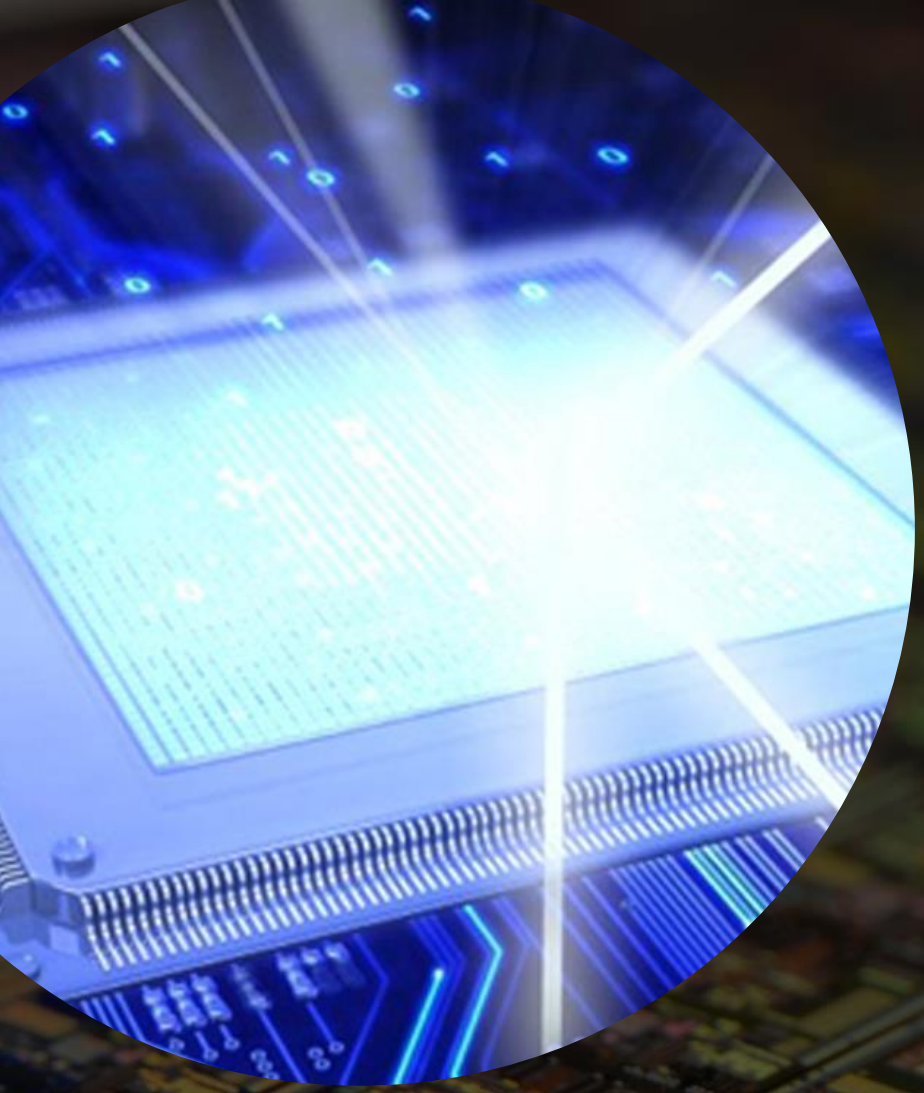
Pockels-enhanced ultra-efficient photonic chips

Swiss Photonics

June 2021

Lumiphase



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We create novel communication chips boosted by a unique optical crystal

to enable our customers to provide faster networks that consume less energy

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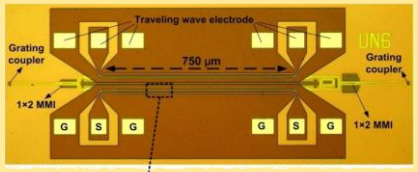
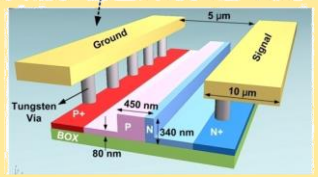
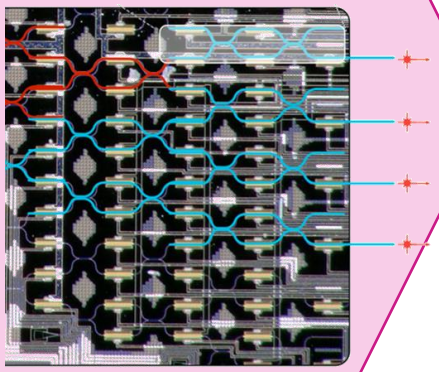
High-speed communication



