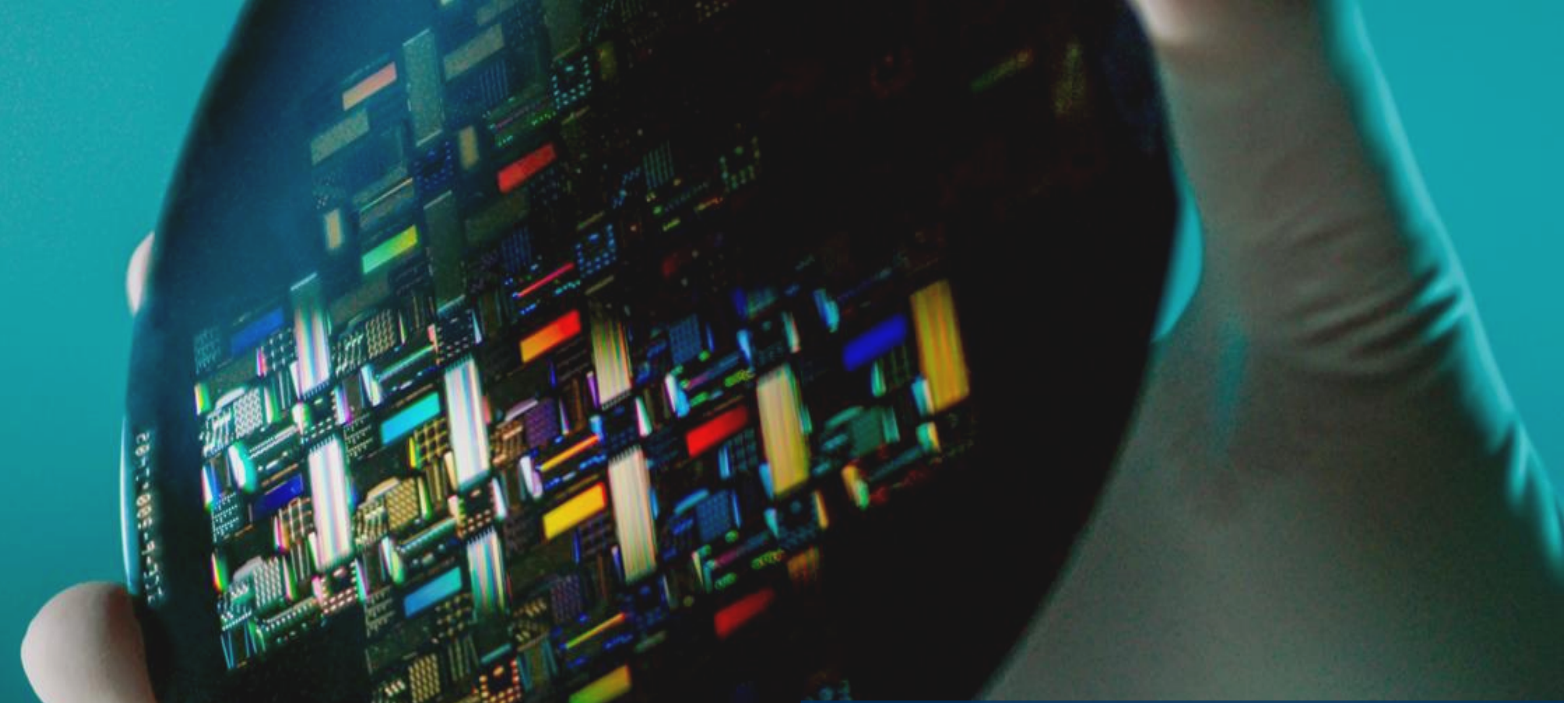


Enabling Innovation: Open access foundry for TFLN-photonic integrated circuits

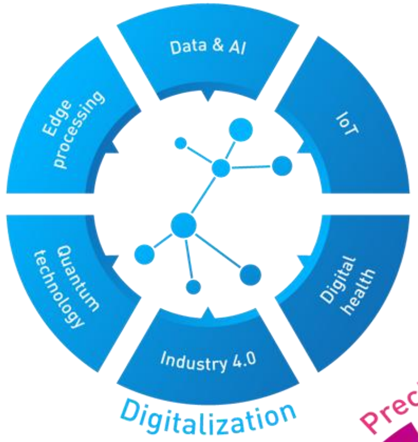
Homa Zarebidaki

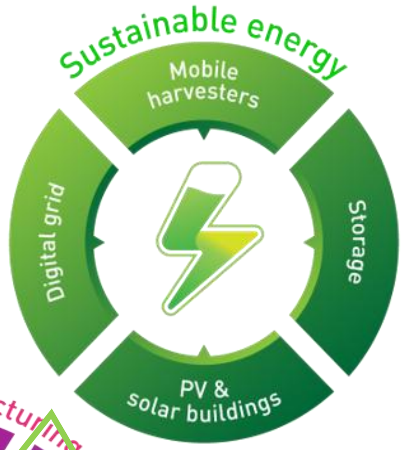
CSEM AT A GLANCE

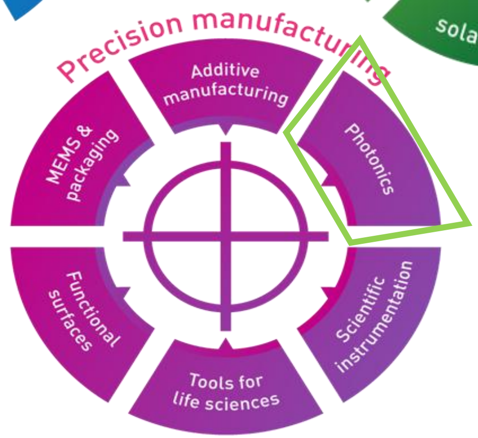
Swiss Center for Electronics and Microtechnology

We are a return-profit, public-private, Swiss technology innovation center.

