Federal Ministry
of Economics
and Technology

KompetenznetzeDeutschland
networking for innovation

Innovation policy, information society, telecommunications

Annual Report 2010 | 2011

The Kompetenznetze Deutschland Initiative – Network Profiles

www.bmwi.de

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Content

Preface

A desire to innovate and to develop cutting-edge technologies is vital if Germany is to remain competitive. It safeguards our country's future and generates sustainable growth and new jobs.

Regional technology networks, such as my ministry's "Kompetenznetze Deutschland" (Networks of Excellence Germany) initiative, can make a substantial contribution to boosting the innovative capacities of German firms. We can see from experience that such networks often help companies to become the quickest and most effective at responding to the latest challenges. Networks foster a targeted interplay between stakeholders from different sectors, stages of the value chain and academic disciplines, and this stimulates an intensive transfer of technology to spark off innovations. By co-operating and acting together, members of a network can learn from and support one another.

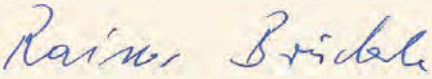
My ministry's initiative forms the framework for the 102 networks in Germany, which are characterised by a high level of performance, efficient co-operation and close engagement between companies, universities and research establishments. In this way, they boost the innovative strength of their members and regions. The outstanding expertise of the networks particularly benefits the many small and medium-sized companies who make up roughly half of the membership.

The annual report provides a good insight into the technical focus and wide-ranging activities of the various networks of excellence. In particular, it gives an impressive insight into the respective fields of technology and regions. For this reason, the report also serves as a communication channel for interested parties worldwide, enabling them to pinpoint innovative potential in Germany.

I wish you a stimulating and informative read.

Yours,

Federal Minister of Economics and Technology



Rainer Brüderle

Dear reader,

Looking back over the last two years and the changes mentioned in the 2008/2009 Annual Report of the "Kompetenznetze Deutschland Initiative", the main goal has been to systematically enhance and make use of the potential which is inherent in networks due to their structural features: flat hierarchies, cooperation among competitors, a strong orientation towards research and development, the creation of joint system solutions and so on. Networks can score with these advantages when there are market chances to exploit and innovative products and services to be offered. At that time no one would ever have suspected that the global economy was to experience one of its biggest crises and that even global players would be shaken to their foundations, dramatically disproving, in some cases at least, the self-confident myth of being "too big to fail".

Now the member networks of "Kompetenznetze Deutschland" are fundamentally the exact opposite of big companies. In fact, they are highly dynamic systems which should be able to react resiliently and flexibly to economic blows or even major shocks. But despite these definite advantages, times of global economic crisis still raise the question of whether and to what extent networks and clusters rise to the challenge of offering competitive advantages to their members through the results of sound networking. Can a network really be a driving force for a stricken member company in difficult times or does it merely offer additional support in phases already characterised by growth?

The final answer to this question has not yet been given by science or practice. However, times of crisis can and should always be seen as a special time for innovations as well. On the one hand, countercyclical innovating offers the chance of transferring resources from the decreasing day-to-day business to research and development and launching novel or significantly improved solutions in order to overcome the crisis and its effects as fast as possible. On the other hand, taking this step becomes easier when the required effort and investment can be shouldered by several network members; companies with limited financial backing and personnel in particular will profit disproportionately from this. Member companies in networks enjoy the innovation-related advantages of being able to concentrate on their own strengths while expanding their technological scope via cooperation at the same time. This allows the companies within the network to concentrate on their core business and to optimise their own range of products. In doing so, they will profit from comprehensive solutions and will be able to amplify their resources with a successful launch on the market.

Altogether, the image that emerges, albeit put into perspective by economic necessities, bears witness to the obvious advantages which result from a company's involvement in networks. In view of the assumption made above that clusters and networks are an important driver of innovations and economic and technological performance, and possibly even a source of support in especially difficult times, Germany is still making insufficient use of the existing potential. For this reason, the advancement of clusters is of the utmost importance as an element of economic policy. Besides the creation of financial incentives (normally for a limited period of time), the continuous enhancement of existing networks and clusters proves to be a central task in this context. In the long run, clusters will only be able to establish themselves as dynamic, innovative and economically successful entities if they are able to complete the transformation into strategically oriented, operationally

functioning structures. The Kompetenznetze Deutschland Initiative of the Federal Ministry of Economics and Technology (BMWi) supports its members as they undergo these essential processes with targeted services and coaching offers and the joint development of tools, contents and strategies, and it enables them to learn the use and dissemination of "good practices" from one another. In this way, complementarily to existing approaches to cluster politics, the Kompetenznetze Deutschland Initiative supports successfully initiated cooperation structures and their sustained development.

Prof. Dr. Jörg Sydow

Institute for Management of the Freie Universität Berlin and Chairman of the Scientific Advisory Board of "Kompetenznetze Deutschland"

The Initiative

The Kompetenznetze Deutschland Initiative

The development of innovative products and processes and their rapid national and international commercial launch are the key factors for economic growth and the sustainability of industries. In this process, Germany as a business location must focus on industries in which it can tap its existing innovation potential as efficiently as possible, so that it can generate cutting-edge innovations in ever-shorter product cycles. Innovative products and processes can be generated especially quickly in regional technology networks, in which the actors cooperate with each other along the whole value added chain and share their knowledge intensively. Thus, many networks have been established by private initiative and public financial support measures in Germany over the last few years, which have advanced successfully ever since.

Under its Kompetenznetze Deutschland Initiative, the Federal Ministry of Economics and Technology assembles the most innovative and high-performance technology-oriented networks. These networks are characterised by the intensive activities and cooperation between the parties involved and by their jointly defined aims. Furthermore, they excel as far as their proximity to industries and markets, their regional foundations, their drive and their flexibility are concerned. All these qualities turn the networks of the Initiative into a core element of performance and competitiveness. In addition, the networks represent Germany's concentrated strength in numerous fields of technology and the economy.

Over 100 networks from nine innovation sectors and eight innovation regions are currently operating under the Kompetenznetze Deutschland Initiative, covering all essential sectors of high technology. The number of networks varies slightly over time, because new technology networks are admitted while some networks merge as a consequence of their common themes or leave the initiative if they cease to meet the quality requirements.

The Added Values of Membership

Being made up of the best-performing and most cost-effective technology networks, the Kompetenznetze Deutschland Initiative is the "club of the best innovation networks" in Germany. For this reason, one of the most important added values for members is the "Kompetenznetze Deutschland" seal of quality, a registered trademark the members receive upon admission. Membership in Kompetenznetze Deutschland is a distinction which symbolises recognition of member networks' performance by the Federal Ministry of Economics and Technology.

Other advantages for the participating networks are:

- membership as a seal of quality confirming the network's high level of performance and organisation, certified by a scientific advisory council,
- permission to use the registered trademark "Kompetenznetze Deutschland",
- greater visibility for decision-makers in business, politics and administration as a result of national and international presentation,
- the chance to network, exchange information and benchmark with the best networks in Germany,
- the extensive support offered them in elaborating development strategies, becoming active on an international level and initiating cooperation activities.

The Aims of the Initiative

The Initiative aspires, on the one hand, to represent Germany as a centre of innovation on a national and international level and, on the other hand, support its participating networks in their development and activities. In order to achieve these two main goals, the Initiative engages in specific activities.

For the purpose of external representation, the Initiative concentrates the information about Germany's most effective competence networks, areas of innovation and innovative regions and presents them effectively to the public.

Internally, the Initiative supports participating networks in their further development and transformation processes, assists them with horizontal networking within the same and between different areas of innovation, gives them access to innovative information and communication infrastructures, and provides them with an opportunity of reaching their target audiences through other platforms such as fairs, events and publications as well. It also organises internal workshops to promote the mutual exchange of experience among members as well as some open to all interested parties regardless of affiliation with the Initiative.

These inwardly- and outwardly-directed goals of the Kompetenznetze Deutschland Initiative are reflected in the diverse offers made by the Initiative to its internal and external target groups, the most important representatives of which are:

- national innovation networks,
- investors and business founders in search of a location for their business,
- decision-makers from industry, politics and administration,

- similar international cluster and network organisations,
- present and future scientists,
- the media and the interested public.

The Initiative operates through an external agency based at VDI/VDE Innovation + Technik GmbH in Berlin. This agency has developed a comprehensive, task-oriented portfolio of services to promote the advancement of the Initiative, the support of network management and the relations with its various target audiences (see Section "The Agency" on page 10).

Process and Criteria of Admission

As the membership in the Initiative represents a seal of quality, admission as a member must depend on certain clearly defined requirements in order to preserve the high standards of the Initiative. An independent scientific advisory council, in close cooperation with the Federal Ministry of Economics and Technology, decides on admission provided these requirements are met. The Federal Ministry of Economics and Technology invites renowned representatives from science and economy to join this council, which not only decides about the admission of new networks, but is also involved in setting the strategic focus of the Initiative.

The admission of new networks to the Initiative is preceded by an intensive evaluation process. The following core criteria are essential for admission:

- the sustainable existence of the network,
- the technological focus (unique features / thematic focus),
- a high level of organisation and intensive member participation,
- the responsibilities and activities of the network (generation of added value for the members through activities in specific areas of responsibility),
- the membership structure (at least 15 members representing the various levels of the value-added chain, with a 50% minimum ratio of companies),
- the existence of a strategy for internationalisation, or the intention of expanding activities to a transnational level.

Membership of the Initiative is dependent on a quality assurance. The close interlinkage between members and the Agency allows for targeted support in coping with critical network phases. If this cannot be done successfully, membership of the Initiative will be terminated.

The Agency

The Agency of the Kompetenznetze Deutschland Initiative

The Agency of the Kompetenznetze Deutschland Initiative is based at VDI/VDE Innovation + Technik GmbH in Berlin. The Agency is responsible for three fundamental areas of activity:

- services for the members of the Initiative,
- membership quality assurance, and
- strategic aspects of network and cluster policies.

The Agency develops and implements various demand-oriented services for the members of the Initiative. It does this in close cooperation with the members in order to ensure that precisely fitting new services are implemented and the existing portfolio of services is refined continuously.

The services provided can be categorised as follows:

Consultancy for interested networks

- First contact and network visit
- Expert monitoring during the admission process
- Support of the activities and further development of the member networks
- Benchmarking (interviews and comparative analysis with the best networks / elaboration of an extensive benchmarking report)
- Analyses of member satisfaction (On behalf of a network, the Agency interviews its members in order to ascertain the degree of their satisfaction with network activities and to identify further new fields of activity for the network management.)
- The Agency conducts "Training" workshops for the network offices on current network- or management-related topics (topics already covered: "Education and professional training in networks", "Financing networks", "Public relations for networks", "Making a network international", "Networks and sustainability").
- The work-group concept (The Agency has established and is coordinating three work-groups on the topics of "Financing", "Management of innovations" and "Excellence in cluster management". The members of the Initiative specify the precise contents and aims in a joint process of deliberation with the Agency. The work-groups receive resources of their own to carry out their activities.)
- Initiation of exchanges and cooperation with other national and international networks and cluster initiatives (pre-arranged meeting service at events and fairs)
- Support of efforts to reach an international level of operation (organisation of networking visits / joint booths at German and foreign fairs / development of strategies for internationalisation / provision of information about instruments for internationalisation)

Internationalisation

- Identification of foreign networks suitable for transnational cooperation projects
- Initiation and moderation of bilateral network cooperation projects
- Surveys and international cluster mapping
- Participation in cluster projects of the 7th Framework Programme and know-how transfer from these projects in keeping with the interests of the members
- Development of harmonised methods of evaluation and indicators of quality for clusters and networks

Individual services

- In close cooperation with the member networks, the Agency develops demand-oriented services for individual networks and topics and implements them together with the networks (an "Optical Technologies Cluster Atlas", for example).
- Individual coaching for networks that have, for example, discovered shortcomings through benchmarking, or for networks looking for a new perspective. The portfolio of services is continually being expanded to meet the demands made by new responsibilities and other developments specific to individual networks or clusters.

The continuous safeguarding of the quality and representativeness of the members of the Initiative is an essential responsibility of the Agency in order to realise the Initiative's aspiration to excellence. On the one hand, this involves all processes required of new applications for admission up to and including the presentation of the applications to the scientific advisory council of the Initiative. On the other hand, it includes the critical examination of current members. If the quality standards are no longer met by a network, it receives active support in recovering the level of quality expected by the Initiative. Should the network be unable to recover from this critical phase in spite of this joint effort, its membership in the Initiative will finally be revoked.

The Agency is concerned with basic problems of innovation and cluster policy and strategically develops the topic "Networks and Clusters" in close cooperation with the Federal Ministry of Economics and Technology. The

basic aim of the Agency is to help represent Germany as a centre of innovation on a national and international level and to support its participating networks in all of their endeavours and their further development.

The following examples are typical activities carried out by the Agency.

Initiating cluster policy processes

- Communication with cluster policy representatives on the regional, national and European levels
- Shaping of cluster policy discourses in a national and international context
- Studies and discussion papers about topics relevant for clusters
- Consultancy for providers of funding in designing funding measures for clusters

In order to enhance the public image of the Initiative, the Agency collects and concentrates information about Germany's most effective competence networks, areas of innovation and innovative regions and presents them effectively to the public. In addition, the Agency promotes the formation of international networks by such means as initiating cooperation activities with networks from other countries. For this purpose, the Agency makes use of various communication channels, fairs and events.

Examples of activities in this area are:

Public relations for the Initiative as a whole

- Operation of the website www.kompetenznetze.de for the target group-oriented presentation of relevant content for and about the member networks. Information for and about the networks can be accessed and placed here by the networks themselves. Includes an online newsletter.
- Publication of a biennially issued annual report
- Compilation and publication of short studies about topics relevant to networks
- Organisation of workshops on special topics
- Organisation of the annual congress
- Organisation of joint booths at trade fairs

Organisation of the "Competence Network of the Year" contest

- Organisation and realisation of the annual "Competence Network of the Year" Award

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Partners of the Initiative Kompetenznetze Deutschland

The AMA Association for Sensor Technology is a professional association with a strong orientation to small and medium-sized enterprises comprising many of the companies and research institutions not organised in networks. It fulfils a number of functions throughout Germany for which in other branches of industry networks are responsible.

AMA Association for Sensor Technology

The AMA Association for Sensor Technology is a professional association dedicated to supporting the overall conceptual, professional and economic interests of all those who deal with technical measuring systems for any of the multitude of applications for which these are used.

It covers the entire value chain of sensor and measuring technology, from basic research to production and service providers, and from micro technologies to sensor devices, complex measuring, testing and switching systems, and actuating elements. The AMA Association currently has 460 members, of which approximately 80% are enterprises and 20% R&D institutes.

The most important objectives of the association are:

- to promote the branch of sensor technology and its representatives in the areas of research, industry and services,
- to represent the common interests of producers and service providers vis-à-vis national lawmakers, national administrations, international institutions, national and international pressure groups, the mass media and the general public, and
- to maintain and stimulate the exchange of ideas and experience between users, suppliers and research institutions.

Due to the leading position of European sensor technology on the world market, the AMA Association also sees itself as a representative of European sensor technology with a worldwide impact, especially with regard to microsystems technology.

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Deutscher
Industrie- und Handelskammertag

Representing the interests of the German economy, the DIHK is in charge of appointing a member of the scientific advisory board. The Agency of the Initiative maintains close contacts with a number of Chambers of Foreign Trade to assist members in their efforts for internationalising their activities.

Association of German Chambers of Industry and Commerce

The Association of German Chambers of Industry and Commerce (DIHK) is the central organisation of the 80 Chambers of Industry and Commerce in Germany. All German companies registered in Germany, with the exception of trades businesses, the free professions and farms, are required by law to join a chamber.

Thus, the DIHK speaks for more than three million entrepreneurs. They include not only big companies but also retailers and innkeepers. This gives the association considerable political influence. It does not represent any specific corporate group but all commercial enterprises in Germany.

The DIHK has the special task of assisting the German Chambers of Commerce Abroad (AHKs). The closely-knit network of Chambers of Commerce Abroad, with delegate and representative offices in more than 80 countries on every continent of the world, is of major importance to German industry in a world of global markets. The Chambers of Commerce Abroad delegates and representations advise firms in situ on investment and market opportunities and help them make international business contacts.

The Chambers of Industry and Commerce (IHK), Chambers of Commerce Abroad, German business delegates and representations (AHK) all work closely together within this network, coordinated by the DIHK.

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In the marketing of gtai in situ, members are an attractive key account for the German industrial location in the different branches. At the same time, the Partnership together with gtai supports the internationalisation efforts of members and their export drive.

Germany Trade & Invest

Germany Trade & Invest is the foreign trade and inward investment agency of the Federal Republic of Germany. Formed through the merger of the German Office for Foreign Trade and Invest in Germany GmbH, Germany Trade & Invest officially came into being on 1 January 2009. The mission of Germany Trade & Invest is to promote Germany as a location for industrial and technological investments and to identify investors for the German market. The organisation advises foreign companies looking to expand their business activities in the German market. It provides information on foreign trade to German companies that seek to tap into foreign markets. Germany Trade & Invest provides comprehensive and client-oriented economic and industry data as well as information about calls for proposals in foreign countries, investment and development projects, and legal and customs regulations. The promotion of economic activity in Germany's new federal states, including Berlin, also forms an integral part of the agency's external trade and business location marketing remit.

Germany Trade & Invest can count upon an international network of industry analysts who perform on-site research into foreign markets and support foreign businesses looking to establish a company in Germany. Our international team of experts works together closely with the German Chamber Network. This growing partnership allows German exporters and potential foreign investors alike to benefit from a centralised first point of contact overseas, with client-specific information and consultancy services all provided under one roof.

All inquiries relating to Germany as a business location are treated confidentially. All investment services and related publications are free of charge.

Contact

Germany Trade & Invest – Gesellschaft für Außenwirtschaft und Standortmarketing mbH

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The Agency exchanges information on new funding initiatives of the Federal Government at regular intervals, thus keeping members of the Initiative updated on all of such activities. As a central information agency, the Förderberatung (advisory for financial assistance) also provides the announcements for the website of the Initiative.

Federal "Research and Innovation" Funding Advisory Service

The Federal "Research and Innovation" Funding Advisory Service provides institutions of higher education, research institutions and in particular small and medium-sized enterprises (SMEs) with quick access to funding programmes and opportunities for research and innovation.

The Federal "Research and Innovation" Funding Advisory Service offers:

- advice and information on Federal Government funding opportunities for research and innovation
- information about procedures and conditions related to funding programmes and support in submitting applications
- contact details for the persons responsible for the funding programmes in the project management organisation or the appropriate Ministry department
- information on the research and funding structure of the Federal Government, Federal States and the European Commission
- support in initiating cooperation projects between SMEs and research institutions.

In addition, the Federal "Research and Innovation" Funding Advisory Service provides individual consulting and offers news in German on Federal and European research funding every two weeks via e-mail.

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Internationales Büro des BMBF

The Partnership supports the internationalisation efforts by the members of the Initiative particularly with regard to cooperation between industry and research. To this end, the Initiative and its members are involved in various activities of the International Office. Additionally, measures to support this process have been encouraged specifically for networks.

International Bureau of the BMBF

The International Bureau (IB) has been commissioned by the German Federal Ministry of Education and Research (BMBF) to strengthen the international ties of German universities, research institutes and enterprises with the ultimate goal of building competencies and fostering competitive advantages for industry and the research community in Germany in the areas of research and innovation.

In doing so, the International Bureau is making an important contribution to cultivating an international dimension within the research programmes of the BMBF.

The IB contributes to the implementation of the Federal Government's High-Tech Strategy and the Strategy of the Federal Government for the Internationalisation of Science and Research, which was initiated by the BMBF.

The IB sees itself as a service provider for the BMBF, or rather a service provider for the German science community on behalf of the BMBF.

Its responsibilities are:

- supporting the ministry in planning and implementing international agreements and cooperation programmes
- observing relevant international developments in the areas of research and innovation policy
- advising and supporting stakeholders in the German scientific landscape in opening up opportunities for international networking and advertising Germany as an excellent place for science, research and innovation
- contributing to the strategic development of the international dimension of the European Research Area.

In dialogue with the research divisions of the BMBF and their project management organisations, the IB initiatescooperation on research topics with a high policy priority with competent partners in a variety of countries.

The IB possesses detailed knowledge of the capacities for cooperation in other countries as well as the legal and political framework for cooperation. Moreover, it maintains contact with relevant organisations abroad as well as with German organisations active in cooperation at the international level. The IB provides BMBF funding to German universities, research institutes and small and medium-sized enterprises (SMEs) for investigating the potential for cooperation with partners abroad and for the preparation of projects involving international cooperation.

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Kompetenznetze in der Medizin

The Competence Networks in Medicine pool excellent research activities in major areas of medicine, making them an important contact for all members with a relationship to this branch of industry.

Competence Networks in Medicine

The Competence Networks in Medicine are the result of a funding measure started in 1999 by the Federal Ministry of Education and Research (Bundesministerium für Bildung und Forschung, BMBF), initiating and supporting large-scale research projects in establishing supraregional networks. Since the measure was introduced, the total number of funded networks has increased to 21.

Oriented specifically towards diseases with a high socio-economic impact, these networks focus on a two-pronged approach to innovation-oriented research and the transfer and implementation of research results in practical and economically viable solutions. Currently, the networks address the following diseases:

- neurological diseases: stroke, Parkinson's disease, multiple sclerosis
- psychiatric diseases: degenerative dementia, schizophrenia, depression and suicidality
- cardiovascular diseases: congenital heart defects, atrial fibrillation, heart failure
- cancer diseases: acute and chronic leukaemias, malignant lymphomas, paediatric oncology and haematology
- chronic inflammatory diseases: asthma/COPD, rheumatism, chronic inflammatory bowel diseases
- infectious diseases: HIV/AIDS, hepatitis, community-acquired pneumonia, sepsis
- metabolic diseases: obesity, diabetes mellitus.

Due to the interdisciplinary cooperation between scientists, physicians and patients' organisations, the development of new and efficient solutions for urgent patient care issues has been noticeably accelerated. It has already become clear that research results so far have contributed decisively toward improving prevention, early diagnosis, therapy and aftercare.

Besides intensive research activities, the following measures in particular have been taken: databases and material pools have been built up, collaboration with national study groups has been advanced and the transfer of research results into practice has been accelerated. Moreover, the competence networks compile reviews and guidelines, develop standards in diagnostics and therapy, implement quality management measures and transfer issues of practical relevance to research.

The Competence Networks in Medicine, the Coordination Centres for Clinical Studies, which are located at diverse university hospitals, and numerous other medical research associations collaborate within the umbrella organization TMF e.V. in order to develop joint solutions for the requirements and problems of networked medical research.

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Technologie Allianz

As a key channel of distribution of new innovations by the scientific community, the Technology Alliance provides information about new patents that are made available to the networks and on the website of the Initiative.

TechnologieAllianz e.V.

TechnologieAllianz e.V. is a nationwide network with the purpose of marketing technologies derived from German scientific research.

The association unites 28 technology and patent agencies from all German regions. Its members represent more than 200 scientific institutions and over 100,000 scientists, making a central collection of research results of German universities and research institutions available to interested companies. As a network for marketing the results of German research, the main objectives of TechnologieAllianz are:

- to be a competent and consistent contact point for businesses seeking a professional transfer of patented research results,
- to supplement traditional technology transfer between science and business and to accelerate this transfer by giving it new impulses,
- to guarantee regional presence and a supraregional information flow.

More than 100 professional innovation managers with proven expertise and industry knowledge advise and support companies and business start-ups in their search for new methods and products and offer detailed information about protected research results. They also arrange partnerships between businesses and scientific institutions and negotiate licence agreements and cooperation contracts.

As sales partners for scientific institutions and competent partners of business enterprise, the members of TechnologieAllianz provide exclusive access to scientific research results. In so doing, they are procuring technologies out of a total asset of 2,000 economically relevant and already protected inventions from 14 branches in order to guarantee interested companies a head start in the market.

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As an excellent network of education and training, TheoPrax covers a subject that is considered by most of the networks as an important overriding field of activity against the background of the development of competences and human resources.

TheoPrax Centre

TheoPrax is a training network that has been in operation since 1996. Its aim is to connect theory with practice through the TheoPrax® teaching and learning methodology. Project work on an offer-order basis, which is integrated in the curriculum of schools and universities, creates a link between education and industry. Through project work based on a specific order from a company or service provider, pupils and students become familiar with the working world and professional working methods in a real-life context. Over 600 projects have been successfully completed by pupils and students in collaboration with industrial partners or service providers.

The main objectives of the training network are:

- to complement frontal teaching with equally weighted project work
- to increase the technical, methodological, social and personal competences of the participants
- to help the participants to think and act with reference to a wider context
- to stimulate entrepreneurship among pupils and students
- to raise interest in technology and the natural sciences
- to foster cooperation between schools or universities and industry.

Partners in the TheoPrax network include over 30 large companies, over 30 SMEs, more than 50 professors from universities, colleges and research centres, over 60 comprehensive and vocational schools, 15 alliances, associations and numerous local authorities.

For the regional supervision of the companies, education centres and research institutions involved, eleven communication centres have been set up in eleven German states, beside the TheoPrax Centre at the Fraunhofer Institute for Chemical Technology (ICT) in Pfinztal.

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European Cluster Policy

Networks and clusters are an important topic in different European countries and on the part of the European Commission. So far, the emphasis has been on developing and establishing network and cluster structures with the central aim of significantly enhancing the technological and economic efficiency of regions and regional players. To this end, nations have adopted various approaches, resulting, among other things, from a different interpretation of the cluster concept, from divergent governmental and administrative systems, the framework of cultural and institutional conditions, and differing economic and technological structures.

At the end of 2008, the European Commission published the document "Towards world-class clusters in the European Union – Implementing the broad-based innovation strategy". It signalled a significant shift in the priorities of European network and cluster policy, defining, in the first place, a number of long-term objectives, such as e.g.

- Fostering transnational cooperation between clusters by opening the European Research Region;
- Improving cluster policies on national and regional level;
- Developing novel and improved instruments designed to encourage the involvement of small and medium-sized companies in clusters;
- Installing a group of experts to support the European Commission in issues of cluster policy, and
- Furthering the excellence of cluster organisations.

This clearly shows that "Europe does not need more clusters, but more efficient and internationally more visible clusters". This is the reason why the document met with a resounding international response from political decision-makers, cluster managements and cluster participants involved. Moreover, it served as a basis for a number of measures by the European Commission that were conceived from the end of 2008 on and are currently being implemented. In detail:

Establishment of the "European Cluster Policy Group"
The European Cluster Policy Group was set up at the end of 2008. 20 renowned experts of the national and international cluster community were appointed to the Group. The Group advises the European Commission on which measures existing clusters of worldwide importance can take with a view to developing such measures further. The recommendations of the Group concentrate on the following major areas:

- New instruments and approaches to facilitate transnational cluster cooperation within Europe
- Modes of functioning and enhancement of the efficiency of cluster structures in new technology fields
- Improvement of excellence and quality of cluster initiatives and, particularly, of cluster managements
- Harmonisation of the different instruments of the European Commission for the improved support of clusters.

The results will be presented to the interested persons who are responsible for and participating in the clusters during a public conference to be held in Brussels in September 2010. This should be followed by an open process of debate with the interested public to reach the broadest possible consensus.

European Cluster Observatory Project (www.clusterobservatory.eu)
This project is aimed at the statistically based identification of clusters in Europe and will run for another three years. Compared with its predecessor, there will be significant changes concerning both a revised methodology for the identification of clusters and an interactive communication platform. This platform is intended to contribute to mutual exchange between cluster initiatives listed in the Observatory. The objective is to ensure that use is made of the European Cluster Observatory by decision-makers in the field of cluster policy and, increasingly, by cluster managers for cooperation requests and the mutual exchange of experience.

European Cluster Excellence Initiative (www.cluster-excellence.eu)
The Initiative is engaged in working out indicators for enhancing the quality of cluster managements. It thereby wants to make an active contribution to developing World Class Clusters in Europe, thus building a set of quality indicators and a harmonised system of evaluation enabling clusters to document their specific cluster excellence. In so doing, a methodology – similar to benchmarking – of voluntary mutual comparison is chosen, stimulating learning from whoever is best. Furthermore, the project also contains components for the harmonised basic and further training of cluster managements. Currently, different organisations are offering training programmes for cluster managers in Europe. The programmes of the leading training providers shall be brought together in order to achieve quality improvement and harmonisation.

Promoting cluster excellence - measuring and benchmarking cluster performance and quality of cluster organisations
Seminar of the European Commission, December 2009, Berlin

TACTICS Project

The project Transnational Alliance of Clusters Towards Improved Cooperation Support (TACTICS) actively continues the activities of the former European Cluster Alliance (ECA). This includes, on the one hand, support and further development of the ECA by establishing a Permanent Secretariat and, on the other hand, the implementation of the high-level TACTICS Reflection Group and of six working groups which cover different aspects regarding transnational cluster cooperation.

The European Cluster Alliance itself is a merger of four European cluster projects founded within the framework of the Initiative PRO INNO Europe® in the period between 2006 and 2009. It comprises a total of 88 European cluster regions.

In all these measures and groups German competence networks and/or the Agency of the Kompetenznetze Deutschland Initiative are involved. This enables German participants to take an active part in setting future accents of cluster policy on a European level. This will also increase the international awareness of the German role in these topics, but above all the visibility of the German networks and clusters.

In addition to that, further directorates general of the European Commission, following up on these measures, have reinforced their activities in the last few years to intensify cluster cooperation. This includes, inter alia, the "Region of Knowledge Programme" (GD Research) and the INTERREG Programmes (GD Regio). Among them are the so-called "Knowledge and Innovation Communities (KICs)", coordinated by the European Institute for Innovation and Technology (GD Education and Culture). In these programmes also German clusters are actively involved.

On the one hand, these measures are supposed to initiate further international cooperation between clusters and networks in Europe. On the other hand, the improved efficiency of cluster management is in the focus of these cluster policy activities, because all cluster participants will consequently profit from it, and the competitiveness of the cluster as a whole will thus be improved.

Catchy buzzwords like Cluster Management Excellence or World Class Cluster should be mentioned here just as an example and they rather symbolise this trend. However, the first programme papers of the European Commission on the 8th Research Framework Programme clearly indicate that this trend could continue. This goes to show that clusters could assume an important role in future research projects to increase the sustainability of these projects with the aim of their better commercial exploitation. Although the precise function of clusters is still open in this context and needs to be defined, primarily excellent clusters and cluster managements should be in the focus.

These measures are being accompanied by a number of cluster programmes of member states. They, too, are concentrating more and more on giving assistance to the more powerful clusters to enable them to develop processes of innovation more efficiently and to enhance their competitiveness. This is what is basically meant by "World Class Cluster". In the following, we will present some of the national cluster activities.

Cluster Initiatives in Europe

Pôles de Compétitivité – France

”Pôles de compétitivité” are associations of firms, higher education centres and research units within a given geographical area. Active in targeted technological fields with high market potential, they implement a common strategy aimed at generating synergies centred on cooperative R&D projects in order to reach the critical mass needed for international visibility. This new industrial policy was launched in 2004. There are 71 “pôles de compétitivité”, with high sectoral focus on biotechnologies, information technologies, transportation, energy, the environment and the food industry.

Innovation is one of the main engines for the networks, along with activities in support of their members, with a particular focus on international cooperation.

For more information on ”pôles de compétitivité”, see www.competitivite.gouv.fr.

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The Hungarian Pole Programme

The Hungarian Pole Programme is a major, two-pillar economic development programme backed by Structural Funds sources amounting to 1.5 thousand million euros between 2007 and 2013. On the one hand, the Programme intends to develop the eight Hungarian pole cities and the surrounding areas by creating a favourable economic environment through education, training and especially private sector-driven investments in R&D&I infrastructure. On the other hand, the programme aims to help develop clusters that in the medium term can achieve international competitiveness through high value-added, export-oriented and innovative activities. The Pole Programme uses a unique four-stage cluster development model. Currently, there are 16 accredited clusters in Hungary, mainly in the fields of medical sciences and biotechnology, ICT, the packaging industry and renewable energy.

For more information on the Hungarian Pole Programme, see www.polusprogram.eu.

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Luxembourg Cluster Programme "Turning Innovation into Business"

Luxinnovation (National Agency for the Promotion of Innovation and Research) manages an active Cluster Programme that currently includes 5 technology clusters: SurfMat (Surface Treatment and New Materials), InfoCom (Information and Communication Technologies), AeroSpace (Aeronautic and Space Technologies), BioHealth (Biotechnologies and Health Technologies) and EcoDev (Ecotechnologies and Sustainable Development). These clusters unite more than one hundred Luxembourg-based companies and public or private research centres. The objective of the Cluster Programme is to reinforce the competitive advantage of innovative Luxembourg-based firms and organisations.

For more information on the Luxembourg Cluster Programme, see www.luxinnovation.lu.

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Point One - The Netherlands

Point One is an innovation programme for cluster formation in the Netherlands. It was launched in 2006 and focuses on selected business areas in nanoelectronics, embedded systems and mechatronics. Point One has chosen an integrated approach including activities in the areas of national and international R&D, human capital, and specific SME projects. The aim of the programme is to position the Netherlands as a global market leader in cooperation with leading European clusters, and to anchor SMEs in international partnerships.

For more information on Point One, see www.point-one.nl.

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Knowledge Transfer Networks - United Kingdom

A Knowledge Transfer Network is a single overarching national network in a specific field of technology or business application which brings together people from businesses, universities, research, finance and technology organisations to stimulate innovation through knowledge transfer. KTNs have been set up and are funded by the Technology Strategy Board, the UK's innovation agency (see www.innovateuk.org). There are currently 19 KTNs with a membership of around 60,000.

The KTNs aim to deliver improved industrial performance through innovation and new collaborations by driving the flow of people, knowledge and experience between business and the science base, between businesses and across sectors.

For more information on KTNs, see www.ktnetworks.co.uk.

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BioCon Valley® – Life Science and Health Economy in Mecklenburg-Vorpommern

BioCon Valley®

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Pharmaceutical production at Riemser Arzneimittel AG
Source: Riemser Arzneimittel AG

The Mecklenburg-Vorpommern countryside
Source: Projektgruppe Landesmarketing Mecklenburg-Vorpommern

The network

In the fields of life science and health economy, BioCon Valley® is the central contact point in the state of Mecklenburg-Vorpommern. Founded in 1996 as a consequence of the federal Bioregio competition, BioCon Valley® has bundled and represented the interests of enterprises, universities, colleges and non-university research institutions active in these branches in the northeast of Germany ever since.
This development is being advanced by the region's successful achievement of recognition in its core competencies

- medicine / medical technology,
- agrobiotechnology and
- marine biotechnology.

