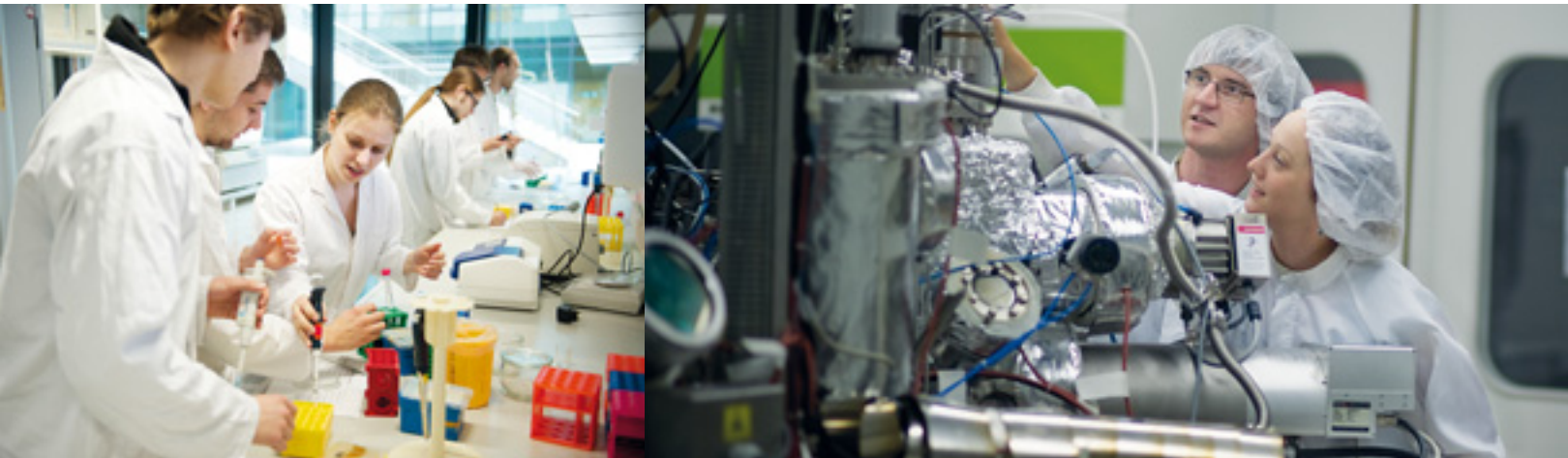


EBERHARD KARLS
UNIVERSITÄT
TÜBINGEN



2014

University of Tübingen

One of Germany's Universities of Excellence

ANNUAL REPORT



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STATUS UPDATE

Forging ahead with the Excellence Initiative

Tübingen, as one of Germany's Excellence Initiative universities, is making good use of that funding program to nurture key research and to make Tübingen an attractive location for outstanding scientists and academics to work and teach. Excellence Initiative research here has already yielded concrete results in Neuroscience and Education which are helping to improve people's lives.

Tübingen has made great strides with Excellence Initiative sponsorship. Our four broad-based research platforms are conducting innovative, interdisciplinary research across the sciences and humanities. New core facilities have given us top-quality equipment, data processing capacities, and other state-of-the-art infrastructure. More flexible funding schemes have helped to make our University more attractive to junior researchers and have boosted collaboration with industry. And our initiatives to support internationalization and equal opportunities have helped us to welcome more outstanding researchers from across Germany and abroad to come and work in Tübingen.

Begun in 2005, the Excellence Initiative has given German research a visible boost. Germany now has the largest number of top universities after the US and UK. Under new agreements between Germany's federal and state governments, there is a good chance that our Excellence projects – the Center for Integrative Neuroscience and the Education Science Graduate School LEAD, as well as many others established since 2012 as part of our institutional strategy – will be able to continue their work on a permanent basis.

Greater long-term security

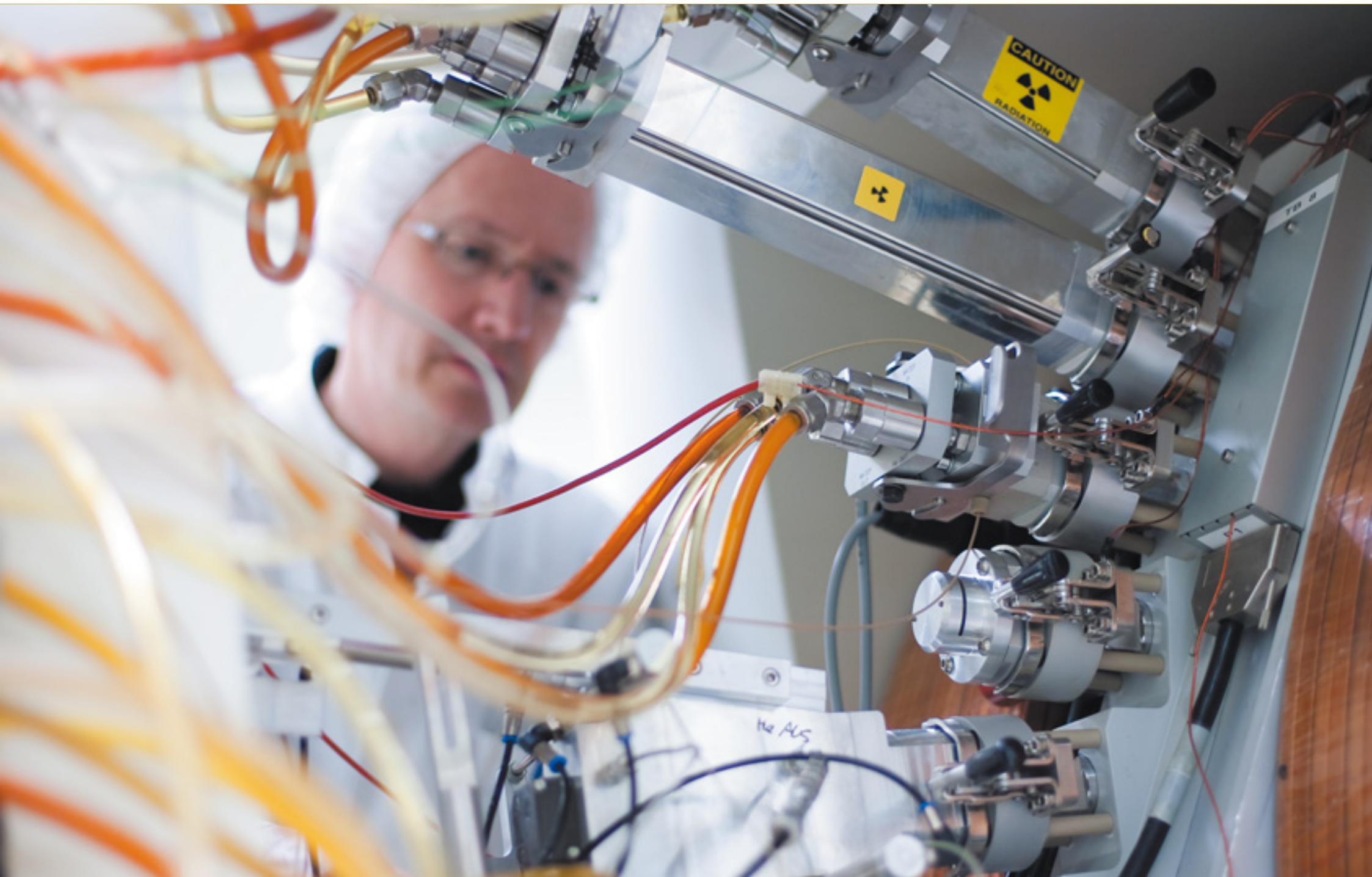
Other recent decisions by the German government will benefit the University of Tübingen. In the future, Berlin will bear the full cost of student allowances. This will put more cash into the coffers of our state of Baden-Württemberg, which has pledged to invest more in its universities, and provide compensation for energy costs, which have risen strongly over the past 15 years.

These reforms became part of a reorganization of the financial relationship between the state of Baden-Württemberg and its universities as a major funding plan was set to expire at the end of 2014. Following months of debate – and huge protests by University staff and students in May 2014 – a new plan was agreed. This means the University of Tübingen can now draw up secure budgets until 2020. Previously time-limited initiatives for quality assurance and upgrading curricula can now proceed on a sustainable financial footing.

We are optimistic about the future as we see that major investments in research and teaching are beginning to pay off. Many smaller measures made possible by Excellence Initiative sponsorship are also bearing fruit, making Tübingen more attractive and flexible – and better equipped to meet future challenges.



We offer modern facilities and an attractive environment for researchers and students alike.





RESEARCH

SETTING THE SEAL OF EXCELLENCE ON RESEARCH

Success in the Excellence Initiative gave the University of Tübingen a new status within Germany and around the world. Yet we are aware that our status is not just a reward for achievement – it is a duty to maintain high standards and to build on them. University of Tübingen researchers have taken on the challenge, founding a wide variety of groundbreaking projects. Tübingen is becoming more competitive both among German universities and internationally. Together with the attractive environment Tübingen provides, that is a major advantage for junior researchers.

BUILDING ON SOLID FOUNDATIONS

The German government's Excellence Initiative sponsors the University in all three funding lines – excellence cluster, graduate school and institutional strategy. Tübingen's neuroscience excellence cluster, the Center for Integrative Neuroscience (CIN) was launched in 2007. Further Excellence Initiative sponsorship came in 2012 for the LEAD Graduate School of Learning, Educational Achievement, and Life Course Development, which uses empirical research to forge education policy. The University's overall institutional strategy, Research – Relevance – Responsibility, also received Excellence Initiative backing in 2012.

The institutional strategy funding enabled us to establish 16 new chair professorships, eleven junior professorships, and ten junior research groups. Nearly all these positions

have now been filled. The additional outstanding scientists and academics brought to Tübingen by this funding are enriching the University in many innovative areas of research and teaching. The University is also taking special measures to promote junior researchers – via its Graduate Academy, year-round training workshops, summer and winter schools, and in PhD networks.

We have taken steps to become more international, with notable success. For instance, we are expanding our partnerships with top universities around the globe via various programs for visiting researchers such as the Tübingen Distinguished Guest Professorship Program, the Visiting Professorships and the Teach@Tübingen program.





Neuroscience excellence cluster unlocks mysteries of the brain

The Center for Integrative Neuroscience (CIN) unites researchers from various disciplines in the quest to understand the brain and its workings. The focus is on perception and memory, and on how feelings, communication, and actions arise. This research can often be used to examine the effects of various diseases in the brain and how to track them, leading to improved diagnostics and treatments for motor, memory and perception disorders. The excellence cluster is headed by Professor Hans-Peter Thier.

With extended funding from 2012, CIN has added a professorship of Systems Neuroscience and a further junior research group on the neurobiology of vocal communication. Core facilities available to CIN working groups were supplemented by a new lab for two-photon excitation microscopy and an anatomy imaging facility for confocal microscopy, enabling researchers to make highly detailed images – even of living tissue. In addition, an MRI scanner with a magnetic field intensity of three tesla was installed in late 2014 as part of the University's neuroscience core facilities. It is administered by Professor Klaus Scheffler, who is affiliated with the Max Planck Institute for Biological Cybernetics and the University Hospitals' Department of Biomedical Magnetic Resonance as well as the CIN. The

CIN collaborates with Japanese research institutions in projects sponsored by the German Research Foundation and the Japan Science and Technology Agency.

A total of five professors, two senior professors and 16 junior research group leaders are currently engaged in interdisciplinary research at CIN, along with some 200 other researchers. The excellence cluster also includes 70 scientists from other faculties and external partners such as the Max Planck Institutes for Intelligent Systems and for Biological Cybernetics, the Hertie Institute for Clinical Brain Research, the German Center for Neurodegenerative Diseases, the Bernstein Center for Computational Neuroscience, and the Fraunhofer Institute for Manufacturing Engineering and Automation.

The Center for Integrative Neuroscience is located among the University hospitals and other research institutes on the hills overlooking Tübingen's historic heart.

Integrated research and training in Education

The Excellence Initiative-backed Graduate School of Learning, Educational Achievement, and Life Course Development (LEAD) incorporates an interdisciplinary research program, with more than 40 PhD students from the field of Education and related disciplines carrying out empirical research into education issues with LEAD academics. The Graduate School is aimed at basic research – starting with questions arising from practical teaching and resulting in both theoretical development as well as answers relevant to policies applied in schools.

The LEAD Graduate School researches key issues in education policy.



The structured training program incorporates a number of highly successful components, including the regular LEAD Lecture Series featuring special international guest speakers such as Tübingen Distinguished Guest Professors Brent Roberts and Jacquelynne Eccles.

LEAD offers outstanding funding opportunities both to PhD students and to interdisciplinary researchers via its Intramural Research Fund and the LEAD Research Center. Their aim is to promote an exchange between academia and the public, for instance in the form of a partnership program with local schools, consultation on curriculum design, and evaluation to help ensure high standards in research.

Promoting practical applications

The University of Tübingen's institutional strategy, Research – Relevance – Responsibility, sets out our plan to promote application-oriented basic research. To this end, we created four new research platforms to meet the challenges arising from health, the environment, and education. The Clinical Research platform focuses on individualized medicine – optimizing treatment for each patient and requiring intense clinical studies. The Medical Technologies platform develops concepts in clinical imaging and sensor technology in collaboration with industry. It also includes the successful Industry on Campus program, whereby commercial researchers in medical technologies take time to conduct research at the University. The Environment System Analysis platform brings together expertise from the areas of water management, pollutants, sensor technology and biodiversity. These researchers also work with members of the fourth platform, Education, Society, Norms and Ethical Reflection, which supports research in the humanities and social sciences.

The University's intensified focus on application-oriented research marks a new opening towards business – for example, in the Lebensphasenhaus project. This "house of life phases" was designed by experts from several faculties and partners from the commercial sector, and it researches some of the questions arising from the medical aspects of aging, putting the results into practice.

