

# EPIC Online Technology Meeting on Quantum Communication and QKD



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iXblue Photonics  
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# Quantum communication and QKD

## European ecosystem



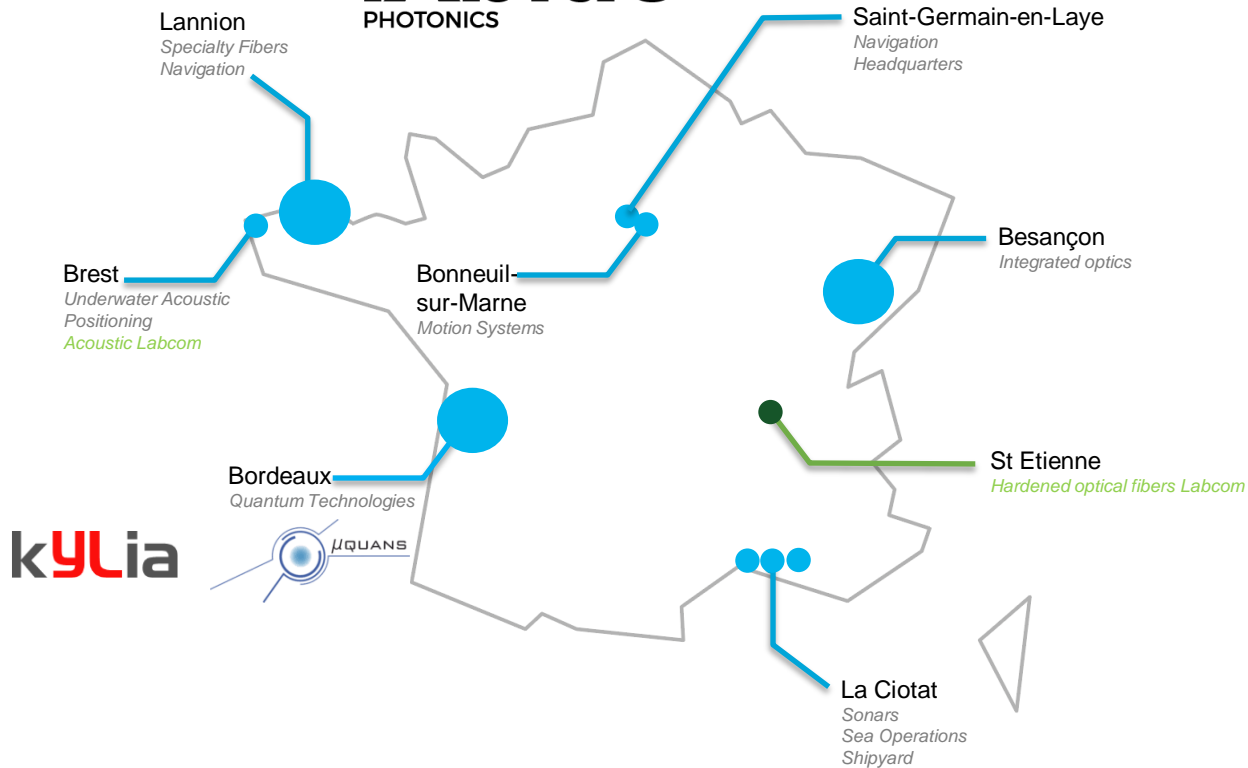
- Strong academic community
- Strong photonics industry
- Increasing demand from governments and the European Union
- Demand for European and mature systems

## Requirements

- Performant hardware:
  - some similar to laser communications, with a variety of modulation/encoding formats
  - focus on mastered noise**, linearity and distortion properties rather than ultra-high rate
  - some very specific to a quantum protocol (quantum sources, detectors, memories...)
- Efficient signal processing
- Cybersecurity standards, common criteria, EU rules
- Telcordia or/and Space qualified components and systems
- Trusted supply chain

