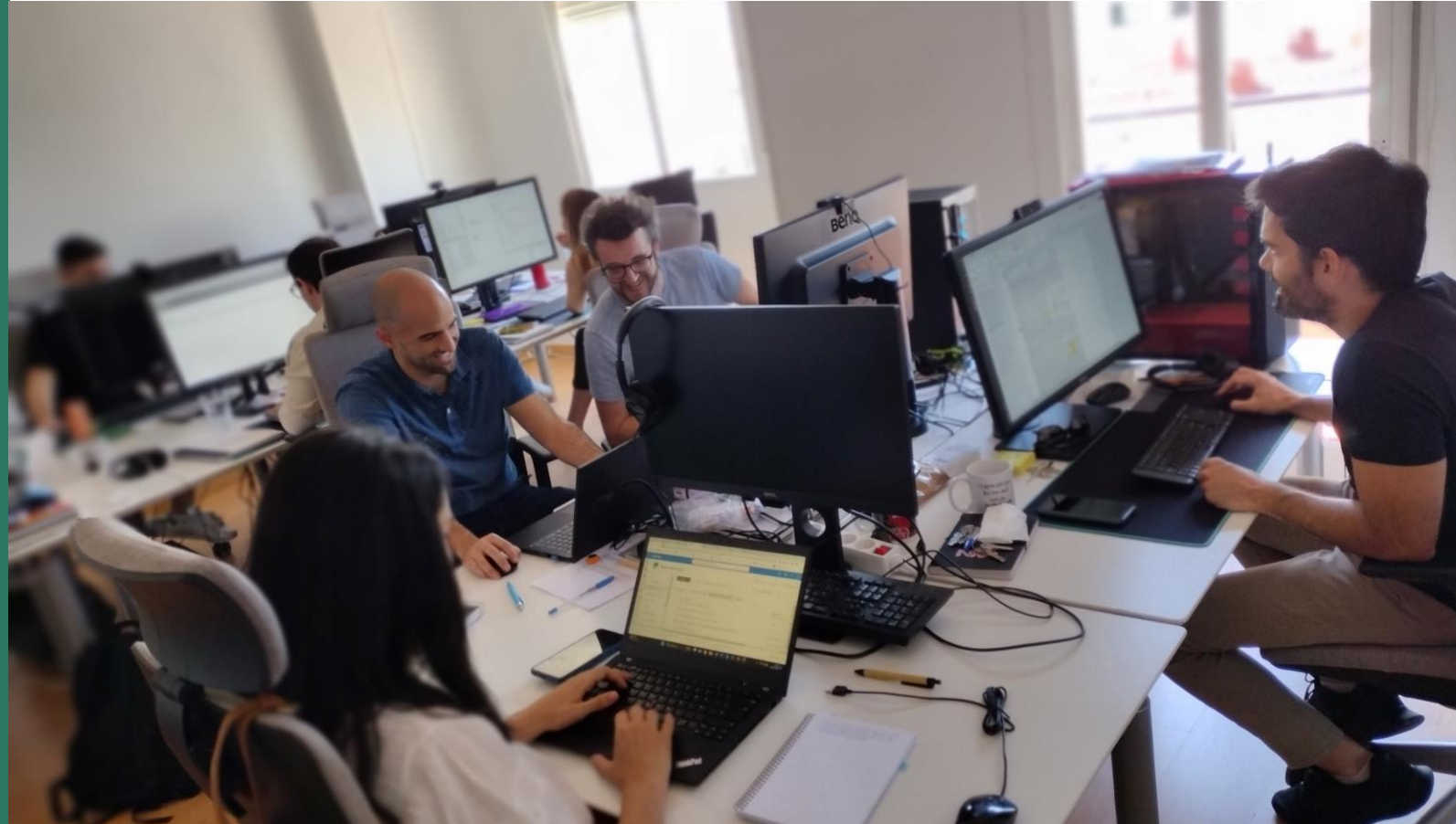
Source: Dr. Eric Mounier and Jean-Louis Malinge, Yole Développement, "Silicon Photonics and Photonic Integrated Circuits 2019", [http://www.yole.fr/PhotonicIC\\_SiPhotonics\\_MarketUpdate\\_Intel.aspx#.Xttu8DpKhPY](http://www.yole.fr/PhotonicIC_SiPhotonics_MarketUpdate_Intel.aspx#.Xttu8DpKhPY)

# Why Alcyon?

Alcyon masters different design techniques which enables us to design robust, high speed and low power Photonics applications.

Alcyon runs a foundry and platform agnostic model to fit with every to customer needs.

## #EasyPhotonics



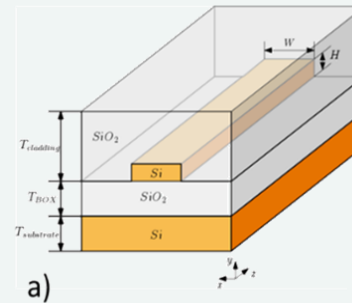
# Alcyon enables Hybrid Integration

Alcyon's high-performance design know-how translates efficient photonics into modular and combinable IP portfolio

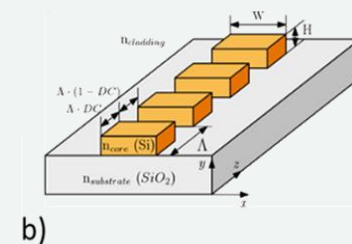
## Master integrated photonics design techniques

- Including unique Subwavelength grating (SWG)
- Working > C+L

### Traditional Waveguide

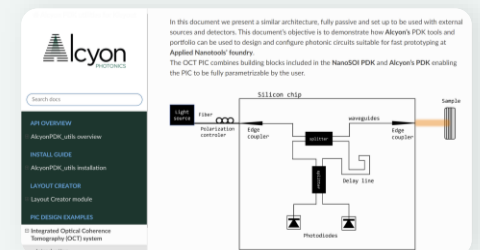


### Alcyon SWG Waveguide



## Modular IP

- BBs, PICs
- Passive, tunable and active
- +10 international progressing patents
- Top foundries validation
- Si, SiN, III-V

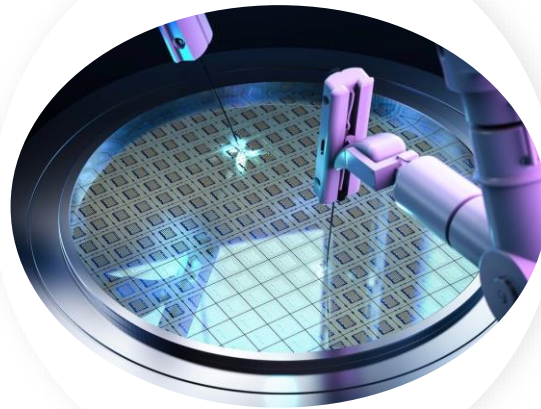


# Alcyon's customer journey



Partner foundries

Your Products



# What can Alcyon do for you?



## EFFICIENCY

**Alcyon's design techniques build efficient, robust, validated and foundry compliant Photonic Integrated Circuits**



## SCALE

**Alcyon's portfolio lower time to market whilst ensuring proven reliability**





# Accelerating Integrated Photonics Adoption



[www.alcyonphotonics.com](http://www.alcyonphotonics.com)



<https://www.linkedin.com/company/alcyonphotonics>



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