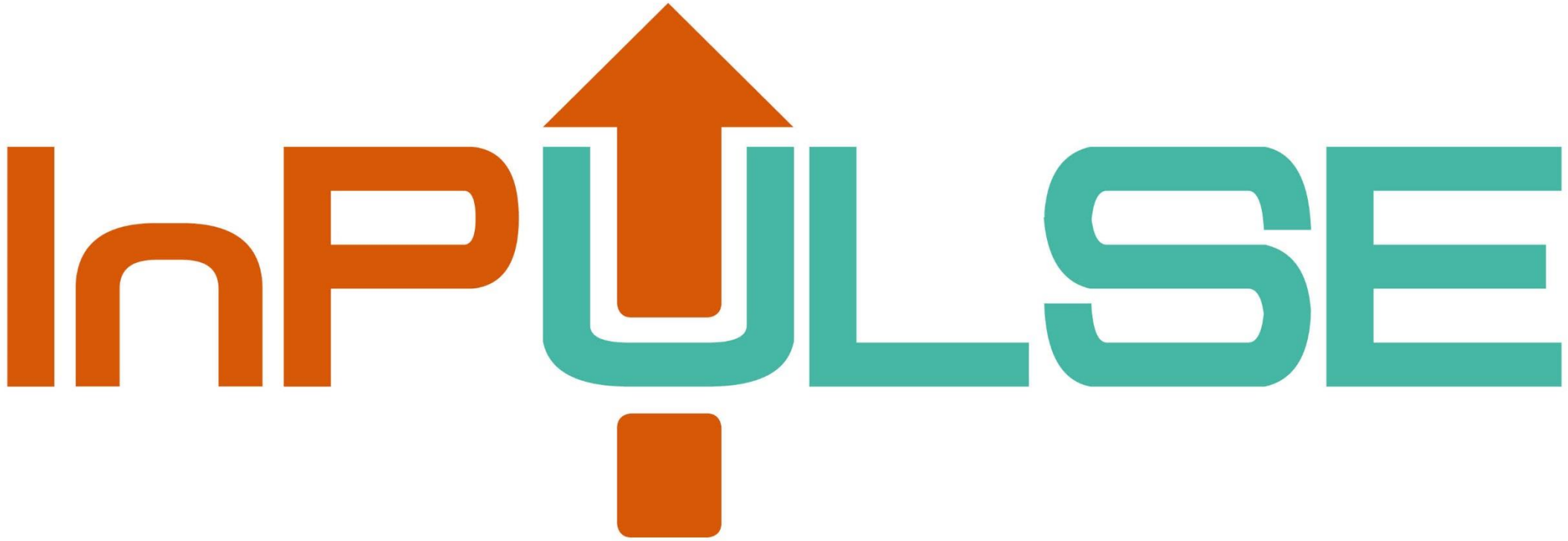

Indium-Phosphide Pilot Line for up-scaled, low-barrier, self-sustained, PIC ecosystem

