



Nanotechnologie – Made in Germany

Exhibitors of the German Area, NSTI
Nanotech 2008, Boston, June 1–5, 2008



**Strong partners for a
prosperous co-operation**

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Federal Ministry
of Education
and Research

Research in
Germany



Land of Ideas

www.research-in-germany.de



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Germany



Land of Ideas

Welcome to Nanotech Germany

Small ideas make it big in Germany. Without nanotechnology our lives would be unimaginable. Nearly all branches of industry profit from the progress being made in nano research. At the same time, nanotechnology still has a wealth of innovative potential to exploit. Germany has set itself the goal of becoming a pacemaker, decisively shaping the future of nanotechnology – even today, German researchers are right up front in third place in the international league table for patent applications.

In 2008 and 2009, the nanotechnology location Germany is showcasing itself internationally in the context of the “Welcome to Nanotech Germany” initiative. The object is to step up cooperation between German and international research establishments and enterprises.

At international fairs, such as nanotech Japan 08, NSTI Boston 08, China International Industry Fair 08, and nanotech Japan 09, interested partners are being given the opportunity to make contact with German research establishments and innovative enterprises. On top of this, presentations are planned for special congresses and conferences as well as workshops, partnering events and symposia.

For further information please visit: www.research-in-germany.de/nano

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AGeNT-D is a consortium of the nine German Nanotechnology Competence Centers (CCNano), which are networks of partners from science, industry and finances. They are focussed on different areas of nanotechnology and supported by the Federal Ministry of Education and Research (BMBF) since 1998. Central goal is the concentration of the knowledge in the area of nanotechnology and its supply to industry and society to profit by applications. AGeNT-D was established in February 2007 and is supported by the BMBF. It is managed by CC NanoOptoelectronics. The managing director is Prof. Dr. Dieter Bimberg.

The members are presently

- cc-NanoChem e.V.-Competence Center Chemical Nanotechnology for New Materials
- CeNTech - Center for Nanotechnology
- ENNaB - Excellence Network NanoBioTechnology
- INCH - Interdisciplinary Nanoscience Center
- NanoBioNet e.V. - Network of Competence for Nano- and Biotechnology
- NanoMat - Competence Network for Nanomaterials
- NanOp - Competence Centre for the Application of Nanostructures in Optoelectronics
- UFS - Competence Center Ultrathin Functional Films
- UPOB - Competence Center Ultra-Precise Surface Figuring e.V.

Working areas and targets of AGeNT-D

- Development of mutual R&D strategies
- Strengthening of supraregional networking and international co-operation
- Strengthening of technology transfers within and between the networks
- Political advisory work
- Education and advanced training
- Standardisation
- Constitution of mutual public relations
- Grant of nanoscience awards

The German-Japanese Workshop for Young Scientists of Nanotechnology is organized by the Network NanoMat and BW-i and will be held at the nano tech 2008 on Thursday, 14th February.

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Ultra-high precision spatial positioning of objects is of prime importance in the emerging field of nanotechnology. attocube systems' patented new type of precision-positioning technology is based on an innovative concept that meets those market demands. The ultra-compact Titanium translation stages allow operation under extreme environmental conditions such as cryogenic temperatures (10 mK – 300 K), high magnetic fields (+31 T) and ultra high vacuum environments (5×10^{-11} mbar). These features present a revolutionary advancement for the positioning market leading to new research in numerous areas.

Applications of these outstanding nanopositioning modules, well-known in many labs around the world, include scanning probe techniques such as scanning electron microscopy, confocal microscopy, scanning force microscopy, scanning tunneling microscopy and near-field optical microscopy, to name just a few. Furthermore, they are suitable for general beam manipulation applications involving optical fibers and solid state waveguides.

The product line of attocube systems AG ranges from these stand-alone simple positioning components for laboratory applications to complete automated and integrated solutions for low temperature- / UHV- scanning probe microscopy (SPM). The product range includes different species of Confocal Microscopy (CFM), Atomic Force Microscopy (AFM), Near-field Scanning Optical Microscopy (NSOM) and Scanning Tunneling Microscopy (STM) offering operation modes down to 300 mK as well as high magnetic field and vacuum compatibility.

The product range is completed by innovative and highly flexible control systems for multiple SPM modes. Various SPM hardware and software modules make image acquiring a simple task. 2D and 3D software allow image processing for visually appealing, professional and publishable results.

As a market leader for low temperature Scanning Probe Microscopy we continuously work on supporting our customers to achieve reliable scientific results efficiently. Thus, our aim is to open up new possibilities ranging from scientific research to industrial applications.



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AXO DRESDEN GmbH - Applied X-ray Optics and High Precision Deposition – stands for the development and production of high quality single multilayer X-ray optics and complex X-ray optical systems for a wide field of applications both in the hard X-ray and in the soft X-ray regime.

AXO DRESDEN has installed flexible and efficient technologies to provide our worldwide customers in the fields of X-ray analysis, lithography, astronomy, spectroscopy and medicine with serial products for industrial manufactures of X-ray instrumentation and analytical equipment and with single solutions for research and industries.

Our production program contains both single multilayer X-ray optics and complex X-ray optical systems to generate high intensive 1- and 2- dimensional collimated or focussed monochromatic X-ray beams, monochromators on flat and curved substrates, special customized depositions and applications in X-ray reflectometry, X-ray diffraction and X-ray fluorescence analysis.

To produce nanometer thin films and multilayers showing sub-nanometer precision across large substrates up to 500mm in length or 200mm in diameter, AXO DRESDEN is applying and developing different complementary high precision deposition techniques like magnetron and ion beam sputtering and pulse laser deposition.

As a Spin-off of the Fraunhofer Institute Material and Beam Technology (IWS) Dresden, Germany, AXO DRESDEN is an independent supplier of X-ray optics and represents more than 15-years experience in the fields of high precision deposition and design, development and application of multilayer X-ray optics. To guaranty our customers high quality solutions and innovative products also in the future we are working in close collaboration with the Fraunhofer IWS, other Fraunhofer Institutes, the University of Technology Dresden and with several national and international research institutions to ensure our position as a leading supplier for multilayer X-ray optics and high precision deposition.



Baden-Württemberg International

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Baden-Württemberg (BW) is one of the most innovative Regions in Europe. In 2007, the State ranked first in Germany, with its 127 patent registrations per 100.000 inhabitants (28,5 % of all German patent registrations). In R+D spending (3,9% of GDP) and R+D personnel intensity (nearly 2,0%), BW is among the leaders all over Europe, hosting one-fourth of the research capacity maintained by German institutes. Over and above, the high technological level of the State is fueled by companies like Daimler, Porsche, Audi, Bosch, SAP, Zeiss, Heidelberg Printing, Trumpf, IBM and HP, all of which have their headquarters or major subsidiaries in BW:

Baden-Württemberg International (bw-i) is the economic development agency of the Federal State of BW and the centre for competence for promoting and marketing BW as a prime location for investment, business cooperation and collaboration in science and research.