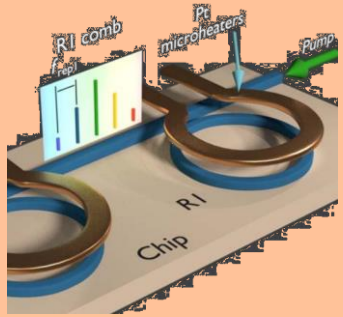


Photonic accelerators

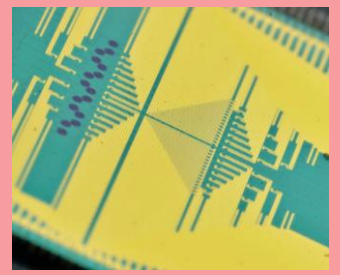


Efficient on-chip electrical phase control

Integrated sensing



Novel computing paradigms



Xiao, X. *et al. Opt. Express* (2013); Cardenas, J. *et al. Sci. Adv* (2018); Shen, Y. *et al. Nat. Photonics* (2017); Wang, J. *et al. Science* (2018), Bogaerts et al. *Nature* (2020)

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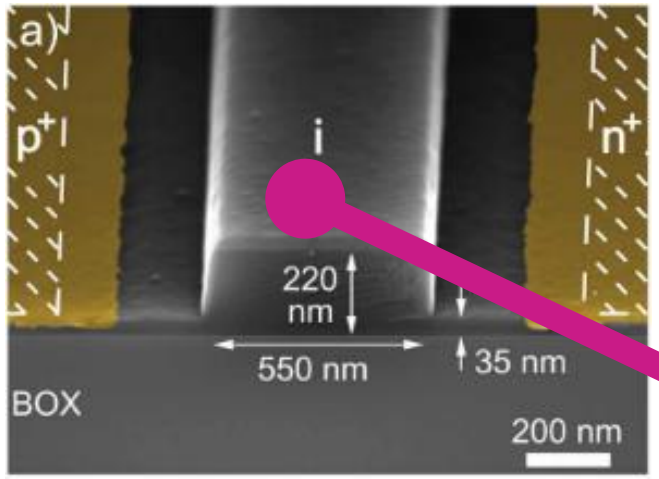
Plasma dispersion effect

