



# Photonics in Germany

ISSUE 2021/2022

**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 have increased the number of start-ups and 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 41 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, AgfaGevaert, Osram and Laserline – where business is booming. Between 2005 and 2019, revenue rose 220 percent from EUR 17 billion to EUR 37.5 billion. Exports grew 1.6 percent in 2019 to EUR 27.1 billion, with the greatest number of sales in the European Union, followed by Asia and North America respectively.

### High Demand for German Photonic Products

An export quota rate of around 70 percent 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. Average company spending of 10 percent of total revenue on research and development helps make the photonics sector one of the most research-intensive sectors in Germany.

## The German Photonics Industry in Numbers

### 142,500

people work in the optical and photonic technologies sector in Germany

### 41%

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

### 1,000

companies operate in Germany's photonics sector including major global players

### EUR 37.5 billion

industry turnover – with an above average growth rate in recent years

### EUR 27.1 billion

export volume in 2019 – greatest number of sales in EU

→ Further information:  
[www.gtai.com/electronics](http://www.gtai.com/electronics)

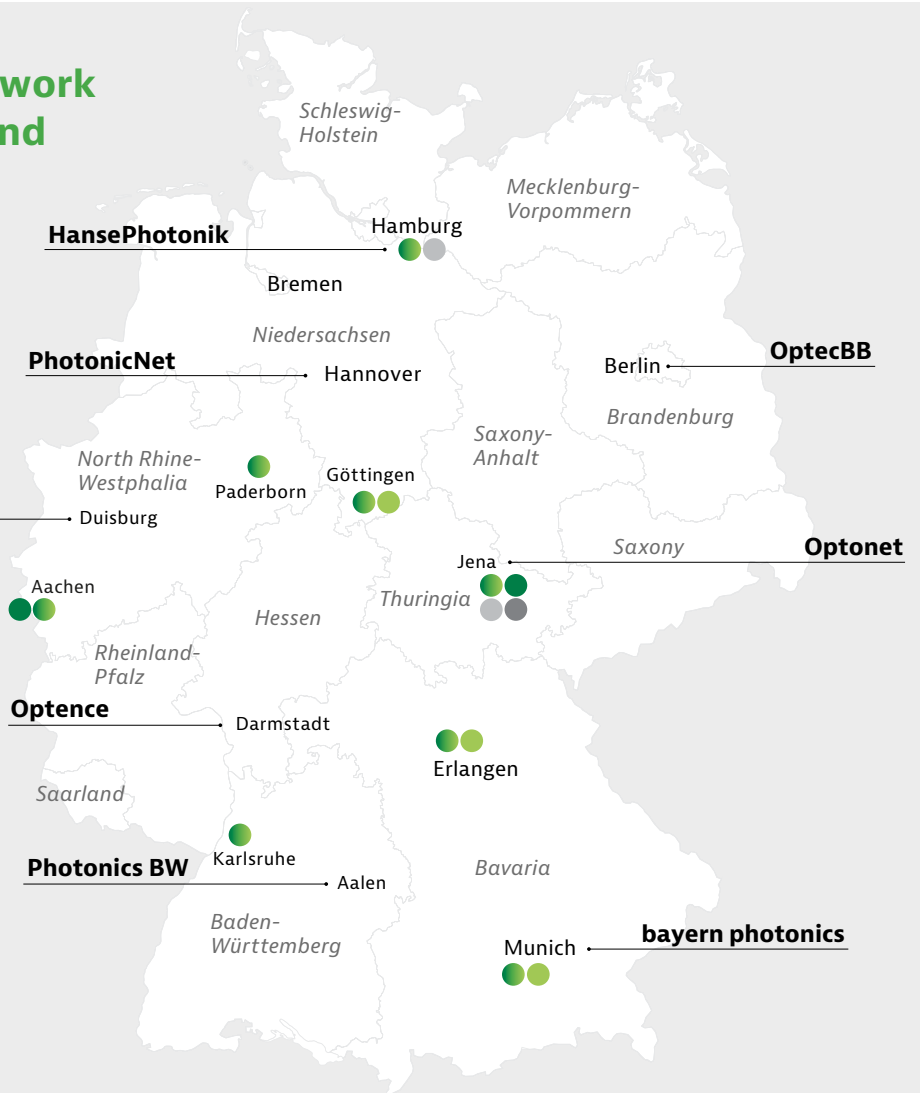
# National Excellence Network for Photonic Research and OptecNet Network

## Max Planck School of Photonics

[www.maxplanckschools.de/en](http://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 2020

## 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 Federal Ministry of Education and Research (BMBF) supports a network of excellence under the lead of the Fraunhofer Institute of Applied Optics and Precision Engineering (IOF). The Max Planck School of Photonics (MPSP) focuses key strengths of the German photonics community and aims to provide world-class research support to companies from all over the world. The consortium aims to connect all major and innovative photonics communities to an interdisciplinary cluster.