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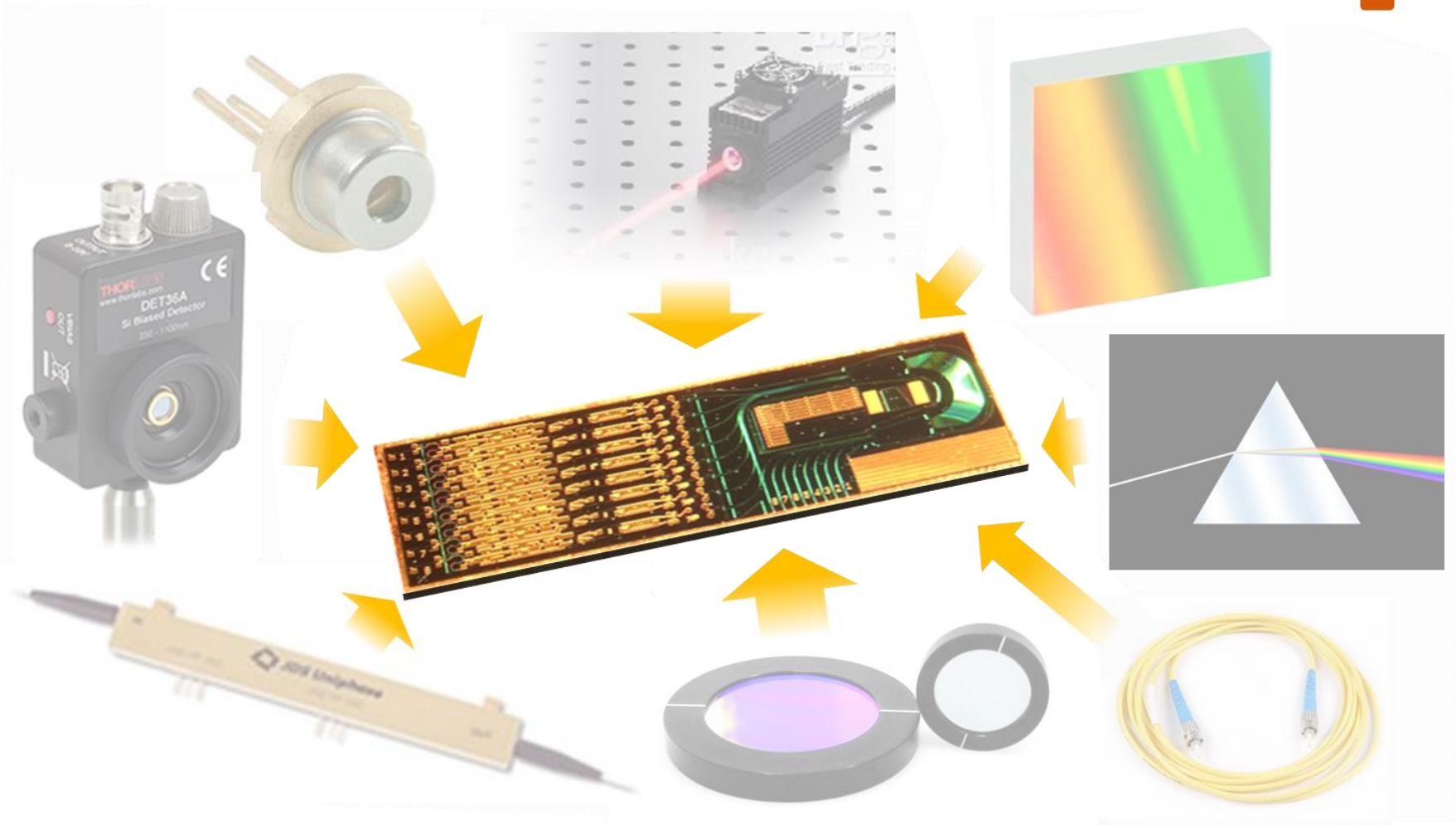
