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Optical and Microsystems Technology in the German Capital Region Berlin-Brandenburg

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Optec-Berlin-Brandenburg (OpTecBB) e.V.

Cluster Colloquium

Photonics, Micro- and Nanotechnologies in the Baltic Sea Region

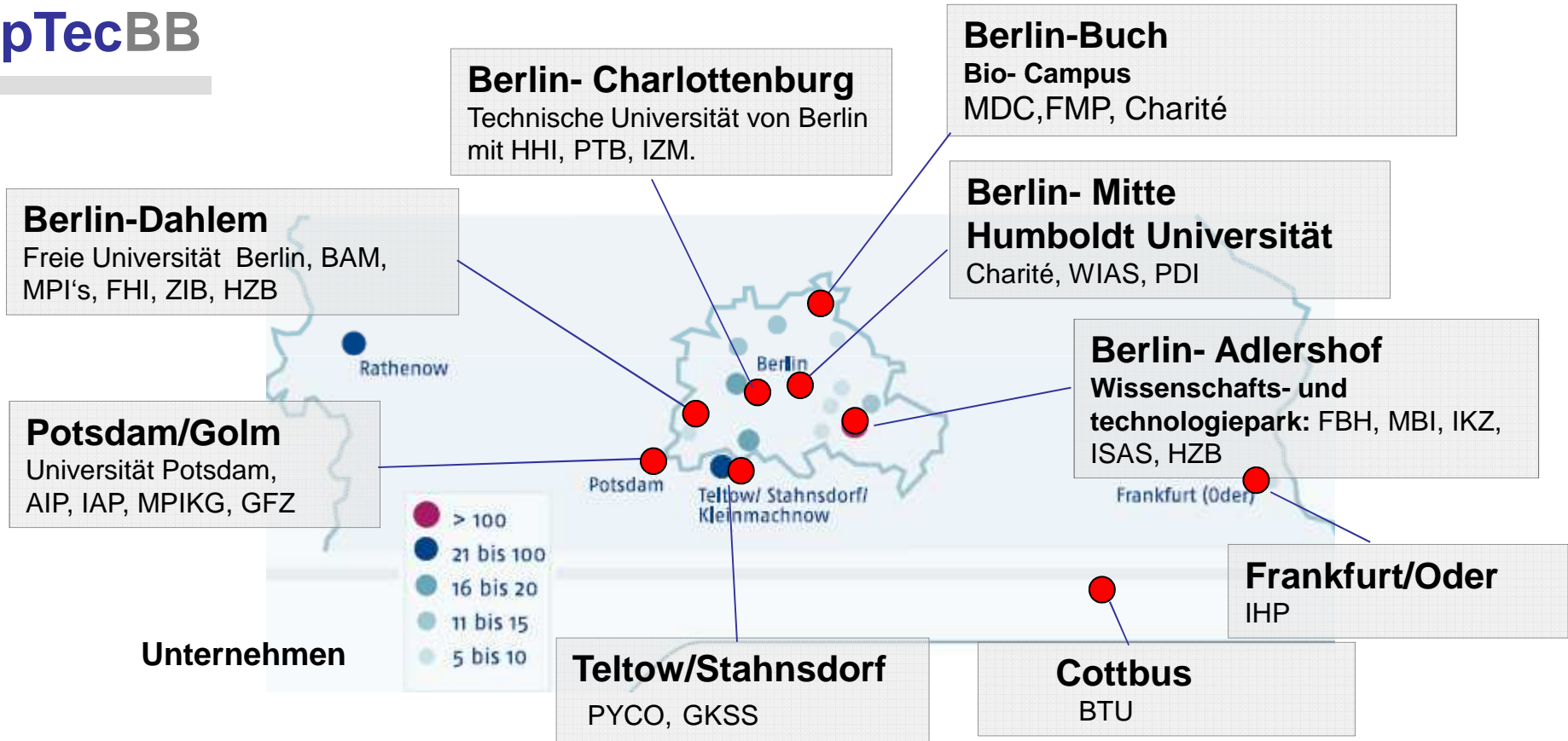
Laser Optics Berlin, March 23rd, 2010





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Science Landscape: Major Sites in Berlin-Brandenburg