Our activities and services include initiating cooperation between local and foreign companies. We promote BW as a center for business and R+D and offer professional advice and individual assistance to foreign companies looking to invest in our area. Our mission is to effectively position BW as the leading business location in Europe and to raise BW's profile as a Center of Excellence for higher education, research and sciences.

Find out more about this outstanding region at:

www.bw-i.de

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Substance for Success.

BYK is one of the world's leading suppliers of additives used in the coatings, inks and plastics industry. Additives are used by processing industries in the production of coatings, inks, and plastics. In very small quantities, BYK additives simplify manufacturing processes, and significantly improve the quality of finished goods, such as motor vehicles and furniture. BYK has been producing additives since 1962 in Wesel, Germany. Today it employs over 1.000 people worldwide, 25 % of whom work in research and development departments or technical laboratories.

BYK is a member of ALTANA (Wesel). ALTANA develops and produces high quality, innovative products in the specialty chemicals business and has been exclusively involved with Nanophase Technology Corporation (NTC), a leading company in the field of nanotechnology, since March 2004.

In close collaboration with NTC (USA) BYK is developing additives for paint and plastic systems based on nanotechnology. The first nanoadditives series NANOBYK, which visibly improves the scratch and abrasion resistance of coatings while simultaneously preserving all other important paint properties such as gloss, flexibility and adhesion, has already been successfully launched on the market.

You will find more information on nanoadditives at:

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The Bayreuth center for colloid and interface science is a central institution of the university of Bayreuth. Its main purpose is the intensification of the university's collaboration with regional, national and international companies in handling colloidal systems. The central functions of the center are: (i) combining and strengthening colloid and interface research ranging from fundamental questions to industrial applications, (ii) providing aid in problem solving and optimization of industrial processes and (iii) making the knowledge and experimental infrastructure at Bayreuth University accessible for industrial companies.

Main Research and Core Capabilities:

- Formulation, stabilization and dispersion of Latices
- Characterization and modification of surfaces and coatings
- Topographically microstructured surfaces
- Self – healing surfaces
- Generation of nanoporous capules and membranes
- Synthesis of polymer systems for self-organizing nanostructures – analysis and characterization of high performance complex polymer structures
- Nanoparticulate – based systems via molecular design
- Nanoparticles for catalysis
- Hybrid materials and Nanocomposites
- Polymer compounds, nucleating agents and pigments – their synthesis, characterization, treatment and processing
- Micelles, microemulsions, colloids, gel former – and their application
- Microemulsion – based new decontamination systems
- Dynamic transport phenomena
- “chemical tailoring” of clay minerals with all-round application - solid state chemistry and structural analysis at the transition of short range to long range order
- Preparation and coating of porous ceramics specially for medicine
- Biomaterials

More information concerning the BZKG Management Board and the infrastructure of the central institution you will find at: www.bzkg.de

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CAN GmbH offers companies and research institutions contract research and development services in the area of nanotechnology and participates in national and international research programs.

The focus of our activities is the utilization of new findings in chemical nanotechnology and nanoanalysis especially in the areas of consumables, specialty polymers and health care.

Our main areas of expertise are the production of many nanoparticulate and nanocomposite materials, encapsulation of active ingredients as well as development of nanoparticle-based biological and medical markers.

Main area of expertise: Synthesis, Analysis and Application of

- Magnetic Nanoparticles
- Fluorescent Nanoparticles
- Technical Nanoparticles
- Polymer Nanostructures
- Core Shell Systems
- Carrier Systems

Range of research we offer:

- development of marker molecules
- development of contrast agents
- development of toxicity assays
- development of drug delivery systems
- development of nanoparticulate solutions

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CeNIDE, the Center for Nanointegration Duisburg-Essen, was founded in 2005 by members of the physics, chemistry and engineering departments as a framework for the diverse nano-activities at the University Duisburg-Essen.

CeNIDE is based on the strongly interdisciplinary research excellence in the area of Nanoscience and Nanotechnology at the University Duisburg-Essen. This includes 30 working groups, representing an exceptionally broad knowledge base in fundamental nanoscience, unique fabrication facilities for nanoscale materials in large quantities, and experience in questions of scalability and reliability.

The main goal of CeNIDE is to promote interdisciplinary education as well as communication and collaboration among the different groups working in nanoscience and technology and industrial partners.



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CeNTech: Academic and Industrial Expertise

With the aim to exploit the vast potential and multifaceted prospects of nanotechnological research, CeNTech in Münster was created as one of Europe's first centers for nanotechnology dedicated to direct selected ideas and results. A total area of 2.400 square metres are at the disposal of researchers from companies and several faculties of the University of Münster. Research and development at CeNTech focusses on nano-scale analysis and nanobiotechnology here in particular the use of nanomaterials for biological and medical applications.

Technology Transfer at CeNTech

As the administrative, business oriented division, the CeNTech GmbH, provides the platform for entrepreneurs to further develop their research ideas into marketable products. As mediator between academic and corporate interests, the CeNTech GmbH assists industry partners in the development and improvement of new and existing products. CeNTech promotes the formation of start-up companies that originate from university research and supports the expansion of companies in the nanotechnology sector.

Core Activities of CeNTech

- Scientific Excellence focussing on Nanoanalytics and Nanobiotechnology
- Training and Education
- Technology Transfer
- Patent processing and utilisation
- Start up consulting
- Participation in and coordination of national and international networks
- Coordination of network HiNanoAnalytics (www.hinanoanalytics.de)

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Within the center the faculties of Physics, Biology, Chemistry, Electrical- Mechanical- and Civil- Engineering and the Institute of Nanostructure Technology and Analytics (INA) cooperate on interdisciplinary research projects to promote the fundamental research in the field of nanostructure science, to take part in the development and to contribute to the strengthening of the state of Hesse as a high-technology region and market by efficient technology transfer.

New nanostructures are synthesized and examined with respect to their special properties. We furthermore support - as far as possible - the practical application of our results in cooperation with partners from the industry.

Some key words and topics:

- self-organized and light-induced processes
- biological building principles and growth processes
- self-organized aggregation by molecular recognition
- combination of organic and inorganic materials
- high-resolution scanning microscopies
- fs laser spectroscopy

You will find more information about CINSaT and the University at:

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Clariant is a global leader in the field of specialty chemicals. Strong business relationships, commitment to outstanding service and wide-ranging application know-how make Clariant a preferred partner for its customers.

Clariant, which is represented on five continents with over 100 group companies, employs around 21,500 people. Headquartered in Muttenz near Basel, Switzerland, it generated sales of around CHF 8.1 billion in 2006. Clariant's businesses are organized in four divisions: Textile, Leather & Paper Chemicals, Pigments & Additives, Functional Chemicals and Masterbatches.

Within the Division Functional Chemicals the Business Line Industrial Performance Chemicals is developing products based on nanotechnologies or for nanotechnological applications. We work in close cooperation with our customers to develop specific solutions to their needs along the production chain.

Easy to Clean Coatings

Innovative coatings based on composite organic-inorganic nano-particles derived from sol-gel technology allow a broad spectrum of surface modifications. We offers a versatile range of Easy-to-Clean (ETC) coatings for the protection of glass, ceramic and metal surfaces. All products are based on fluoropolymer modified nano-particles in solution and can be applied to the substrate by spray application or wiping.