The technological focus

The network's main competence is in the red, green, blue and white biotechnologies, medical technology and health economy. The outstanding success of the state's institutions is demonstrated by the Centres for Innovation Competence (Zentren für Innovationskompetenz ZIK), which have been established near Greifswald and Rostock. In the context of the "Spitzenforschung und Innovation in den Neuen Ländern" (Top-level research and innovation in the New German Länder) initiative, projects in the following fields are being realised: molecular medicine and functional genome research in humans and animals, life-science automation, medical technology, plasma technology, regenerative medicine and plant breeding.

BioCon Valley® is a partner of BIOKATALYSE2021, the cluster for industrial biotechnology in northern Germany. With the "HIC@RE Gesundheitsregion Ostseeküste" (Baltic Sea coast health region) project, Mecklenburg-Vorpommern has been selected as one of 20 German health regions of the future. The annual Federal Conference for Health Economy, organised by BioCon Valley®, is held in Rostock and has become an important platform for the entire branch.

The unique Feature

BioCon Valley® concentrates the competencies of the state of Mecklenburg-Vorpommern in the fields of life science and health economy in a unique public-private partnership.
Services of the BioCon Valley® initiative include:

- up-to-date information concerning the entire branch,
- networking between experts and potential cooperation partners in Germany and abroad,
- initiation of projects within the network,
- supervision of new business centres,
- marketing for the entire bioregion and health region.

In order to increase the critical mass in science and business, BioCon Valley® cooperates in strategic partnerships with the members of ScanBalt. This is a network of biotechnology regions and life science initiatives in the Baltic Sea region. Furthermore, BioCon Valley® cooperates with the Hoa Lac Hi-Tech Park in Vietnam and the Mie region of Japan.

BIOKON – Biomimetics Network of Excellence

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Bionik-Kompetenz-Netz

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The "technical plant stem"
T. Speck, University of Freiburg

A modem for underwater communication
R. Bannasch, EvoLogics GmbH

The network

The primary objective of BIOKON is to make biomimetics useful as a source of ideas and innovation for technology, business and society. The non-profit research community includes more than 80 universities, research institutions, companies and individuals working in the field of biomimetics throughout Germany. As an information and education platform, BIOKON concentrates and links the activities and expertise of important biomimetics working groups so that biological problem-solving and optimisation strategies are developed into new products and technologies in a goal-oriented manner.

The technological focus

Biomimetics taps nature's huge reservoir of structures, process optimisations and functional solutions in order to find technical applications of natural principles. The optimisation of resource and energy efficiency that took place in the evolution of all biological systems is of special interest. It offers great potential for more sustainability in the economy.

An essential part of the innovative power of biomimetics is founded on the interaction between basic research in biology and the growing technical capabilities of nano-technology, microsystems technologies, optoelectronics, material sciences and processing technologies. In general, it is a long way from the biologically inspired idea to a marketable product. One decisive step on this way is the creation of convincing technical prototypes and demonstration products derived from nature's energy- and resource-efficient examples. To facilitate access to information and promote technical exchange, BIOKON has set up committees focusing on particular topics in biomimetics.

Workgroups of BIOKON

- Architecture and design
- Lightweight structures and smart materials
- Structures and functions of surfaces and interfaces
- Fluid dynamics, motion systems
- Robotics and biomechatronics
- Sensors, data processing and communication
- Optimisation algorithms.

Services

- combining resources and competencies
- initiating, executing and accompanying international research, development and implementation projects
- consulting and lobbying in science, business and politics
- promoting education and training measures
- organising conferences, workshops and exhibitions for the scientific community and the general public
- public relations.

The unique features

Selected biomimetics projects

- Transferring self-cleaning abilities of micro and nanostructured hydrophobic plant surfaces to technical products (Lotus Effect®; Prof. Dr. Wilhelm Barthlott, University of Bonn)
- Adhesive microstructures (Prof. Dr. Stanislav Gorb, University of Kiel)
- Fluid dynamics and aerodynamics (Prof. Dr. Cameron Tropea, Technical University of Darmstadt)
- Underwater communication systems based on dolphin communication (Dr. Rudolf Bannasch, EvoLogics GmbH)
- Non-toxic biofouling prevention. (Prof. Dr. Antonia Kesel, University of Applied Sciences, Bremen)

Bio^{M} Biotech Cluster Development GmbH – Bavarian Biotech Cluster / Munich Region

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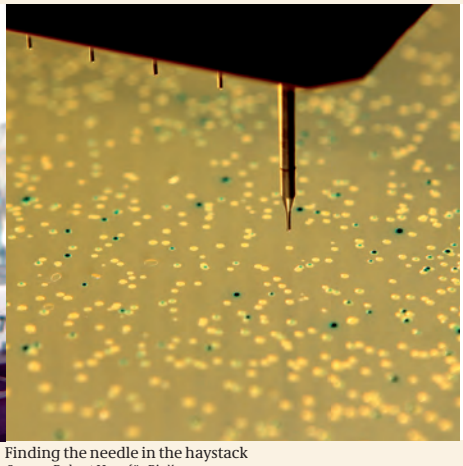
Biotechnology is colourful
Source: Robert Haas für Bio^{M}



Finding the needle in the haystack
Source: Robert Haas für Bio^{M}

The network

Bio-M Biotech Cluster Development GmbH is a service and consulting company aiming to promote the development of the Munich Biotech Cluster as an internationally renowned centre of excellence in the field of innovative biotechnology. It is the first point of contact for biotech start-up companies seeking financial support or business advice. Bio-M assists Munich-based companies in finding the right contacts and partners through its network, which includes all important players in the region: representatives from public offices, scientific institutions, venture capitalists and biotech companies.

The technological focus

The Munich Biotech Cluster has a special focus on the development of medical therapeutics and diagnostics. However, the network also covers the entire range of biotechnological innovations and applications, including agro-biotechnology, industrial production of pharmaceuticals, additives for the food industry, renewable primary products (e.g. biogas) and industrial bioproducts.

The unique features

In 1996, Munich was one of three winners in the "BioRegio Competition", an initiative by the German Federal Ministry of Education and Research in support of biotech regions with the highest industry potential. Since then, due among other reasons to an excellent base of scientific institutions, the Munich Biotech Cluster has become the leading biotechnology cluster in Germany and number four in Europe. There are 350 biotech, pharmaceutical and clinical research organisations based in Munich, of which seven biotech SMEs are listed on the stock exchange. 30,000 people work in the biotechnology sector in industry and science, for example at two "universities of excellence" and three Max Planck Institutes. The impressive drug pipeline of Munich companies has already brought four drugs to market successfully.

BioRiver – Life Science im Rheinland e. V.

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Aachen, Bonn, Cologne and Düsseldorf: Life Sciences in the Rhineland

The network

BioRiver was founded as an independent agency of the Life Sciences industry in the Rhineland in 2004. It is funded entirely by the participants of the Rhineland Bioregion. BioRiver successfully drives the region's networking efforts and offers a hub for an intensive exchange between business, science, investors and politics. The agency promotes the transfer of technology between science and business through the active work of its members and mediates between teams of scientists, research projects and the industry.

BioRiver is also a first-rate address for contacts from industry and science alike.

The technological focus

208 life science companies are currently active in the BioRiver region, including 121 biotechnology companies, 65 pharmaceutical companies and 22 contract research institutes (CRO). Pharmaceutical biotechnology, molecular diagnostics and analysis and bio process engineering are the small and medium-sized companies' main fields of activity in the BioRiver region, supplemented by innovative medical technology companies based primarily in the Aachen area. Amongst many other internationally active businesses, Germany's biggest biotechnology companies Qiagen and Miltenyi Biotec are located in the BioRiver region.

The BioRiver region's universities and research institutes possess distinct competencies in the biomedical sector. The research foci of the Rhineland are united under the umbrella of BioRiver Science. The Bonn Science Region represents the neuroscience sector, Cologne focuses on inflammation, infection and oncology, Düsseldorf University and Forschungszentrum Jülich cooperate in the field of enzyme research and the Aachen region leads in the medical technology and biomaterials sectors.

The unique features

As the first university in North Rhine-Westphalia, the University of Bonn established a new interdisciplinary centre for pharmaceutical research at the end of 2007. More than 20 teams of medical and scientific experts will work here in close cooperation to develop novel drugs.

As one of three winners, the Neuroalliance of the University of Bonn successfully presented its concept at the national BioPharma competition. The Federal Ministry of Education and Research awarded 20 million euros in prize money to this alliance of six institutes and industrial partners (Siemens, SchwarzPharma) for the purpose of researching diagnostics and cures for neurodegenerative diseases.

The "Neuroalliance" consortium puts into practice a new type of strategic partnership between publicly funded research institutes, the pharmaceutical industry, biotechnology companies and government agencies, in which all links of the value added chain are represented. The twelve partners involved intend to develop therapeutic and diagnostic approaches for the treatment of neurodegenerative diseases from the research stage to marketability.

BioTOP Berlin-Brandenburg

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The biocapital region Berlin-Brandenburg

The network

BioTOP Berlin-Brandenburg is the central contact and coordination office for all issues concerning biotechnology in the German capital region.

The Berlin-Brandenburg region offers outstanding development potential and ideal conditions for the biotech industry. In a scientific environment that is unique in Europe, research and development is taking place at five universities, three universities of applied sciences and in more than 20 research institutes with a total of 350 work groups. More than half of the over 190 biotech companies are spin-offs of the universities and research institutes.

The technological focus

In Berlin-Brandenburg, a broad range of activities is taking place in basic research, technology development and clinical research. Strong networks with partners from both academia and industry have been established in the following fields: biohybrid technologies, drug discovery and development, glycobiology, molecular diagnostics and bioanalytics, nutrigenomics, plant genome research, regenerative medicine, RNA technologies, ultrastructure research and white biotechnology.

The unique features

Due to its critical mass of young innovative companies and internationally recognised research facilities, Berlin-Brandenburg offers many opportunities for interdisciplinary cooperation. Highly qualified personnel are readily available, and experts from all over the world see Berlin as a great place to work.

The bundling of competencies in biological basic research, biotechnology and biomedicine in fields of focus is a special feature of the Berlin-Brandenburg biotechnology region. The extensive high-performance potentials developed in these fields form the foundation of the international pre-eminence of the life sciences in this region. Close cooperation of partners from science and industry in networks will continue to ensure effective technology transfer and consequently permit swift conversion of the results of basic research into wide-ranging applications.

BioValley Platform Germany / Freiburg BioRegion

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BioValley Science

BioTech Park

The network

BioValley Platform Germany is a partner of the trinational BioValley network, which combines the biotechnological potential of the centres Freiburg, Basel and Strasbourg.

The members are the Freiburg, Offenburg and Southwest economic regions, the Freiburg BioRegion, WVIB, BioValley Deutschland e.V., the Southern Upper Rhine and Lake Constance Region Chambers of Commerce, the Karlsruhe TechnologyRegion and the Universities of Freiburg, Offenburg, Furtwangen and Lörrach.

Like the Freiburg BioRegion, BioValley Platform Germany is managed by the Technology Foundation BioMed Freiburg.

The technological focus

BioValley is among the first European initiatives in the life sciences area and stands out especially due to its scientific expertise in the area of tissue engineering, plant biotechnology, immunology, oncology, cell and developmental biology, neurobiology, microsystems engineering, nanotechnology and systems biology.

The research institutions on the German side are the University of Freiburg, the Freiburg University Medical Center, the Tumor Biology Center, the Max-Planck-Institute of Immunobiology, the Fraunhofer Institute for Physical Measurement Techniques IPM, and the Offenburg and Furtwangen Universities of Applied Sciences.

Of particular importance is the very effective transfer of technology via the University of Freiburg, the portfolio of which includes all leading high-tech companies.

The unique features

The BioValley Platform Germany is an important partner of the trinational BioValley.

The Upper Rhine is a globally unique cross-border life sciences cluster with one of the highest densities of activities involving life sciences in the world.

Twelve universities, 100,000 students, 15,000 scientists, 40 scientific and academic institutes involved in life science, biotech, chemistry or nanoscience, 400 research groups and 600 innovative companies speak for themselves.

A total of 150 companies have been founded in the BioValley during the last years.

40% of the biggest pharmaceutical companies in the world are settled in BioValley, including global players like Novartis, Roche, CIBA, Lonza and Syngenta as well as branches of large pharmaceutical companies such as DSM, Pfizer, Sanofi-Aventis and others.

The main tasks of the trinational BioValley Initiative will be to preserve the existing structures, to further profile the “BioValley” brand and to connect the fields of biotechnology, pharmacy and medical technology to form an extensive Life Sciences Cluster which will establish itself worldwide as a strong European knowledge and research region.

Food-Processing Initiative e. V.

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Food-Processing

Kooperationspreis 2009 award ceremony

The network

Food-Processing Initiative e.V. (FPI) is the network for food processing and food technology.

The association, founded in November 2000 by companies of the food sector, identifies partners for projects, arranges contacts with experts, promotes the transfer of technology and mediates developments.

As a mediator between the partners of the process chain, research institutions and policymakers, FPI creates new connections. Competencies complement each other in cooperation. Thus, value is created in process and product improvements and in market development.

The technological focus

FPI combines the competencies involved in producing high-quality and innovative food. With its members and cooperation partners, the association represents the food industry as the core area of the nutrition value-added chain.

FPI gives priority to the following three areas:

- **Food innovation**
  To be able to withstand the increasing competition in the long term, we need innovative ideas not only on the product level, but also in processes and services.
- **Food marketing**
  At trade fairs, the association presents the competencies of the food industry and food technology.
- **Food international**
  The export of products, technologies and services offers tremendous potential for the food industry.

Together, we create innovation for success in the markets of tomorrow.

The unique features

FPI strengthens food processing and food technology companies in addressing the current challenges with new ideas, projects and partners. We are firmly established in the industry while at the same time we have in mind the overall development.

Bringing together the players from manifold subsectors of the food industry and diverse levels of the value chain creates synergies. FPI unites designers and initiators and moderates processes and developments.

FPI supports companies through its years of close contacts with researchers and companies and its competent expertise in

- transferring knowledge and trends to companies,
- designing processes,
- developing and implementing new ideas,
- establishing new contacts with business and research partners, and
- opening up new markets.

FPI sees “networking with the best” on an international level as an important building block in strengthening the innovative capacity of the food industry.

foodRegio

foodRegio

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Lübeck is a centre of cereal production

Intelligent energy management in autoclaving
Source: Hawesta-Feinkost Hans Westphal GmbH & Co. KG

The network

The foodRegio network was launched in the North German region of Lübeck by food processing companies, research and development facilities and educational institutions. The aim of the network is to provide a measurable added value for the food processing industry by initiating joint projects in the areas of product development, production innovation, joint logistics and human resources development. This involves cooperating closely with scientific institutions such as Lübeck University of Applied Sciences and the Fraunhofer Research Institution for Marine Biotechnology.

The technological focus

Only by picking up evolving trends such as more demanding consumers, changing functions of food, concentration processes in the retail sector and shorter product life cycles in time will the food industry be able to remain competitive.

For this reason, the main focus of the project working groups is on fostering product innovations and streamlining production processes. The projects “Energy Management” and “Residue Utilisation” are examples of successful production optimisation, carried out in cooperation between leading companies within foodRegio and Lübeck University of Applied Sciences. The results were noticeable cost reduction and improved economic competitiveness of the participating companies. However, there can be no technological progress without highly qualified personnel. To counteract the skill shortage, a new engineering degree programme has been set up at Lübeck University of Applied Sciences. The curriculum of the “Bachelor of Food Processing” course was adapted to meet industry requirements and defined to a significant degree by the companies themselves.

The unique features

The foodRegio network was launched in the Lübeck region mainly by owner-operated companies from within the Schleswig-Holstein food industry. Therefore the initiative, unlike other networks within the food processing industry, follows the bottom-up approach and is highly result-oriented. Accordingly, the topics discussed are closely attuned to the specific practical requirements of the enterprises. Because of its relatively small operative radius, there is a high geographical density of enterprises within the network, which facilitates practical collaboration amongst the 29 project partners. The homogenous composition of the network with regard to the structure of the enterprises is particularly advantageous; the emphasis is on such products as cereals, spices, confectionery and food additives.

The unique geographical position of foodRegio, close to the Baltic Sea and its littoral states, is an exceptional advantage. This proximity greatly favours cross-border cooperation between food industry networks and individual network members from different nations. An outstanding example of this is the baltfood project, in which specific know-how is transferred across the Baltic Sea and made available on a broader geographical basis.

Genome Analysis of the Plant Biological System

gabi
Genomanalyse
im biologischen
System Pflanze

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Developing special maize species for energetic use
Source: Andreas Resch – Fotolia.com

Rapeseed: soon an important provider of valuable protein Source: Oliver Hoffmann – Fotolia.com

The network

The research consortium Genome Analysis of the Plant Biological System is financed by a public-private partnership formed by the Federal Ministry of Education and Research and private-sector enterprises. Partners from the industry have joined forces in a Trade Association for Plant Genome Research, GABI. The Plant Innovation Agency, associated with GABI, works on commercialising the results. GABI implements the high technology strategy of the German government in the area of "Innovative plants – new paths in agriculture and industry".

The technological focus

The technological focus of GABI is on sequence data and genome analysis. Detailed knowledge of a plant genome, from the basic sequence to the organisation of the genome to the explanation of the function of individual DNA sections, is an integral part of plant research and a necessary prerequisite for targeted breeding. Genes are identified and their functions in the plant biological system analysed. The genetic diversity of plants and its enormous potential for plant breeding is also investigated. Detailed analysis of plants' metabolisms is important, too. Utilising modern omics technologies makes it possible to measure the contents of not one but hundreds to thousands of molecules in one measurement. Bioinformatics is essential for the analysis of omics data.

All these technological facets of genome research are used in GABI projects. The latest and best technological platforms of modern plant genome research are made available to all project partners in the GABI research consortium to conduct basic research and tackle the challenges of 21st century agronomy.

The unique features

The GABI research cluster has successfully brought together basic researchers with plant breeders. GABI projects cover the whole range from innovative basic research to product development. GABI played an essential role in establishing genome analysis as the most important tool for modern plant breeding. However, national genome research is only one aspect. GABI has contributed to establishing an unprecedented degree of international networking in the field of genome research. The global challenges of the 21st century can only be tackled through international networking. Another focal point of GABI's work is the proactive support of young researchers. With its support of three internationally renowned young researcher groups, GABI is a showcase project in the plant research field.

InnoPlanta – Plant Biotechnology

InnoPlanta
Nordharz/Börde

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Biotech maize compared to conventional maize
Source: InnoPlanta e. V.

Gatersleben biotech campus
Source: IPK Gatersleben

The network

InnoPlanta e.V. is an association for the promotion of modern plant breeding. InnoPlanta supports all activities of agricultural businesses, companies, scientific institutions, regional authorities and organisations which promote the scientific and economic development of plant biotechnology. InnoPlanta engages in public relations aimed at increasing the acceptance of plant biotechnology.

Founded as a regional network in 2000, today more than 100 members from science, seed breeding, agriculture, politics and the service industry are working together in InnoPlanta. With its Consortium of Innovative Farmers, it is taking action all over Germany.

The technological focus

New Potential for Agriculture

Plant biotechnology is one of the key technologies of the 21st century. It plays an increasingly important role in mastering global challenges in the areas of nutrition, renewable resources, energy, health and environmental protection. Plant biotechnology offers new potential for agriculture, thus strengthening its competitiveness and sustainability.

The Northern Harz / Börde region is considered the birthplace of modern plant breeding. Favorable climatic conditions and excellent soil quality are advantages that led to the establishment of a plant-breeding industry of worldwide repute about 100 years ago. Comprising significant scientific facilities (IPK Gatersleben, JKI Quedlinburg), breeding companies, plant biotechnology companies and infrastructure facilities, the region ranks among the most important centres of modern plant breeding in Germany and Europe.

The unique features

In the context of the InnoRegio project promoted by the Federal Ministry of Education and Research (BMBF), InnoPlanta has coordinated 38 plant breeding projects with a total volume of more than 30 million euros within the last years. Priority was given to the following issues:

- developing new, molecular-genetic techniques of plant breeding
- resistance breeding for important cultivated plants
- breeding of plants with novel and improved ingredients
- optimisation of regional crops by breeding.

250 patent applications have been filed and 123 new jobs have been created.

InnoPlanta was the project executing organisation for the first test cultivation of the genetically modified Bt corn MON 810 in Germany.

As a result of the difficult general conditions for the utilisation of green genetic technology in Germany, the Consortium of Innovative Farmers “InnoPlanta AGIL” was founded in 2006 under the umbrella of InnoPlanta. InnoPlanta AGIL counsels and supports farmers in the practical use of plant biotechnology and actively takes part in the public discussion about green biotechnology.

The annual InnoPlanta Forum has established itself as an important communication platform for green genetic technology in Germany.

Competence Network Biomimetics

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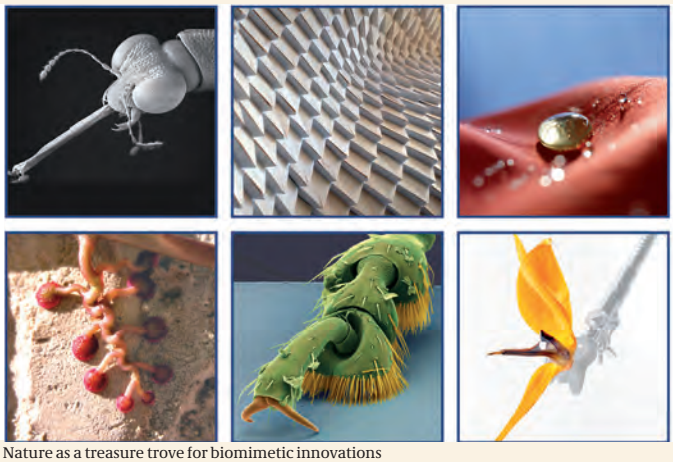

Nature as a treasure trove for biomimetic innovations

The network

The "Competence Network Biomimetics" is a network whose members are engaged in the systematic translation of problem solutions of nature into technical applications (biomimetics). The network's supporters are the Universities of Freiburg, Tübingen, and Stuttgart, the Institute of Textile Technology and Process Engineering in Denkendorf, the Karlsruhe Institute of Technology, the Max Planck Institute for Metals Research in Stuttgart, and the State Museum of Natural History Stuttgart. The network is funded by the Ministry of Science, Research and the Arts of Baden-Württemberg.

The technological focus

The Competence Network Biomimetics is a platform for scientists of various disciplines and for partners from industry and business, making the joint development of innovative products and technologies possible. The "Centre for Biomimetics Research" and the "Centre for Biomimetic Innovations for Industry" were established for this purpose. Due to the interdisciplinary character of its active members and the current R&D projects, a transfer of research results into technical products along the complete value chain is guaranteed. Core competencies in the field of biomimetics are:

Research and Development

- form-structure-function relationships in plants, animals, and plant-animal-interactions
- mechanical testing and technical biology
- surfaces and interfaces
- lightweight construction and materials
- optimisation
- fluid dynamics
- energy
- fibre-based materials and composite materials
- architecture
- transfer into technical applications on laboratory and pilot plant scale, and scaling up to industrial level

Services

- consultancy for scientists and industry
- project management
- industry workshops, creative workshops and conferences
- expert database on biomimetics
- public relations
- education, further training, and on-the-job training

The unique features

As a particularly innovative scientific discipline with excellent future prospects, biomimetics is attracting more and more attention nationally and internationally. In Baden-Württemberg it is now represented by outstanding institutions. Biomimetics, or "learning from nature" involves the transfer of knowledge and technology from basic biological research to innovative technical products and processes. Plants and animals have increasingly turned out to be a treasure trove of biomimetic innovations with a diversity developed in the evolutionary pro-cess over the last 3.8 billion years.

Medtech & Biotech Competence Network

KompetenznetzeDeutschland
Kompetenznetzpreis 2009 | 2. Preis

Kompetenznetz Medtech & Biotech

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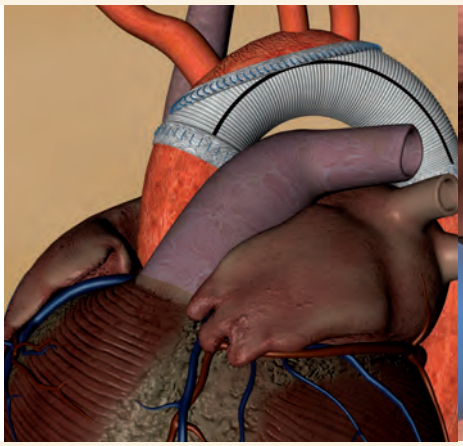
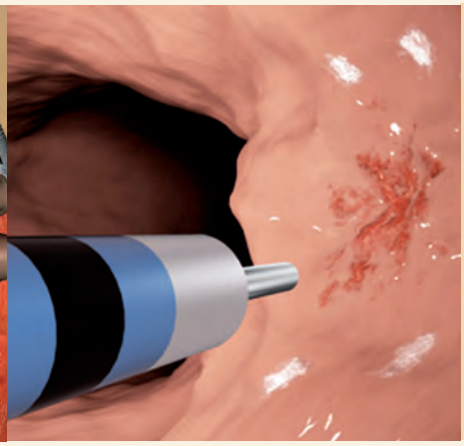


Successful reconstruction of the arch of the aorta
Source: JOTEC GmbH



HybridKnife simplifies endoscopic submucosal dissection
Source: ERBE Elektromedizin GmbH

The network

The aim of the Medtech & Biotech Competence Network is to intensify cooperation between the medtech and biotech sectors and to strengthen their position as key technologies in the STERN BioRegion. Medical technology is an already established industry branch with considerable tradition behind it, whereas biotechnology is relatively young in comparison, 50% of the companies active in this branch having been founded after the year 2000. Cooperation between these two highly innovative yet very different branches will further the development and marketing of new bio-medtech products and therapies whilst providing welcome access to innovative convergence technologies.

The technological focus

Huge potential for new approaches and innovative concepts is generated when the biotech and medtech branches cooperate with each other. One important area is the development of devices and instruments with biocompatible or organic coatings. Hechingen-based JOTEC GmbH is working, for example, on the development of functional nano-surface modifications for vascular prostheses which will enable the autologous in vivo colonisation with stem or progenitor cells circulating in the blood of the patient. The researchers' aim is to have the patient's own stem cells colonise the implant immediately, thus providing the implant with a natural environment which is ideal from a physiological point of view.

Cooperation between the two branches is also very helpful in optimising the healing of wounds and the regeneration of tissue structures as demonstrated by the example of ERBE Elektromedizin GmbH, which is further developing its water jet technology for treating lesions in the gastro-intestinal system to enable the needle-free injection of biomaterials and cells which are capable of healing.

The unique features

Closing the gap between regenerative biology and medical technology

The competence network "Regenerative Biology BioProfile", founded in 2003, has ensured that regenerative biology and medicine have secured a firm footing in the STERN BioRegion. The current "REGiNA" project (Users' Centre for Regenerative Medicine in the Neckar-Alb and Stuttgart Health Region) will take this a giant step further after winning one of two prizes in the "Health Regions of the Future" competition held by the Federal Ministry of Education and Research (BMBF).

In February 2009, the "Regenerative Biology BioProfile" competence network won second prize in the BMBF "Competence Network 2009" competition for its success in bringing regenerative biology and medical technology closer together. Those involved in this accomplishment are not resting on their laurels but intensifying their efforts to find and tap synergies. This is why the competence network was re-named "Medtech & Biotech" in October 2009 to reflect its new focus at first sight.

The extraordinarily high number of medtech companies in the STERN BioRegion is the ideal foundation for strengthening the network; 120 medtech companies are based in the region and today, 65 of these are actively involved in the competence network which also cooperates intensively with other competence networks such as the "Baden-Württemberg: Connected" and "Medical Valley Hechingen".

NGFN-Plus and NGFN-Transfer in the Programme of Medical Genome Research

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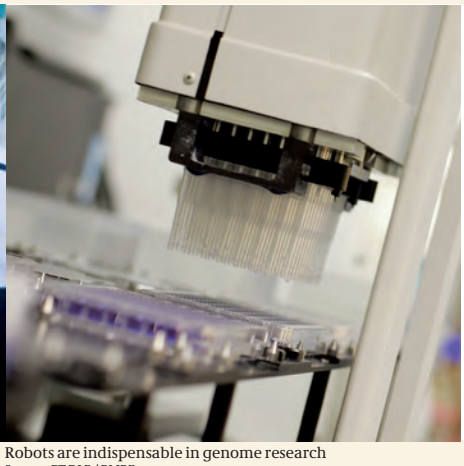
Computer-supported heart analysis
Source: PT DLR / BMBF



Robots are indispensable in genome research
Source: PT DLR / BMBF

The network

The Programme of Medical Genome Research is a large-scale biomedical research programme in extension of the National Genome Research Network (NGFN). 156 million euros have been earmarked for the Programme for 2008 to 2011 by the German Federal Ministry of Education and Research (BMBF). In NGFN-Plus, 26 Integrated Genome Research Networks focus on the systematic analysis of the molecular basis and on combating diseases that are central to health policy. In NGFN-Transfer, eight Innovation Alliances transfer results from medical genome research into medical and industrial application.

The technological focus

The NGFN scientists cooperate in investigating the function of genes and proteins in the development of hitherto incurable diseases. The aim is to promote the development of innovative methods for prevention, diagnosis and therapy. The large repertoire of technologies includes methods of functional and structural genomics, proteomics, epigenetics, systems biology, bioinformatics, genetic epidemiology, genotyping, ("next-generation") sequencing and "proof-of-principle" approaches such as animal and tissue models. The technology development projects focus on innovative solutions in such fields as chip technology and material production and in the use of molecular tools like microRNA in diagnostics and therapy. Standardisation and quality control are benchmark procedures in all areas.

The unique features

The output of the NGFN includes over 80 patent applications, 2,400 scientific publications, and cooperation in 60 EU projects. NGFN scientists have already identified disease genes for allergies, chronic intestinal inflammation, alcoholism, epilepsy, Parkinson's disease and sarcoidosis as well as gene signatures for neuroblastoma, Parkinson's disease, prostate cancer and heart failure which constitute a substantial advance in prognosis and diagnosis. The identification of so-called biomarkers for prevention, diagnosis and therapy of a broad spectrum of diseases is one main focus of the NGFN scientists. They have also developed tools against autoimmune diseases, established systematic proof-of-principle approaches such as animal models and cell-based assays, used active semiconductor chips to develop highly complex peptide arrays and optimised micro-endoscopes for brain analysis. The success of the network is due to the intensive cooperation of scientists from all disciplines from clinics, universities and research institutes all over Germany. The fruitful collaborations in the NGFN are also the basis of cooperative efforts with international universities and research institutions such as participation in the international projects "1,000 Genomes Project", "Genomics and Physiopathology of Cardiovascular and Metabolic Diseases" and the "International Cancer Genome Consortium". Of considerable significance for the work of the National Genome Research Network in the Programme of Medical Genome Research is the close synchronisation of science and industry. In the NGFN-Transfer sub-programme, in particular, the goal of this close cooperation is to transfer research results directly into the development and optimisation of diagnostics and therapeutics. For this purpose, the NGFN research groups have made cooperation agreements with selected companies of all scales at an early stage.

Lower Saxony Competence Centre for the Food Industry
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Highly innovative technology for the food industry
Source: Deutsches Institut für Lebensmitteltechnik (DIL e.V.)

Modern processing in the food industry
Source: Regionale Innovationsstrategie Weser-Ems (RIS e.V.)

The network

In Lower Saxony, the food industry is of very great relevance due to its economic power, technological know-how, and large number of employees. It is the most important business sector in the state after the automobile industry. NieKE bundles the competencies of this sector and creates synergies between the participants. Networked under the NieKE umbrella are scientific institutions, users, producing companies, service organisations and banks. The services offered by NieKE are focused on SMEs.

The technological focus

The competitive capabilities of food producers in the market depend very strongly on the production methods applied. Consumer expectations concerning product safety and quality are increasing, requiring, beside the optimisation of existing technologies, the development of new technical processing possibilities for commercial use.

In addition, requirements for electronic documentation are increasing due to the ever more complex systems involved. In this respect, traceability and food safety are central aspects of operations across all food chains. The focus in this area is on the fully automatic documentation of work processes by means of RFID and telematic systems.

The significance of such promising technologies as optical technology and nanotechnology will increase in all areas of food production. Nanotechnology, for example, will be of special importance for coating surfaces which come into contact with foods.

Modern agricultural machinery involves very many technology fields, with electronics increasingly developing into a core competence in this respect. Networking individual systems to enable interaction between system technologies with classic engineering and mobile hydraulics opens up the possibility of creating a complex total system.

The unique features

The greatest strengths of the network are its up-to-dateness, the possibilities it offers for knowledge transfer and the services it provides. These include forums on specific topics, studies, newsletters, discussion events and technology transfer.

The network participants are characterised by very high professional qualifications and a close association with the food industry. The main goal of network activities is to promote the vitality and innovative strength of the sector. Among its most important tasks are:

- initiating and offering scientific guidance for value chains, determining research and development requirements in enterprises, preparing projects
- supporting the development of new functional foods, designing production lines
- securing food quality and safety
- supporting and supervising product and process developments.

RiNA Network RNA Technologies

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The RiNA network organised the 2007 OTS Annual Meeting in Berlin

RiNA's protein biosynthesis service

The network

The RiNA network supports applied research in the field of RNA technologies. Topics addressed by the network include RNA interference, aptamers, ribozymes, cell-free protein biosynthesis and structural analysis of RNA molecules. The goal is to develop research results into marketable products. An essential basis is the interaction of academics and industry, which is promoted by a set of activities including seminars, workshops and the network's homepage. RiNA also organises international meetings and offers project management services.

The technological focus

Ribonucleic acid (RNA) molecules are found in every living cell, where they serve as information carriers, regulators, structural molecules or enzymatically active substances. New functions of this exciting class of molecules are being discovered continuously. The applications of these properties and the possibility of easily synthesizing RNA molecules chemically have led to the so-called RNA technologies.

RNA molecules are being developed as new drugs to silence undesirable gene expression leading to diseases. The discovery of the so-called "RNA interference" mechanism makes it possible to turn off virtually any gene with short interfering RNA molecules (siRNA) and has acquired enormous importance in medical research. For several years now, RNA interference has also been the main topic of research in the RiNA RNA Technologies Network.

