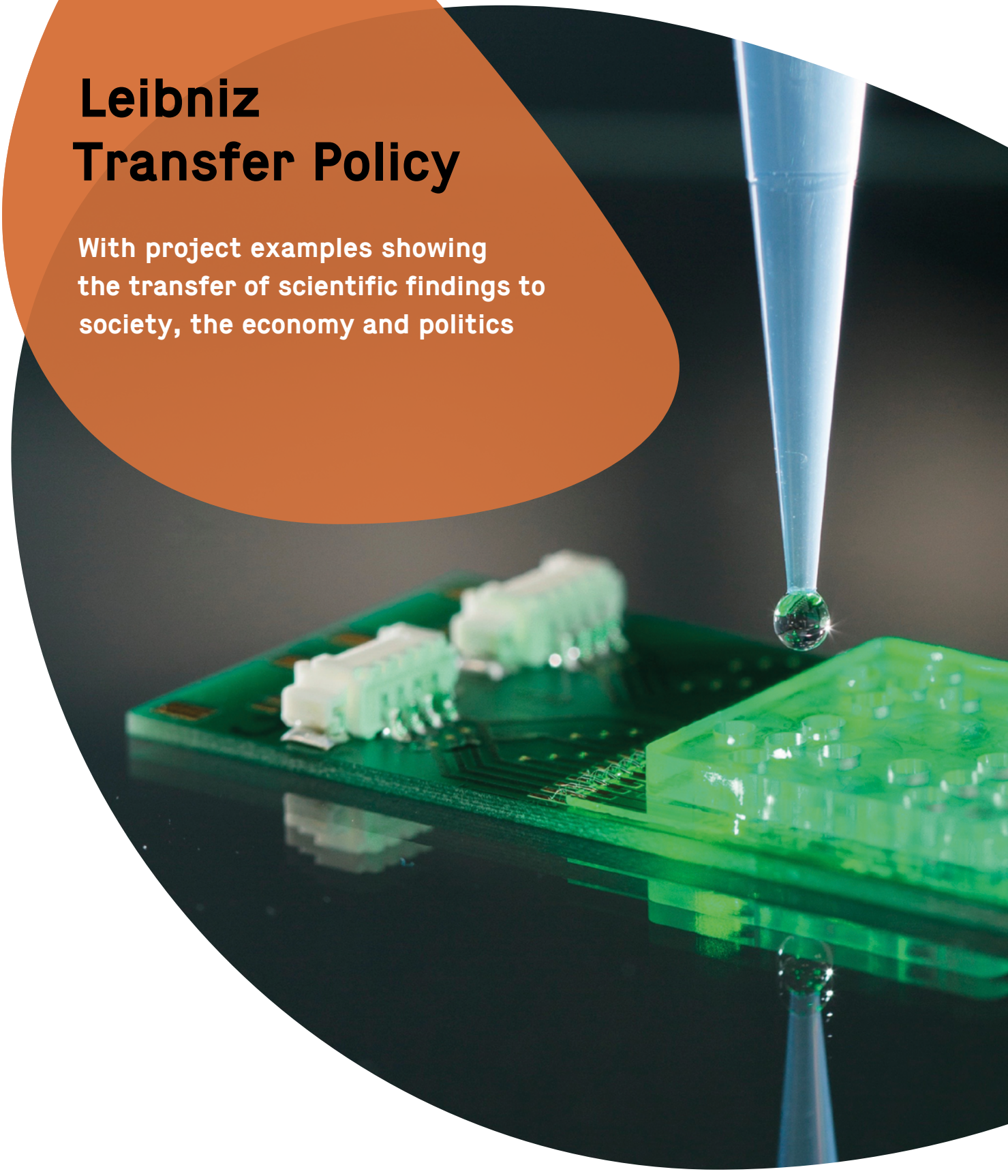
Leibniz Association

Leibniz Transfer Policy

With project examples showing the transfer of scientific findings to society, the economy and politics



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Knowledge transfer at the Leibniz Association covers the full range from technology transfer to social and political consultancy.”
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Jörg Hacker,
President of the German National Academy of Sciences Leopoldina (2010 – 2020)

Preamble

Gottfried Wilhelm Leibniz formulated the scientific ideal *theoria cum praxi*. With this in mind, the institutions of the Leibniz Association have set themselves the objective of conducting research for the benefit of society. They respond to society's information needs and to topical questions. By communicating research findings to non-academic target groups, they play a significant role in developing society's capacity to reflect and innovate.

With its broad spectrum of independent institutions specialising in different fields, the Leibniz Association is particularly well placed to respond to the complexity of the major challenges facing society. Its five sections cover a large number of research fields and academic disciplines: Humanities and Educational Research, Economics, Social Sciences and Spatial Research, Life Sciences, Mathematics, Natural Sciences and Engineering, and Environmental Research. Research-based knowledge has to be transferred if it is to play an effective role in society, for example as a basis for political and economic decision-making processes, technological innovations or supporting cultural developments. Leibniz institutions decide which forms of knowledge transfer to use, based on their defined mission and strategic orientation.

The aim of this policy is to make use of the strengths of Leibniz research – the diversity of its approaches, its competitive edge and networking potential – for knowledge transfer and to develop them further.

Definition

Leibniz Transfer relates to the exchange of knowledge between academia and the non-academic world. The Leibniz Association sees successful knowledge transfer as the target-group-specific and quality-assured transfer of research findings and – in the other direction – the integration of questions raised by society into research projects. It therefore functions as a bidirectional interface. Leibniz Transfer links society's knowledge needs and the knowledge that exists within society to the research agendas of Leibniz institutions, and puts non-academic stakeholders in a position to understand and apply research findings and their requirements, but also their limits. A prime example is technology transfer with its close integration of future users into the entire research process.

Leibniz knowledge transfer therefore covers all activities that communicate knowledge generated through research – including, in particular, technologies – as well as skills, resources and the understanding of academic culture itself, and which promote dialogue between science and society. This includes human resources transfer, i.e. highly qualified researchers (usually with a PhD) who continue their career in industry, set up their own businesses or join the civil service. In view of the different target groups – from policymakers and industry to the media, civil society interest groups and the general public – knowledge transfer needs different forms of communication and dialogue. For the Leibniz Association, knowledge transfer is a basic requirement for using its research findings and knowledge bases to help solve society's challenges, contribute to innovation and prosperity and strengthen society's capacity to reflect.

Characteristics

The best way to define knowledge transfer is through what it aims to achieve: to increase society's capacity for decision-making and action.

There are a number of ways of differentiating between different types of knowledge transfer. The following list of polarity profiles does not claim to be exhaustive:

- by driving force – between proactive and reactive;
- by communication direction – between unilateral, dialogue with feedback, and communication cycles;
- by regularity and frequency – between immediate response to current events and periodic, independently planned activities;
- by knowledge application objective – between concrete applications/uses and public education

Another differentiating factor is linked to the core tasks of Leibniz institutions: the requirements and conditions for knowledge-oriented research differ from the requirements and conditions for application-oriented research. Institutions that provide information infrastructure and the research museums have their own knowledge transfer functions.

Knowledge transfer therefore represents a very diverse sphere of activity that cannot always be clearly delineated. There may be manifold productive overlaps e.g. with public relations work, school education and training. Leibniz institutions select the appropriate measures and processes for their knowledge transfer, depending on the reach, aims and intensity of their interactions with their target groups and partners. In technology transfer and in research with industry partners, for instance, success often depends on a close exchange of information during the research process. By contrast, social and political consultancy often calls for a critical distance and independence from the research processes that precede it.

Typical forms of knowledge transfer include the targeted communication of knowledge, consultancy, and joint development and application of products. Knowledge transfer recipients may also be multipliers with close links to particular target groups, such as think tanks in political consultancy, and educational establishments and the media for communicating knowledge to the general public.

It is the task of the individual institutions to select the content and communication form for their knowledge transfer, in consultation with the individual recipients. The recommendation for transferring knowledge successfully is to communicate with stakeholders and continuously review knowledge needs. This makes it possible to adapt knowledge transfer to take account of the target groups' conditions for action and expectations. This kind of transfer also deepens society's understanding of the logic of research, but also of the limits of its application.
Leibniz institutions plan their knowledge transfer as part of their overall strategy. The aim is to establish knowledge transfer as a fundamental component of scientific work – one that is systematically considered throughout the research process, from project planning to dissemination of the results.

