FACT SHEET

GTAI GERMANY TRADE & INVEST

# The German Photonics Market

Issue 2024/2025

**Optical and photonic technologies have enjoyed consistent growth in recent years – with new markets including augmented and virtual reality, digital health, autonomous driving, machine vision, and smart farming all creating new business opportunities. Increasing public investment and R&D efforts in quantum communication and computing helped consolidate Germany's international technological leadership.**

## Europe's Photonics Leader

Germany boasts one of the world's most thriving and innovative photonics sectors and ranks as Europe's leading photonics nation, with more than 40 percent of continental production. Germany's photonics sector has developed to become one of the country's most important future industries and a motor for innovation and growth. Approximately 1,000 companies currently operate in the sector – including major names like Bosch, Jenoptik, Trumpf, Zeiss, Schott, X-FAB, Osram and Laserline – where business is booming. The German photonics sector is expected to generate sales of around 50 billion euros with their 190,000 employees with an expected annual sales growth of around seven percent until 2027.

## High Demand for German Photonics Products

Foreign business plays a key role for manufacturers, with the export ratio at around 70 percent – and rising. This testifies to the international competitiveness of innovative photonics solutions made in Germany. The export rate in the production technology sector is particularly high at 80 percent, with the medical technology and life sciences sector also above 70 percent. Taken in total, German photonic company export value is considerably higher than is the case for companies in the manufacturing sector. The high R&D ratio of more than 10 percent is proof of the industry's above-average innovative strength. New application fields of photonics, such as quantum technologies or solutions for precision agriculture, offer a lot of potential in addition to the already established areas.

## *The German Photonics Industry in Numbers*

***190,000***
people work in the optical and photonic technologies sector in Germany

***40%***
market share of continental production – making Germany Europe's leading photonics nation

***1,000***
photonics manufacturers in Germany including major global players

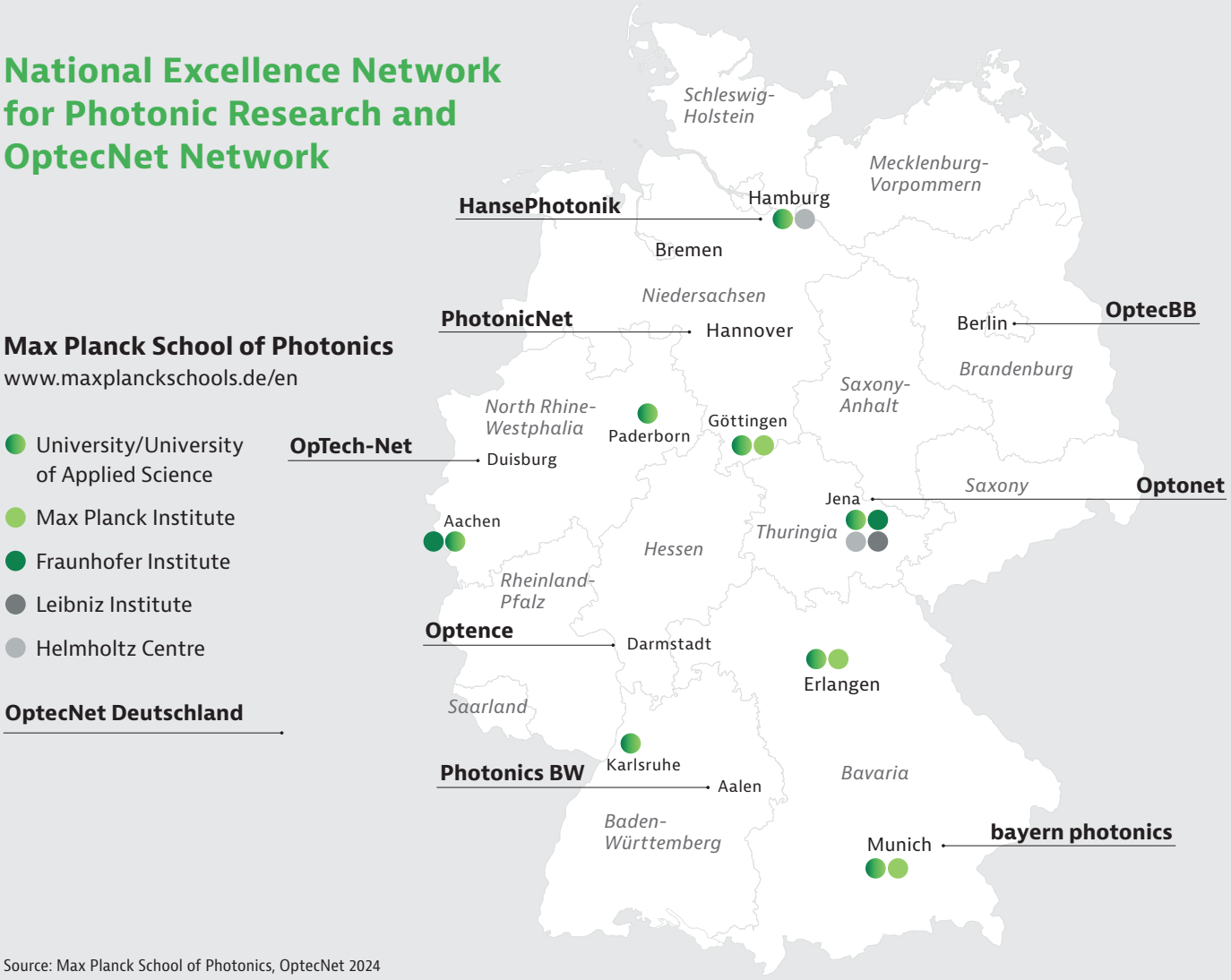
***EUR 50 billion***
of sales generated in the industry