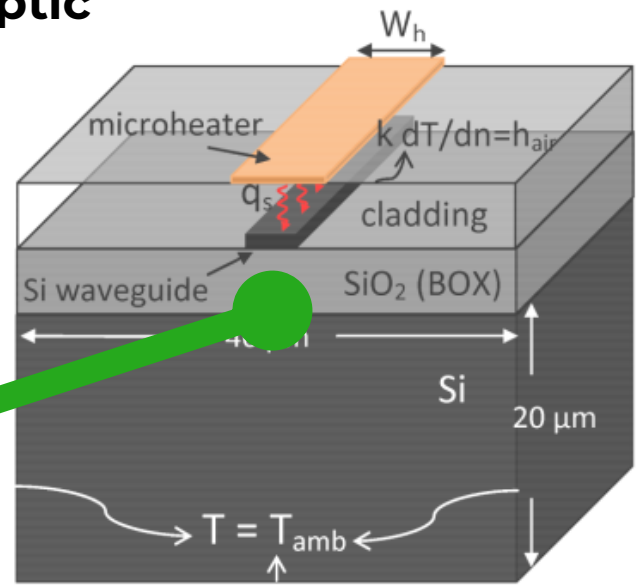


High insertion loss
Amplitude modulation

Silicon photonics technologies

Efficient on-chip electrical phase control

Thermo optic effect



Slow, high power consumption

Pockels effect

Not integrated

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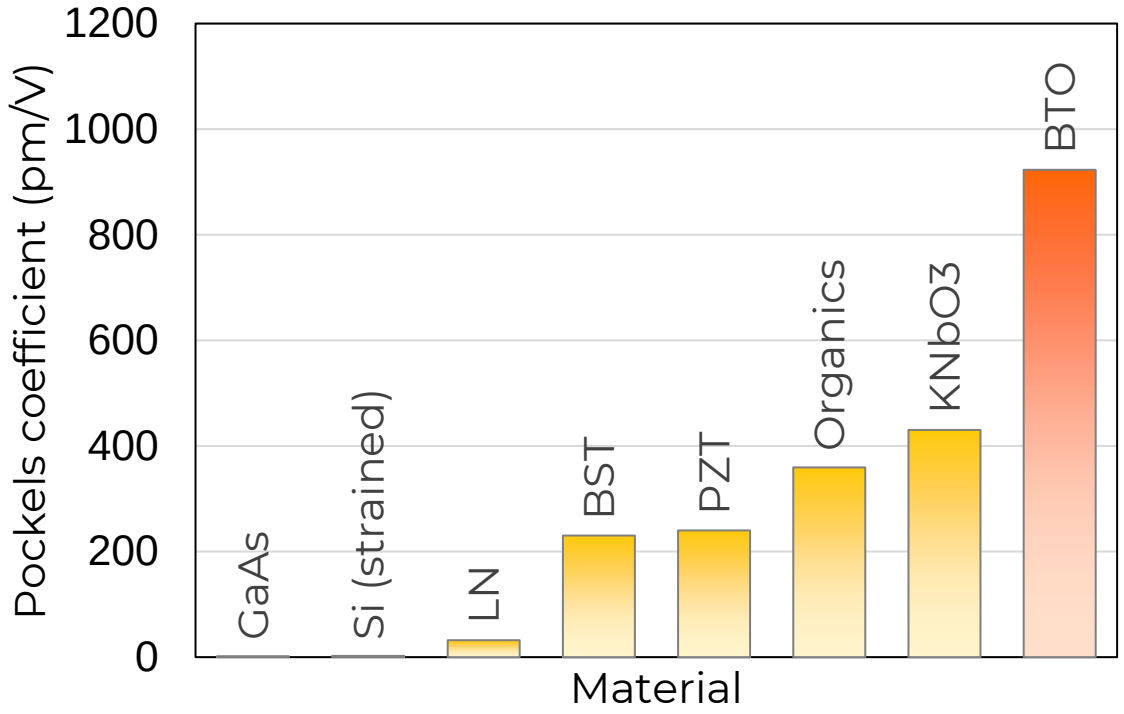
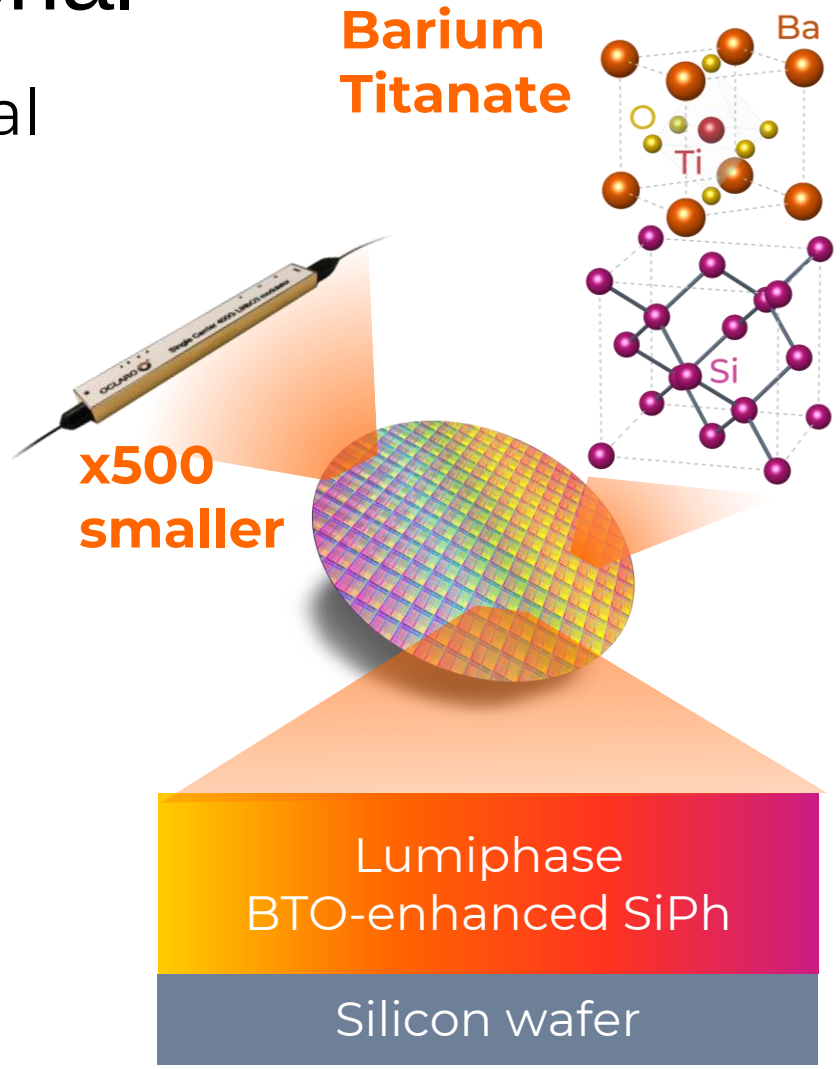
An ultra-efficient electro-optic material embedded in silicon photonics