# iXblue Photonics: from components to systems

## iXblue PHOTONICS



**9**  
**industrial**  
**sites**



**100%** of R&D  
and production  
as well as  
**90%** of suppliers  
located in France



**Joint**  
**Research**  
**Laboratories**

# iXblue Photonics: from components to systems

## Components

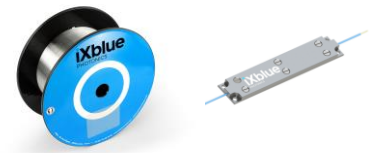
Phase, Amplitude, IQ Modulators  
(COTS, Space model)



Modulators Matching components  
(RF Amplifier, MBC)



Fibers  
(Fiber, patch-cord, FBG)



## Turn-key devices and systems

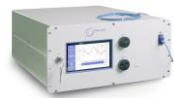
μoptics and passive optics integration



ModBox  
(CS-RC-SSB)



Lasers  
(Narrow-linewidth, high-power)

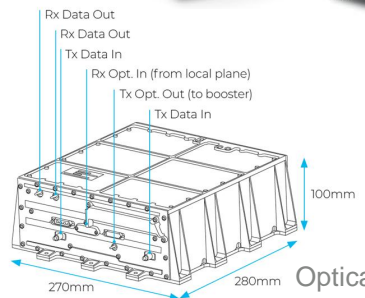


## Instruments

Absolute Quantum Gravimeter



Cold atom frequency metrology



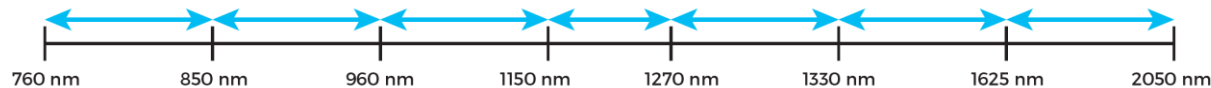
Optical Transceivers  
for Space Communications

# Some Quantum Communication enabling products

Component level: LiNbO<sub>3</sub> Amplitude modulators

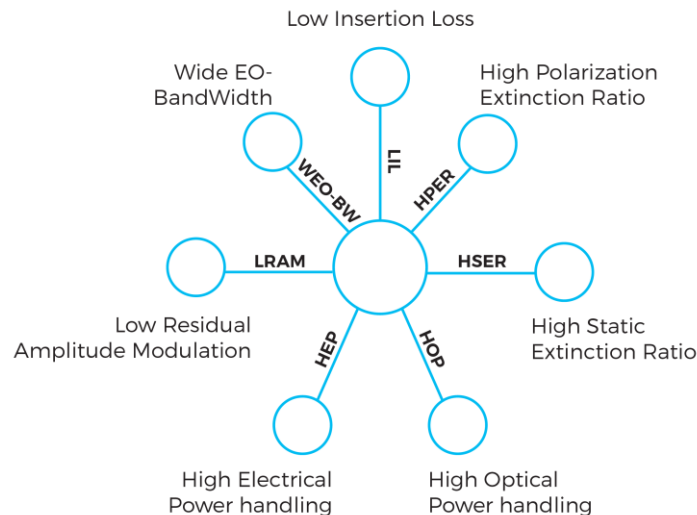
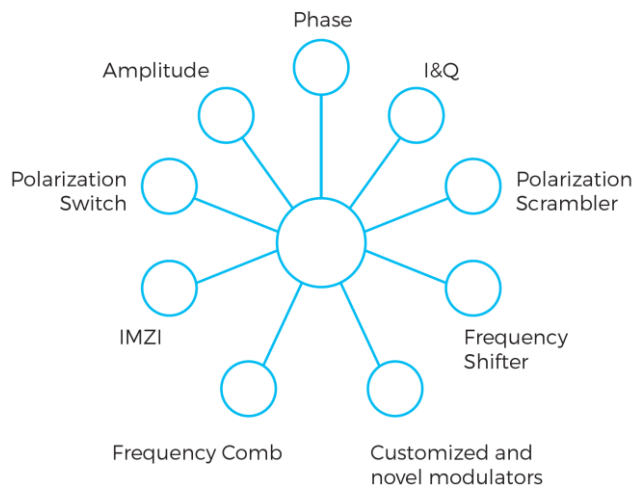