***10%***
R&D ratio making it far above average innovative strength

**→ For more information, please visit our website**
www.gtai.com/photonics

Source: SPECTARIS, 2024

## National Excellence Network for Photonic Research and OptecNet Network




**Max Planck School of Photonics**
www.maxplanckschools.de/en

- University/University of Applied Science
- Max Planck Institute
- Fraunhofer Institute
- Leibniz Institute
- Helmholtz Centre

**OptecNet Deutschland**

Source: Max Planck School of Photonics, OptecNet 2024

# Connecting World-Class Research

**Germany is home to an impressive number of regional and national networks and clusters. The rapid proliferation of science and industry clusters can be attributed to the country's advanced level of industrial diversity aligned to a sustained and forward-looking innovation policy. Generous R&D funding promotes innovation as part of a long-term roadmap for the photonics future.**

### Max Planck School of Photonics

The Max Planck School of Photonics (MPSP) focuses the key strengths of the German photonics community and aims to provide world-class research support. The MPSP connects existing national and international graduate programs, including the International Max Planck Schools (IMPRS), the DFG Graduate Schools, the PIER Helmholtz Graduate Schools as well as the graduate school of the federal Excellence Initiative. The consortium aims to connect all major and innovative photonics communities to an interdisciplinary cluster. The network is coordinated by the Abbe School of Photonics, situated at the Friedrich-Schiller-University Jena. One of three pilot schools established to bundle national excellence, the MPSP will share in annual funding of EUR 9 million for a period of five years.

### University Partners

MPSP university partners are located across Germany and represent a significant share of university-based photonics research excellence. They include the University of Hamburg, the Georg-August-University Göttingen (GAU), the Aachen University (RWTH), the Friedrich-Schiller-University Jena (FSU), the Friedrich-Alexander-University Erlangen-Nuremberg (FAU), the Karlsruhe Institute of Technology (KIT), the Ludwig-Maximilians-University Munich (LMU), and the University of Paderborn (UPB).

### Research Institute Partners

Research institute partners represent the breadth and diversity of Germany's four major research associations. They include the Fraunhofer Institute for Applied Optics and Precision Engineering (IOF), the Fraunhofer Institute for Laser Technology (ILT), the Max Planck Institute for Biophysical Chemistry (BPC), the Max Planck Institute for the Science of Light (MPL), the Max Planck Institute of Quantum Optics (MPQ), the Detaches Elektronen-Synchrotron (DESY), the Helmholtz Centre for Heavy Ion Research Institute Jena (GSI), and the Leibniz Institute of Photonic Technology (IPHT).

