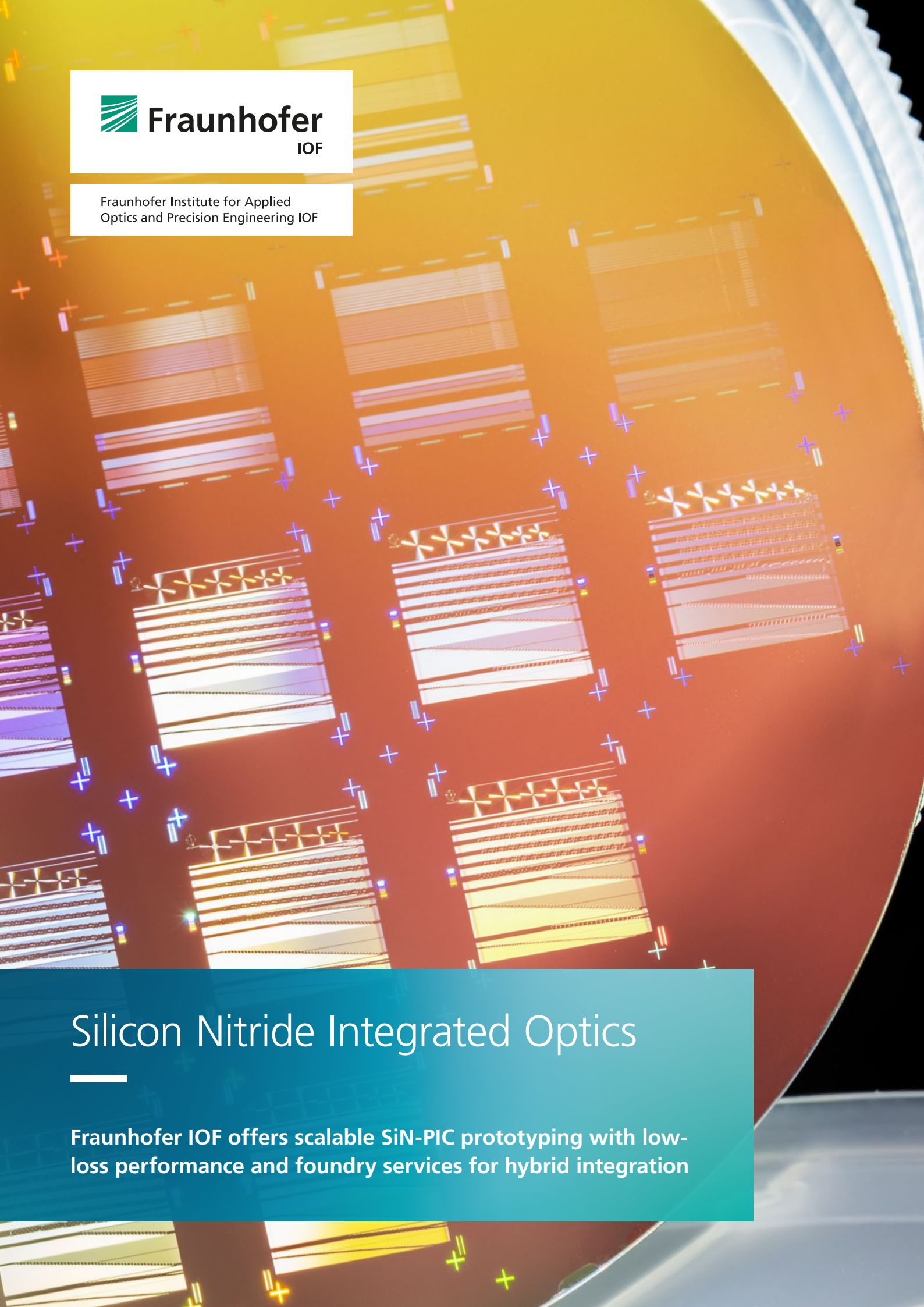
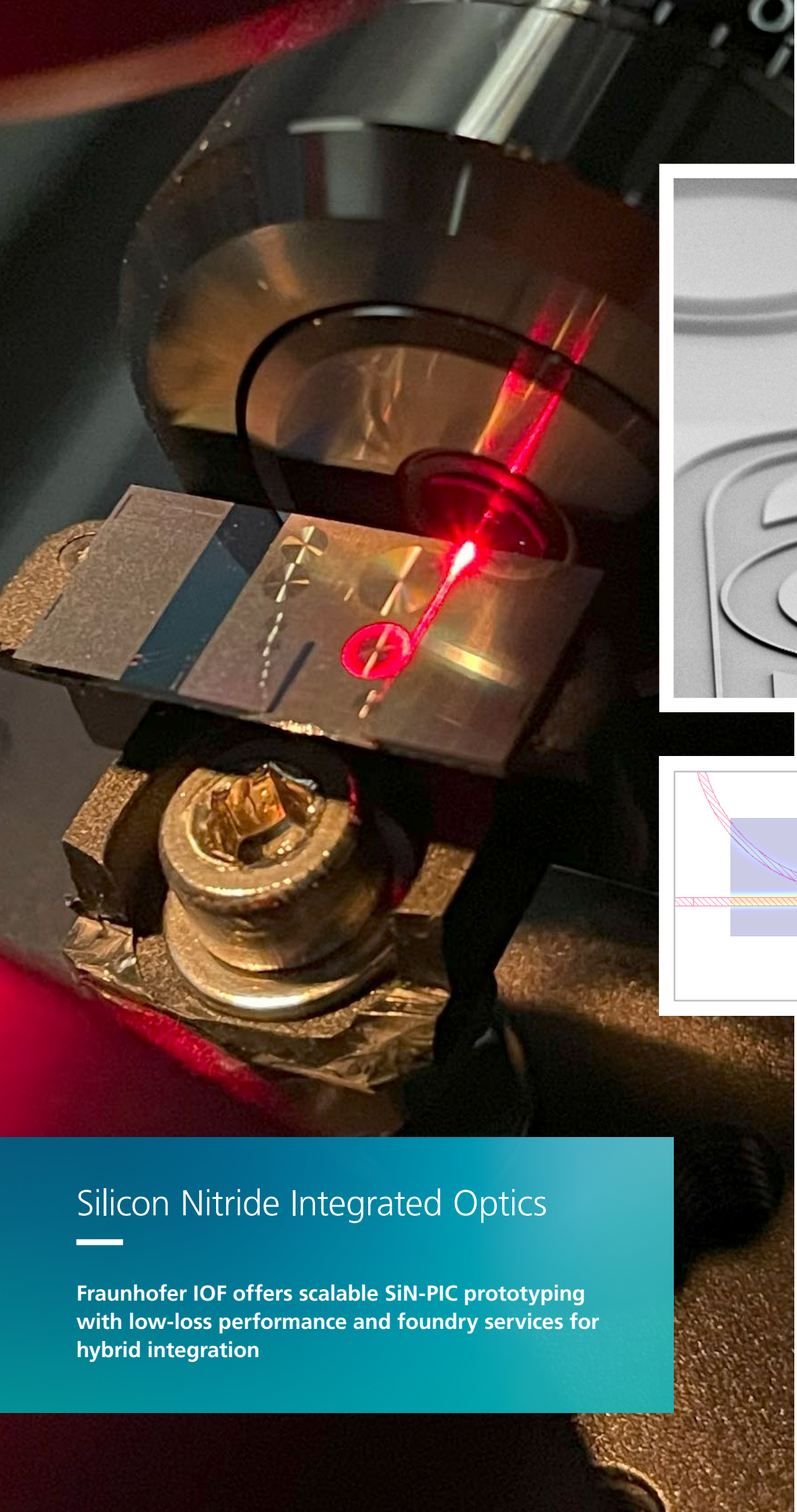
Fraunhofer IOF