Other specialty nanocoatings are offered by Clariant through the New Business Development Group.

Dispersing Agents

A comprehensive range of dispersing agents for nano-particles based on both polymer and surfactant chemistries is available, accompanied by technical support from our application laboratory.

You will find more information about Clariant, its businesses and products at:

www.clariant.com
www.ipc.clariant.com



Fraunhofer Institut
Zuverlässigkeit und
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The department Multi Device Integration was founded in 1998 and is located in Chemnitz, Saxony. Its basic fields are the development of Micro-(Nano)-Electro-Mechanical-Systems (MEMS), technologies and equipment for manufacturing MEMS in silicon and other materials. Further research fields are back-end-of-line technologies for future micro and nano electronics, printed electronic systems for ubiquitous low-cost applications and investigation of micro and nano reliability for smart systems. In near future Microsystems will be quite more multifunctional e. g. the integrated combination of electronics for signal and information processing with sensors and actuators in silicon and nonsilicon technologies. The so called multi device integration to smaller and smarter systems is our vision.

Main Research Activities:

Design and Development of MEMS

- MEMS design and modelling
- Sensors, actuators, and electronics (e. g. acceleration sensors, gyroscopes, scanner)
- Transducer and analyzer systems (i. e. spectrometer, ultra sonic)
- Measurement and characterization

Back-End-of-Line BEOL

- Spin-on dielectrics, Air Gap structures, and integration of low-k dielectrics
- Copper interconnect metallization systems (e.g. 45nm pitches) and diffusion barriers,
- Scaling effects, reliability, modelling and simulation

Development of Advanced Technologies

- 3D-patterning, deep silicon etching and wire, chip and wafer bonding technologies,
- Chemical mechanical planarization (CMP)
- MEMS Packaging at wafer level

Micro and Nano Reliability

- Reliability for Microsystems e. g. for Automotive and IT applications
- Combination of Reliability, Miniaturization and Microsecurity
- Thermomechanical Simulation and Reliability for Nanoelectronics

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The network “high performance nano-analytics for medicine and biomedical materials” (HiNanoAnalytics) represents scientific research institutes with international reputation (University of Münster, University of Greifswald, Technical University of Ilmenau, Fraunhofer Institute for Biomedical Engineering), small and medium sized companies (arrows biomedical GmbH, nanoAnalytics GmbH, ChemBiotech) as well as strong management expertise in technology transfer (CeNTech GmbH, marcotech oHG), thereby bringing together a considerable knowledge pool in high performance analytics.

HiNanoAnalytics links scientific excellence in basic and applied research with commercialisation of advanced technologies in nanotechnology based analytics. The network has significant expertise in the following areas:

- New surface/interface properties at nano scale
- New analytical methods for medical applications
- Biomedical applications of nanoparticles
- DNA gold nanoparticle conjugates
- Magnetic nanoparticles and marker monitoring
- Micro/nano-electronic research
- Cryobiophysics, cryotechnology
- Molecular oncology
- Commercial surface analytics
- Development of new tools and technologies for analytics
- Development of new analytical devices
- Commercialisation of nanotechnology
- Marketing and technology management

HiNanoAnalytics actively supports the transfer of outstanding research into new innovative products for the biomedical and Life Science related market. Additional knowledge in training, education and organisation of events like scientific conferences provides HiNanoAnalytics with a highly unique position in the area of high performance analytics.



Hochschule Offenburg
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Hochschule Offenburg University of Applied Sciences
Competence in Engineering Technology, Business Administration and Media Management

The University of Applied Sciences Offenburg is among the most important Institutes of Higher Education in the region of the Southern Upper Rhine area. Founded in 1964 as a State School of Engineering, today there are around 2400 students enrolled at two campus locations in Offenburg and Gengenbach. In educating a new generation of highly qualified young people and in its application orientated approach the University of Applied Sciences is making a valuable contribution to enhance international competitiveness of the region of Southern Baden in the state of Baden-Württemberg, Germany.

The University of Applied Science in Offenburg is partner in a BMBF project (Bundesministerium für Bildung und Forschung) called “Up-conversion Multiplex Diagnostic Assays” (UNDAM). Currently we are in charge of the nanoparticle production using a technique called Laser Ablation of Microparticles. These microparticles are so-called Up-conversion Phosphors that emit visible light being excited by NIR. Produced nanoparticles are to be provided to the other project partners: University of Freiburg (Freiburger Materialforschungszentrum “FMF”), Stratec Biomedical Systems AG, and AnDiaTec GmbH & Co. KG to produce biological markers in medical applications.



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Innolume empowers innovative companies to design revolutionary new products by supplying quantum-dot based diode light sources (diode lasers, gain chips, SOAs, SLDs) in the operational from 1050nm to 1320nm.

We may provide bare dies, chip on carriers as well as fibre-coupled modules. Having all growth, processing, dicing/package and testing capabilities in-house we are able to develop customised solutions efficiently and with short design circles.

Innolume stands for high-performance customer-specific light solutions, prior in the medical technology sector, enabling the exploitation of the wavelength range from 1050nm – 1320nm.

Name your property needs of the light: Innolume will make them come out of the fiber.

Explore a new wavelength range: www.innolume.com



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INNOWEP Measuring & Testing is a German company that since its foundation in 1990 has become a leading specialist for surface-, material- and functional testing.

INNOWEP develops and manufacture innovative measuring and testing methods, equipment and up-to-date industrial solutions. This technology is applicable for R&D, QA and the manufacturing process.

INNOWEP cooperates with top level companies in different branches as well as established international institutes and has its own worldwide distributor network.

Products:

- **UST[®]**: Universal testing unit for the continuous micro mechanical characterization of material and functional properties on flat and structured surfaces.
UST[®] enables objective statements about e.g.: micro abrasion, scratch resistance, wear behaviour, elasticity & plasticity, damping, softness, micro hardness, roughness, micro force measurements and haptical values
- **ABREX[®]**: Standardized and reproducible soft-chemo mechanical hand abrasion test according to DIN EN 60068-2-70 / IEC 68-2-70. It enables a real life testing procedure on nearly all surfaces and materials like coatings and printings. It is also used for wear tests against fingernails or shoe soles.
- **OptoTop[®]**: Optical surface measuring system for quick and contact less measurement of topography, geometry (nano, micro and macro geometry) and roughness values through chromatic confocal sensor.
- **TRACEiT[®]**: The new and patented TRACEiT[®] system is a quick, mobile and contact-free surface profilometer It enables highly precise 3D-topography analysis, measurements of roughness values and documents also the visual impression similar to the human eye.

Besides the development and production of testing instruments, INNOWEP also provides service measurements and contract R&D in its own laboratory.

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Invest in Germany is the inward investment promotion agency of the Federal Republic of Germany. We assist and advise potential investors interested in Germany.

Foreign enterprises planning to establish their business operations in Germany can obtain information on the business environment, such as the corporate investment framework, tax regulations, and subsidies.