Another focus is the development of RNA aptamers as biosensors and drugs. Aptamers are small nucleic acids with the ability to specifically bind other molecules or even surface structures. Due to this ability, aptamers are suited for manifold applications in the life sciences.

In addition, ribozymes, antisense molecules and structural analysis of RNA are under investigation in the RNA network. The network is always open to new topics in the field of RNA research.

The unique features

International Congress: 3rd Annual Meeting of the Oligonucleotide Therapeutics Society

RiNA organised the 3rd Annual Meeting of the Oligonucleotide Therapeutics Society from 4 to 6 October 2007 in Berlin. The congress brought together more than 300 world leading experts from academic research and industry. The aim was to create strong synergies between different oligonucleotide-based disciplines and foster cooperation that will boost progress in the development of oligonucleotide therapeutics for the benefit of patients awaiting innovative and effective treatment.

New protein synthesis service

The development of "cell-free protein biosynthesis" systems has been supported by the network for several years. Now, a protein synthesis service is being offered based on prokaryotic and eukaryotic cell-free systems for various applications, such as structural analysis, high-throughput screening, and protein labelling. The protein synthesis service is realised in RiNA's own laboratories and complements the EasyXpress Kits commercialised by network partner Qiagen.

ScanBalt - Life Science on Top of Europe

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Roundtable discussion to initiate ScanBalt in November 2001
Source: BioCon Valley 2001

ScanBalt BioRegion in the Baltic Sea region

The network

ScanBalt BioRegion represents the life sciences in the Baltic Sea region and includes regional and national networks and clusters of industries, universities, service providers, hospitals, public authorities and other important players. ScanBalt BioRegion comprises 2543 life science or life science-related companies, 1012 academic institutes and institutions, 238 hospitals and clinics, 112 investors and others. The aim of ScanBalt BioRegion is to improve regional economic development and meet challenges for society in the environment, health, nutrition and energy fields.

The technological focus

The ScanBalt not-for-profit membership association was established in June 2004. The regional and national networks and clusters constitute the basis for ScanBalt. ScanBalt is a mediating, coordinating and communicating umbrella and/or platform for interactions among the networks and clusters. ScanBalt acts as a service provider for the ScanBalt BioRegion Community with a secretariat located in Copenhagen (Denmark), while liaison offices are currently located in Tartu (Estonia), Gdansk (Poland) and Rostock (Germany).

The unique features

In order to strengthen the cooperation in the ScanBalt BioRegion in the fields of biochemistry, biotechnology and biomedicine, enhance and encourage the networking of academic and industrial sectors and develop international collaboration and knowledge exchange, the annual ScanBalt Forum is organised each year in a different ScanBalt country.

A series of ongoing and already finalised projects reflects the work done to successfully network science, business and administration (“triple helix”) across national borders, an effort which is unique in Europe.

Examples of ongoing projects are: Nordic-Baltic Expats Forum and Bridge-BSR (EU FP7). Examples of previous projects are: ScanBalt BioRegion, Network of Networks (Nordic Innovation Center), ScanBalt CompetenceRegion (EU FP6), ScanBalt Campus (Interreg IIIB), Boost Biosystems (EU FP6), Trayss Prime (EU FP6) and Communication in ScanBalt BioRegion (Nordic Innovation Center).

BalticNet-PlasmaTec

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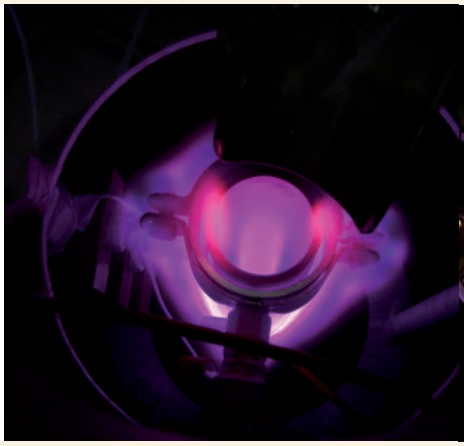
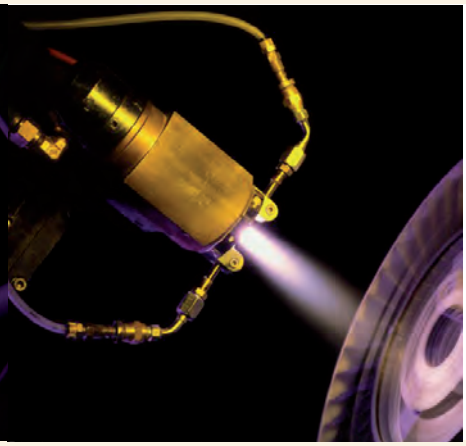


Plasma
Source: IEAP Christian-Albrechts-University



Plasma beam
Source: Aludra bv, Vlaardingen, Holland

The network

The BalticNet-PlasmaTec network stands for a technology- and market-oriented cooperation betweeen science, research and enterprise in the field of plasma technology. BalticNet-PlasmaTec supports existing and initiates new cooperation activities between universities, the industry, small and medium-sized companies, public entities and other important protagonists from the field of plasma technology. We have made it our goal to raise awareness of plasma technology in society.

The technological focus

Today, plasma technology has become an interdisciplinary and key technology which finds application in many diverse fields of industry. Among the uses of plasmas are: etching computer chips, applying a non-reflecting coating to lenses, giving light in the form of luminescent substances and cleaning exhaust gases. Plasma-coated tools have a longer product life, require little or no lubricant or cooling liquid and make precise work possible. In the medical field, plasma is used to coat instruments and implants with functional layers. And these are only a few examples.

The possibilities for application of plasma technology are not exhausted yet and continue to be investigated. Particularly in the fields of micro and nanotechnology, as well as in biotechnology, medicine and environmental technology, many new plasma-based developments are predicted. Often, however, the application of these new technologies is not exploited to its maximum potential due to the lack of knowledge of many potential users about the possibilities offered by plasma technology.

The unique features

Over the last few years, BalticNet-PlasmaTec has developed into an attractive platform for users and researchers in the field of plasma technology. The network has reliable contacts to scientific and public entities and manifold relations with industrial partners particularly in the Baltic Sea Region. However, BalticNet-PlasmaTec is not only active in the Baltic States, Scandinavia and Poland, but also has cooperation partners in Russia. We have also continued to develop our international co-operation projects outside the Baltic Sea Region with new projects in India and Israel.

Through these targeted marketing activities, we promote German strengths in the area of research and development together with university and non-university research institutes, R&D networks and research-intensive enterprises. Another main focus of our work lies in initiating contacts with enterprises which are innovative or willing to innovate in the fields of metalworking, medical technology and environmental protection and with the corresponding university facilities around the globe.

New project ideas and new partners are always welcome. For more information please contact us.

Baden-Württemberg Fuel Cell Alliance

Brennstoffzellen-Allianz Baden-Württemberg

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B-Class F-CELL (fuel cell car) by Daimler AG
Source: Daimler AG

Fuel cell for home energy supply by the company Hexis
Source: EnBW AG

The network

The Baden-Württemberg Fuel Cell Alliance is a merger between the Fuel Cells Research Alliance and the Fuel Cell Competence and Innovation Centre of the Stuttgart region. It has existed since September 2007 and currently incorporates 70 members, among them industrial enterprises, research facilities and universities. Its goal is to support research and development of fuel cell and hydrogen technologies in the federal state of Baden-Württemberg by the means of public relations, the development and promotion of projects, cooperation between business, politics, research and industry and national and international protagonists.

The technological focus

The activities of the Baden-Württemberg Fuel Cell Alliance comprise all technologies and areas of application of fuel cells and hydrogen. These include vehicles, infrastructure, stationary and domestic power generation along with specific markets such as critical power supply and portable applications. The technological activities include PEM, MFC and SOFC, high and low temperature fuel cells, fuel reformation, hydrogen production and dissemination, hydrogen storage, material, components and systems together with the corresponding control technology, software and manufacturing technology. A great deal of attention is directed toward the development of sustainable methods of hydrogen production.

Our members' main technical focuses are, among others, automotive engineering, i.e. automobiles and buses (Daimler), aeronautics (DLR) and stationary energy production (EnBW, CFC Solutions). Our main focuses of research include methods of sustainable hydrogen production, materials and operations science and industry-oriented applied research (DLR, Fraunhofer-Gesellschaft, Max Planck Institutes, ZSW). The strategic importance of Baden-Württemberg as an important global automobile industry location is evidenced by numerous development activities for fuel cell and system components in the supplier industry.

The unique features

The Baden-Württemberg Fuel Cell Alliance links the activities taking place in business, research and politics, in industrial enterprises, research facilities and universities and thus constitutes the central comprehensive platform for communication and cooperation in the field of fuel cell and hydrogen technology in the federal state of Baden-Württemberg. Baden-Württemberg is the state with the highest industrial turnover in Germany, it invests 4.2% of its gross state product in research and development and is home to numerous significant industrial companies and major research facilities.

The main activities of the Baden-Württemberg Fuel Cell Alliance are:

- informing members and the public,
- collaborating with decision-makers in politics, business and science,
- promoting the stakeholders' networks,
- cooperating with national and international agents such as NOW and HyRamP,
- developing and supporting projects and research activities,
- assisting in the application process for funding on the national and European levels.

Current projects are the Bodensee flagship project promoted by NOW, the creation of a "Baden-Württemberg Stack" for small services in stationary usage and the development of hydrogen cartridges. The Stuttgart region is one of eight model regions for electric mobility in Germany. The Baden-Württemberg Fuel Cell Alliance supports the creation of a federal agency for electric mobility and is actively involved in its design.

KompetenznetzeDeutschland
Kompetenznetzpreis 2010 | 1. Preis

ECPE
European Center for Power Electronics e. V.

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ECPE-Automotive-Demonstrator
Source: ECPE e.V.

ECPE European Center for Power Electronics e.V.
Source: ECPE e.V.

The network

Today, the ECPE network consists of about 40 industrial member companies and more than 50 universities and research institutes, the so-called "Competence Centres".

The main objective of ECPE is to promote research, innovation, education, publicity and technology transfer in the area of power electronics in Europe. ECPE intensifies and promotes research and development in the area of power electronics in a European competence network of research institutes coordinated by industrial partners.

In addition, ECPE constitutes the platform for the Bavarian Power Electronics Cluster.

The technological focus

Precompetitive research

The research activities of the ECPE network financed by the industry are focused on so-called demonstrator projects, in which ambitious new power electronic systems or subsystems are developed and realised by leading European competence centres.

1. "System Integrated Drive for Hybrid Traction in Automotive"
   The integration of the power electronic inverter with an electrical machine in the automotive powertrain is the main focus of the automotive Demonstrator Programme, in which the existing cooling circuit of the internal combustion engine is also used for direct liquid cooling of the power electronics.
2. "Power Supplies with Ultra-High Power Density"
   This Demonstrator Programme aims to develop an ultra-compact isolated DC power supply with a three-phase PWM rectifier front end for applications in variable speed drives, IT systems, and process technology, where the focus is placed on the application of advanced power semiconductors and integration and cooling technologies.
3. "Industrial Drives – System Integration"
   The main objective of this Demonstrator Programme is to significantly reduce the size of the converter of a 2.2 kW industrial drive for an asynchronous machine, compared to current commercial units. The development of these key technologies is focused on compactness of design, manufacturability, reliability and cost.

The unique features

Energy efficiency – the role of power electronics

Power electronics is the key technology for controlling the flow of electrical energy from the source to the consumer load precisely according to the requirements of the load. It is responsible for the reliability and stability of the entire power supply infrastructure in Europe.

In spite of its tremendous importance, however, there is a lack of awareness of the role of power electronics in our modern industrial society, even among the well-informed general public.

The ECPE position paper highlights the contribution of power electronics to reducing energy consumption and describes the technologies which must be developed in order to place Europe in a leading position in the future.

Nuremberg Energy Region – Competence and Cooperation Network of the Energy Industry in the Nuremberg Metropolitan Region

ENERGIEregion Nürnberg e.V.

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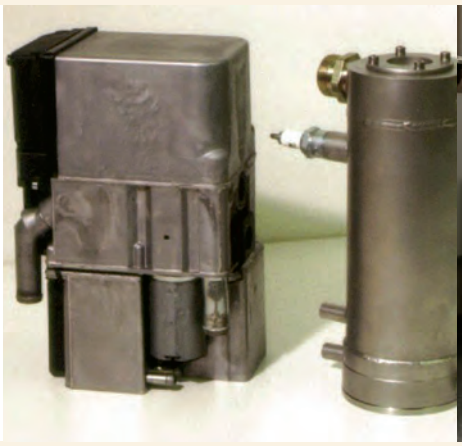

Device based on porous burner
Source: Universität Erlangen-Nürnberg, Lst. für Strömungsdynamik

Fully automated optical test rig
Source: Universität Erlangen-Nürnberg, Lehrst. f. Techn.Thermodynamik

The network

With about 500 companies and more than 50,000 jobs in the energy sector, the Nuremberg Energy Region occupies a leading position in Europe. Competencies in the region are unique in the following sectors:

- energy technology
- power electronics
- automation
- energy and buildings.

These four areas of specialisation lead to the inclusion of further competencies in the network. Founded in March 2001, the Nuremberg Energy Region has since functioned as a nucleus of crystallisation in these networking activities.

The technological focus

Work done by Nuremberg Energy Region focuses on the following key activities:

- integrating new technologies into system solutions
- developing new applications for automated energy management
- bringing technology partners together in collaborative ventures, through technology transfer and cooperative exchanges
- initiating and providing guidance to technology networks
- promoting combined product/service packages
- providing international marketing support for small and medium-sized enterprises
- raising the network's national and international profile
- operating a cooperation platform for R&D projects
- offering joint training and education activities
- intensifying the dialogue between industry, academia, and government.

The unique features

Five windows for viewing columns of fire

One of the world's most modern test facilities for fuel injection systems was recently installed at the University of Erlangen-Nuremberg. The newly established Nuremberg LTT Test Center of the Chair of Technical Thermodynamics of Professor A. Leipertz and Professor M. Wensing is investigating active combustion sequences with the goal of increasing the efficiency of modern combustion engines and reducing pollutant emission to a minimum.

The new test rig makes it possible to simulate the conditions at the moment of injection in a modern diesel engine. A feature of particular note is the flowthrough mode of the new installation, which enables investigations to take place every second.

Porous burner technology

A novel combustion technology has been developed by the Institute of Fluid Mechanics under the direction of Professor A. Delgado at the University of Erlangen-Nuremberg. The porous burner technology makes burners with wide and infinitely variable power modulation, compact design, and low emission rates possible. It can be used in all situations in which burners with these properties are required, such as building services, automotive engineering, fuel cell technology, etc.

“LOOP“ – The Resource and Energy Efficiency Network

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Founding lead
Source: Firma MRU GmbH

Sustainabilitiy in Production (publication cover)

The network

The “LOOP” network focuses on improving resources and energy efficiency in industrial enterprises, especially in product design and production, but also in recycling and disposal processes. Having focused initially merely on the recycling of materials, the network now offers the entire range of efficiency improvement, from consultancy (technology, economics, ecology) to materials, product, and process development.

The technological focus

- Materials development (use of renewable resources, use of secondary raw material, composite materials)
- Product design (design for recycling, design for the environment, lightweight construction)
- Process development (integrated processes, closed loop processes)
- Closed loop recycling management (industrial closed loop recycling systems, logistics, closed loop supply chains)
- Economical and life cycle assessment

The unique features

Innovative technologies for resource-efficiency - resource-intensive production processes (integration and transfer project)

The aim of this integration and transfer project is the strengthening of innovation through the internal and external networking of the collaborative projects funded by the programme “Innovative technologies for resource efficiency - resource-intensive production processes”. A “competence network for resource-efficiency” will allow significant innovation and efficiency potentials to be developed. Substantiating these, advancing their implementation and building up research fields and spheres of activity is the focus of this integration and transfer project. It ensures the application-relevance of the funded developments and their focus on the requirements of resource efficiency and sustainability. Information transfer, work on cross-sectoral and cross-technological fields and additional research will increase the benefit that the individual consortia will obtain from their research. The BMBF will also be supported in the further development of this funding area.

Hydrogen and Fuel Cell Initiative Hesse

Initiative Hessen

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Competence Atlas Fuel Cell Hessen

Hydrogen
Source: Linde AG

The network

The Hydrogen and Fuel Cell Initiative Hesse forms a network with competence in hydrogen and fuel cell technology. Its major goal is to support activities to achieve greater economic viability, sure footing in the market, and more widespread application of these technologies. This is done through research promotion, competence networking, knowledge management, mutual exchange of information, and technology transfer.

The technological focus

Focal points of technology in Hesse are the materials and components industry and systems for portable and stationary applications of fuel cell technology. In addition, as a by-product of large chemical plants, great quantities of quasi-green hydrogen are available for the applications.

The unique features

Each autumn, the Hesse Fuel Cell Forum takes place, the most important industrial sector meeting of the region. It is directed towards both a specialist audience and the general public. On this day, expert speakers inform about the status of current research and development or impart user experience. The discussions and conversations that take place serve to stimulate new projects and applications and lay the foundations for new cooperation agreements.

In cooperation with the Hessen Agentur, the Initiative organises a joint stand for Hessian participants at the “Hydrogen + Fuel Cells” group exhibit at Hannover Messe. This platform enables Hessian universities and companies to present their competence internationally and to make valuable contacts.

Zero Regio (Region with zero emissions) is an integrated project co-financed by the European Commission in the 6th Framework Programme. The goal of the project is to build and test a hydrogen infrastructure for powering fuel cell passenger cars in two European regions, Lombardy and Rhine-Main. It will demonstrate the viability of zero emission road transport systems in normal daily use in European cities. Under the coordination of Infraserv Höchst, a total of 16 partners from four European states form the project consortium.

KompetenznetzeDeutschland
Kompetenznetzpreis 2010 | 3. Preis

Network of Competence for Distributed Energy Technologies

Energie mit System
deENet

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Solar field


Wind farm

The network

Over the past 25 years, the North Hesse region has built up extensive know-how in the field of distributed power generation and energy efficiency. Successful companies, the University of Kassel and research institutions are addressing a range of issues such as distributed power generators, environment-friendly construction, rational energy utilisation and climate-efficient production methods. deENet, comprising over 90 companies, research institutions and service providers, was founded against this backdrop in 2003.

The technological focus

One particular focus of deEnet research concerns electrical systems engineering, i.e. controlling and managing distributed generation and integrating it into power supply systems. The network has set itself the goal of combining the scientific resources available in the North Hesse region in the fields of energy-optimised buildings, climate-efficient production, and solar-powered heating, cooling, and process heat with the competencies and fully-fledged cooperation structures in the field of electrical systems engineering. The objective of this structural networking, coupled with the targeted promotion of cooperative ventures, is to develop new products and services that will bring about a lasting improvement to North Hesse's regional economy and generate new jobs for the future.

The unique features

North Hesse 2020: Distributed power generation and jobs

By 2020, at least 20,000 new jobs can be created in the North Hesse region in the field of distributed power generation and energy efficiency. That is the result of a study on the regional business potential, carried out by deENet for regional companies and authorities. Based on an extensive survey of present conditions and analysing the future potential, the study describes the measures necessary to create at least 20,000 jobs by developing technological competence and implementing technologies of distributed power generation and energy efficiency widely in the region. To achieve the results described in the study, deENet will put even more effort into a professional cluster management by implementing the drafted measures into a strategic concept for the region.

100% RE Regions in Germany

On the path to widespread use of Renewable Energy (RE) sources, regions are among the most important players in Germany. In cooperation with the University of Kassel, deENet is carrying out a nationwide R&D project including scientific analysis and strategic guidance of decision makers in districts, townships, and regions which have made it their goal to obtain 100% of their energy from renewable energy sources. The project, which is supported by the German Ministry for the Environment, Nature Conservation and Nuclear Safety, will identify and communicate the success factors necessary to achieve this goal.

KUMAS – Kompetenzzentrum Umwelt e. V.

K U M A S
Kompetenzzentrum Umwelt

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The Bavarian Congress on Waste Disposal and Landfills

The KUMAS Center is located in Augsburg

The network

Founded in 1998, KUMAS – Center of Competence in Environmental Affairs laid the foundation for a continuous expansion of Bavarian environmental technology and thus the strengthening of the region. One of KUMAS' main objectives is to support environmental activities in unison with politics, administrative institutions, science, research, development, education and business. A strong environmental network has been built up by over 200 partner companies. Environmentally oriented companies and institutions can benefit from active networking as well as from the wide range of services offered.

The technological focus

KUMAS' focus is on supporting young and small companies during their foundation phase, and helping existing companies to cope with increasingly tough national and international competition. It also tries to make Bavaria an attractive business location for new companies to settle in. Thus, the "Future technology environment" concept will create new jobs while securing those already existing. Due to its competencies in environmental activities KUMAS is focused on the following environmental issues:

- environmental education
- foundation of new companies
- environmental economy
- sustainable economic activities
- resource efficiency
- environmental medicine
- renewable energies
- environment – traffic and logistics
- export of environmental technology.

Due to intensive measures and project sponsoring by the Free State of Bavaria, numerous activities have been developed in the aforementioned areas and the frame conditions for the region improved. Due to the support of over 100 young companies by UTG (Environmental Technological Business Center), quite a large number of new jobs has been created. Topical issues such as waste disposal, landfill technology, water, emission protection, energy efficiency and supply and renewable raw materials are discussed at annual congresses and trade fairs.

The unique features

The KUMAS network is unique with respect to its characteristics and scope of activities. As early as 1998 the Förderverein KUMAS e.V. started to establish a strong environmental network comprising partners from politics, administrative institutions, science, research, education and business. Today, over 200 business partners are actively involved in this broad network by participating in working groups and cooperating in the organisation of congresses and trade fairs. Environmental issues can be dealt with in great detail due to the support of KUMAS members who make their great expertise available.

For over 10 years, KUMAS has awarded the "KUMAS-Leitprojekt" environmental prize to selected companies and institutions. In 2010 the award, representing a high standard of environmental innovations, was presented for the 40th time.

The manifold services offered by KUMAS are rounded off by individual consulting services which aim to promote the transfer of know-how, create new contacts, establish cooperation projects and, last but not least, point out appropriate approaches to the global market.

KUMAS is an independent institution committed solely to its members, operating without subsidies and financed exclusively by membership fees and the proceeds from its activities.

Fuel Cell and Hydrogen Network NRW

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Mobile hydrogen filling station traiLH2
Source: Linde AG

Filling station for methane and hydrogen from digester gas
Source: Emschergenossenschaft Lippeverband

The network

The Fuel Cell and Hydrogen Network NRW (FCHN NRW) was founded in the year 2000. The goal of the network is to establish a new market branch by introducing the fuel cell technology to suitable pilot markets in a targeted manner. Accompanied by research and development and the installation of the necessary hydrogen infrastructure, the activities of the network will help to pave the way for this new technology into such mass markets as cars and residential heating.

The technological focus

Two-thirds of the 360 network members are companies, roughly 20 percent are institutes. The majority of companies are small and medium-sized and come from the machinery and the electrical engineering sector. These companies have adapted their original products to the special demands of fuel cell systems. This helps to improve the efficiency and reliability of fuel cell systems. Examples of system components are compressors, pumps, and special inverters.

Fuel cell applications for early markets constitute another project focus. These are markets where the user is willing to pay the as yet higher prices of the fuel cell because it offers an additional benefit compared, for example, to batteries. Examples are the logistics sector, protection against grid failures, and the leisure sector. Typical developments are fork lifts, cargo bikes, midi busses and uninterrupted power supplies. Currently, a project team is developing a fuel cell-driven articulated bus to be operated in Cologne. Furthermore, projects for the sustainable production of hydrogen have been launched.

The unique features

With the launch of the “NRW Hydrogen HyWay” under the umbrella of the NRW climate protection strategy of 2008 the Network’s activities will be significantly extended. The regional government will provide another 60 million euros for development, demonstration and infrastructure projects. Between 2009 and 2011, in the course of this project, activities which have already been initiated along the 240-kilometre-long hydrogen pipeline and at other locations will be intensified. Hydrogen, as a by-product from existing industrial processes, will form the nucleus for initial applications and will in the medium term be available in sufficient amounts under interesting economic conditions.

NRW is also a partner in HyRaMP ((Hydrogen and Fuel Cell Regions and Municipalities Partnership), which aims to represent the region’s ambitions in the EU Joint Technology Initiative JTI.

NRW is regarded as one of the leading fuel cell locations in Europe, a reputation backed up by the close cooperation of the Network with partners all over the world and the settlement of international fuel cell companies in NRW.

Network for Innovative Closed Loop Recycling Technologies NiK

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Waste - source of future resources
Source: Fraunhofer IML

Application of new technologies in the closed loop economy
Source: Fraunhofer IML

The network

The realisation of creative closed loop strategies requires economic and ecological knowledge in the fields of production, logistics and closed loop economy. The interdisciplinary Netzwerk innovative Kreislauftechnologien NiK (Network for Innovative Closed Loop Recycling Technologies) provides a basis for discussions about current topics of waste and resource management. Besides holding regular conferences, it evaluates and presents current technology developments, assists in procuring funding, and initiates national and international R&D projects.

The technological focus

The NiK network addresses institutions from business, science and politics. It is engaged in a wide variety of issues concerning the following topics:

- products and closed substance cycles in the closed-loop economy
- disposal logistics in industry, commerce and services
- out-plant logistic structures and strategies
- business development and future strategies.

NiK always aims to link up research and industrial application and to enable an efficient transfer of knowledge between business, science and politics. The benefit for participants lies in the generation and verification of ideas, the rapid initiation of projects, the strategic business planning, the early response to legislative initiatives and the discussion with funding authorities. These aims are supported especially through our regularly-held conferences for exchanging experiences and informing about current developments in the closed-loop economy and waste industry. The success of NiK is based on its high acceptance among its diverse stakeholders and on the large number of successfully initiated projects since 1998.

The unique features

NiK has been a success story for eleven years now. Its currently 29 members use the forum for information exchange, brainstorming, fast project initiation and strategic planning.

NiK is currently focussing on the transition of the waste management industry to a resource producing closed-loop industry. In connection with increasing cost pressure, further exacerbated by the financial crisis, this transition process leads to new requirements as far as quality and efficiency standards are concerned. This effect is felt similarly by companies in the private and public waste management sector and by industry and trading companies with internal waste management tasks.

For this reason, at the present moment the network is paying special attention to these changes so greatly affecting the branch. The NiK conferences take up the current discussions and problems within the waste management sector. The goal is to present companies with practically applicable options for securing their competitiveness and developing new areas of business. To this end, legal developments and technical and organisational solutions for the optimisation of business processes of waste management companies are discussed.

Environmental Technology Cluster Bavaria

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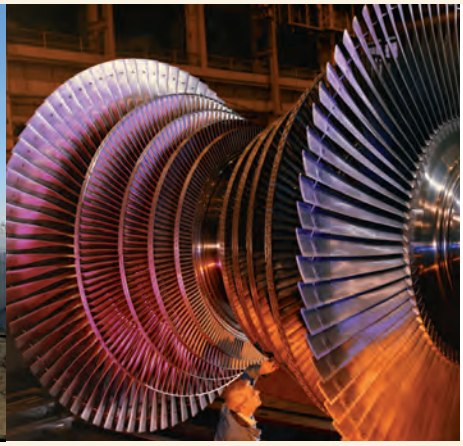
Biogas is part of a sustainable energy portfolio
Source: Agentur für Erneuerbare Energien



Cleantech is precision work
Source: Grünbeck Wasseraufbereitung GmbH

The network

The Environmental Technology Cluster Bavaria is an initiative of all the Bavarian chambers of commerce and industry and two chambers of crafts. Together, these institutions form the association responsible for the cluster. Its aim is to create a Bavaria-wide network which concentrates the initiatives already existing and fosters innovation and internationalisation in the sector of environmental technology. The impetus to initiate the cluster was given by the Bavarian Ministry of Economic Affairs, which also finances the project.

The technological focus

In specifying its technological focus, the Environmental Technology Cluster Bavaria was driven by the needs and interests of its member enterprises in combination with the most promising market opportunities. In fact, those sub-sectors were chosen which had the largest overlap of existing know-how and future potential. Micro clusters which had already developed were also taken into consideration. As a result, the Environmental Technology Cluster Bavaria concentrates on water and wastewater treatment, recycling and alternative energy production with a focus on energy from biomass and waste.

The unique features

Compared with other cleantech networks, the Environmental Technology Cluster Bavaria has a markedly holistic approach. Most of these overwhelmingly local networks fail to represent at least one element of the value chain and therefore achieve suboptimal results. Through its comprehensive Bavaria-wide mandate, the Environmental Technology Cluster Bavaria profits from supra-regional synergy effects. In addition, it covers topics such as coordination of research, access to financing instruments and funding programmes, and internationalisation. Member companies also benefit from the large international network of the cluster.

Wind Energy Agency Bremerhaven / Bremen (WAB)

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Nacelles of REpower Systems 5M turbines
Source: Jens Meier


Multibrid M5000 turbine on a WeserWind tripod foundation
Source: Jens Meier

The network

The Wind Energy Agency Bremerhaven / Bremen (WAB), as a regional network, boosts the innovative and dynamic wind energy industry in the northwest corner of Germany. WAB counts more than 250 businesses and institutes as members.

WAB goals are to:

- strengthen and expand the wind energy network
- foster cooperation between science and business
- develop offshore wind power
- promote repowering, the replacement of old turbines with new and more efficient ones.

WAB is supported by funding from the state of Bremen.

The technological focus

WAB is the wind energy sector's leading industrial association in Germany's northwest region; its more than 250 members are involved in most phases of wind turbine production. The enterprises involved include turbine and rotor blade manufacturers, steel companies, businesses that oversee logistics, experts in environmental impact assessment, specialists in forecasting wind strength and direction, institutes involved in basic and applied research, and business administrators. Members of the WAB network are involved in every capacity from initial design and planning to the construction and operation of multi-megawatt turbines on land and at sea.

Also, numerous educational establishments and prestigious institutes carry out qualification, research and development related to the industry. A list of WAB members can be viewed on the WAB website.

The unique features

Forward-looking innovations and projects give an indication of the potential and know-how to be found among members of the WAB network:

Multibrid and REpower are developing and manufacturing turbines with a capacity of five megawatts especially for offshore use. Six REpower 5M and six Multibrid M5000 wind turbines were delivered to the alpha ventus offshore wind farm in 2009.

- Offshore wind turbines standing in waters more than 25 m deep need stable tripod or jacket foundations like those manufactured by WeserWind Offshore Construction Georgsmarienhütte.
- A test platform is being built in Bremerhaven for the static and dynamic testing of rotor blades with a maximum length of 90 m. Several institutes in the Fraunhofer Gesellschaft (IFAM, LBF and IWES) and the rotor blade competence group (a working group of all rotor blade and wind turbine manufacturers in Germany) are involved in the project.
- Deutsche WindGuard is carrying out tests in its wind tunnel at peak velocities of 250 km/h; this simulates the real peak velocity of wind at the tip of a turbine's blades.
- Energy & meteo systems is developing methods for forecasting performance which can be used by wind farm and grid operators as well as power utilities. Forecasts for a 24-hour period are off by only 6%.

Aachen Centre of Competence for Medical Technology

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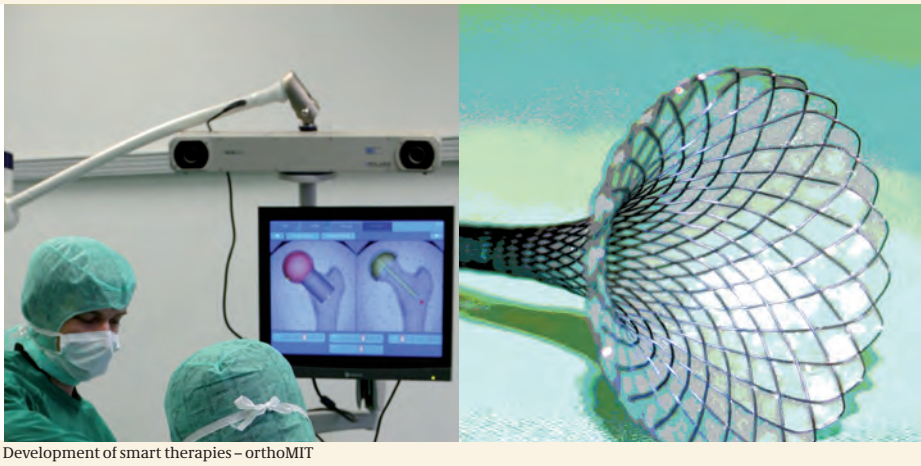

Development of smart therapies – orthoMIT

The network

AKM was one of the eight award winners of a competition held by the German Federal Ministry of Education and Research (BMBF) in 2000. What began as a partnership between research institutes, clinics and companies has today established itself as the Aachen Centre of Competence for Medical Technology – AKM. The agency AKM Innovationsmanagement GmbH takes care of operations management and provides services along the supply chain.

The technological focus

Minimally invasive medical techniques require the use of extremely small instruments. Ideally, the development of miniaturised medical devices and systems should be organised in joint projects involving close collaboration between experts from a number of different disciplines. This is the task of the Aachen Centre of Competence for Medical Technology, which strengthens the region's medical technology basis in the process. Furthermore we see ourselves as a multiplier of knowledge and a facilitator of its transfer into practice. From ideas to products: AKM delivers service and knowledge transfer in medical technology for the worlds of science, business and policy development.

The unique features

In the field of scientific project management, AKM participates in the funding application process and the coordination of joint projects in federal state and national competitions in the field of medical technology. One of the nationally funded projects is orthoMIT – minimally invasive orthopaedic therapy. The main objective of the project is to develop an integrated platform for smart therapy in orthopaedic surgery and traumatology. Flexible modules for hip, knee and spine surgery make an individual therapeutic procedure possible. orthoMIT is one of the largest projects of orthopaedic research in Germany. This joint project of 24 partners – clinics, research institutes, medical industry enterprises and further stakeholders – will receive funding of nearly 14 million euros from the Federal Ministry of Education and Research until the year 2010. Another project coordinated by AKM is called ForSaTum and will start in 2010. The goal here is to develop a unique research satellite for the accelerated implementation of new tumour treatment methods.

Furthermore, AKM is a competent contact for providing a detailed picture of the state of the art in the field of medical technology in the form of expert comments and incisive analyses.

