

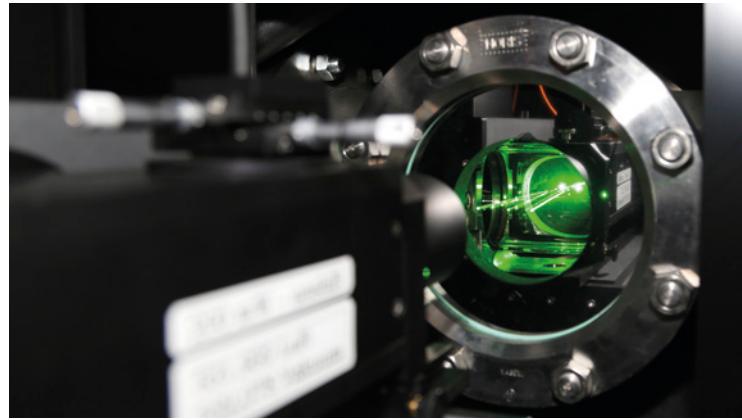
# Laser Technology

in the Capital Region Berlin-Brandenburg

THE GERMAN CAPITAL REGION  
excellence in photonics



Laser stack assembly at the Ferdinand-Braun-Institut



Laser optics volume flow measuring device at PTB

#### Companies

adloptica  
A·P·E Angewandte Physik & Elektronik  
art photonics  
BAUER + MÜCK  
Berliner Glas  
Brilliance Fab Berlin  
Canlas Laser Processing  
CLS Clinical Laserthermia Systems  
Compact Laser Solutions  
CryLaS  
CRYSTAL  
DoroTEK  
eagleyard Photonics  
FCC FibreCableConnect  
Finisar  
FISBA Photonics  
F&K Physiktechnik  
HOLOEYE Photonics  
II-VI DIRECTPHOTONICS  
II-VI HIGHYAG  
itec Automation & Laser  
JENOPIK Diode Lab  
KOMLAS Optische Komponenten und Lasersysteme  
Laser Electronics  
Laser-Mikrotechnologie Dr. Kieburg  
Limmer Laser  
LINLINE  
LTB Lasertechnik Berlin  
Lumics  
Newport Spectra-Physics  
OECA Opto-Elektronische Componenten und Applikations Gesellschaft  
Optikexpertisen  
Dr. Volker Raab  
OsTech  
Photon Laser Manufacturing  
Photon Laser Engineering  
PhotonTec Berlin  
PicoQuant

Based on its broad spectrum of applications in science and industry, laser technology is one of the most important focal areas in the capital region's Photonics cluster. In total, over 60 companies are active in the field. More than ten of them manufacture lasers and the remaining companies are in upstream or downstream segments of the value chain. The majority are components suppliers or system developers. Many companies benefit from this concentrated know-how. Today, there are hardly any sectors of industry in which laser technology does not play a role as an enabling technology. In addition to materials processing, the fields of application range from sensor systems and biotechnology, medical and environmental technology and information and communication technology to lighting and display technology, space applications and safety.

#### Long tradition

The capital region's strong position is not a random phenomenon. Instead, it is the result of a long tradition. After all, the theory behind lasers originated in Berlin. In 1916, Albert Einstein postulated the theory of absorption and the



»Diode lasers are a key component in photonics. In this field, companies and research institutions from Berlin are setting international performance and quality standards with their advanced high-tech products.«

Prof. Dr. Günther Tränkle  
Director of the Ferdinand-Braun-Institut

stimulated emission of photons in Berlin in his work „On the Quantum Theory of Radiation.“ The experimental proof was also produced in Berlin. Rudolph Ladenburg and Hans Kopfermann were the first scientists to successfully observe negative dispersion (amplification of light) on lines of electrically excited neon in 1928, thus providing the experimental proof of the stimulated emission Einstein had predicted. The first German laser was built in 1961/62 at TU Berlin.

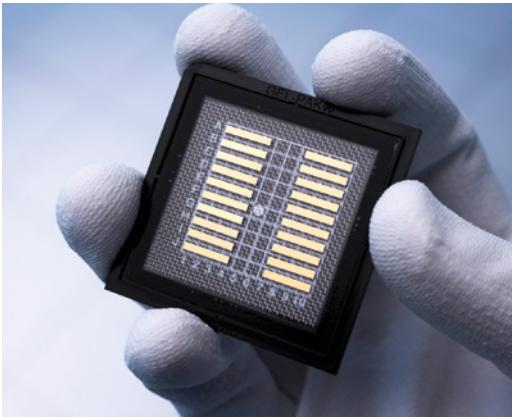


»The widely used term "Industrie 4.0" is for us more than just a trend and great ideas. Here in Berlin, together with our partners from the region, we already develop and produce intelligent and networked laser and arc welding manufacturing systems that continuously excite our worldwide customers.«