Our range of services includes strategic planning, market research, and competitive analysis. Our experts provide comprehensive project management and support services from site selection to the final realization of the investment.

All inquiries are kept confidential and our services are free of charge.

We support investors from our headquarters in Berlin and our offices in the US, China, and Japan.

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The JENOPTIK Laser, Optik, Systeme GmbH is a subsidiary company of the JENOPTIK AG.

As a provider of specific customer solutions and an innovative-minded performer, JENOPTIK Laser, Optik, Systeme GmbH has collected comprehensive skills & proficiencies in research, development and manufacturing, notably by concentrating on high-quality products in dedicated, fast-growing niche markets.

Microsystem technology is universally acknowledged as one of the key technologies of the new millennium. Replication processes have taken on signal importance for the application- and market-oriented production of micro- and nanocomponents.

JENOPTIK has developed a range of hot embossing systems for the highly precise molding of micro- and nanostructures in polymers and other materials. Hot embossing is a fast, flexible and economical method that enables the use of low-cost tools and opens up to a whole variety of manufacturable materials.

Wherever superior precision is of vital necessity, the long grown experience and skill of our highly qualified staff as well as our access to the extensive know-how of the JENOPTIK technology group provide a solid and valuable asset that warrants innovative results on excellent quality levels.

You will find more information about Jenoptik's products and technologies at:

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The 400 year old Justus-Liebig-University (JLU) in Giessen hosts about 22000 students covering practically all aspects of university education.

In its research focus the natural sciences (medicine, biology, chemistry and physics) play an exceptional role working together in the program “life, nutrition and energy”.

In the field of nanoscience and nanotechnology devoted to the energy conversion, storage and efficiency the JLU covers a multiplicity of innovative ways to synthesize and functionalize new nanomaterials. This ranges from the self-organized growth of nanowires and nanorods, mesoporous materials with huge internal surfaces, epitaxial film growth of semiconducting and ion conducting heterostructures (MBE, PLD, CVD) and quantum dots from chemical solutions.

Using electron beam lithography artificially structuring enables to functionalize the nanosized materials towards magnetic, thermoelectric and sensor applications.

The JLU has put considerable financial support into the scientific equipment pool for the synthesis and characterization of modern nanostructures also for the benefit of the students in the newly established materials science B.Sc./M.Sc. course “Advanced materials” opened in 2006.

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The Laser Centre Hannover (LZH) is the leading institute in the field of nanomanufacturing using ultrafast lasers. Working directions nanoscience are: Nanoparticles, Nano-Drugs, Nano-Biomaterials, Nanocomposites, Two-Photon-Polymerisation, Micro- and Nanostructuring, Plasmonics.

Nano-products and services are:

- Nanoparticles of any solid material in various liquids
- Nanocomposites
- Nanopatterning, Microstructuring
- 3D-Nanostructures
- Photonic Crystals, Plasmon nano devices

such as

Laser-manufactured 'Nano-Cocktails':

Nanoparticles are used as functional elements in medical products. The embedding of nanoparticles into a polymer is used to 'bio-activate' plastics with proliferative or antimicrobial effects.

A novel technique has been established using laser ablation in liquids: Multifunctional nanoparticle-based polymer implants and nano-drugs are manufactured with 100% purity and stability. There are no restrictions in the nanoparticle material (metal, ceramic) and the liquid carrier. This novel method allows a homogenous manufacturing of multifunctional medical products with embedded nanoparticles-mixtures, which are called 'NANOCOCKTAILS', shown during NanoTech2008 at the German Pavilion.



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In the last decade **LayTec** has established itself as a major provider of in-situ optical sensors for research and production thin-film applications. In-situ monitoring dramatically reduces development cycles, increases yield, enables superior quality control and provides best possible reproducibility.

Our sensors measure such growth parameters as substrate temperature, strain-induced substrate bowing, growth rate, layer thickness, doping levels, ternary material composition and surface roughness with extreme precision starting with the deposition process.

Because our in-situ sensors proved indispensable for optimising material quality and obtaining run-to-run reproducibility in epitaxy-based opto-electronic and electronic applications, **LayTec** quickly became the market leader in compound semiconductor monitoring instrumentation for epitaxial thin-film growth (MOVPE, MBE), replacing conventional ex-situ models of characterisation. Continually adapting its products to a swift moving industry, innovative **LayTec** products have become international best sellers for LED production.

Our **EpiCurve**[®] **TT** type of sensors allows simultaneous and wafer-selective temperature, reflectance and wafer bowing measurements with an outstanding resolution up to 0.3 km^{-1} . Our **EpiTT** sensors are the first choice today for LED production world-wide and provide emissivity corrected temperature measurements based on the combination of pyrometry and reflectance measurements at two optimized wavelengths. **EpiRAS**[®] **TT** is still the most advanced multi-wafer in-situ sensor for cubic compound semiconductors. It is a unique tool for the R&D of GaAs- and InP-based opto-electronic devices.

All of **LayTec**'s high-precision instruments are built in our in-house production facilities. This gives us the added capability to respond quickly to potential engineering needs for sensor customisation and OEM integration.

LayTec produces the most advanced in-situ multi-wafer monitoring systems available today. We balance the spirit of innovative, pioneering invention with solid production efficiency. Fast-paced product development is inspired by a continuing dialogue with our customers and OEM partners. Supported through an international network of local distributors, **LayTec** sensors are in use at leading institutes and manufacturing facilities around the world.

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Messe Stuttgart is the organizer of the new International trade fair for precision mechanics, ultra-precision, micro and nano technologies, MiNaT, www.messe-minat.de; it will take place again October 07 – 09, 2008 (together with SEMICON Europe) in Stuttgart.

With the successful start of MiNaT 2007 in June, exhibitors displayed machines, products, systems and components from the areas of micro- and nanotechnology, precision engineering, ultra-precision processing as well as testing machines and measuring systems. Also exhibited were software, raw materials, materials, semi-finished products and services. VDMA Micro Technology is the technical partner and sponsor of MiNaT.

facts and figures for MiNaT 2008:

- 125 exhibitors and 3.000 visitors expected; International participation

Exhibitor nomenclature:

- micro and nano technologies, ultra precision, precision mechanics, general technologies and services,

Visitor target groups:

- mechanical engineering and plant construction, motor vehicle construction and automotive component suppliers, electrical engineering and electronics, life science industry, nutrition and food industry, environmental technology and power engineering, aerospace industry, consumer industries, information and communication technology, metalworking industry, ...

More information with www.messe-minat.de, www.messe-stuttgart.de!

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The mst-network Rhein-Main is a 3 year local old association of more than 30 companies and research organisations in the high tech area around Frankfurt, Darmstadt, Hanau, Wiesbaden, Mainz and Aschaffenburg in the centre of Germany. In this network start-up and established companies in the area of magnetic sensors, infrared detectors and thermopiles, gas sensors, optical sensors, and their application in instruments are working together with universities and research organisations. Also material and support companies are among members.

The partners have organised in working groups (WG), including a new WG on Micro-Nano-Integration, founded in May 2007, with main activities in the area of utilization of nanowires and carbon nanotubes, and other nanomaterials, in particular for sensors.