**Close cooperation of research & industry –
basis for the photonics & microsystems cluster**





Berlin-Brandenburg- an industry region between tradition and modernity



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Milestones:



J. H. A. Duncker



Old ROW Building

- 1801: Duncker's patent on multiple polishing machine > Optische Industrieanstalt Rathenow
- 1896: 163 optics companies in Rathenow
- Late 19th century: First industrial production of optics (Goerz; later Zeiss) and lighting products (Osram) in Berlin
- 1939: 2.244 companies and 27.248 employees in and around Berlin

- After WW II 80 % of the industry were either destroyed or dismantled
- West Berlin: special competencies in optical data transmission & laser technology
- East Berlin / Rathenow: Expropriation of companies & centralisation of optical science in Berlin- Adlershof



Centre for Photonics and Optical Technologies;
WISTA MANAGEMENT GmbH, Berlin-Adlershof

* sources KOR & TSB Adlershof





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At a glance: Optical & Microsystems Industry in Berlin-Brandenburg



400 companies; 280 of them active in optics & photonics
82% SMEs with less than 250 employees
(26 research institutes, 5 universities)



Characteristics of the industry: fragmented, mainly SMEs, regional located, often with a small budget for own research and development, but globally active

*source TSB Adlershof





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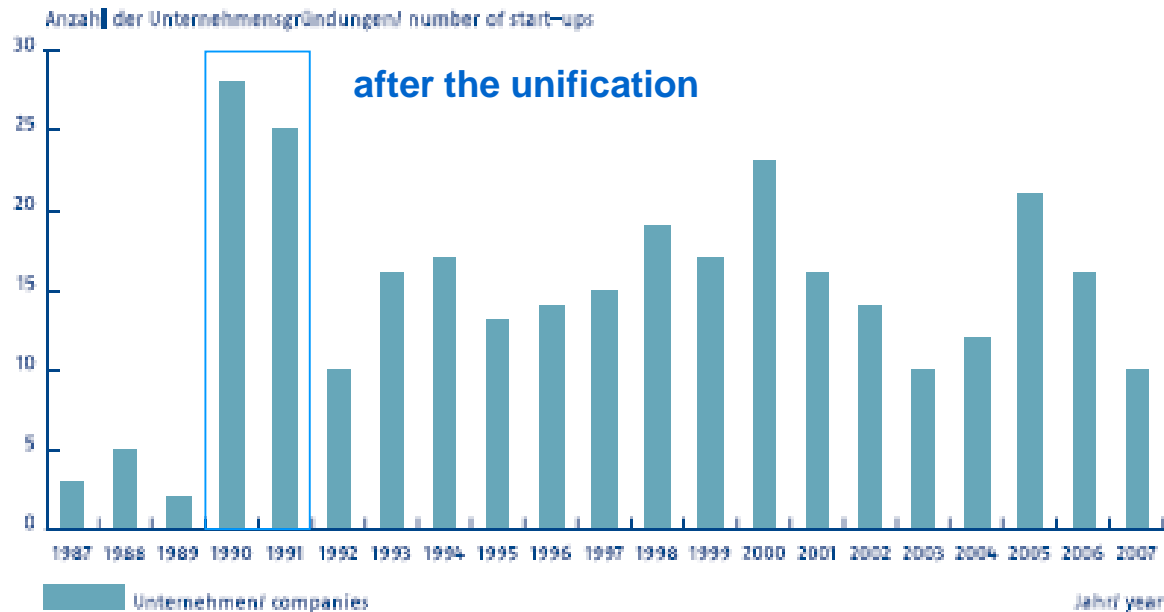
New companies in optics & photonics after the unification



Science and Technology Park Berlin-Adlershof; WISTA MANAGEMENT GmbH

- **After 1989: numerous start-ups by formerly state-employed specialists mainly in the newly created science and technology park Berlin-Adlershof**

- **Maintenance of scientific potential in „Academy of Sciences“ - successors in Adlershof**



