

## AT A GLANCE

Customized SiN PICs for wavelengths from NIR to VIS. The platform includes multiple photonic building blocks and supports hybrid integration of lasers, gain chips, and detectors. Applications in life sciences, analytics, and sensing are enabled by surface functionalization and wafer-level microfluidics.



### Features

- Low-loss waveguides ( $< 0.2$  dB/cm @ 1550 nm)
- Passive and thermo-optical elements
- Integration of active elements (InP, GaAs, PolyBoard etc.)
- VIS to NIR wavelength range
- SiN thickness of 200 or 400 nm (other thicknesses on request)
- SSC enabling seamless integration with SMF and other PICs

### Services

- PDK-based PIC designs
- Customized PIC designs
- SiN wafer fabrication
- Integration of active components
- Packaging



*External-cavity laser module at 1550 nm*

## References

### International R&D projects

POINTER

QSNP

Qu-Test / Qu-Pilot

(funded by EU commission)

### National R&D projects

PHIONA

PolyChrome Berlin

PoLiSiQ

optION

(funded by BMBF)

### Association

PolyPhotonics e.V.

[www.polyphotonics-berlin.de](http://www.polyphotonics-berlin.de)



Klara Mihov

Hybrid Integration and Sensing

Phone +49 30 31002-675

[klara.mihov@hhi.fraunhofer.de](mailto:klara.mihov@hhi.fraunhofer.de)

Fraunhofer Heinrich Hertz Institute

Einsteinufer 37, 10587 Berlin

Germany

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

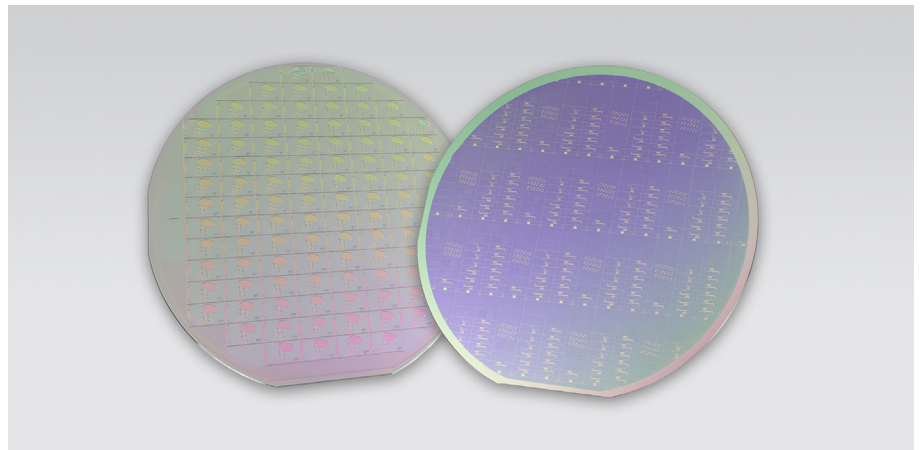
## Applications

- Sensing and analytics
- Medical and life sciences
- Quantum technology
- Telecom / datacom

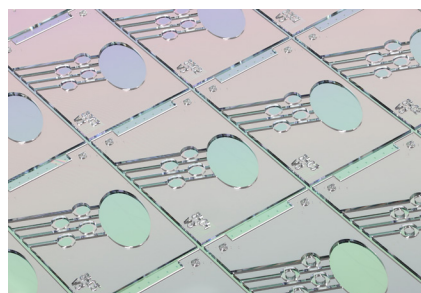
## Technical Background

Low-loss structures such as ring resonators, MMIs and AWGs, gratings as well as thermo-optical elements like phase shifters, VOAs and tunable gratings are fabricated on wafer scale.

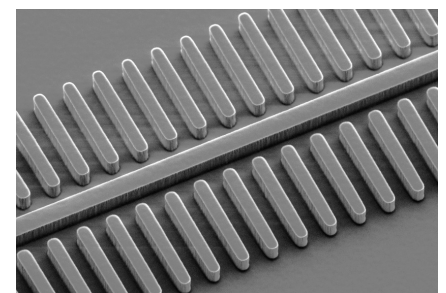
Customized designs are available.



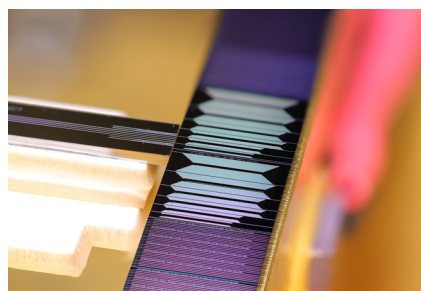
*μ-fluidic wafer (left) and SiN wafer (right)*



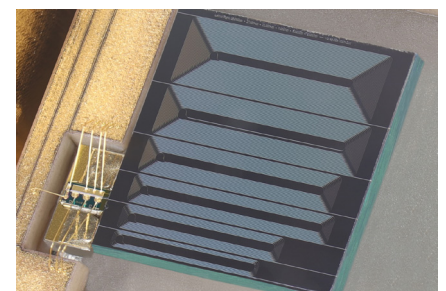
*Wafer-level microfluidics for sensing*



*Gratings in SiN*



*Hybrid integration of SiN with TFLN*



*Mode-locked laser (InP-SiN integration)*