

# Joint European Platform for InP-based Photonic Integrated Components and Circuits

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## Objectives

- JePPIX aims to create a solid infrastructure, offering access to Indium Phosphide based technology for proof of concept, prototyping and, long term, large volume manufacturing.
- JePPIX is working to establish a Generic Foundry operation in an industrial fab. for fabrication of application specific InP Integrated Circuits (ASPICS).
- JePPIX aims to achieve large reductions in access costs for its users, fundamentally changing the cost structure of the industry.

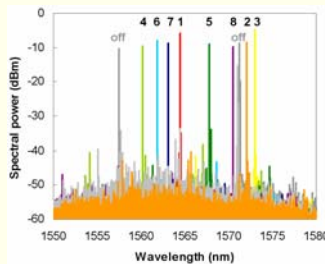
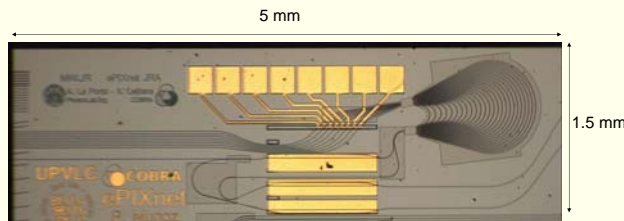
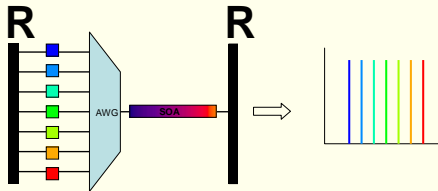
## Some background

- Access costs to existing custom InP fabs are very high.
- A generic fab runs a fixed process with documented design rules.
- It is open to all.
- It is application blind.
- Generic fabs do not exist for InP-based photonics at the moment.

## Highlight: Example of fabricated circuits: Multi-Wavelength Laser

- A Multi-Wavelength Laser capable of nanosecond switching speeds
  - SOA Gain
  - AWG
  - Passive waveguides

X Leijtens et al. LEOS PD'08  
P Muñoz Muñoz - This meeting

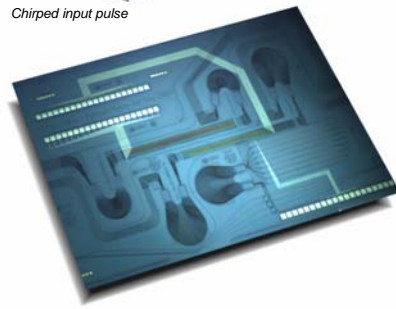
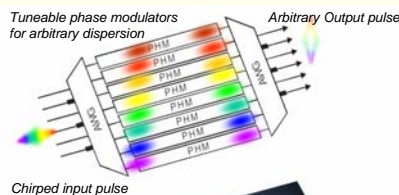
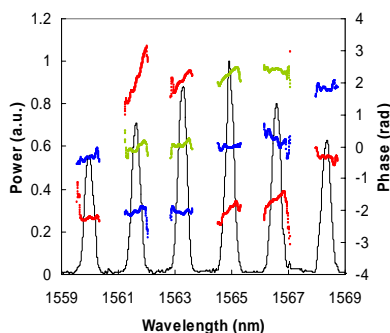


## Impact

- JePPIX aims to provide Europe with a strategic advantage in photonic integration
- What can JePPIX achieve?
  - Market restructuring around a generic fab capability
  - Stimulate Design House specialists skilled in ASPIC design
  - Growth in wafer volumes for fabs
  - Reduced cost of entry into the technology for new users
  - Cost reduction for all low to medium volume fab users
  - Rapid prototyping and validation stages
  - Proven reliability
  - Accessibility to technology (very good for EU countries not strong in InP based technology at the moment)
  - Training and Infrastructure support
  - Main beneficiaries will be SMEs and fabless companies

## Highlight: Example of Fabricated circuits: Pulse Shaper

- Spectral phase control of short optical pulses ~1550nm
- Complete arbitrary pulse generator is possible
  - Phase Modulator
  - Passive Waveguides
  - AWG.



Martijn Heck, Pascual Muñoz Muñoz et al., LEOS '07  
and J. of Quantum Electronics, p370 QE44(4) April 2008

## Methodology

- Establish a Generic Platform Process from elementary process building blocks:-
  - Gain Block (Semiconductor Optical Amplifier)
  - Passive Waveguide – deep and shallow
  - Deep to Shallow transition element
  - Phase Modulator
  - DBR Grating

on which more complex sub-circuit elements can be built:-

- AWG (Arrayed Waveguide Grating)
- Laser
- Mach-Zehnder modulator

and Application Specific Photonic Integrated Circuits (ASPICS).

- JePPIX is working with its industrial partners to address how to move the platform onto an industrial process which can provide
  - high performance
  - reduced access costs
  - which is self sustaining in the long term
  - proven long term device reliability as required by commercial users