A center dedicated to personalized medicine

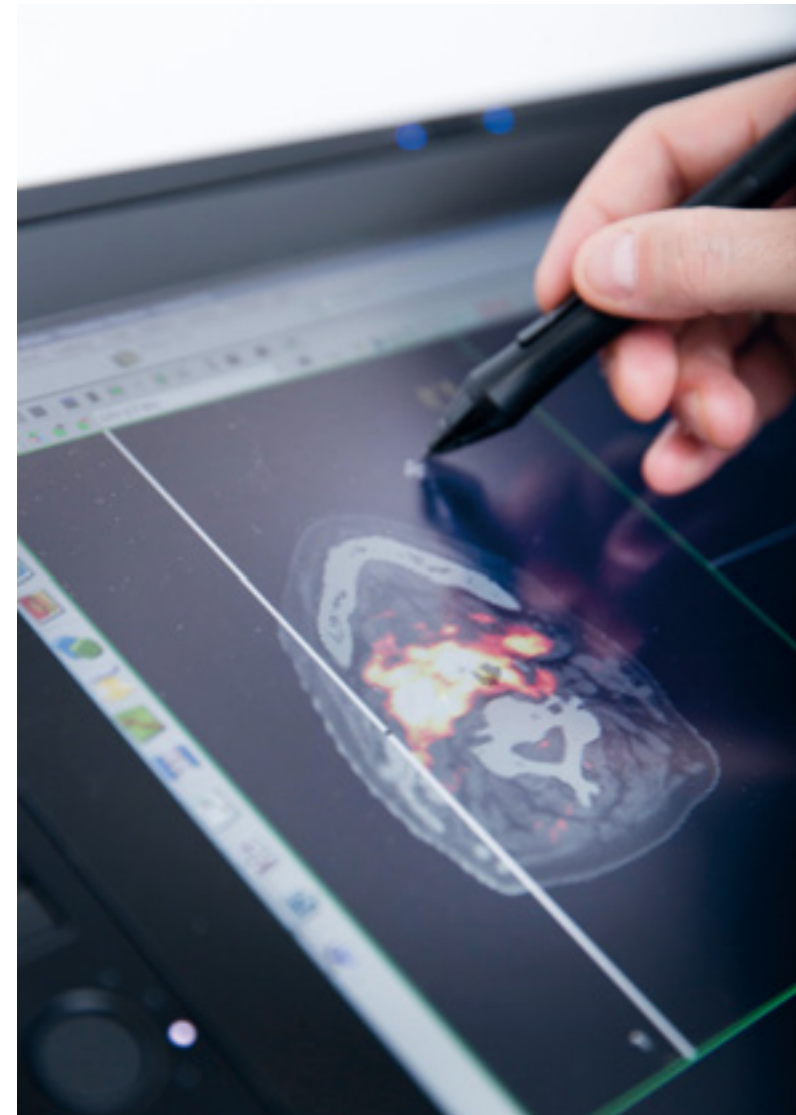
The Faculty of Medicine and University Hospitals founded the Center for Personalized Medicine in December 2014, putting Tübingen at the forefront of research into the causes of disease in individuals and the development and testing of individualized treatments. The Center brings together 23 departments, research centers, institutes and hospitals, and is part of the Clinical Research platform established by the University's institutional strategy, developed under the German government's Excellence Initiative. "Personalized medicine works on the conviction that only a precise understanding of the causes of a disease can lead to a treatment which tackles those causes," says the spokesman for the research platform, Professor Nisar Malek.

Cancer is a catch-all term for hundreds of different diseases. Today, researchers are able to make very fine differentiations within a single type of cancer and to record the molecular-biological data of a tumor. Individual disease characteristics can also be isolated in patients with disorders of the heart, metabolism or autoimmune system. The Center for Personalized Medicine will focus on diseases for which there is little or no effective treatment.

The Center works in five main areas – high-throughput screening, functional and molecular imaging, complex diagnostics, treatment development and experimental treatments. Biomedical researchers work with colleagues specializing in clinical imaging, drug development and clinical medicine; the vast amounts of biomedical data are processed by the Quantitative Biology Center (QBiC), a University core facility. One aim for new treatment is the development of peptides and antibodies to create individually-tailored vaccines for use against tumors. Another is drug repositioning – expanding the spectrum of applications for approved medicines.

In the clinical-translational field, the focus is on the prompt application of research findings in diagnostics and treatment, allowing patients to benefit from innovative developments as early as possible.

Highly accurate diagnoses and greater knowledge of patient characteristics enable the Center for Personalized Medicine to fine tune treatments in each case.



RISING THROUGH THE RANKINGS

Tübingen leaps 100 places

The University of Tübingen rose significantly in the Times Higher Education World University Ranking 2014-15, to no. 113 internationally from 201-225 the previous year.

Tübingen showed a strong improvement in the categories of Teaching, where it rose to 41.5 points from just over 31 the previous year, Research (44.7 points, up from 21.6), and Industry Income (up to 54.7 from 32.3). The Citations category was stronger than ever at 74 points, up from 71.8.

The improved result reflects the University's performance in the fields of research and teaching, in obtaining third-party funding, and its increasingly good contacts with industry.

On this indicator, Tübingen is now ranked seventh among the German universities after LMU Munich, Göttingen, Heidelberg, the Humboldt University in Berlin, the Free University of Berlin, and the Technische Universität München.

NEW APPROACHES TO TREATING PARKINSON'S DISEASE

Parkinson's is a degenerative disease of the central nervous system which reduces a patient's mobility as it progresses. The main symptoms are shaking, rigidity, and difficulty walking. In Germany, more than one percent of the population over 60 suffers from Parkinson's. But the disease is also found in much younger people.

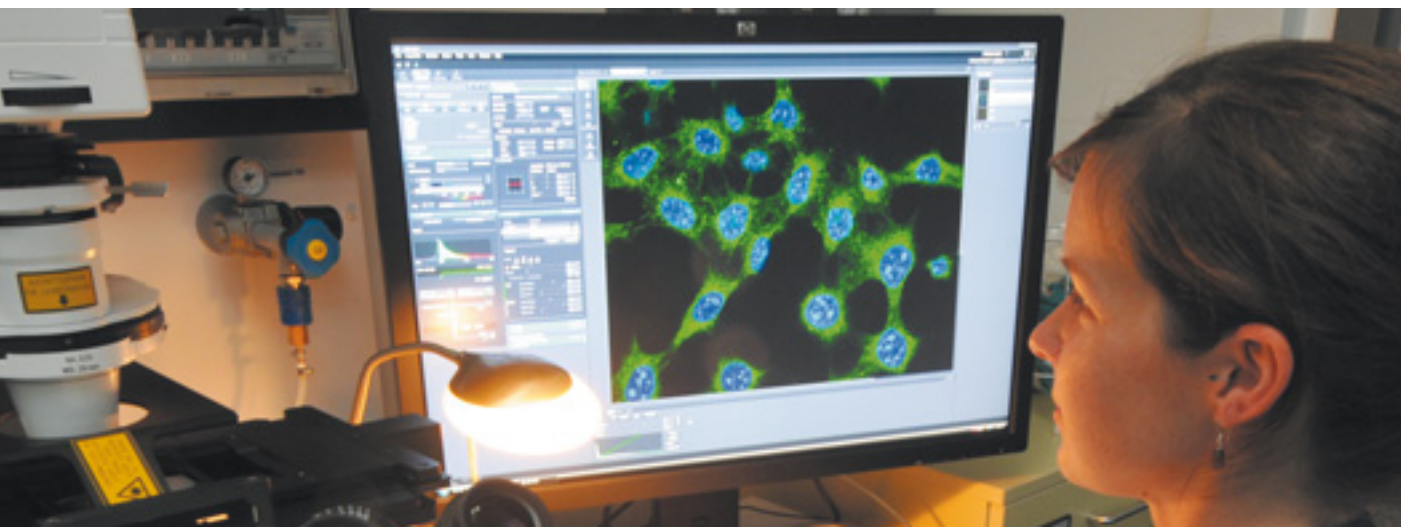
Nerve cells die off in the substantia nigra, an area of the midbrain. These cells produce dopamine, a messenger chemical in the brain which plays an important role in coordinating movement. Lower dopamine levels cause the typical symptoms of Parkinson's disease. Rarely can a catalyst be identified, and although the symptoms can be treated, there is no cure.

Tübingen has become a center of expertise in dealing with Parkinson's disease. Researchers led by Professor Thomas Gasser are examining the possible causes of the disease, its progression and how to diagnose it as early as possible, with a special focus on genetically-based Parkinson's.



Professor Thomas Gasser

Professor Gasser is medical director of Neurology at the Tübingen University Hospitals and at the Hertie Institute for Clinical Brain Research. The Department of Neurology has been associated with the German government-backed German Center for Neurodegenerative Diseases (DZNE) since 2010 and receives part of its funding from it. Tübingen neurologists also head two European Union-sponsored projects: COURAGE-PD, part of the international Joint Programming for Neurodegenerative Diseases initiative, was launched in 2013 and probes the causes of Parkinson's disease variants at both the genetic and molecular level; and Multi-Syn, which began in 2014 and seeks to use Tübingen's highly-advanced clinical imaging techniques developed under Professor Bernd Pichler for the diagnosis of the disease up to 20 years before obvious symptoms appear.



DOUBLE SUCCESS FOR A GEOSCIENTIST AND HIS PROJECTS

Professor Todd Ehlers of the University of Tübingen Geoscience Department received a five-year €2m European Research Council Consolidator Grant for the project Extreme Tectonics and Rapid Erosion in Mountain Environments (EXTREME), starting April 2014. Another Ehlers project, EarthShape: Earth Surface Shaping by Biota, receives more than €10,2m in German Research Foundation (DFG) sponsorship under the DFG's priority program. That funding starts in 2015 and runs for six years.

Professor Todd Ehlers came to Tübingen in 2009 from the University of Michigan. He heads the Earth System Dynamics research group. EXTREME focuses on the movement and deformation of continental plates – and the effects these processes have on climate and erosion. Plate boundaries are areas of particular activity, resulting in earthquakes, landslides, and extreme weather conditions. Research into plate deformation is aimed at predicting and mitigating the danger to humans.



Professor Todd Ehlers

The interplay of climate and tectonics at plate corners is at the heart of Ehlers' research. He challenges the notion that rapid deformation at plate corners is caused from the top down by factors like erosion; he works on the premise that deformation comes from below, where continental plates collide. Subducting plates buckle in three dimensions – and can produce major deformation in the plate above. However, studies of mountain building and erosion are complicated because when tectonic processes build large mountains such as the Himalaya or the Andes their topographic development modifies global climate over millions of years. Ehlers' proposal investigates the links between tectonic, climate, and erosional processes during mountain building.

The EXTREME project will develop models of plate boundaries' physical changes over time with corresponding models of the atmosphere and mountain erosion. The models will be integrated with geological data and optimized using comparisons with past tectonic and climate events in the Himalaya, Alaska, the Olympic Mountains in the northwest USA, and in the Andes.

Ehlers and Professor Friedhelm von Blanckenburg of the GeoForschungsZentrum GFZ Potsdam are coordinators of

Installing a weather station on the Altiplano in Bolivia at 3,500 meters.



a new research program sponsored by the German Research Foundation (DFG). The program allocates €6m over three years for the project EarthShape: Earth Surface Shaping by Biota.

A common Geoscience paradigm holds that the Earth surface is shaped mainly by the climate eroding soil and tectonics building mountains. The EarthShape project challenges this paradigm to explore how biological processes form soil, influence topography, and thereby help to shape the Earth's surface. Research into biological effects on topography is particularly important for understanding how future climate and biological changes will impact the Earth's surface. This priority program will help place German-funded research at the forefront of this field of study.

The project brings together an unprecedented consortium of different scientific disciplines in the geosciences, ecology, soil science, hydrology, microbiology, and geography to work in coastal Chile. The location was selected because it contains one of the largest biological and climate gradients in the world – providing a natural laboratory to study how biology and topography interact.

www.earthshape.net

Geoscientists find valuable information in sand and gravel samples.



EUROPEAN RESEARCH COUNCIL GRANTS

The European Research Council awards Advanced Grants of up to €2.5m over five years to independent scientists from any discipline who have made a recent significant contribution to research in their fields. Advanced Grants fund innovative and ambitious projects with the potential to lead to a major breakthrough in the relevant field of research. Researchers with seven to twelve years' experience following their doctorates are eligible for Consolidator Grants of up to €2m over five years if they can demonstrate promising research achievements and excellent projects. Starting Grants go to junior researchers to support their transition to an independent career. The program is an EU initiative to encourage young researchers to remain in Europe. Researcher with many years of experience following their PhDs may apply for up to €1.5m over five years for outstanding projects.

New ERC Starting Grant for gene correction

Biologist and junior professor Dr. Michael Kormann receives his starting grant for the project entitled: Biochemically modified messenger RNA encoding nucleases for in vivo gene correction of severe inherited lung diseases (BREATHE). Project researchers are seeking to replace a pathogenic gene with a healthy one, or to strengthen faulty genes by producing the right proteins. This kind of treatment could help patients with cystic fibrosis, certain forms of asthma, or blood disorders such as thalassemia.

Kormann and his team are seeking ways to correct the relevant gene in the lung cells, giving patients a chance



Dr. Michael Kormann

of curing severe hereditary lung diseases. Laboratory testing has allowed them to correct genetic damage to lung cells in animals by unraveling the DNA and replacing the affected part. The team is focusing on introducing the proteins responsible for unraveling the DNA using messenger RNA which does not activate the immune system. Mice with the hereditary pulmonary disease surfactant protein B deficiency were kept alive with the help of modified RNA as well as via genetic therapy and gene correction.