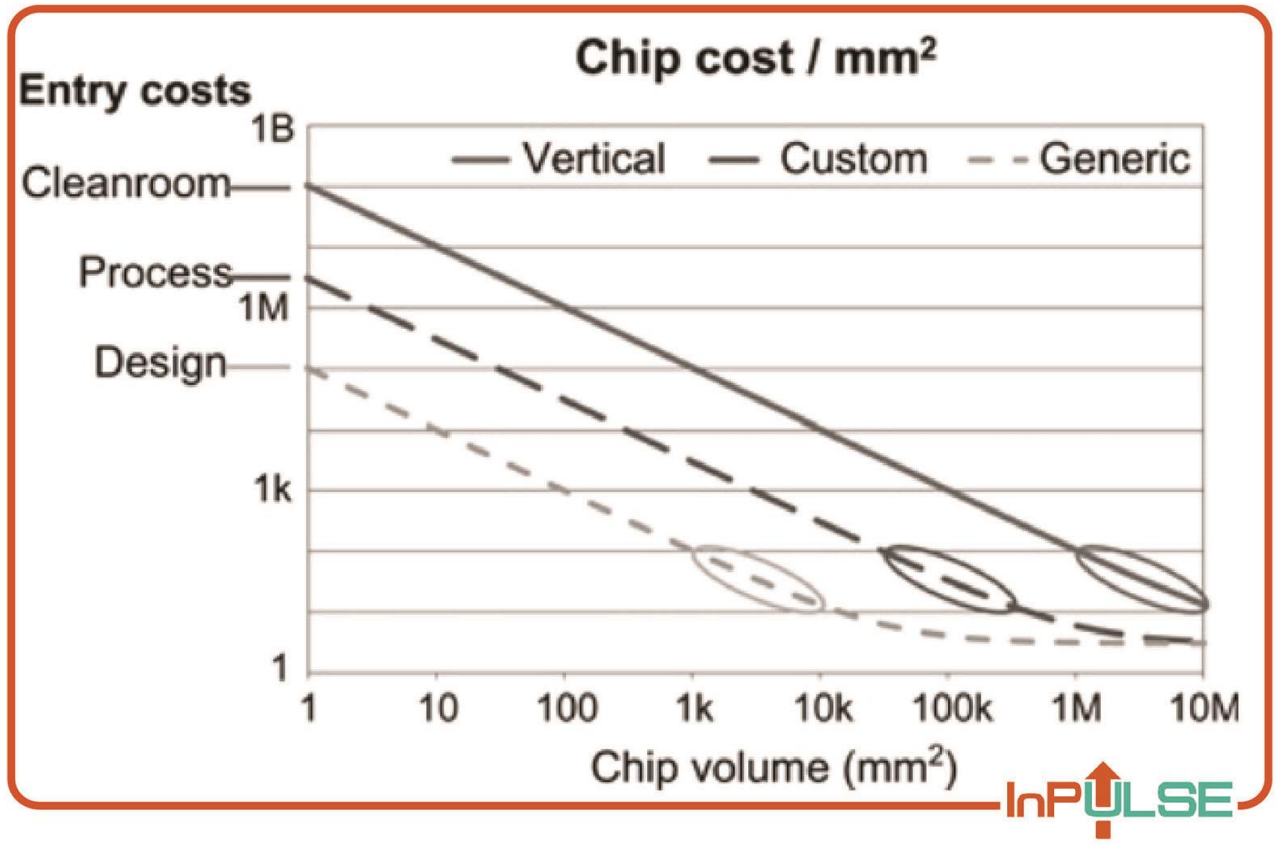
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824980