## Operating wavelength



## Key Features

### Modulator types



# Some Quantum Communication enabling products

Subsystem level: Micro-optical assemblies

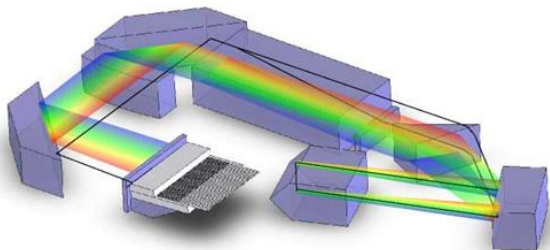
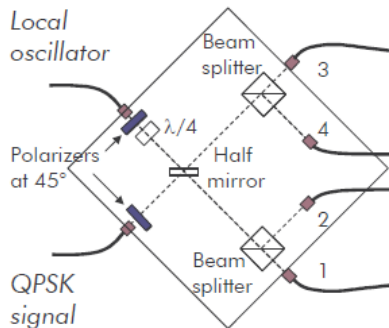
Stable and optimized performances  
on micro-benches

Delay line interferometers

Telecom multiplexers

90° optical hybrid

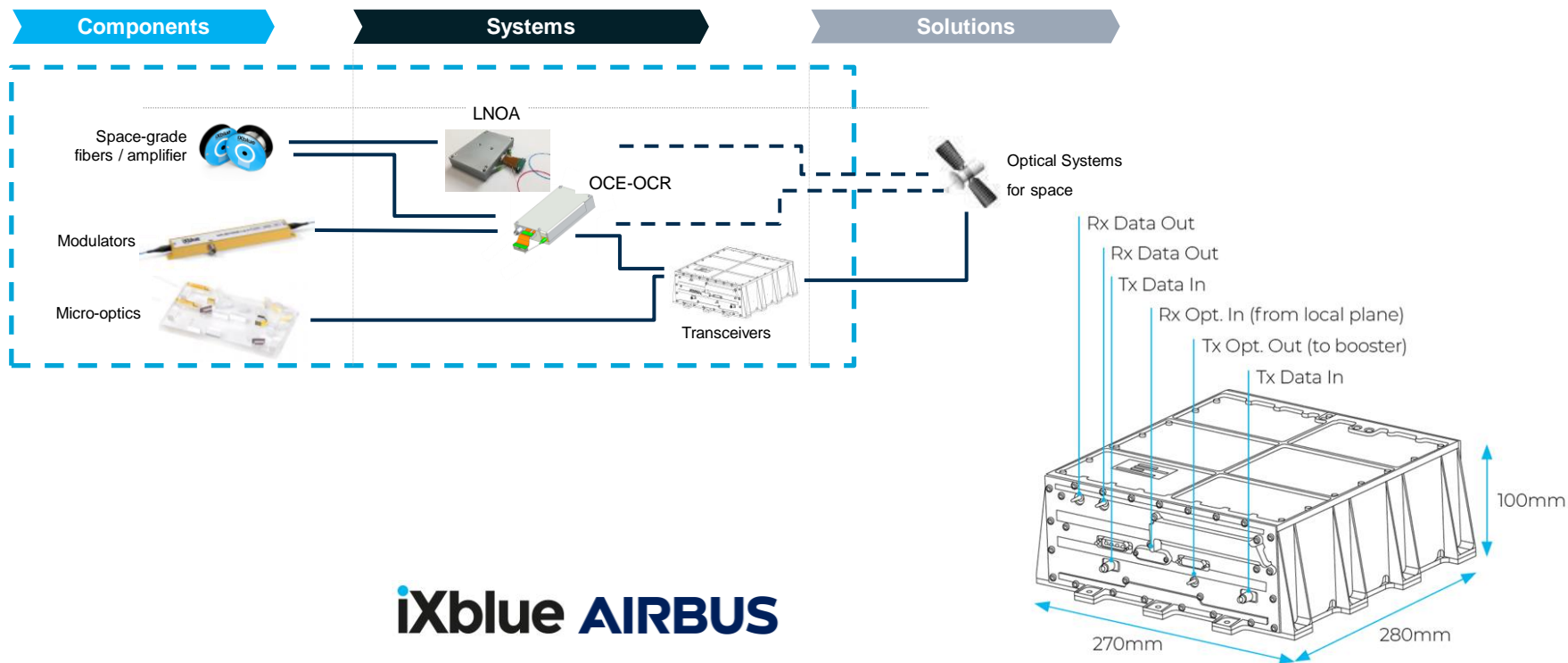
Custom passive or active layouts



COH dimensions: 70 x 50 x 10 mm<sup>3</sup>

# Some Quantum Communication enabling products

System level: Spaceborne optical transceivers