European Research Council Grants at a glance

Advanced Grants

Name	Project	Duration
Professor Hans-Georg Rammensee Interfaculty Institute for Cell Biology	Mutation-driven Immunoediting of Human Cancer? (Mutaediting)	2013 - 2018
Professor Gerhard Jäger Institute of Linguistics	Language Evolution: The Empirical Turn (EVOLAEMP)	2012 - 2017
Prof.essor Bernd Pichler Department of Radiology	Multiparametric Tumor Imaging and Beyond: Towards Understanding in vivo Signals (IMAGELINK)	2012 - 2017
Professor Ernst Pernicka Institute of Prehistory and Medieval Archaeology; now at Heidelberg University	Tin Isotopes and the Sources of Bronze Age Tin in the Old World (BRONZEAGETIN)	2013 - 2018

Consolidator Grant

Name	Project	Duration
Professor Todd Ehlers Geoscience Department – Geodynamics	Extreme Tectonics and Rapid Erosion in Mountain Environments (EXTREME)	2014 - 2019

Starting Grants

Name	Project	Duration
Professor Michael Kormann University Children's Hospital – Department of Paediatrics	Biochemically modified messenger RNA encoding nucleases for in vivo gene correction of severe inherited lung diseases (BREATHE)	2015 - 2020
Dr. Markus Siegel Werner Reichardt Center for Integrative Neuroscience	Spectral Fingerprints of Neuronal Interactions (SPECFIN)	2014 - 2019
Dr. Daniela Thorwarth University Department of Radiation Oncology	Biologically individualized, model-based Radiotherapy on the Basis of multi-parametric molecular Tumor Profiling (BIO-IRT)	2013 - 2018
Professor Sonja Utz Knowledge Media Research Center	Redefining tie strength – How social media (can) help us to get non-redundant useful information and emotional support (ReDefTie)	2013 - 2018
Dr. Stephan Wenkel Center for Plant Molecular Biology	Designing microProteins to Alter Growth Processes in Crop Plants (MIPDESIGN)	2013 - 2018
Professor Andreas Kappler Geoscience Department	Microbial formation of minerals by communities of Fe(II)-oxidizing bacteria in modern and ancient environments (MICROFOX)	2012 - 2017
Professor Johannes Krause Tübingen Center for Archaeology	Ancient Pathogen Genomics of Re-emerging Infectious Disease (APGREID)	2012 - 2017
Dr. Hendrikje Nienborg Werner Reichardt Center for Integrative Neuroscience	Optogenetic Examination of the Role of Feedback on Visual Processing and Perception (NEUROPTOGEN)	2012 - 2017
Professor Katerina Harvati Geoscience Department	Paleoanthropology at the Gates of Europe: Human Evolution in the Southern Balkans (PaGE)	2011 - 2016
Dr. Steffen Katzner Werner Reichardt Center for Integrative Neuroscience	Cortical Circuits of Visual Perception (Percept)	2011 - 2016

COLLABORATIVE RESEARCH CENTERS

In 2014, the German Research Foundation (DFG) approved a new, interdisciplinary collaborative research center on the Molecular Coding of Specificity in Plant Processes (SFB 1101) at the University of Tübingen. From 2014, Tübingen researchers will also be taking part in the transregional collaborative research center Biological Design and Integrative Structures (SFB-Transregio 141). In all, the University of Tübingen hosted six collaborative research centers and one transregional in the period ending December 2014, and participated in four further transregional efforts.

Molecular Coding of Specificity in Plant Processes

The German Research Foundation (DFG) approved the new €10m multidisciplinary collaborative research center Molecular Coding of Specificity in Plant Processes (SFB 1101) from April 2014. Funding is for four years; the spokesman is Professor Klaus Harter of the Center for Plant Molecular Biology (ZMBP). The project involves 13 ZMBP working groups, a group from the Institute of Physical and Theoretical Chemistry and one from the Interfaculty Institute of Biochemistry (IFIB) in Tübingen, as well as five groups from the Tübingen Max Planck Institutes and three research groups from the Centre for Organismal Studies (COS) at Heidelberg University.

They may look small and insignificant, but plant cells have remarkable abilities to develop and adapt to their environment.

Recent research has identified many key factors which contribute to plant development and adaptation to environmental influences such as light, drought, and the presence of pathogens. The new SFB will take this a step further, examining the causal mechanisms of these factors down to the atomic level and determining how plant cells catalyze particular biological processes. Researchers have mapped the genome of model plant *Arabidopsis thaliana*, which is the focus of SFB 1101.

They have identified the factors linked with important functions such as the formation and aging of the leaf, blossoming, and starting defense mechanisms to fight bacteria or fungi. Such factors also regulate the plant's development and adaptation to the environment. The new collaborative research center will examine these functions, how they are regulated and coordinated, right down to looking at which genes become active within a cell when these functions come into play.



The researchers in SFB 1101 will also develop new microscopic and spectroscopic methods such as super resolution microscopy, which is essential for the quantitative investigation of plant molecular functions.

The collaborative research center investigates plants from the overall organism right down to the cellular and molecular levels.



Better, stronger, faster – Bionic structures in architecture

Researchers from the universities of Tübingen, Stuttgart and Freiburg are investigating how materials, structures and processes adopted from nature could revolutionize architecture in the coming decades. They are working within the German Research Foundation-backed transregional collaborative research center Biological Design and Integrative Structures, with funding of €9.3m over four years. It is coordinated by the University of Stuttgart.

“We aim to secure bionic knowledge and processes within architecture, while also investigating the biological models which underlie them and the implications for materials science,” says Professor Klaus Nickel, spokesman for the Tübingen part of the collaborative research center. Overall coordinator Professor Jan Knippers of the Institute of Building Structures and Structural Design at the University of Stuttgart, says the goal is “multifunctional, adaptable and at the same time ecologically efficient structures which surpass the boundaries of traditional construction.”

Nickel, head of Applied Mineralogy in Tübingen, examines how energy dissipates in nature – information which could be used to reduce earthquake damage to buildings – and how small models in nature can often be transposed to the dimensions of architecture without losing their desirable attributes.



This pavilion was inspired by the structure of a sea urchin shell.

Other Tübingen project groups are headed by palaeontologist Professor James Nebelsick and evolutionary biologist Professor Oliver Betz. Nebelsick’s findings on the construction of a sea urchin skeleton will be integrated into collaboration with Stuttgart engineers developing shell segments to be incorporated into buildings. He is also collaborating with architects at Stuttgart and physicists in Freiburg on new production techniques based for instance on the growth of mollusk shells. Oliver Betz is investigating the active movement of jointless structures, and the concept of the organism in biology and architecture as the basis of constructive biomimetics.

Collaborative research centers at the University of Tübingen

Title	Spokesperson	Duration
Molecular Coding of Specificity in Plant Processes (SFB 1101)	Professor Klaus Harter Center for Plant Molecular Biology	1 April 2014 - 31 Dec. 2017
Resource Cultures: Socio-cultural Dynamics in the Treatment of Resources (SFB 1070)	Professor Martin Bartelheim Institute of Prehistory and Medieval Archaeology	1 Oct 2013 - 30 June 2017
Threatened Orders (SFB 923)	Professor Ewald Frie Institute of Modern History	1 July 2011 - 30 June 2015
Emergence of Meaning: The Dynamics and Adaptivity of Linguistic Structures (SFB 833)	Professor Sigrid Beck Institute of English Languages and Literatures	1 July 2009 - 30 June 2017
The Bacterial Cell Envelope: Structure, Function, and Infection Interface (SFB 766)	Professor Wolfgang Wohlleben Interfaculty Institute of Microbiology and Infection Medicine	1 July 2007 - 30 June 2015
Immunotherapy: Molecular Basis and Clinical Application (SFB 685)	Professor Hans-Georg Rammensee Interfaculty Institute for Cell Biology	1 July 2005 - 30 June 2017

Tübingen coordinates the transregional collaborative research center:

Title	Spokesman	Duration
Plasticity and Sleep (SFB-Transregio 654)	Professor Jan Born Institute of Medical Psychology and Behavioral Neurobiology	1 July 2005 - 30 June 2017

Tübingen participates in these transregional collaborative research centers:

Title	Tübingen spokesman	Duration
Biological Design and Integrative Structures. Analysis, Simulation and Implementation in Architecture (SFB-Transregio 141)	Professor Klaus G. Nickel Geoscience – Applied Mineralogy	1 Oct. 2014 - 30 June 2018
Pathophysiology of Staphylococci in the Post-genomic Era (SFB-Transregio 34)	Professor Andreas Peschel Interfaculty Institute of Microbiology and Infection Medicine	1 July 2006 - 30 June 2018
Control of Quantum Correlations in Tailored Matter: Common Perspectives of Mesoscopic Systems and Quantum Gases (SFB-Transregio 21)	Professor Reinhold Kleiner Institute of Physics	1 July 2005 - 30 June 2017
Gravitational Wave Astronomy: Methods – Sources – Observation (SFB-Transregio 7)	Professor Kostas Kokkotas Institute of Astronomy and Astrophysics	1 Jan. 2003 - 31 Dec. 2014

DFG-BACKED RESEARCH UNITS, CLINICAL RESEARCH UNITS, CENTERS OF ADVANCED STUDY

The German Research Foundation (DFG) sponsors units in which researchers can work together on a specific, innovative research task. The groups usually receive funding for six years and frequently lead to the establishment of new disciplines. Clinical research units carry out translational research – with the long-term aim of integrating their findings into new therapies. Centers of advanced studies are the humanities equivalent, deliberately adopting comparatively open-ended approaches or an experimental character. The University of Tübingen is currently home to six such research units.

New network investigates information flows in the brain

The clinical research unit the Physiology of Distributed Computing Underlying Higher Brain Functions in Non-Human Primates is a network of research institutions where scientists from different disciplines are working together to probe the complex workings of the brain in primates. Funding of some €3.5m will run for three years. The unit's spokesmen are Professor Peter Thier of the Hertie Institute for Clinical Brain Research in Tübingen and Professor Stefan Treue of the German Primate Center in Göttingen. The unit also includes researchers from the University of Marburg and the Ernst Strüngmann Institute in Frankfurt am Main.

Twelve working groups are analyzing complex information processing involved in perception, behavior, and communication. The aim is to understand how primates take in visual stimuli and use them to plan and carry out voluntary movement. This is based on flows of information in the brain, which are being examined on several

levels, both within and across regions of the brain. The project includes ethical studies on biomedical research involving animals as well as studies on how to reduce the stress of experiments.

Words, Bones, Genes, Tools – New humanities research center

The German Research Foundation approved a new humanities center of advanced studies called Words, Bones, Genes, Tools. Professor Gerhard Jäger of the Linguistics institute and Professor Katerina Harvati of the Senckenberg Center for Human Evolution and Palaeoecology will

receive some €2.7m over four years for the center, which seeks to fill a gap in our knowledge of early human history. The early phase of modern humans, 100,000 to 40,000 years ago, has been studied in detail in the fields of archaeology, paleoanthropology and genetics. Yet historical linguistic studies have so far examined a period of 5,000 to 10,000 years ago at most. How did humans develop in the intervening time? The new research center aims to shed light on this period via interdisciplinary collaboration between the fields of linguistics, paleoanthropology, archaeology and genetics. New developments in each of these disciplines now make it possible to work together effectively in this area.

Tübingen research units/ Centers of advanced study

Institute	Title	Spokesperson
Institute of Linguistics and Senckenberg Center for Human Evolution and Paleoecology	Words, Bones, Genes, Tools Tracking Linguistic, Cultural and Biological Trajectories of the Human Past (FOR 2237)	Professor Gerhard Jäger Professor Katerina Harvati
Center of Neurology and Hertie Institute for Clinical Brain Research	The Physiology of Distributed Computing Underlying Higher Brain Functions in Non-Human Primates (FOR 1847)	Professor Hans-Peter Thier
Interfaculty Institute for Cell Biology	cGMP Signaling in Cell Growth and Survival (FOR 2060)	Professor Robert Feil
Institute of Psychology and Knowledge Media Research Center (IWM)	Analyzing and Promoting Effective Processes of Learning and Instruction (FOR 738)	Professor Friedrich Hesse

Clinical research units

University Hospitals	Title	Spokesperson
Cardiology and Cardiovascular Medicine	Platelets – Molecular Mechanisms and Translational Applications (KFO 274)	Professor Meinrad Gawaz
Urology	Treatment of Urinary Incontinence via Cell-Based Regeneration of the Urethral Sphincter (KFO 273)	Professor Arnulf Stenzl

NEW RESEARCH PROJECTS

Three Tübingen projects explore links between land use, ecosystems processes and biodiversity

Three Tübingen University professors will be pursuing vital biodiversity research funded by a special German Research Foundation program. Geoscientist Yvonne Oelmann is examining the cycle of phosphate, the essential nutrient in fertilizer, over different periods and in varying intensities; greater biodiversity is linked to reduced nutrient loss in ecosystems. Biologist Oliver Bossdorf examines the effects of changing land use on the epigenetic diversity of meadow plants; and his colleague Katja Tielbörger is working with colleagues at the Hebrew University of Jerusalem to challenge one of the holy cows of biodiversity

research – the notion that increasing diversity of habitat automatically leads to greater species variety. Species tend to disappear when land use changes, such as when forestry and agriculture intensify. The loss of species can have a negative effect on the productivity and stability of ecosystems – which in turn can mean losses in forestry and farming. But little is known about the precise connections between the intensity of land use, the loss of biodiversity and the intrinsic value of ecosystems. The DFG program is one of the biggest and most comprehensive biodiversity projects in the world, says Professor

Oelmann, pointing out that thousands of areas across Germany are included in the research. Vast numbers of organisms and ecosystem processes are being examined as well as the diversity of species and the genetic diversity within species. The program is also expected to provide practical findings on how to maximize yields from land use as well as the diversity of species. The DFG Biodiversity Exploratories program is coordinated by Bern University.

www.biodiversity-exploratories.de



Sheep pastures in the Schorfheide region of northeastern Germany (above) and the seasonal pastures of the Swabian Jura in the southwest (left) are among the biotopes under examination by Tübingen biologists.