We enable competitiveness through innovation by developing and transferring world-class technologies to industry







230
INDUSTRIAL CLIENTS / YEAR

203
PATENT FAMILIES

1984
FOUNDED

600
SPECIALISTS in 2023

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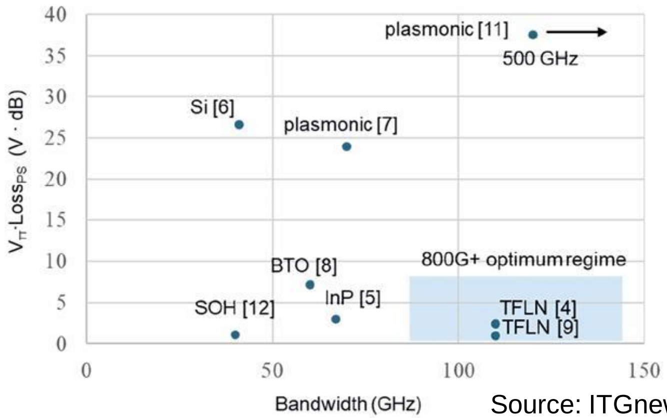
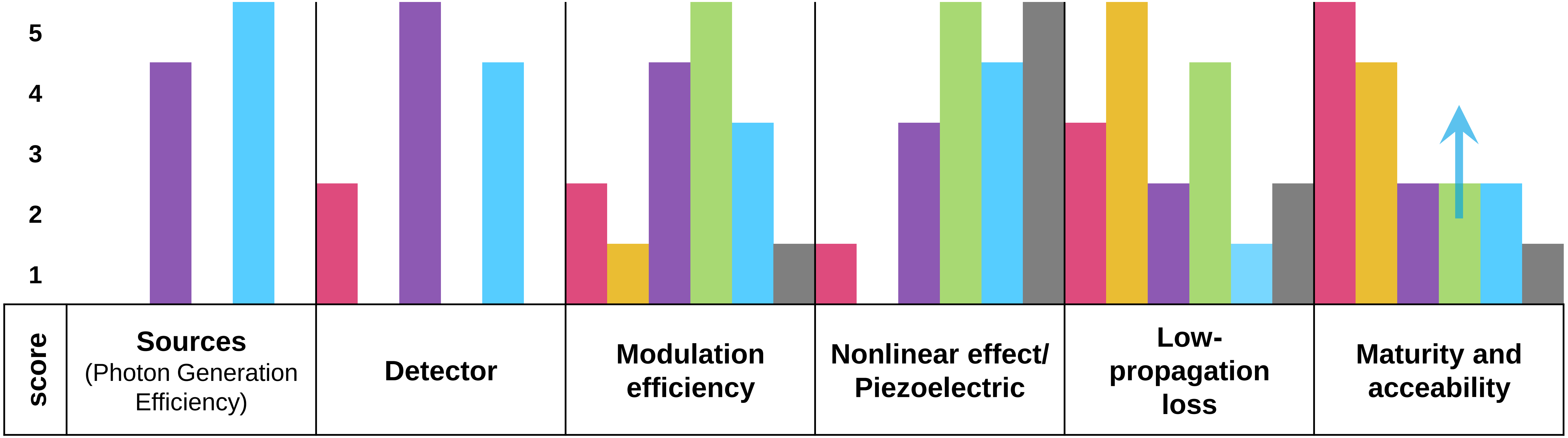
ARE PICS READY TO ADDRESS TECH. NEEDS?!



