

Overall strategies

- Strengthen competitiveness
- Providing innovation
- Founding new companies
- Special SME focus
- Technology transfer
- Better exploitation of basic research
- Generate new jobs
- Providing the appropriate tools!

BMBF Networks of Competence: Nanotechnology

- CC-NanoChem
- Nanoanalytics
- NanOp
- Upob e.V.
- Ultrathin Functional Films Saxony
- NanoMat
- CC-NanoBioTech (Nanobiotechnology)

CC-NanoChem (five years)

- Functionality by means of chemistry, production and application of nanomaterials and molecular architectures
- 147 Members:
 - 21 universities, 27 R&D institutes, 50 SMEs, 15 large companies, several venture capitalists, consulting companies
 - **Co-Directors**
 - Prof. Dr. Ch. Ziegler, University Kaiserslautern
 - Prof. Dr. H. Schmidt, INM Saarbrücken
 - 14 Start-ups
 - >50 products

Successful conferencesNanomedEJIPAC



Separation technique for viral DNA

CC-NanoChem – Examples

Nanoparticle Technologies and Applications

Synthesis, Processing and Application of nanoparticles are essential for the production of nanomaterials

Nanomaterials and applications include transparent composites for optics, ferroelectrical and superparamagnetic materials, absorbers, catalysts, <u>ceramics</u>, sensors and biosensors, nanobinders, corrosion inhibitors, supports for biologically active compounds, wear protection, barrier layers,...



Ceramic membrane for ultrafiltration (INM, Saarbruecken)

CC-NanoChem – Examples

Materials and Surfaces for Life Science

Nanomaterials with special surface functionalities and micro- or nanostructures

Applications in biology, medicine, food production, cosmetics, molecular and cellular biotechnology and biocompatible implantates



Cells with incorporated iron oxide nanoparticles (INM/Charité Berlin)

The New CC-*Nano*Chem – Objectives: materials and material technologies

• Focus on three fields:

- Nanoparticle fabrication and processing technologies for materials
- Surface technologies and their applications for all industrial branches
- Life Science Applications of nanomaterials
- strong cooperation with national, European and international networks (e.g. with oncoming networks on Nanotechnologies (e.g., Small Business Network")
- development of new business models for starting enterprises (e.g. Public-Private-Partnership models)
- coordination between demand of the market and research (studies, workshops, fairs)
- education/teaching, PR, information portal
- Vertical interdisiplinarity
- IP and standardisation issues
- France included!
- Strong commercial focus: 50 industrial fundsand own commercial activities!
- Contining and expanding EJIPAC

Fraunhofer + Leibniz + University!

The New CC-NanoChem - Structure



Future 2004: Start as registered association CC-NanoChem e.V.

The New CC-NanoChem - Structure

Management

Leader: Prof. Schmidt Stearing Committee (Prof. Schmidt, Prof. Fuhr, Prof. Breme) Four coworkers in headquarter

Scientific Adivsory Board

Prof. Breme:Metallic materials for Life SciencesProf. Fuhr:Surfaces and Applications for Life SciencesProf. Schmidt:Nanoparticles and Surface Technologies

Technical working groups

Nanoparticles, Processing, Optics and Microelectronics, Functional layers, Surface technologies, Life Science

Non-technical working groups:

Technology transfer and consulting, Networking, Certification and Standards, Education and Teaching, Toxikology

Nanoanalytics

- Measuring and analysis of structures down to nano-scale dimensions: measuring and analysis of surfaces and components for quality control and for reproducible mass production. Most prominent example of nano-analytics: scanning probe technologies.
- 9 universities, 11 R&D institutes, 17 small- and medium sized companies, 8 large companies
- Future: HanseNanoNet (Hamburg), CeNTech (Munster), Munich
- Contact: Prof. Dr. W. M. Heckl, Ludwig-Maximilians-Universität München

NanOp

- Application of nanostructures in optoelectronics: quantum effects in optoelectronic components (communication technology, environmental monitoring, CD players, laser TV, displays, etc.)
- Members: 15 Companies, 7 R&D institutes, 14 universities, 4 other partners (banks, consuting)
- Contact: Prof. Dr. D. Bimberg, TU Berlin

Upob e.V.

- Precisely formed and smoothed surfaces, used for example in optics, wafers and printing/reading heads, are forming markets growing into the billion range.
- 50 members
- In ultraprecise manufacturing, so far 35 patents, more than 120 cooperations and a turnover of about DM 3 billion have been created.
- Contact: Dr. Brand, PTB Braunschweig

UFS

- Ultra-thin functional layers: ultra-thin layers in electronic components, sensors, implants and artificial skin, in X-ray optics or in abrasion and corrosion protection layers
- Topics: advanced CMOS, new devices, biomolecular layers, protection layers, Ultrathin layers for optics and photonics, nanoactors and nanosensors
- Members: 44 Companies, 10 universities, 22 R&D institutes and 5 networks
- Contact: Dr. A. Leson, FhG IWS Dresden

NanoMat

- Synthesis and Analysis of metallic and ceramic nanostructured materials and their functions which results from their nanoscaled dimensions
- 24 Members
- Contact: Dr. Regine Hedderich, Geschäftsstelle Forschungszentrum Karlsruhe GmbH

Nanoclub Lateral

- Production and use of lateral nanostructures: Structuring technologies on a sub-50nm scale for high-density data storage, electronic components with a structural width of under 50nm, a new generation of electronic components, applications in biotechnology, etc.
- 50 institutes, 20 companies
- Contact: Dr. Heinrich Kurz, RWTH Aachen

Other German Networks

- National Contact Point for Nanotechnology (www.vdi.de)
 Consulting for EU projects and funding
- VDI Field of Excellence Nanotechnology (www.vdi.de)
 - VDI is very large community of scientific researchers
 - Nanotechnology information portal for existing and potential members
- DFG CFN Center of Functional Nanostructures
 - Scientific network of 35 research institutes in Karlsruhe
- NanoBioNet e.V. (www.nanobionet.de)
 - National community with topics in Nanobiotechnology
- Nanotechnologie e.V. (www.nanotechnologie-ev.de)
 - National community with topics in Nanotechnology