**iXblue AIRBUS**

# OpenQKD

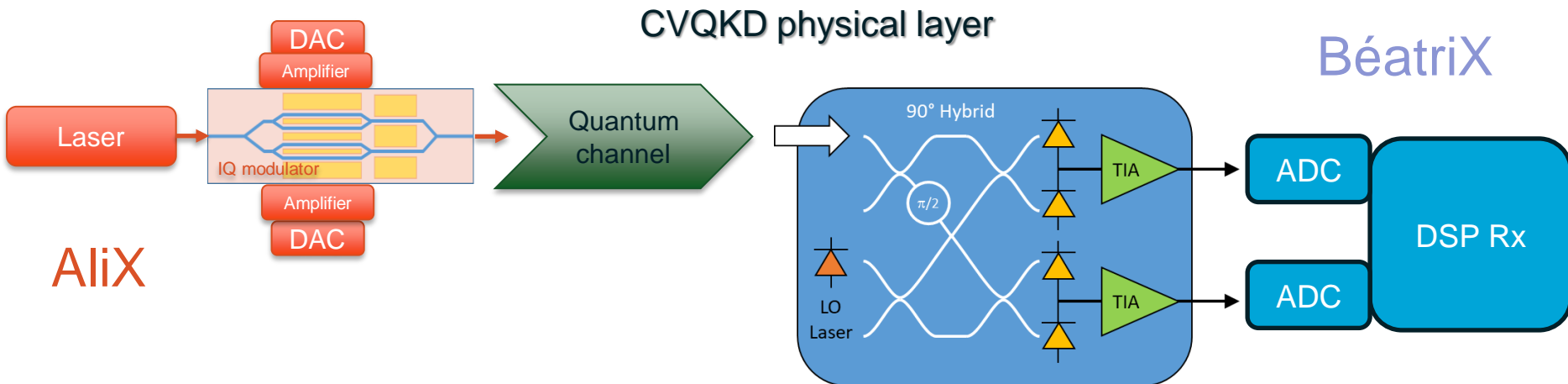
Next-generation QKD systems

## CVQKD systems development with CNRS

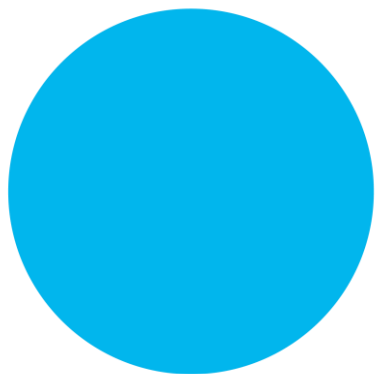
- use standard telecom components and DSP techniques
- high-rates at metro scale
- cost-effective

### Needs:

- detectors
- random number generators
- networking and high-speed electronics
  - hardware and software
- efficient error correction
- infosec expertise







**Thank you**  
**([photonics.ixblue.com](https://photonics.ixblue.com))**