Source: ITGnews, 02/2025

Si | SiN | InP | TFLN | GaAs | AlN



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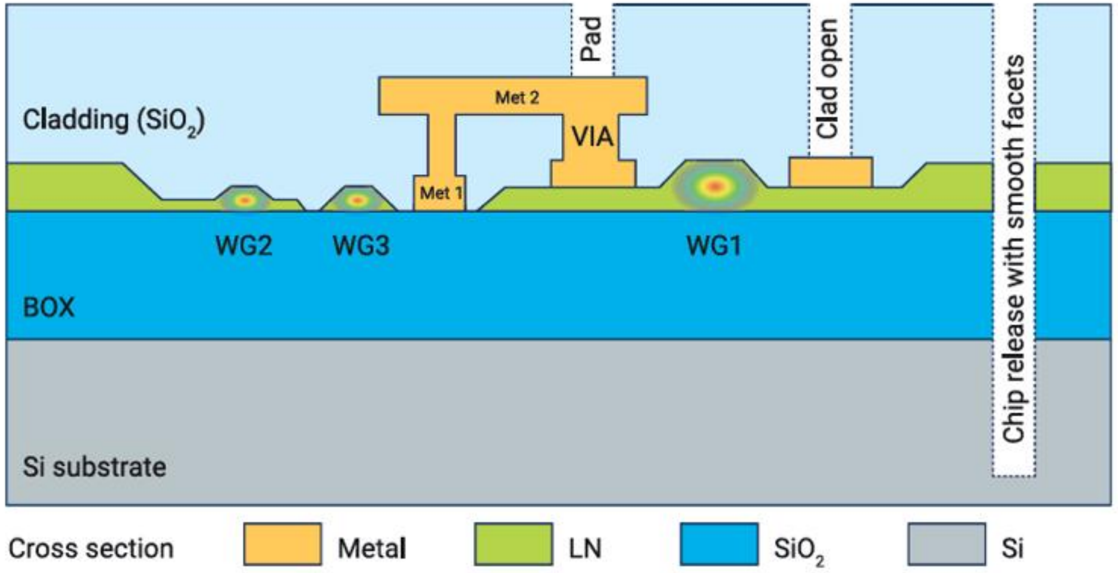
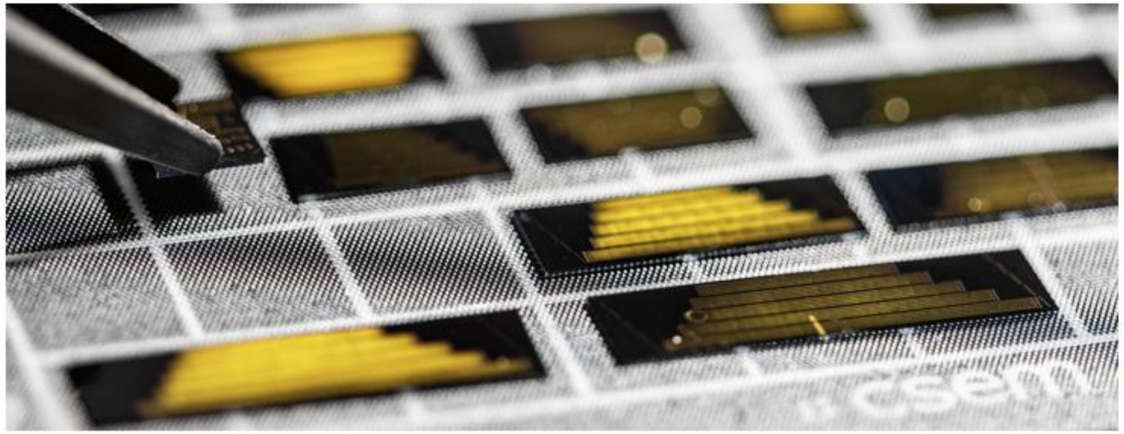
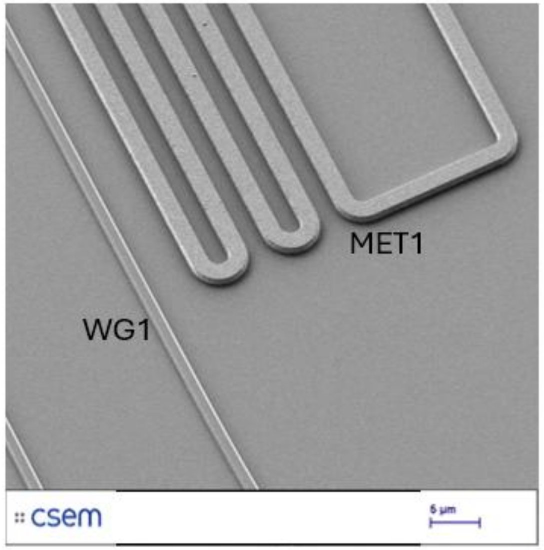
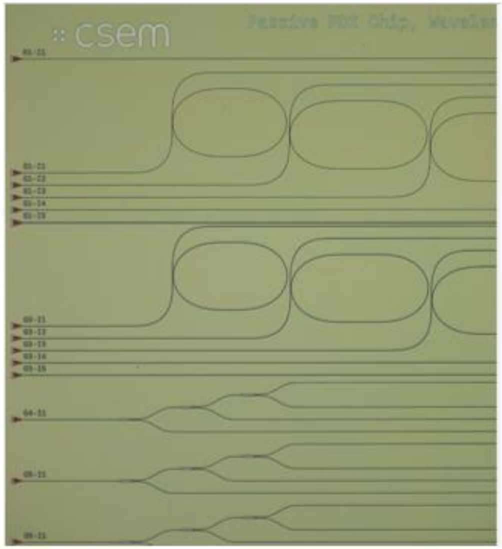
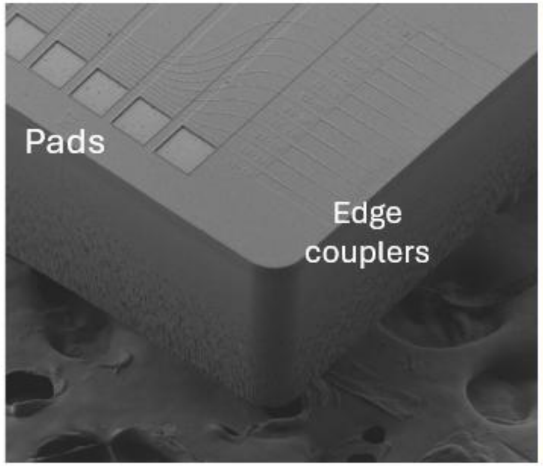
CSEM’S TFLN PIC PLATFORM – OPEN ACCESS