Photonic integration – optical chips



Value proposition

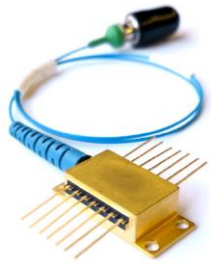
InPulse **enables** fabless businesses to transition from first concept experimentation to **industrial prototype and pre-production** with shared technology investments



From prototype to pilot production

Idea | Research | Prototyping | Piloting | Manufacturing

TRL1 → TRL2 → TRL3 → TRL4 → TRL5 → TRL6 → TRL7 → TRL8 → TRL9



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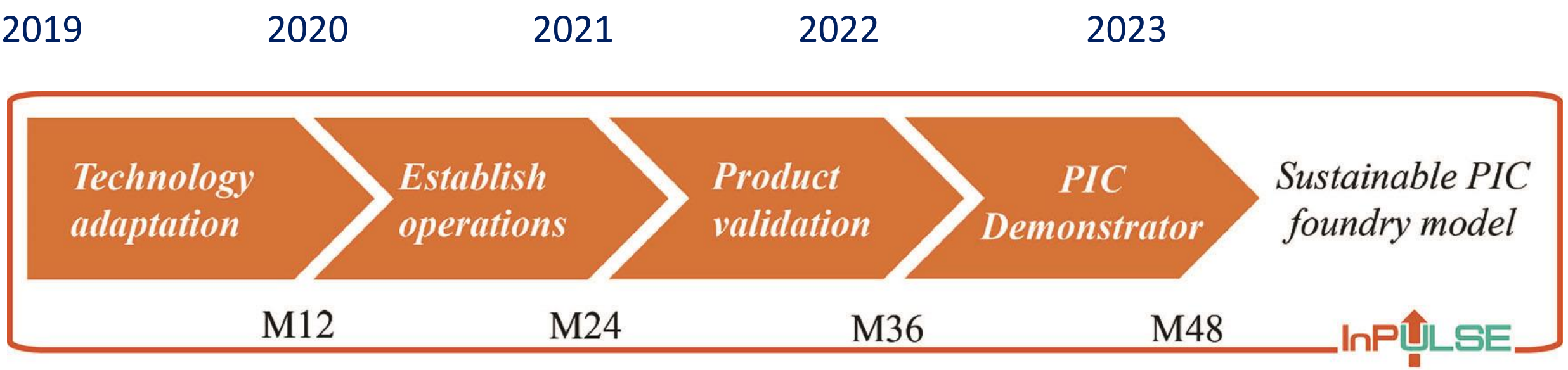
Integrating the Photonic Ecosystem