The network activities includes

- Common research and development projects and active technology transfer. Examples include the integration of nanomaterials for microsensors.
- Training and education.
- A common marketing and information distribution platform.
- Deepening the cooperation between the partners and also with external partners.

We have several WGs on Micro Drives, Microassembly and micro machining, Microsensors and micro-optics, Semiconductors and ASICs, Bio-MEMS, and Micro-nano-integration. These WG have regularly common meetings, with exchange of experience and discussion leading to common projects.

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The Nano- und Materialinnovationen Niedersachsen (NMN) e.V. association furthers the transfer of nano and material innovations from science and research in the economy of Lower Saxony.

Objective is the introduction of innovative product developments and optimization of the high-tech basis. NMN e.V. coordinates a comprehensive network for this purpose consisting of research, economy and politics.

It offers its members valuable services, particularly with access to new technologies and markets as well as targeted, specialized information.

- Technology transfer from science and research into the economy
- Development of marketable product concepts with pilot character
- Optimization of high-tech basis in Lower Saxony
- Expert dialog
- Establishment of new business contacts
- Implementation of leading expert fairs
- Initiation of cooperation projects
- Marketing

Together with two of its members the Laser Center Hannover (LZH) and the Genthe-X-Coatings GmbH, Nano- und Materialinnovationen Niedersachsen e.V. will for the first time be presenting nanotechnology developments and products on Nano tech 2008.

You will find more information about NMN e.V. at:

www.nmn-ev.de

NANOCRAFT

exploring nanospace

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User oriented research for technical and biological surfaces

The NanoCraft was founded in 2001 as a Spin Off from Max-Planck-Institute of Colloids and Interfaces (MPI-KGF) by Dr. Sabri Akari.

Specialization: Nanotechnology and Surface Analyses

We perform research and development projects in the region of Nano-, Bio- and Surface Technologies in cooperation with universities and industrial partners. A large number of first class companies from different industrial branches are already working with us and use the obtained information for their own development with high satisfaction.

Chemical Force Microscopy in combination with Digital Pulsed Force Mode:

NanoCraft (Research & Development) combined the self developed Chemical Force Microscopy with the Digital Pulsed Force Mode, this opened for the first time the possibility of chemical and also biological force mapping of technical and biological surfaces on nano- and μ -scale. It is now possible to determine and image several interaction forces like H-Bonds, van der Waals, hydrophobic, ionic and polar interactions. Parallel to Adhesion Force Imaging it is also possible to image further physical properties like elasticity and viscosity. With the options of LFI (Low Force Imaging), HRI (High Roughness Imaging) and the possibility of measuring in different media, the investigation of interfaces is getting a new dimension of quality. This unique analytical service is offered exclusively by NanoCraft in the frame of mission oriented research.

A selection of our developments of novel Nanocoatings (patented):

- Ultra thin conductive protection layer for electrical contacts
- Ultra thin protection layer for jewellery

Awards:

- Innovation Award Baden-Württemberg, Germany, 2003
- International Technology Award euregio.bodensee, 2004

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The **Nanoinitiative Bayern GmbH** is responsible for the management of the **network institution “Cluster Nanotechnologie” in Bavaria / Germany** which has been initiated by the Bavarian State Government in 2006.

The main objective of the ‘Cluster Nanotechnologie’ is the further development of a nanotechnology competence network in order to support an efficient transfer of scientific results into industrial applications. For this purpose, it is essential to closely link the research, industrial and teaching sectors. Primary target groups are enterprises with application potential for nanotechnologies, with a special focus on small and medium-sized enterprises (SMEs), universities, universities of applied sciences and public research institutes.

The **network association Nanonetz Bayern e.V.**, whose members have already performed considerable basic work to further develop the leading role of the Bavarian industry via the application of nanotechnologies, acts as a platform for the Cluster Nanotechnologie.

Major competences of the Cluster Nanotechnologie:

- Promotion of cooperations between R&D institutions and operators in the industry
- Support of application-oriented research
- International marketing of research
- Project application and management
- Organisation of seminars and workshops with regard to nanotechnology
- Sourcing and preparation of knowledge with regard to nanotechnological questions
- IP consulting
- Promotion of nanotechnological content of teaching in schools and at universities

For further information on the Cluster Nanotechnologie please visit the following website:

www.nanoinitiative-bayern.de

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nanoplus Nanosystems and Technologies GmbH is a Germany-based SME. Since its foundation in 1998 the company develops and manufactures optoelectronic devices for various industrial applications, such as gas sensing, precision metrology as well as for telecom and medical purposes.

Key products are complex coupled distributed feedback lasers. They are based on a patented technology and characterized by

- single mode emission with line width < 3 MHz
- high side mode suppression ratio of typically 35 dB
- mode hop free tuning over a broad frequency range
- combined with low back reflection sensitivity
- and low thresholds.

nanoplus covers the whole wavelength range from 760 nm to 3 μ m with its DFB and Fabry-Perot laser diodes.

Furthermore nanoplus fabricates DFB- and FP-Quantum Cascade Lasers in the wavelength range from 5 μ m to 14 μ m.

For more detailed information about nanoplus Nanosystems and Technology GmbH products, please refer to www.nanoplus.com.



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nanoproofed® GbR is a company producing nanotechnical coatings. We are merchandising, applying and offering service functioning of nanotechnical coating products throughout Germany. Our aim is to find individual solutions for every customer, who uses special coatings. In cooperation with our laboratories, we are capable to additionally develop non-standard products for special surfaces.

Under our name of the registered trade-mark "**nanoproofed®**" we have partnership distributors all over Germany. General importers in several foreign countries are our representatives for our international sales. We are supporting not only industry, trade and craftsmanship but also - through our sales partners- private customers with long-lasting nanotechnical surface sealings of completely variable materials. As experts in our field and as international traders of nanotechnical sealings, we are concentrating on these fields of activity:

- We are offering consulting for exploiting all products' application possibilities.
- We are supporting the product choice procedure to find your individual sealing.
- We are supporting you integrating the sealing technology into your production process.
- We are offering to sell our products for your own use.
- We are constantly recruiting sales partners worldwide.

Our product range encloses the products offered in the shop for final consumers as well as sealing products who are conceived by a little more complex application (as for example thermal fixation) especially for industrial use. These products are extremely loadable and show the optimum of that what is available today in the nanotechnical sealing. Appeal to us, we consult you with pleasure.

nanoproofed ® has ordered from safety standards authority Thüringen (Germany TÜV) a study, with which under scientific conditions of independent, skilled place the effectiveness ours **nanoproofed ®** protection glass and ceramics sealing was tested. The result is exceedingly positive and unequivocal - **nanoproofed ®** protection glass and ceramics sealing is convincing on whole line and now wears officially the " certificated effectiveness proof " of safety standards authority Thüringen (Germany TÜV).

You will find additional information in the internet presence under:

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nanoresins is leading in the development and large-scale manufacture of silica nanoparticles and other additives and raw materials for modifying reactive resins for industrial applications. The strategic emphasis here is on coatings, adhesives, fiber composites and electronics.