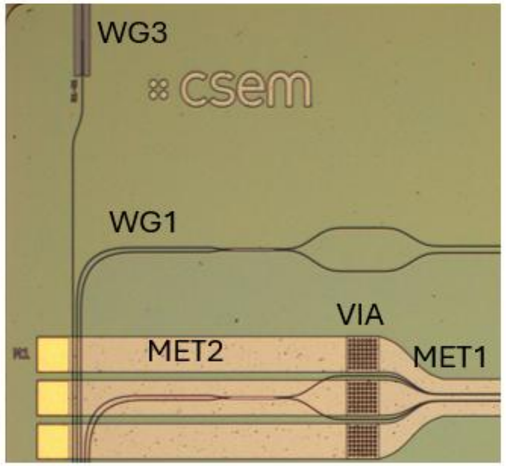






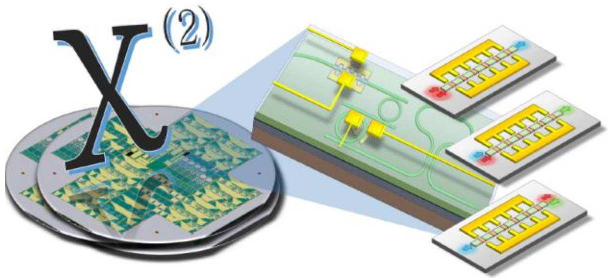


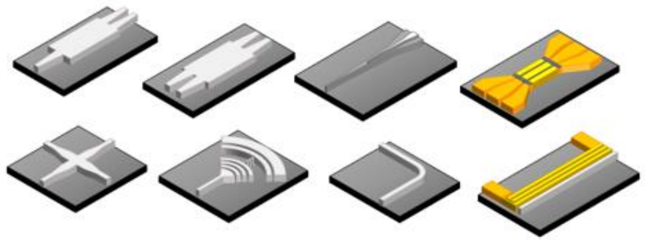




CSEM'S TFLN PIC PLATFORM – OPEN ACCESS

- ❑ Reliable high-yield wafer-scale fabrication process
- ❑ Process Design Kits
  - ✓ C-band
  - ◌ O-band
  - ⌛ 780 nm
  - ⌛ PPLN as a BB