Tübingen participates in research networks for mental illness

In late 2014, Germany's Ministry of Education and Research began sponsoring the country's premier institutions for research into mental illness. €35m in funding will go to nine research networks over four years. They will explore the causes of mental illness as well as seeking better ways to treat them. The University of Tübingen's Department of Psychiatry and Psychotherapy and its medical director, Professor Andreas Fallgatter, is participating in five of these networks – on schizophrenia, addiction, attention deficit hyperactivity disorder, bipolar disorder, and comprehensive treatment.

Tübingen neuroscientists collaborate in EU project to reduce obesity and diabetes

The European Union is sponsoring research into our food choices in a €9m project called Nudge It. Tübingen researchers will be joining with colleagues from six European countries to investigate the metabolic, neurobiological, psychological and social foundations of our eating behavior. It is hoped that a better understanding will make it easier to prevent obesity and associated conditions such as adult-onset diabetes, which are increasing the burden on European health services.

A total of 16 institutions from Denmark, the UK, Sweden, the Netherlands and Switzerland are taking part in the five-year project, which is coordinated by the University of Edinburgh. The Tübingen research teams led by PD Dr. Hubert Preissl (Institute of Medical Psychology/Fetal Magnetoencephalography Center, fMEG) and Professor Andreas Fritsche (Internal Medicine IV) will use clinical imaging to examine the processes in the brain which influence our eating habits. Hormonal influences are of particular interest; the Tübingen researchers have many years

of experience in the field and cooperate with German research centers focusing on adiposity and on diabetes.

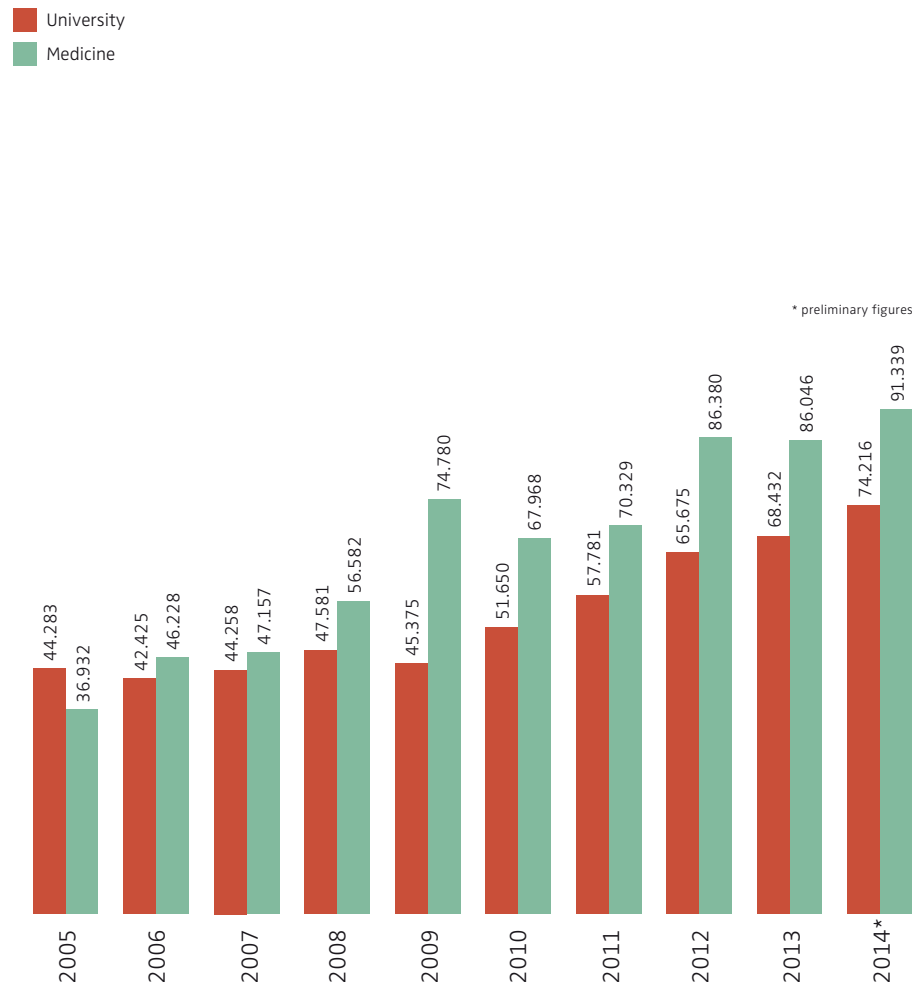
The project aims to provide policymakers with the scientific foundation to promote healthier eating via practical help. The project is called "Nudge It" – underlining the idea that a gentle push in the right direction can be more helpful than radical bans.

www.nudge-it.eu

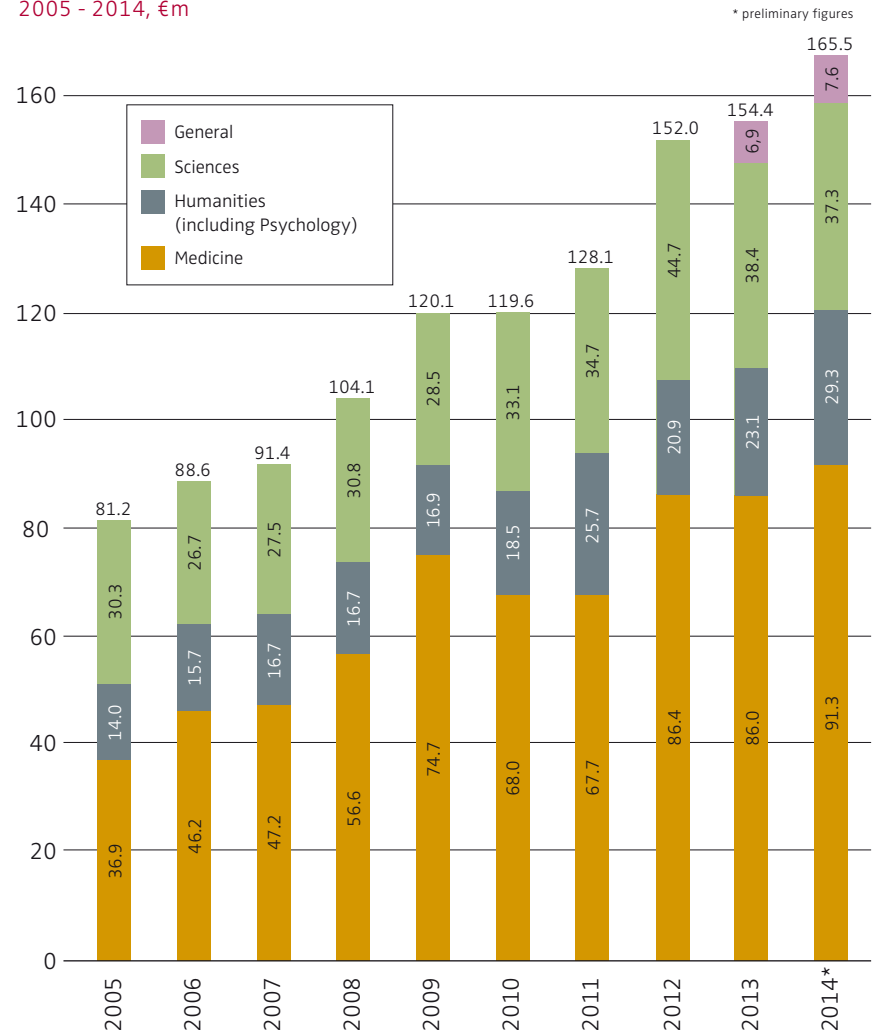


*A nice healthy apple - or a piece of cake?
The EU's Nudge It scheme aims to prevent obesity-related diseases by encouraging consumers to make healthy choices.*

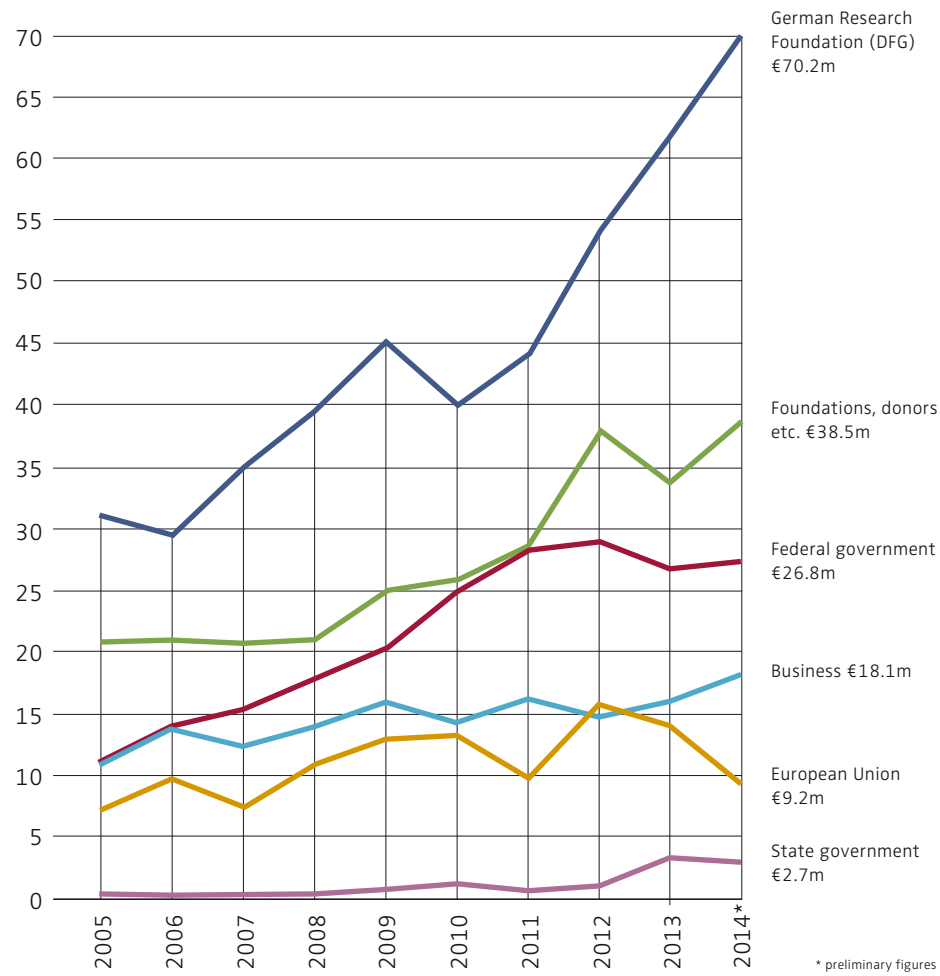
Third-party funding 2005 - 2014, €m



Third-party funding attracted by the Sciences, Humanities and Medicine 2005 - 2014, €m



Sources of third-party funding
2005 - 2014, €m



RESEARCH IN BRIEF

Europeans' mysterious ancestors ...

An international team of researchers led by the Harvard Medical School and the Tübingen palaeogeneticist Professor Johannes Krause used ancient and modern genomes to find out which genetic influences acted on today's European population. They used genetic material from the remains of a 7,000 year old farmer of the Linear Pottery Culture in southwest Germany, an 8,000 year old hunter from present-day Luxembourg, and seven 8,000 year old skeletons from Sweden. For comparison, the researchers collected data from some 2,400 people in 200 modern populations around the world. They found that Europeans



Excavations in Motala, Sweden, yielded DNA from the remains of seven hunter-gatherers who lived some 8,000 years ago.



This 8,000 year old skull from Luxembourg provided DNA material from a farming society.

today are descended from not two ancestral groups as expected, but three. The first were indigenous hunter-gatherers; the second group consisted of farmers migrating to Europe from the Mideast around 7,500 years ago; and a mysterious third population that spanned northern Eurasia and genetically links Europeans with Native Americans. Northern Europeans have up to 50% of their genes from the hunter-gatherers – while southern Europeans have more genes originating with the first farmers.

... had canine company

Professor Johannes Krause also reconstructed ancient canid DNA, allowing a comparison of mitochondrial genomes from prehistoric dog and wolf remains with those of modern dogs and wolves from all over the world. The study included genetic data from 18 prehistoric wolves and dog-like canids along with 49 wolves and 77 modern dogs, including old breeds such as the basenji, the dingo, and North American coyotes, as well as a number of Chinese breeds.

The researchers found that all dogs living today go back to four genetic lineages, all of which originate in Europe. The majority of DNA from modern dogs could be traced to just one lineage – which is closely related to that of a wolf skeleton found in a cave in northern Switzerland. It appears wolves were first tamed in Europe during the last major Ice Age, between 18,800 and 32,100 years ago. That means man's best friend predates agriculture – and was likely an important part of Ice Age hunter-gatherer society.



New strategies for “old” antibiotics

Tübingen researchers say new components in medicine could help conventional antibiotics overcome resistant bacteria. A team headed by Professor Christoph Mayer, of the Interfaculty Institute of Microbiology and Infection Medicine, in collaboration with the Graduate School of Chemical Biology in Konstanz, has discovered how *Pseudomonas* bacteria recycle an important building-block in their cell envelope – thereby avoiding the effects of the broad-spectrum antibiotic fosfomycin.

The researchers isolated two new genes in *Pseudomonas* bacteria which were needed for this recycling process and switched them off in the laboratory, overcoming this internal resistance to fosfomycin. The relevant genes, it turns out, are present in many bacteria, including many which cause disease in humans. It is possible that all of them could use the recycling technique to reduce the effectiveness of fosfomycin.

