

NanoMat at Pracze Campus – a key element for European research

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In cooperation with:

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www.eitplus.pl

Wroclaw Research Centre EIT+



- the 4-th biggest city in Poland
- with the 2-nd largest budget
- metropolitan area population: 1 mln
- Lower Silesia region population: 3 mln

... sounds good
- but good enough?

Wroclaw Research Centre EIT+



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27 hectares

19000sq. metres usable space

5 hectares for development



The biggest infrastructure project in Poland granted from EU funds 140 M €

DCMiB Wrocław 2010

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The laboratory of the applied optics, and a big square for a barbecue

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and it's side view

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Future laboratory of materials characterization

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The main entrance, before staff arrival

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The headquarter of WCB EIT+ early morning....

Yes, it is a phantastic place to work !!!



INNOVATIVE ECONOMY
NATIONAL COHESION STRATEGY

EUROPEAN UNION
EUROPEAN REGIONAL
DEVELOPMENT FUND



The Application of Nanotechnology in Advanced Materials (NanoMat)

General goal of the NanoMat project:

- development of technologies for fabrication of new materials in nano scale
- and their application in modern electronics, photonics, energy storage and medicine

PROJECT CONTRACTORS

Project contractors – selected in tenders

Universities and research institutes.:

- University of Wroclaw
- Wroclaw University of Technology
- Electrotechnical Institute
- Institute of Low Temperature and Structural Research, Polish Academy of Sciences

Laboratory base:

- existing labs of the contractors (years 2009-2014)
- **WRC EIT+ own infrastructure built under the DCMiB project (years 2012-2014)**

Total budget: **NanoMat - 30,1 mln €**

RESEARCH WORKPACKAGES IN THE NanoMat PROJECT

Workpackage 1

Materials and nanomaterials for photonics, micro and nanoelectronics, and sensing

Workpackage 2

Photonic waveguide structures for applications in metrology and telecommunications

Workpackage 3

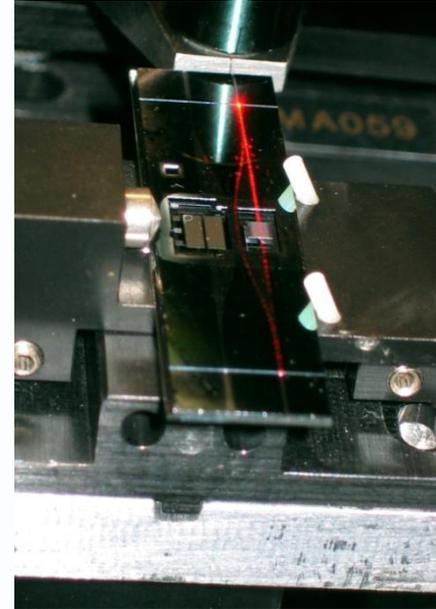
Polymer functional materials

Workpackage 4

Nanocomposites and smart materials

Workpackage 5

Rare elements and their compounds as starting materials for application in electronics, photonics and sensorics.



Wrocław, June 16-17th 2010

RESEARCH WORKPACKAGES IN THE NanoMat PROJECT

Workpackage 6

Materials and technologies for advanced systems of energy storage and conversion

Workpackage 7

Additive fabrication for manufacturing customized and mass products

Workpackage 8

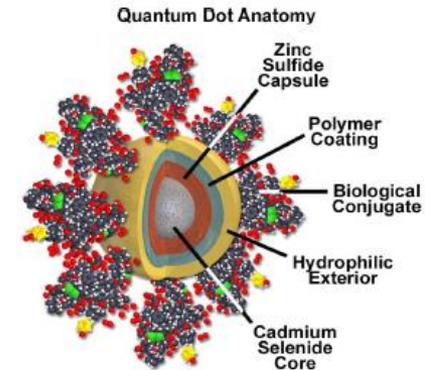
Laser micromachining technologies and their applications

Workpackage 9

Nanomaterials prepared by the sol-gel method for biomedical, optical and textile applications

Workpackage 10

Polymer and ceramic nanocomposites for electrotechnical applications



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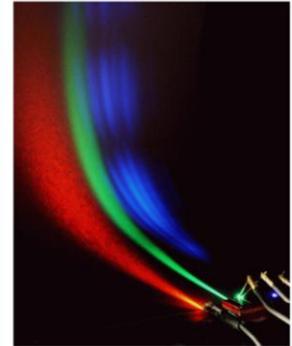
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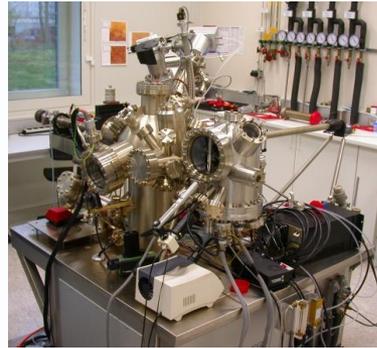
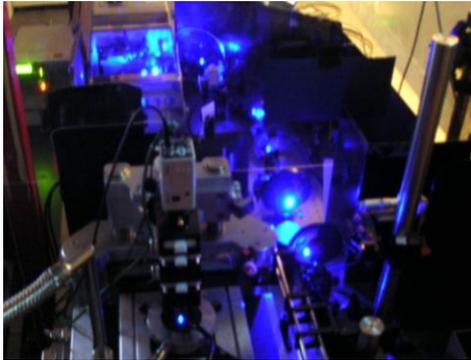
hommel@ifp.uni-bremen.de

- Study of physics and PhD (1979) at the Warsaw University in Poland.
- Full professor at the University of Bremen, Germany since 1994.
- Wide bandgap semiconductors, epitaxial growth and optoelectronic devices.
- 2006-09 Alexander von Humboldt Honorary Research Fellow of the Polish Science Foundation FNP.
- In addition since 2010 Scientific Coordination of the NanoMat at EIT+ in Wroclaw.