Source: TSB Adlershof 2008; Commercial Register



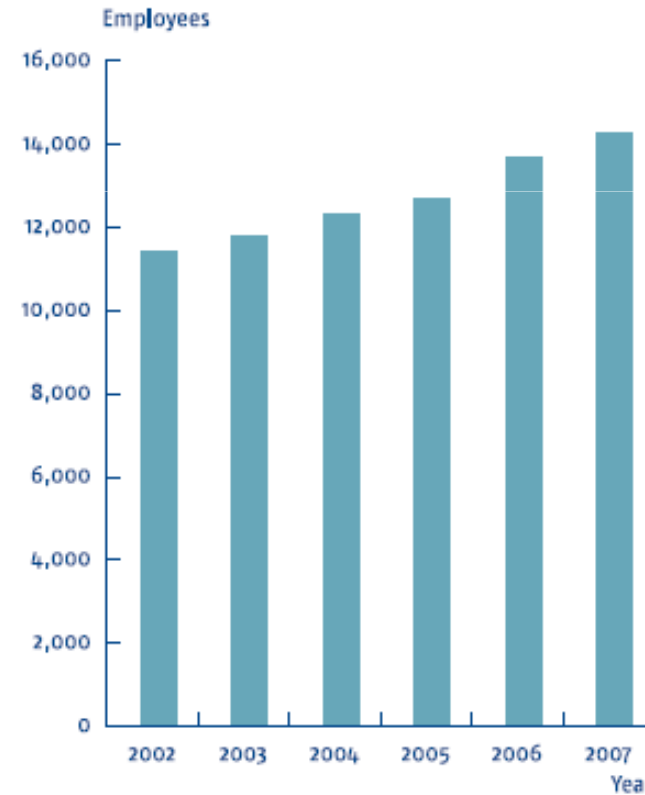
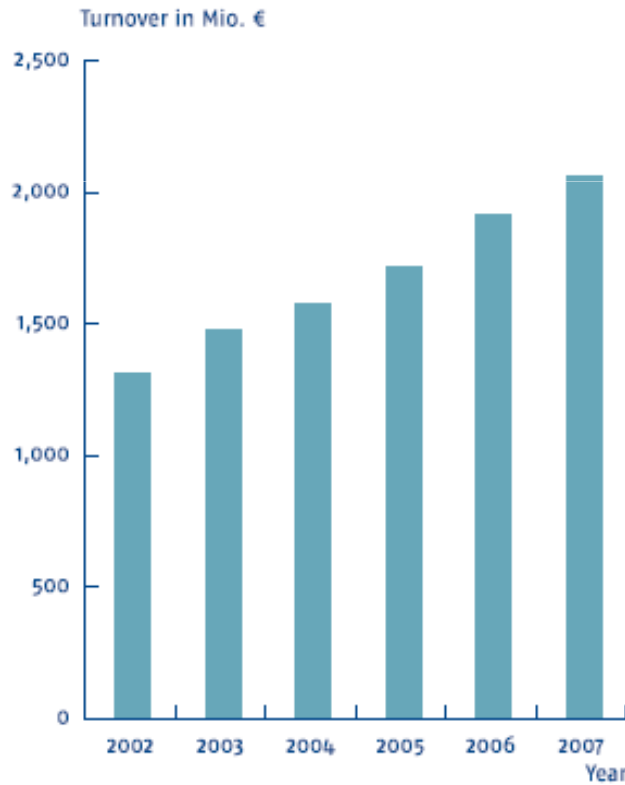


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Turnover & Employment Statistics



Companies from Berlin-Brandenburg in the optical industry and the closely related microsystems technology