Fragmented Supply Chain

InPulse in a nutshell

1. Create **manufacturing process design kits** by using smart testing to efficiently collect manufacturing statistics
2. **Increase capacity for open access** industrial prototyping and systematically improve performance of the building blocks
3. Validate the pilot line with two experienced Participants to validate and stretch the platform **performance beyond state of the art**
4. Demonstration through tens of external user designs
5. Establish a **sustainable business model** with a resilient industrial eco-system to ensure continued open-access after four years
6. Support businesses as they scale to volume production

InPulse Project Phasing



Stabilising and optimising processes

Manufacturing PDKs developed

Two validation circuits taken to TRL7

New demonstrator circuits in development

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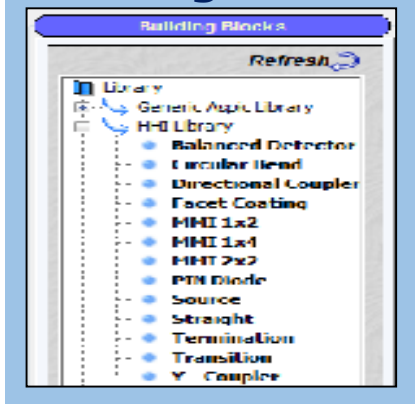
Design automation

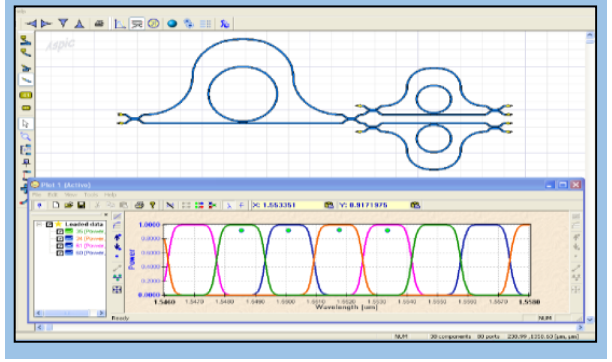
Design Kit



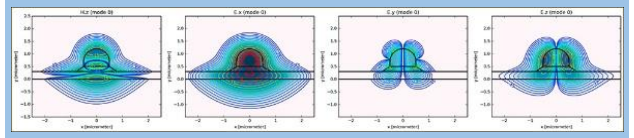
Designer

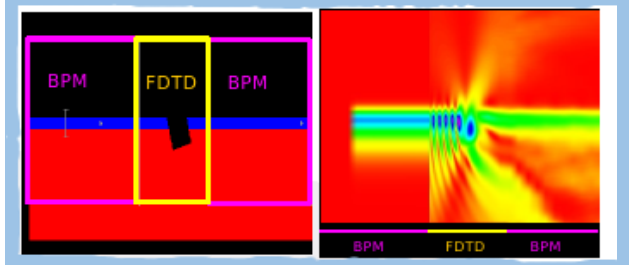
Foundry

Circuit Simulator

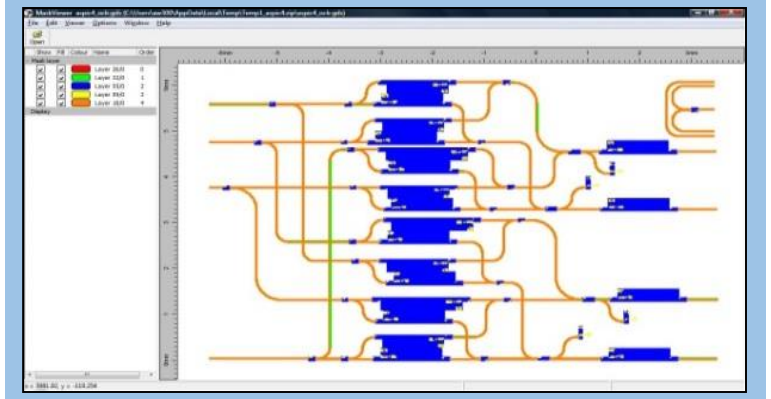


Physical Simulations



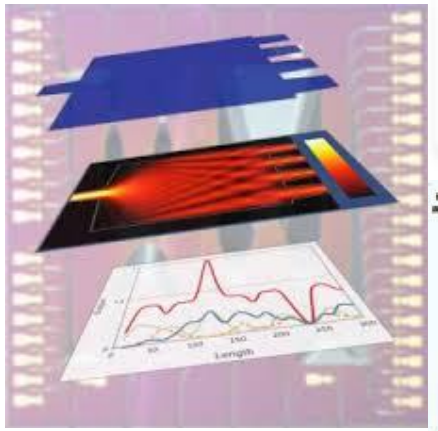


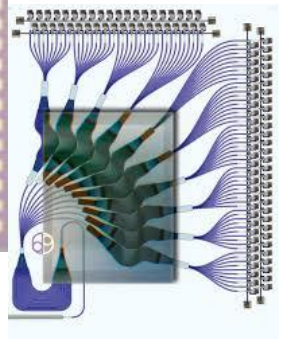
Mask Generator

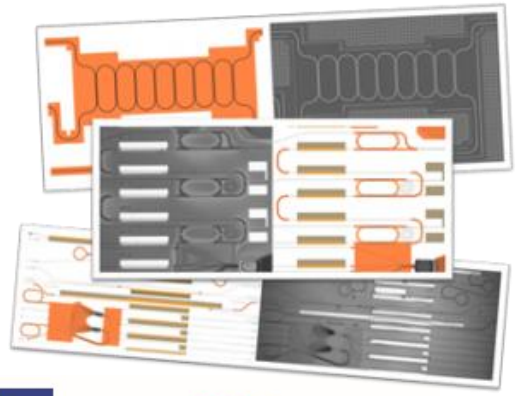


Faster and fewer design cycles

IP development







Commercial Design houses:

- Photonic IC
- Building Blocks for PIC designers
- PDKS for foundries
- Generate IP on top of generic technologies
- shorten concept to prototype time