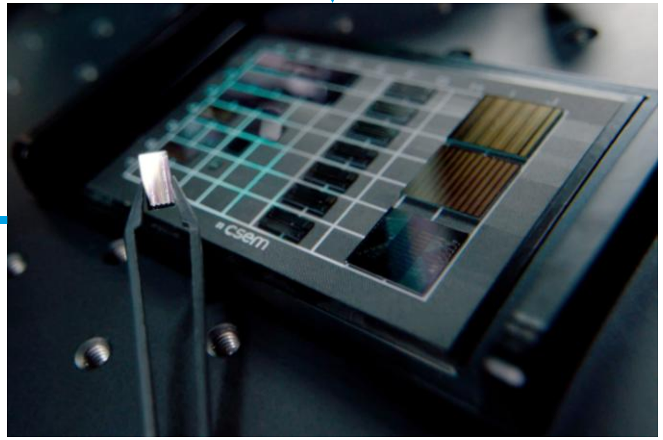




VPIphotonics

LUCEDA PHOTONICS

Nazca design



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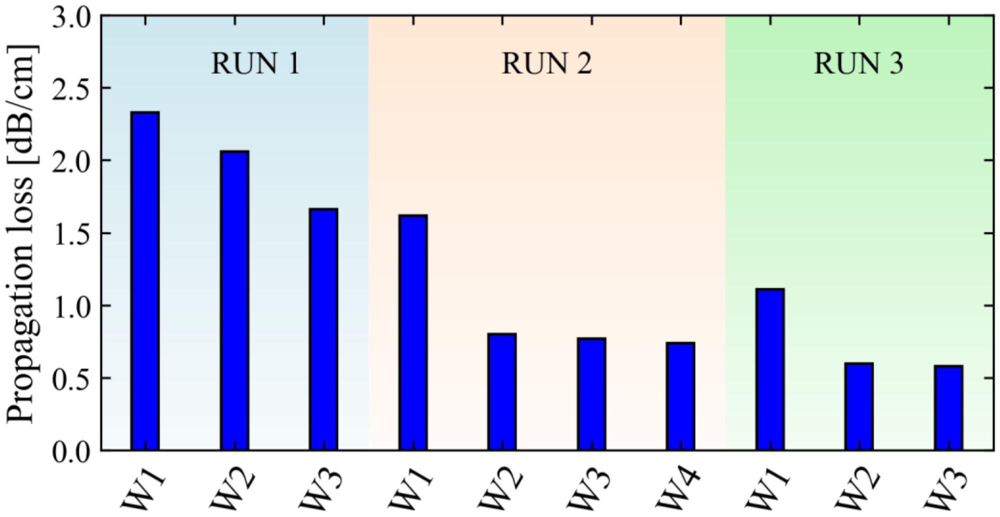
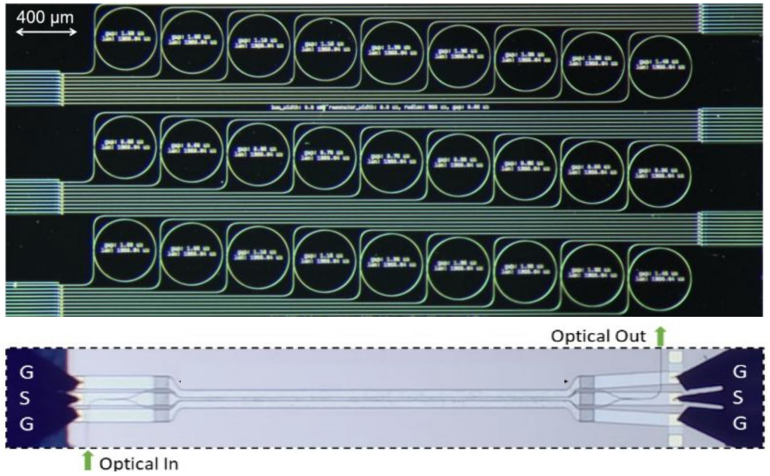
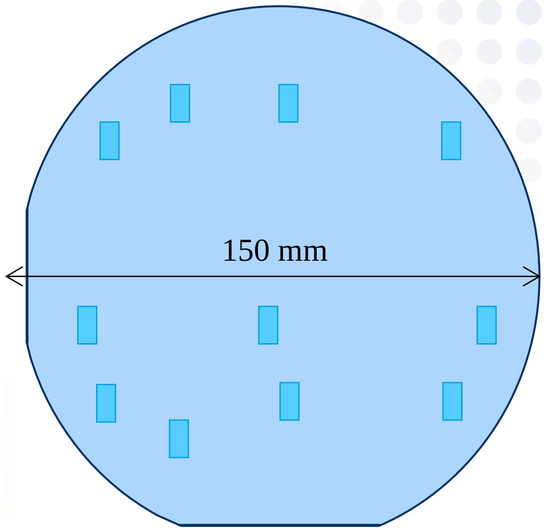
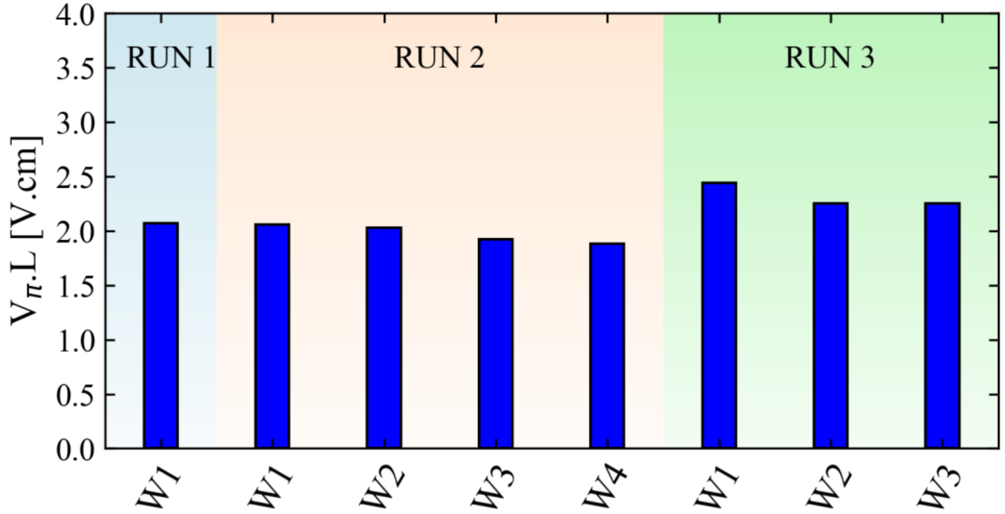
PLATFORM STANDARDIZATION

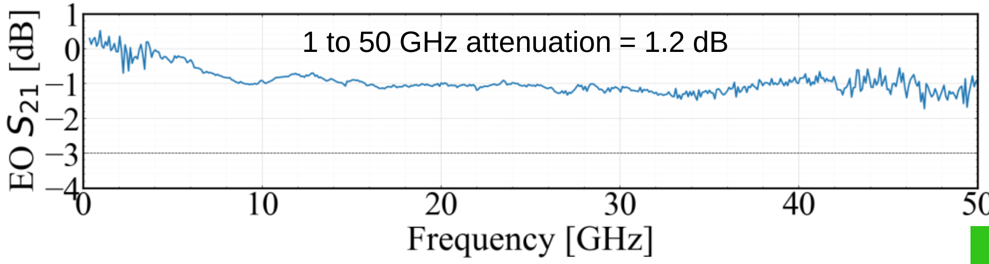




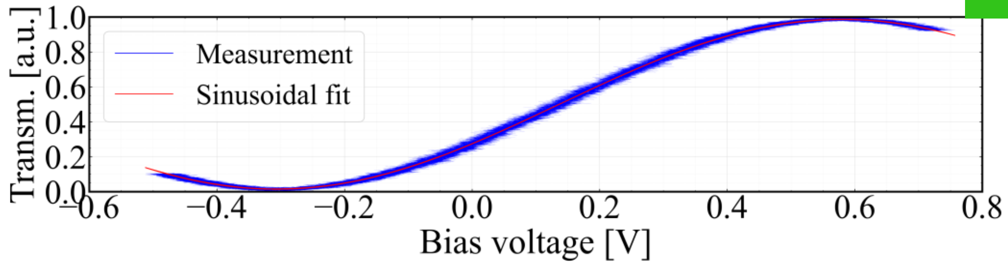




EO BW> 100GHz



V_π< 1 V



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FROM PLATFORM STANDARDIZATION TO THE APPLICATION

TFLN Foundry

ELENA
Lithium Niobate PICs for Europe

PALTTERN

LiDAR/ Neromorphic

LOLIPOP

Telecom

sprinter

Quantum Technology

CLUSTEC

UTP4Q
QUANTERA

QUANTIFY

Standardization

- Monolithic TFLN - PDK
- Hybrid and Heterogeneous
- CMOS integration
- Packaging - ADK