Source: TSB Adlershof 2009; MARKUS - Database



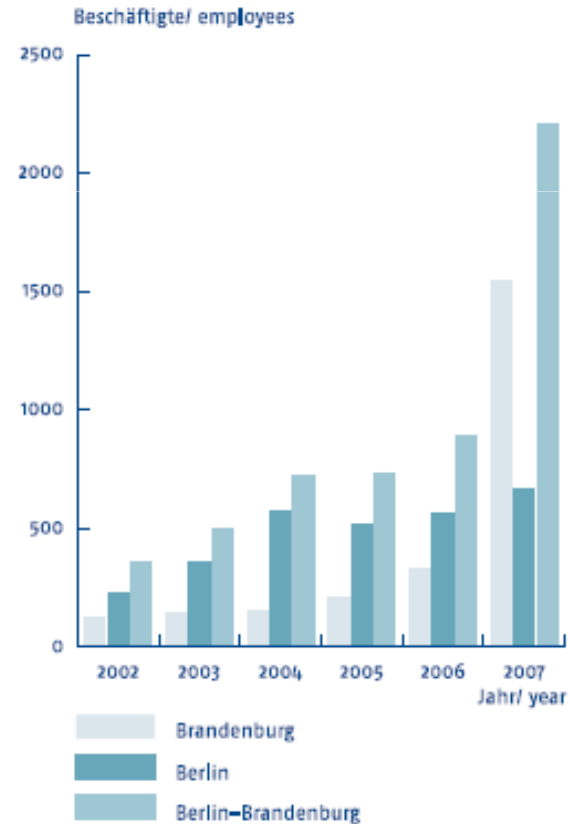
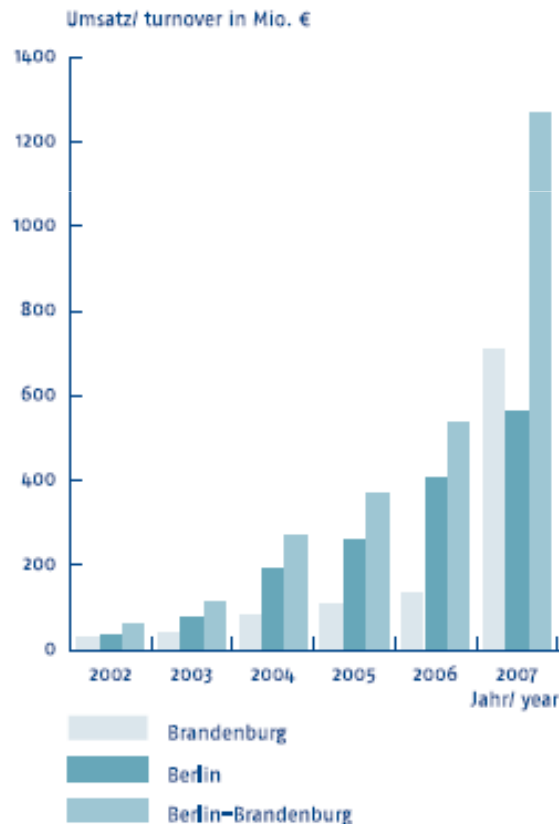


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Berlin-Brandenburg: the new German center of photovoltaics



Companies from Berlin-Brandenburg in the growing photovoltaic industry – new applications for optical analytics and material processing by laser





Products from Berlin- Brandenburg



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Eyeglasses



Lighting



Optical instruments



Precision Optics

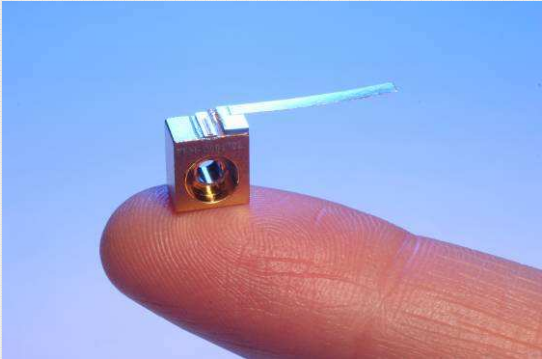




Products from Berlin- Brandenburg



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High Power Laser Diodes



Laser & Spectrometer



**Scientific Instruments
and Analytics**





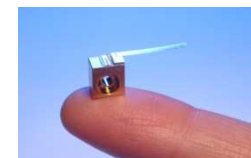
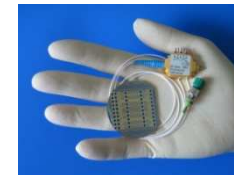
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Sciences & Technologies Core competencies



Core competences in Berlin-Brandenburg:

- Biomedical optics
- Innovative ophthalmology
- Lighting
- Multi sensors, visualization and signal processing
- Optical process measurement technology
- Terahertz technology
- UV- and X-ray technology
- Photonics for communication and sensors
- Laser technologies
- Microsystems technologies :packing & system integration





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Photonics for Communication & Sensors