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Amgen Research GmbH at BioPark Regensburg


Cutting edge research at BioPark Regensburg

The network

The BioPark Regensburg GmbH is the management and administrative headquarters of the biotechnology cluster known as BioRegio Regensburg in East Bavaria. Located strategically at the northernmost point of the Danube, in the Austrian-Czech-German triangle, the area is regarded as the gateway to the East of the extended European Union. Currently, 40 firms with over 2,500 employees are active in the field of life sciences in BioRegio Regensburg. As a result, it has become an exceedingly important region for biotechnology in Bavaria, second only to Munich.

The technological focus

BioPark Regensburg celebrated its tenth anniversary in 2009. In this period, over 254 million euros have been invested in the development of the "life sciences", of which 102 million euros were venture capital. 33 companies have been founded since 1999 and the number of employees has increased more than six-fold to 2,600. This establishes BioRegio Regensburg, following Munich, as the second largest biotech-cluster in Bavaria. Among the flagship companies in the BioPark is Antisense Pharma GmbH, which was awarded the Deutscher Gründerpreis (award for outstanding entrepreneurs) for its novel treatment of brain tumours. The company Geneart AG, the first BioPark company to go public in May 2006 in Frankfurt, won the European Biotechnica Award in 2008. AMGEN Research GmbH, founded in 2000 in the BioPark, is the only research centre in Europe belonging to one of the largest biotech companies in the USA. In 2008, BioPark Regensburg was awarded the title "Landmark" by the Federal Initiative "Germany – Land of Ideas".

The unique features

Several companies at BioRegio Regensburg have developed into internationally active production locations with clean rooms. These include pharmaceutical companies such as Bionorica AG and Haupt Pharma Amareg GmbH, biotechnology companies such as Syntacoll GmbH and PAN Biotech GmbH, as well as medical technology companies such as RKT Roding Kunststoff-Technik GmbH and Gerresheimer Regensburg GmbH.

Together with the state of Bavaria, the city of Regensburg and the consultancy company Capgemini Deutschland GmbH, BioPark Regensburg GmbH has identified regional interdisciplinary fields in the region. In the applied fields of molecular diagnostics, biochips and biofunctional surfaces, regional companies active in the sectors glass industry, engineering, electronic technology, textiles and nutrition were brought together via workshops with the BioRegio Regensburg companies. Through this new technology-spanning network, the dynamics in the cluster were increased. A further extension is the Sensor Technology cluster platform. In addition to the successful company PreSens Precision Sensing GmbH (chemosensors and biosensors), the cluster management of the Sensor Technology Strategic Partnership (SPS) is located in the BioPark.

Rhine Neckar BioRegion

BioRegion
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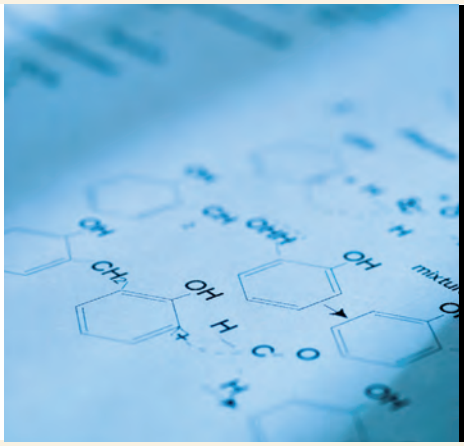
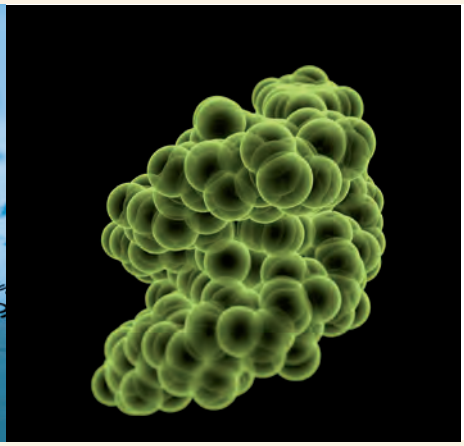


Diagram of molecular structures
SOurce: iStockphoto.com/ Emrah Turudu



DNA molecular structure
Source: iStockphoto.com

The network

The Rhine Neckar BioRegion association unites nearly 90 members with the aim of fostering the development of the Rhine-Neckar metropolitan region into a leading European life sciences location. Among the members are research institutes such as the German Cancer Research Center (DKFZ), the European Molecular Biology Laboratory (EMBL), the universities of Heidelberg, Mannheim and Kaiserslautern and large companies such as Roche Diagnostics, BASF, Merck and Abbott. In addition, over 60 biotech companies and service providers are involved, as are regional public authorities, chambers and associations.

The technological focus

- Biotechnology
- Cell-based and molecular medicine
- Personalised medicine
- Biomarkers
- Oncology

The unique features

In 2008, the network participated successfully in the Leading Edge Cluster Competition initiated by the German Federal Ministry of Education and Research, the goal of which is to discover and support Germany's most high-performance clusters. The Rhine-Neckar contribution was the only successful one in the field of life science. The concept of a "Cell-based and molecular medicine biotechnology cluster (BioRN)" which was awarded a public grant of 40 million euros is based on a consortium of about 100 partners from the areas of business, science and politics. In a joint cluster strategy, the aim is to strengthen the existing excellence in the field of cell-based and molecular medicine in the Rhine-Neckar metropolitan region and to achieve a leading position in Europe. With the help of the grant, the goal is to develop a total of 70 new drugs, diagnostic products and technology platforms as well as approximately 20 innovative services by 2013. This will guarantee 400 highly qualified jobs in research and development. It is planned to create another 4,000 jobs by 2018. Together with the Heidelberg Technology Park, the association has founded the BioRN Cluster Management GmbH, which manages the coordination, networking, development and marketing of the BioRN cluster. Further partners in this public-private partnership model are the Chambers of Commerce and the Rhine-Neckar Metropolitan Region (MRN).

GIQS e.V. (Trans Border Integrated Quality Assurance)

GIQS
Grenzüberschreitende Integrierte Qualitätssicherung e.V.

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GIQS develops technical solutions for crisis management


Food safety is one of the core issues of GIQS

The network

The network promotes cooperation between private and public organisations from the scientific, business and administrative sectors with the goal of removing obstacles between companies, production stages and national borders, thus improving the quality and optimising the processes of the participating organisations.

The technological focus

The technological focus of the GIQS competence network is concentrated on developing information and communication technologies suited for application in inter-enterprise quality, health, and crisis management in the agri-food sector. Potential user groups, data warehouses and interdisciplinary research groups jointly develop information and communication models. In the process, existing models are adapted to the requirements of the market. The private enterprise network partners are involved in the development process, ensuring that the requirements set by the producing, processing and acting stage of the value creation chain are taken into consideration as well as the technical realisation possibilities (by the software developers). Testing of models takes place in the daily business routine. During these pilot activities, the developments are validated and improved.

The unique features

The GIQS network is active regionally, nationally, and internationally. Its goal is to unite companies, administration and/or scientific institutions of the agricultural and food sector in the German-Dutch border area and beyond in clusters in order to better be able to use synergy effects.

An increasing number of cooperation partners and a continuously broadening field of research activities account for the suitability of this strategy.

The increasing internationalisation of the existing network offers members extended access to know-how of both scientific and economic nature.

For its innovative role in the transfer of knowledge between science and commerce, GIQS received the North Rhine-Westphalia Food Processing Cooperation Award in December 2002. GIQS has established itself as a permanent institution in joint research and development in the agricultural and food industry.

HörTech – Competence Centre for Hearing Device System Technology

HörTech
Kompetenzzentrum für Hörgeräte-Systemtechnik

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Oldenburg Speech Test

Hearing Garden at the "House of Hearing" in Oldenburg

The network

The HörTech gGmbH was founded in 2001 as a centre of competence for hearing aid systems. The aims of this non-profit organisation are to support science and research and to develop new methods and expertise concerning hearing. The institute has its origins in a national contest of the German Federal Ministry of Education and Research. Since then, it has come to enjoy international appreciation. Its efforts in basic research, which are widely renowned, have contributed to improvements in hearing aid technology. The HörTech gGmbH is based in the "House of Hearing" in Oldenburg.

The technological focus

The employees of HörTech try to improve hearing aids according to the individual requirements of hearing impaired persons, and to find methods for facilitating their rehabilitation. The most recent expertise in the area of audiology and digital signal processing is combined in this scientific work. For these purposes, HörTech profits from a nationwide network of competence.

The unique features

One of HörTech's main projects is the so-called "Audiology Initiative in Lower Saxony (AIN)", which was co-founded by the Hannover Medical School (MHH) and the University of Oldenburg in 2006. This initiative combines the otorhinolaryngologic competence of the MHH (Clinic for Laryngology, Rhinology and Otology, Prof. Lenarz) with the audiological/technical competence in Oldenburg (Medical Physics and Hörzentrum, Prof. Kollmeier). The AIN is the basis for the globally unique research and development cluster Auditory Valley. The aim of this cluster is to combine the audio system, hearing aid and cochlear implant technologies in order to improve the quality of life of numerous people. The motto of the cluster is: "Hearing for everyone: Everybody, every situation, every branch".

The centre of competence is also involved in the projects "HurDig" (www.hurdig.de), "Modellbasierte Hörgeräte" (Model-based hearing aids) and "Gestaltung altersgerechter Lebenswelten" (Design of age-appropriate living environments) within the framework of national and international research.

Medimplant Centre of Competence

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Aerial photograph of Medimplant

Medimplant Centre of Competence for cardiovascular implants

The network

The Medimplant Centre of Competence for Cardiovascular Implants develops new implants for cardiac patients. Innovative ideas from scientific research are directly transferred into product development.

So far, 17 development projects for cardiovascular implants have been carried out, resulting in 49 publications, 13 patents, and five marketable products as well as the establishment of a large animal laboratory (Medimplant GmbH, founded in 2001).

In 2002, a biocompatibility laboratory was founded to carry out biological evaluation tests in compliance with ISO 10993.

The technological focus

The “absorbable metal stent (AMS)” as an alternative to the conventional treatment with permanent metal stents has been developed in cooperation with BIOTRONIK AG. The magnesium-based and therefore degradable stent offers a temporary stabilisation of the vessel after an-gioplasty until the healing process is concluded, without permanently exposing the tissue to mechanical stress. The advantages have been confirmed in clinical trials.

BIOTRONIK’s AMS programme was granted the Novelty Award during the European Professional Course on Revascularisation in 2007.

Another new implant used in clinical trials is the CH-endograft, which serves as an aortic valve substitute in the treatment of aortic valve stenosis. Since 2007, the CH-endograft has been successfully implanted into 38 patients.

Furthermore, a prototype of a coronary stent containing a biocompatibly integrated oscillating circuit has been developed. This stent is visible in MRT and shows active resonance properties.

The unique features

The biocompatibility-testing laboratory BioMedimplant performs analyses essential for the CE-marking of medical devices. The toxicity of new materials is evaluated in vitro according to ISO 10993-5. This includes the examination of vitality and proliferation of cells in culture. If a material is rated biocompatible in vitro, an evaluation in an animal model follows. Based on histopathologic methods (according to ISO 10993-6) the local tissue reaction is examined after explantation. Currently, tests for irritation and hypersensitivity (ISO 10993-10) and hemocompatibility (ISO 10993-4) are being established. The biocompatibility-testing laboratory is specialised in evaluating new stent materials for academic and industrial partners.

In the future, the service will be extended to testing nanoparticles and tissue-engineered materials. By request, BioMedimplant will also design assays for special problems.

Medical Valley
European Metropolitan Region of Nuremberg

MEDICAL VALLEY
Europäische Metropolregion Nürnberg

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The pulsating heart of Medical Valley, the IZMP Erlangen

An innovation from MV EMN: Siemens SOMATOM Sensation
Source: Siemens Healthcare

The network

Medical Valley EMN (European Metropolitan Region of Nuremberg) is distinguished by its unrivaled concentration of medical technology companies, research centres and health industry institutions. Medical Valley EMN was founded on 1 January 2007 to optimise the networking of science, business and health care in a goal-oriented manner, thereby shortening the innovation cycle of new medical technology products. The organisation's membership is characterised by players from the fields of science, non-academic research, business, service providers/suppliers, health care, investment and politics.

The technological focus

Medical Valley EMN is part of the medical technology field. Approximately 500 companies in Medical Valley EMN are active in this field, either directly or indirectly. 180 of them are dedicated medical technology companies. Siemens Healthcare, one of the world market leaders in medical technology, has its headquarters in the cluster. Over 50 research institutes, application centres and similar facilities devote themselves to field-specific or interdisciplinary medical technology issues. The provider activities addressed by business and science in the cluster encompass all relevant steps in medical care – prevention, diagnosis, therapy and rehabilitation.

Medical Valley EMN is one of the world leaders in the following medical technology product categories:

- imaging diagnostics (computerised tomography, magnetic resonance tomography, interventional imaging)
- therapy systems (ophthalmology, lithotripsy, Lasik)
- telemedicine (medical information systems, home care, remote rehabilitation, monitoring)
- high-tech implants (pacemakers, revision implants).

The unique features

Medical Valley EMN is the region in Germany where innovative medical technology is brought quickly from idea to product and where emphasis is placed on all steps in the innovation chain. Both of the important health care areas of activity – health management and medical technology – are well-represented and closely coordinated.

The intensive interaction between both processes in "clinical validation" leads to early feedback regarding insufficient ergonomics or practicality.

medways e. V.

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The network

medways e.V. is a network of leading German research institutes, industrial enterprises and universities. In this federation, new procedures for diagnostics and therapy in ophthalmology are developed, as well as internationally marketable medical technology products.

Many years' experience in this sector make medways a competent partner for project management and consultation on all matters in the area of medical technology.

The technological focus

The main focus of the activities of the medways competence centre is on research and development of diagnostic procedures for the four main diseases of ophthalmology: ametropia (refraction), cataract, glaucoma and diseases of the retina.

In addition to the R&D projects, further education courses for technical engineering staff, natural scientists, physicians and opticians are key activities of the centre.

The unique features

The success achieved by the medways Thüringen competence centre is best demonstrated by the 90 percent transfer rate of its research and development projects into internationally marketable products or procedures with practical relevance. More and more often, these results are achieved in multidisciplinary consortiums such as the Centre of Head Surgery (CoHS), a project for the treatment of presbyopia using femtosecond lasers.

Center for Molecular Diagnostics and Bioanalytics (ZMDB)

Zentrum für Molekulare Diagnostik und Bioanalytik

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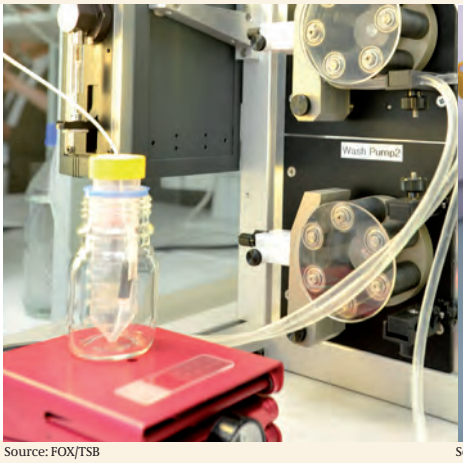
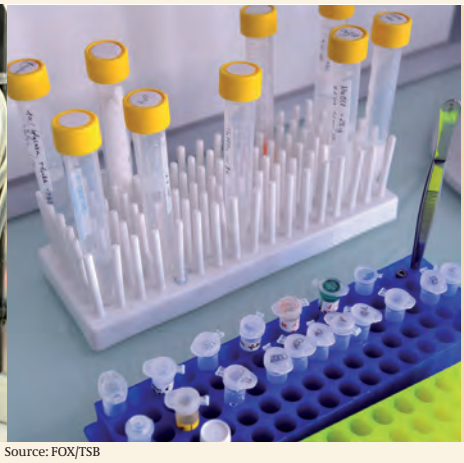


Source: FOX/TSB


Source: FOX/TSB

The network

The Center for Molecular Diagnostics and Bioanalytics (ZMDB) is the regional platform that connects basic research, technology development, clinical research and industrial application to promote the development and production of innovative diagnostics in Berlin-Brandenburg.

The ZMDB operates in close cooperation with the Fraunhofer Institute for Biomedical Engineering IBMT, Charité – Universitätsmedizin Berlin and the companies in the regional biotech industry.

It was established to support the Joint Innovation Strategy of the states of Berlin and Brandenburg and is managed at BioTOP.

The technological focus

The ZMDB comprises three focus areas:

Technology development
- biosensor development
- point-of-care diagnostic systems (POCT)
- design and production of biochips
- innovative spotting technologies
- multiparameter analytics
- laboratory automation
- Web-based data management
- terahertz technologies
- microelectronic circuit development
- software development.

Innovative biomarker strategies & clinical studies
- (epi-)genomics, proteomics, glycomics, metabolomics
- interdisciplinary biobanking / preservation support
- assay development and validation
- professional study management
- focus indications: cardiovascular diseases, tumors, infections, diabetes, sepsis, autoimmune diseases.

Industrial applications
- comprehensive bioanalytics solutions (medicine, food, environment)
- biochip production
- minimal invasive glucose sensors
- microarrays (DNA, RNA, protein, glycan)
- RT-PCR diagnostics
- immunoassays.

The unique features

Berlin-Brandenburg and its many high-performing companies and research facilities offer broad expertise in the development of innovative diagnostics.

The region covers the entire value-added chain for in vitro diagnostics. It has Germany's densest research and clinical landscape and is home to leading international diagnostics manufacturers like A. Menarini Diagnostics, Epigenomics and Thermo Fisher Scientific, as well as some 80 biotech companies.

As an independent technology transfer platform that is open to all players in the field, the ZMDB is a unique institution which connects basic research, technology development, clinical research and industrial application. The ZMDB has a clear focus on the indication areas cancer, cardiovascular diseases, infections and immunology.

The ZMDB with its many interfaces is also a competent cooperation partner in the following fields:
- molecular imaging
- therapy research
- theragnostics.

Baden-Württemberg: Connected

KompetenznetzeDeutschland
Kompetenznetzpreis 2008 | 1. Preis

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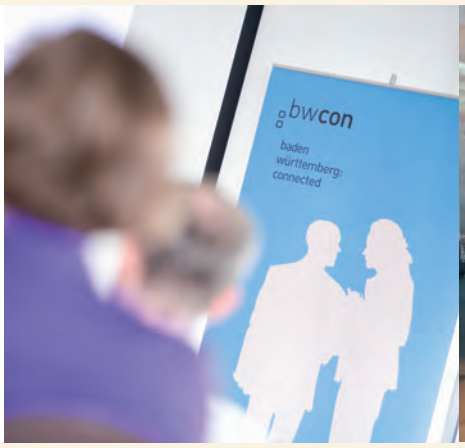

Source: Julia Grudda


The 2009 CyberOne High-tech Award ceremony
Source: Christian Haas

The network

Baden-Württemberg: Connected e.V., or bwcon for short, is the top business initiative promoting Baden-Württemberg as a high-tech location. As one of the most successful European technology networks, bwcon connects more than 480 companies and research institutes. Currently more than 4,600 experts are benefiting from systematic networking via the bwcon hub. The added value generated by bwcon is to be found in the possibilities offered by new cooperation projects and connections.

The technological focus

With its fields of activity *bwcon: ICT network, bwcon: creative* and *bwcon: Health Care*, bwcon is creating a base for the cross-sectoral usage of technologies and an interdisciplinary cooperation which is unique in Baden-Württemberg.

The network promotes young and growing companies via the *bwcon: CyberOne High-tech Award* and the extensive counselling and coaching programme *Coach&Connect plus+* in the *Network for Business Excellence*. This includes an extensive range of counselling and coaching, events and workshops.

The network's *bwcon: Coaching group* consists of top-level entrepreneurs and top-notch managers who offer the knowledge gained in the course of their successful careers to young and medium-sized companies. These 26 active or former executives and managers in the high-tech sector possess a combination of experience and know-how which is of great value for young and medium-sized companies. Their services focus on the evaluation of business concepts, project-related coaching, support in the acquisition of funding and temporary management functions.

The unique features

The *bwcon: CyberOne High-tech Award* is the business sector's most important technology award in Baden-Württemberg. bwcon awards this trophy to trend-setting business concepts of all high-tech sectors, such as industrial technologies, systems and applications in the fields of the information technologies, telecommunications, media, medical technologies, environmental and energy technologies and life sciences/biotechnologies. CyberOne offers the unique opportunity of having one's business concepts checked by experienced business experts, venture capitalists and scientific professionals. The winners receive prizes amounting to 35,000 euros and a year's mentoring by an experienced manager. To date, more than 200 million euros of venture capital have been mobilised by the CyberOne award. With its annual award, bwcon reaches young companies, the innovative business concepts of which give impulses and set new standards. The award ceremony is a summit of over 500 representatives from business, science and politics.

CyberForum

CyberForum
HIGHTECH. UNTERNEHMER. NETZWERK.

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High tech

A congress keynote

The network

The registered association CyberForum is the largest regionally active high-tech business network in Germany. Over 780 company members as well as 8,000 participants from companies, local authorities, universities and research institutes from the Karlsruhe TechnologyRegion take part in this innovative network. Inspired by the motto “from the network, for the network”, experiences, ideas and business know-how are exchanged, discussed and implemented. In the process, companies benefit from the wide range of offers in all stages of development.

The technological focus

One main focus of CyberForum is to link up and network the ICT sector in the Karlsruhe TechnologyRegion. The region offers ideal conditions for research und science institutions such as the Karlsruhe Institute of Technology (KIT), the Karlsruhe University of Applied Sciences, institutes of the Fraunhofer-Gesellschaft, the Forschungszentrum Informatik (FZI) or the Center for Art and Media Karlsruhe (ZKM). They are the basis for a strong IT-Cluster with over 3,600 companies and 36,000 employees. According to the European Cluster Observatory the Karlsruhe IT-Cluster ranks among the three most significant IT clusters in Europe. Growth is accelerated by CyberForum offers such as mediation of business know-how (our mentoring & coaching programme) and venture capital providers (CyberForum Business Angel), our education initiative, assistance for start-ups, networking events on specific topics and coordinated network projects along diverse value added chains. A further focal point is to link the IT sector, as an interdisciplinary technology, with other sectors of the economy. That is why not only software companies, communication and IT service providers are CyberForum members, but also companies from the creative, energy, biochemical or engineering sectors, to name a few.

The unique features

CyberForum was founded as a public-private partnership in 1997. With its more than 780 members and its team of 14 highly qualified staff members, it is the largest and most successful regional high-tech entrepreneur network in Germany. CyberForum offers its members demand-oriented services accompanying all the stages of business growth. In addition, the high level of voluntary dedication of its members (entrepreneurs) to the network offers the unique possibility of expanding business know-how and contacts within the network. More than 120 topic-based events per year form an ideal basis for personal business networking and an exchange of experience between decision-makers in the Karlsruhe TechnologyRegion. According to a recent survey, 67% of our members confirmed the very high networking quality of the CyberForum services.

GEOkomm networks

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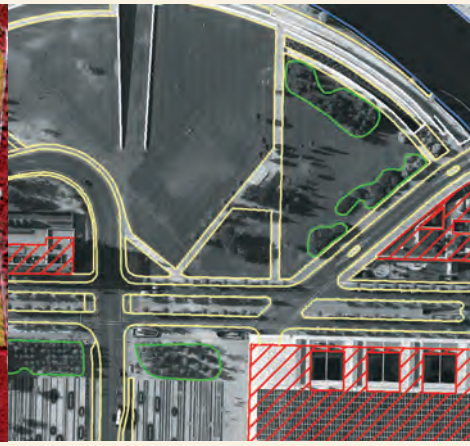
Change detection


Cadastre

The network

The value chain of geographical information technologies covers the creation, processing and use of data related to conditions and events beneath, on or above the surface of the earth.

Prominent representatives of the geographical IT branch in the Berlin-Brandenburg capital area have been united since 2005 in the GEOkomm networks knowledge network. Renowned research institutes and small and medium-sized enterprises, developing their knowledge and their innovative potential within the network, are determined to act in international markets with new products, services and their know-how.

The technological focus

In cooperation with partners from the scientific community, major national research institutes, universities and private institutes, the most recent research results are used in commercial applications and are being applied in business processes within the network. The spectrum varies from such topics as satellite imagery, map-based environmental data and transport information to the analysis of locations for real estate investment. Some project examples:

- **GeoMonitor**: development, implementation and operation of an international web-based location system offering interactive services concerning cities, regions or specific topics
- **Geo-risks / risk management**: development of alert systems such as the Tsunami Early Warning System used in the south Pacific, or flood protection and forecast systems
- **3D city modelling**: 3D virtual city models, based on high resolution aerial imagery, with the help of which it is possible, for instance, to define solar panel construction areas for landowners to optimise their solar energy potential
- **Carbon credits**: monitoring of forest and jungle surfaces with the help of remote multi-sensor technologies - observation and reduction of greenhouse gas emission
- **PROGRESS – environmental change and geo-risks**: research and technology centre in Potsdam for natural risks, climate change and sustainability
- **EnMAP**: the Environmental Mapping and Analysis Programme - a forward-looking hyper-spectral satellite mission.

The unique features

Germany's capital region is particularly capable in the field of geoinformation due to its large and renowned research sector. In no other part of Germany are so many specialised faculties, research institutes and small and medium-sized enterprises concentrated in one place, working dynamically in this field of technology and contributing to technological advances. The resulting relationships, characterised by close cooperation between industry and research, and the large number of professionals create a unique environment for innovative excellence. The network makes it possible to strengthen already existent core competencies, reduce costs through division of labour and put new business models and innovative solutions into effect.
GEOkomm networks targets international markets, taking advantage of its already existent contacts and cooperation relationships with countries such as Russia, India, China and the United Arab Emirates as well as European networks. In light of the technological advances, the internationalisation and the specialisation taking place in this sector, the need for up-to-date mediation of operational knowledge and skills has grown significantly and will keep on growing in the future. GEOkomm recognised this trend very early on and has created the GEOkomm academy in response to it.

it.saarland

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International computer science students
Source: Bellhäuser / das bilderwerk

Architecture simulation at Saarland University
Source: Bellhäuser / das bilderwerk

The network

The it.saarland competence network comprises the Competence Center Computer Science at Saarland University as well as Software Forum Saar (SFS). By interconnecting research facilities and IT companies, more than 300 scientists and 50 industry partners are part of the network.

The agenda:

- to promote dialogue and cooperation between universities and companies
- to enable fast access to scientific and entrepreneurial knowledge
- to use public relations to motivate more students inside and outside Germany to start their career in Saarland.

The technological focus

Saarland computer science research has a considerable impact in Germany. The spectrum of services, products, and know-how of the IT companies in Saarland has constantly grown over the last years.

Business informatics, enterprise software, language processing, security solutions, and artificial intelligence are excellent work areas with an internationally renowned competence.

There are many cooperation projects between IT research and industry in Saarland. Global players like Intel, Microsoft, Google, Siemens, the German automotive industry and the European aerospace industry work together on joint research projects. Over the last 10 years, Saarbrücken has witnessed the emergence of influential companies such as IDS Scheer and SAP Retail Solutions, and more than 70 spin-offs.

The Saarland IT industry is working in various fields (e.g. consulting, software development, and e-business). Their services range from the optimisation of business processes to standard software and the development of individual software. Products in language technology, e-learning, mobile solutions and services, 3D-computer graphics, and IT- and network security are becoming ever more important.

The unique features

The Competence Center of Computer Science at Saarland University was founded in 2004 with the support of the local government. There are about 40 computer science-related institutions as well as non-academic facilities in Saarland that are affiliated with the Competence Center. In 2007, the German Research Foundation (DFG) granted funding for the "Multimodal Computing and Interaction" Cluster of Excellence and the Saarbrücken Graduate School of Computer Science in the context of the Excellence Initiative of the German federal government and the federal states.

The success story of Saarland Computer Science goes on.

In the beginning of 2010, the Federal Ministry of Education and Research (BMBF) announced the funding of the Cluster "Software innovations for digital business" as one of the winners of the cluster competition of the federal government. Participating institutions are the German Research Center for Artificial Intelligence (DFKI), the Fraunhofer Institute for Experimental Software Engineering (IESE) and the universities of Kaiserslautern, Karlsruhe, Darmstadt, and Saarbrücken. Industrial partners include SAP, Software AG, and IDS Scheer alongside small- and medium-sized companies.

IT4work – Rhine Main Neckar Software Cluster

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Support letter presentation to Rhine Main Neckar Software Cluster
Source: Markus Schmidt

The network

The Darmstadt Chamber of Commerce and Industry (CCI) is the supporting organisation for the IT4work – Rhine Main Neckar Software Cluster. IT4work is a consortium of high-performance IT companies and leading research institutes located in the Darmstadt Rhine Main Neckar Engineering Region.

The technological focus

The main points focused on by the IT4work – Rhine Main Neckar Software Cluster are:

- ERP software,
- security technologies on the Internet,
- graphical data processing,
- virtual desktop design,
- telecommunication technologies.

In addition, we have experience in the fields of:

- e-business / e-marketing / tele-engineering / M-commerce,
- e-education / computer-based training,
- business process control.

Modern business software and working systems are subject to constant change. A rapid and safe exchange of large amounts of data and the availability of information at any time and at any place are preconditions for an efficient economy. IT4work deals intensively with this topic. We place great emphasis on the security of data transfer and on the sustainable and ergonomic design of working environments geared primarily to the user's requirements.

The globalisation of competition requires international cooperation, and, at the same time, the complex tasks require more interdisciplinary project work. IT-supported teamwork, characterised by a high extent of flexibility and dynamics, will be the form in which work is carried out in the future.

Intelligent environments, augmented and virtual realities, virtual engineering, public key infrastructures, smart card technologies, trusted signature terminals - these are just a few of the technologies which are implemented by the IT4work - Rhine Main Neckar Software Cluster network of excellence.

The unique features

In the area of enterprise software, the IT4work – Rhine Main Neckar Software Cluster is one of Germany's most high-performance ICT networks of manufacturers, service providers, research and training institutions and users. In Darmstadt alone, the following important research and training institutions belong to the cluster: the Technical University of Darmstadt, the University of Darmstadt and the Fraunhofer Institutes for Secure Information Technology (SIT) and for Computer Graphics Research (IGD). They are highly regarded internationally. The Software AG, the largest producer of enterprise software in Hesse and the second largest software company in Germany, is represented in the cluster, as well as many small and medium-sized enterprises of the Hessian enterprise software sector. In addition, SAP AG is represented in the Rhine Main Neckar Software Cluster by SAP Research CEC Darmstadt. The location of the cluster management at the Darmstadt Chamber of Industry and Commerce (IHK Darmstadt) is the best prerequisite for a targeted transfer of technology. The close connection with the "Software Cluster", winner of the "Leading Edge Cluster Competition" of the Federal Ministry of Education and Research (BMBF), ensures the combination of excellent research with marketable products.

medRegio Lübeck eHealth competence network

medRegio Lübeck

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Patient-supporting processes

Innovative IT creates more space for medicine

The network

The medRegio Lübeck GmbH was founded in 2004 as a public-private partnership. It concentrates the special competencies in the Lübeck region in the fields of medical technology, medical IT and health care management with the aim of applying innovative solutions to secure optimal medical care for patients. This network of partners, including prestigious representatives from business, science and education, is producing innovative concepts and projects. In this way, the potentials for economic growth in this field are tapped and the state of Schleswig-Holstein is strengthened as a health location.

The technological focus

The technological focus is on developing, providing and operating the technological and organisational infrastructure for comprehensive telematics and eHealth services in the field of health management. This includes such activities as developing medical logistics systems and integrated IT solutions and supply systems for hospitals, as well as offering consulting support. The primary goal is to create success by supporting the market attractiveness of cluster partners and their clients.

The unique features

A private-public partnership, an important cluster in the region and an attractive market combined are achieving success for the partners and their network.

Regina e. V. – Information Technology Competence Network Aachen

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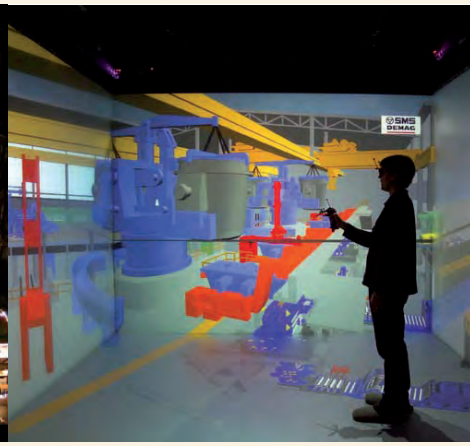
Aachen



IT
Source: Virtual Reality Center Aachen

The network

REGINA is an association of more than 100 Aachen-based companies, educational establishments, and research institutes. Although competitors in some areas, the mainly small to medium-sized enterprises which make up the network have embraced the concept of forming an alliance to bring mutual benefit to all its members. Many of the general tasks they face are dealt with through collaboration within REGINA in order to avoid unnecessary repetition or duplication of work.

The technological focus

In the IT environment, REGINA members make a considerable contribution to securing Aachen's position as a high-tech region. Most of them are innovative small to medium-sized enterprises. Their activities fall into the following categories:

- communication
- hardware
- domain-specific software
- technical applications / automation
- controlling / optimisation
- infrastructure, Internet, e-commerce
- technology transfer
- research and training.

These companies include world market leaders in specialised sectors, such as AIXTRON (semiconductor technology), DSA (testing systems for the car industry) and CSB (sector software for the food industry).

The unique features

The events organised by the REGINA IT network address technical, economic, and strategic issues affecting the business of the network's members as well as enabling a special personal contact. When members meet at the management get-togethers, information events, social events and in working groups organised by REGINA, each of the members can expect to benefit from the experience of the others.

SafeTRANS - Safety in Transportation Systems

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SafeTRANS Industrial Day

The network

SafeTRANS links industrial and academic stakeholders in the area of processes and methods for the development of complex, safety-critical embedded systems in transportation (automobile, aircraft, railway). By integrating OEMs, suppliers, SMEs, research institutes and universities, we take a holistic approach to making safe mobility possible in the face of growing traffic density, increasing complexity of systems and shorter innovation cycles.