Application oriented

- LIDAR
- Telecom
- Quantum technology
- Sensing

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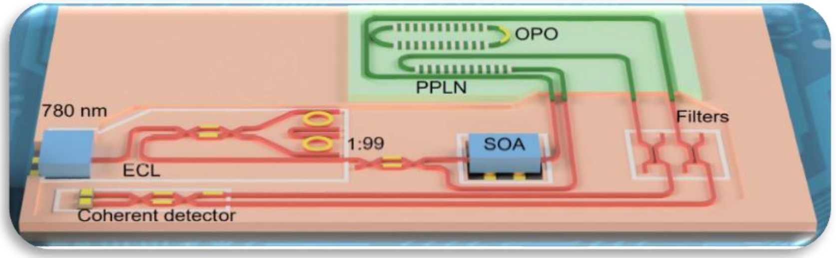
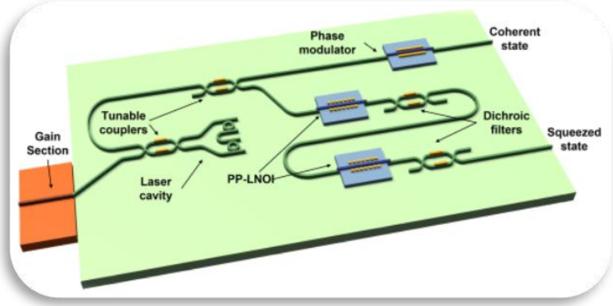
FROM PLATFORM STANDARDIZATION TO THE APPLICATION

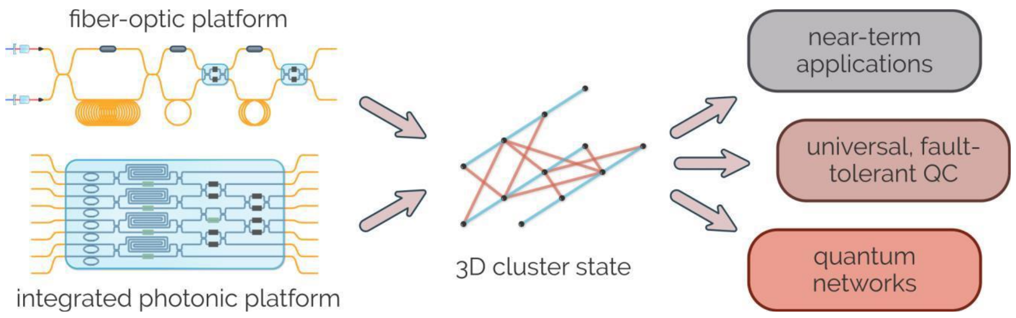
QKD transmitter
(Integration with SiN, Ge, GaAs)



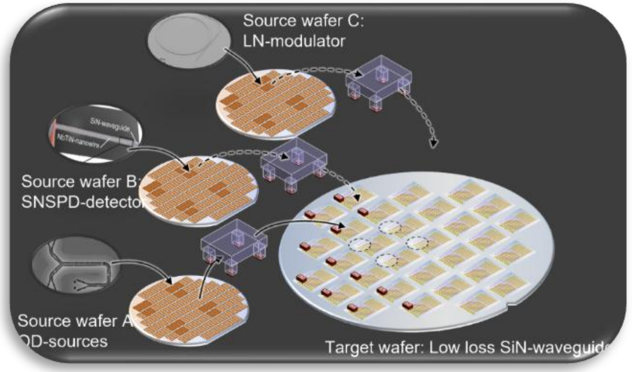
Quantum enhANned phoTonic
Integrated sensors for metrologY



Scalable Quantum computing/
Networking via Continuous Variable
Cluster States



PIC Platform for Quantum Tech.
(MTP of several BB on SiN)