Igor Haschke  
Scansonic Group

#### Top-level research

The research institutions from Berlin lead the world. The Max Born Institute for Nonlinear Optics and Short Pulse Spectroscopy (MBI) concentrates its research program on new sources for ultra short and ultra intense light pulses, pulse formation, pulse characterization and measuring techniques for ultrafast processes in a broad spectral range from middle infrared to the X-ray range. It also studies ultrafast, nonlinear phenomena in atoms, molecules, clusters and plasma, as well as on surfaces and in solid bodies. Ferdinand-Braun-Institut researches innovative diode lasers and UV LEDs based on III/V semiconductor technology. It covers the entire value chain and a



Diode laser bars of JENOPTIK Diode Lab GmbH

- 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: Beam sources, beam guidance systems, rapid deflection systems and processing heads for materials processing, additive laser manufacturing, processing of transparent materials, high power (direct) diode lasers, laser diodes for optical communication, stabilized pumping laser diodes, lasers in the infrared range, light sources for fiber optic sensor systems and spectroscopy
- Appealing location for well-educated skilled specialists
- Excellent financial incentives

broad frequency spectrum from infrared to the ultraviolet spectral range. The focus is on increasing the brilliance, efficiency and reliability of high-performance diode lasers. The fields of application range from pumping of solid-state lasers and direct material processing to display technology and optical communication. The Institute of Solid State Physics at TU Berlin works on the epitaxy of semiconductor hetero- and nano-structures, new materials such as carbon nanotubes and graphene, and the development of laser diodes, UV LEDs and single photon emitters.

The collaborative project iLaP (intelligent laser and electric arc systems with integrated process knowledge and intuitive operation) aims to translate the Industry 4.0 concept into practical applications for material machining. It develops connected systems that will be able to collect and analyze extensive process data as a basis for semi-autonomous decisions, thus introducing more flexible production to clamping technology, additive manufacturing and laser welding. Five companies and two scientific institutes contribute to the project.



»Thanks to the funding from the state of Brandenburg, we were able to implement key investment projects at the Stahnsdorf location. Brandenburg Economic Development Corporation (WFBB) gave us active, uncomplicated support during the application phase.«

Jürgen Niederhofer  
General Manager  
Newport Spectra-Physics GmbH

PT Photonic Tools  
Schleicher Electronic Berlin  
Scansonic  
Scopis  
SECOPTA  
SLT Sensor- und  
Lasertechnik  
Smart Laser Systems  
TRUMPF Laser- und  
Systemtechnik  
W.O.M. World of Medicine

**Education and Research**  
BAM Federal Institute for  
Materials Research and  
Testing

Ferdinand-Braun-Institut,  
Leibniz-Institut fuer Hochst-frequenztechnik (FBH)  
Fraunhofer HHI  
Fraunhofer IPK  
Fraunhofer IZM  
Humboldt-Universität  
Institut für angewandte  
Photonik  
Max Born Institute  
Paul-Drude-Institut für  
Festkörperelektronik  
Physikalisch-Technische  
Bundesanstalt (PTB)  
Technical University of  
Applied Sciences Wildau  
TU Berlin  
University of Applied  
Sciences Brandenburg  
University of Potsdam

**Associations and networks**  
iLaP  
INAM Innovation Network  
for Advanced Materials  
Laserverbund Berlin-  
Brandenburg  
OpTecBB



»The capital region has a laser technology tradition that goes back over 50 years. The close cooperation between the many research institutions, innovative companies and users in industry, medicine, transport and communication has a fixed institution that has been active in the region for over 20 years: the Laserverbund Berlin-Brandenburg e.V. industry association.«

Prof. Dr. Eberhard Stens  
Spokesman of the focal area Laser Technology

## Networking

The strong network fosters close collaboration that enables the creation of innovative products at all levels of the value chain. Various networks provide an ideal platform in this regard. Optec-Berlin-Brandenburg (OpTecBB) is the competence network for photonics and microsystems technology in the states of Berlin and Brandenburg. Comprising 110 institutional members, the association cooperates with Berlin Partner and the Brandenburg Economic Development Corporation (WFBB) to manage the cluster.

The aim of the nonprofit Laserverbund Berlin-Brandenburg is to promote the spread of laser technology. In this regard, it supports collaboration between business and science in the areas of laser research, development and application. Moreover, it organizes seminars, workshops and network forums, advises on the use of laser applications and acts as an intermediary to companies working in the area of laser technology.

# Our aim: your success!

Berlin and Brandenburg support the focal area Laser technology 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 Corporation (WFBB) 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](http://www.photonics-bb.com)

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