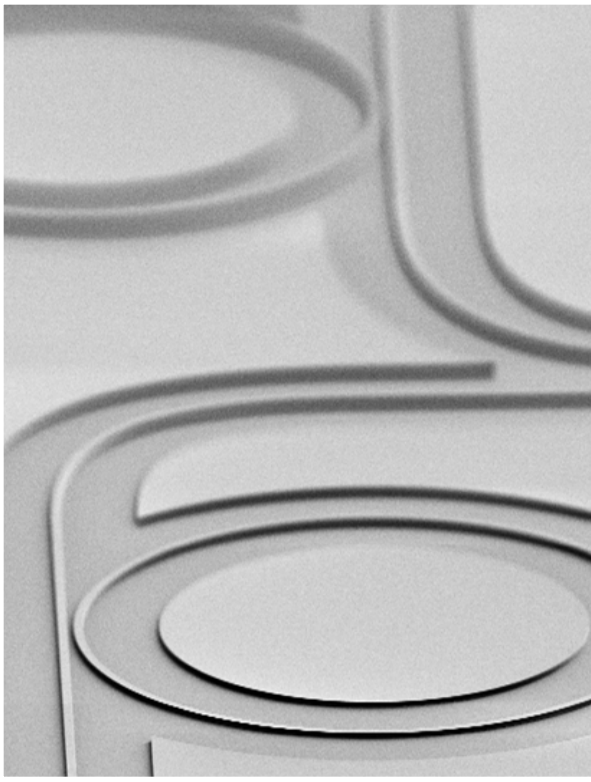
Fraunhofer Institute for Applied Optics and Precision Engineering IOF