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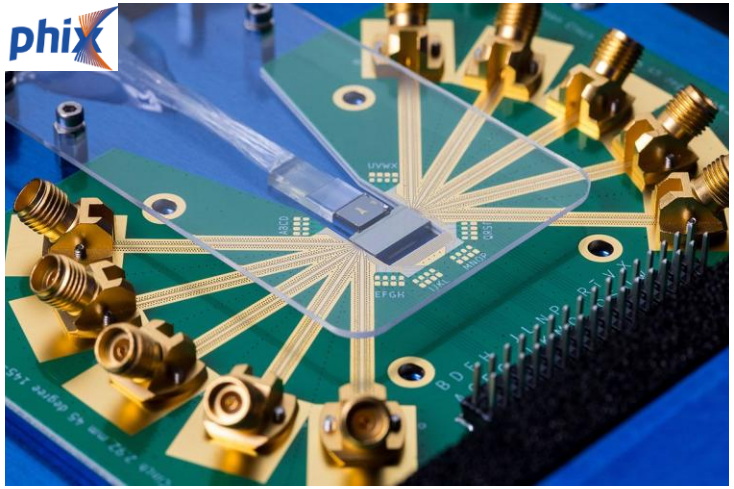
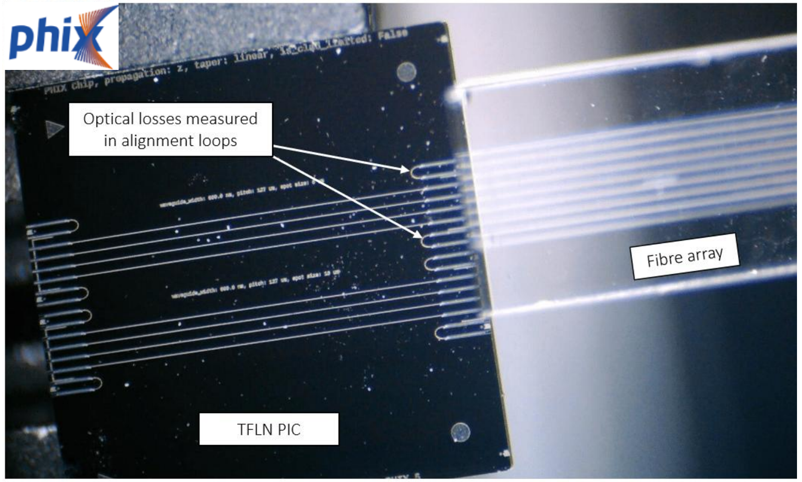
SOME PUBLIC ANNOUNCED ACHIEVEMENTS

High speed EO modulators- hybrid integration with SiN chip on an advanced PCB and assembly



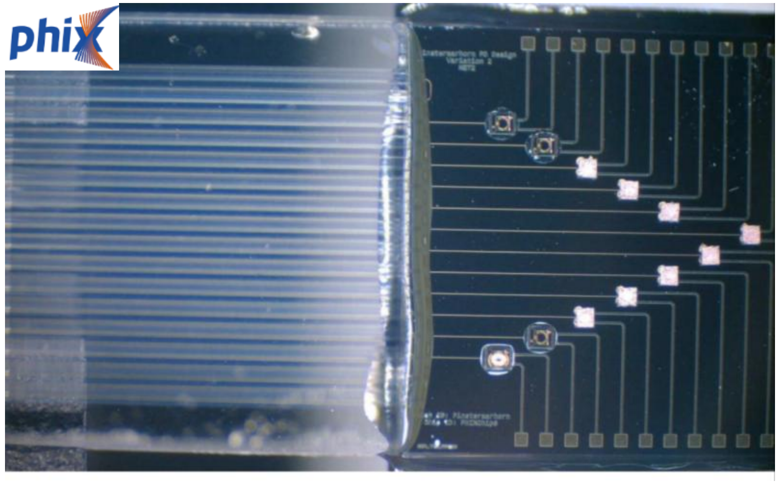
https://horizon-de-lolipop.eu/lolipop-module-assembled-by-phix/

Fiber-to-chip optical coupling losses of less than 2.0 dB per facet, demonstrated by PHIX



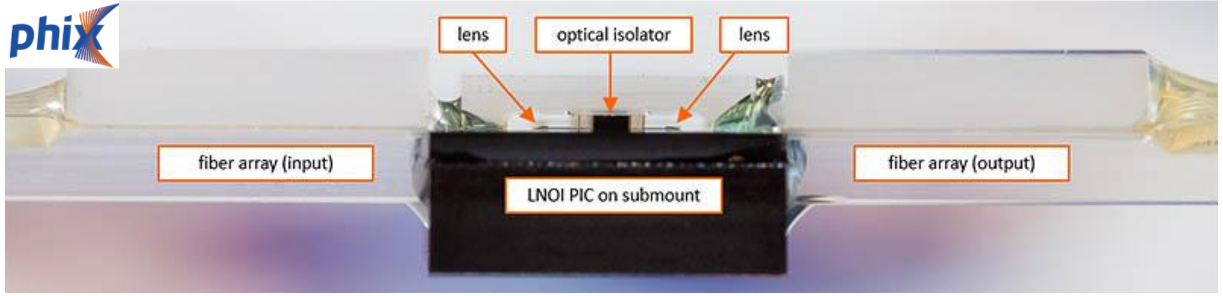
https://pattern-project.eu/key-milestone-achieved-for-facet-fiber-chip-coupling/

Optical assembly of a fibre array with an LNOI test PIC populated with two types of InP photodiodes

