

## AT A GLANCE

Photon pair source for quantum technologies based on HHI's hybrid integration platform PolyBoard



### Features

- Fiber-coupled nonlinear crystals based on hybrid integration
- Spontaneous parametric down-conversion (SPDC) using nonlinear crystals
- Polarization handling on PIC
- Temperature stabilization

### Applications

- Quantum communications
- Quantum processors
- Quantum sensing

### Photon Pair Source

The PolyBoard wafer technology, featuring hybrid integration and a micro-optical bench, enables the implementation of photonic integrated circuits for quantum technologies, including photon-pair sources with hybrid integrated nonlinear crystals.

## References

International R&D projects  
 POLYNICES



Dr. Moritz Kleinert  
 Hybrid Integration and Sensing

Phone +49 30 31002-380  
 moritz.kleinert@hhi.fraunhofer.de

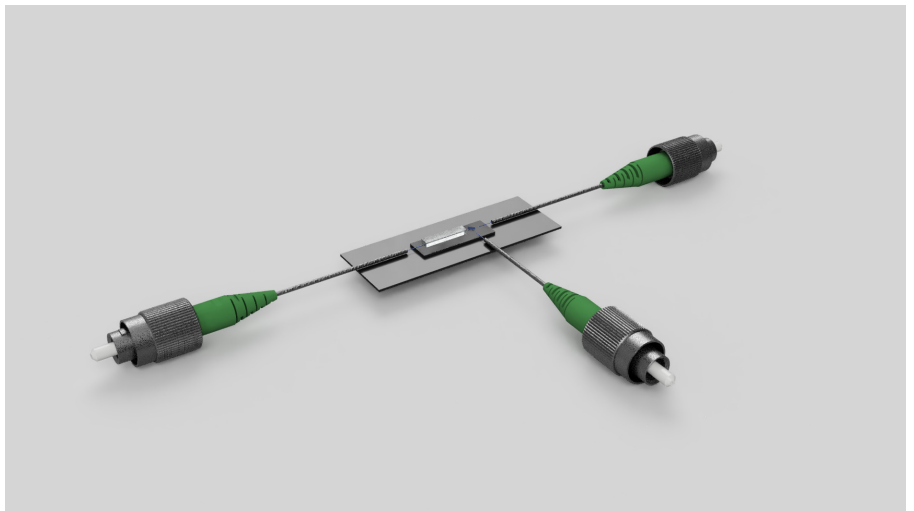
Fraunhofer Heinrich Hertz Institute  
 Einsteinufer 37, 10587 Berlin  
 Germany

[www.hhi.fraunhofer.de/phs](http://www.hhi.fraunhofer.de/phs)

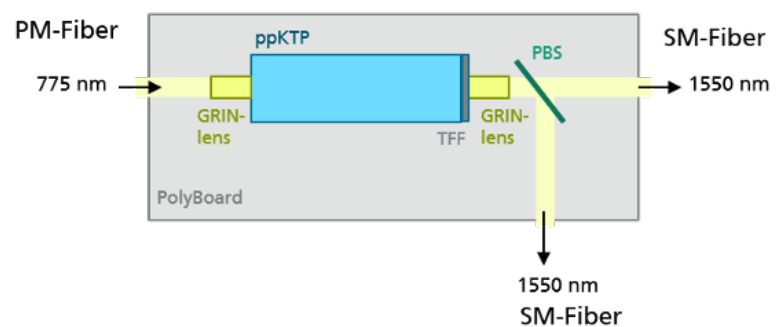
## Technical Background

Down-conversion of 775 nm to 1550 nm using a ppKTP crystal, TE/TM separation by a polarisation beam splitter (PBS).

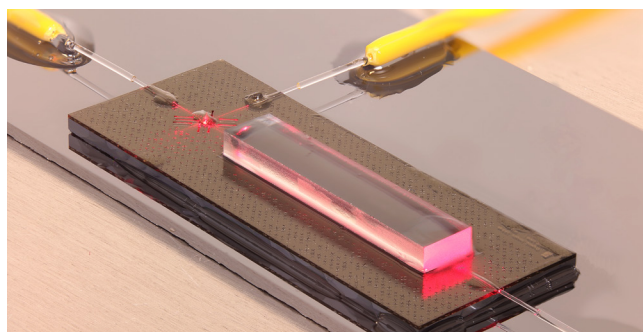
Other types of crystals can also be utilized.



*Photon pair source with embedded ppKTP crystal*



*Schematic of photon pair source*



*Hybrid integrated photon pair source in HHI photonic platform*