Evaluation

Research-based knowledge transfer is one of the Leibniz institutions' services, and is essential for their communications with society. It should therefore be evaluated in terms of its strategic importance and effectiveness, taking account of each institution's defined mission. As part of their transfer strategies, the Leibniz institutions therefore develop their own institution-specific criteria for evaluating the implementation and sustainability of their transfer

activities. In general, the evaluation should consider two aspects: the status of knowledge transfer within an institution's strategic management, and the implementation and attainment of the knowledge transfer objectives.

The status of knowledge transfer in strategic management can, for instance, be reflected in the division of responsibilities between different levels of the hierarchy, in the allocation of resources and in personnel development criteria. By contrast, the attainment of knowledge transfer objectives is somewhat removed from the scope of individual researchers or individual Leibniz institutions. The impact of knowledge transfer activities depends on a large number of factors and actors and is often achieved only after a long delay. Transfer inputs and outputs are, however, relatively easy to record, or to assign directly or indirectly to particular activities, and to document.

In addition, in view of the huge range of possible transfer activities, and in the light of the widely differing objectives in terms of the transfer target groups, it is helpful to develop additional evaluation criteria. With this in mind, all Leibniz institutions define a set of criteria in their transfer concept against which they, or external auditors, will evaluate their transfer activities. These criteria explicitly include qualitative information, verbal accounts and the description of sample transfer processes. It is important that an institution's transfer achievements are always assessed in the context of its defined mission and strategy.

Governance

A central concept for Leibniz institutions is that they generate knowledge based on scientific standards and rules. From this it follows that the transfer of this knowledge should also take place in accordance with binding rules. Knowledge transfer should be tied to scientific work or domain-specific expertise of the researchers or institutions. This kind of knowledge transfer makes a significant contribution to society's acceptance of research and scientific principles. Knowledge transfer needs a set of rules to safeguard quality, as well as ongoing governance by the researchers and by the institutions themselves. Compliance with these rules relies on the responsibility of research institutions to act ethically and transparently vis-à-vis society. The roles and interests of knowledge transfer partners must always be clearly defined. In particular, the independence of research must not be compromised by transfer interests.

Within knowledge transfer, the requirement for independent, transparent and intersubjectively traceable knowledge acquisition for research and science is reflected in the duty to disclose any third-party influence, personal interests and dependence on third parties, so that the recipients are in a position to evaluate the transferred results accordingly. In a similar way, there should be clear communications on the uncertainties surrounding results, the possible interpretations of the available data and where the boundary lies in terms of the researcher's personal opinion. Such personal opinions should always be clearly identified as such in all transfer formats.

Leibniz institutions establish a knowledge transfer culture that ensures compliance with the rules of good knowledge transfer. At the same time, the aim is to safeguard the status of knowledge transfer by ensuring that it is considered, implemented and reviewed at all levels of an institution. This kind of governance that regulates the ethical and pragmatic aspects should be based on an institute-specific transfer concept.

The status of knowledge transfer is reflected in the fact that it is important for the entire institution and is also pursued and developed by top management. The institute management boards are responsible for the strategy, development, monitoring and consolidation of transfer activities.

Important resources in the area of knowledge transfer include staff entrusted with transfer activities, e.g. transfer officers, transfer offices, press offices and, where necessary, staff who advise inventors on commercial application. They provide important support services for re-

searchers, safeguard know-how in dealings with knowledge transfer recipients, analyse the transfer potential in research, and systematically evaluate it. In consultation with transfer actors from academia and target groups, they draw up optimum knowledge transfer paths, which they monitor, evaluate and develop further. At the same time, they provide new ideas for innovative transfer approaches at the institution. While doing so, they maintain close, transparent communication with the management board of the institute, the researchers, infrastructure staff and administrative staff.

The people involved in knowledge transfer processes should receive suitable training. They should extend their knowledge by sharing experiences with other research institutes. The Leibniz Association offers regular forums and training courses for this. Other aids that are helpful for their work include manuals that set out the principles of good knowledge transfer, practical guides that include examples for specific transfer activities (“toolboxes”), describe standard processes and provide templates and individual support, e.g. for draft contracts with industry stakeholders, or for accompanying processes relating to spin-offs from Leibniz institutions.

A central criterion for the efficiency of knowledge transfer activities is how well the activity fits the target group. To achieve a good match, research institutions should study the characteristics and needs of their target groups in depth and consult with them directly – where this makes sense and is possible. Institutional bodies such as scientific advisory councils, user advisory councils and supervisory committees can also provide important advice here.

Outlook

This policy emphasises the fundamental significance of knowledge transfer as part of the Leibniz institutions’ social responsibility as a scientific association. In view of the current tendency in the media and in society to cast doubt on scientifically generated findings and facts, there is a particular need for science as a whole to clarify the quality of its results and the routes that lead to its findings. Knowledge transfer is therefore highly relevant politically as well as a means of educating people about the quality standards of scientific work.

The quality of knowledge transfer depends largely on the motivation and abilities of the individual researchers. They are the source of transfer-relevant knowledge and expertise, so recognition of transfer as an important component of scientific work at Leibniz institutions should be strengthened. To improve the reputation of knowledge transfer, but also to improve individual transfer skills over the long term, there is a need to systematically establish a knowledge transfer culture at Leibniz institutions as a whole.

The strategic importance of knowledge transfer as a social responsibility and its institution-specific manifestations should be reviewed periodically and developed further. This, combined with ongoing personnel development and training, is the condition for ensuring that staff are able to carry out their knowledge transfer responsibilities independently in line with the institute’s objectives, so that excellent research-based knowledge from the Leibniz Association can play an effective long-term role in society.

Project examples for knowledge transfer to society, industry and policymakers

Exhibition and Arts

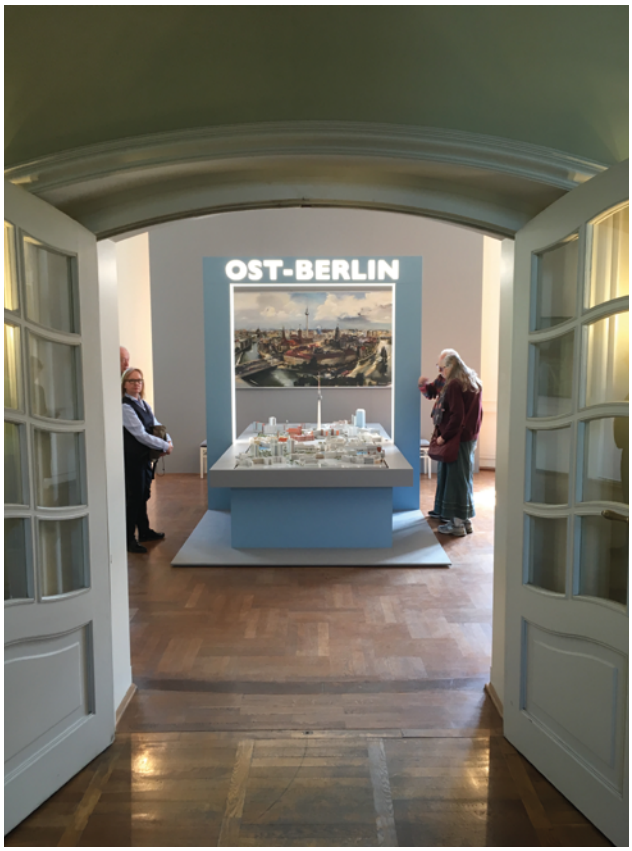
Exhibitions and artistic interpretations communicate research findings clearly to a wider public. In particular, they help introduce children and young people to science and its questions, and also to the boundaries of scientific knowledge. The Leibniz research museums are a particularly good example, with their unique ways of building bridges between science and society.