Berlin-Brandenburg: the centre for high-speed optical communication

Leading edge research

Future network

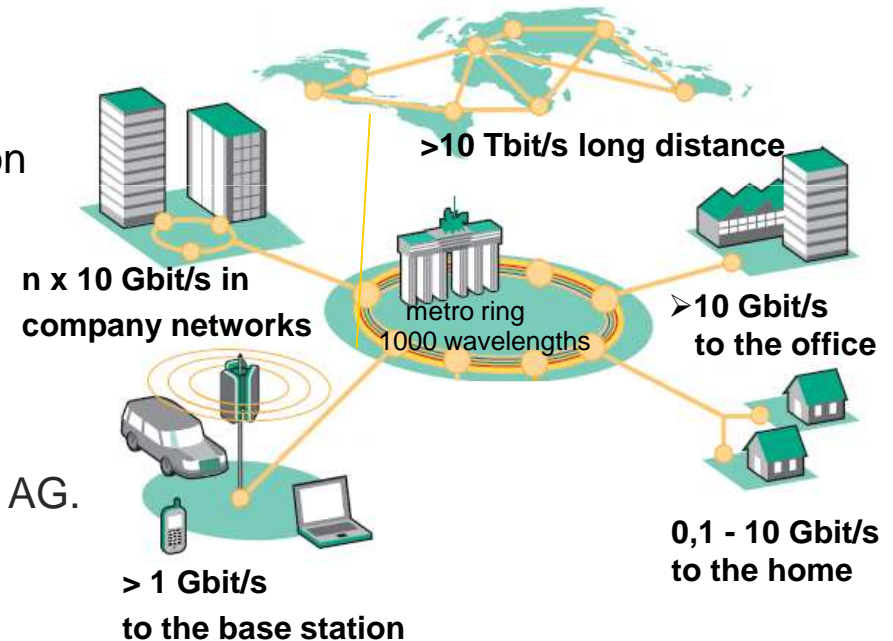
High-speed components, simulation

Transfer of technology

research & development at HHI, TU Berlin, IZM and production by U2t photonics, FOC, MergeOptics, SHF communication AG.

Marketable products

Sources, detectors, transceiver, optical connectors, optical fibre components



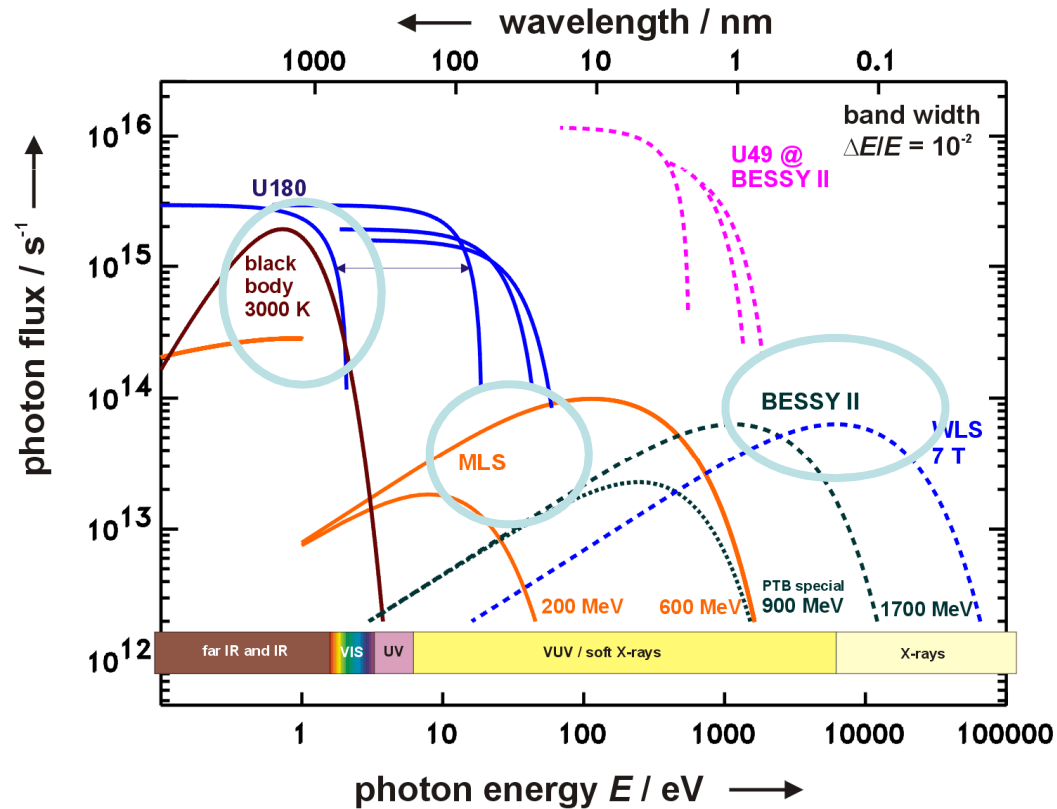
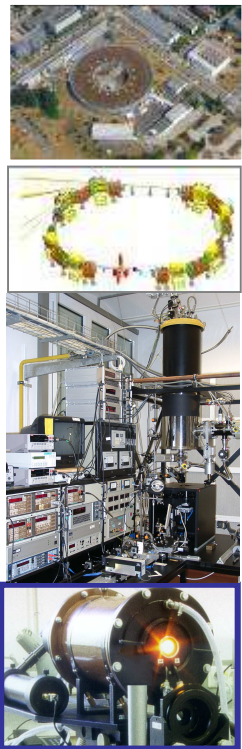