The technological focus

- Seamless design of embedded systems for the transportation domain, including innovative methods and tools for analysis, formal verification, virtual product integration and automatic test-vector generation
- Analysis and validation of non-functional properties such as real-time behaviour, non-interference between tasks, etc.
- Human-centered engineering, i.e. including humans and their behaviour in the analysis of embedded systems
- Methods and tools for architectural design, exploration, and evaluation
- Multi-criteria component-based design processes
- Multi-criteria requirement engineering
- Methods and tools for cost-efficient re-certification / re-validation of new system configurations
- Tool integration in development platforms
- Design and analysis of cooperating autonomous systems

The unique features

SafeTRANS facilitates cooperation between industrial and academic partners, identifies cross-domain synergies and enables the transfer of best practices between domains.

To realise national and European R&D goals, SafeTRANS supports its members in compiling and harmonising R&D strategies, identifies research priority themes and feeds them into national and European funding programmes. On a national level, SafeTRANS coordinates the creation of an Embedded Systems roadmap in cooperation with the Federal Ministry of Education and Research (BMBF). On a European level, SafeTRANS maintains strong cooperative ties with the two French Pôles de Compétitivité Aerospace Valley und System@tic Paris-Region to implement the ARTEMIS Innovation Cluster EICOSE. In this context, SafeTRANS drives the harmonisation of priority themes for the Strategic Research Agenda and Multi Annual Strategic Plan of the ARTEMIS Joint Undertaking as well as for the ITEA2 roadmap.

In addition, SafeTRANS supports project incubation and consortium formation for its members. An example project in ARTEMIS is CESAR – Cost Efficient methods and processes for SAfety Relevant ES, with more than 50 project partners and more than 56 million euros total expenditure.

Knowledge transfer and networking are made possible by the biannual SafeTRANS Industrial Day, which features top-class presentations from industry and research and provides ample room for discussions and cross-domain knowledge transfer.

Virtual Dimension Center Fellbach w. V.

VIRTUAL DIMENSION CENTER

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VDC Demo Centre

VDC power wall

The network

The Virtual Dimension Center (VDC) was founded in 2002 as a competence centre and innovation network for Virtual Engineering technologies, based in the city of Fellbach in the middle of the Stuttgart region. It brings together the expertise of leading researchers, developers, suppliers and end-users of 3D visualisation, simulation, and Virtual Reality (VR) technologies.

The technological focus

The specific competencies of the VDC lie in networking a large number of companies which offer or apply VR and digital product development technologies (design, calculation, simulation, and technical 3D visualisation). Science and research are very well integrated in the VDC network through the participation of excellent universities and Fraunhofer Institutes. The same applies for the field of education and training.

The unique features

Knowledge Base: Business Location Presentation with Virtual Reality

The Knowledge Base is a mobile, immersive and virtual walk-through world which enables users to experience the "soft" factors of a region while, at the same time, demonstrating its technological know-how and competence.

3D Fitness Check

The benefits of today's numerical simulation and visualisation techniques in the three-dimensional environment and the benefit of VR, with the possibility it provides of interacting with it, are undisputed. However, many companies are still working with 2D CAD systems or their products are only partially compatible with the 3D system they use. The "3D fitness check" offers help in making the transition to the new technologies.

CoSpaces: Innovative Collaborative Work Environments for Individuals and Teams in Design and Engineering

The EU project "CoSpaces" evaluates collaboration at individual, team and enterprise levels, and develops collaboration models emphasising applications of problem solving, creativity, participatory and knowledge-based design in innovative collaborative work environments. The objective is to create an innovative distributed software framework that will support easy creation of collaborative work environments for distributed knowledge workers and teams in collaborative design and engineering tasks.

Network for Mobile and Satellite Communication Technology Lower Rhine

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The network

The Mobile Radio Communications competence network came into being with the formation of IMST GmbH, which has been operating since 1993.

Today, the network focuses on products and services for radio communications, antenna technology, microelectronics and other radio solutions. Any kind of radio communication with at least one mobile part is defined as mobile radio communication in this context.

Around the IMST as a nucleus of crystallisation, noted stakeholders have joined forces. The University of Duisburg-Essen, the Fraunhofer Institute of Microelectronic Circuits IMS, and Infineon AG are partners.

bavAIRia e. V.

bavAIRia
Europe's heart of aerospace and navigation

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Airliner
Source: Stephen Strathdee

Satellite navigation system Galileo
Source: ESA

The network

The Bavarian state government has commissioned bavAIRia e.V. with the management of the aviation and aerospace cluster as well as the satellite navigation cluster. bavAIRia's goal is to pinpoint Bavarian expertise in aviation, aerospace and satellite navigation, to strengthen the connections between these specialists and thus to preserve and intensify the global competitiveness of the above-mentioned branches. The members of bavAIRia e.V. reflect the entire range of Bavaria's industry and research in all its diversity.

The technological focus

Together with industry and research groups, bavAIRia develops appropriate measures in the areas of technology, financing, internationalisation and the securing of expertise, monitoring and facilitating their realisation.

bavAIRia initiates and organises specific platforms for the aviation and aerospace cluster in order to focus on and actively support fields of high strategic relevance, including engine construction, "more electric aircraft", cabins, engineering services, unmanned aerial vehicles (UAV), defence, small and micro-satellites, and EU/ESA programmes such as "Global Monitoring for Environment and Security" (GMES).

In the satellite navigation cluster, GNSS user forums on security, GIS and land use, tourism and leisure, transport and logistics, eHealth, and space applix and ICT are actively engaged in implementing innovative ideas and applications in dialogue with users. The Galileo Road Show introduces the general public to the potentials of Galileo far beyond the borders of Bavaria. In the context of EU projects, bavAIRia e.V. links Bavarian industry and research with ESA, GSA and the European Commission.

Throughout the clusters, bavAIRia concentrates on education and training in order to ensure the availability of a new generation of well-trained experts. The platform "Science bavAIRia" also focuses on both clusters in order to intensify interactions between universities and research institutions.

The unique features

International networks, e.g.

- a partnership with the Canadian region Quebec
- a joint agreement to found a leading twin cluster for aerospace between the Abu Dhabi Airports Company (ADAC) and bavAIRia e.V.
- bavAIRia partnership with "ESBAS – The Aegean Free Zone Development & Operating Co.", one of the leading institutions of the Izmir aerospace cluster.

Cooperation with other clusters (rail technology, automotive, logistics)

- Galileo Roadshow in various cities
- participation in regional and international trade shows, e.g. Paris Air Show, Aerospace Testing Expo, Munich Satellite Navigation Summit, Systems, ION GNSS, Berlin Air Show, etc.
- founding of the ENCADRE Association as a cluster of clusters in the Space Applications industry of Europe
- working committees with cluster managers, with ESA, EC and GSA.

The joint initiative “Hamburg – The place for aviation”

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A319 “Hamburg Shopper“ – cowling with coat of arms
Source: Gregor Schläger, Lufthansa Technik AG

Where planes are born

The network

In the year 2001, companies of Hamburg’s aviation industry, industry associations and institutions, universities and public authorities founded the industry initiative “Hamburg – The place for aviation”. With its strategy of taking aviation to a new level of efficiency, comfort, reliability and flexibility, the Aviation Cluster of the Hamburg Metropolitan Region was declared the winner of the federal government’s excellence cluster competition in 2008. Its pioneering projects are supported by 40 million euros of federal funds.

The technological focus

Hamburg as the place for aviation is Germany’s number one, Europe’s number two and the world’s number three location of the civil aviation industry. Shaped by a 100-year history, it provides employment for 36,000 people. Airbus, Lufthansa Technik, Hamburg Airport and 300 suppliers cover the entire life cycle of civil aircraft and the aviation value-added chain. Their successful participation in the 2008 excellence cluster competition encouraged all the network protagonists to move even closer together. Their integrated strategy to promote “A New Kind of Aviation” is centred on the fields of competence aircraft/aircraft systems, cabins/cabin systems, aviation services and air transport systems. These are supported by a growing scientific landscape researching both basics and applications. Another pioneer is the Centre for Applied Aviation Research (ZAL). Founded in 2009, it offers, inter alia, test infrastructures for cabin technologies. Hamburg is regarded as Europe’s leading training centre for aeronautical engineering. A key element in the efforts to secure skilled workers is the Hamburg Centre of Aviation Training (HCAT), a training facility of corporate partners, universities and vocational schools.

The unique features

Hamburg as the place for aviation boasts excellent experiences in the development of cluster strategies. The excellence cluster competition won in 2008 is evidence of this. Beside the innovation landscape, the tightly-woven network contributed significantly to this success.

Within the context of the EU’s CLUNET project, Hamburg, backed by its wealth of experience, initiated the European Aerospace Cluster Partnership (EACP), which it will continue to coordinate in the future.

Europe’s aviation clusters were thus given their first permanent platform for intensive knowledge transfer and joint projects. To stand its ground in the face of global competition, it is increasingly important for the European aviation industry to utilise its own innovation potential to the fullest and to cooperate with suitable European partners. The EU supports transnational cooperation between clusters.

In May 2009, EACP’s more than 30 founding members signed a letter of intent in Hamburg. Initial projects will cover the fields of internationalisation, qualification and financing.

bayern photonics
Competence Network for Optical Technologies

bayern photonics
Kompetenznetz Optische Technologien

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Joint booth for members at international trade fairs
Source: OptecNet Deutschland e. V.

LED
Source: OSRAM Opto Semiconductors GmbH

The network

bayern photonics e.V. is the Competence Network for Optical Technologies in Bavaria. It supports companies, research institutes and service providers from this branch with the aim of strengthening regional cooperation within the network, thus promoting innovative structures in Bavaria.

Our network offers its diverse partners the possibility of interacting and communicating on a neutral platform and of finding the right partners for joint projects or research topics.

bayern photonics currently provides its manifold services to approximately 70 members.

The technological focus

bayern photonics focuses on the following technological fields of activity:

- optical technology for industrial production
- lighting
- lasers
- life science / biophotonics
- sensors and metrology
- optical technology for information and communication
- optical design
- and much more.

Our service package includes:

- connecting science and industry
- technology management
- supporting business start-ups
- providing training and education
- managing marketing and public relations.

We provide information exchange and information transfer through diverse activities:

- expert groups
- regulars' table on laser topics
- workshops
- advanced training courses.

The unique features

bayern photonics is one of nine regional Competence Networks for Optical Technologies in Germany. Together with the other eight regional Competence Networks, bayern photonics is united in the nationwide association OptecNet Deutschland. This association acts as a representative and contact on the national and international level. The goal of this unique networking structure is to boost the optical technologies as key technologies for Germany.

The nationwide network OptecNet Deutschland offers the members of the German Competence Networks for Optical Technologies many advantages, such as joint stands at national and international trade fairs like LASER World of PHOTONICS (Munich), Optatec (Frankfurt), Photonics West (San Francisco, California, USA) and Photonica (Moscow, Russia). Another advantage offered to members is free of charge or reduced rate participation in nationwide events, such as joint expert group meetings, workshops, training courses and many more.

Cluster Initiative Bavaria - Nanotechnology Cluster

Cluster
Nanotechnologie

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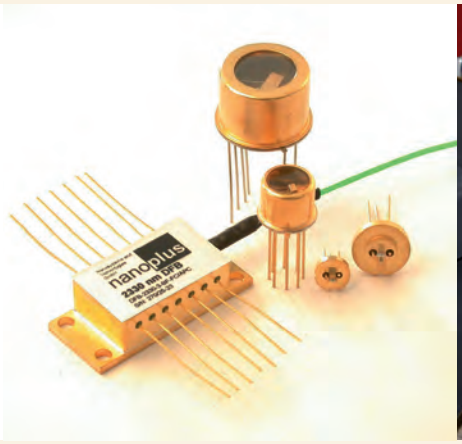
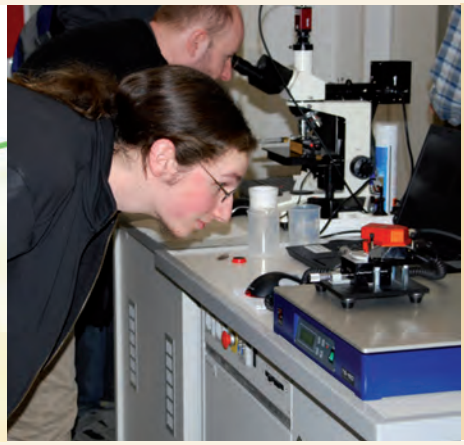


DFB laser diodes for gas-sensing applications
Source: nanoplus Nanosystems and Technologies GmbH, Gerbrunn



Promotion of young researchers in the natural sciences
Source: Nanoinitiative Bayern GmbH

The network

The Nanotechnology Cluster was initiated within the Cluster Initiative of the Bavarian state government in 2006. Besides its cluster management Nanoinitiative Bayern GmbH, the Nanotechnology Cluster consists of the not-for-profit association “Nanonetz Bayern e.V.”.

Approximately 350 participants currently benefit from the cluster’s activities.

The technological focus

- Raising awareness of nanotechnologies in industry and business, providing information and creating transparency about the application possibilities and targeted consulting of commercial enterprises regarding the potential for their specific branch of industry.
- Supporting nanotechnology-related teaching at schools and universities with the aim of increasing the number of young academics in the natural and engineering sciences.
- Strengthening the transfer of technology and optimising the networking.
- Interlinking research and industry for an efficient transfer of research results into products and processes.
- Supporting an active transfer of know-how.
- Organising workshops focussing on specific issues under consideration of the local economic structure.
- Intensified consulting on the use of funding instruments and stimulation of R&D activities in the industry and at universities through information about EU, federal government and state government support programmes.
- Coordinating research topics at universities and developing application-oriented research at universities of applied sciences.
- Participating actively in the discussion about the chances and risks of nanotechnology.

The unique features

The main goal of the cluster is to further develop and strengthen a competence network in the area of nanotechnology with the participation of industry, universities and research institutes as well as service providers and financiers. Interdisciplinary research and cooperation between research and industry should be supported for a more efficient transfer of research results into applications. Creating an optimal environment will increase the attractiveness of the location for enterprises.

The target audience also includes enterprises which do not have their main focus of activities in the nanotechnology field, but are potential users. This strategy has innovative cooperation approaches as a consequence, i.e. cooperation projects with other clusters of the Bavarian Cluster Initiative or with networks from other federal states or countries. The Bavarian State Ministry of Sciences, Research and the Arts, responsible for the Nanotechnology Cluster, and the cluster advisory board support this generalist approach because their main focus is on establishing functioning networks in a new high technology sector, while excellence-oriented research associations such as CeNS/NIM, EAM and BZKG are already being funded by other support programmes.

IVAM Microtechnology Network

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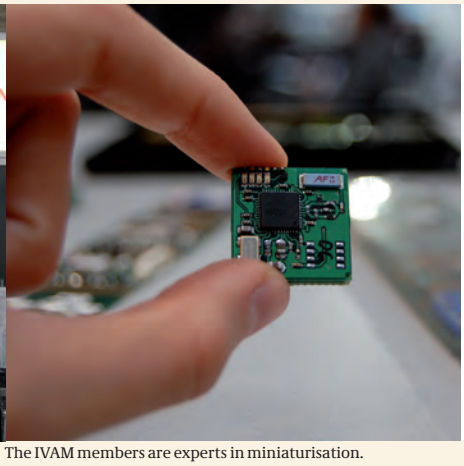
The IVAM product market at MicroNanoTec/HANNOVER MESSE



The IVAM members are experts in miniaturisation.

The network

IVAM is an international network with about 300 members from all relevant fields of microtechnology, nanotechnology and advanced materials. IVAM's main purpose is to make technological innovations and developments known to a broad public and help them conquer the market. In particular, the network supports small and medium-sized enterprises (SMEs) in bringing their innovative techniques and products to the market and prevailing in international competition.

The technological focus

As interdisciplinary technologies, microtechnology, nanotechnology and advanced materials supply many different branches. Medical technology and research and development are currently the most important target markets. Furthermore, micro and nano products are utilised in measurement and control technology and in the automotive and aerospace industries. Energy and efficiency applications will certainly grow in importance in the future. The main technology areas of the companies, institutes and partners in the IVAM network are, amongst others, micromechanics, surfaces/coatings, sensor technology and micro-optics.

The unique features

IVAM arranges international business and research cooperation projects. For this purpose, the network organises joint pavilions at trade fairs and holds workshops, seminars and business round tables. The IVAM joint pavilions at MicroNanoTec/HANNOVER MESSE (Hannover, Germany) and COMPAMED/MEDICA (Düsseldorf, Germany) are among the largest marketplaces for miniaturised high-tech solutions.

In Asia, IVAM promotes the innovations of its members at the Exhibition Micromachine/MEMS and nano tech (Tokyo, Japan) and at NANO KOREA (Seoul, Korea). During the Microtechnology Summer School (www.mikrotechnik-summerschool.de), IVAM establishes contacts between high-tech companies as potential employers and students as future employees.

IVAM promotes innovative products and developments through the German high-tech magazine "inno" and the newsletters MikroMedia (in English and German) and NeMa-News (in German). IVAM's websites www.ivam.eu and www.neuematerialien.de include news about microtechnology, nanotechnology and advanced materials, links to all members of the network, and the search engine IVAM directory online.

Furthermore, IVAM aids company start-ups, assists SMEs in acquiring funding, conducts research for market studies (www.ivam-research.com) and does project work, in the European project "CORONA" (www.corona-mnt.eu) and the BMBF project "mstIfemNet meets Nano and Optics" (www.mst-ausbildung.de/maeta), for example.

Ultra-precise Surface Figuring Competence Centre

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Joint trade fair booth of CC UPOB e.V.

Pupils are interested in the new AFM kit

The network

The Nanotechnology Competence Centre CC UPOB is a registered association with 34 members. Its activities are financed mainly by member contributions and income from fee-based services. The association promotes the cooperation of its members in the field of ultra-precise surface figuring. It creates opportunities for the exchange of ideas and experience, and supports the resulting cooperation.

The technological focus

"The manufacture of technical functional areas of highest precision and their metrological characterisation" is the objective which unites all members in the CC UPOB association. To achieve this objective, very diverse approaches and methods are combined. The structure of the CC UPOB association can, therefore, be subdivided into four competence areas:

- mechanical/chemical finishing
- ion beam and plasma finishing
- optical finishing and related fields
- characterisation of surfaces.

Ultra-precise technology includes all finishing procedures in which bodies and surfaces with macroscopic dimensions are manufactured with extreme precision of form and smoothness. The more precisely smoothed and formed the surfaces are, the better their characteristics. However, this process requires the investigation of methods of finishing new materials. For this purpose, conventional methods must be perfected and totally new production methods developed and optimised with the aid of simulation and modelling.

The unique features

High-level expert meetings

The CC UPOB association regularly organises international meetings which show the status quo, the capabilities and the research needs in the area of ultra-precise surface figuring. In the first half of 2010, CC UPOB will organise a meeting on the topic of "asphere metrology". Here, manufacturers of measuring instruments will present the diverse methods, modes of operation and the potential of their devices and practically demonstrate the strengths of their systems with various samples, while at the same time offering a glimpse of future trends in the sector of metrology.

AFM kit for pupils

With the aid of an Atomic Force Microscope (AFM), the nanoworld can be made "visible". Based on its experience in microscope development, the Physikalisch-Technische Bundesanstalt (PTB), a founding member of CC UPOB, has developed raster force microscopes suitable for use in education and training facilities due to their simple construction and operation. The aim of these activities is to make a cost efficient microscope kit available and to compile a list of experiment proposals, which are developed together with the schools. The PTB and CC UPOB support schools of the region in purchasing, assembling and beginning operation of one of these devices.

Measurement Valley e. V.

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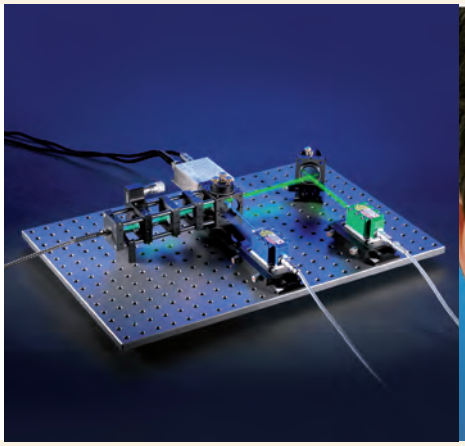
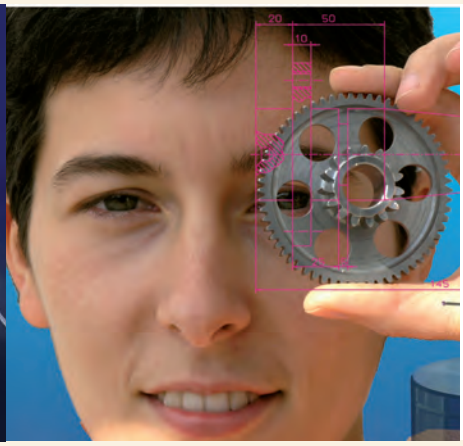


Precision mechanics and laser
Source: LINOS Photonics GmbH & Co. KG



Precision machining
Source: HAWK FH Hildesheim / Holzminden / Göttingen

The network

Modern metrology is the key to ensuring the quality, precision and safety of competitive products. The demand for innovative measurement technology is on the rise, not only in engineering and R&D, but also in the fields of ecology, food analysis, transport and traffic, and production. In Göttingen, in close cooperation between basic research and industrial application, products on the cutting edge of technological progress are being developed.

The technological focus

Measurement Valley technology is used with great success throughout the world – in engineering and the automotive, food, energy, and aerospace industries as well as in medical engineering, food and drink, and energy technology.

Measurement Valley offers metrological solutions for:

- acoustics
- humidity
- form
- mass and weight
- length
- laser
- surface analysis
- optics
- position sensing
- vibration
- material properties
- material quantities
- radiation
- flow
- temperature
- environmental monitoring systems / ecology
- gearing
- control and regulation engineering
- wind.

The network offers solutions to optimise research and production processes. Some examples are:

- active vibration isolation
- automation
- image acquisition and processing
- biotechnology and mechatronics
- software development
- embedded systems
- energy management
- inductive components
- engineering services
- data analysis and modelling
- optical systems and components
- prosthetics and rehabilitation
- control and regulation engineering
- softmagnetic materials.

The Measurement Valley companies help to make life easier, safer and more comfortable.

The unique features

The Göttingen region is home to the highest density of competence in measurement technology in Germany and a historically developed process chain of science, research and enterprise. Today, many of the 36 members of Measurement Valley have established themselves as market leaders in such segments as optical metrology, sensor technology, high-resolution, laser-based and plasma-based metrology, 3D measurement, neuronal metrology, adaptronics and mechatronics.

Furthermore, they lead in the markets of weighing, filter technology, precision mechanics, orthopaedics and environmental measurement technology.

Few industries can do without the enabling technology of metrology. Electronic testing, measuring, controlling and monitoring can be found in almost every industry.

Microsystems Technology Network Rhine-Main

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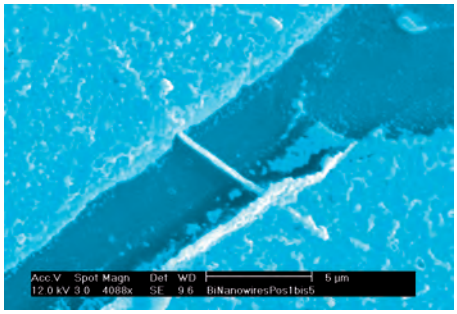
Micro-nano integration


Nanowire

The network

The aims of the MST Network Rhine-Main are:

- to enhance technology and knowledge transfer between science and industry in the area of microsystems technology
- to improve conditions for microsystems technology in the Rhine-Main area
- to increase the scientific and technological competence of the region.

These aims are being achieved through:

- information exchange and mutual support
- a common platform to present the companies of the region
- support of cooperation and technology transfer between research institutes and industry.

The technological focus

Our members' common aims are achieved by

- a common presentation platform for participants from the region (a common leaflet, Internet presence, support activities)
- contact to other national and international networks and associations
- development of new technologies and support of innovations
- generation of joint new projects.

Our industrial partners offer the following products, technologies and services:

- magnetic sensor elements, gas sensors, infrared thermopiles, optical sensors
- microelectronics, ASICs, and their applications
- optical systems and analytical instruments
- user support in machine building and automotive technologies.

The unique features

Micro-nano integration

Technical developments in microsystems technology are leading to the further miniaturisation of microstructured elements and products and to the utilisation of different nanomaterials. These developments lead to new and improved products, in particular in the area of gas sensors. The INANOMIK project currently being supported by the German Ministry of Education and Research is investigating the application of metallic nanowires for gas sensors.

KompetenznetzeDeutschland
Kompetenznetzpreis 2010 | 2. Preis

NanoBioNet – Network for Nano & Biotechnology

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Working in the clean room

NanoSchoolBox – an experiment case for the classroom

The network

NanoBioNet is an efficient network of more than 100 members from universities, research institutes, clinics and businesses active in the areas of development, production, industry and commerce, and technology transfer. Each individual member contributes to a broad spectrum in the process, which makes the system attractive for all participants. All of the members are interested in research and development and the practical applications of nanotechnology and biotechnology for the creation of marketable products and new jobs.

The technological focus

- Nanotechnology
- Biotechnology
- Nanobiotechnology
- Life science
- Ethical challenges of nanotechnology

The unique features

NanoBioNet is a non-profit association, moderating and developing the dialogue between economy, science, politics and the general public.

NanoBioNet focuses on the following main priorities:

- to provide support to research and development
- to establish nano- and biotechnology in all fields of education
- to inform the general public about nano and biotechnological topics.

NanoBioNet has been working for many years in education on the topics of nano- and biotechnology. Besides vocational training courses and training events for teachers, in 2004 NanoBioNet put together the first experimental nanotechnology kit for schools. Based on this experience and taking into account international requests for a more detailed new experimental kit, the new “NanoSchoolBox” was developed and is available in German, English and French. 14 experiments and five exhibits take teachers and pupils on a voyage into the nanocosmos.

NanoBioNet has been awarded several prizes:

- Winner of the “365 Landmarks in the Land of Ideas” contest, 2007
- Saarland state award for Communication Design, 2009
- “Kompetenznetz 2010“ Award of the “Kompetenznetze Deutschland” initiative of the Federal Ministry of Economics and Technology, 2010

NanoMat – Network for Nanotechnology Materials

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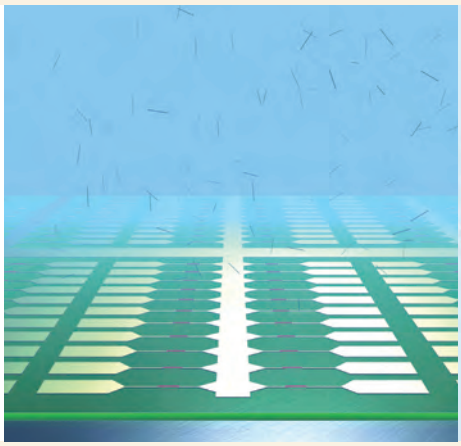

Array of carbon nano tubes connected to electrodes
Source: Forschungszentrum Karlsruhe GmbH

NanoMat partners as ligands of a light-collecting complex

The network

Nanomat is a shared interest network of nanotechnology on a national level in Germany. Currently, through the network, 29 partners coordinate their research activities in the area of nanoscale and nanostructured materials which enable novel or enhanced properties or functions.

NanoMat has a distinctive thematic focus covering all stages of the value added chain. The high performance of NanoMat is evidenced by numerous prizes, academic awards, cooperative agreements with industry and start-ups.

The technological focus

All over the world, nanotechnology is seen as a pacesetter in relation to the most diverse industries. Nanotechnology offers great opportunities for science and industry if the research results can be implemented quickly. Since new technologies can be successful only if they are accepted by the population, the NanoMat partners have actively participated in the discussion about this new technology and contributed to the Nanocare Project (www.nanopartikel.info) significantly.

To improve the international competitiveness of the German economy and of the SMEs in particular, the NanoMat partners launched the "NanoMat for Small and Medium-Sized Enterprises" initiative. This initiative formed the conceptual core of the nanoValley.eu project in the Rhine-Neckar metropolitan region. In this project, which was originally formulated in 2007 together with NanoMat partner BASF, the members draw upon professional skills, personal contacts and other sources of impetus from research and science.

The unique features

Given the increasing international integration of markets and the continuing high pace of innovation, NanoMat's goal is to convert early scientific discoveries into new products and processes.

Since 1998, NanoMat has offered the possibility of interdisciplinary and cross-institute collaboration to make completely new and unexpected solutions and insights possible.

With NanoMat, three research centres of the Helmholtz Association, eleven universities, a Max Planck Institute, an institute of the Gottfried Wilhelm Leibniz Scientific Community, the Hohenstein Institutes, an Institute of the Polish Academy of Sciences, four institutes of the Fraunhofer-Gesellschaft, the Munich Re Group, the Swiss Federal Laboratories for Materials Testing and Research (Empa) and six large-scale business enterprises coordinate their research programmes.

NanoMat offers the following services:

- coordination of research
- consulting and project management
- technology transfer
- start-up initiatives
- conferences and seminars
- fairs and exhibitions
- international marketing for nanotechnology
- education and training.

Nanotechnology Centre of Competence “Ultrathin Functional Films”

nanotechnology
CC "Ultrathin functional films"

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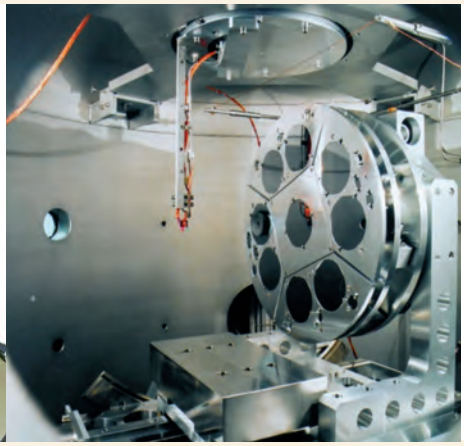
Thin films are a key element in nanotechnology
Source: Fraunhofer IWS Dresden



Sample system in an EUV reflectometer chamber
Source: Fraunhofer IWS Dresden

The network

Ultrathin films are the gist of nanotechnology. Their areas of application range from microelectronics and optics to medical science and sensor technology to wear protection films. In 1998, in order to enable their consequent industrial development, enterprises, university institutes, research establishments, and associations focused their knowledge and united to form a network. The resulting Competence Centre for Ultrathin Functional Films is funded by the Federal Ministry of Education and Research.

The technological focus

Research and development work on ultrathin films by the Competence Centre is focused on the following areas:

- advanced CMOS,
- novel components,
- biomolecular films for medicine and engineering,
- nanoscale protective coatings,
- ultrathin films for optics and photonics,
- nanosensor / nanoactuator / nanoreactor technology.

The Centre has 88 members. Its office is hosted by the Fraunhofer Institute for Material and Beam Technology in Dresden.

The unique features

On May 26 and 27, 2009, the international nanotechnology symposium “Nanofair 2009 – New ideas for industry” was held at the International Congress Center Dresden. Nanofair is an example of the international activities of the nanotechnology competence centres of Dresden and Karlsruhe, the city of Dresden, and the Association of German Engineers VDI.

More than 230 participants from the scientific community and industry took advantage of the opportunity to inform themselves and discuss the latest developments and products in nanotechnology. The technical topics of the symposium covered the areas of electronics, materials, surfaces, optics and biosciences. The symposium was accompanied by an exhibition. As it was a success, the partners have already started organising the 8th symposium on July 6 and 7, 2010.

Optec-Berlin-Brandenburg

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The network

Optec-Berlin-Brandenburg (OpTecBB) e.V. is the competence network for optical technologies in Berlin and Brandenburg. It was founded in Berlin on September 14, 2009. The professional competence of its members from industry and science has made it the umbrella organisation and the hub for transfer of knowledge and technologies in the optics/photonics sector of the capital region. OpTecBB provides efficient communication channels and workshops for its members. In addition, OpTecBB supports joint projects and cooperation within the network. OpTecBB keeps close contact with the science and business departments of the Berlin and Brandenburg administrations and is actively involved in the implementation of the innovation strategy in the optical technology sector.

The technological focus

The focus of the activities of OpTecBB is defined by the specific competencies, strengths and needs of the Berlin-Brandenburg region. Currently, OpTecBB is concentrating its activities on the following topics, which at the same time represent the specific profile of Berlin and Brandenburg in Germany's scientific and industrial environment:

- UV and X-ray technologies
- biomedical optics
- innovative ophthalmic optics
- laser technologies
- light engineering
- multi-sensor technologies
- optical process measuring
- photonics for communication and signal processing
- terahertz technologies
- along with a general focus on basic and advanced education.

A particular effort was made to bring together the region's potential in the areas of terahertz technologies and light engineering. These fields of technology are expected to generate important impulses for future tasks in security technologies, energy efficiency and environmental protection.

The unique features

The Berlin-Brandenburg region has a high density of universities and institutes active in photonics research and a large number of companies, especially SMEs, specialised in photonics. A unique feature of the region is the high concentration of laser technologies, X-ray analysis and optical communication technologies in combination with opto-electronics and microsystems technologies.

Research institutes and companies form a value-added chain which will enable the region to participate in future developments in light generation and act as a system provider in the utilisation of this technology. The region has a number of designated research institutes which are active in the research-intensive sector of terahertz technologies in order to build a fundament for local industrial exploitation in the long term.

OpTech-Net e. V.
Competence Network for Optical Technologies

Kompetenznetz Optische Technologien

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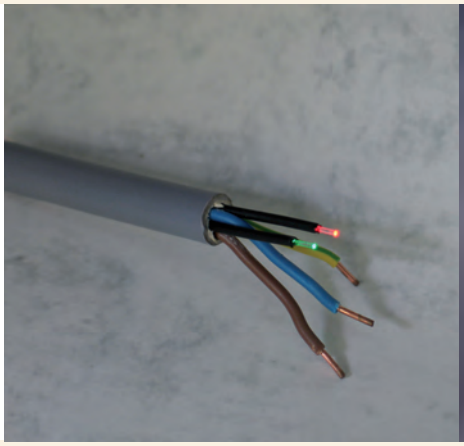
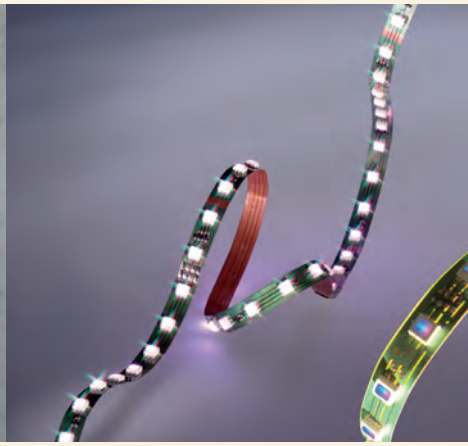


Polymer fibre integrated in a traditional power cable



Light emitting diodes
Source: Vossloh-Schwabe Optoelectronic GmbH & Co. KG

The network

OpTech-Net e.V. is one of the regional competence networks for optical technologies. The goal of the network is to strengthen the partnership between companies, research institutes and universities. OpTech-Net e.V. acts as a communication platform for advancing strategic cooperation between its members. As a broker, initiator and coordinator of new projects and alliances between the scientific and business communities, OpTech-Net e.V. aims to reduce the time frame for marketing innovative products through networking.