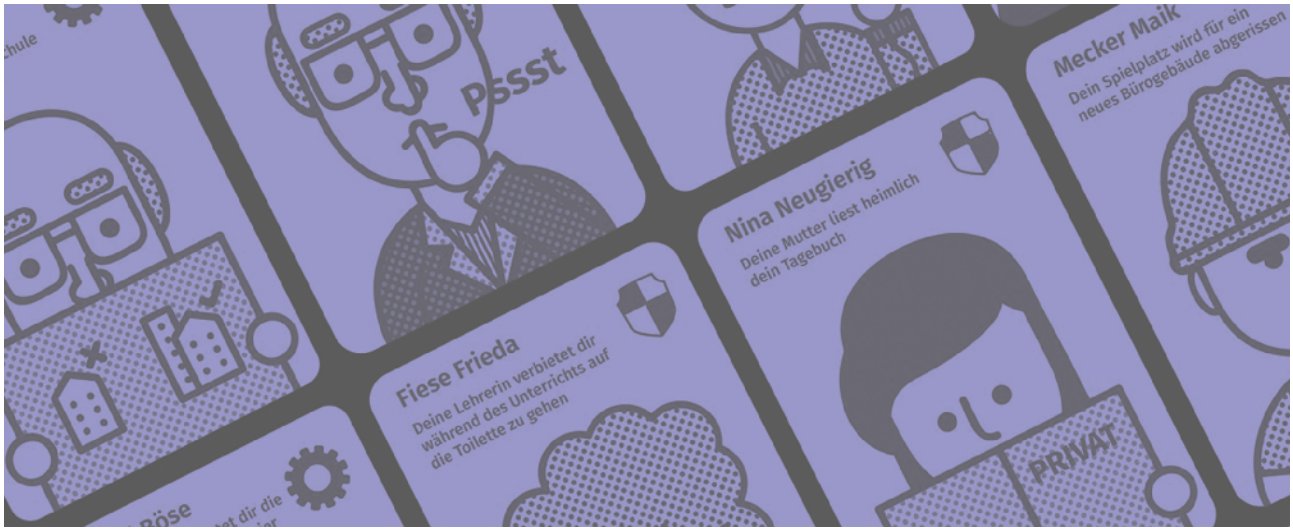
Exhibition »East Berlin. Half a Capital«

30 years after the fall of the Berlin Wall, the Leibniz Centre for Contemporary History in Potsdam (ZZF) and Stadtmuseum Berlin are shining a spotlight on the former East German metropolis of East Berlin in a joint exhibition at Museum Ephraim-Palais. The focus is on the social and cultural dimensions of life in the 'half capital'. To accompany the exhibition, students on the Public History Master's degree course, which is run jointly by the ZZF and Freie Universität Berlin, have developed contemporary, interactive events for museum and city visitors.

The exhibition was supported by Lotto Stiftung Berlin and the Federal Foundation for the Study of Communist Dictatorship in East Germany.

https://zzf-potsdam.de/en/forschung/projekte/east-berlin-half-capital
https://ost.berlin/exhibition





Exhibition »digging deep, crossing far«

The global impacts of the First World War provide the sounding board for the artistic perspectives on display in the 'digging deep, crossing far' exhibition at the Kunstraum Kreuzberg/Bethanien exhibition space in Berlin. Taking inspiration from the camps for non-European prisoners of war in Zossen-Wünsdorf, historians from the Leibniz-Zentrum Moderner Orient (ZMO) worked with artist Sonya Schönberger (Berlin) to produce a video installation that traces the experiences of a Nepalese prisoner in Wünsdorf near Berlin during the First World War. Researchers also supported other artists involved in the exhibition, including The Tentative Collective (Karachi) and sound artist Gilles Aubry (Berlin), who both worked with audio recordings of Indian prisoners of war. The exhibition was shown in Bangalore, Karachi and Lahore. Local discussion of findings in local languages is a key element of knowledge transfer at the ZMO.

http://digging-deep-crossing-far.de/en/

Visual Society Program

In the Visual Society Program – a collaboration between the Berlin Social Science Center (WZB) and Berlin University of the Arts – young designers work with social researchers to step outside their subject areas. The aim of the collaboration is to create new ways of approaching socially relevant issues and to find visual ways of interpreting social science research findings to make them accessible to the general public. The results included a multi-award-winning website on the WZB's Double Shift study about the integration of Syrian refugees in Jordan, an infographics book on suicides in the former German Democratic Republic, and a card game on children's rights.

www.wzb.eu/de/presse/visual-society-program

Imaginary

The Oberwolfach Research Institute for Mathematics (MFO) is involved in Imaginary gGmbH, which explains mathematics clearly and communicates methods and ideas interactively through international exhibitions and on its website. Since 2014, the MFO has been publishing short essays, written by the people of international standing who take part in its academic programmes, in Snapshots of Modern Mathematics from Oberwolfach. They present ideas and methods of modern mathematical research in layman's terms and make them accessible to sixth-formers, secondary school teachers, science journalists and other interested parties.

IMAGINARY gGmbH was formed from a spin-off of an MFO third-party-funded project with the Klaus Tschira Foundation, supported by funds awarded by the Leibniz Association's Senate Competition Committee (SAW).

https://imaginary.org/snapshots
https://about.imaginary.org

Research museums as places of knowledge transfer

With their three-pronged mission – collect, research and communicate – the eight Leibniz research museums are perfectly placed to facilitate dialogue between science and society. Their exhibitions and events provide unique, active, sensuous and emotional educational experiences. At their best, they inspire people of all backgrounds and ages to become interested in science and research, and invite them to engage critically with the subject matter. They shape cultural identity and contribute to social integration. In order to fulfil their mission, the research museums are constantly adapting their outreach activities in line with changing audience response patterns, as well as adopting and evaluating new technical possibilities. Since 2017, the Leibniz research museums have been strengthening their role as places of knowledge transfer through a joint action plan.

www.leibniz-gemeinschaft.de/forschung/forschungsmuseen/aktionsplan

Education and Training

Education is a classic channel for knowledge transfer. Numerous Leibniz Institutes offer free or low-cost educational programmes for people at different stages of their lives. In doing so, they make an active contribution to an effective education system and promote lifelong learning. Human resources are an important part of knowledge transfer between science and society. The Leibniz Association is keen both to support the next generation of scientists and to make it easier for trained scientists to embark on non-academic careers.

School labs

Ocean acidification, overfertilization of the seas, and plastics in the oceans are some of the pressing environmental problems studied by the Leibniz Institute for Baltic Sea Research Warnemünde (IOW). The institute runs the Plasticschool and Marischool labs for secondary school pupils, where sixth-formers can gain insights into the work of researchers and run their own experiments to find out more about environmental issues. The IOW also supports teachers by providing teaching materials that deal with current research findings. The products and services can be booked online. The IOW has a dedicated schools outreach officer who has set up a strong network that stretches far beyond the region.

https://plasticschool.de
https://marischool.de

KlimafolgenOnline – Climate impacts and education for Germany

»KlimafolgenOnline« presents the impacts of climate changes on German agriculture and forestry, its water and energy sectors, tourism and health. The website enables the public to access the research findings of the Potsdam Institute for Climate Impact Research (PIK) for the period 1901–2100 on a number of different geographic scales. Building on this, an environmental education site was also developed. Called »KlimafolgenOnline-Bildung«, this site lets schoolchildren observe local climate changes through a number of different scenarios and explore the consequences. The site also provides materials for school teaching and vocational training, as well as tutorials and a glossary.

www.klimafolgenonline.com
www.klimafolgenonline-bildung.de

Practical experience for doctoral students

The research programme run by the Germanisches National Museum (GNM) and the University of Erlangen-Nuremberg gives postgraduate students in the humanities and sciences the opportunity to gain an insight into future occupational fields while doing their PhDs, and to qualify for a non-university occupation. While writing their dissertations, the six programme participants research the history of the GNM and the historical development of its collections. They also turn their research findings into innovative outreach concepts. Practical modules with experts from the private sector integrate theory and curation practice.

The research programme is funded by the Volkswagen Foundation.