Speaking both languages fluently and having the knowledge of both societies and cultures I am intending to be a real link between the Lower Silesia region and Germany and more general „old Europe“

PL
 μ -PL
CL



Surface science

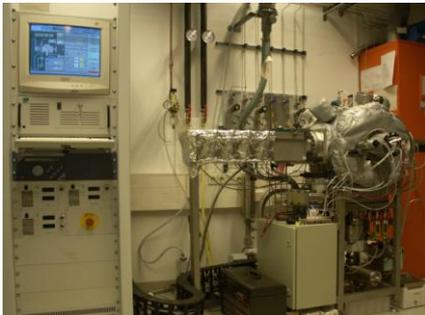


XRD



... to create a very flexible, high-end laboratory for growth, characterization and device processing of nano-structures

Lithography & dry etching



STEM and FIB for nano-characterization & nano-processing

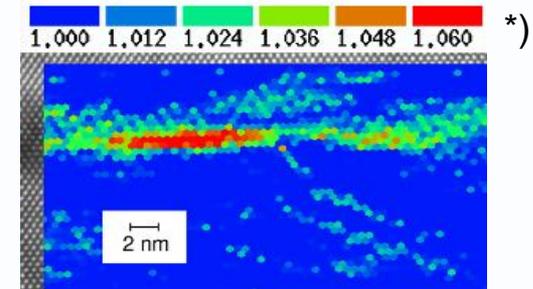


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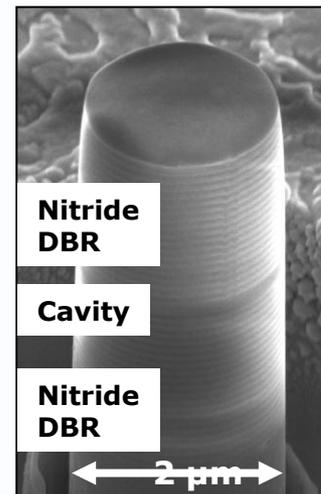
... UV emitter for water purification



... multi-wavelength emitter for fast spectral analysis for bio-medical applications



... single photon emitter for quantum cryptography



Cd-rich islands / 2ML CdSe
*) Red (blue) areas indicate CdSe (ZnSe) content. The key denotes the relative lattice constant.

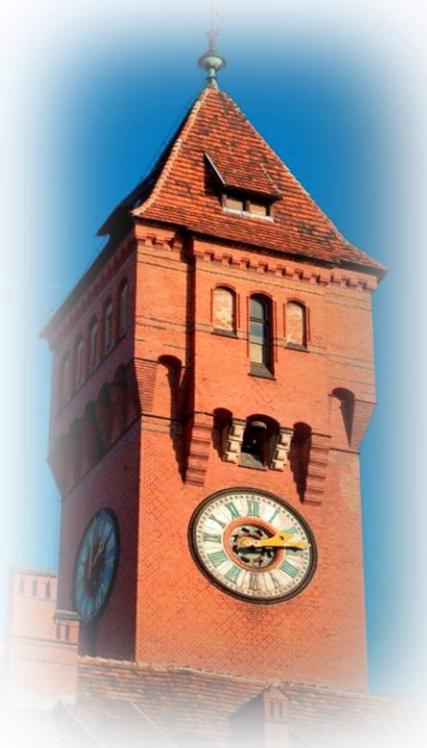
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General goals:

- to make the Lower Silesia region stronger in R&D and TT
- to establish co-operations with the best groups in Poland
- to be a *needed* partner and not simply a *bad* competitor for them
- to go strongly into European networks and to attract young researchers from all over Europe as well as established scientists

... and most important:

To educate a new generation of interdisciplinary oriented students open minded to modern technologies in order to improve significantly human life in future!



**NanoMat at Pracze Campus –
a key element for:**

conducting research on an advanced *European level*

- *in Europe*
- *for Europe*
- *with Europe*

Thanks for your attention

Dziekuje za uwage i cierpliwosc!

***See you at the latest at the
inauguration of the new laboratories !!!***

NanoMat PROJECT

General goal of the NanoMat project:

- development of technologies for fabrication of new materials in nano scale and their application in modern electronics, photonics, energy storage and medicine

Selected project objectives:

- development of type AIIIIV-N semiconductor nanostructure technology for the construction of radiation emitter and gas and flame sensing systems
- development of novel technologies of photonic fiber fabrication with improved transmission properties for application in nonlinear optics and lasers, metrology and telecommunication
- common use of different functional polymer materials: nanolayers, nanospheres, and hybrid materials made of nanosphere dispersed in polymer matrix
- fabrication of nanocomposite polymers and SMART-type magnetic materials in nano and micro scale for applications in medicine, telecommunication, electrotechnics, optoelectronics and bioengineering
- development of high magnetic hardness nanocomposites based on domestic raw materials
- development of ultrananoporous carbon-based material with ability to store hydrogen on capacity level required for practical application
- development of generative methods for design and fabrication of micro- and nanomaterials
- development of novel technologies for laser machining of solid materials
- synthesis of new nanomaterials obtained by sol-gel technology and based on titanium dioxide and silicon, and demonstrating photocatalytic, biological, protective or magnetic properties

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