A foundational electro-optic material

- BTO as the strongest electro-optic material
- Compatible with silicon technology



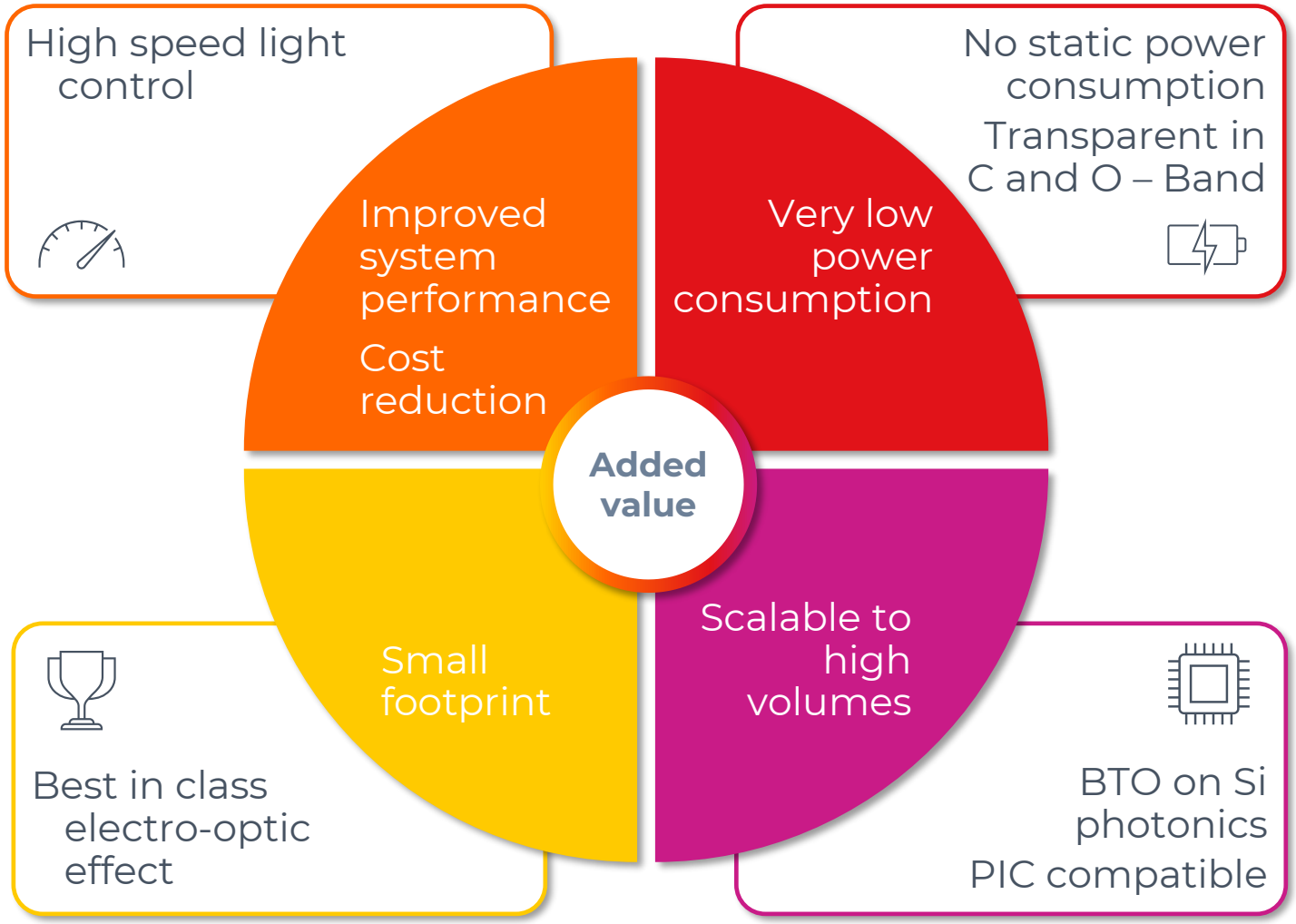
The strongest Pockels effect



Embedded in Silicon photonics

Benefits

- Very high bandwidth >> 70GHz



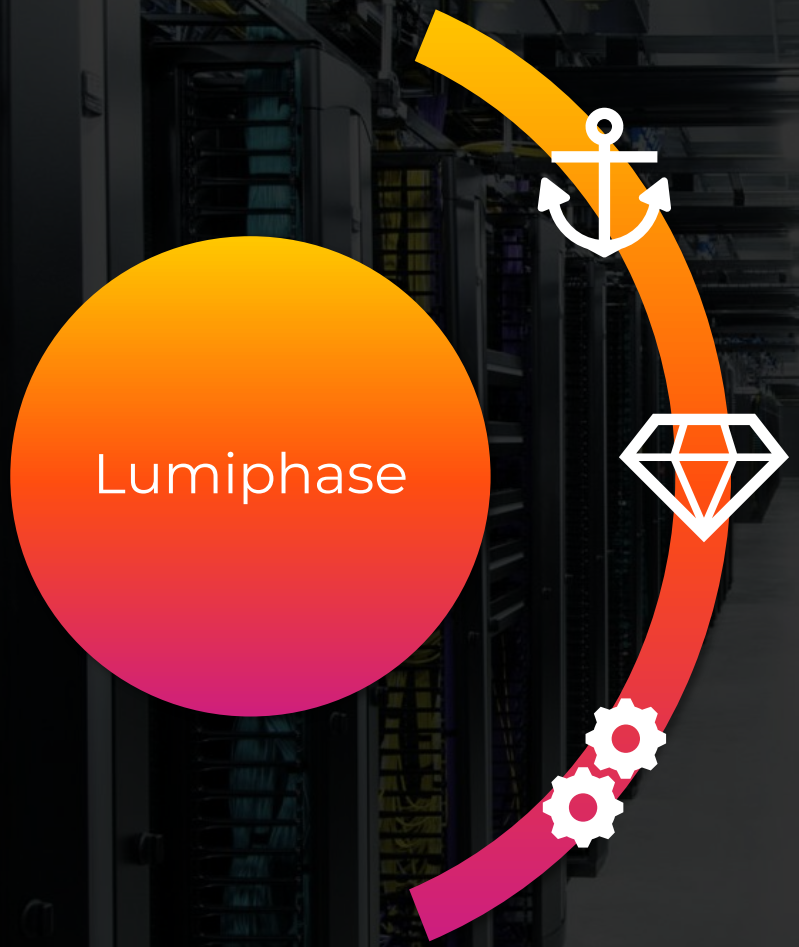
- Low Insertion loss 1dB
- Insulator – very low leakage current

- Very high electro-optic efficiency
- Very compact modulators << 1mm
- Pure phase shift (similar to LN)

- Chemically and thermally stable Pockels material
- CMOS compatible material

About Lumiphase

In a nutshell...



Swiss start-up founded in Jan. 2020
with roots at IBM.

Unique technology to control light.

Customer focused.
Strategic partnerships.

Our fundamental innovation solves an industry-wide problem
and benefits from the exponential scalability of semiconductors.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