New program cuts genome sequencing time

Scientists are making great strides in fast genome sequencing. Instead of sequencing the DNA of a single organism, today it is possible to log all the DNA in a soil sample containing bacteria, fungi and insects. This produces enormous amounts of data, which can be identified by comparing it with the database of genomes already sequenced. The most commonly used algorithm is BLAST (Basic Local Alignment Search Tool). Now Tübingen computer scientists Benjamin Buchfink and Professor Daniel Huson have developed a new program, Diamond (double index alignment of next-generation sequencing data), which is up to 20,000 times faster. The program cuts years of calculation time down to days by aligning short DNA sequencing reads to a protein reference database, while sorting out the types of DNA in the sample and cross-referencing them. This tool makes it possible to work with very large data sets – for instance, when developing treatments on the basis of individual genetic characteristics.

Black and white? We still see red

Neuroscientists Michael Bannert and Andreas Bartels of the Bernstein Center and the Werner Reichardt Center for Integrative Neuroscience investigated what happens in the brain when we look at black-and-white photographs. They compared the brain activity of participants looking at black-and-white photos of bananas, broccoli, and strawberries, with their brain activity when looking at real colors. It turned out that the mere sight of black-and-white photos automatically elicited brain activity patterns that specifically encoded colors.

The brain encodes the typical color of the object seen, even though it was presented in black and white. The projection of prior knowledge onto the earliest processing stages of the visual brain may facilitate the recognition of objects in dim light or fog.



Why does a proton spin?

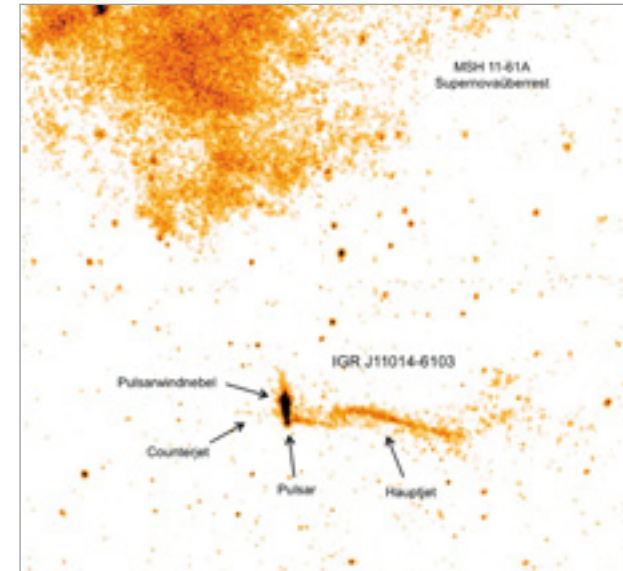
Physicists long believed that protons were spun by their constituent quarks alone – until a 1987 experiment at the CERN laboratories in Switzerland showed that quarks were responsible for only about a quarter of proton spin. This led to a “spin crisis” in particle physics. Now, Dr. Marco Stratmann and Professor Werner Vogelsang of the Tübingen Institute for Theoretical Physics and their colleagues from the Universidad de Buenos Aires, Professor Daniel de Florian and Professor Rodolfo Sassot, have studied experimental data from the Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Laboratory in the US. The researchers compared the data with a theoretical model predicting the spin direction of other particles, gluons, providing part of the momentum involved in proton collisions. Their calculations suggest that gluons may be the main driving force behind the proton’s spin.

Rich-poor gap increases risk of civil war

Economic historians Professor Jörg Baten and Christina Mumme found extremes of wealth inequality could explain the frequency of civil wars in Latin America and Africa over the past 200 years. In collaboration with Utrecht University in the Netherlands, they compiled a far-reaching study using the first data on the global development of wealth inequality over the past two centuries. The historians observe a steadily increasing rich-poor gap in many regions around the globe. The study showed that incomes in Europe and North America had come closer into line in the 1970s – but that since then, the gap between rich and poor has grown, particularly in eastern Europe and the United States. If this development continues, it could provide fertile ground for conflict, the researchers found.

Historians found increasing inequality leads to greater social unrest.

A Chandra telescope image shows pulsar IGRJ11014-6103 with a jet of particles shooting out at a right angle.



The runaway pulsar and its perpendicular jet

An international team of astrophysicists including scientists from the University of Tübingen’s Institute for Astronomy and Astrophysics has discovered a system in our galaxy which is expelling a jet of highly energetic particles some 37 light years long. The system, IGR J11014-6103, contains a pulsar born in a supernova explosion 10,000-20,000 years ago. Since then, the pulsar has been moving very rapidly away from the debris of the explosion. The pulsar is emitting the longest jet ever found in the galaxy, revealed by X-ray emissions, and astonishingly, the jet emerges almost at right angles to the direction of the pulsar motion.



WELCOMING JUNIOR RESEARCHERS

Specific psychotherapies offer best chance of curing anorexia

Anorexia nervosa is a condition in which young people, mostly girls or young women, eat too little. In up to 20% of cases it is fatal, making it the most dangerous of mental disorders. Psychotherapy is the recognized treatment in Germany, yet until recently, there had been no major studies of its effectiveness of treatments. A study by Tübingen Professor Stephan Zipfel and Professor Wolfgang Herzog of the University of Heidelberg collected data from 242 adult anorexia patients, analyzing the effects of three different psychotherapies. Compared with standard psychotherapy, two new techniques offered somewhat better results: Focal psychodynamic psychotherapy, which focuses on unhappy relationships and impaired abilities to process emotions; and cognitive behavioral therapy, which aims to normalize eating habits and to process difficulties associated with the eating disorders – such as a lack of social skills or the inability to solve problems. However, one quarter of the patients in the standard psychotherapy study were still suffering from aspects of the disorder a year after the end of treatment.

Portrait: Jonas Rose

Reverse-engineering the brain

Neurobiologist Dr. Jonas Rose came to Tübingen in 2014 from the Massachusetts Institute of Technology (MIT) in the US. For a German-born researcher married to a researcher, the choice was a good one. “Germany is an attractive location for me and my wife. Sooner or later we would have tried to come back, at least to Europe,” says Rose. His wife is now conducting research at Tübingen’s University Department of Psychiatry, while Rose investigates the intelligence of birds with one of the leaders in the field, Professor Andreas Nieder at Tübingen’s Institute for Neurobiology.

Jonas Rose secured a €900,000 Freigeist Fellowship from the Volkswagen Foundation which will allow him a large degree of freedom: “I can use the money quite flexibly and will be completely independent in my research. It is up to me to make something of it.” The Freigeist Fellowship is a new scheme aimed at supporting junior researchers with out-of-the-ordinary projects. The funding is for five years.

Recent research has shown that intelligence is not just a human thing. “Intelligent behavior has been strongly defined from the human perspective,” says Rose. Yet birds – corvids such as crows – demonstrate a wider repertoire of behaviors than many mammals. “They are smarter than they should be,” says Rose. The last common ancestor of birds and mammals lived more than 300 million years ago – so intelligent behavior must have evolved in parallel. Rose’s project is called A Bird’s Eye View of the Evolution of Cognition: Crows as a New Model for Cognitive Science – and in it, he will probe the fundamental requirements for intelligent behavior.



Dr. Jonas Rose

Intelligence is closely linked to the capacity for a “working memory” of up to a couple of minutes: keeping knowledge in mind and being able to apply it – like a phone number when you are reaching for the phone. Rose calls this “active memory,” which is different from remembering where you parked the car two hours ago – a form of long-term memory. Yet he says there is no clear dividing line: “Intelligence research originated in psychology and with human concepts. It’s time to define brain structures physiologically.” Rose describes his approach as reverse engineering: “I see the brain as a big, high-performance machine. I don’t construct it – rather, I am taking it apart to see how it works.”

Jonas Rose, born 1978, studied Cognition Science at the University of Osnabrück and completed his Master’s degree in Neuroscience at the University of Otago in New Zealand. He then did his doctorate in Biological Psychology at the University of Bochum, where he first started researching birds.

Habilitations completed in 2013

Faculty	Habilitations	
	female	male
Protestant Theology	2	0
Catholic Theology	1	1
Law	0	0
Medicine	5	25
Humanities	3	4
Economics and Social Sciences	3	2
Science	2	7
Total	16	39

Research Training Groups

Title	Spokesperson, Faculty	Duration
Humanities		
Ambiguity – Production and Reception	Professor Matthias Bauer Humanities	1 Oct 2013 - 31 March 2018
Religious Knowledge in Pre-modern Europe (800-1800). Transfers und Transformations – Ways to the Modern Knowledge Society	Professor Andreas Holzem Catholic Theology	1 April 2011 - 30 Sept. 2015
Science		
Research training group Stuttgart – Tübingen Spectral Theory and the Dynamics of Quantum Systems	Professor Marcel Griesemer University of Stuttgart Professor Stefan Teufel (deputy spokesman) University of Tübingen	1 Oct 2013 - 31 March 2018
International Research Training Group Tübingen – Hohenheim – Waterloo: Integrated Hydrosystem Modelling	Professor Olaf Cirpka Science	1 April 2012 - 30 Sept. 2016
Medicine / Science		
Molecular Mechanisms in Bacterial Survival Strategies	Professor Karl Forchhammer Interfaculty Institute of Microbiology and Infection Medicine	1 April 2012 - 30 Sept. 2016
International research training group Tübingen – Dundee: The PI3K Signal Pathway in Tumor Growth and Diabetes	Professor Erwin Schleicher Medicine	1 April 2006 - 31 March 2015

PhD Networks

PhD networks are generally formed by three to five professors from different disciplines whose doctoral students are examining one topic from different perspectives. The PhD networks each provide up to seven grants for three years. Very successful PhD networks can form the basis of a bigger research project – such as a research training group sponsored by the German Research Foundation.

Title	Spokesperson	Duration
The Influence of Tax Law on Multinational Corporations	Professor Frank Stähler International Economics and Labor Markets	Since 1 May 2014
A Different Aesthetic – Figures of Reflection in the Arts	Professor Annette Gerok-Reiter Institute of German Language and Literature	Since 1 Feb. 2014
The Castle and the Nobility	Professor Sigrid Hirbodian Institute of Library Science for Historians	Since 1 Nov. 2013
Of Plants and Men: Principles of Chitin Recognition in Arabidopsis and Humans	Professor Dominik Hartl University Children's Hospital – Department of Paediatrics	Since 1 Oct. 2013
Vision-based Flying Robots	Professor Andreas Zell Wilhelm Schickard Institute of Computer Science	Since 1 Oct. 2013
Holy Texts: Literature as Sacred and the Sacred as Literature	Professor Birgit Weyel Protestant Seminary	1 April 2003 - 31 Dec. 2011
Combinatory Structures and Methods in Mathematics and Computer Science	Professor Jürgen Hausen Institute of Mathematics	Since 1 Nov. 2010
Carbon on Substrates – From Molecules to Films	Professor Klaus Nickel Mineralogy and Geodynamics	Since 1 Oct. 2010

Doctorates completed

in winter semester 2012-13 and summer semester 2013

Faculty	Doctorates	
	female	male
Protestant Theology	1	7
Catholic Theology	3	3
Law	12	25
Medicine	203	131
Humanities	9	14
Economics and Social Sciences	14	18
Science	121	133
Total	363	331



Professor Marja Timmermans

AWARD-WINNING RESEARCHERS

Humboldt Professorship: Plant geneticist Marja Timmermans

The University of Tübingen has approval for a second prestigious Alexander von Humboldt Professorship. With Germany's richest international research prize, plant geneticist Professor Marja Timmermans, comes to Tübingen in 2015.

How do plants form patterns of leaves along their stems? How are the differences between the top and the bottom of the leaves formed? Leaf development is Marja Timmermans' special field. She is responsible for a number of discoveries which have attracted international attention, and her methods are applied in labs around the world. For

instance, Timmermans has been able to explain the role of mobile RNA in the formation of leaves.

Timmermans studied first in her native Netherlands, then at Rutgers University and Yale. Since 1998 she has been carrying out research at Cold Spring Harbor Laboratory in the US state of New York. She became an assistant professor there in 2001 and a full professor in 2009.

As Humboldt Professor at the Center for Plant Molecular Biology (ZMBP), Timmermans will build bridges between cutting-edge basic and applied research. The ZMBP is also seeking to specialize in research into maize – an area in which Timmermans has carried out significant research.

The Humboldt Professorship is awarded for five years and comes with up to €5m in funding. The scheme, run by the Humboldt Foundation and financed by the German research ministry, aims to attract leading scientists and academics to German universities. Tübingen currently hosts a 2012 Humboldt Professor – linguist Rolf Harald Baayen from the University of Alberta, Canada.

Portrait: Lars Zender

“One foot in the clinic and one in clinical research”

When asked what is so fascinating about the liver, Professor Lars Zender doesn't have to think twice: “This immense capacity for regeneration, it is the only human organ which can recreate itself from one-third of its mass and function fully again.” Zender has headed the Tübingen Division of Translational Gastrointestinal Oncology since 2012. He develops new methods of treating tumors of the liver and gastro-intestinal system.

Born in 1975, Zender is the youngest person to win the DFG's 2014 Gottfried Wilhelm Leibniz Prize, Germany's premier research prize of €2.5m. “It is a great honor,” he says, “We conduct innovative research, but there are so many high-caliber researchers in the country who deserve this award.” Zender received the German Cancer Society research award in 2013.

Zender has focused on the liver since his student days in Hannover, where he was involved in projects to regulate liver cell death. After completing his doctorate and medical residency, he went to conduct research at Cold Spring Harbor Laboratory in New York under the DFG's Emmy Noether Program. Zender returned to Germany in 2008, continuing his gastroenterology research, heading Emmy Noether and Helmholtz junior research groups.

Zender was attracted to Tübingen because it offered a hybrid position, “with one foot in the clinic and one in clinical research,” as he puts it. As a doctor and a scientist, Zender believes that researchers must be active in patient care if their research is to translate into better treatment for patients as early as possible. Zender stresses that Tübingen is very strong in this translational research.