Excellence in Optical Metrology - PTB



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Broadest photon spectrum worldwide- realised by different light sources & detectors





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Laser technologies



Semiconductor diode lasers: high-power light sources for industrial applications

Leading edge research

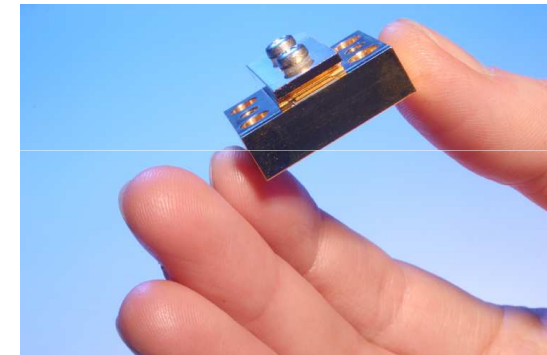
- Top-level results in efficiency and reliability (>70% electro-optical efficiency)
- Highest output-powers: > 500 W
- High beam quality: excellent usability of light
- Compact design: low cooling effort

Transfer of technology

- Research & development at the FBH
- Industrial production by Jenoptik, eagleyard etc.

Products

- Various applications in industry:
materials processing, medical technology,
printing, ...



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Laser technology LASERLAB-EUROPE II



*The Integrated Initiative of
European Large Scale Laser Institutions
in the EU 7th Framework Programme*

National resources:

Contractors:

**27 laser infrastructures
from 16 countries**

13 subcontractors

6 associate partners

Participants from

19 European countries

Co-ordinator: W. Sandner, MBI



<http://www.laserlab-europe.eu>





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Lighthouse Projects: Innovative lighting

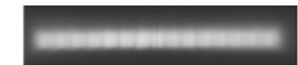
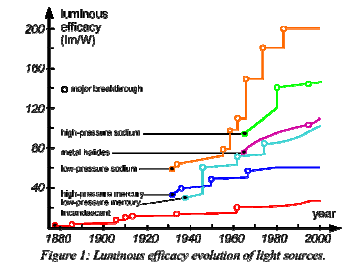


New lighting concepts (e.g. adaptive lighting) and usage of new light sources

Improvement of illumination quality and efficiency in general - a contribution to the environment protection

Objective

Region Berlin-Brandenburg towards a centre for innovative lighting



Dyn. Optik +
LED-Array





Lighthouse Projects: Laser Applications & Analytics in PV Production



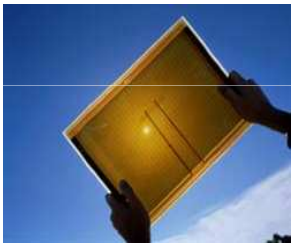
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Innovative laser based technologies for solar cells marking, cutting, drilling, repairing, edge isolation

Analytics for solar cells

Optical thin film measurements, X-ray Analytics, imaging technologies for characterization and und quality control/ inspections



Background:

- 30 PV companies and suppliers
- 12 institutes with PV-related research in Berlin-Brandenburg





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More Details:

Report 2008/2009

Optical Technologies and Microsystems Technology

Berlin-Brandenburg

published by TSB Adlershof





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Thank you for your attention!