The technological focus

Optical technologies are the key technologies of the 21st century. Special focal points of the network lie in the following areas.

Optical communication technology
Optical communication technology is widely used for data transfer over long distances. In addition, optical data transfer on the basis of polymer optical fibres (POF) is gaining importance for distances up to 100 metres.
Photovoltaics
The main focus in this field lies on efficient production procedures with lasers and new nano-based materials for photovoltaics.
Materials
The production of special semiconductor components, their handling and encapsulation play an important role.
Optical measuring technology
Contactless measuring technology on the basis of optical technologies is another main focus among our members. The surface measuring technology of numerous parameters is of particular relevance.
LED technology
Light-emitting diodes (LEDs) form the basis for multi-functional light sources and displays. They make novel functions possible while saving electrical energy at the same time.

The unique features

The success of new technologies depends on the cooperation of diverse actors. Aside from universities, research institutes and manufacturers, the early involvement of users is necessary. In some areas, craftsmen play a determining role.

Further education for craftsmen on the subject of POF networks
The significance of polymer optical fibres and their components and systems for optical communication networks is on the rise. In Germany, these networks are often installed by craftsmen, who thus constitute the connection between manufacturers and users. The early integration of this group in the development process will increase the manageability of the components and systems. At the same time, the growing know-how offers benefits for both sides. In periodic education seminars, craftsmen learn about the use of POF and its associated components. Insights collected in this learning process are made available to the expert group for optical communication technology and thus advance the development of products and systems.

Membership in the International Optoelectronics Association (IOA)
Knowledge about future technological developments and markets is very important for companies and institutes, especially on the global level. In recent years, the IOA has become a fundamental forum for the exchange of information. The IOA is an association of ten networks from different countries in Asia and Europe and the USA, created to bundle information for its members.

Optence e.V., Network of Competence for Optical Technologies Hesse / Rhineland-Palatinate

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Precision plastic optics for automated teller machine
Source: Viaoptic, Wetzlar

Moulded glass precision micro optics
Source: GD Optik, Sinn

The network

Optence considers itself to be a centre for cooperation and knowledge transfer in the field of optical technologies. It links partners from the industry and R&D institutions, and establishes new and effective communication structures in order to cut time from idea to commercial product. With joint public relations work, Optence is improving the public image of the optical technologies. In addition, Optence offers a variety of services such as consulting for funding programmes and start-ups, project management, technical training programmes and special workshops.

The technological focus

Vertical integration along the supply chain is extraordinarily strong within Optence. From material suppliers to designers and manufacturers of optical components, to subsystems and system integrators, the whole supply chain is represented.

The region around the city of Wetzlar, where about 75 optical companies manufacture optical components and systems, is of special importance. Also in the economically fast-growing Rhine-Main area there are many companies active in the fields of laser technology and metrology, as well as a growing number of users of optical technologies such as the medical technology and the automation industries.

The unique features

Since its inception, Optence has launched numerous cooperation projects. An especially successful project has involved the development of a new generation of head-up displays for the automotive industry. With the help of the Optence knowledge base, the combination of injection moulding know-how, optical design competence, and diffractive optics calculation made a low-cost hybrid optical system possible which is a major improvement over the first-generation system.

Optence has been working very successfully with start-up and spin-off companies. The Corrsys 3D Sensors AG was founded as a joint venture by Optence members. Luphos GmbH, a spin-off from the IAP of the Technical University in Darmstadt, was supported in its initial financing and in acquiring its first projects. A partnering event with Israeli photonics companies in Wetzlar and subsequent business visits to Israel was extraordinarily successful for all participants.

OptoNet e. V. – Competence Network for Optical Technologies

optonet
knowledge competence cooperation

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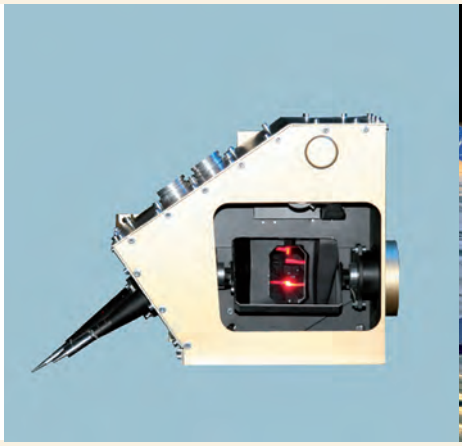

Jenoptik's rendezvous and docking sensor
Source: © Jena-Optronik GmbH (Jenoptik)

Rendezvous in space: ATV "Jules Verne" docking to the ISS
Source: © ESA-D. DUCROS

The network

The OptoNet Competence Network links up more than 90 Thuringian companies, research and education institutions, technology transfer agencies, capital providers and public institutions. Its aim is to play an active role in shaping the national and international development of optical technologies.

Both large companies and a host of newly founded small and medium-sized enterprises possess leading technologies for optical and optoelectronic components and systems. Universities and research institutions of excellent repute complete the profile of this traditional optics region.

The technological focus

The stakeholders contribute expertise in the following areas:

- basic research on optical technologies
- information visualisation
- optical surfaces and coatings
- optical information technology and metrology
- active optical fibres and fibre sensors
- image processing
- optical system design
- optical precision engineering
- laser technology.

The unique features

Premiere in Space: Jena-Optronik sensors make fully automated docking of unmanned transporters to the ISS possible

With the docking of the first ATV (Automated Transfer Vehicle) to the International Space Station (ISS), Europe experienced a premiere in outer space. The rendezvous and docking sensors built by Jenoptik enable this fully automated process at a height of 350 kilometres.

Automated docking takes place with the help of the rendezvous and docking sensors RVS TGM (telegonometer) and RVS VDM (videometer). From a distance of around 3,000 metres, the RVS system is able to measure the distance and approach direction of the ATV to the ISS. For this purpose, RVS sends laser beams as short light pulses and a reflector system in the RVS channels these light pulses to the ISS. On the Russian ISS module "Zvezda", to which the ATV docks, reflectors are installed which reflect the laser light back.

This light is recaptured by the RVS. The resulting time difference and the line of sight of the reflector system are used to calculate the distance between the two space vehicles, their relative speed, and the angle of approach, so that an exact and secure docking of the supply vehicle can be effected.

PhotonAix – Competence Network for Optical Technologies

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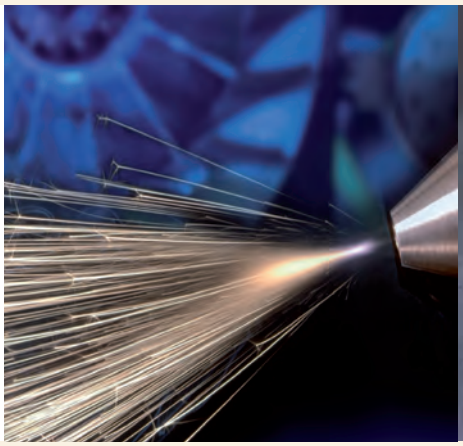

Laser cladding
Source: Fraunhofer ILT

SLM: Selective Laser Melting
Source: Fraunhofer ILT

The network

PhotonAix, the Competence Network for Optical Technologies and Systems, was founded in 2002 by the Fraunhofer Institute for Laser Technology ILT, the Fraunhofer Institute for Production Technologies IPT and the Laboratory of Machine Tools and Production Engineering WZL of the RWTH Aachen. Aachen-based PhotonAix and eight other regional competence networks in the field of optical technologies are concentrating the skills of their more than 400 members from research and industry with the mutual goal of promoting optical technologies in their respective regions.

The technological focus

These networks represent the full range of optical technologies “Made in Germany”, from laser-based materials processing and biophotonics to transportation and aerospace applications.

They are primarily engaged in providing services such as technology management, start-up consulting, regional technology and industry marketing, quality training and education initiatives, as well as fostering communications within the network.

The regional concentration of expertise leads to practical, real-time problem resolution and an accelerated transfer of research results into market-ready products.

The unique features

Besides participating at Photonics West in San Jose, Optatec in Frankfurt and LASER in Munich as a joint exhibitor with the other German competence networks for optical technologies, other major activities were the Photonics21 European technology platform and the formation of the North Rhine-Westphalian initiative NRW-Photonics.

The objective of the Photonics21 technology platform is to further strengthen Europe’s leading role in the field of optical technologies and to coordinate joint research and development activities.

PhotonicNet - Optical Technologies Competence Network in Lower Saxony

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Kompetenznetz Optische Technologien

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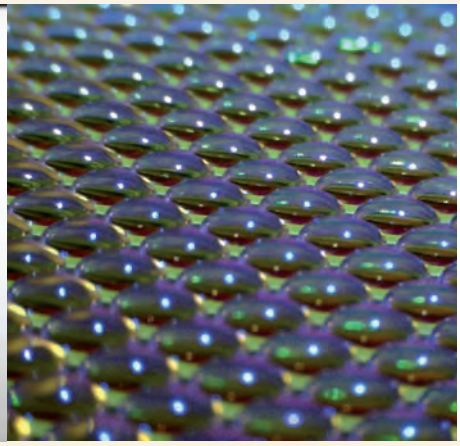
Interference filter
Source: Laser Zentrum Hannover e. V.



Polymer microlens array

The network

PhotonicNet is a partnership of internationally renowned research centres, universities and world leading companies in the field of optical technologies, with core competencies in “optical precision technology”.

The cooperation between industry and science opens up the enormous potential the tool “light” offers, providing a fast and efficient transfer of scientific knowledge and technology to the market.

40 PhotonicNet partners with 3,500 employees generate significant synergetic effects through an intensive dialogue between R&D, production and application.

The technological focus

The technological core competencies within the network are in the area of optical precision engineering, with special emphasis on:

- photon sources and systems
- optical and precision engineering components and systems
- coating, micro-optics
- micro and macro material processing
- information and communication technologies
- measurement, sensors and metrology
- life science and biomedical engineering
- microscopy
- technical and further education
- innovation transfer.

You will find a selection of examples of these core competencies on our website.

The unique features

International commitment

The supra-regional network OptecNet Deutschland e.V. was founded with the intention of effectively representing the nine regional networking initiatives on the national level and expanding the international presence of optical technologies “Made in Germany”. A total of more than 450 members profit from this common platform with a global web presence, large booths at international trade fairs and congresses, and nationwide and international PR and media.

In addition, PhotonicNet is in contact with the Scottish Optical Association (SOA), especially in the field of biophotonics.

The “Kaiser Friedrich Research Prize”

In 2003, PhotonicNet launched a unique research award for optical technologies. The “Kaiser-Friedrich-Forschungspreis” is awarded every two years and endowed with 15,000 euros. The prize money is donated by Stöbich Brandschutz GmbH.

Photonics BW e. V.

Photonics BW
Kompetenznetz Optische Technologien

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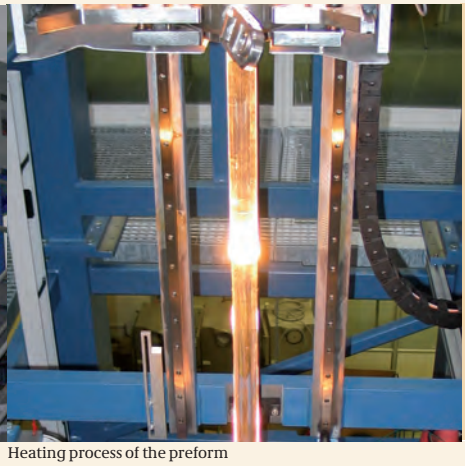
Fibre manufacturing facility


Heating process of the preform

The network

The competence network "Photonics BW e.V." was founded in July 2000 as a BMBF-funded non-profit association with the goal of supporting and promoting optical technologies in Baden-Württemberg.

Our objectives:
- support for regional cluster-building
- promoting the advancement of optical technologies in research, development and application, training and education, promotion of science in education and public relations
- promoting the three-way dialogue between industry, science and government
- strengthening international competitiveness
- building a sustainable future for the business economy of Baden-Württemberg.

The technological focus

We promote the optical technologies in the areas of research, development and application.

Photonics BW working groups
Forging links between science and industry is one of the fundamental aims of Photonics BW. To promote efficient R&D processes and facilitate rapid product implementation, the network has set up six working groups, in which experts meet at regular intervals to share their knowledge and to discuss topical issues arising at the pre-competitive and non-commercial level of research.
- Laser materials processing
- Optical design and simulation
- Optical communications
- Optics in medicine and biotechnology
- Optical measurement techniques
- Training and consulting.

The unique features

Fibre manufacturing facility at the Institut für Strahlwerkzeuge (IFSW) of the Universität Stuttgart
At the beginning of 2008, the IFSW set up its new fibre manufacturing facility, which allows research on novel optical fibres for laser technologies.

The new equipment now available at the institute will in particular enable the development of novel beam delivery fibres for the flexible transmission of high-power and high-brilliance laser radiation. This will help to decisively improve the capabilities of existing and future continuous wave and pulsed laser sources with high power and high beam quality.

The IFSW takes a holistic research approach and is also active in process development for laser applications and laser-based manufacturing.

Silicon Saxony e. V.

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Network Thinking – Growing Together
Source: www.photocase.com

The network

Silicon Saxony® is Europe's largest and most successful branch association for the semiconductor, electronics and microsystems industry. Established in 2000 as an initiative of 20 partners, it now links 270 commercial enterprises, research institutes, universities and colleges. The competencies of its member companies represent the entire value creation chain of the microelectronics industry. In addition, the member companies are increasingly entering such growth sectors as the photovoltaics and solar industry and the software sector.

The technological focus

Silicon Saxony®'s associated members employ more than 35,000 people and generate over four billion euros per year. Innovation, successful promotion policies, profitable investments, the exemplary commitment of member companies, and a well-structured network are the foundation of our success: today Silicon Saxony® is the largest semiconductor cluster in Europe. We are working intensively to cooperate with other network organisations of microelectronics centres across Europe. It is our common goal to strengthen the European microelectronics and semiconductor industry in the face of global competition. We invite you to accompany us on this path and to contribute to the further growth of Silicon Saxony®.

The unique features

With the objective of strengthening the sustainability of the business region of Saxony as a location for microelectronics at both the national and international level, the association sees itself as a communication and cooperation platform for its members. The close cooperation existing within the network promotes and stabilises the economic development of the member companies. Intelligent cooperative partnerships among the members make for knowledge transfer, synergies and close business relationships and promote innovative capacity. Outwardly, Silicon Saxony makes a vital contribution to actively marketing Saxony as a business location and creating networks among European microelectronics locations.

In May 2009, Silicon Saxony® organised the fourth "Silicon Saxony Day". This is both a semiconductor conference and a trade show, offering all member companies the opportunity to present their products and technologies. The 2009 event took place at Dresden Airport and reached an international level. Over 70 exhibitors and nearly 70 conference contributions presented the complete performance range of the European semiconductor industry and research institutions. The fifth "Silicon Saxony Day" will be held on 18 and 19 May, 2010.

SpectroNet & VisQuaNet – The Imaging & Vision Network

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System solution Vision Components smart cameras
Source: www.vision-components.com

The network

The competence network SpectroNet & VisQuaNet operates within a branch of industry and creates system solutions for visual quality assurance with colour and spectral imaging using hardware, software, services and training in research and industry, food and health care, transport and environment, and security and administration. The network member enterprises and research facilities are located in middle, southwest and southern Germany (Berlin, Erfurt, Ettlingen, Ilmenau, Jena, Konstanz, Nufringen, Puchheim, Schmalkalden, Stuttgart and Waghäusel).

The technological focus

The technological emphasis of our network is placed on the innovation field of optical technologies. As enabling technologies, with their connections to modern information and communication technologies, they are converging independently of location, branch, and cluster in the growing markets of visual quality assurance with digital, colour and spectral imaging.

The unique features

The highlights are miniaturised system solutions with hardware, software, services and training for visual quality assurance with color and spectral imaging

- to see what the human eye cannot see,
- to see beyond where the eye can reach,
- to analyse coloured objects,
- to visualise complex situations,
- to capture important situations,
- to implement mobile data transfer,
- to process data reliably.

The fields of application are research and industry, food and health care, transport and environment, and security and administration.

Further highlights are collaboration forums and network-supported qualification measures to train certified TÜV Innovation Consultants.

Strategic Partnership for Sensor Technology

Sensors Bavaria
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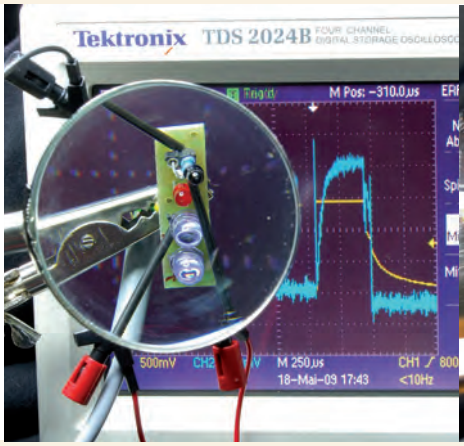

Sensor technology is a key technology


Sensor technology in the beverage industry
Source: Krones AG

The network

In the context of the Bavarian Clusters Campaign, a high tech initiative of the Bavarian state, the Strategic Partnership for Sensor Technology (SPS) acts as network platform for the field of sensor technology. This network, with its over 45 members from industry and business and its 150 partners, promotes company networking, competence development and advancement of innovation. The SPS subsidiary Sensorik-Bayern GmbH supports SPS as a service company, initiating and accompanying R&D projects to completion and offering its customers a large range of specialised services.

The technological focus

The central goal of this technology network is to increase the market opportunities of Bavarian sensor technology companies, which are all active in the development, production, sales or application of sensors. To achieve these goals, SPS intensifies the initiation of cooperation agreements and joint projects on regional, national and international levels. In addition, the sensor technology network expedites the expansion of research capacities at Bavarian universities and supports knowledge and experience exchange between large corporations, small and medium-sized businesses, and universities. In addition to organising workshops, technical forums, conferences and publications it is the declared goal to stimulate cooperation.

The unique features

SPS offers customised service packages to its members. The network, with all its members and partners, is supported by its subsidiary Sensorik-Bayern GmbH, which was established in 2007 by SPS. Its main goals are to initiate and carry out joint and funded projects as well as offering services in research and development, innovation management and technologically oriented management consultancy. Clients from small and medium-sized enterprises are provided with sensor-specific know-how for developing their innovative products, while major producers can use the network services to adjust their company resources in a flexible manner. The technical focus is on sensor system development, measuring and testing tasks and feasibility studies. As a further service for its members, SPS operates a sensor technology professional pool as an interface between employers and applicants. This online platform for applications and job opportunities offers active support for small and medium-sized businesses and serves as a catalyst in the application process.

Center for Microsystems Technology Berlin (ZEMI)

ZEMI
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Use our portfolio according to your requirements
Source: ZEMI, Photos: BAM V.4, HZB AZM, FBH, B. Schurian, Fraunhofer

The network

The Center for Microsystems Technology in Berlin (ZEMI) is an association of research institutes which focuses on the regional research and development potential in microsystems technology. As a one-stop agency, ZEMI is the central contact for industry cooperation and particularly supports small and medium-sized companies via technology transfer.

The technological focus

The competencies of ZEMI cover the entire scope of the value-added chain – from the design and development of production processes, the production of prototypes and the realisation of small series up to the testing of the microsystems. Our extensive portfolio helps to shorten the development periods of industrial partners, thus reducing investment costs.

These are some examples of services in the ZEMI competence fields:

Design and simulation
- system design
- VR applications
- simulation

Production technologies
- material development
- microtechnological processes
- laser structuring
- microforming
- microassembly
- system integration
- packaging

Test and analysis
- process analysis
- function and reliability tests
- damage analysis.

The unique features

In addition to competent and extensive project management, ZEMI also provides requirement-oriented educational programmes and training, advice for industry partners and support for companies in regard to continuing and further training.

With the Microsystems Summer School in Berlin, the ZEMI partners make their regional competencies in microsystems technology accessible as a nationwide offer in academic training. Employees of companies, graduates and PhD students of natural and engineering sciences are given an outline of trends in microsystems technology research.

ZEMI also coordinates several networks in the field of education and in fields of application of microsystems technology. ANH Berlin, for example, offers a broad practice-oriented spectrum of services for vocational training. Focal offers of this network are consulting about suitable professions, support in finding applicants for vocational training, administration support and additional training courses for companies which will prospectively start vocational training and need support in administration, know-how and organisation.

cc-NanoChem e.V. Competence Centre – Chemical Nanotechnology for New Materials

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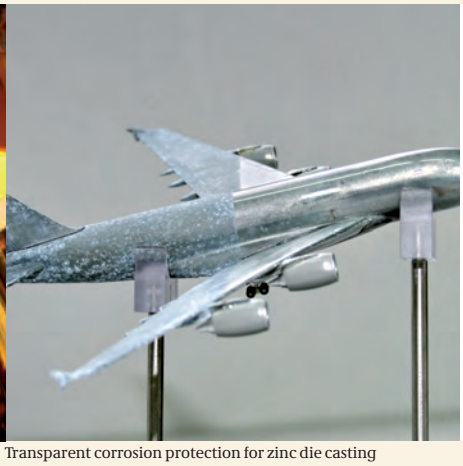
Getting students interested in nanotechnology


Transparent corrosion protection for zinc die casting

The network

Chemical nanotechnology is a future key technology. Whether in automotive engineering, optics or electronics, in medical technology or civil engineering, nanotechnology has an enormous market potential.

cc-NanoChem e.V. unites the following participants with a focus on chemical nanotechnology: notable industrial enterprises, nanotechnology users and producers of nanomaterials from medium-sized enterprises, independent contractors from the patent, consulting, and service fields, universities and research institutes. The branch office is located at the renowned INM Leibniz Institute for New Materials in Saarbrücken.

The technological focus

Currently, our focus is on three platforms with promising industrial potential:

- nanoparticle technologies and the resulting industrial applications
- surface technologies and the resulting innovations in many branches
- nanomaterials for applications in the life sciences.

Chemical nanotechnology is the basis for new materials with new functional properties. Existing products are improved and completely new ones are developed.

Qualities like scratch-resistant, easy-to-clean, abrasion-resistant, antibacterial, corrosion protection, anti-fingerprint, anti-graffiti, anti-fog, fire protection, photocatalytic and decorative can be combined practically at will.

The unique features

Members of cc-NanoChem profit from the following benefits:

- always the latest news by e-mail
- early information about new support programmes
- mediation of project partners
- linking-up of customers and suppliers
- exertion of influence on decision-making bodies
- free-of-charge or reduced-rate access to events
- exchange of experience at thematic workshops organised by network partners
- assistance with feasibility studies
- expertises on safety and sustainability
- large online member area
- database with over 500 presentations
- utilisation of offers of partner networks.

CFK-Valley Stade – New manufacturing methods and automated production processes for composite lightweight construction

CFK VALLEY STADE™

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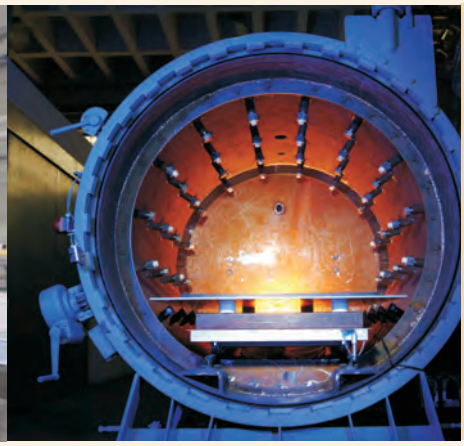
Automatic tape-laying process
Source: M Torres



First microwave autoclave in the world
Source: Deutsches Zentrum für Luft- und Raumfahrt (DLR)

The network

The CFK-Valley Stade Competence Network develops emerging construction methods and automated manufacturing processes in the carbon fiber reinforced plastics (CFRP) growth market. The interdisciplinary core competencies represented by leading experts at CFK Valley Stade e. V. cover the entire value creation chain, from the composite training of highly qualified personnel, to design and serial production, to the disposal of CFRP structures at the end of their operational life. The focus is on all industries in the mobility and mechanical engineering sectors.

The technological focus

Approximately 90 national and international companies and research institutions have already combined their complementary know-how in the CFK-Valley Stade network of competence.

In view of the market needs for shorter development times, reduced costs and higher production rates, the members of CFK-Valley Stade have set themselves the ambitious goals of:

- developing process chains for automated production
- falling below the cost-per-piece of lightweight metal components
- increasing production rates
- training highly qualified personnel
- shortening development times
- settling selected suppliers and development partners in the region.

These goals are realised in 12 task-specific project and work groups. The resulting knowledge benefits all participants and brings about technological innovations that create competitive advantages in the competition for customers and market shares.

The unique features

Optimal infrastructure in one location

Together with renowned companies and research establishments, an innovation complex with an excellent infrastructure has been created under the umbrella brand name of “CFK-Valley Stade”. The nucleus is the Technology Centre with room for the development activities of the members. The annexed Service Centre makes it possible to settle further development partners. An international event (CFK-Valley Convention) and a University of Applied Sciences round off the range of services on location. In addition, a large-scale research centre is currently under construction.

Globally unique composites study courses

Highly qualified composite engineers and skilled workers with knowledge in composite processing are essential for a greater market penetration of CFRP material. In order to meet this need, CFK-Valley Stade has set up two trend-setting study courses with leading representatives from the industry and with the University of Applied Sciences in Göttingen (PFH). These courses culminate in the degrees

- Bachelor of Engineering and
- Master of Science.

Recycling

A CFRP recycling centre started operations in Stade in 2008 with the aim of providing a guarantee to CFK-Valley partner companies that they will be able to send in their CFRP components and semi-finished materials for recycling as of 2010.

Textile Research Council

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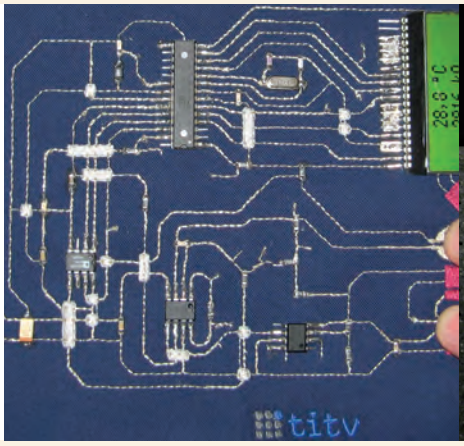
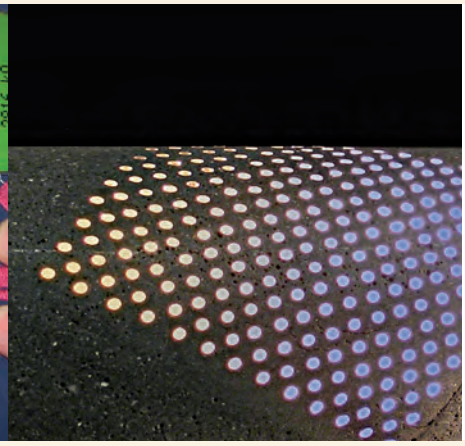


Embroidered circuit for temperature measurement
Source: Textilforschungsinstitut Thüringen-Vogtland, Greiz



Translucent concrete structure
Source: Inst. f. Textilmasch. + text. Hochleistungswerkstofftechnik

The network

The Textile Research Council (FKT) promotes and coordinates industry-driven cooperative research projects and strives to develop the overall performance of textile research. Research activities are funded by the Federal Ministry of Economics and Technology (BMWi) and carried out in cooperation with 15 research institutes. In total, 20 textile industrial associations representing more than 1,500 companies are involved, operating along the whole value-added chain including such auxiliary segments as textile machinery engineering, chemical fibres and textile-related services.

The technological focus

The core topics driving research in textiles can be classified according to their future impact on society as a whole:

Health
In the sectoral vicinity of medical technology, biotechnology, pharmacology, outpatient and home care services and other health-related areas, textiles can contribute significantly to improving the productive efficiency of health care.

Mobility
The application of textile solutions in light-weight fibre-reinforced composite materials for vehicle and aircraft construction plays a decisive role in reducing energy consumption and pollutant emission.

Safety
Textiles offer a wide range of solutions in the area of safety and protection, solutions which allow for the equal priority accorded to safety and comfort nowadays.

Communication
In order for textiles to be part of successful applications in the core innovation areas mentioned above, progress in the integration of microsystems technology in textiles must be made.

Emotionality
Textiles fulfil an essential emotional function for the user – a function that is as important as the technical innovation potential.

The unique features

The services delivered by FKT in the area of technology transfer include publications, conferences and workshops that are produced or organised by the commissioned research institutes. The annual Textile Research Report introduces the most recent research results in the form of synthesis reports with references to the corresponding publications. Via the Internet platform of the FKT, members and associated enterprises can access detailed information. Furthermore, a textile database with worldwide research results is available on www.fiz-technik.de.

Currently the focus of research promoted by the Federal Ministry of Education and Research (BMBF) is placed on the integration of microsystems technology in technical textiles and the application of nanotechnology in textiles. An AiF-DFG Cluster Initiative aims to link fundamental research with industry-related applied research activities.

In order to establish international networks, the FKT participates in preparing and formulating research projects within the framework of the EU Framework Programme for Research and Technological Development.

Northern Germany Surface Technology Engineer Competence Centre (I-KON)

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Automatic coating
Source: Stäubli


Manual coating

The network

I-KON is the practically orientated network for surface technology. Its participants' competencies support the development of complete innovative solutions for the industry.

The competencies of the members hailing from the industry, the service sector, research institutes and universities complement each other, including basic and advanced education and professional training.

The competence network I-KON was established in 2005 with the kind support of the Lower Saxony state government. It operates nationwide, with a European focus.

The technological focus

The members offer products and services for the following areas of surface technology:

- pre-treatment
- coating technologies
- paints, testing, processing
- drying technologies
- facility construction
- environmental protection
- economic effectiveness
- process security
- basic, enhanced and professional training
- miscellaneous.

We focus on improving economic and energy efficiency, enhancing the quality of the production process and developing innovative paint systems, highly abrasion-resistant paints and novel plant technologies. Close cooperation between and extensive knowledge from theory and practice lead to the rapid development of procedures and the necessary facilities to implement these advanced processes, which include nanotechnologies such as "thinking" coats.

We sort the problems of surface technology into the appropriate groups and offer solutions for them, leading to the development of novel processes and techniques. This means that special, individual solutions are generated for problems ranging from mechanical and chemical pre-treatment to the finished, coated product, solutions which leave the plants and processes currently on the market far behind them.

We pay special attention to energy conservation (sectional aeration), cost-effectiveness (automation, logistics), and environmental protection (exhaust air and water purification).

The unique features

I-KON develops practically orientated innovations in surface technology. We promote cooperation between members, thus enhancing the companies' economic efficiency for the benefit of the users. Companies of the manufacturing industry receive targeted information and counselling from our members in the form of short advisory sessions, which include a determination of the status quo, an on-site survey, a discussion of the current situation, the identification of individual possibilities for process optimisation, and means of complying with environmental standards.

The "Promotion of R&D projects" task force provides information about funding programmes and offers advice on defining research projects, acquiring the appropriate type of promotion and finding the right partners.

Network of Competence Industrial Plasma Surface Technology

Kompetenznetz INPLAS

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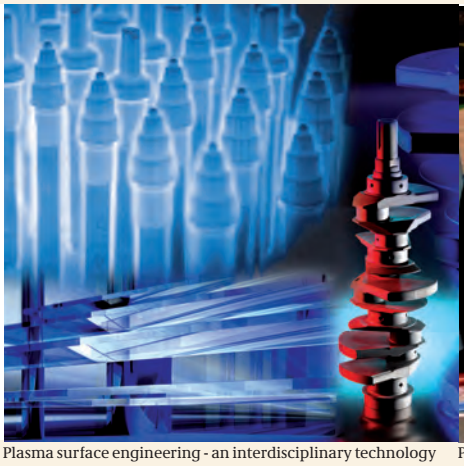

Plasma surface engineering - an interdisciplinary technology

Parliamentary Evening in Berlin

The network

Plasma is an important tool for the production of high-quality thin films and a key technology for innovative surfaces and new products. The spectrum of application fields ranges from the hardening and tempering of metal surfaces in the automobile and tool construction industry, to the coating of architectural glass and plastics, to the treatment of surfaces for biological and medical applications and microelectronics. The applications are getting more and more demanding; process cycles, on the other hand, must be simplified in order to reduce production costs.

The technological focus

INPLAS considers itself to be the central contact point for all matters concerning plasma surface technology. As an interdisciplinary key technology, plasma technology is represented in the following application fields:
optics and glass, automotive and aerospace, information technology and electronics, power engineering and energy management, environmental engineering and life science, mechanical and agricultural engineering tools.

To further the strategic development of plasma surface technology, work in the areas mentioned above is promoted in six technology-oriented workgroups. The workgroups consist of employees of the member companies and institutions.

Currently, the following thematically focused workgroups are active:
new plasma sources and processes, optical coatings, large area coating, wear protection of components, hard and super-hard coatings for tools, plasma polymers and biofunctional coatings.

The aim is to pursue project ideas, initiate and realise projects, and develop strategic research targets in order to present a strategic concept for the documentation of the research needs in plasma surface technology.

The unique features

Mechanical / automotive engineering and tool construction

- enhancements in performance and lifespan (e.g. development of a gearbox weighing 36% less)
- reduction of energy losses.

Photovoltaics

- Advances in plasma technology will make production of thin film solar cells much cheaper. Today, quantitatively and technologically, Germany is the world leader in the field of photovoltaics.

Coating of glass and transparent materials

- temperature-resistant and electrically conductive transparent layer systems
- transparent scratch protection on soft polymer surfaces (e.g. replacement of heavy mineral glass with polycarbonate in the automobile industry).

Atmospheric plasmas

- coating or functionalisation of hardly accessible surfaces of microcomponents (e.g. internal coating of cavities and small tubes, etc.)
- specific adjustment of wetting behaviour for biotechnology.

Intelligent surfaces

- coatings with switchable optical and thermal properties
- self-cleaning surfaces on the basis of photocatalysis
- coatings with integrated sensors for force, temperature, and distance measurement.