# Supporting Innovation

**Photonics Germany**
Photonics Germany enhances the German high-tech industry's standing both nationally and in Europe. The alliance works to boost the competitiveness of companies and research institutions by improving conditions for photonics and quantum technologies and developing targeted funding offers. It serves as a key contact for political matters, including funding policy, legislation, and workforce development. Additionally, Photonics Germany acts as a central dialogue partner for international associations.
*https://photonics-germany.de/?lang=en*

**Industry Association SPECTARIS**
Spectaris is the German industry association for the high-tech medium-sized business sector and representative body in the areas of medical technology, consumer optics, analytical, bio and laboratory technology as well as photonics. Spectaris pools the interests of around 400 member companies from Germany and their 300.00 strong workforce. Through its political activities, public relations and industry marketing, the association gives its members a voice, formulates new responsibilities and opens up new markets. This ensures the international competitiveness of German industry in these sectors and thus safeguards locations and jobs.
*https://spectaris.de/en*

**OptecNet Deutschland**
The German optics and photonics industry is concentrated within several clusters and industry associations. Regional clusters are organized in OptecNet Deutschland – the association of the German Regional Competence Networks for Optical Technologies. Founded in 2000 as an initiative of the Federal Ministry of Education and Research (BMBF), OptecNet Deutschland is the supraregional association of the seven regional competence networks. OptecNet's mission is to support the optical technologies as key technologies for Germany.
*https://optecnet.de/en*

**OptoNet Jena**
OptoNet Jena represents key players in the industry within one of the core photonics regions in Germany, fostering communication and cooperation among them. It enhances the international visibility of the cluster, initiates activities to promote talent, and supports marketing efforts of its members. Some of the most prominent members of OptoNet Jena include renowned institutions and companies such as Carl Zeiss, Jenoptik, and the Fraunhofer Institute for Applied Optics and Precision Engineering.
*https://optonet-jena.de/?lang=en*

**OpTecBB**
Optec-Berlin-Brandenburg (OpTecBB) e.V. is the competence network for optical technologies and microsystems technology in the Berlin-Brandenburg region. It is an initiative of companies and scientific institutions in Berlin-Brandenburg which aim to explore and use these technologies together and is a member of EPIC - European Photonics Industry Consortium.
*https://www.optik-bb.de/en/*

**Research Program on Quantum Systems**
The German Federal Ministry of Education and Research (BMBF) has launched a €1 billion program to advance quantum technologies and photonics over the next decade. This initiative aims to integrate photonics with quantum systems, enhancing applications like quantum communication and sensing. With the programme's interdisciplinary focus and interfaces to artificial intelligence and the semiconductor industry, the programme ensures that germany remains a pioneer in the most important industries of the future.
*www.quantentechnologien.de*

## Reasons to set up production in Germany

**Skilled Workforce**
The country boasts a highly skilled and educated workforce, particularly in engineering and technical fields - crucial for the photonics industry.

**Diverse Application Markets**
Diverse markets are driving demand and fostering innovation in the German photonics industry. Autonomous driving, biophotonics, digital health, augmented and virtual reality, smart farming, and manufacturing as well as the semiconductor industry are all creating significant business opportunities.

**Supportive Cluster Struture**
As well as the already mentioned clusters, there are also several regional industry clusters that support domestic as well as international companies and help foster strong connection between them.

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Find out how your company can profit from Germany's research excellence. Contact our industry experts to make an appointment: **jerome.hull@gtai.de** and **martin.mayer@gtai.de**

# Our Support for Your Business in Germany

Germany Trade & Invest (GTAI) is the foreign trade and inward investment agency of the Federal Republic of Germany. We advise and support foreign companies planning to expand into the German market and assist German companies seeking to enter global markets.

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Our Investor Consulting division of specialist industry teams provide international investors in all sectors with comprehensive consultancy services specific to each individual investment project. Services include:

- Market and industry reports
- Market entry analyses
- Business and tax law information
- Funding and financing information

All investment-related services are provided entirely free of charge and all enquiries are treated with the utmost confidentiality.


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