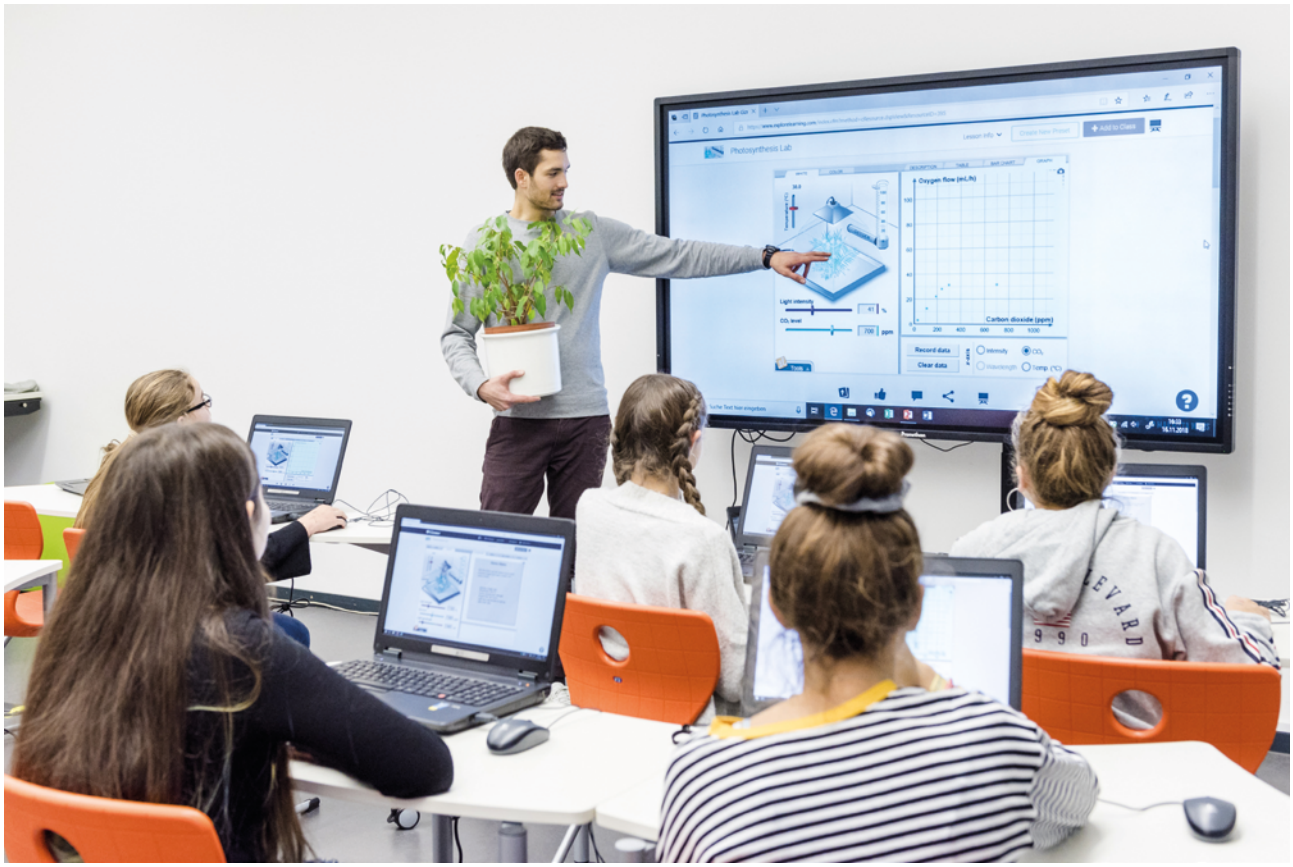
www.kunstgeschichte.phil.fau.de/forschung/forschungsprojekte/modellierung-von-kulturgeschichte-am-beispiel-des-gnm/

YES! – Young Economic Summit

YES! – Young Economic Summit is a nationwide competition in Germany that focuses on knowledge transfer between academia and schools. Researchers from prestigious institutes set challenges and the young people develop their own solutions with the help of researchers and teaching modules from the Leibniz Information Centre for Economics (ZBW). This gives them insights into research work, specifically in the social sciences and economics, and they learn about tools for solving economic, environmental and social problems. In discussions with figures from industry, science and politics, they gain a greater awareness of global interrelationships and learn that they can help shape economic reality.

YES! is a joint project run by the ZBW and the Joachim Herz Foundation.

www.young-economic-summit.org/en/



Tübingen Digital Teaching Lab (TüDiLab)

The TüDiLab is a facility of the Leibniz-Instituts für Wissensmedien (IWM) and the Tübingen School of Education at Tübingen University. It simulates a classroom equipped with the kind of digital media and research tools typically found in schools. Thanks to its data, it can describe teaching and learning processes in real classroom situations with high temporal resolution. In the TüDiLab, prospective and practising teachers can acquire digital media teaching skills and test out the potential of digital media. In addition, the facilities can be used for process-oriented research into the effects of media-based teaching. Trainee teachers, for instance, can be trained in media-supported teaching and have their lesson scenarios tested with school classes in the TüDiLab.

The TüDiLab is supported by the Baden-Württemberg Ministry of Science, Research and the Arts through the 'strengthening beacons of teacher training' line of funding, part of a programme for developing teacher training in Baden-Württemberg.

www.tuedilab-tuebingen.de

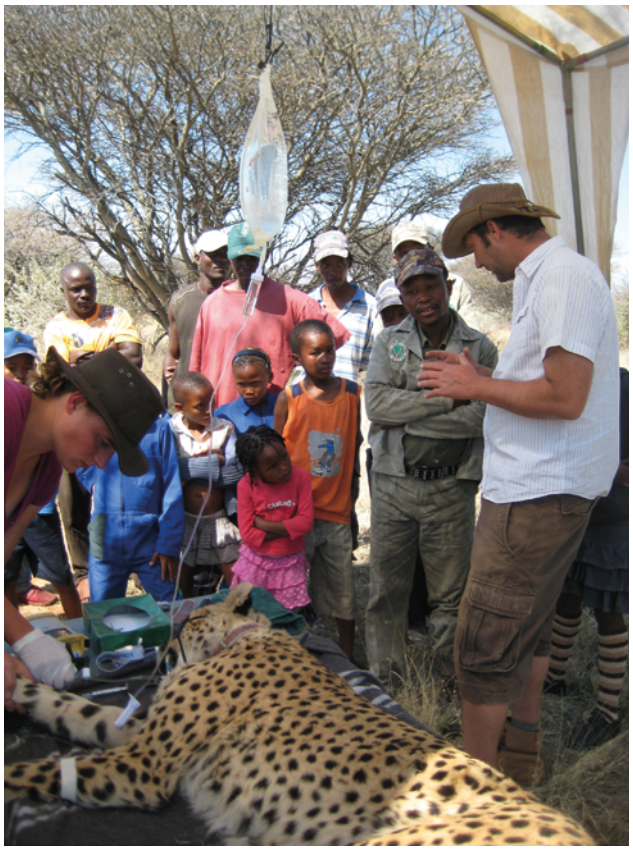
wb-web: Skills for teachers working in adult education and further training

wb-web is a free website for developing professionalism among teachers in adult education and further training. Across Germany, around 530,000 trainers, course leaders, youth leaders and lecturers use the site to find evidence-based information and networking opportunities. All the content is easy to use under a Creative Commons licence. wb-web collaborates with 16 umbrella and specialist associations that contribute their expertise and create and distribute content. wb-web is currently being expanded with the addition of EULE, a practical online learning course for adult education teachers, which also generates research data on skills acquisition.

www.wb-web.de

Capacity Building

Knowledge transfer for capacity building aims to expand people's and societies' capacity for decision-making and action. Leibniz Institutes work with experts from science and industry and with organisations and groups to strengthen their competencies and resources for the long term. In particular, sharing specialist technical and organisational knowledge with partners from so-called emerging and developing countries can help solve pressing global challenges.



Solutions to the farmer–leopard conflict

The Leibniz Institute for Zoo and Wildlife Research (IZW) runs research projects with interest groups to develop solutions to conflicts between humans and wild animals. One such conflict exists in Namibia, where farmers shoot leopards to protect their livestock. In a long-term project, the IZW is working with farmers to study the leopards' movement patterns and feeding habits. The results allow the farmers to move herds with young calves into areas where fewer leopards are hunting. As a result, far fewer calves are killed. The farmers are now also involved in developing research questions and applying for funding, e.g. for an IZW research project on leopards.

www.izw-berlin.de/en/stakeholder-publications.html

Transfer for better healthcare in Namibia

The Research Center Borstel – Leibniz Lung Center (FZB) has set up a sequencing lab for the molecular genetic characterisation of complex strains of Mycobacterium tuberculosis (MTB) in a bilateral partnership at the University of Namibia School of Medicine (UNAM). The lab supplies clinical diagnostic genetic testing lab reports for drug-resistant MTB to a partner hospital in Katutura in Windhoek. Based on these reports, patients who are found to have a multidrug-resistant or extensively drug-resistant strain of tuberculosis can be given individually tailored antibiotic treatment. The FZB provides ongoing support to the lab at the UNAM, including lectures by scientists, training courses and technical support.

