Leibniz
Ferdinand
Braun
Institut

NEW IMPULSES.

Partner for industry & research

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150
scientists

305
patents

340
employees from 24 countries

We look forward to further cooperating with you.

The Ferdinand Braun Institute starts the year 2021 as an independent gGmbH within the Leibniz Association. This new legal form offers the opportunity to create the optimal environment for our application-oriented research. As a fast-growing institute, we need flexible structures that allow us to respond quickly and proactively to new requirements. This is how we want to offer you, our partners and customers, the best possible service.

We would also like to give you a preview of the further technological possibilities opened up by our new cleanroom. With an additional 1,000 square meters of laboratory space, it offers state-of-the-art facilities and expands our existing portfolio in III-V semiconductor technology.

We look forward to continuing our collaboration with you. Under our new name Ferdinand-Braun-Institut gGmbH, Leibniz-Institut für Höchstfrequenztechnik (FBH gGmbH), we will continue to provide you with tailored research and development in the accustomed quality – from materials to prototypes. Please feel free to contact us at any time.

Yours sincerely,

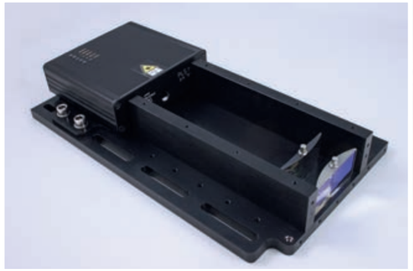
Prof. Dr. Günther Tränkle
Scientific Director

KNOW-HOW

comprehensive expertise & complete solutions

For almost 30 years, we have been researching and developing electronic and optoelectronic components based on III-V semiconductors – with internationally leading results. As a one-stop service, we offer our partners from research and industry complete solutions with the full value chain in-house. Our portfolio ranges from customer-specific epitaxy and tailored devices to modules and, increasingly, systems with which we demonstrate applications.

To ensure preliminary research, we meanwhile maintain eight joint labs with universities from all over Germany. This way, we address future topics that will only become industrially relevant in a few years' time. This also includes the newly created research area of Integrated Quantum Technology. In this field, we are combining our unique microintegration technology that is used in robust diode laser modules for space applications with innovative research on, for example, nanostructured diamond systems and materials. This is how we aim to transfer proof-of-concept demonstrators of quantum technology from the laboratory to industry-suited solutions.



On behalf of OQmented, the Ferdinand-Braun-Institut has developed a pulse laser source including control electronics. The MEMS specialist has integrated FBH's module with further components into its LiDAR system. During testing, objects were detected in a wide angular range of 140 degrees at distances of up to 25 meters.

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Partner for industry & research

Fully automatic electroplating system with 8 chambers
for electrochemical deposition and surface preparation

STATE-OF-THE-ART

cleanroom expands research infrastructure

We are currently putting an additional cleanroom into operation. You can look forward to 1,000 square meters of state-of-the-art technology environment for micro- and nanostructures. As part of the Research Fab Microelectronics Germany (FMD), we are expanding our research infrastructure with high-performance large-scale equipment for semiconductor manufacturing, funded by the German Federal Ministry of Education and Research with around 34 million euros.

The facilities include a wafer stepper, photo and electron beam lithography systems, a high-temperature ion implanter as well as systems for plasma etching, sputter coating, electron beam evaporation and electroplating. We are creating the necessary technical environment in the new cleanroom with funding from the state of Berlin and the European Regional Development Fund (ERDF).

Wafer stepper & scanning electron microscope (SEM)
when inserting a mask (top) and detector at the SEM to determine chemical elements (below)

Friedrich Paul Witek
Management Representative,
SENTECH Instruments GmbH

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Results obtained from the device processes performed at the Ferdinand-Braun-Institut help us to permanently advance SENTECH plasma process systems. This allows us to offer our customers state-of-the-art equipment that is optimally suited to meet real-world requirements.

new capabilities – from 3D to 5G MIMO

Simultaneously, we are establishing a 3D printing center of competence, comprising high-performance systems that can print various precious metals as well as ceramics with utmost precision. One of the systems has the capability to print even complex metal objects with sub-micrometer resolution.

