

Photonics made in Germany

Technology manufactured in Duisburg

With our Photonic Integrated Circuit (PIC) technology, we offer cutting-edge solutions for a wide range of applications, such as sensing, photonic computing, and quantum technologies. Our post-CMOS compatible technology enables photonic integration on foundry wafers, making it possible to combine photonic and electronic components on one wafer. The photonic waveguides are manufactured on 200 mm wafers. Optionally, we also support process transfer and scaling.

Fraunhofer IMS

Working on a safe, secure and sustainable future with the help of **Smart Sensor Systems**: Our institute consists of numerous research labs, in which we provide ASIC and chip design, CMOS, MEMS, LiDAR development services and many more microelectronic solutions. A seamless path from initial idea to development and production, while maintaining the highest quality and reliability standards, is our offer. We look forward to giving a long-term support to our customers and be a reliable research and development partner. Fraunhofer IMS provides numerous technologies in four business units: Health, Industry, Mobility, as well as Space and Security.

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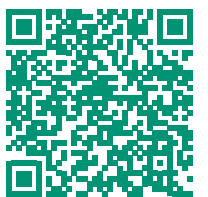
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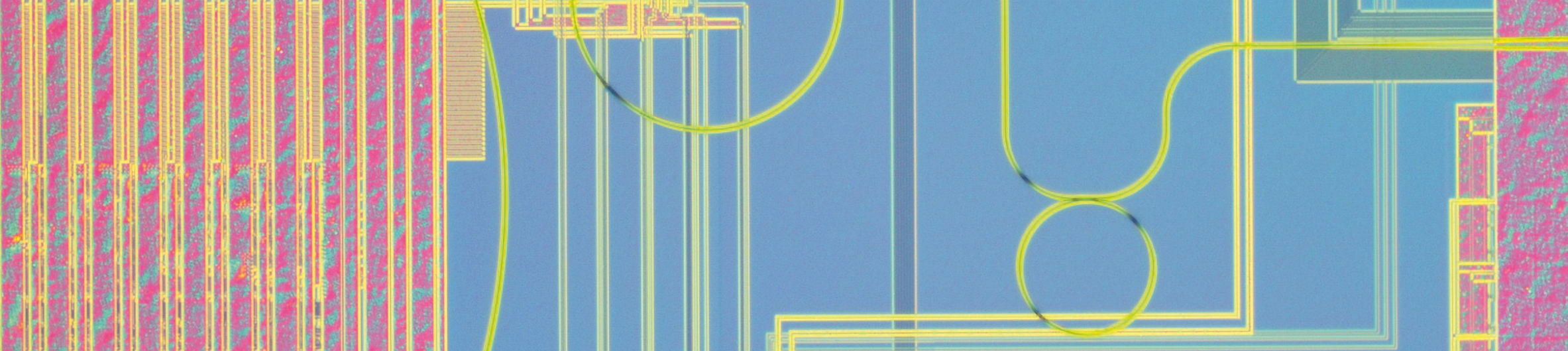
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Customizable photonics platform

Photonic Integrated
Circuits (PICs):
From research to pilot
fabrication





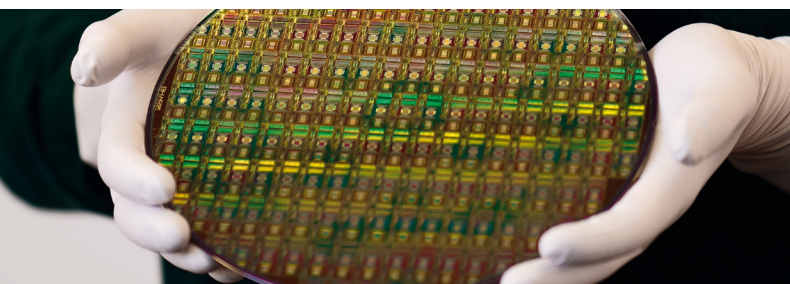
Photonics and electronics made in one manufacturing platform

Photonic platform

We develop photonic circuits and systems based on dielectric materials. Our platform offers standard silicon nitride photonics, as well as processes for flexible integration of further materials to leverage their optical properties.

The Fraunhofer IMS photonic platform uses back-end-of-line processes to enable photonics as a post-processing option, which is useful for wafers with integrated electronics. In addition, we also provide post-processing for CMOS wafers from other foundries.

Our extensive experience in microelectronics manufacturing allows us to offer high-quality, reliable equipment manufactured at high yield rates in our state-of-the-art clean room facility.



Customized processes

Silicon nitride photonics offers low losses, no two-photon absorption, and an extensive wavelength range from 400 nm to approx. 3 μm . Devices like couplers, waveguides, ring resonators, thermo-optical phase shifters, and more are available.

Integration and application of additional and new materials allow the implementation of exciting new functions. Other photonic materials, such as tantalum pentoxide and more, can also be used as waveguides.

The fabrication in our in-house clean room allows us to adapt process specifications, giving you the opportunity for application-specific designs. Dimensions and material thicknesses can be custom tailored. We individually develop processes on your pre-processed wafers to adhere to your specifications fully.

Planarization options are available for heterogeneous integration of III-V semiconductor components. This enables chip-to-chip or chip-to-wafer integration of laser sources and active elements.

From idea to pilot fabrication

We offer services to support your idea at all stages, from first draft to pilot fabrication. Our services include:

- Device design and simulation
- Process development
- Chip fabrication
- Wafer processing up to pilot fabrication
- Device characterization
- Process transfer

Our technology platform is accessible via R&D collaborations and contracting. We are also open to collaborative projects with public funding.