KompetenznetzeDeutschland
Kompetenznetzpreis 2009 | 3. Preis

Lüdenscheid Centre of Competence for Surface Technology and Plastics

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Innovations for the plastics industry

The network

In the Centre of Competence for Surface Technology and Plastics, partners from a number of sectors collaborate on R&D projects and organise training opportunities for their members. It is a continuously growing network, focused on sustainability and financially supported exclusively by external industrial funds. The network is represented by the Kunststoff-Institut für die mittelständische Wirtschaft NRW GmbH, focusing on improving the quality and efficiency of injection moulded parts.

The technological focus

The network's activities focus on surface engineering and decorative finishing processes for plastic components, the modification and functionalisation of moulds and component surfaces, and analysis and testing. The various working groups in the network are currently dealing with the following topics:

- surface treatment and decoration for plastic parts
- lotus effect® on plastics
- hybrid technologies, plastic-metal composites
- surface and thin-layer technologies for moulds
- optimising surface properties by inductive heating of injection moulding tools
- creating design surfaces with combined surface and thin-film technologies
- creating biomimetic surfaces
- antibacterial plastic surfaces
- lubricant-free injection moulds
- back injection of metal.

In addition, the following services are offered:

- process development and optimisation
- extensive analysis technology (colour and gloss measurements, surface energy, scratch and abrasion resistance, measurement of coating thickness)
- application-oriented selection of surface and layer technologies for moulds
- complete execution of processing steps: definition of pre-treatments and after-treatments, sampling of individual decoration processes including the introduction of new decoration technologies (prototypes, sampling, practical damage analysis).

The unique features

Application Centre for Surface Technologies (AOT)
The AOT was equipped with systems for various coating technologies. This equipment allows the quick production of prototypes, close-to-production sampling, and small-batch production based on established processes.

The Centre comprises the following core stations: a robot coating station, a plastic electroplating station, a coating station using cubic printing / digital direct printing and an IMD manufacturing cell.

In addition, various printing systems, a laser and a blasting system were installed. The test and analysis department was also expanded considerably. Technology transfer shows possible applications for innovative surface treatment methods. Companies can test these applications at the Centre and apply new surface technologies to their initial samples without having to invest in new equipment themselves at this early stage. Failure analyses are also possible, thereby securing running processes. The Institute also offers capacities for development and technological expertise, such as

- a laboratory accredited according to DIN EN ISO/IEC 17025
- material and damage analyses
- process engineering and development
- moulded part and mould optimisation
- quality and environmental management.

Plastics Innovation Centre Aachen

INSTITUT FÜR
KUNSTSTOFFVERARBEITUNG
AN DER RWTH AACHEN

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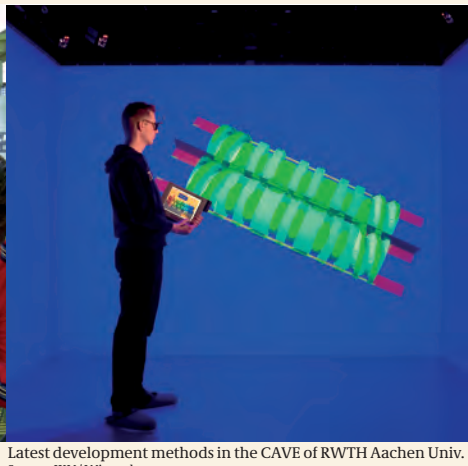
Blown film unit in the IKV extrusion experimental plant
Source: IKV / Winandy



Latest development methods in the CAVE of RWTH Aachen Univ.
Source: IKV / Winandy

The network

The plastics industry established the IKV – the Institute of Plastics Processing – as a central research facility in 1950. The focus of this network is on converting the knowledge of plastics into successful innovations. The Association of Sponsors of the IKV with 250 companies in the plastics segment is a member of the AiF (German Federation of Industrial Research Associations), and sponsors small and medium-sized enterprises through joint research. With its head Professor Walter Michaeli and with its practically oriented research, the IKV is able to train highly qualified plastics engineers.

The technological focus

The research carried out by the IKV and its network partners is oriented to the needs of industry, and is focused on the processing of plastics and rubber. For this purpose, the IKV is subdivided into four specialist departments: Injection Moulding/PU, Extrusion and Further Processing, Part Design/Materials Technology, and Composites/PU Technology.

The key areas of activity include the design of moulded parts and tools, the improvement of machines and plants, and the optimisation of manufacturing processes. Apart from that, the IKV studies aspects of quality assurance, materials technology and economics.

The Centre for the Analysis and Testing of Plastics (KAP) at the IKV is dedicated among other things to examining and assessing damage in plastic components. As a result, production processes can be optimised and the choice of the “right” plastic can be made easier.

The Training/Skilled Crafts department at the IKV provides a comprehensive range of further training courses in plastics processing for the skilled crafts in 40 plastics training centres in Germany. In this segment, plastics are increasingly replacing traditional materials.

The unique features

Overall, the IKV offers a unique “consistency” in plastics research, because it has the means to answer all research issues that arise in the development chain from the original idea to the finished product.

The Association of Sponsors of the IKV includes representatives from the whole value chain of the plastics industry. The members of this unique network benefit directly from the research results of the IKV and are thus able to decisively improve their competitiveness.

With over 300 staff and its outstanding connections with industry and the university, the IKV is nowadays globally recognised as one of the major research institutes in the field of plastics processing. The research partners of the IKV have direct access to the latest developments and the extensive knowledge from 60 years of research activity.

The International Plastics Colloquium, the many regular specialist conferences, and the IKV’s participation at trade fairs ensure a broadly based transfer of plastics technology.

KompetenznetzeDeutschland
Kompetenznetzpreis 2008 | 2. Preis

Frankonia Plastics Network (KNF)

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The Frankonian Engineering Forum

"Best network service 2008" award ceremony in Berlin

The network

The Frankonia Plastics Network (KNF) was established by an initiative of enterprises of the plastics industry based on the conviction that dialogue and cooperation between enterprises is fruitful for all sides. A platform for mutual exchange was initiated to allow companies to exchange technical information and give them the opportunity to find common solutions for their often similar problems.

The emphasis is on information management and exchange of experience on all company levels.

The technological focus

The processing of polymeric materials along the value chain is the focus of our work. KNF brings the actors together in "competition-free" situations, offering them the chance to work on self-defined technological problems.

By involving all company levels, it is possible to generate comprehensive solutions. Cooperation between plastic processors, tool makers and technology-oriented suppliers creates greater transparency for all as far as the current state of plastics technology is concerned. This makes quick, non-bureaucratic, mutual support possible for all participants and shortens the start-up times of cooperation projects. Mutual support ranges from resource sharing to information and experience sharing concerning processes and technologies up to joint education and training.

The unique features

In technology-oriented task groups, novel approaches to surface treatment have been developed. Thus, for example, the intelligent combination of known processes made it possible to apply a high-quality coat of paint to a hitherto uncoatable plastic surface. There is an intensive exchange of views on all facets of plastic processing, from toolmaking to the end product and from automation technology to energy efficiency.

Implementing a new training concept
In a training programme accompanied by scientific monitoring, plastic specialists are being trained to become generalists with the task of preventing efficiency losses at interfaces within individual companies as well as across company borders. In February 2008, this concept was awarded the prize (by Kompetenznetze Deutschland) as "Best Network Service." In addition, the network designs and implements cross-company training programmes and services.

Design and implementation of an education initiative in the plastics industry
The project "MyPlastics – Your Future with Plastics" is intended to encourage qualified young people to apply for technical jobs in the plastics industry. Through information sessions in schools, the pupils´ knowledge concerning training offers and content is enhanced.

Materials Valley e. V.

materials valley

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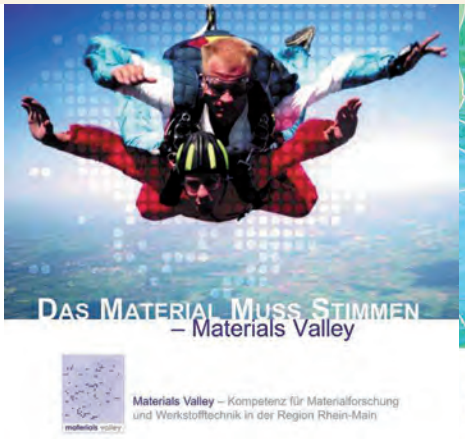

Materials Valley e. V.

Materials Valley e. V.

The network

The Materials Valley e.V. network, established to develop the Rhine-Main region as a high-tech centre for materials research and materials technology, offers conferences (such as the Materials Forum) and workshops on highly specialised topics. Held on site at local companies, the events focus on topics proposed by association members, ensuring relevance to practical needs and applications. In 2009, a series of eight technology-oriented evening lectures (featuring 16 talks) drew about 350 participants, and about 200 attended four workshops that included 47 presentations.

The technological focus

The events focus on materials technology and engineering, chiefly in terms of their industrial applications. The association aims to offer interdisciplinary programmes that facilitate the transfer of expertise from one field to another.

The unique features

Highlights of association activities are the one-day workshops held at member firms, which draw as many as 180 people from all over Germany. The following upcoming workshops will round out this year's offerings:

- Bioactive management and physical methods which stimulate cell growth
- Electrochemical energy, storage and convertor systems
- Thermal management in electronic circuits and LED systems
- Red and white biotechnology: Manufacturing from substances by fermentation methods, their reprocessing and purification

The very positive feedback from people with an interest in technology who attend these events makes it clear that the model of communicating interdisciplinary knowledge meets the needs of industrial-sector participants. At the same time, the events give speakers from industry the opportunity to showcase their companies' technical competence and their own expertise. In many cases, the events have sparked very successful collaboration between member companies and between member firms and research institutes. They have also served as the starting point for development projects sponsored by the German Ministry of Education and Research (BMBF) and others.

RIKO – Realisation of innovative construction materials made from renewable resources

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Hybrid housing for a multi-megawatt wind energy plant
Source: Fassmer GmbH & Co. KG

Finished hybrid housing (exterior view)
Source: Fassmer GmbH & Co. KG

The network

Construction materials made from renewable resources possess a high innovation potential and show concrete approaches towards a sustainable economy in many industrial sectors. Natural fibre-reinforced composites are up to 30% lighter than their glass fibre counterparts while demonstrating comparable physical properties. For over ten years now, the RIKO competence network has promoted the development of this immense potential in lightweight construction and helped create marketable products and technologies made of biocomposite materials.

The technological focus

Fibre-reinforced composites made of renewable resources consist of a (preferably biopolymer) matrix reinforced with directed and / or undirected natural fibres, depending on stress subjection.

Natural ingredients can be bast fibres like domestic flax or hemp, but also a number of new cellulosic continuous filaments as reinforcing components.

Characterised as a matrix, the thermoplastic or duroplastic biopolymers act as a bedding compound and stabilise the fibres. They transfer the external forces into the fibres and protect them from external stress factors.

Various manufacturing technologies, such as pressing and curing, hand laminating, vacuum infusion methods and the pultrusion method are improved and optimised for biocomposite materials by diverse specialists.

The unique features

The RIKO Network of Competence focuses on the comprehensive treatment of all process levels in terms of concurrent engineering.

Among the network's tasks are the targeted market transfer of current and continuously updated results, support in developing products and semi-finished products made of renewable resources, and the setup and maintenance of a central database that provides a wide range of information for companies, research institutions, promoters, associations and the media. In addition, the network focuses on bringing together and networking potential partners in a targeted manner and provides advice, support and assistance to project partners.

Sample project: NFRP-GFRP hybrid housing for a multi-megawatt wind power plant

By manufacturing a housing prototype in the context of this project, it was possible to demonstrate the feasibility of manufacturing large-scale structures with natural materials. It was also possible to use the tools and processes of an already existing serial production for this purpose. A few distinctive features identified during the manufacture of the prototype would make some process adaptation necessary should serial production with natural fiber fabrics be introduced. However, these do not by any means pose an insurmountable obstacle to its implementation.

Bergisch tri-city area automotive economic region

kompetenzhoch3
Wirtschaftsregion Bergisches Städtedreieck

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Pedestrian detection
Source: Delphi electronics & safety

Road sign detection
Source: Delphi electronics & safety

The network

The network's core expertise lies in the fields of metalworking, electric / electronic / mechatronic technologies, surface treatment and coatings. The region is dominated by global players and small and medium-sized enterprises cooperating as suppliers and system specialists. The variety of competitive skills opens up new opportunities for regional and inter-regional networks and cooperation in joint projects in the areas of production, training and education, procurement, sales and marketing, and logistics.

The technological focus

The Bergisch tri-city area is an established focal point of the automotive supply industry. The 280 firms that make up the Automotive Field of Competence currently represent a workforce of 16,000 employees, spread throughout the economic region. Numerous "big players" and market leaders of different sizes conduct their international business from this location: Delphi, Brose and DuPont Performance Coatings in Wuppertal, CRH in Solingen, AVL Schrick developing the latest generation of combustion engines and Volkner producing luxury campers.

This region excels in its range of production and services, which are unique in Germany. The amount of vertical and horizontal integration enabled by collaboration within the region is high.

Rapid implementation of the latest advances in technology among supplier companies through collaborative R&D projects helps the network meet market requirements. In this respect, the Bergische Universität Wuppertal generates synergies, offering the only German institute for safety engineering, along with valuable technical faculties. Current projects in the Automotive Field of Competence focus on technologies to reduce fuel consumption and active and passive safety systems, to name but a few examples.

The unique features

Active Safety Car designed to improve road safety

The Active Safety Car research project is aimed at improving road safety and fuel efficiency. It is part of the Automotive North Rhine-Westphalia programme in Germany. Delphi, a leading supplier for the automotive industry, has been selected to lead the project with the help of researchers from the Bergische Universität Wuppertal, Ceteq, Riedel Communications & Co. KG, Maschinenbau-Kooperation-Wuppertal and Wirtschaftsförderung Wuppertal.

Launched in January 2009, the Active Safety Car project team is developing an active safety system that allows information about potential hazards to be shared and exchanged between vehicles.

Project objectives include developing camera-based pedestrian recognition and high bandwidth car-to-car and car-to-infrastructure communication, establishing a warning suite that alerts drivers to situations that could lead to an accident, and designing an embedded processing technology application.

For more information, see www.active-safety-car.de .

Forestry and Wood Cluster Initiative Bavaria

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The forest/wood/paper cluster - handcraft and high-tech


Wood - a resource used for material and energy purposes

The network

The Forestry and Wood Cluster Initiative was founded within the context of the Bavarian Cluster Initiative in 2006 and aims to foster networking along the wood value chain. The Cluster links up know-how vertically across all sub-sectors and horizontally across departments, the research sector and a great diversity of individual initiatives. Currently more than 500 companies, initiatives and associations are members of this strong alliance. With 200,000 employees and a turnover of 30 billion euros per year, this is one of Bavaria's most important sectors, both economically and socio-politically.

The technological focus

Bavaria boasts a large lumber supply in comparison with its international competitors. It has a modern and sound infrastructure, capable companies and exceptionally well-trained employees. All these factors provide a stable basis for the further development of the forestry and wood sectors. The renowned bavarian education, research and testing facilities contribute to establishing the potential for further growth of the Bavarian forest industry. The large number and great variety of players is a peculiarity of the forest/wood/paper sector. The broad span of participants encompasses, amongst others, forestry (more than 500,000 woods owners), the wood cutting and processing industry, the predominantly internationally active pulp and paper industry, the wood crafts, the sector of energy-producing wood, the trade sector and the subcontractors. The craft sector (carpenters, joiners) alone includes more than 10,000 mostly small and medium-sized companies. This is why connecting the individual players along the wood value chain and improving cooperation between educators, researchers and practitioners is of special importance for the work of the cluster.

The unique features

Within the Cluster, members can make contact with existing regional initiatives and companies which position themselves not primarily as competitors but as cooperating partners. In cooperation with research institutes, neurally structured networks are created which define themselves as learning units. It is the responsibility of the Forestry and Wood Cluster Initiative to support this development. Currently, solutions for such topics as "logistics", "wood mobilisation" and "green building" are being developed. Thus, the cluster management is initiating regional pilot projects and analysing the flow of resources and products in order to develop effective solutions. Cluster surveys and instruments for network financing have been published to date. In addition, companies will find support for international activities here. The cluster is increasingly becoming active in an advisory and informative role on a political level. It addresses topics, acquires scientific knowledge (e.g. climate-neutral building with wood) and sees to the acceptance of these topics on all levels via well-directed public relations. The Forestry and Wood Cluster Initiative defines itself as the trigger of a self-organising and open structuring process. It mobilises slumbering economic potential – with noticeable success.

Mechatronics & Automation Cluster e. V.

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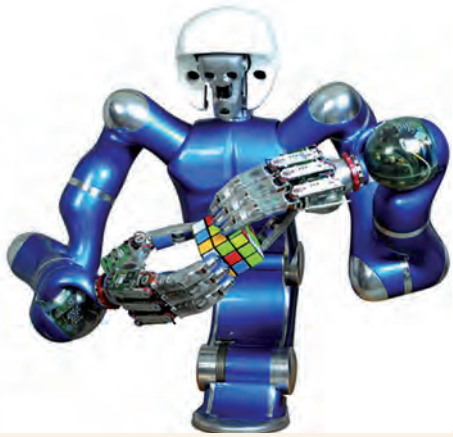
Helical PU transmission



Justin the robot
Source: DLR

The network

Our network is made up of stakeholders from all sectors that have an interest in developing mechatronics and its applications. The Mechatronics & Automation Cluster promotes technical exchange and creates regional value chains. Interlinking the mechatronic competence in industry and scientific facilities strengthens the Bavarian economy and increases the attractiveness of Bavaria as a business location. Our network is a platform and, at the same time, a forum for defining and realising measures which foment the progress of mechatronics and its adjoining disciplines.

The technological focus

Members of the Mechatronics & Automation Cluster contribute their know-how in such scientific fields as mechanics, electronics and informatics, thus guaranteeing the integrative character required by the discipline of mechatronics. The Cluster has performed essential basic work on industrial problems in over 40 projects, thus offering valuable support in the conception, development and production of mechatronic systems with the highest reliability and acceptable costs. The Cluster is concerned with mechatronic methods of development, production, and operation, mechatronic drives, robotics, micromechatronics and smart materials. The network's core competencies are product and production technologies, control and regulation algorithms, experimental verification and virtual prototypes. In task groups, questions are discussed concerning resource-efficient production, man-machine interaction, micro-mechatronic system integration, and new sensor-actor materials and structures.

The unique features

"With the third-generation lightweight construction robot, developed in the Mechatronics & Automation Cluster network, we are approaching the limits of what is physically possible", says cluster member and director of the Institute for Robotics and Mechatronics, Professor Gerd Hirzinger, referring in particular to the robot's nearly 1:1 ultimate load/weight ratio. Instead of mechanically rigid, heavy construction elements, it uses much lighter components, but with correspondingly lower flexural strength. In order to achieve the necessary accuracy of movement for positioning, each of the robot's "limbs" is equipped with an extensive set of sensors, integrated digital and analogue signal processors, robust onboard data processing circuits and its own power electronics. These features were developed, built and tested by various partners of the Mechatronics & Automation Cluster using concurrent engineering.

The Key Region – Velbert / Heiligenhaus

SICHER!
VELBERT. HEILIGENHAUS
Die Schlüsselregion.

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A network meeting of The Key Region


Security systems from The Key Region

The network

The Velbert/Heiligenhaus region, located in the triangle formed by Düsseldorf, Essen and Wuppertal, is home to the leading cluster in the security and door hardware technology area. Under the name The Key Region, it takes front rank not only in Germany, but also internationally: there is no other region in the world with a similar cluster structure in this branch of business.

The Key Region association is the cluster initiative of the region – a network of companies, institutions and universities in a cluster concerned with locking, securing and door hardware.

The technological focus

Over 7,000 people, i.e. around 16% of all employees in the security and door hardware technology branch in Germany, work in the Key Region in over 70 enterprises. Together with upstream and downstream branches such as electronics, toolmaking, casting, surface refinement, plastics engineering and others, security and door hardware technology make up the value chain of the locking, securing and door hardware cluster. Around 17,000 people are employed in Velbert and Heiligenhaus in this value chain.

The marked specialisation of the region is emphasised by the presence of cluster-specific institutions such as the Professional Association of the Lock and Door Hardware Industry, the Testing Institute of the Locks & Fittings Quality Assessment Association, and the Joint Training Workshop of the Industry, which is strongly geared toward the cluster.

The unique features

Campus Velbert/Heiligenhaus
Campus Velbert/Heiligenhaus is the cluster brand for universities in the Key Region, which are located in Velbert/Heiligenhaus due to the cooperation with the cluster initiative and work closely together with the local industry.

The Bergische Universität Wuppertal has a base in the Key Region with its Institute for Security Systems. The Institute was founded in 2007 as a public-private partnership between business, science and local authorities.

The Hochschule Bochum, located at Campus Velbert/Heiligenhaus since 2009, offers in-firm training in combination with academic studies, leading to a bachelor of engineering.

The Campus Velbert/Heiligenhaus functions as the think tank of the cluster, creating a knowledge base for entrepreneurial innovations by providing new insights into areas of future significance. In addition, it contributes to delivering skilled employees for the cluster.

FORMETA – Forum for Metal Working

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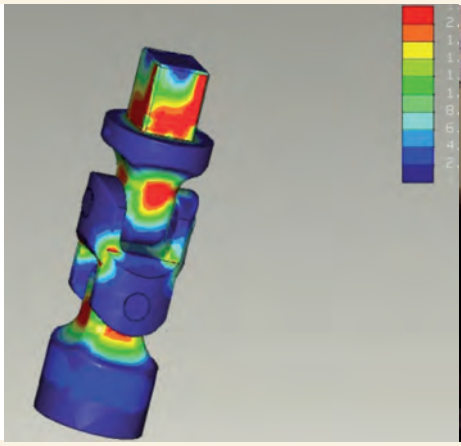
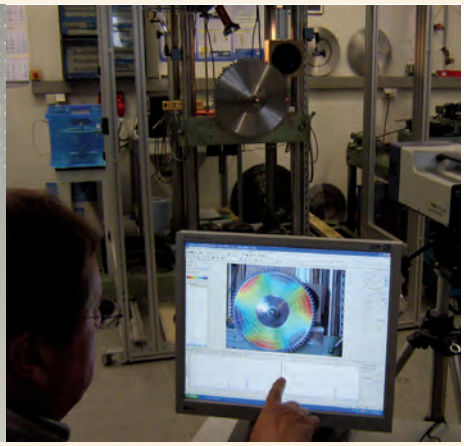


Development of a connection assembly to increase endurance
Source: FGW



Oscillation analysis of rotating tools
Source: FGW

The network

Innovation born out of tradition – tools and cutting tools with an international reputation and high-precision components for mechanical engineering are produced in the Bergisch tri-city area.

FORMETA mobilises competencies from a well-established and at the same time highly innovative area of interest. Cutting tools made in Solingen and tools from Remscheid are well-known all over the world and they decisively influence the international market with the terms “Made in Germany”, “High-quality tools made in Germany” or with the brand name “Solingen”.

The technological focus

An important concern of FORMETA is the research and development prior to competition and irrespective of the line of business. In almost 200 cooperation projects, application-oriented solutions were elaborated for the member companies of the network. The FGW (Research Association for Tools and Materials), as a member association of the AiF (German Federation of Industrial Research Associations), supports the competence network actively and takes care of partner acquisition, filing of applications, planning of financing, project realisation, administrative support and reporting. In 2006, there was a budget of over 2 million euros available for cooperative technology development. At present, the network manages more than 30 projects with a total volume of over 13 million euros. The funds brought into the projects by the enterprises themselves amounted to almost 1 million euros in 2006. This shows that the industrial members of the network are actively engaged and play an active part in the research projects.

The following topics have top technological priority:

- machine and manually operated tools and cutting tools
- innovative materials
- intelligent tools with adaptronic structures.

The unique features

FORMETA arranges regular series of seminars and informative meetings for its members. In June 2007, more than 50 high-ranking representatives of science, trade and industry came together at the meeting of the expert committee on residual stresses in Remscheid. During the scientific discourse, new measuring methods and procedures and current problem solutions were discussed. The FORMETA competence network was a co-organiser of the event.

FORMETA was the main organiser of the tool seminar “It’s Tool Time”. This time, this regularly held series of events dealt with the Equipment and Product Safety Law and its implications. The almost 100 representatives of tool manufacturers and distributors were able to get some first-hand information about the legal requirements and their consequences for everyday business. In further meetings, the results of currently running and recently finished research projects will be disseminated.

ICM – Institute of Mechanical and Plant Engineering Chemnitz e.V.

ICM
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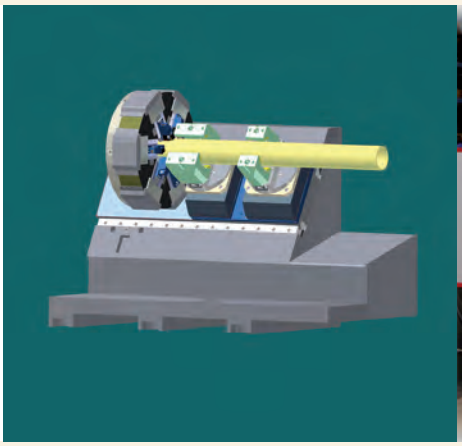

ROTA – Technology for complete machining

Prototype of the ROTA system

The network

ICM e.V. was founded in 1992 and is a recognised private non-profit R&D institution.

1. Product innovation

- Development of systems to monitor and control processes
- Special technologies for complete machining
- Product and concept development for recycling technologies
- Ergonomic and safety-related design.

2. Process innovation

- Methods for innovation processes between SMEs and service providers
- Development of models for supply structures
- Research on the globalisation capabilities of SMEs
- Developing hybrid products.

The technological focus

Projects in the area of process innovation

NEMO Network "RailTecNet" (Competence network for special rail engineering and technical steel construction)
RailTecNet aims at developing new market opportunities through innovative facilities, equipment, and technical solutions and technologies in railbound plant, component, and special mechanical engineering.

INNVELO
The ZIM-NEMO network INNVELO is developing an innovative traffic and logistics concept for metropolitan areas using electric vehicles for individual and municipal transport.

Projects in the area of product innovation

ROTA - Technology for the complete machining of rotation-symmetric components (InnoWatt)
The ROTA project developed a fully automated machine system for the modular processing of pipes made of steel, stainless steel, and non-ferrous metals. This system processes the ends of pipes used in petroleum and natural gas extraction plants more efficiently.

Process optimisation of the interlocking of intramedullary fixations (ProInno II)
The objective of the project is to develop an internationally unique, modern and efficient method using new procedures and functional processes to decisively improve the interlock of intramedullary fixations, to avoid or significantly minimise the application of x-ray diagnostics, and to guarantee a technical functionality supporting the reliable distal and proximal fixation of the intramedullary nail.

The unique features

Innovation highlight

OKE (Object-oriented cooperation development)
The OKE method is derived from the Innoregio programme ("Innosachs" / "Innosystem") of the Federal Ministry of Education and Research. It is directed at companies wishing to establish strategically-oriented cooperative ventures and is based on the object-oriented approach used in software development.

Intralogistics Network in Baden-Württemberg

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Planning and implementation of a palletising robot
Source: Aberle Automation GmbH & Co. KG

The "Hi-Racker" narrow aisle truck
Source: Dambach Lagersysteme GmbH & Co. KG

The network

Intralogistics covers the organisation, execution and improvement of the in-house material flow for industrial enterprises, wholesalers and retailers supported by technical systems, services and by human and energy resource allocation.

Intralogistics is a growing sector all over the world. Germany contributes 20% to the total trade volume and is promoted as the export world champion. The epicentre of German intralogistics can be found in the state of Baden-Württemberg. Since 2006, more than 100 years of experience in material handling science have been concentrated in a new network of competence.

The technological focus

General technological advances and developments in the market are continuously questioning existing intralogistic solutions. We detect these trends and organise task groups to find new and successful solutions such as:

- a description of all the required steps of planning on the way to intralogistic systems with optimal dimensions, and
- concepts for combining manual and automated handling and distribution.

We also initiate, coordinate and develop enduring inter-corporate research and development projects with research facilities, such as

- KARIS, a novel technical concept of autonomous and interacting material flow agents to adapt rigidly installed material flow systems and make them more flexible.

The Intralogistics Network in Baden-Württemberg has two equally important aims: scientific and practical implementation. The transfer of knowledge and technology from universities to practical use is also supported by participation of the Network in the education of the industrial sector's young talents and in its vocational training.

The unique features

The Intralogistics Network in Baden-Württemberg is a non-profit organisation. Our members represent the complete value-added chain of intralogistics:

- component manufacturers
- system integrators
- designers and consultants
- users
- retailers
- researchers
- scientists and developers.

We operate in a multidisciplinary way. Knowledge of mechanical and electrical engineering, data acquisition and processing, ergonomics and controlling is needed for convincing intralogistics solutions.

One of our main goals is to demonstrate the logistical coherence of the complete system to intralogistics users in particular, beyond the consideration of technique. Our other activities, such as building a benchmarking system, are intended to offer advice for improvement and increases in efficiency. Practice-oriented professional development is promoted on every level. In exchanges of information on special themes, the sole business proprietor must be on a par with the corporate director, the warehouse manager with the university professor.

We are a member of the Supply Chain Council (U.S.A.) and other inter-trade and scientific organisations. For solutions to any questions concerning intralogistics, we can make contact with expert problem-solvers.

Adaptronics Competence Network

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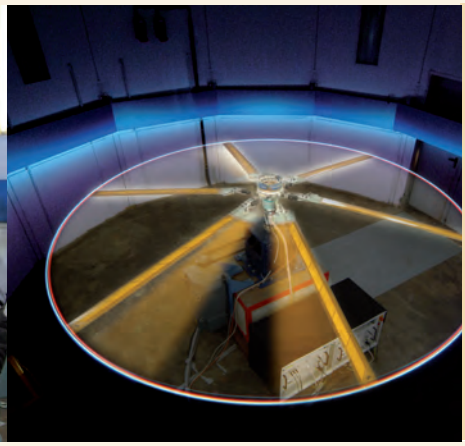
Rotor blade with integrated piezoceramic actuators
Source: DLR



Centrifugal test of an active rotor blade
Source: DLR

The network

The goal of the Adaptronics Competence Network is to introduce smart structure solutions to the domain of mechanical engineering. The result of this process is "intelligent structural systems", which can efficiently address issues of shape control and active reduction of noise and vibration. Moreover, smart structures enable solutions where passive approaches reach their limits (e.g. lightweight design vs. acoustics). Within the scope of the network, core competencies are developed which help to preserve and strengthen the value creation potentials of the involved partners in future markets.

The technological focus

The extremely multidisciplinary character of smart structures manifests itself in a huge range of current and future research and development tasks. The development of intelligent structural systems is strongly interconnected with the work areas of multifunctional materials, integration and application technologies, controller design and power electronics, modelling and simulation, and system reliability.

The continuing revolution in multifunctional materials needed for actuating, sensing, and load supporting purposes seriously affects the performance of smart structure systems. In order to achieve a structurally compliant integration of multifunctional materials, efficient integration and application technologies are required.

The work areas controller design and power electronics constitute the link between actuators and sensors. In order to efficiently address requirements of noise and vibration reduction in lightweight structures, model-based optimal controllers are used.

The availability of exact system models and efficient computational tools is of vital importance for the optimisation of actuators, sensors and controller design. Due to the manifold interactions of adaptive structural systems, system reliability is another important technological focus of the Adaptronics Competence Network.

The unique features

The new generation of low-resistance wings, which require a laminar flow of air around them, have extremely high requirements with regard to surface quality. Especially the nose of the wing is of particular importance since even the smallest unevenness can lead to a disturbance of the laminar flow. In a kind of domino effect, this disturbance can then continue downwards, causing a considerable increase in resistance.

For this reason, the network partners EADS IW and DLR are working together with Airbus within the Aerospace Research Program IV on a new generation of high-lift systems for the wing's leading edge that fulfil the high requirements for profile precision. The developed concept can be moved gap-free and continuously between the extended high-lift and clean configurations. Special attention has to be given to the skin, since it has to be elastically deformed while simultaneously being able to carry the air loads. Along with special design methods and skin materials, kinematics are necessary that can form the skin into its target shape without requiring constraining forces.

Preparations are currently being made to manufacture a 1:1 ground demonstrator. It will be finished by the beginning of 2010 and will undergo a number of mechanical tests.

Competence Network for the Sustainable Use of Wood (NHN)

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High-quality timber for submission (Norway spruce)


High-quality sawn wood

The network

The Competence Network for the Sustainable Use of Wood (NHN) is a research and development cluster of industrial enterprises and research establishments active along the entire forestry and wood value chain.

The core competencies of the NHN are to be found in the areas of wood production, wood technology, wood processing, biotechnology and molecular biology. Networking different areas of competence makes it possible to realise interdisciplinary concepts all along the forestry and wood process chain.

Process Technology Competence Network Pro3 e.V.

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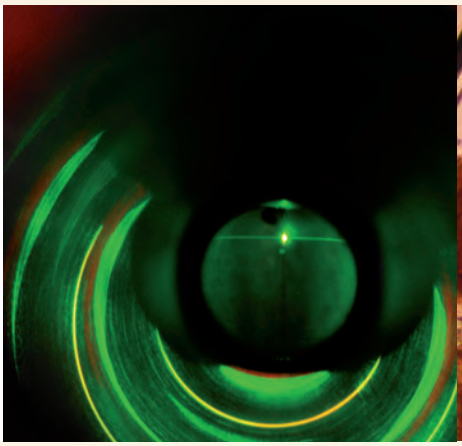
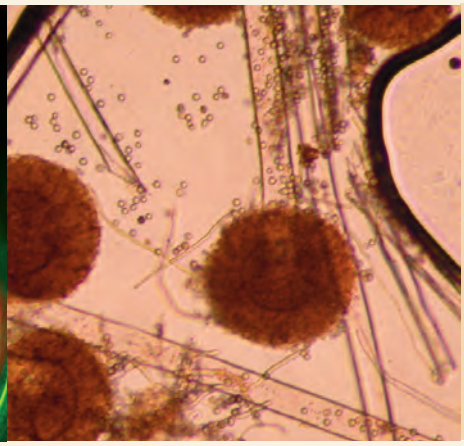


Optical investigation of parameters in spray processes
Source: Lehrstuhl für Prozessmaschinen und Anlagentechnik, Uni Erlangen



The mould Aspergillus niger produces citric acid
Source: Karlsruher Institut für Technologie (KIT) / C. Syldatk

The network

The main goal of the Process Technology Competence Network Pro3 is to focus and link the activities of our members in the applied research, teaching and industrial application of process engineering and technology:

- develop concepts for new solutions in process technology
- ensure the rapid transfer of knowledge from basic research to industrial application
- realise high-quality educational programmes
- increase in attractiveness to outstanding students, graduates, post-docs and guest researchers
- become a knowledge resource for participating companies.

