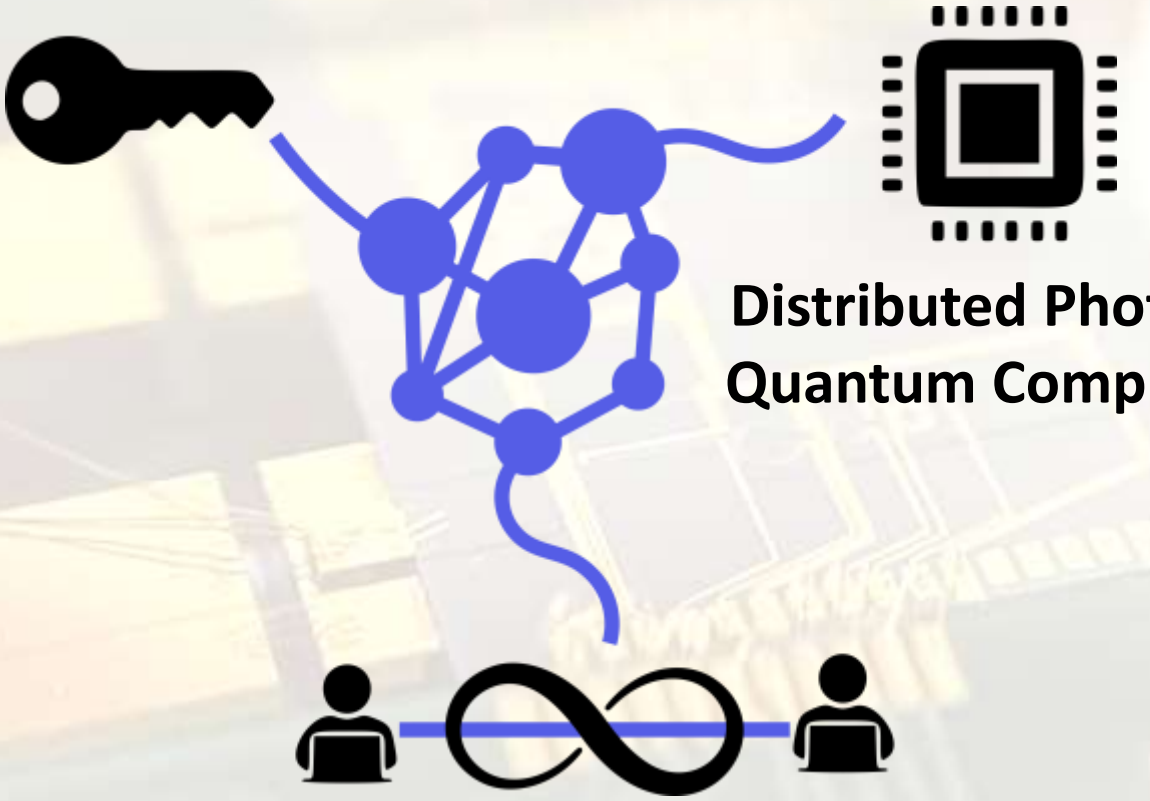
Empowering quantum photonics with turnkey integrated quantum sources