There is a great need for new medications and treatment options. Recently, doctors found a way to cure most cases of hepatitis C, a chronic liver condition which often leads to cancer. “But for several years now, we have been observing a swift rise in fatty degeneration of the liver, which leads to cancer of the liver and gall bladder via a similar mechanism. These are lifestyle diseases,” Zender explains. The capacity of a chronically infected liver to regenerate is reduced. Overall, the number of cases of liver cancer is not likely to fall.

Zender and his team are systematically seeking active agents – they identify new target structures in tumor cells and pass them on to an expert for structure-based drug design, who does a virtual search for agents which could fit onto the target structure like one puzzle piece onto another. This binds and inhibits the structures, hindering cell growth. The most promising agents are synthesized in the laboratory of Professor Stefan Laufer at the University of Tübingen's Pharmaceutical Institute. “The pipeline is well filled,” says Zender.



Professor Lars Zender

The agents must then pass through what researchers call the valley of death. “These active agents have left the area of basic research and their further development cannot be financed by academic programs. They are far from being available for use,” Zender explains. Despite heightened awareness of the problem among health policy experts, that gap has yet to be bridged. Zender says “Tübingen has to stand for one thing in translational research, as in everything else: We do the job.”



SPONSORSHIP

FUNDING FOR CUTTING-EDGE PROJECTS

The broad spectrum of innovative research at the University of Tübingen has attracted many different sponsors. What they all have in common is that they seek to promote creative approaches to tackle today's issues. Germany does not have a strong tradition of endowments like the United States. We are therefore very proud that many foundations and individuals value our University enough to sponsor projects, research, and professorships. Some of our sponsors are state-backed, independent research bodies, while others are wholly funded by business or private individuals. Sometimes funding is given to advance research and teaching in a particular discipline; sometimes it is bestowed on the most outstanding researcher in a particular field.

EDUCATION RESEARCH FOR TODAY'S WORLD



The Hector Foundation II, the state of Baden-Württemberg and the University of Tübingen established the Hector Center for Education Science in September 2014. The Hector Foundation II will support the center with funds totaling €7.5m over the next ten years in order to finance academic positions, research projects and empirical studies. The state of Baden-Württemberg is making available further funds amounting to €1.8m for a new postdoc program.

The benefactor Dr. h.c. Hans-Werner Hector aims to support the development of new tools and methods for education, "to be able to precisely determine the gifts, intellectual grasp and intelligence of children and young people and promote these in a sensible way." The foundation intends to make Tübingen University one of the world's leading centers for empirical research in education. Tübingen is already well placed with its LEAD Excellence Graduate

The Hector Center for Education Science in Europastrasse is sponsored by Dr. Hans-Werner Hector and his wife Josephine – reinforcing Tübingen's position at the forefront of Education research.

School, the Leibniz Knowledge Media Research Center and a research group funded by the German Research Foundation. Professor Ulrich Trautwein, who also heads the LEAD Excellence Graduate School as its director, is the founding director of the Hector Institute.

The main emphases at the Hector Center for Education Science will include conducting and evaluating major long-term studies which follow the educational biographies of high school students, and investigating development at different types of German high schools. The center will even handle large-scale intervention studies on encouraging motivation among students in the field of mathematics and sciences and studies on the effects of reforms within the education system.

The sponsors, Dr. h. c. Hans-Werner Hector and his wife Josephine, founded the Hector Foundation II in March 2008 to promote institutions and students specializing in mathematics, technology and the sciences.

A WIDE VARIETY OF SPONSORS

Hertie Foundation backs rehab study for stroke patients

Strokes often cause considerable damage to victims' motor skills; often it cannot be reduced using conventional physiotherapy. Neurologists at the University Hospitals and the Hertie Institute for Clinical Brain Research are therefore working with the Hanover University of Music, Drama and Media and the Popakademie Baden-Württemberg to try a new approach. Motion sensors placed on the arms of stroke patients are used to make music, providing a combination of different sensory inputs – from the eyes, ears and the body as it moves. This can improve control of arm movements as the sound helps patients recall lost patterns of motion. A computer registers the motion and translates it into music, allowing patients to “compose” sounds and even melodies.

The Hertie Foundation is providing €206,000 for this project to help some of the 250,000 people who suffer a stroke in any given year in Germany alone.



Pedro de Elejabeitia (right) of the Santander Consumer Bank AG and University President Professor Bernd Engler at the signing of the cooperation agreement.

Santander Consumer Bank sponsorship

The University of Tübingen signed a €102,000 sponsorship deal with the Santander Consumer Bank AG in November 2013. The agreement focuses on two projects in the field of Egyptology, the expansion of languages offered at the University's Language Learning Center, and on scholarships for five outstanding students under the Deutschlandstipendium scheme; it will run for three years.

Santander is sponsoring two PhD students at the Institute for Ancient Near Eastern Studies who are working to excavate and restore the tomb of Thutmose III. The bank is also financing a major publication on the Institute's research into Egypt's biggest temple complex at Carnac.

The bank has also undertaken to finance the expansion of English and Spanish courses for Tübingen students and staff at the Language Learning Center, which provides quality training in eight languages. This will help prepare University members for today's increasingly international careers.

The Santander Consumer Bank is supporting Tübingen Egyptologists in their work on the historical location of Carnac; here a scene from the southern wall of a temple at Carnac.



Endowed professorships

Field	Name	Sponsor
Humanities		
Asian and Oriental Studies, Economic Ethics	Professor Matthias Niedenführ	Karl Schlecht Foundation
Economics and Social Sciences		
Intergenerationally Just Policies	Professor Jörg Tremmel	Foundation for the Rights of Future Generations
Science and Technology in Schools	Professor Kerstin Oschatz	Gips-Schüle Foundation
Medicine		
Neurodegenerative Diseases	Professor Thomas Gasser	Hertie Foundation
Cell Biology: Foundations of Neurological Diseases	Professor Matthias Jucker	Hertie Foundation
Clinical Neurogenetics	Professor Ludger Schöls	Hertie Foundation
Functional Neurogenetics	Professor Philipp Kahle	Hertie Foundation
Neurology/ Epileptology	Professor Holger Lerche	Hertie Foundation
Preclinical Imaging and Imaging Technology	Professor Bernd Pichler	Werner Siemens Foundation
Occupational and Social Medicine	Professor Monika Rieger	Südwestmetall Employers' Federation
Clinical Pharmacology	Professor Matthias Schwab	Robert Bosch Foundation
Infectious Diseases of the Circulatory System	Professor Harald Langer	Lichtenberg Professorship (VW Foundation)
Neuroplasticity of the Developing Brain	Professor Martin Staudt	Schön Kliniken GmbH, Behandlungszentrum Vogtareuth
Molecular Biology of Degenerative Retinal Disorders	Professor Marius Ueffing	Tistou und Charlotte Kerstan Stiftung Vision 2000 – Sehen – Kunst – Sinnesfunktion
Molecular Diabetology	position not yet filled	Sanofi-Aventis Deutschland GmbH
Science		
Neurology/ Epileptology	Professor Christopher Miller	Carl Zeiss Foundation



Buck Foundation backs key chemical research for use in medicine

The Stuttgart-based Karl and Anna Buck Foundation sponsors junior researchers at Tübingen's Faculty of Science, pledging a six-figure sum for three PhD students in Chemistry over several years in an agreement signed in early 2014.

The Foundation is backing the development of contrast agents for medical diagnosis via MRI, improving the clinical images. This work is being carried out at the Institute of Anorganic Chemistry. In a further sponsored project at the Institute of Organic Chemistry, two students are investigating new substances for use in photodynamic treatments – vital for treating certain forms of cancer.

The Karl and Anna Buck Foundation has been promoting valuable scientific and medical research since 2000.

CULTURE AND SOCIETY

Cradle of biotech research to become a museum

The former kitchen at Hohentübingen Castle became the world's first biochemical laboratory when Friedrich Miescher isolated nucleic acid, the stuff of DNA and RNA, there in 1869. Tübingen biotechnology company CureVac has donated €100,000 to enable the University Museum to restore the earlier lab and its equipment and make

them accessible to the public – underlining the University's great tradition in biochemistry.

"The old castle kitchen is an important part of our history," said CureVac boss, Dr. Ingmar Hoerr, at the signing of the deal with Museum director, Professor Ernst Seidl. "It was here 145 years ago that Friedrich Miescher dis-

covered the molecule which forms the basis of our cancer treatments and vaccines. We are very proud that the birthplace of RNA is here in Tübingen. It is a great example of the innovation maintained here over generations." CureVac received the European Commission's Vaccine Prize in 2014.



Left to right: Professor Ernst Seidl, Director of the University Museum; Dr. Ingmar Hoerr, managing director of CureVac; and University President, Professor Bernd Engler, sign the agreement to recreate as a museum the lab in Hohentübingen Castle where nucleic acid was discovered.

Record number of Deutschlandstipendium grants

The University of Tübingen raised funding for nearly 200 Deutschlandstipendium scholarships in 2014 – more than ever before. Each outstanding student sponsored receives €300 per month to help with expenses while studying: The German government matches each €150 given by a private donor with €150 from its own coffers. Sponsors include the Hugo Rupf Foundation, the Gips-Schüle Foundation, the Karl Schlecht Foundation, the Gerhard Rösch Foundation, and Santander Consumer Bank as well as numerous private citizens, emeriti and alumni. The biggest sponsor of these grants was once again the Unibund, the association of friends of the University.

The scholarships were presented at a ceremony in April 2014 – where scholarship holders met their benefactors. University Vice-President of Academic Affairs, Professor Karin Amos, stressed the importance of this link. Dr. Sabine Lutz of Robert Bosch GmbH spoke on behalf of the sponsors, encouraging students to look beyond performance markers and to experience life at university to the full.



Law student Markus Jurawitz expressed thanks to sponsors on behalf of all the new scholarship holders.



New scholarship holders from the Faculty of Protestant Theology (above) and from the Faculty of Catholic Theology (below), with Professor Karin Amos, Vice-President of Academic Affairs





NETWORKS

SUCCESSFUL PARTNERSHIPS

The University of Tübingen works closely with people and institutions in Germany, across Europe, and around the world. We have worked to build stronger ties with Asia, welcoming distinguished academics here in Tübingen. Along with high-level exchanges, we are now sending more students abroad and enrolling more international students than ever before. Such exchanges broaden individuals' horizons and benefit Tübingen as a place to live, work and study. Within Germany, we are associated with research institutions at the cutting edge of their fields, and we invite scientists working in industry to share their skills at the University – all of which enrich the world of ideas that is the bedrock of Tübingen University.

TÜBINGEN AROUND THE WORLD

Two major honors for Taiwan Center

Tübingen University's European Research Center on Contemporary Taiwan (ERCCT) was raised to the status of an **Overseas Center** by the Chiang Ching-Kuo Foundation for Scholarly Exchange, a respected Taipei-based organization promoting China and Taiwan studies. Worldwide there are only four such Overseas Centers; the other three are at Harvard, the Charles University in Prague, and the Chinese University of Hong Kong.

The European Research Center on Contemporary Taiwan received a major prize in Paris from the Institut de France.





The European Research Center on Contemporary Taiwan was named an overseas center by Taiwan's Chiang Ching-kuo Foundation. The Foundation's president, Professor Yun-han Chu (left), traveled to Tübingen in July 2014 to sign the memorandum with President Engler.

The first guest professor of Global Literary Studies, Professor Makarand R. Paranjape (center) with Professor Martin Louis Vialon (left), Director of the sponsoring Auerbach Archive in Oldenburg, and Professor Jürgen Leonhardt, Dean of Humanities



New guest professorship of Global Literary Studies

Professor Makarand R. Paranjape of New Delhi became Tübingen's first guest professor of Global Literary Studies in October 2014. The Erich Auerbach guest professorship of Global Literary Studies has been awarded to the University of Tübingen for four years and is sponsored by the German Ministry of Education and Research and the German Academic Exchange Service (DAAD) with €100,000. Its aim is to promote internationalization at German universities.

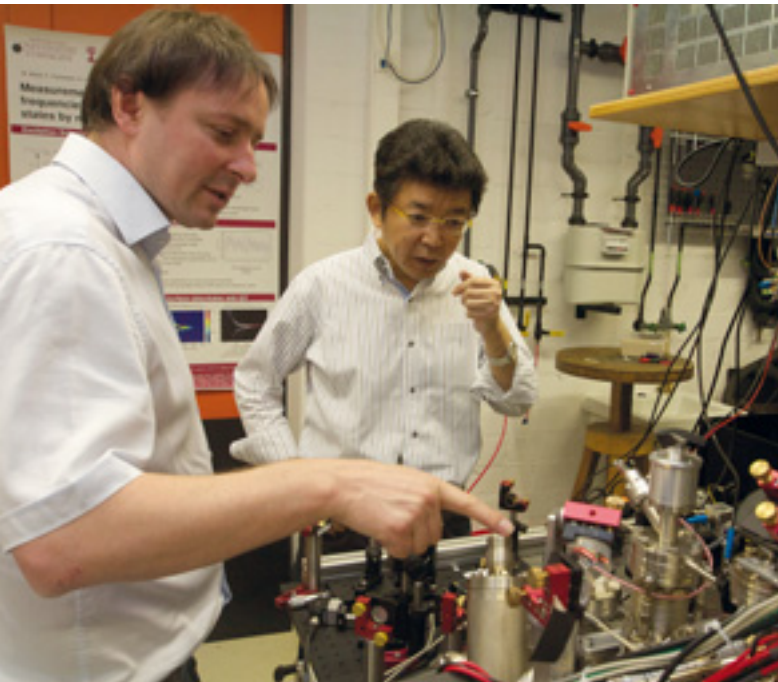
Over the next four years, Tübingen will host outstanding literary scholars from around the world – from Australia (Bill Ashcroft, Vijay Mishra), India (Makarand Paranjape), South Africa (Dan Ojwang), the UK (Suman Gupta, Adrian Poole, Andrew Webber) and the US (Mark Sanders, Robert Tally). Each guest will hold three seminars over a period of three months.