The technological focus

Special emphasis is placed on the following topics:

Product design

- functional particles
- aerosols, submicron particles
- polymer technology
- emulsifying
- food processing

h

Process modelling and control

- modelling, simulation and control of dynamic processes
- bioprocess technology and biosystems
- thermodynamics of complex fluids

Reaction engineering

- chemical reaction engineering for heterogeneous systems
- fuel cell systems
- integrated processes.

The unique features

The Pro3 strategy is focussed on 3 fields:

- development of research projects
- integration of innovative ideas of SMC into the transfer of technologies
- initiatives to assure a new generation of engineers.

The mould Aspergillus niger produces citric acid

Citric acid is an important primary metabolite, which is an intermediary product in the tricarbonic acid cycle. Citric acid is industrially used in detergents, food and pharmaceutical products. First isolated from lemon juice, it was known since 1893 that moulds are able to produce citric acid. In 1923 already the first microbial fermentation process was introduced. Today about 99% of about 1,000,000 tpa are produced by microbial fermentation mainly using Aspergillus niger as the production strain.

Optical investigation of parameters in spray processes

The distribution of concentration of the materials used in a particle spray process is still unknown. With the support of optical and laser optical methods, it is now possible to measure precisely, via an inspecting window, the distribution of the concentration of the materials even in high pressure processes. From these results, the kinematic and thermodynamic interaction in the spray jet can be deduced. These results are an important basis for understanding and modelling particle spray processes, minimising the distribution of the particles and optimising the particle shape.

Mechatronics Cluster BW e.V.

Kompetenznetzwerk Mechatronik BW e.V.

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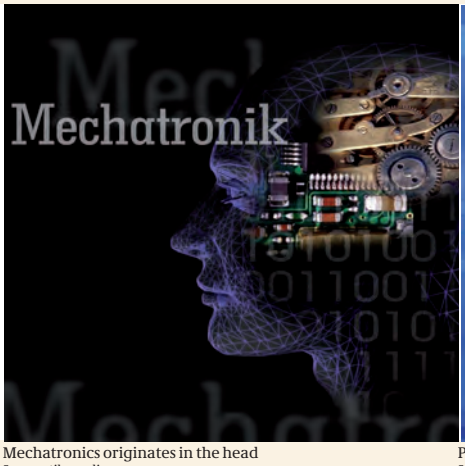

Mechatronics originates in the head
Source: tilpmedia

Precision robotics for neurosurgery
Source: Fraunhofer IPA

The network

The Mechatronics Cluster BW e.V. (KMBW) is an industry-driven cooperative group of approximately 90 entities from business, science and politics. The interdisciplinary technology of mechatronics links all technical industries and topics as the central network topic and focuses on future topics. Large enterprises active worldwide, SMEs, start-ups, universities and research establishments are our network partners for successful realisation.

The technological focus

For Germany, mechatronics is an important interdisciplinary technology. The German economy earned the title of "world export champion" with vehicles, production engineering and chemical products. Plants for the production of pollution-free energy and medical technology devices from Germany are also renowned all over the world. These industries would not be conceivable without mechatronics. Everywhere actions take place in an automatic fashion and largely without human involvement, mechatronics can be found. Thus, mechatronics supports humans in carrying out activities and tasks with high precision, speed and security. Assistance systems in cars, such as ABS or ESP, are good examples of mechatronics in everyday life. KMBW promotes the performance of its members with branch-spanning topics such as qualification, standardisation, intelligent products, intelligent and transformable production, e-mobility, energy engineering, renewable energies, and development methods and tools.

The unique features

Being an interdisciplinary technology, the range of topics in mechatronics offers an ideal environment for interdisciplinary, constructive and lasting cluster activities. Combined with the homogeneous membership structure of KMBW, made up of large and small enterprises, and the broad branch-spanning member spectrum, the result is the most important unique selling proposition and a large success factor of KMBW. Out of this variety, new interfaces between very diverse branches and topics are constantly emerging. This favours the emergence of radical innovations and forms the basis for the real-life industry-driven cluster strategy for which KMBW is well known. Focuses on realisation and sustainability are core elements of this strategy. KMBW can develop the competency to solve any task; all the partners and competencies necessary for this can be reached quickly and accessed efficiently.

Mechatronics Competence Network in Eastern Bavaria

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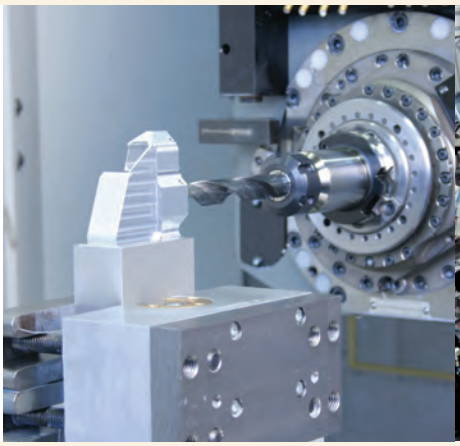
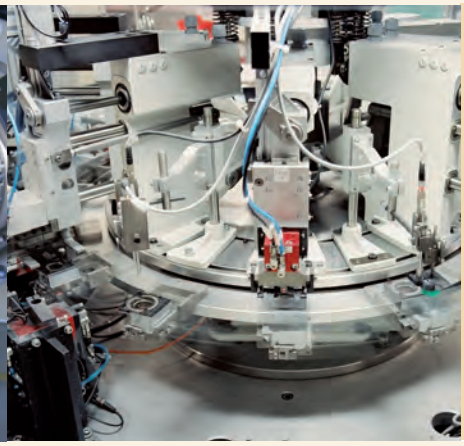


Precision engineering in machining
Source: Mühlbauer HighTech International AG



Process technology in production
Source: Zollner Elektronik AG

The network

In April 2000, the Mechatronics Competence Network in Eastern Bavaria was founded as a public-private partnership on the basis of a cooperation agreement. Since then, the Network has developed in a very positive manner, exerting a strong attraction on potential partners. Today, the Network consists of over 30 companies, two universities of applied sciences, the vocational school, the adult education centre, the Industry and Commerce Chamber, and the business development corporation of the Cham administrative district as the project management.

The technological focus

The mix of industries represented in our Network offers great advantages to our members due to the large variety of technological competencies to which they have access, such as mechanical engineering, microsystems technology, materials technology, software development, electronics, metrology, control and feedback control systems, rapid prototyping, plastics engineering, automotive engineering, precision engineering, and logistics.

The unique features

Cooperation within the Network has increasingly intensified relations between the member companies. The fact that today, almost half of the companies are willing to exchange internal data when necessary, is an especially encouraging result.

The positive experience companies have gained in joint R&D projects promotes further cooperation. The fact that several joint R&D projects are currently running is proof of the growing confidence companies have in the Network. In one of these projects, an 18 metre long and four metre high four-legged walking robot is being developed, which will be converted into a “dragon” and used as a long-term prop in a local theatre festival.

Another important component of our services is our innovation management. Every year, the project management arranges innovation workshops in cooperation with innovation consulting and transfer institutions. Lectures, tours of company premises, and good practice examples inform the network members about concrete possibilities of joint development of product, service and process innovations. The focus of these workshops is on regional exchange of experience between small and medium-sized enterprises (not only Network members), but information is exchanged between SMEs, large-scale enterprises, and academic research institutes.

Competence center for the construction industry

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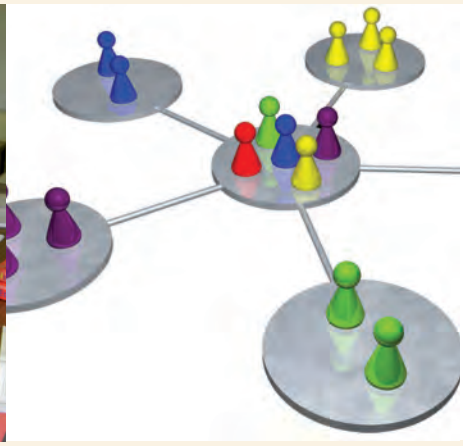
EU support programme "QUALIBAU-EN"



Networking and moving

The network

KompetenzZentrum Bau Neumarkt GmbH (KBN) was founded in 2000 as a "regional organisation for the development of Neumarkt i. d. OPf. into a competence region for innovative construction". Within the framework of the "High-tech Offensive", KBN obtained a 50% sponsorship by the Bavarian government. For the other 50%, companies, the city and the rural district of Neumarkt were involved as proprietors. A supporting society is associated with the GmbH, which forms the network. Since 2006, the GmbH has been a subsidiary of the Max Boegl group of companies.

The technological focus

In pilot projects, actions in the following subject areas have been realised:

- 3D laser scanning
- the use of knowledge databases by construction firms
- optimising logistics in the construction process
- digital delivery note for ready-mixed concrete
- EIS – Equipment Information System
- webcam documentation of work progress on building sites
- the use of containers in construction projects
- optimising the use of electrical power on building sites.

As a regional academy, KBN organises modular seminar events (subject-specific, social, organisational and leader competence) based on the specific requirements of the construction industry. Currently, about 40 topics are summarised in a programme. In addition, specialist events are conducted under the aegis of KBN, which impart the latest know-how on the basis of practical examples.

Construction professions are introduced in the eighth grades of local schools, thus improving the image of the construction industry. In addition, KBN cooperates with the working group "Schule Wirtschaft" and obtained a sponsorship for the advancement of educational training from the EU.

The unique features

Equipment Information System

EIS is a computerised equipment database for construction machines, which has been running reliably at the Max Boegl group of companies since its completion. As a pure web application, it is executable in all common browsers and accessible worldwide. Access to the database occurs via an intuitive and user-friendly interface. The application is compatible with databases like MySQL, Oracle, PostgreSQL, and Microsoft SQL.

Paper catalogues, with all their disadvantages, have been rendered dispensable. Changes and new entries have to be made only once centrally in order to be available for the next query. The largest benefit of EIS lies in the time saved and the ease of searching for equipment.

Leonardo da Vinci – QUALIBAU-EN

In the context of the Lifelong Learning Programme of the European Union, KBN receives incentives for a project called QUALIBAU-EN. In this project, apprentices in construction professions are given the chance to participate in a three-week language study holiday in Chester (Great Britain). The aim is to improve the participants' English language skills in order to improve their chances in the hard European competition in the construction sector. It is planned to continue the project until the end of the Lifelong Learning Programme in 2013.

Laser Technology Region Nuremberg

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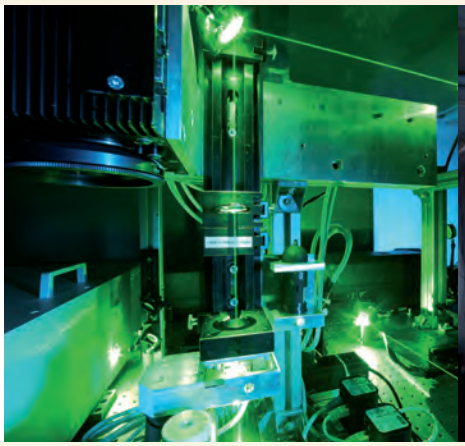
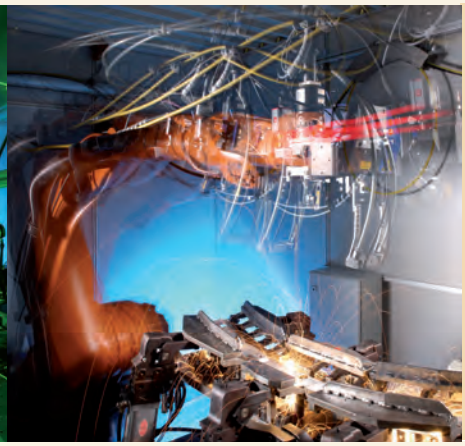


Precision processing with an ultrashort pulse laser
Source: Fuchs / blz



Remote welding with disk laser
Source: Fuchs / blz

The network

The Laser Technology Region Nuremberg network acts as a connecting link between fundamental scientific research and industrial application. Its main task is to make the potential of photonic technologies available for users. As this network consists of members from academic as well as industrial backgrounds, the resulting synergy effects contribute to a sustainable development of laser technology.

The technological focus

The work done by the network members covers the entire spectrum of laser material processing and medical laser technology as well as the associated process engineering and system technology. Through their research and development work, the network partners have attained expertise in various areas. In this context, optimising techniques for laser processing of various materials is as much the researchers' objective as developing new techniques for processing on macro, micro or even nano scale.

Technology transfer allows regional, national and international companies to benefit from the know-how that the members of the network have attained in research projects. This knowledge is applied to development work, engineering services, training and consulting.

The unique features

Development through international cooperation
With the support of the network, a testing and consulting centre for laser technology at the St. Petersburg State Polytechnic University, Russia, was opened up in summer 2009. This centre offers support and consulting services for companies and research institutions in the field of laser material processing.

The close cooperation with the Institut National d'Optique (INO) in Quebec, Canada is another important milestone as far as the internationalisation of the network is concerned.

Sustainability through education
The Erlangen Graduate School in Advanced Optical Technologies (SAOT) is one of two important new network members. With some of the world's leading experts, the excellence institution SAOT provides an interdisciplinary research and education programme in order to promote innovations in the field of photonic technologies and improve the network of researchers.

The second important new network member is the Chair of Photonic Technologies, which was established under the guidance of Prof. Michael Schmidt at the Department of Engineering at the Friedrich-Alexander University of Erlangen-Nuremberg. In the future, the Chair will develop solutions to matters of academic and industrial relevance, in order to support an application-oriented transfer of technology between science and industry.

Baltic Maritime Alliance (Germany)

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LNG tanker
Source: Nordic Yards

Innovative LNG fuelling system
Source: Nordic Yards

The network

Since it was founded in the year 2000, the Baltic Maritime Alliance (Germany) has developed into a network of innovation for the maritime industry of Mecklenburg-Vorpommern. The network brings together research and the maritime industry and promotes science, research and development. MAO supports its members in initiating and organising research and development projects, carrying out scientific events, and promoting young scientists.

The technological focus

Our technological focus is on the following areas:

- maritime logistics
- products and technologies for shipbuilding
- offshore wind technology
- boat building and yacht construction / maritime high-performance technology
- maritime security
- environmental engineering
- hydraulic construction and coastal protection.

The unique features

Since the Baltic Maritime Alliance (Germany) was founded, nearly 120 projects have been initiated and implemented. Among these are the InnoRegio project Maritime Alliance and several NEMO projects.

Netzwerk Industrie RuhrOst e. V.

NIRO the dynamic difference.

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NIRO creates future prospects for young talents

Strengthening of locations through efficient production

The network

Over 60 companies from the fields of engineering, metalworking and industrial electronics came together in 2007 to form the regional network known as Netzwerk Industrie RuhrOst (NIRO). This organisation uses specific measures and projects to create direct tangible and intangible benefits for its partners. The common goal is to reinforce the competitiveness of its economic location through knowledge-based innovation management at national and international level.

The technological focus

NIRO supports its members in developing and introducing innovative processes in the fields of product development, production, procurement and human resources. In the production segment, the partners interact with one another on the subject of the integrated production systems in place in the respective corporate cultures. A comprehensive audit of low-waste production and a cooperative learning culture enable rapid progress to be achieved here, resulting in even more efficient production.

Joint product development processes in engineering and production technology are promoted via a product development benchmark. In addition, NIRO companies cooperate on numerous research projects. These include developing a robot system to assist in welding tasks for piping and frame constructions, devising a cost-optimised production and stockpiling strategy following the cessation of production, and making production processes more flexible.

The unique features

Within the membership structure of NIRO each company stands for itself, without the need to vie with competitors. This creates an atmosphere of trust which enables the creation of new value-added chains in the fields of production and engineering, as well as the introduction of new solutions in product development. The basis for all actions is the exchange and forwarding of knowledge, perfected through an internal member knowledge database and moderated working groups.

Successful activities to date include establishing the first university of cooperative education in the state of North Rhine-Westphalia for the subjects of Engineering, Mechatronics, Trade and Logistics, collaborating with Technische Universität Dortmund, and supporting projects aimed at qualifying young talent and career choice orientation. The latter also includes sponsoring the student motor sport team at TU Dortmund and supporting the “Technology Perspectives” network and the “Future Through Innovation” centre.

Tangible material benefits are derived from joint purchasing, for example of electricity, office supplies or tools. Small and medium-sized enterprises in particular benefit from guaranteed net prices and modern instruments such as approval processes, budgeting and an optional linkup with the ERP.

CNA – Center for Transportation & Logistics Neuer Adler e.V.

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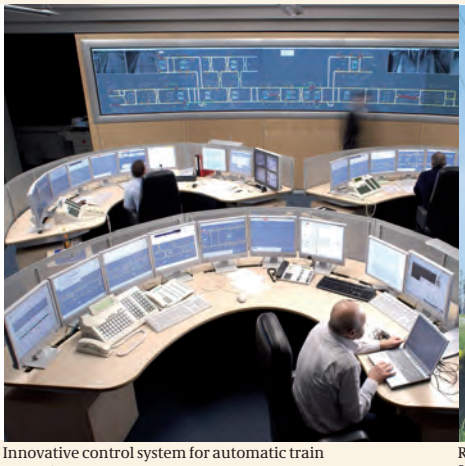

Innovative control system for automatic train operation Source: VAG, Claus Felix

Rail technology cluster - a strong network for the sector
Source: Siemens AG, Mobility

The network

Since 1996, under the motto "Intelligence for Transport and Logistics", the CNA skills initiative has played an active pioneering role in shaping the sector's future. The Nuremberg Metropolitan Region alone is home to some 750 transport and logistics companies employing 75,000 staff and generating global annual sales of around 20 billion euros.

Within the framework of the cluster initiative launched by the Bavarian government, CNA has been entrusted with the management of the rail technology cluster since September 2006.

The technological focus

CNA's four steering groups and the four steering groups of the rail technology cluster constitute a platform for innovation for new projects. The steering groups give their members an opportunity to exchange ideas and experience on a neutral platform. Many project groups have already been formed and have forged project-related alliances.

At CNA the steering groups are divided up thematically into "Logistics", "Telematics", "Automotive" and "Drive Technology".

In the rail technology cluster, the steering groups "Rolling Stock", "Operation and Maintenance", "Infrastructure and Energy" and "Train Control and Command" generate the impetus required for innovation by enabling experts to exchange technical know-how.

The cluster activities are rounded off with workshops, conventions, participation in trade fairs, and comprehensive press and public relations.

The unique features

CNA has already initiated and monitored numerous nationally and internationally acclaimed pilot projects. The innovative technologies associated with these projects create cutting-edge jobs, thereby making a valuable contribution towards shaping and securing the future of the transport and logistics sector.

The RUBIN fully automated metro system, a project that CNA helped to get off the ground, successfully started operations in 2008.

CNA was also one of the partners in the ORINOKO telematics project, which has laid the foundations for innovative adaptive traffic control in Nuremberg.

Under the name Syntegra®, Siemens has developed a radical new gearless direct drive for rail applications, which is being field-tested successfully at the moment. The innovative motor bogie for metro and urban railway systems sets new standards in terms of both operating efficiency and environmental protection. The drive was developed on the basis of work done in a research project that was co-initiated by CNA and the rail technology cluster.

Each year CNA presents its "Innovation Award" to a company in recognition of an exceptional project, product or service. 2010 will see the eighth CNA Innovation Award bestowed. Extraordinary entrepreneurial or academical achievements may be rewarded with a special prize by the panel of experts.

car e.V. - competence center automotive region aachen / euregio meuse-rhine

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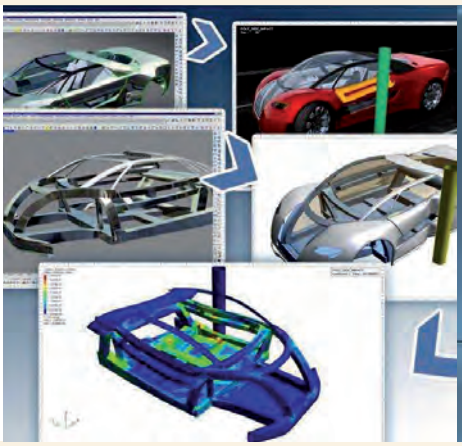

Networking means to design
Source: Imperia GmbH, Aachen

car represents the entire process chain
Source: ZenTec automotive GmbH

The network

car e.V. is an independent network of competencies, consisting of companies and research institutes active in the automotive industry. car is financed mostly through membership fees and research projects, and offers its approximately 60 members in Germany, Belgium and the Netherlands a broad spectrum of services, including the organisation of events and mediation of contacts to supra-regional networks and international projects. Since early 2007, car provides HR marketing support to its members through the “One application - 60 recipients” campaign.

The technological focus

car e.V. has mainly automotive companies, research institutions, and intermediaries as its members. Together, they offer a wide range of product and process expertise. Their individual specialities include research and advanced engineering of various automotive systems, development and manufacturing of diverse electronic and mechanical components, as well as assembly and maintenance of cars and systems. In addition, members provide a multitude of service offers not limited to the automotive industry.

The unique features

The multinational Euregio Meuse-Rhine, located around the border tripoint of the Netherlands, Belgium and Germany, unites five partner regions with an area of approximately 11,000 square kilometer and a total population of 3.7 million. Due to the outstanding infrastructure, the multinational location, and the excellent engineers trained in the region, it offers numerous advantages. Two-thirds of the population of Western Europe live within 500 km of the Euregio. With Düsseldorf, Cologne-Bonn, Maastricht-Aachen and Brussels, four international airports are within an hour’s drive.

With the RWTH Aachen University, the FH Aachen University of Applied Sciences, the renowned Forschungszentrum Jülich, four Fraunhofer Institutes and a multitude of private research institutions, the Aachen region alone offers a research infrastructure that can be rivalled by few other regions in the world. Of the over 30,000 students at the RWTH Aachen University, 40 percent study to become engineers. With 142 million euros in third-party funds, the RWTH is in a leading position in Germany. The FH Aachen University of Applied Sciences is one of the largest universities of applied sciences in Germany, pressing ahead with 250 research and development projects.

European Centre for Innovation in Rail Technology

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Joint IZBE booth at the InnoTrans 2008 fair
Source: IZBE

SupraTrans levitation vehicle concept study

The network

The European Centre for Innovation in Rail Technology (IZBE) was founded in 2000 starting as a local network in Saxony. The aim of the members is to cooperate within an independent branch organisation of enterprises, consultants and research organisations active in rail technology. The IZBE offers a platform for communication between its members, sets up targeted contacts with third parties (i.e. non-members), and organises joint development projects and similar activities.

The technological focus

The technological focus of the network is on topics which could potentially affect the rail sector. Each topic is dealt with by an IZBE working group consisting of interested representatives of member entities. Current topics are:

- training,
- operation and traffic,
- electrical equipment,
- vehicle technology and
- traffic route construction.

In addition, the IZBE is prepared to react with activities of its own to new developments in the rail sector or requirements of its members.

The unique features

The activities of the IZBE are concentrated on applied research and development, with an emphasis on the realisation of development results, product ideas and new technologies in the rail industry. The association was founded because an independent institution of this kind did not previously exist in Saxony. Unlike the IZBE, various state and local institutions with the goal of promoting economic development focus on location, but not on content-related aspects. Academic institutions, on the other hand, pursue special interests according to their specific area of research. The IZBE is unique in that it provides a politically and economically independent umbrella for the cooperation of research institutions, engineering service providers, vehicle and component manufacturers, and transportation companies.

Some highlights of the last years were:

- the joint booth at the AfricaRail 2007 trade fair in June 2007 in Johannesburg Mitrand in South Africa,
- the technical and organisational support given by the IZBE to research projects concerning innovative loading units and their handling by means of combined transport (TRIMOTRANS et al.),
- the joint booth at the InnoTrans 2008 fair in September 2008 in Berlin and at the Euregia 2008 fair in October 2008 in Leipzig,
- the realisation of several international symposiums: the most recent was “The goods transport and logistics master plan” (April 2009) and the next will be “Approval of electrical rail equipment” (November 2009).

ITS Niedersachsen e.V.

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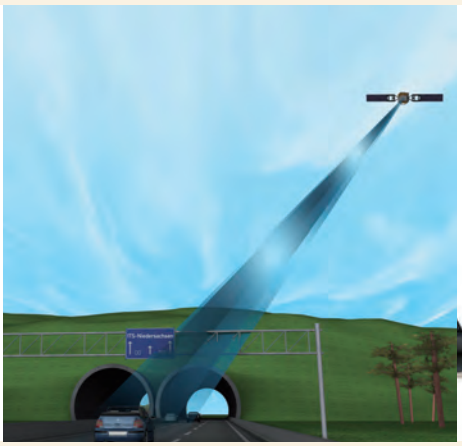

An example of traffic telematics

The test vehicle Caroline
Source: TU Braunschweig

The network

ITS Niedersachsen, formerly known as "GZVB – Gesamtzentrum für Verkehr Braunschweig", was explicitly commissioned to serve as a neutral representative of the entire state of Niedersachsen for topics centred mainly around intelligent transport systems and services and working in the national and international arenas. The safety-critical applications in particular and the related requirements they make on technology, processes and testing distinguish the competence and core know-how of ITS Niedersachsen.

The technological focus

As a network of competencies, ITS Niedersachsen encourages its members to engage in networking with each other, mediates contacts and arranges project consortia for specific tasks. Emphasis is placed on maintaining and intensifying the exchange of scientific know-how, organising symposia and training courses, supporting the procurement and realisation of national and European-funded projects in the region and strengthening and positioning the region through public relations. ITS Niedersachsen holds national and international conferences in specific fields each year and involves its members in topic-related stands at international trade fairs.

The unique features

The activities of ITS Niedersachsen contribute to increasing safety, efficiency and environmental compatibility in the traffic and transport sector. The network has comprehensive system competence in aviation, rail and road transport. In the area of safety critical systems, the value added services include certification and concession. Current activities focus on driver assistance and automation systems, power train, electric and hybrid drives and energy management, vehicle bodies, motion simulation, information systems for mobile applications, intelligent transport systems and applications for global satellite navigation systems such as GPS, GLONASS and Galileo.

Under the name of "GAUSS", ITS Niedersachsen nationally and internationally concentrates the competencies of its members in the area of safety-critical applications and their certification. The Niedersachsen business location has been in a leading position for numerous years, a fact imposingly demonstrated by the first GPS-based landing of an airplane worldwide.

In this context, the GAUSS application centre has the following objectives:

- active participation in the development of European-level standards with the involvement of our members and
- development of a simulation and testing environment, in cooperation with partners, to be ready for use before Galileo becomes fully operational.

Caroline

With the VW Passat Variant "Caroline", a team from the Technische Universität Braunschweig successfully took part in the 2007 DARPA Urban Challenge in California, USA, where it was one of the eleven finalists out of a total of 89 entries. The test vehicle is able to navigate autonomously in urban traffic, moving into lanes, mastering junctions and overtaking manoeuvres, steering into parking spaces and detecting blocked roads. For this purpose, it was equipped by the TU Braunschweig and industry partners with the necessary hardware and software to detect its position and spatial environment, navigate and plan routes, make decisions and apply adaptive control.

Hamburg Logistics Initiative

KompetenznetzeDeutschland
Kompetenznetzpreis 2009 | 3. Preis

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Hamburg container terminal
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Hamburg storehouse city (aerial view)
www.mediaserver.hamburg.de / C. Spahrbier

The network

The Hamburg Logistics Initiative (LIHH) serves as an industry network. To further expand Hamburg's role as the leading logistics hub in Northern Europe, the Hamburg State Ministry for Economic Affairs and Labour, together with companies and institutions, established the LIHH. The registered association "Logistik-Initiative Hamburg e.V." was founded by representatives of the business community to support the Initiative. With about 450 active members from the logistics industry and related sectors, this powerful network is the largest of its kind. Over ten science-related networks are also members.

The technological focus

In the technology area, the Hamburg Logistics Initiative is present with its "Future Logistics" working group.

The objectives of this working group are to define basic principles of efficient logistic processes, to record logisticians' requirements for innovative technical solutions, to verify technical products, concepts and ideas as to their suitability for daily use, and to gather best practices and benchmarks. Alongside information exchange and partner matchmaking, pilot projects in the various subject areas are identified and initiated.

The first working groups, which dealt with the topics RFID in the field of logistics and security in the supply chain, have already been concluded. However, one team is still working in the field of supply chain security and counterterrorism laws. In 2008/2009, the working group has focused on questions concerning service-oriented architecture in computing.

Examples of future projects in the field of technology are:

- RFID in container shipping
- dispatching systems for distribution processes
- virtual authorised agent
- Logistics Challenge, process-oriented simulations.

The unique features

In February 2009, the Initative was named "Kompetenznetz 2009" by the Agency of the Kompetenznetze Deutschland Initiative. In particular, the jury acknowledged the sustainable and "tempestuous" development of the initiative, which has attracted more than 400 member companies in only three years' time.

In June 2009, the Initiative and 26 of its members presented themselves with a 300-square-metre booth at the transport logistic trade fair in Munich. Small and medium-sized businesses were thus offered the chance of being present at the biggest international exhibition for logistics, telematics and transportation.

In November 2008, the Initiative awarded Hamburg's prize for sustainable logistics, the HANSE GLOBE, for the second time.

In addition, the cluster management organises, leads and coordinates eight working groups and a large number of workshops in which current topics of the logistics sector are taken up in order to inform the participants or to discuss solutions in all areas of activity. In the working groups, pilot projects are initiated and innovations promoted.

Network of Automotive Excellence

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Opening of the NoAE Innovation vernissage
Source: Katrin Heyer

The 2009 judging panel
Source: Katrin Heyer

The network

The NoAE is an open initiative of various companies with the target of strengthening the competitiveness of the European automobile industry and its suppliers. The NoAE was founded in 2002 in cooperation with leading automobile companies and the European Commission in the context of an international event. Within the framework of the NoAE, commercial strategies and partnership models are developed and put into practice.

The technological focus

NoAE currently consists of four different project initiatives or main areas of activity:

NoAE ASP5: Innovation scouting
In the ASP5 area of activity, manufacturers, suppliers and service providers have been cooperating for over three years. The initiators are Audi, Daimler, Mazda, Opel and ESG.

NoAE A2T
The NoAE A2T Initiative has the primary goal of strengthening the competitiveness of the three leading industries automotive, aerospace and transportation. The main theme for 2009/2010 is cross-sector electronics development. The initiators are the companies Bombardier and ESG.

The same parts for telematics services
Use of the same resources (automobile, infrastructure and services) leads to cost reduction. The initiators are the companies BMW, FORD, ESG, Microsoft, IMST, Fraunhofer IAO and iteratec.

Electric mobility
In this area, the focus is centred on the following key aspects:

1. Benchmarking as a project approach: Project partners are manufacturers, suppliers, energy providers and innovative SMEs.
2. Electric mobility alliance: this initiative has the goal of linking key players from various sectors to meet the common challenge of electric mobility.

The unique features

The NoAE Innovations Competition: successful for more than 3 years
Since 2007, automobile manufacturers (Audi, BMW, Daimler, Ford, MAN, Mazda, Porsche, Volkswagen – and since 2009 also FIAT, Mitsubishi and Toyota) and well-known suppliers have been working together to search for ideas and solutions featuring a high level of customer benefit and a high transfer potential into the automobile, regardless of which sector the original idea came from. The NoAE Innovations Competition is also directed towards start-ups, young entrepreneurs, innovators, researchers and companies from outside the industry. It offers a good market entry point into the automobile and supplier industry. The former German Federal Minister of Economics and Technology, Dr. Karl-Theodor zu Guttenberg, was the patron of the 2009 NoAE Innovations Competition.

The 2009 competition broke all records:

- There were over 380 submissions from 20 different countries.
- The 30 selected award winners are from Germany, the Netherlands, Switzerland and Austria.
- Among the award winners are established suppliers, but also SMEs, research institutes and universities from outside the industry.

In the years to come, the NoAE Innovations Competition will be expanded together with international partners.

TSB Innovationsagentur Berlin GmbH / Transport Technology Systems Network (FAV) Berlin

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Tomorrow´s traffic management - an event hosted by DLR and FAV Source: TSB-FAV

Tegel Airport Center
Source: TSB-FAV

The network

The cluster and its networks

TSB-FAV has been acting as the cluster manager for more than ten years. Based on its neutrality, TSB-FAV provides and organises contacts for companies and research institutions, supports project development on the regional, national and European levels, assists in the acquisition of initial funding and manages projects in special cases. In the German capital region, ten networks with about 500 member companies and research institutes are active in such cluster fields as the automotive, aerospace and logistics sectors.

The technological focus

The joint innovation strategy of Berlin-Brandenburg is the basis for activities in the following areas of excellence.

Railway technology

With research, development, production and maintenance of infrastructure (track construction, signalling equipment) and vehicles (railcar, locomotive and coaches), all important activities for the definition and development of the railway system of the future are present in the region.

Road transport / Automotive

Besides OEMs and Tier 1 suppliers, many SME are active as component and assembly suppliers. In addition, Berlin serves as a widely noted test site for new fuels and vehicle engines – for upcoming e-mobility for instance.

Intelligent transport systems

The capital region is a very important field for providers and operators of intelligent transport systems and is becoming an European model for modern traffic management.

Logistics

The unique potential for logistics in the capital region results from its position in the centre of the “new Europe” and along the transport axis to the growth markets. The focus is on establishing the region as a hub for hinterland transport.

Aerospace

Activities in this sector focus on the implementation of projects which strengthen system and subsystem competence in the region, particularly in the areas of engine technology, cabin equipment, and small satellites.

The unique features

The EU project AAS – Integrated Airport Apron Safety Fleet Management has as its goal safe and efficient apron management. Its focus is on developing an integrated system to optimise all apron processes.

The Modellregion Elektromobilität Berlin-Potsdam (Berlin-Potsdam Electric Mobility Model Region), supported by the German Federal Ministry of Transport, Building and Urban Affairs, aims to tap the potential offered by electric mobility with respect to traffic, energy, the environment and urban development.

International cooperation beyond the EU borders is essential to understanding the challenges and conditions of transport systems. The CETRRA project brings together European SMEs and Asian research institutes to initiate project consortia.