Jan Heine, CEO and Co-founder at Twin Photonics

EPIC Online Technology Meeting on Photonics for Quantum Industry

13.01.2025

The quantum internet



Quantum Key Distribution

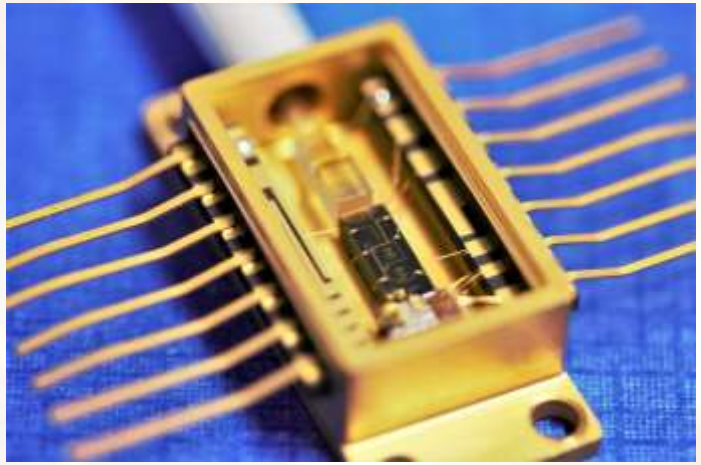
Distributed Photonic Quantum Computing

Broadcasting entanglement

Our offer – research driven, industry ready

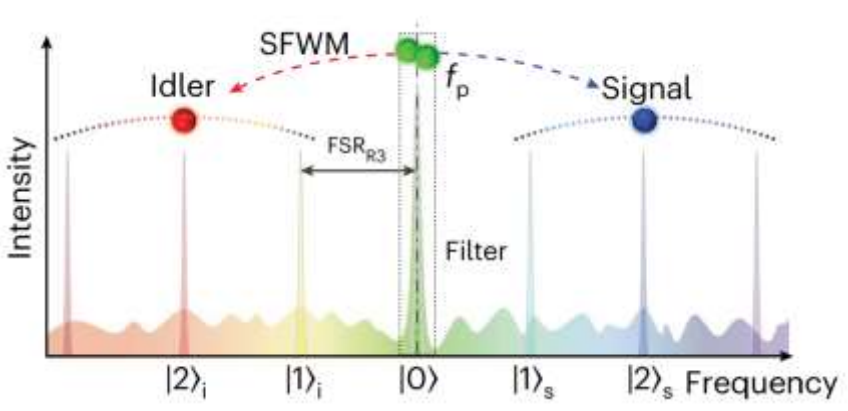
Entangled photon pair sources

- Turnkey
- Fully integrated -> fits into a standard butterfly package
- C-Band emission, frequency tunable
- Heralded single photons, multiplexed in frequency
- Entanglement in frequency bins, time bins (soon)
- Fully European supply chain



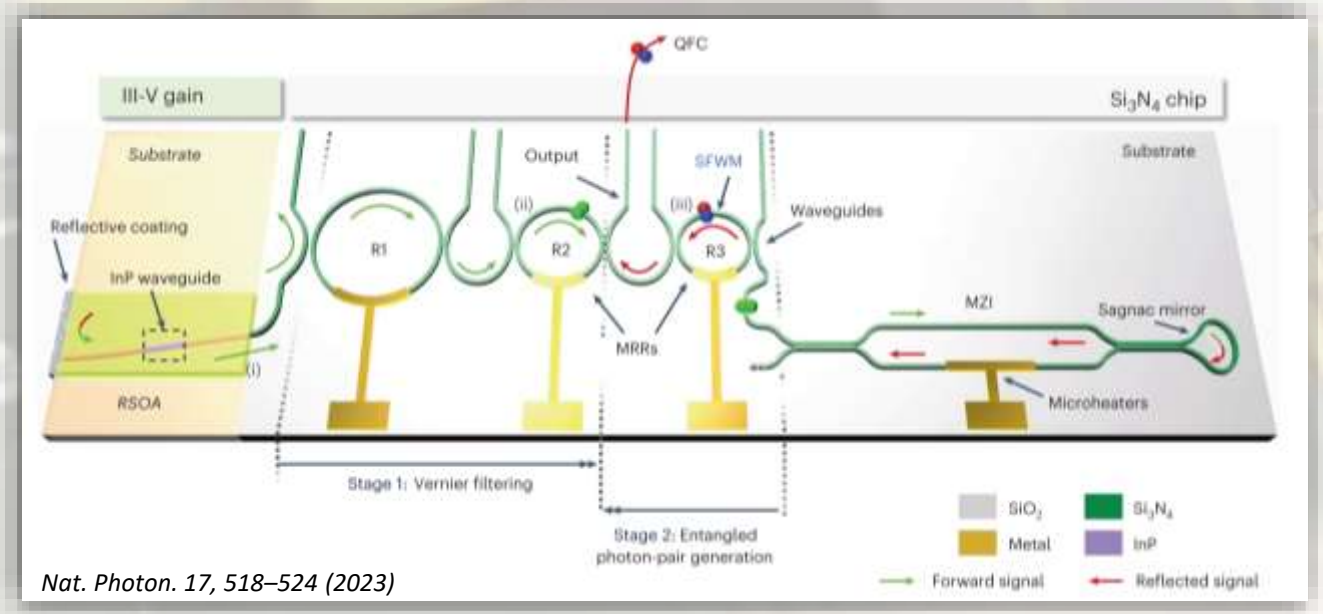
Time bin and frequency bin entanglement are:

- Scalable (many basis states): high dimensional encoding
- Easily multiplexed (frequency domain)
- Easily interfered (time-domain)

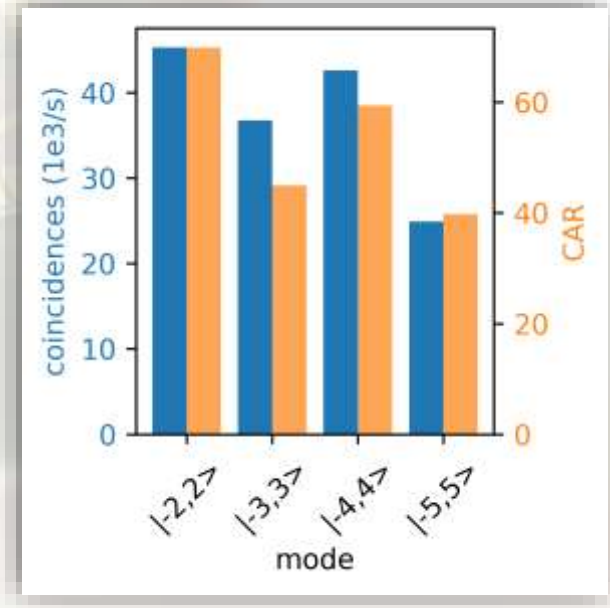


Prototype performance

- Turnkey!
- Hybrid silicon nitride & indium phosphide integrated design
- Fully packaged, with driver electronics
- Stable operation over weeks! (>90% photon pair rate)



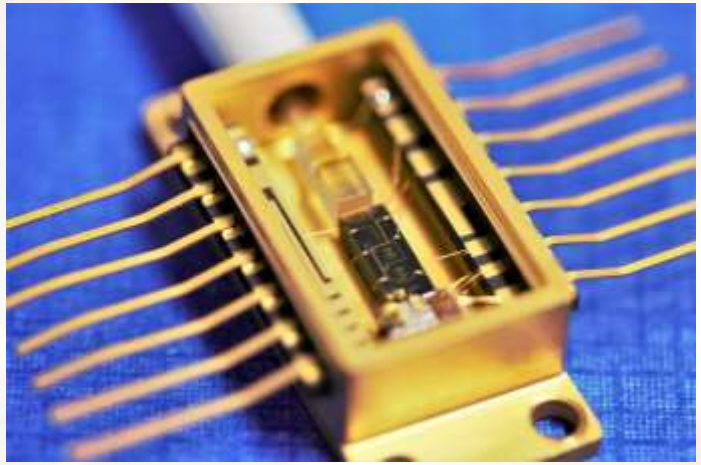
Nat. Photon. 17, 518–524 (2023)



Near future goals

C-band entanglement source with

- Dense mode spacing (25-50GHz)
- Many entangled modes (>50)
- Ultrahigh photon rates
- Time-Bin entanglement for QKD applications



More wavelengths to come!

- Design is center frequency agnostic
- 1.3 um fiber communication
- Satellite communication
- NIR atom/molecule interaction, sensing and many more
- Customizable to your requirements!

Who are we?

- Founded just 10 days ago!
- Originating from quantum photonics research group at Leibniz University Hannover, Germany
- Quantum photonics and business experts, including

Jan Heine, CEO and Co-founder

Prof. Dr. Michael Kues, Co-founder

What are we looking for?

Your usecase

- Get in touch with us

Feedback on the prototype

- Get a virtual lab demonstration
- Rent/purchase a prototype

High-isolation fiber-optic filter

- Later chip integrated

Get in touch

Jan Heine

Jan_Heine@outlook.com

Michael Kues

Michael.Kues@gmail.com

https://www.linkedin.com/company/twin-photonics

Request our specification sheet for the prototype!