



AUGMENTED SILICON PHOTONICS WITH INTEGRATED LASERS

Developing and supplying Photonics IC, mass-produced in semiconductor foundry, for ultimate connectivity in Data Centres, HPC and 5G

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FIEEE webinar, 16, Juin 2022



COMPANY OUTLOOK

- Fabless, developing and marketing Silicon Photonic Integrated Circuits, PIC
- Created in November 2018, HQ in Grenoble, France
- Raised 4M€ in August 2019 from private funds
- Core technology licensed from CEA-Leti, a leading technology research institute in micro & nanotechnologies, with an expanding patent portfolio through our own development
- Manufacturing agreements with Commercial Foundry & Industrial partners
- Laureate of European Innovation Council (EIC) Accelerator, rewarding the most innovative/ high growth potential startups





WHAT WE DO – OUR AMBITION

We develop and market Augmented Silicon Photonic Circuits with integrated lasers for ultra highspeed optical communications



Enabling the deployment of **cloud HPC** (from Electrical to optical transmissions between XPUs)

Solving the **data center** challenges of scaling data traffic at controlled cost and power

consumption

e.g. SCINTIL Photonic IC with 1600 Gbit/sec



Supporting the deployment of **innovative** solutions for **5G** infrastructure

Broader impact: Sensing (FMCW Lidar) and Quantum photonics opportunities

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SCINTIL PHOTONICS

SCINTIL BUSINESS MODEL

- Supply standard Photonic Integrated Circuits to Module and Equipment Manufacturers
- Offer reference package implementations





AUGMENTED SILICON PHOTONICS



COMBINING THE BEST OF SiPho & InP

Process Silicon Photonics devices in a Commercial SiPho foundry leveraging standard SiPho material platform



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Bond unprocessed III-V/InP dies on the **backside** of the SiPho processed wafer,



Complete the lasers fabrication with a CMOScompatible process



TARGET CUSTOMERS & END USERS



Equipment Manufacturers	
Module Manufacturers	

Customers





OPTICAL COMMUNICATIONS TARGET APPLICATIONS



Data Center

Source : Google Data Centers, Dublin



Source : Nvidia Super Computer



Source : Ericsson MIMO antenna









DATA CENTERS GLOBAL CONTEXTE

Data traffic doubling every 2 years



Source : Equinix Interconnection Index Vol.5

Exponential Growth of the Interconnection Bandwidth (CAGR of 44%)

~ 100 new hyperscale DCs each year



~750 hyperscale DCs in operation in the world in 2022. 100MB\$ annual CAPEX for new constructions and upgrades

~ 3% of the WW electricity in 2022



Critical environmental impacts if efficiency gains do not continue



Ideally, when traffic doubles... energy per bit (pJ/bit), density (Gbps/mm2) and cost (\$/Gbps) ... need to be divided by 2

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FROM DISCRETE TO FULLY INTEGRATED

Discrete and EML based solution for 400G



Source : System Plus Consulting

SCINTIL Augmented Silicon Photonic IC with Integrated laser array (CWDM and DWDM)





✓ Lower \$/Gbit

- ✓ Smaller size
- Reduce power with co-packaged optics (CPO)



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SCINTIL PHOTONICS

MARKET FORECAST

Pluggable tranceivers to remain the favourite configuration of Data Centre operators > 10Mu of 800G and 1.6T in 2027



Source: Lightcounting Webinar- June 2022

CPO to primarily serve the AI Cluster and HPC with ~ 4Mu of in 2027



Source: Lightcounting Webinar- June 2022



OUR UNIQUE PIC SOLUTION

- Monolithic integration of laser array by III-V/InP bonding on the backside of a SiPho wafer
- Enable high bandwidth density in a small footprint with scalable PIC design for both pluggable transceivers and CPO
- Reduce power consumption of compute systems by enabling co-packaged optics.
- Build on existing SiPho foundries standard process
- Leverage the wafer-scale manufacturing, test and packaging volume production of the microelectronics supply chain.







Merci !

SCINTIL PHOTONICS



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