The project is also supported by:
AID Diagnostika GmbH in Straßberg

Mobile labs for the control of epidemics in East Africa

Since 2012, the Bernhard Nocht Institute for Tropical Medicine (BNITM) has been using mobile labs to fight epidemics in remote areas, for instance, during the Ebola epidemic in West Africa. To facilitate early identification of transnational epidemics, the institute is supporting the development of a further nine mobile labs in six East African Community countries. The BNITM is using its expertise in virology, infection epidemiology and diagnostic development to train two experts from each of the partner countries to run the labs, as well as training them in the latest diagnostic methods. In line with the train-the-trainer concept, these experts will then train lab staff in their home countries.

The project is funded by the Federal Ministry for Economic Cooperation and Development (BMZ) through KfW, the German state-owned development bank

http://mobilelabs.eac.int/

Protecting and using biodiversity

Since 2012, the Leibniz Institute of Plant Genetics and Crop Plant Research (IPK) has been collaborating with the Ethiopian Biodiversity Institute in Addis Ababa. Ethiopian and German researchers are fighting hunger by strengthening agriculture, improving local food supplies and supporting sustainable development. The central ex-situ gene bank of the IPK, one of the oldest and largest gene banks for crop plants in the world, has already supplied Addis Ababa with more than 7,000 samples, including 5,500 barley samples. They represent an important resource for breeding locally adapted varieties. The IPK also helps with the procurement of machines and equipment. In summer 2018, for instance, a new cold storage unit was officially opened that complies with international gene bank standards. In addition, Ethiopian scientists, gene bank staff and agricultural employees receive further training at the IPK and in Ethiopia.

The project is funded by the Federal Ministry of Food and Agriculture (BMEL) and by private partners, including KWS Saat AG in Einbeck.

www.bmel-kooperationsprogramm.de/projekte/aethiopien/beitrag-zur-foerderung-der-nachhaltigen-landwirtschaftlichen-produktivitaet-in-aethiopien/

Recommended courses of action for tropical coastal ecosystems

Tropical coastlines harbour some of the most species-rich habitats on Earth and support the livelihoods of large numbers of people. The dynamic, expanding societies in these countries are, however, causing environmental pollution and overexploitation of natural resources, which, together with global environmental changes, are having an impact on the fragile ecosystems. The Leibniz Centre for Tropical Marine Research (ZMT) investigates the interrelationships between humans and ecosystems along tropical coastlines. Sharing knowledge is essential when it comes to studying these issues and cannot be replaced by transferring research findings after the event. The scientists therefore work with stakeholders in the tropics, identify problems and research topics locally, and contribute to target-group-specific solutions.

www.leibniz-zmt.de/de/kooperationen.html

EU Non-Proliferation and Disarmament E-Learning Course

In 2010, the European Union set up a network of independent research institutions to advise the official EU bodies and the governments of its member states on pressing ahead with non-proliferation and disarmament of weapons of mass destruction and stemming the illegal proliferation of small arms and light weapons. The Peace Research Institute Frankfurt (HSFK) is a member of the network's coordinating consortium. Together, the partners developed the free Non-Proliferation and Disarmament online EU course for interested practitioners and academics. There are 15 units so far. In them, 24 experts, including five from the HSFK, teach on the theme of arms control, disarmament and non-proliferation through 144 videos, themed pages and interactive elements.

The project is funded by the European Union.

www.nonproliferation-elearning.eu

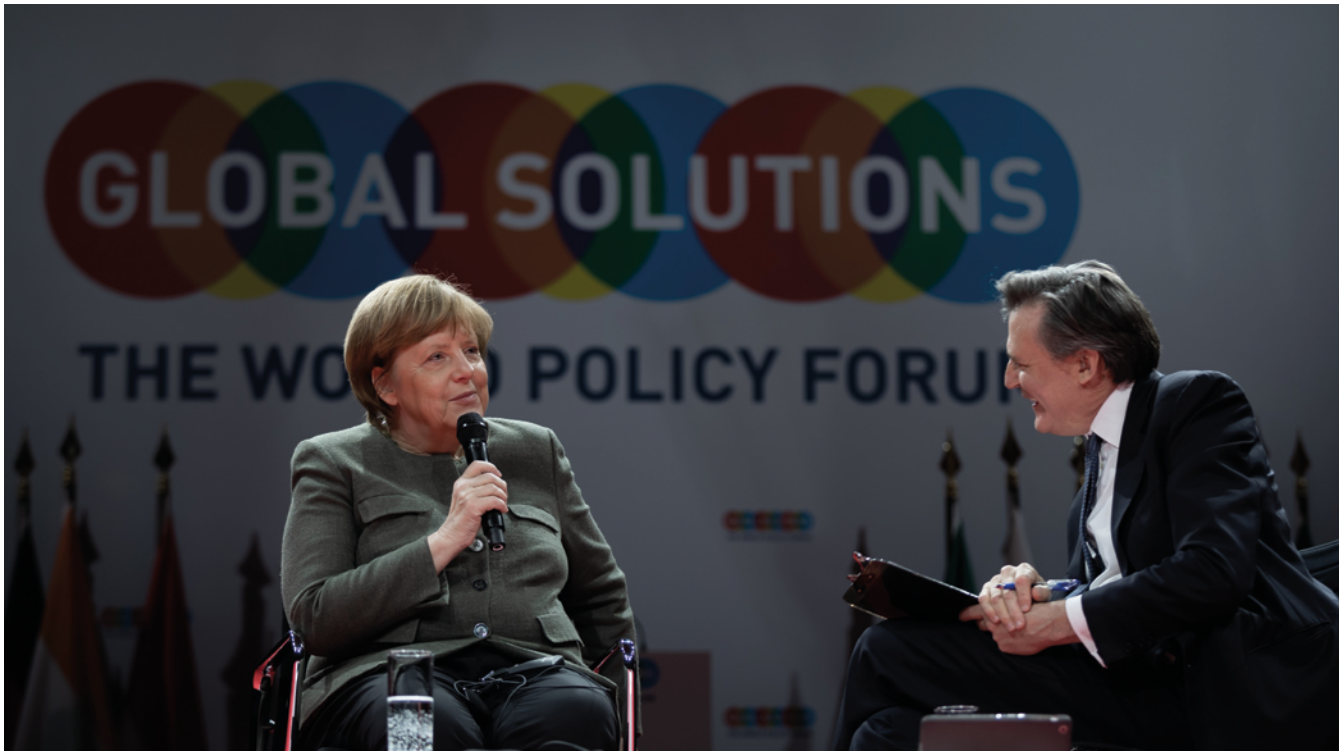
Public Policy Consulting

Leibniz Association scientists help shape dialogue and debate at all levels of the political system. Based on their research findings, they provide advice at national and international level to parliaments, ministries, associations and other bodies, give their opinions on current politics and evaluate long-term developments in expert reports and forecasts. In this way, knowledge generated through independent research can form the basis for political and economic decision-making processes.

Crisis Talks

Throughout the history of the European Union, crises have often been an important engine for change and progress. So far, the very heterogeneous and consensus-focused EU has been able to overcome obstructions and bring about integration in crisis situations. Since 2015, the Leibniz Research Alliance on Crises in a Globalised World has been running a series of Crisis Talks examining how Europe should deal with current and past crises. The Crisis Talks are organised in partnership with the Representation of the State of Hessen to the EU, the Europe Office of the Leibniz Association and the 'Normative Orders' Cluster of Excellence at the University of Frankfurt am Main. Here, researchers from the Leibniz Research Alliance on Crises in a Globalised World present their research work and enter into dialogue with political and social actors. Research and practice both benefit from this knowledge transfer through dialogue, and together contribute to a better understanding of some of the challenges facing society.

www.leibniz-krisen.de/en/transfer/crisis-talks



Advising the G20

The presidency of the Group of Twenty largest industrialised and emerging countries (G20) is supported each year by a network of prestigious think tanks (T20). In 2017, the Kiel Institute for the World Economy (IfW Kiel) was mandated by the German G20 presidency to help coordinate this consultancy process, and restructured it. Task forces and the Think20 Summit 'Global Solutions' produced recommended courses of action, including possible ways of supporting poorer countries in their efforts to look after refugees, measuring and combating inequality in countries, and implementing a socially sustainable climate policy. The success of this initiative formed the basis for ongoing G20-focused international political consultancy work by the IfW, which continues to be involved in the T20 task forces.

www.ifw-kiel.de/institute/research-centers/global-commons-and-climate-policy/projects/dialogue-on-climate-economics/

Lively dialogue at European level

Since 2014, the Leibniz Centre for European Economic Research (ZEW) has been hosting Lunch Debates in Brussels four times a year, encouraging discussions on key European questions, such as the EU budget, Brexit and the Eurozone. Kick-off speeches by ZEW researchers are followed by a panel discussion with high-calibre representatives from academia, the European Commission, the European Parliament and other European organisations. The Lunch Debates, which take place in the offices of the Representation of the State of Baden-Württemberg to the EU, reflect a broad spectrum of opinions from beyond the individual EU states and are very well received. They give the ZEW the opportunity to feed research findings into the discussion at EU level and to obtain feedback for its own research.

www.zew.de/en/events-and-professional-training/public-events/zew-lunch-debates

Creating transparency on global land acquisitions: The Land Matrix database

Investors have bought up nearly 50 million hectares of agricultural land in developing countries since 2000 – land that was previously used mainly by small-scale farmers. The transactions account for over 1 per cent of the total useable agricultural area in these countries. The German Institute of Global and Area Studies (GIGA) conducts research into the impacts of these land acquisitions and, together with international partners, runs the Land Matrix database, which people can use to look up and submit information on land deals. A central role is played by Regional Focal Points in Asia, Africa, Latin America and Eastern Europe, which coordinate data collection, produce country reports and support people affected by land deals. The partners of the Land Matrix are in dialogue with the World Bank, national development cooperation organisations and NGOs with international operations.

