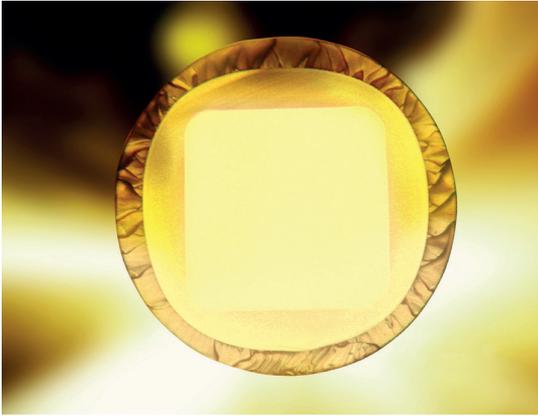


Photonics for Communication and Sensors

in the Capital Region Berlin-Brandenburg



Special optical fiber with square core



On-wafer chip characterization at Fraunhofer HHI

Companies

ADVA Optical Networking
 AEMtec
 art photonics
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 Adlershof
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 LOPTEK Glasfasertechnik
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 micro resist technology
 OECA Opto-Elektronische
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 Optris
 Panono
 PDW Analytics

Since the beginning of the Internet Age, transferring large amounts of data across large distances in the shortest time possible has been a natural part of daily life at home and work. Optical communication technology and fiber optics are the technological foundation of today's Internet. Berlin-Brandenburg is one of the world's leading locations in this field.

The German capital region unites worldwide leading research institutions such as the Fraunhofer Heinrich Hertz Institute (HHI), the Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik (FBH) and the Fraunhofer Institute for Reliability and Microintegration (IZM) with major sector players like Corning, Finisar, Leoni, ADVA and Coriant and many highly innovative small and medium-sized companies like SHF, LUCEO and FOC. Thanks to the high level of interconnection in its photonics cluster and the location's appealing incentives, Berlin-Brandenburg offers unique conditions to innovative companies in the sector. Optical communication networks, energy-efficient laser diodes and the implementation of the 100G standard are the region's primary focal areas.



Peter Streit
 Senior Vice President Operations
 Coriant GmbH

»State-of-the-art technology in historical buildings! Juxtapositions like this are typical of vibrant Berlin – and support Coriant's choice of Berlin as its location. It is the perfect place for being involved on a global level.«



Prof. Dr. Martin Schell
 Director
 Fraunhofer Heinrich Hertz Institute

»Half of all the information on the Internet is transferred via transmitter and receiver chips that were developed and produced in Berlin.«

New paths for wireless data communication

Wireless data transmission via radio is standard today, but this is not always the ideal solution. Optical wireless data communication can be a valuable alternative because it facilitates reliable high-speed connection in areas where radio-based systems cannot be used or are undesirable – in medicine, production halls, aircraft or under water, for example.

The researchers at Berlin's Heinrich Hertz Institute are working on one method called visible light communication (VLC). With this wireless transmission technology, data can be transferred via the commercial LED lamps used to illuminate rooms. At a data rate of up to 800 Mbits/s, the developers' optical WiFi technology holds the current world record.

Data highways in space

When Sentinel-1A, the ESA imaging satellite, was successfully launched, Berlin reinforced its position as a reference site for development and production in the field of free-space optical communication. Equipped with a laser communication terminal that contains the Ferdinand-Braun-Institut's laser diode benches and several optical components and systems from Berliner Glas Group, the satellite uses

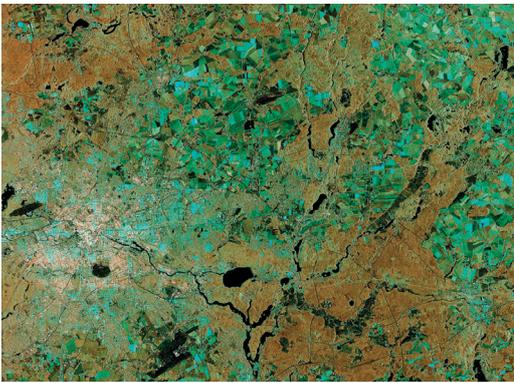


Photo of Berlin from the Sentinel-1A satellite, transmitted via laser

laser to transmit data across very long routes: a first in imaging satellite communication.

Laser technology shift

Internet services and the associated data centers require enormous amounts of electricity. This is a highly important ecology- and economy-related theme. The interconnects used today are encountering physical limits when it comes to energy efficiency, data rate and transmission distance. This is why a technology shift that will satisfy data center electricity needs at high transmission rates and temperatures is necessary. This is where research being done at TU Berlin comes in. The scientists there are developing innovative optical interconnects based on radically energy-efficient, surface-emitting lasers. In comparison to classical electrical and optical interconnects, they provide a significantly higher data transmission rate – at a low energy consumption rate, higher temperatures and larger maximum transmission routes.



»For optical communication and sensor systems technology, the physical advantages of optoelectronics and optical packaging technologies in data communication and telecommunication, medical technology, industrial sensor systems and the life sciences are crucial. A wide spectrum of expertise, a first-class research infrastructure, short channels and sustainable networks – these are the factors that make Berlin-Brandenburg attractive. For many years, the close exchange between science and business has been a tradition in our focal area of photonics for communication and sensors.«

Dr. Henning Schröder
Spokesperson Focal Area Photonics for Communication and Sensors
Fraunhofer IZM

- Powerful scientific basis
- Large number of specialized small and medium-sized companies with a wide range of know-how
- Close networking between science and business
- R&D areas of concentration: Photonics system integration (chip-integrated and hybrid), optical sensor systems for orientation and position determination, analytics, the development of high-rate dynamic communication systems and free-space optical communication
- Appealing location for well-educated skilled specialists
- Excellent financial incentives



»FISBA is the market leader in the area of micro optics for laser diodes. Our experience shows that Berlin is a hot spot for new developments and their translation into industrial applications in our field and adjacent ones.«

Michael Graurock
Managing Director
FISBA Photonics GmbH

Close networking in the cluster

Photonics for communication and sensors is one of the six focal areas in the Photonics cluster in Berlin-Brandenburg, one of the world's leading sector locations. The powerful scientific basis and the large number of specialized small and medium-sized companies with a wide range of know-how create the ideal conditions for mutual transfer between science and industry. At the same time, it drives innovation in other sectors. This is reflected in a very dynamic growth profile. The yearly growth rate averages 8% and the share of exports is 86%.



High speed, high sensitivity silicon avalanche photodiodes (APD)

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OUT
TH Wildau
TU Berlin
University of Potsdam

Associations and networks
AMA Association for Sensors and Measurement
OpTecBB
Photonic BB

Our aim: your success!

Berlin and Brandenburg support the focal area Photonics for Communication and Sensors with an economic policy developed across state borders in the Photonics cluster. The cluster is managed under the aegis of Berlin Partner for Business and Technology, the Brandenburg Economic Development Board (ZAB) and the network OpTecBB. Our aim is to provide comprehensive support to companies and scientific institutions interested in inward investment or further development in the capital region.

We are ready to assist you with:

- Finding a site
- Funding and financing
- Technology transfer and R&D cooperation
- Cooperating in networks
- Recruiting personnel
- Developing international markets

Reach out and contact us!
www.photonics-bb.com

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