The new status guarantees funding from the Chiang Ching-Kuo Foundation for at least five years. "This is a milestone for European Taiwan research and an important step towards long-term training of junior researchers," said Professor Gunter Schubert, ERCCT director and Professor of Greater China Studies at Tübingen's Institute of Asian and Oriental Studies. Foundation President Professor Chu Yun-han signed the cooperation agreement in Tübingen on 14 July 2014.

The ERCCT also received the 2014 **French-Taiwan Cultural Award** in recognition of its services to Taiwan research in Europe. The award is made annually in Paris by the Fondation culturelle franco-taiwanaise de l'Académie des sciences morales et politiques and comes with €25,000 prize money.

The ERCCT was founded on 1 July 2008 as a joint venture between the University and the Chiang Ching-Kuo Foundation and is unique in Europe. The Center supports the work of junior researchers and promotes academic dialogue between Europe and Taiwan.

www.ercct.uni-tuebingen.de



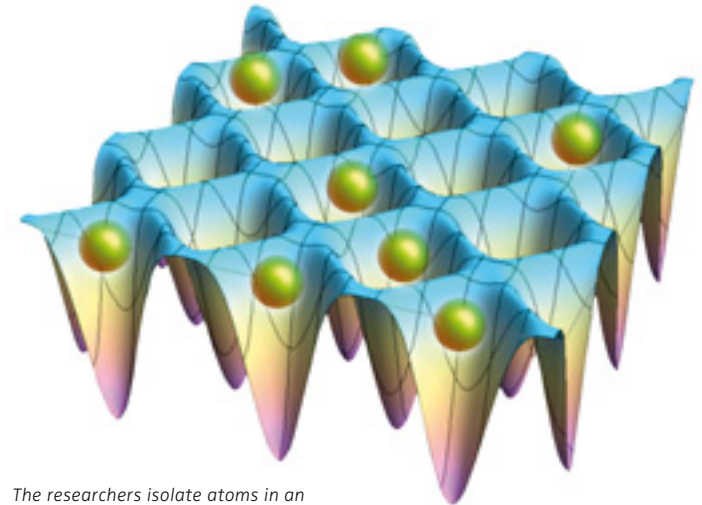
Tübingen Distinguished Guest Professor Hidetoshi Katori (right), works closely with Professor József Fortágh at the Institute of Physics.

Distinguished Guest Professor takes timekeeping to the limit

The Excellence Initiative earmarked more than €10m for internationalization over the five years to 2017. Among the relevant measures is the Tübingen Distinguished Guest Professorship Program, aimed at reinforcing our partnerships with research institutions the world over, while bringing outstanding researchers to Tübingen to work with our staff and students, as well as promoting the exchange of students, PhDs and postdocs.

Professor Hidetoshi Katori of the University of Tokyo and Japan's premier research institute, RIKEN, brought the interaction of atoms with chip surfaces to Tübingen in July 2014. Professor Katori specializes in super-accurate atomic clocks and as a Distinguished Guest Professor will be carrying out research for extended periods at the Institute of Physics at the University of Tübingen over the next three years. His invitation to be a Tübingen Distinguished Guest Professor was initiated by Professor József Fortágh of the Center for Quantum Science. The two men are working closely on a number of projects. They are both interested in manipulating single atoms for extremely precise measurements – or even to develop a wholly new kind of computer.

Hidetoshi Katori has been a Physics professor at the University of Tokyo since 1999. In 2011 he became director of research at RIKEN's Quantum Metrology Laboratory, where his work includes an innovative space-time project. Professor Katori has worked in Germany before, at the Max Planck Institute for Quantum Optics near Munich from 1994 to 1997. He has been seeking a new strategy for building a high precision atomic clock since then. Scientists measure the frequency with which an atom jumps



The researchers isolate atoms in an optical lattice like eggs in an egg carton. This prevents them from interacting.

between two states. Since 1967, a second has been defined by the duration to complete 9,192,631,770 oscillations that is radiated by Caesium-133 to transit between the two hyperfine levels of its ground state. Today's Caesium clocks are accurate to a second over 30 million years. What may seem extremely precise to the layman is not good enough for these researchers. They began to develop clocks based on the transitions of a single ion – which could be isolated from all outside interference.

"In Garching I spent a lot of time catching just one single ion," smiles Hidetoshi Katori. But he was still not satisfied. He wanted even greater precision. He wanted a clock which was accurate to a fraction of a second with an amazing 18 digits after the decimal point. Instead of

measuring the transitions of a single ion, he aimed to measure many neutral atoms at the same time. His presentation of this idea at an international conference in 2001 was met with scepticism. But, as so often the case with unusual ideas, it was important not to be put off. "In physics you must be an optimist," he says.

In order to exclude the possibility of interactions between the atoms or between the atoms and their environment, Katori isolates the atoms using six lasers in a three-dimensional optical lattice. "Imagine an egg carton with an atom sitting isolated in each pocket. This way it is possible to quickly measure around one million atoms at once," he explains. His "optical lattice clocks" may allow us to re-define the second even more precisely in about 10 years.

Other physicists have become much less skeptical – with many of them competing to create the most accurate clock in the world. Superaccurate timing devices are needed to investigate just how constant physical constants are. Atomic clocks are also particularly precise sensors of the space-time curved by gravity, and can be used to measure the tiniest change in altitude. In their collaboration, Katori and József Fortágh plan to integrate high-precision atomic clocks into microchips – which could result in new findings for basic research as well as creating new, mobile sensors to be built into navigation systems, or even quantum sensors for measuring altitude.

Baden-Württemberg Foundation promotes academic mobility

Since 2001, the University of Tübingen has used the Baden-Württemberg-STIPENDIUM scheme to sponsor more than 1,400 students in its international exchange programs. Under the scheme, students from southwestern Germany go abroad and an equal number of foreign students are able to come to Baden Württemberg universities. In 2013-14, a total of €255,000 was made available for the University of Tübingen.

Under the "BWS plus" part of the scheme, universities can get funding for innovative collaboration with partner institutions abroad. In 2011, Tübingen successfully applied for its Multilateral Strategic Partnership project. The poster child for such multilateral cooperation is the Matariki Network of Universities, under which seven universities formed an alliance in 2010: Durham, UK; Uppsala, Sweden; Queen's in Kingston, Canada; Dartmouth in Hanover, USA; the University of Western Australia in Perth; Otago, New Zealand – and Tübingen. Other exchanges receiving funding from the BWS plus scheme focused on strategic partner universities in Asia, particularly in China and Singapore.

The three years of BWS plus funding ran to September 2014, providing €130,000 for mobility measures and international workshops in Tübingen, as well as exchanges for 16 PhD students for up to six months. A number of these measures have led to success in the form of stronger and enduring international contacts.

International initiatives lead to increased DAAD funding

The German Academic Exchange Service (DAAD) also promotes the international exchange of people and ideas via a wide range of programs. In 2013, the University of Tübingen received some €4.3m euros, more than half a million more than in the previous year.

The DAAD sponsored 208 international students, doctoral candidates and visiting academics to come to Tübingen for studies and research, while financing 177 locals to go abroad. Funding for individuals ran to €2.32m, around a quarter million more than in 2012. For projects and group programs such as ERASMUS, Bachelor-Plus, PROMOS and ISAP, the University received almost €2m from the DAAD – up some €300,000 from the previous year.



European Center for Chinese Studies, Peking University - BEIJING

Tübingen Center for Japanese Language, Dōshisha University - KYOTO

Tübingen Center for Korean Studies, Korean University - SEOUL

Our partners around the world

The University of Tübingen has three branches in Asia and maintains regular exchange programs with some 150 institutions of higher education in 62 different countries, as well as with our six partners in the Matariki Network of Universities. The locations of our partner universities are marked on the map.

The University is also highly active in the European Union's Erasmus Program, involving partnership deals with around 300 European institutions. Our seven Faculties also run more than 90 exchange programs with institutions in Europe and around the globe.

Approximately 800 Tübingen students annually take advantage of the many exchange schemes we offer. This mobility gives them valuable international experience and helps strengthen the University's international networks.

North America

Canada

University of Alberta - EDMONTON, ALBERTA

McGill University - MONTREAL

McMaster University - HAMILTON, ONTARIO

Ontario Colleges and Universities - ONTARIO*

Université Laval - QUÉBEC

Mount Allison University - SACKVILLE, NEW BRUNSWICK

United States of America

University of Alaska - FAIRBANKS, AK

Northern Arizona University - FLAGSTAFF, AZ

Arizona State University - TEMPE, AZ

University of Arizona - TUCSON, AZ

University of California - BERKELEY, CA

California State University - CA*

University of Denver - DENVER, CO

Connecticut State Universities and Colleges - CT*

Yale University - NEW HAVEN, CT

Georgetown University - WASHINGTON, D.C.

Drake University - DES MOINES, IA

Roosevelt University - CHICAGO, IL

Butler University - INDIANAPOLIS, IN

Valparaiso University - VALPARAISO, IN

Bellarmino University - LOUISVILLE, KY

Louisiana State University - BATON ROUGE, LA

University of Massachusetts - BOSTON, AMHERST, MA*

Tufts University - MEDFORD, MA

Washington College - CHESTERTOWN, MD

University of Maryland - COLLEGE PARK, MD

University of Michigan - ANN ARBOR, MI

Western Michigan University - KALAMAZOO, MI

University of Missouri - COLUMBIA, MO

Washington University - ST. LOUIS, MO

Montana State University - BOZEMAN, MT

Princeton Theological Seminary - PRINCETON, NJ

State University of New York - STONY BROOK, NY

Hobart and William Smith Colleges - GENEVA, NY

North Carolina State Universities - NC*

University of North Carolina at Chapel Hill - CHAPEL HILL, NC

Antioch University - YELLOW SPRINGS, OH

Oregon University System - OR*

Reed College - PORTLAND, OR

Temple University - PHILADELPHIA, PA

College of Charleston - CHARLESTON, SC

University of Tennessee - KNOXVILLE, TN

Rhodes College - MEMPHIS, TN

Texas A & M University - COLLEGE STATION, TX

University of North Texas - DENTON, TX

University of Washington - SEATTLE, WA

University of Hawai'i at Mānoa - HONOLULU, HI

* national exchange



Latin America

Argentina

Pontificia Universidad Católica Argentina - BUENOS AIRES

Universidad Nacional de Córdoba - CORDOBA

Brazil

Universidade Federal Fluminense - NITEROI

Universidade Federal do Rio Grande do Sul - PORTO ALEGRE

P.U.C. do Rio Grande do Sul - PORTO ALEGRE

Universidade Federal de Pernambuco - RECIFE

Univates em Lajeado - LAJEADO

Universidade de Santa Cruz do Sul - SANTA CRUZ

Universidade Federal de Santa Maria - SANTA MARIA

Universidade de São Paulo - SÃO PAULO

Campus Universitário Ribeirão Preto - SÃO PAULO

Chile

Pontificia Universidad Católica de Chile - SANTIAGO

Ecuador

Universidad San Francisco de Quito - QUITO

Colombia

Universidad de los Andes - BOGOTÁ

Universidad Icesi - CALI

Mexico

Universidad Iberoamericana - CIUDAD DE MEXICO

El Colegio de México - CIUDAD DE MEXICO

Universidad de Guadalajara - GUADALAJARA

Universidad de Guanajuato - GUANAJUATO

Tecnológico de Monterrey - MONTERREY

Universidad de Monterrey - MONTERREY

Universidad de las Américas - PUEBLA

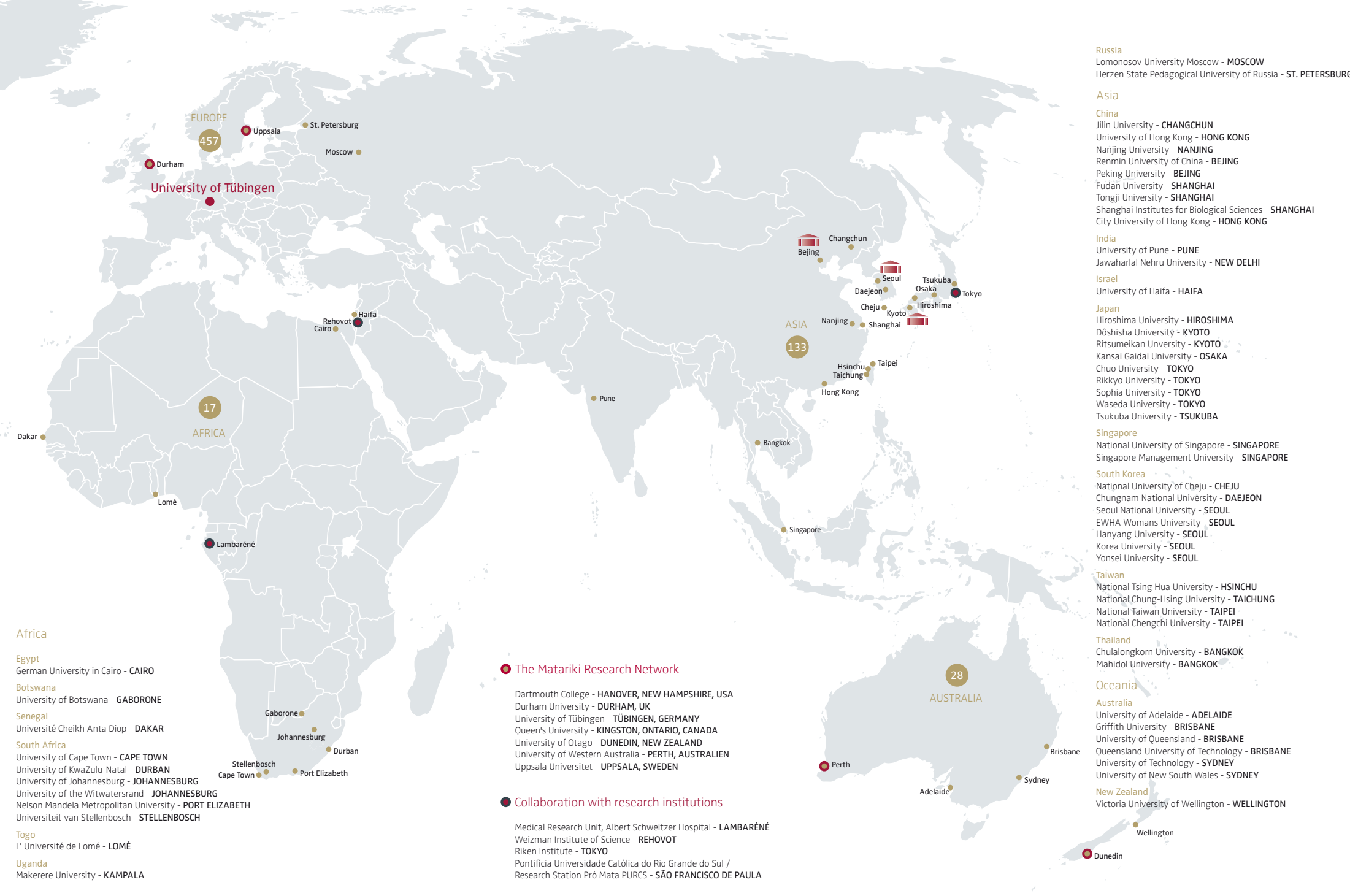
Benemérita Universidad Autónoma de Puebla - PUEBLA