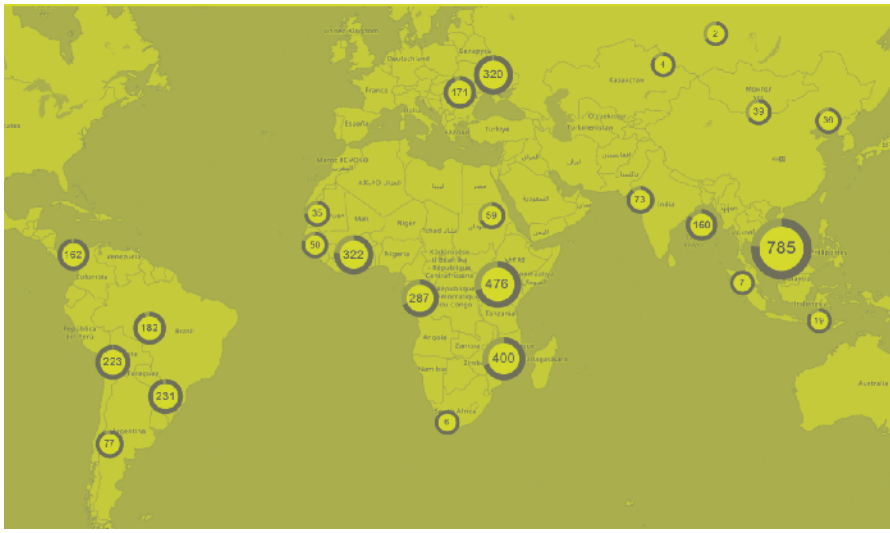
The Land Matrix is supported by funds from the European Commission, the Federal Ministry for Economic Cooperation and Development, the French and Dutch ministries of Forgein Affairs, and the Swiss Agency for Development and Cooperation. Its global partners are the International Land Coalition, the Centre de Coopération Internationale en Recherche Agronomique pour le Développement, the Centre for Development and Environment at the University of Bern and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

www.landmatrix.org

Evidence-based Evaluation of the Minimum Wage

Seen in historical terms, the statutory minimum wage is a rare 'labour market experiment'. Before Germany introduced its minimum wage, it was estimated that 4 million workers earning less than EUR 8.50 per hour would be affected. The basis for many of the estimates was the long-term survey conducted by the Socio-Economic Panel (SOEP), a Leibniz infrastructure facility based at the German Institute for Economic Research (DIW Berlin). A project funded through the Leibniz Competition expanded the minimum wage database up to 2018 and prepared the data so it could be used by researchers. It showed that in the first two years, significantly more than a million workers were still earning less than the minimum wage, despite the fact that low hourly rates had seen above-average increases. The analyses made an important contribution to evidence-based policy advice and helped make the discussion about the Minimum Wage Act more objective.

www.diw.de/en/diw_01.c.496963.en/projects/evaluating_the_minimum_wage_introduction_in_germany__eva-min.html



Research conducted for society and with society

Social relevance is a key guiding principle of Leibniz research. In order to ensure that publicly financed research can be used for the benefit of society, Leibniz Institutes share their findings with non-academic stakeholders. In doing so, they play a significant role in developing society's capacity to reflect and innovate. In this multifaceted dialogue, researchers also take up ideas from the community and develop new perspectives for their research. This exchange of views can be particularly intense in citizen science, where citizens make a direct contribution to research projects and generate knowledge.

Souci-Fachmann-Kraut nutritional tables

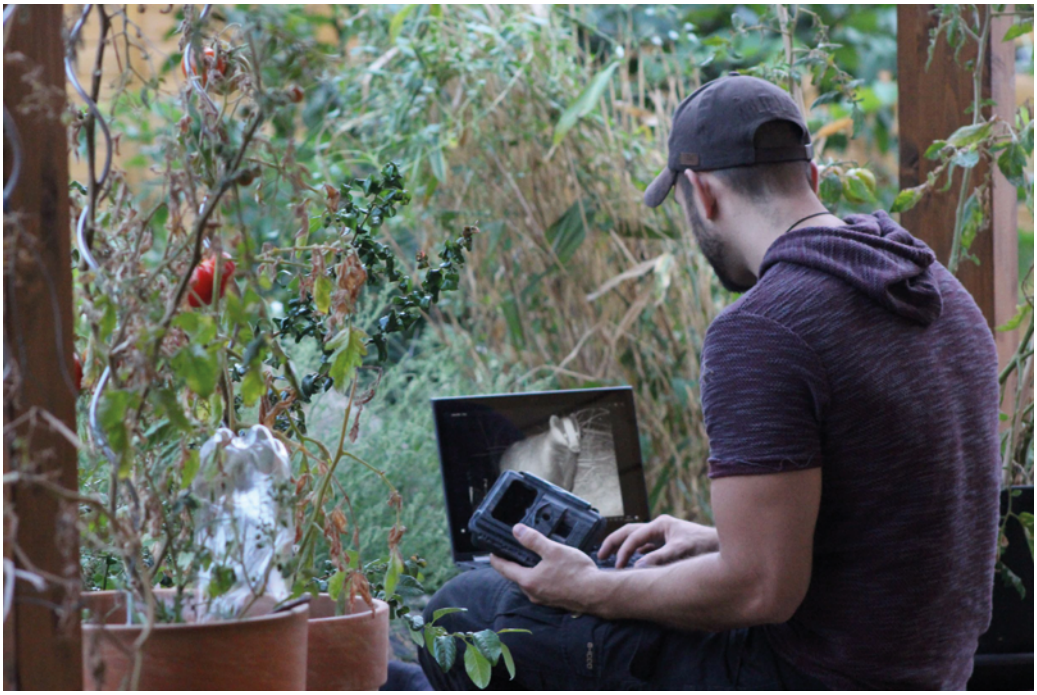
The Souci-Fachmann-Kraut database contains nutritional data for more than 800 foods, with details of around 300 different ingredients. It is continually updated and expanded by the Leibniz-Institute for Food Systems Biology at the Technical University of Munich. The institute evaluates scientific publications and analysis results from certified laboratories, taking into account changes in eating habits and findings in the fields of nutrition and food science. The database supports technical experts working in the areas of dietetics and nutrition or involved in producing, marketing and inspecting foods. It is also one of the sources used by the Federal Ministry of Food and Agriculture (BMEL) for its German Nutrient Database.

www.sfk.online
www.leibniz-lsb.de/en/databases/food-composition-and-nutrition-tables-souci-fachmann-kraut/

Sulphate in the River Spree – Causes, impacts and possible courses of action

'Dialog am Müggelsee' is a regular event run by the Leibniz Institute of Freshwater Ecology and Inland Fisheries (IGB), at which IGB researchers working on various topics discuss them with politicians and representatives of government authorities, environmental associations and industry. One of the events focused on river pollution. Increasing quantities of sulphate are entering the River Spree and its tributaries through groundwater. This pollution has been the subject of intense public and media debates, some of which suffer from a lack of evidence-based arguments. At this event, researchers and guests discussed impacts, courses of action and the latest research. The results of the dialogue on sulphate in the Spree were published in the IGB series IGB Outlines as a free, open-access dossier written in layman's terms.

www.igb-berlin.de/sites/default/files/media-files/download-files/IGB_Dossier_2016_Sulfat_END.pdf



Citizen science as a tool for knowledge transfer

Citizen science can be a good way of disseminating knowledge acquired through research. In an ideal scenario, citizen science projects deliver benefits for both sides: researchers benefit from citizens' ideas and involvement; citizens gain a better understanding of how science works and are given personal, direct access to a research question and to methods for generating new knowledge. However, the benefits that participants actually gain from citizen science projects has not been studied much until now. In the joint WTimpact project, the Leibniz Institute for Zoo and Wildlife Research (IZW), the Leibniz Institute for Science and Mathematics Education (IPN), the Leibniz-Instituts für Wissensmedien (IWM) and the Leibniz Institute for Tropospheric Research (TROPOS) are investigating whether knowledge transfer through citizen science works, and which factors play a role in it.