The company is based in Geesthacht and is active in more than 20 countries, enabling it to serve the world's most important markets. Currently, nanoresins is producing and selling its wide range of high-tech additives and raw materials with a volume of several hundred tons a year.

nanoresins' aim is to give their clients decisive competitive advantages in their end markets thanks to product innovations that are based on completely new combinations of product characteristics, e.g.:

Coatings:

- Improved scratch- and abrasion-resistance
- High transparency and gloss
- Reduced cure shrinkage and CTE

Electronics

- Reduced cure shrinkage and CTE
- No reduction in glass transition temperature (TG)
- Improved fracture toughness

Adhesives

- Improved tear resistance and fracture toughness
- High modulus
- Improved adhesion

Fiber Composites

- Improved toughness and stiffness
- Suitable for injection methods
- Very high impact resistance



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The “Nanosystems Initiative Munich” (NIM) is one of the Clusters of Excellence which have been selected in 2006 by the German Government's "Excellence Initiative". Scientists of international repute from various research facilities in and around Munich and different disciplines such as physics, biophysics, physical chemistry, biochemistry, pharmaceuticals, biology, electronics and medicine have been brought together to form one coherent and focused nanoscience cluster. A number of these scientists have already been cooperating within the Center for NanoScience (CeNS) for many years.

While many individual nanoscale building blocks and components have been devised in recent years, little is known about their integration into functional systems. The overarching vision of NIM is therefore to design, fabricate and achieve control of multi-functional nanosystems, and to unlock their potential for applications in fields as diverse as future information technologies, the life sciences, or combinations of both.

Research areas dominated by quantum effects including single-electron and single-spin behavior, nano photonics, and the development of strategies for quantum computation are complemented by areas that address the exploration of nano sensors and actuators, single-molecule machines, and the observation of nanoscale objects in living cells, as well as drug delivery nanosystems. Experimental studies and technological developments are supplemented by theoretical investigations of complex nanosystems in order to create a broad and deep knowledge base, and to establish an exciting research environment that links traditionally separate disciplines.

A major structural goal of the NIM-cluster is to firmly establish itself as the most attractive nanoscience research site in Germany. Special emphasis is placed on ensuring early independence of outstanding junior scientists, offering them internationally competitive start-up packages and tenure-track professorships that will give them a long-term career perspective and allow for continuity of research. Equal Opportunity funds are available to aid specifically female researchers in achieving their individual work-life balance. NIM also supports young researchers in founding spin-off companies.

Collaborating institutions:

Ludwig-Maximilians-Universität München, Technische Universität München, University of Augsburg, Hochschule München - University of Applied Sciences, Walther Meissner Institute, Walter Schottky Institute, Max Planck Institutes of Biochemistry and of Quantum Optics, Deutsches Museum, Center for NanoScience (CeNS)



nanotechnology

CC "Ultrathin functional films"

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The Nanotechnology Center of Competence "Ultrathin Functional Films" was founded in October 1998. The office is situated in the Fraunhofer Institute for Material and Beam Technology (Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS) in Dresden.

The center of competence joins 51 enterprises, 10 university institutes, 22 research institutes, and 5 corporations into a common network. The members have special know how in the field of thin films and coatings. The work of the center of competence focuses on the fields of:

- Advanced CMOS
- New devices
- Biomolecular films for medical and technological purposes
- Nanoscaled protective layers
- Thin films for optics and photonics
- Nano-size actives and sensorics; nano-systems

Close co-operation of the members of the center of competence is one important aim which assures an efficient use of the available know-how and allows for synergetic effects.

We offer the following services:

- Consulting services
- Research and development
- Testing of new processes
- Development of new coatings
- Education of scientists and technicians

You will find more information about our center of competence:

www.nanotechnology.de

nextnano³

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nextnano³ - semiconductor software solutions

nextnano³ develops software for the simulation of electronic and optoelectronic semiconductor nano devices and materials including semiconductor-electrolyte systems that are used for bio chip applications.

Our customers are the research labs of the leading semiconductor companies in the electronic and optoelectronic sector as well as academic institutions.

Applications include quantum wells, quantum wires, quantum dots, nanowires, nanocrystals, quantum cascade lasers (QCL), resonant tunneling diodes (RTD), high electron mobility transistors (HEMT), Nano-MOSFETs, LEDs, lasers (e.g. VCSEL), efficient solar cells, organic semiconductors, ion-sensitive field effect transistors (ISFET) and new materials like graphene, “strained silicon” or “diluted nitrides”. We are also very active in new disruptive fields like spintronics and quantum computing.

Our unique selling proposition is a better physical method for the calculation of the quantum mechanical properties of an arbitrary combination of geometries and materials, i.e. the nextnano³ software is not limited to certain types of devices and thus perfectly suited for both, currently existing and novel devices, like for instance protein sensors (bio chips).

The customers’ benefits are

- better understanding of device physics
- systematically improve and optimize devices
- less redesign cycles (optimum prototype).

Customer feedback

“One reason nextnano³ is so good at nanoelectronics is that it was not designed for nanoelectronics. It was designed to do physics.”

nextnano³ is a spin-off from the Walter Schottky Institute of the Technische Universität München (Germany).

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PAS-Tech GmbH was founded in 2002 as innovative high-tech-company and was nominated the same year for the "Hamburger Gründerpreis" (Hamburg foundation award).

The company develops and sells cost efficient and compact gas sensors based on the photoacoustic effect. In the photoacoustic effect light absorbed by a molecule is converted into a sound wave carrying information about the kind and concentration of molecules in the sample. PAS-Tech GmbH is the only manufacturer of gas sensors combining the extremely powerful photoacoustic method with distributed feedback (DFB) diode lasers.

Thanks to their sensitivity and selectivity the PAS-Tech gas sensors are particularly well suited for detecting trace elements. The linearity of the photoacoustic signal offers several decisive advantages:

- offset free measurement: easy calibration
- wide dynamic range of concentration measurement: from ppb to %
- small measurement cells and compact sensors
- very low detection sensitivities
- no cross sensitivities

A range of gases can be quantitatively detected based on the modular concept of the gas sensor. The gas sensors are offered either as complete ready-to-use table top devices or as OEM modules to be integrated in complex equipment. Both devices combine sensitive and selective gas analysis with user friendly handling of the sensors.

Apart from the gas sensor modules a sophisticated range of diode laser and measurement equipment is offered, like e.g. diode laser modules, diode laser controller, laser collimators, dsp-based lock-in amplifiers and the MolExplorerTM, a new PC-Programm for the easy calculation and display of molecular spectra based on the HITRAN or GEISA database.

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The Philipps-Universität in Marburg is a German university with a tradition in research and education of nearly five centuries. It is also the oldest university in the world that was founded as a protestant institution and has now around 20.000 students. It offers a broad range of disciplines with the exception of the engineering sciences.