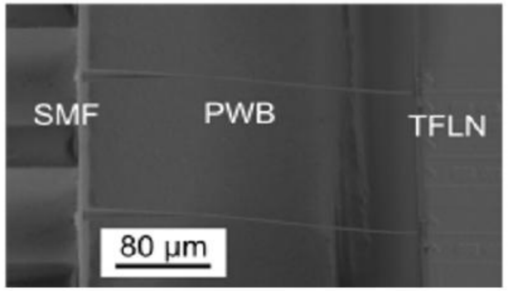


Pattern project, demonstrated by PhiX

SPRINTER Project: Demonstration of a 10GbE Ethernet link over a 5-Km fiber-optic network



https:// www.phix.com/hybrid-integration-optical-isolator-lithium-niobate/



ELENA- CSEM and Vanguard Automation GmbH

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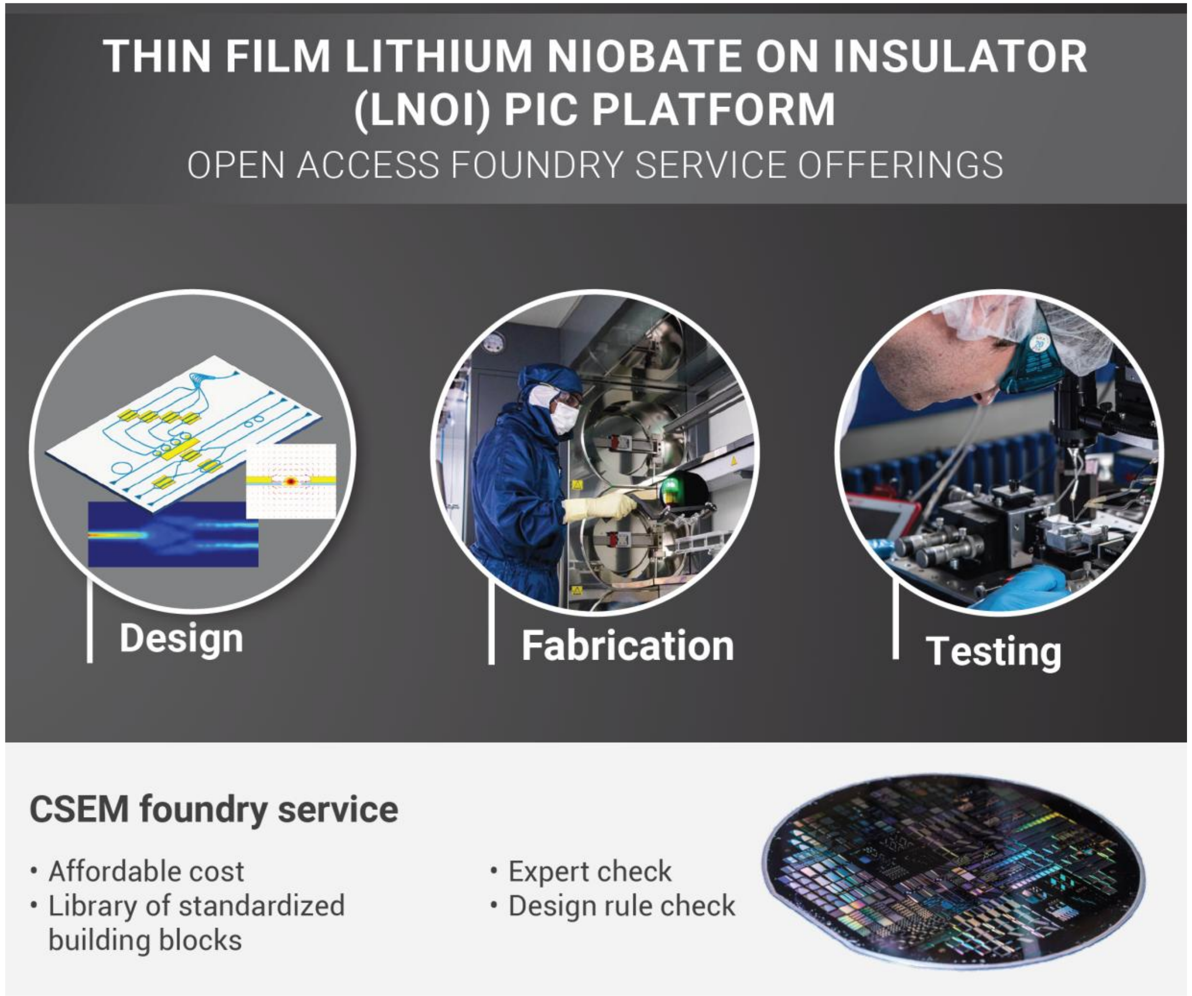
CSEM TFLN PIC PLATFORM: OFFERINGS



- **Strong EU/Global Network/Partnership**
- **Happy customers in 4 continents**

Our Partners

WHY WORK WITH US

- MPW and custom RUNs (3-4 RUNs / year)
- ISO9001-certified 150 mm wafer foundry
- Independent and innovative foundry
- High level of confidentiality

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EMPOWERED BY csem ACCELERATE PROGRAM

SWISS MADE

Technology Transfer


Source: CSEM

CCRAFT

F O U N D R Y

Production-Grade Thin-Film Lithium Niobate Photonic Chips

- 6 years of experience on industrial scale tools
- Tested, derisked PDK, continuously growing
- MPW and dedicated RUNs → 2025
- Roadmap to High-volume production

foundry@ccraft.com

FACING A CHALLENGE?

LET'S TACKLE IT TOGETHER!

A big Thanks to the TFLN PIC team at CSEM

FNSNF
FONDS NATIONAL SUISSE
SCHWEIZERISCHER NATIONALFONDS
FONDO NAZIONALE SVIZZERO
SWISS NATIONAL SCIENCE FOUNDATION
Innosuisse
BRIDGE
HORIZON 2020
Horizon Europe
THE NEXT EU RESEARCH & INNOVATION PROGRAMME (2021 – 2027)
European Commission

csem

FACING THE CHALLENGES OF OUR TIME