### 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 Detached Elektronen-Synchrotron (DESY), the Helmholtz Centre for Heavy Ion Research Institute Jena (GSI), and the Leibniz Institute of Photonic Technology (IPHT).

## Supporting Innovation

### 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.

➔ [www.optecnet.de](http://www.optecnet.de)

### go-cluster Initiative

The Federal Ministry for Economic Affairs and Energy (BMWi) "go-cluster" excellence program brings together around 100 innovation clusters from across Germany. Cluster members are at the cutting-edge of innovation and represent the technological diversity with the country's industry and technology sectors. The initiative provides financial stimulus – in the form of support for innovative services and funding for novel solutions – to optimize cluster management allowing member clusters to position themselves as highly effective and visible international clusters. Membership provides numerous advantages to innovation clusters, actors and partners. Of the 18 photonics clusters and networks recognized by the Clusterplattform Deutschland, 11 enjoy go-cluster status.

➔ [www.clusterplattform.de](http://www.clusterplattform.de)

### Photonic Research Germany

The BMBF has promoted pre-competitive photonics research since 2012 within its Photonic Research Germany program, thereby forming a central pillar of the industry R&D landscape within the country. Five areas of activity were identified as cornerstones of the 10-year funding program. These include the use of photonics in growth markets; development of integrated photonic system technologies; realization of photonic process chains; expansion of photonics base; and innovation in emerging technologies. Public funding of around EUR 100 million each year has been made available to the sector to date. The Photonic Research Germany funding program also brings national and European support measures together under one roof and supports international cooperation activities with partners outside Europe. Furthermore, in the current governmental legislative period, a total of EUR 650 million of quantum technology research is being funded.

➔ [www.photonikforschung.de](http://www.photonikforschung.de)

### Industry Association SPECTARIS

Spectaris is the German industry association for the hightech 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 300,000 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.

➔ [www.spectaris.de/en](http://www.spectaris.de/en)

## Gaining a Foothold in Germany

**Despite the coronavirus pandemic, German optics and photonics have remained robust – attracting major investments from abroad.**

### Canada

Canadian industrial camera manufacturer Emergent Vision Technologies opened a European subsidiary near Stuttgart in July 2020. The new office offers closer proximity to the largest markets in Europe, the Middle East and Africa.

### Netherlands

ASML, a leading Dutch manufacturer of photolithography systems for the semiconductor sector, recently acquired Berliner Glas which produces the ceramic and optical modules used in its lithography products.

### Switzerland/USA

Swiss-American technology company TE Connectivity acquired Berlin-based sensor system supplier First Sensor, accelerating its growth in the increasingly competitive global market.

➔ Find out how your company can profit from Germany's research excellence. Contact our industry experts to make an appointment: [jerome.hull@gtai.com](mailto:jerome.hull@gtai.com) and [max.milbredt@gtai.com](mailto:max.milbredt@gtai.com)

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## Imprint

**Publisher:** Germany Trade and Invest  
Gesellschaft für Außenwirtschaft und Standortmarketing mbH  
Friedrichstraße 60, 10117 Berlin, Germany  
T +49 30 200 099 0, [invest@gtai.com](mailto:invest@gtai.com)

**Executive Board:** Dr. Jürgen Friedrich, Chairman/CEO,  
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**Editor:** William MacDougall, GTAI

**Layout:** Danielle Röbbenack, GTAI

**Print:** Kern GmbH, 66450 Bexbach, [www.kerndruck.de](http://www.kerndruck.de)

**Picture Credits:** Cover: ©GettyImages/Tor Lindqvist; Map of Germany: ©fotolia/Artalis-Kartograp; portraits: ©GTAI Illing & Vossbeck Fotografie

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**Order Number:** 21000

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