The project is funded by the German Federal Ministry of Education and Research (BMBF).

www.wtimpact.de

Diabetes Information Service

Society has a growing need for information about diabetes and about the early diagnosis, prevention and treatment of complications. The German Diabetes Center (DDZ) runs a quality-assured information platform supported by experts that is used by the public, patients and medical experts. The Diabetes Information Service communicates research findings in compliance with the guidelines of the German Diabetes Association (DDG) and recommendations published by international associations. With support from Germany's Federal Ministry of Health, the Diabetes Information Service has also developed an initiative called 'Diabetes – Not just a question of type', which is designed to improve knowledge about diabetes and raise awareness of the disease among specific target groups.

www.diabinfo.de

Flowering meadows for Saxony's butterflies – A public campaign to combat species loss

Butterfly numbers have fallen dramatically. The insects are dependent on a variety of biotopes: food plants for the larvae, safe places for pupation, and flowers as a food source for the adult butterflies. Led by Senckenberg scientists and in partnerships with nature conservation organisations, government agencies and the public, this project aims to create as many butterfly-rich meadows as possible. If butterflies move in, the species can be identified using a butterfly app. Data entered by members of the public into an online portal or linked app is submitted for scientific analysis. The project combines research, citizen science, species conservation and social commitment, and encourages children, young people and adults to take an interest in nature conservation.

The campaign is a joint project of the Senckenberg Society for Nature Research – Leibniz Institution for Biodiversity and Earth System Research (SGN), the Saxony State Foundation for Nature and the Environment (LaNU), the Saxony regional branch of the Nature and Biodiversity Conservation Union (NABU), the Saxony regional branch of DVL (the German society for preservation of the countryside), and Sächsisches Landeskuratorium Ländlicher Raum.

www.schmetterlingswiesen.de
App: https://play.google.com/store/apps/details?id=com.telerik.KBSInsectFinder

»Nationalatlas aktuell« – Germany in maps

The Leibniz Institute for Regional Geography (IfL) publishes a webzine called Nationalatlas aktuell that explains research findings relating to social, economic and environmental issues in Germany and Europe. All the articles consist of high-quality maps and diagrams, reliable data and texts that aid interpretation or provide an evidence-based analysis. They are freely available for personal use and for use in the education sector. In addition, the IfL works with teachers to prepare teaching materials on selected topics. The maps, which are easy to understand, are distributed through media partners, including the magazines Zeit and Bild der Wissenschaft.

http://aktuell.nationalatlas.de

Diabetes Risk Score – Expertise for health protection

Around seven million Germans suffer from Type 2 diabetes. The researchers at the German Institute of Human Nutrition (DIfE) developed the DIfE – GERMAN DIABETES RISK SCORE based on data from the EPIC-Potsdam study. The risk score calculates an individual's risk of developing Type 2 diabetes in the next five years. It is based on information concerning lifestyle, family risk factors and data such as height, age and waist measurement. The questionnaire can be completed at home – either by printing it out or filling it in online. It also includes tips for lowering the risk factors and reducing the probability of developing Type 2 diabetes and its complications. The risk score is already used by large numbers of individuals, doctors' practices and hospitals, pharmacies, companies and associations.

The Diabetes Risk Score was developed by the DIfE using public funds (German central government, Brandenburg state, European Union). It is being developed further within the German Center for Diabetes Research (DZD).

www.dife.de/en/news/diabetes-risk-score/

Technology Transfer

Thanks to their industry-related research and technology transfer, Leibniz institutions are international leaders in many high-tech fields. The close involvement of future users throughout the research process guarantees the effective transfer of technologies, for example for medicine or industry. The Leibniz approach makes it possible to conduct the entire range of research – from basic idea to the development of a demonstrator, or even a prototype. In many cases, the results are patented or licensed and turned into products and services.

Technologies for medicine

BTZ043 – A new tuberculosis drug

The first antibiotic against tuberculosis to be developed in Germany has been granted worldwide patent protection and has successfully completed the Phase Ia human clinical trial. BTZ043 is a benzothiazinone, a new class of antibiotics that target multidrug-resistant tuberculosis strains. The substance was discovered by researchers at the Leibniz Institute for Natural Product Research and Infection Biology (HKI), which has been working on development of the drug since 2015 in partnership with Ludwig-Maximilians-Universität München (LMU Munich) and a number of pharmaceutical companies. The public–private partnership serves as a model for many urgently needed drugs whose development is not pursued by the pharmaceutical industry for commercial reasons.

The development programme is largely financed by two consortia – InfectControl 2020 and the German Center for Infection Research (DZIF) – both of which are supported by the German Federal Ministry of Education and Research (BMBF), and by the Free State of Thuringia.

www.youtube.com/watch?v=60LEbd9XJ_A
www.infectcontrol.de/btz-met-id.html

A milestone in the battle against resistant germs

All over the world, people are increasingly suffering from infections that are resistant to antibiotics. These resistances can lead to treatable diseases becoming deadly threats again. Conventional diagnostic methods take one to three days to identify which bacteria a patient has been infected with and whether they are resistant to antibiotics. During this time, life-threatening infections are often treated with broad-spectrum antibiotics. This leads to more resistance. In response, a team of researchers from the Leibniz Institute of Photonic Technology (Leibniz-IPHT), the University of Jena, and University Hospital Jena developed the RamanBioAssayTM. This fast, laser-based test delivers the vital information in three hours so that the most effective treatment can start straight away. The spin-off company, Biophotonics Diagnostics, uses the new technology to develop systems solutions for infection diagnostics.

The methodological research was funded by the German Federal Ministry of Education and Research (BMBF) through the European Union's 7th Framework Programme for research.

www.youtube.com/watch?v=yzMXwD5_DEg

Space technology for cancer diagnosis

Using an astronomical 3D spectrograph and innovative software, researchers at the Leibniz Institute for Astrophysics Potsdam (AIP) have for the first time used Raman spectroscopy imaging for the non-invasive diagnosis of cancer. The new method can help physicians differentiate between abnormal tissue changes and healthy tissue. Raman spectrometers measure scattered light on molecules and solids and identify biochemical changes. Conventional devices measure only individual points and do not produce images. The method, developed with the Ferdinand-Braun-Institut (FBH) and the Leibniz Institute of Photonic Technology (IPHT), produces images in real time during tissue examinations and filters out light interference. A patent application has been filed.

The methodological research was funded by the German Federal Ministry of Education and Research (BMBF). Further development to produce a device for conducting clinical trials in collaboration with a company is being funded by the EU.

https://unternehmen-region.bmbfcluster.de/de/himmel-und-erde-2418.html

Plasma technology for healing chronic wounds

kINPen® MED is the first plasmajet approved as a medicinal device for the treatment of chronic wounds and pathogen-induced diseases of the skin. It delivers a physical cold plasma with a temperature of around 37 degrees Celsius to the wound with pinpoint accuracy, promotes healing and has proved to be an effective addition to conventional wound treatment. The kINPen® MED is the result of interdisciplinary basic research conducted by the BMBF-funded project Campus PlasmaMed and the 'plasmatis' Center for Innovation Competence at the Leibniz Institute for Plasma Science and Technology (INP). An INP spin-off, neoplas tools GmbH, manufactures the plasmajet and markets it internationally. Successful technology transfer led to a medical advance capable of alleviating the suffering of millions of people.