The work groups Wendorff and Greiner of the Department of Chemistry and Center of Material Science develop new functional materials on basis of nanoscaled polymer and composite fibers. The following production methods and products will be presented and discussed on the basis of some examples of application:

Electrospinning of long polymer, metal, ceramic and composite nanofibers.
Particular attention is drawn to following applications:

- medicine (tissue engineering, inhalation therapy)
- filtration (porosity, efficiency)
- biomimetic filtration of marine gels
- catalysis (homogeneous and heterogeneous)
- textiles (antibacterial)



Part of GE's Sensing &
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phoenix|x-ray, founded in 1999 in Wunstorf close to Hanover, Germany, is a leading manufacturer of microfocus and nanofocus[®] X-ray and computed tomography systems. The company has customer support centers in Stuttgart and Munich/Germany, St. Petersburg/USA, Manila/The Philippines and representations in most industrialised countries worldwide.

As center of excellence for CT, microelectronic and materials science applications, phoenix|x-ray is part of GE Sensing & Inspection Technologies, a leading innovator in advanced measurement, sensor-based and inspection solutions that deliver accuracy, productivity and safety to its customers.

2D X-ray microscopy systems

phoenix|x-ray supplies application oriented microfocus and nanofocus[®] X-ray systems and complete customised inspection solutions supplying all-in-one, customised inspection solutions for scientific research as well as for the electronics, semiconductor, automotive, aerospace and many other industries worldwide.

Computed tomography with submicron resolution

In addition to 2D-inspection systems phoenix|x-ray offers a wide range of high-resolution computed tomographs. The nanotom[®] for example is the first 180 kV nanofocus[®] system which is tailored completely to applications in the material science, micromechanics, electronics, geology and biology. It is suitable for the 3D-examination as well as 3D metrology of the microstructure of material samples in every type like synthetic materials, ceramics, composite materials, metal or rock samples and much more.

Leading in technology

As one of the most innovative companies in the industry phoenix|x-ray has invented some breaking novel technologies and award-winning systems. phoenix|x-ray puts high priority on customer service and great investments in the development of easy-to-use systems and software solutions in order to provide all inclusive and versatile support to customers, establishing mutually beneficial, long-term partnerships.

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SIOS Meßtechnik GmbH specializes in the development and manufacture of precision metrological instrumentation. The company was founded in 1991 by Professor Jäger and employees of the Institute of Process Measurement and Sensor Technology of the Technical University of Ilmenau, Germany. Its close collaboration with the Institute on scientific and engineering matters forms the basis for its lines of innovative, top-quality, ultraprecision products.

The company is headquartered in Ilmenau's "Am Vogelherd" technology park. The firm location in the Ilmenau technology region is yet another reason for successful operations.

SIOS manufactures precision laser-interferometric measuring systems for use in nanometrology that measure lengths, angles, vibrations, or other parameters with ultrahigh precisions and resolutions and are also easy to use. The flexible organizational structure allows to adapt equipment to be manufactured to suit special customer requirements and conditions of use.

A main product of SIOS is the Nanopositioning and Nanomeasuring Machine NMM. This machine has a positioning range of 25 x 25 x 5 mm and a resolution of 0.1 nm. Applications are in calibration of several types of standards, microbiology and semiconductor industry.

Application areas of the SIOS laserinterferometric measuring systems are in nanometrology, microelectronic-device fabrication, gauging and calibration, calibrating machine axes and metrological instrumentation, microtechnology, industrial testing and inspection, coordinate-measurement and positioning systems, feedback control of precision drives, precision-machinery manufacturing, pharmaceutical manufacturing, research and development.

You will find more information about SIOS at www.sios.de.

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The Smart Systems Campus Technopark Chemnitz, an innovative network with expertise in micro and nano technologies as well as in smart systems integration is being created at Chemnitz, one of the German microsystems and nano technology centres, especially for firms that value direct access to famous scientific institutes and leading international companies.

A network of microsystems expertise will have been set up at the Smart Systems Campus in Chemnitz by the beginning of 2009. Young, rapidly growing start-up companies and renowned international corporations will set up new facilities right next to Chemnitz University of Technology and the Fraunhofer Institutes. The idea is to make it easier to connect research and development and the industrial implementation of ideas by having everything on the doorstep.

Research and Development

- Chemnitz branch of the Fraunhofer Institute for Reliability and Microintegration IZM
- Chemnitz University of Technology, faculties of Electrical Engineering/Information Technology, Physics and Mechanical Engineering with the Center for Microtechnologies (ZfM) and the Institute for Print & Media Technology (pmTUC)
- Fraunhofer Institute for Machine Tools and Forming Technology is located nearby

Start-up Building

- For companies setting up in business in sectors related to Microsystems
- 2,500m² of rentable business space with 1,500m² of laboratories & 1,000m² of office space
- The greatest possible flexibility with regard to the infrastructure, media supplies and structuring the available space to take into account changing requirements and tenants
- Standard area with options allowing specific target groups to expand Industrial Business-Park

Industrial Business Park

- Business-park very close to the Smart Systems Campus for other hightech companies
- The developed area measures 1.2 hectares and further 6 hectares could be made available
- Some prospective customers have already shown an interest

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The Institute of Applied Physics focuses on the following fields of research:

- development of sources of highly charged ions and their applications in research and industry
- atomic, plasma and solid state physics with highly charged ions
- ion beam physics
- investigations on semiconductor materials for optoelectronic and other applications
- optical characterization of semiconducting materials and ultra-short-time spectroscopy
- investigations on thin polymer films, on thin ferroelectric layers and crystals as well as on metallic layers and clusters
- basic investigations in the field of semiconductor physics



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“Study the future!” - it's possible at the Technische Fachhochschule (TFH) Berlin, the location in central Berlin for practice-oriented teaching and applied research. There are more than 70 Bachelor and Masters courses at the University of Applied Sciences. Courses range from the classical engineering disciplines Mechanical Engineering, Industrial Engineering, to Information Technology, Pharmaceutical and Chemical Engineering, Biotechnology, Medical Technology, Food Science and Technology, Geoinformation, and much more.

The nanotechnology is applied in many different scientific fields. The University of Applied Sciences (TFH) Berlin, Department of Pharmaceutical Technology focuses on characterizations of pharmaceutical systems. Different drug delivery systems e.g. liposomes, lipid emulsions and nanoparticles were studied and their structures up to nanoscale demonstrated. The techniques e.g. small and wide angle x-ray scattering (SAXS, WAXS) and grazing incidence x-ray scattering (GISAXS) from the synchrotron source are suitable for this purpose because this source can produce a highly intense and focus x-ray. The structure of drug delivery systems with only small amount of samples can be determined. Very comprehensive information is the result. The further useful technique to determine the nanostructure is the small angle neutron scattering (SANS). Because of the opportunity to vary the contrast, different regions of the sample can be observed. A successful measurement by SANS with nanoparticles containing titanium dioxide are shown. However, these modern techniques can be performed only at the large scale facilities (synchrotron or neutron sources) e.g. Berlin Synchrotron Source (BESSY), Berlin/Germany, German Synchrotron Source (DESY), Hamburg/Germany, Hahn-Meitner-Institute (BENSC) Berlin/Germany, Heinz Maier-Leibnitz (FRM II), Munich/Germany. The experiments can be carried out at these institutes on basis of a particular permission applied for together with a respective proposal. These techniques are until now mostly used in the field of physic, biology and chemistry. The present research work shows, however, that they are also useful as complementary techniques for pharmaceutical systems.