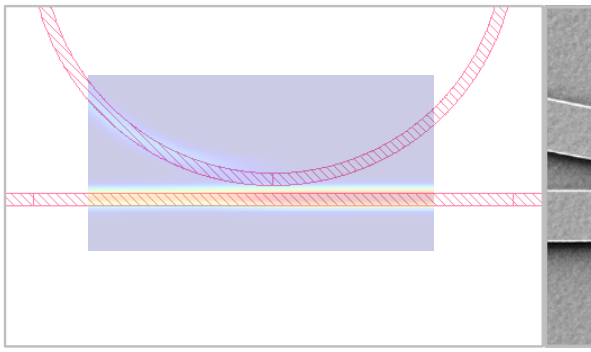


Silicon Nitride Integrated Optics

Fraunhofer IOF offers scalable SiN-PIC prototyping with low-loss performance and foundry services for hybrid integration







Silicon Nitride Integrated Optics

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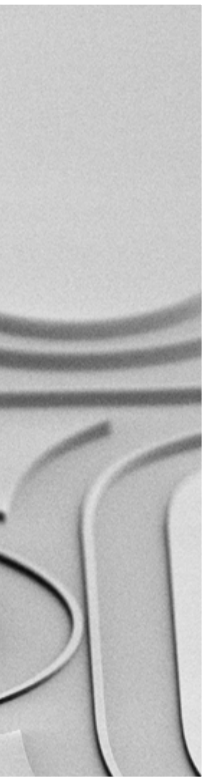
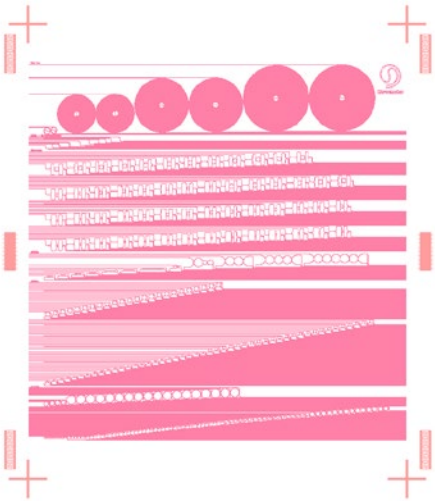
Large image:
SiN spiral excited by
633 nm CW laser.



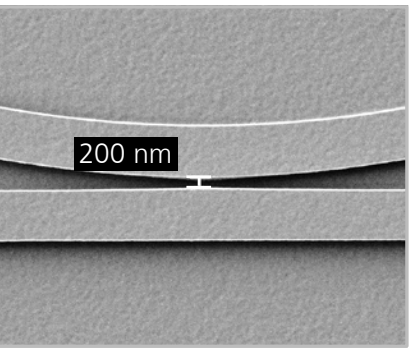
SEM micrograph of add-drop microring resonator (ADMRR).

SiN 400 nm Platform Technology for PIC Development

- Fraunhofer IOF's 4-inch wafer features integrated photonic building blocks using 400 nm low-loss silicon nitride, known for its transparency, power handling, and CMOS compatibility.
- The wafer includes passive components like waveguides, grating couplers and ring resonators, for a wide range of applications such as quantum optics, telecommunication and sensing.
- Successful tests on the 4-inch wafer can be scaled to 12-inch wafers, offering a scalable platform for research and industrial development.



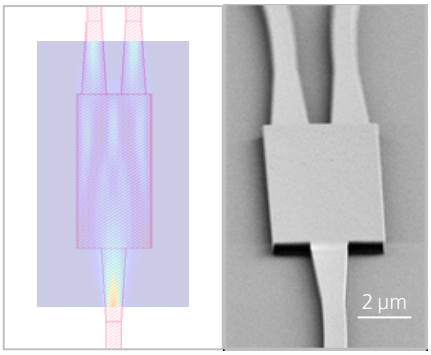
Layout of full chip on the wafer on cover.



*Coupling of SiN microring resonator (MRR) and bus waveguide:
Layout overlayed by the results of a numerical simulation (left).
Scanning electron micrograph (right).*

Fraunhofer IOF Process Development Kit (PDK):

- The Fraunhofer IOF PDK is essential for developing photonic integrated circuits on the SiN 400 nm platform, providing detailed specifications and layout previews.
- It includes performance data for components like waveguides and microring resonators, aiding precise planning and implementation of design projects.
- The PDK serves as a practical reference for professionals in photonics, assisting in successful design project execution and innovation development.



*Multi Mode Interferometer (MMI) Layout overlayed by the results of a numerical simulation (left).
Scanning electron micrograph (right).*

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Cover image:
Silicon Nitride (SiN) PIC development wafer.

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