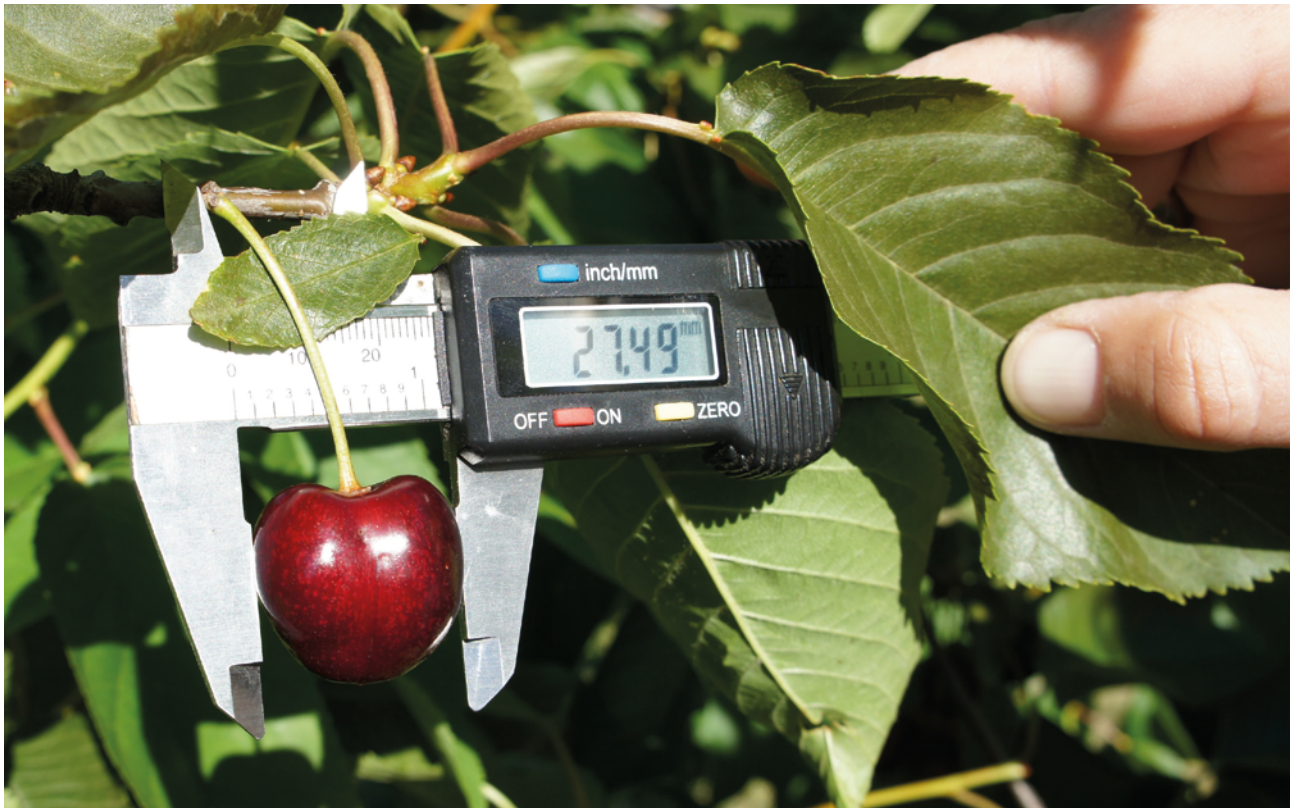
https://neoplas-med.eu/

New technique for vascular surgery

The Leibniz-Institut für Analytische Wissenschaft (ISAS) develops methods for health research and biomedicine, with a particular focus on cardiovascular diseases. For instance, it offers standardised, specific proteome analyses and metabolic analyses. It also works closely with companies on transfer projects and makes its innovations available for specific diagnostic and treatment methods. When a stent is inserted, for instance in a coronary vessel, metabolite deposition on the surface of the tiny tube can jeopardise the success of the operation. ISAS is therefore researching innovative techniques for analysing the stent surfaces in order to work with companies to develop anti-thrombogenic implants.

https://portal.nmwp.de/news/view/48213/clustermanagements-als-innovations-katalysatoren

Technologies for production and industrial manufacture



App for analysing cherry growth

When are cherries ripe? Researchers from the Leibniz Institute for Agricultural Engineering and Bioeconomy (ATB) have developed the Cherry Harvest Size app to help cherry-growers determine the optimum harvest time. Using a smartphone, producers take photos of various cherries from their orchard. The app then uses variety and location-specific ripening patterns to calculate the mean growth rate of the fruits. If it falls below 0.2 mm per day, it is no longer worth waiting for the fruit to get bigger because the risk of damage by pests, disease or bad weather increases with every passing day. Producers can also use the app to grade their cherries for market and make the data available to research.

www.atb-potsdam.de/de/aktuelles-und-presse/pressemitteilungen/pressemitteilungen-detailseite/smarte-unterstutzung-fur-kirschenproduzenten-die-app-cherry-harvest-size-gibt-tipps-zum-erntetermin

New grip structures for robotics and Industry 4.0

Components with highly sensitive surfaces are common in the manufacture of cars, semiconductors and displays. During the production process, these sensitive parts are transported from one place to another in a large number of process steps. The Gecomer® grip structures developed by the INM – Leibniz Institute for New Materials allow objects to be lifted and transported safely. The grip surface is only half the size of a postcard and reduces the risk of damage or sticky residues. The grip structures surpass conventional grip systems, for instance when transporting very small components or transporting components in a vacuum. The technology is being developed further with industrial partners and will lead to new Industry 4.0 applications.

Funding bodies: BMBF, DFG, ERC, EU Horizon 2020, Leibniz SAW, VW-Stiftung

www.innocise.com/en/home/

Growing crystals in a magnetic field

Mobile phones, computers, lasers and LEDs only work because they contain components based on semiconductor crystals like silicon and gallium arsenide. Interest in optimising the quality of these crystals and lowering their production costs is therefore high. Together with partners from industry, researchers at the Leibniz Institute for Crystal Growth (IKZ) have developed specially adapted magnetic fields that can monitor and influence the melt from which the crystals grow without coming into contact with it. The multi-award-winning technology significantly increases the yield of high-quality crystals. It is already being used in industrial applications and further applications are being trialled.

www.ikz-berlin.de/forschung-lehre/volumenkristalle/sektion-halbleiter

Sensor-aided in-situ process control ensures the quality of high-tensile steel

Components made from steel are often austempered to make them harder and more stable. In this process, the components are heated but then, instead of being quenched to bring them back to room temperature, they are held in a hot bath until the transformation to a bainite microstructure is complete. Until now, this process could not be externally controlled. In an industrial collective research project, the Leibniz Institute for Materials Engineering (IWT) and the Institute for Materials Science (IW) at the University of Hanover developed an electromagnetic sensor that tracks the process precisely directly on the component itself in a non-destructive test and ensures the components are of a high quality. The project was supported by companies, which now have access to a sensor prototype so that they can turn the technology into an industrial application.

The project was funded by the Federal Ministry for Economic Affairs and Energy (BMWi) via the German Federation of Industrial Research Associations (AiF).

www.ndt.net/article/dgzfp2011/papers/di3c2.pdf

Publisher
The President of the Leibniz Association
Matthias Kleiner
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10115 Berlin
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Editorial Office
Projektgruppe Leitbild Wissenstransfer
(Sören Auer, Katrin Böhning-Gaese, Miriam Brandt, Ulf Brunnbauer, Thomas Dobner, Ludwig M. Eichinger, Ralph Ewerth, Barbara Hentzsch, Carsten Hucho, Stephan Junker, Sebastian Lentz (Leitung), Andreas Macke, Gert G. Wagner, Hildegard Westphal, Hans-Werner Zoch), Angelika Daniel, Stefanie Hardick, Julia Ucsnay, Christine Wennrich
Layout
Novamondo, Berlin
Pthotos
Cover: Sven Doering/Agentur Focus · Page 5 Jan Zwilling · Page 6 Hanno Hochmuth/ZZF · Page 7 WZB · Page 8 ZMO · Page 10 GNM ; ZBW · Page 11 Universität Tübingen/Christoph Jäckle · Page 12 Steffen Wolf/IZW · Page 13 FZB · Page 14 C. Hoppenhaus/IPK · Page 15 Benedicte Maindiaux · Page 16 Global Solutions/Tobias Koch · Page 17 GIGA · Page 19 Milena Stillfried/IZW; DDZ · Page 20 SGN · Page 21 Seifert/ATB ·
Last update
08/2019

The Leibniz Transfer Policy was adopted by the General Assembly of the Leibniz Association on 29 November 2018. The Leibniz Association will review this policy regularly and update it no later than five years after its adoption.

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