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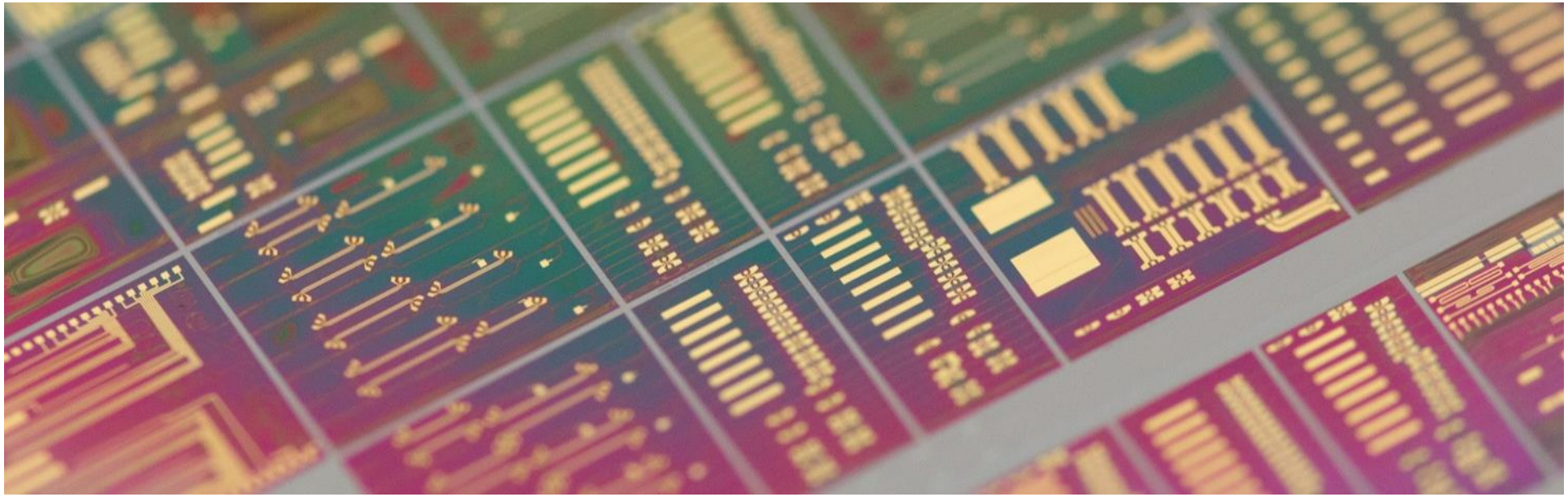
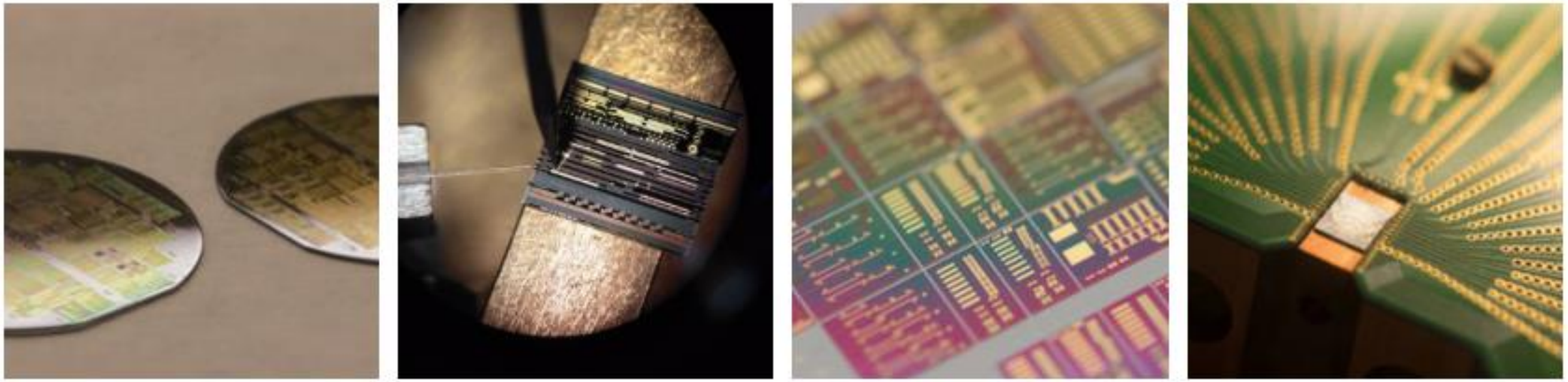
Scaling production



- Three complementary InP PIC fabs for second sourcing
- Reduced time in fab
- Higher frequency wafer starts
- Higher predictability, high performance metrics