You will find more information about research works in the field of nanotechnology at:

prof.tfh-berlin.de/vollrath
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The VDI Technologiezentrum GmbH is a subsidiary company of the VDI (The Association of Engineers).

Since 1973 we are working on behalf of the Federal Ministry of Education and Research (BMBF) and for other institutions and enterprises.

Our activities aim at increasing the technological efficiency and competence of industry and scientific research.

Committed to taking societal responsibility we link competencies to assist in the search, analysis and evaluation of technologies that help to solve ecological, economic and social problems and promote research, development and innovation.

The networked knowledge of our engineers, economists, natural and social scientists supports our clients in making decisions that shape the future.

- We transfer latest results from basic and applied research to new technical products, processes and applications; within project partnerships we support the BMBF and other public bodies by expertise, consultancy and management.
- We transfer knowledge and information from scientific research to a broad implementation.
- We process and evaluate scientific and technological information.
- We provide technological consultancy.
- We analyse and evaluate future technologies.

You will find more information about German nanotechnology at:

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The University of Münster (WWU) is one of the biggest universities in Germany. Located in the western part of the country, currently more than 38000 students are studying at the WWU Münster. The research carried out at the WWU Münster is not only wide-ranging but also often interdisciplinary and international. On this basis, WWU expressly promotes top-level research in high-performance areas. One of the most focused on areas is the emerging and fast developing field of nanotechnology. The variety of different fields of research includes nanobiotechnology, nanobioanalytics, scanning probe techniques, nanomechanics, nanoelectronics and nanomagnetism.

The expertise of Münster's scientists is also documented by numerous national and international cooperations, which make the WWU an attractive environment for any researcher interested in nanotechnology. Among the many large scale national and international projects related to nanotechnology are:

- Nano2Life Network, the first European Network of Excellence in nanobiotechnology coordinated by Muenster and Grenoble
- The Frontiers EU-network for research and innovation on behalf of life sciences related nanotechnology and
- The Bioanalytik Münster Network with the purpose is to promote science, research and education in the field of bioanalytics

Additionally, the Center for Nanotechnology (CenTech), which has been founded as one of the first nanotechnology-centers in Germany, provides ideal conditions for interdisciplinary research and transfer between research and industry. The university and the Centech are also organizing the annual NanoBio-Europe Conference which presents the most recent international developments in the field of nanobiotechnology.

www.uni-muenster.de/en/
www.uni-muenster.de/AFO/



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With approximately 190 employees around the world, Carl Zeiss NTS GmbH develops, produces and distributes market-leading electron and ion-optical end customer systems and OEM products that are used in the material analysis, life sciences and semiconductor industries. Combined production, sales and service sites are located in Oberkochen, Germany and Cambridge, UK. Sales in Germany, the USA, France and England are handled by our own subsidiaries, supplemented by a global network of more than 40 distributors and service teams.

The Nano Technology Systems Division of Carl Zeiss SMT provides its customers with the latest leading-edge E-Beam technology. Within this division you will find over four decades of accumulated experience in the field of scanning electron microscopy and six decades of experience in the field of transmission electron microscopy.

The company's extensive know-how, which nowadays also comprises ion-beam technology and e-beam based analysis technology enable us to deliver innovative solutions for your business. Our global applications and service network guarantees fast, reliable and high quality support focussed on customer requirements. Combined with dedicated upgrade strategies, this will protect your investment for its entire lifetime. The core technology embedded in our innovative products enable us to provide solutions which add value to our customers' business.

Enabling the Nano-Age World®

Visit www.smt.zeiss.com/nts for additional information.

Synoptical Table of Companies' Specifications

	Association / NGO	Coatings	Investor	Nanoanalytics	Nanobiotechnology	Nanodiagnostics / Nanomaterials	Nanoelectronics / Nanophotonics	Nanolithography	Network	Toolmaker	Ultraprecision	Page
AGeNT-D	✓							✓				6
attocube systems AG			✓			✓	✓				✓	7
AXO Dresden GmbH		✓			✓			✓			✓	8
Baden-Württemberg International	✓							✓				9
BYK-Chemie GmbH		✓			✓							10
BZKG – Bayreuth Center for Colloids & Interfaces	✓			✓				✓				11
CAN GmbH		✓	✓	✓	✓							12
CeNIDE - Center for Nanointegration Duisburg-Essen			✓		✓	✓		✓				13
CeNTech GmbH	✓		✓					✓				14
CIN Sat Hessen								✓				15
Clariant Produkte GmbH		✓			✓							16
Fraunhofer IZM - Chemnitz Branch of the Institute		✓	✓			✓	✓					17
HiNanoAnalytics			✓	✓	✓			✓				18
Hochschule Offenburg				✓	✓							19
Innolume GmbH						✓						20
Innowep GmbH		✓	✓								✓	21
Invest in Germany GmbH	✓							✓				22
JENOPTIK Laser, Optik, Systeme GmbH				✓		✓	✓		✓			23
Justus-Liebig-University Giessen			✓		✓	✓	✓					24
Laser Zentrum Hannover e.V.				✓	✓						✓	25
LayTec GmbH			✓									26

Synoptical Table of Companies' Specifications

	Association / NGO	Coatings	Investor	Nanoanalytics	Nanobiotechnology	Nanodensity / Nanomaterials	Nanoelectronics / Nanophotonics	Nanolithography	Network	Toolmaker	Ultraprecision	Page
MINAT 2008 Messe Stuttgart	✓							✓				27
mst-Netzwerk Rhein-Main e.V.	✓					✓	✓		✓			28
Nano- und Materialinnovationen Niedersachsen e.V.	✓					✓			✓			29
NanoCraft		✓		✓	✓	✓						30
Nanoinitiative Bayern GmbH	✓								✓			31
Nanoplus Nanosystems and Technologies GmbH							✓					32
nanoproofed © Illing GbR		✓			✓	✓						33
Nanoresins AG		✓				✓						34
Nanosystems Initiative Munich (NIM)				✓	✓		✓		✓			35
Nanotechnology Center of Competence Dresden	✓	✓							✓			36
nextnano ³					✓	✓	✓			✓		37
PAS-Tech Gasanalytik GmbH				✓			✓					38
Philipps-Universität Marburg - Department of Chemistry					✓	✓						39
phoenix x-ray Systems + Services GmbH				✓		✓	✓					40
SIOS Meßtechnik GmbH										✓	✓	41
Smart Systems Campus Technopark Chemnitz		✓				✓	✓	✓				42
Technische Universität Dresden				✓	✓	✓		✓				43
University of Applied Sciences (TFH) Berlin				✓		✓						44
VDI Technologiezentrum GmbH	✓								✓			45
Westfälische Wilhelms-Universität Münster					✓	✓	✓	✓				46
Carl Zeiss SMT AG				✓						✓		47