Also unique is the highly sophisticated RF measurement system for 5G MIMO applications at the institute. FBH designed the novel overall system from customized high-end components – opening up unique measurement opportunities.

RF measurement system for 5G MIMO
offers unique characterization capabilities

Wafer inspection
for microchip quality assurance

PARTNER FOR INDUSTRY & RESEARCH

exemplary cooperation

Whether international market leaders, highly specialized SMEs or universities – we offer our partners from industry and research tailored solutions meeting their specific requirements.

Trumpf and FBH have been cooperating successfully on high-power diode lasers for many years. The laser manufacturer has additionally opened a branch office in the immediate vicinity of its research partner in 2016. In this collaboration, FBH contributes its expertise in high-brightness laser diodes, bars and stacks that are optimized for high output powers. Trumpf uses these semiconductor lasers to pump its laser systems or as components for direct material processing.

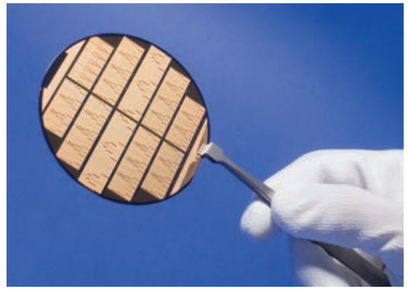
Dr. Berthold Schmidt
CEO, TRUMPF Photonic Components GmbH

”

The Ferdinand-Braun-Institut is one of the leading international research institutes in the field of semiconductor laser diodes. Research partners like FBH are indispensable to secure our international market and technology leadership.

The German Aerospace Center (DLR) has been funding the development of diode laser-based modules for quantum optical experiments in microgravity at FBH for more than 12 years. Repeatedly, the institute has demonstrated its unique expertise in high-performance, compact and reliable photonic hardware for challenging applications in space.

FBH has been working with the Berlin-based company SENTECH for more than 25 years. The low-damage plasma process technology specialist enables FBH to perform exploratory processes for gallium nitride and gallium oxide technology with its reliable systems. In addition, SENTECH operates equipment in an application laboratory at FBH, demonstrating to customers its performance and integration capabilities in advanced device processes.



The full value chain in-house –
from semiconductor chips and demonstrators to applicable systems. Here, FBH performs on-site Raman measurements with its portable SERDS sensor system to identify soil components. This is how in the future nutrients shall be supplied to agricultural soils in a targeted manner. Centerpiece of the system is a dual-wavelength diode laser with two slightly shifted laser wavelengths, which allows Raman signals to be efficiently separated from interfering background signals.

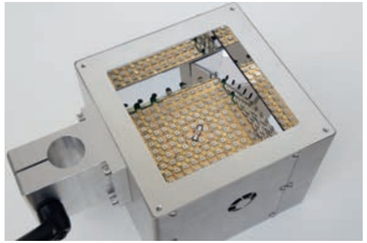
Microintegrated diode laser module
for precision spectroscopy of iodine in space

ADDED VALUE

working with FBH

- contract research & licensing
- research & technology services
- demonstrators & pilot series
- strategic partnerships – projects, networks, application labs, ...
- utilization of research results through strategic partners & FBH spin-offs

Digital power amplifier module
for mobile communications of the future



Irradiation module with 118 UVC LEDs
to render pathogens harmless

Prof. Dr. rer. nat. Hansjörg Dittus
Member of the Executive Board,
German Aerospace Center e.V.

”

The compact diode laser modules from the Ferdinand-Braun-Institut contribute significantly to DLR's ability to provide increasingly complex facilities for quantum optical experiments in space. As part of the BECCAL apparatus, they will enable experiments with ultra-cold atoms on board the International Space Station ISS.

NEW

the most important data at a glance

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Acoustic microscope
for material analysis with ultrasound

ALWAYS UP TO DATE

printed & digital

frequent

with focus on one of FBH's research topics

annual report

the most important results & highlights

FBH research news

latest results on our website

social media

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Metal lift-off processor
for fully automatic treatment with solvents to remove photoresist

Wafer stepper
for photolithographic structuring

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8 joint labs

1,000 m²
additional cleanroom space

246
ongoing research projects

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