Measurement automation

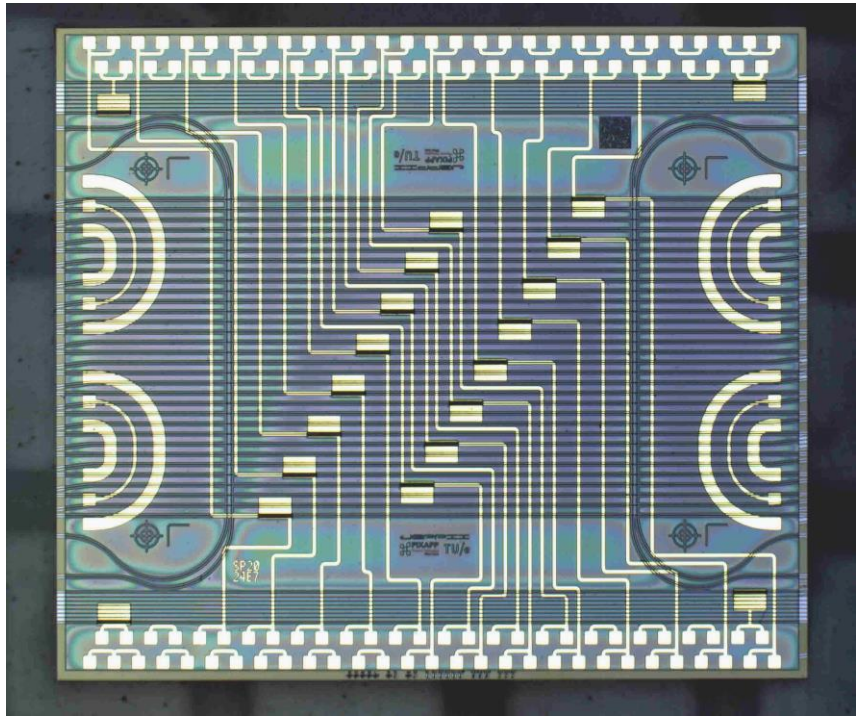


- High throughput test to create manufacturing grade PDKs
- Tight coupling to design tools through standardised building blocks
- Test-as-a-service offer for lab-less designers

Packaging and systems integration

Reference designs to couple

- PICs to package
- Test to design
- Measurement to process centering



InPULSE

ACT PHAST4.0

ePIXfab

PIXAPP Photonic Packaging Pilot Line

PhotonDelta Integrated Photonics Ecosystem

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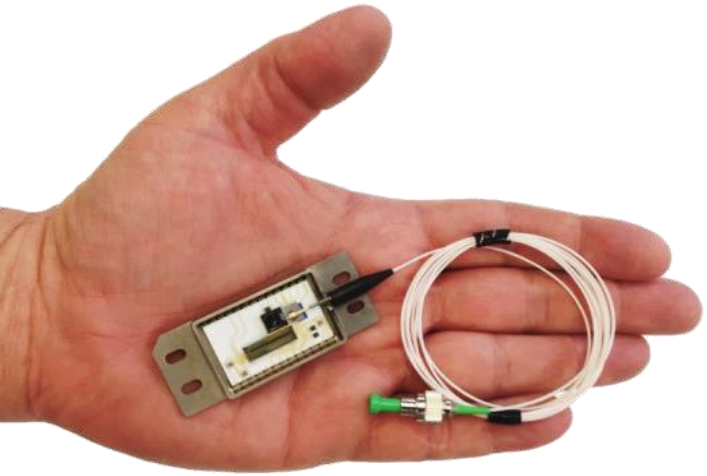
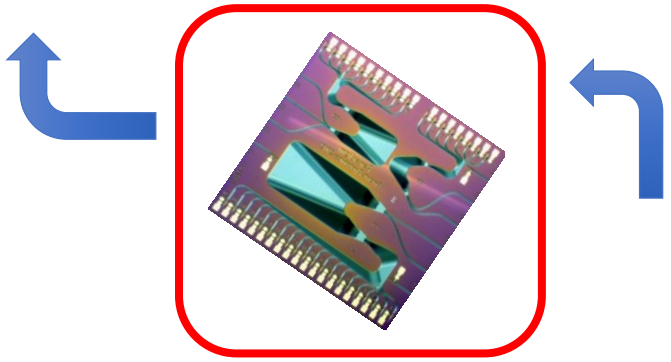


PICs in space – fiber sensors structural health, interferometric

Technobis group



- low SWaP
- low cost
- hybrid integration of optics and electronics
- improved thermal and vibration stability
- improved reliability

	Co-60 (1MeV γ)	Proton (MeV)
Max rate	23 Gy/hr	10^9 p/cm^2/s
Max dose	1100 Gy	10^{12} p/cm^2

- SOA led – 20-30% attenuation (acceptable)
- AWG – phase shift and attenuation below measurement uncertainty

ESTEC test facility Co-60: alignment of dies and package for live-monitoring during irradiation

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III-V lab

SMART PHOTONICS Independent InP Foundry

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EPIC European Photonics Industry Consortium

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