Peru

Pontificia Universidad Católica del Perú - LIMA

Venezuela

Universidad de los Andes - MÉRIDA



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 University of Botswana - GABORONE
 Senegal
 Université Cheikh Anta Diop - DAKAR
 South Africa
 University of Cape Town - CAPE TOWN
 University of KwaZulu-Natal - DURBAN
 University of Johannesburg - JOHANNESBURG
 University of the Witwatersrand - JOHANNESBURG
 Nelson Mandela Metropolitan University - PORT ELIZABETH
 Universiteit van Stellenbosch - STELLENBOSCH
 Togo
 L' Université de Lomé - LOMÉ
 Uganda
 Makerere University - KAMPALA

The Matariki Research Network
 Dartmouth College - HANOVER, NEW HAMPSHIRE, USA
 Durham University - DURHAM, UK
 University of Tübingen - TÜBINGEN, GERMANY
 Queen's University - KINGSTON, ONTARIO, CANADA
 University of Otago - DUNEDIN, NEW ZEALAND
 University of Western Australia - PERTH, AUSTRALIEN
 Uppsala Universitet - UPPSALA, SWEDEN

Collaboration with research institutions
 Medical Research Unit, Albert Schweitzer Hospital - LAMBARÉNÉ
 Weizman Institute of Science - REHOVOT
 Riken Institute - TOKYO
 Pontificia Universidade Católica do Rio Grande do Sul /
 Research Station Pró Mata PURCS - SÃO FRANCISCO DE PAULA

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 Lomonosov University Moscow - MOSCOW
 Herzen State Pedagogical University of Russia - ST. PETERSBURG

Asia
China
 Jiilin University - CHANGCHUN
 University of Hong Kong - HONG KONG
 Nanjing University - NANJING
 Renmin University of China - BEIJING
 Peking University - BEIJING
 Fudan University - SHANGHAI
 Tongji University - SHANGHAI
 Shanghai Institutes for Biological Sciences - SHANGHAI
 City University of Hong Kong - HONG KONG

India
 University of Pune - PUNE
 Jawaharlal Nehru University - NEW DELHI

Israel
 University of Haifa - HAIFA

Japan
 Hiroshima University - HIROSHIMA
 Dôshisha University - KYOTO
 Ritsumeikan University - KYOTO
 Kansai Gaidai University - OSAKA
 Chuo University - TOKYO
 Rikkyo University - TOKYO
 Sophia University - TOKYO
 Waseda University - TOKYO
 Tsukuba University - TSUKUBA

Singapore
 National University of Singapore - SINGAPORE
 Singapore Management University - SINGAPORE

South Korea
 National University of Cheju - CHEJU
 Chungnam National University - DAEJEON
 Seoul National University - SEOUL
 EWHA Womans University - SEOUL
 Hanyang University - SEOUL
 Korea University - SEOUL
 Yonsei University - SEOUL

Taiwan
 National Tsing Hua University - Hsinchu
 National Chung-Hsing University - TAICHUNG
 National Taiwan University - TAIPEI
 National Chengchi University - TAIPEI

Thailand
 Chulalongkorn University - BANGKOK
 Mahidol University - BANGKOK

Oceania
Australia
 University of Adelaide - ADELAIDE
 Griffith University - BRISBANE
 University of Queensland - BRISBANE
 Queensland University of Technology - BRISBANE
 University of Technology - SYDNEY
 University of New South Wales - SYDNEY

New Zealand
 Victoria University of Wellington - WELLINGTON
 Dunedin

PARTNERS AT HOME

At the University of Tübingen, we believe it is important to form new partnerships while strengthening existing ones. Here we tell a tale of two institutes, one a key new associate of national importance, the other a longstanding partner in vital medical research. Collaboration between the world of academia and institutions concerned with immediate practical applications is a two-way street. The University benefits from the experience garnered in the wider society, while the academics involved get the opportunity to follow up ideas which the world of commerce may not support. This is reflected in our Industry on Campus program, which has now involved top commercial researchers from the fields of medical technologies and optical systems.

Association deal with think tank

The IAW is an independent economic think tank which became an associated institute of the University of Tübingen in May 2014. Its interdisciplinary team researches issues crucial to the German economy, which differs from other big economies in many ways. The IAW's research and consultancy services provide qualified information for Germany's policymakers at the state and federal levels.

The IAW is one of Germany's smaller economic think tanks, but it specializes in areas of particular relevance to the German economy, such as the labor market, social security, and the changes wrought by globalization. The IAW also provides a focus on the industrial powerhouse of Baden-Württemberg, the southwestern region home to Daimler, Bosch and many other manufacturing exporters.

In the run-up to the introduction of a blanket minimum wage in Germany, the IAW conducted research of nationwide importance on the issue. IAW Director Professor Bernhard Boockmann and his team investigated the effect of minimum wages introduced in three areas. The researchers found that minimum wages boosted the average incomes of workers but – contrary to microeconomic theory – did not lead to employment losses in those industries.





Professor Karin Amos, Vice-President of Academic Affairs, with the directors of the IAW, Professor Wilhelm Kohler (left) and Professor Bernhard Boockmann (right) at the signing of the association agreement.

IAW Director of Research Professor Wilhelm Kohler employs theoretical and empirical analysis to predict the effects of regional and international integration. Understanding the dynamics of economic change is important – it puts fears of unemployment and other hardships into perspective. It also needed to grasp when fundamental changes have occurred, such as the trade collapse which followed the 2008 financial crisis.

Optimizing medical treatment for the individual

The University has a longstanding partnership with the Margarete Fischer-Bosch-Institute of Clinical Pharmacology (IKP), where researchers are working at the cutting edge of pharmacology to understand why drugs work in some individuals and not in others.

Professor Matthias Schwab has been head of IKP since 2007 and is a professor of clinical pharmacology at the University of Tübingen. He says genetic variation in patients can influence the efficacy of drugs. Most pharmaceuticals used for treating asthma, diabetes and high blood pressure work well on as many as 70 percent of patients, yet may either fail to work or have severe side effects on a significant number of others. Some differences between patients can be attributed to gender, weight or age. Others may have to do with pre-existing conditions. Numerous variables mean each individual's metabolism is somewhat different. An enzyme that is responsible for converting a drug into its active form, for example, can work rapidly or slowly, or may even be missing entirely.

The interdisciplinary work of the IKP involves a number of institutions, including the Robert Bosch Krankenhaus (RBK), a Stuttgart hospital, where beds are reserved for clinical trials. "Early on, the Institute put research results directly into clinical practice, so it was active in translational research long before the concept became com-

monly known," says Schwab. Linking basic research with the treatment of patients has borne fruit. He adds that "When it comes to pharmacogenetics, IKP is among the top ten institutes in the world."

A cooperation agreement was concluded in 1995 between the Robert Bosch Stiftung (Robert Bosch Foundation) and the University of Tübingen, where Schwab is also a professor of clinical pharmacology. The institute works closely with Tübingen's Interfaculty Center for Pharmacogenomics and Drug Research (ICEPHA), which focuses on infectious disease, oncology, immune-mediated inflammatory disease and vascular diseases. Researchers active here include Professors Stefan Laufer, Peter Ruth, and Hans-Ulrich Häring.



Professor Matthias Schwab (right) discussing details with a colleague. He has headed the Margarete Fischer-Bosch-Institute in Stuttgart since 2007.

KEY RESEARCH PARTNERS IN GERMANY

- Institute for Applied Economic Research (associated institute)
- NMI – Natural and Medical Sciences Institute (associated institute)
- Global Ethics Institute (associated institute)
- BCCN – Bernstein Center for Computational Neuroscience
- Helmholtz Association: German Consortium for Translational Cancer Research (DKTK)
- Helmholtz Association: German Center for Diabetes Research (DZD)
- Helmholtz Association: German Center for Infection Research (DZIF)
- Helmholtz Association: German Center for Neurodegenerative Diseases (DZNE)
- Dr. Margarete Fischer-Bosch Institute for Clinical Pharmacology (Stuttgart)
- Forschungsinstitut für Arbeit, Technik und Kultur e.V. – group researching processes of social, cultural and technical change (Tübingen)
- Senckenberg Research Institute (Frankfurt am Main)
- Forschungszentrum Jülich, member of the Helmholtz Association
- Fraunhofer Institute for Interfacial Engineering and Biotechnology (IGB), Stuttgart
- Friedrich Miescher Laboratory, Max Planck Society (Tübingen)
- Heidelberg Academy of Sciences and Humanities
- Helmholtz Centre for Environmental Research (Leipzig-Halle)
- Hertie Institute for Clinical Brain Research (Tübingen)
- University of Applied Forest Sciences – Rottenburg
- Institut für donauschwäbische Geschichte und Landeskunde (Tübingen)
- Institut für Rehabilitationsforschung, Qualitätsentwicklung und Strukturanalyse in der Behindertenhilfe (REQUEST) e. V. (Tübingen)
- Knowledge Media Research Center (Tübingen), sponsored by the Leibniz Association
- MFO mathematics research institute (Oberwolfach), member of the Leibniz Association
- Max Planck Institute for Biological Cybernetics (Tübingen)
- Max Planck Institute for Developmental Biology (Tübingen)
- Max Planck Institute for Intelligent Systems (Stuttgart/Tübingen)
- PH Ludwigsburg University of Education – Faculty of Special Education, Reutlingen
- Staatliches Seminar für Didaktik und Lehrerbildung (Gymnasien) Tübingen
- Universität Hohenheim – Center for Nutritional Medicine (ZEM) Tübingen – Hohenheim
- University of Stuttgart – inter-university center for medical technology (IZST)
- Werner Siemens Foundation

Vision is paramount for Industry on Campus professor

Tübingen University introduced its Industry on Campus model in November 2012, enabling researchers from industry to spend about half their working time in the University, sharing their practical experience in research and teaching. In return, these highly motivated researchers from the commercial sector have the opportunity to work at the cutting edge of application-oriented and basic research. These Industry on Campus contracts are a key part of, and are largely financed by, our Excellence Initiative institutional strategy.

Tübingen University's first such contract was with innovative medical technology company Aesculap AG, making applications developer and biologist Dr. Boris Hofmann the first Industry on Campus professor. The second agreement was with optical systems maker Carl Zeiss AG in December 2013, bringing physicist Dr. Siegfried Wahl to head the University's new ZEISS Vision Science Lab.

Early on in his physics studies at the University of Ulm, Dr. Wahl was infected by his professor's enthusiasm for biophysics. "Back then, Professor Zrenner here in Tübingen was already working towards a retina implant which combined semiconductors with nerve cells," he recalls. Subsequently he took his masters in the physics of semiconductors. For his doctorate he went to the Max Planck Institute for Developmental Biology at Tübingen and researched vision. Working on chickens, zebra fish and rats, he studied how nerve cells interconnect to process optic impressions as the brain develops.

Since December 2013 Siegfried Wahl has been Head of ZEISS Vision Science Labs at the University of Tübingen as part of an Industry on Campus agreement and is back researching the eye. "The field still interests me a lot, that's what appealed to me about the job," he says. At the same time his years of experience at Carl Zeiss AG are interesting to the University as it is building up its applied research facilities. Since receiving his PhD, Siegfried Wahl has worked on research and development in semiconductor technology for Zeiss. The company has a very strong presence in optics, says Wahl, with almost all high-performance semiconductor chips – even those in products from other companies – originating from Zeiss.

Zeiss brought the first modern lens onto the market in 1912. Now, many visual defects can be resolved with individually adapted lenses, which can already allow for several thousand parameters, affecting visual acuity, contrast and color perception, UV protection and sight in twilight, darkness or difficult lighting conditions. Nevertheless, there is still much research to be done to understand all the basics of the complex interaction of eye, brain and lens. Worldwide, improved visual aids could help more than four billion people with poor vision. Above all, Wahl wants to research the neuroscience and optometric aspects of three-dimensional vision and the perception of depth.

For several years at Carl Zeiss AG Wahl was, in cooperation with RWTH Aachen, responsible for innovative processes which aimed to help the partners to learn from one another. "I have experience in the realization and control of such processes," he says. This also contributes to his current position in academic research. "A construct like the



Dr. Siegfried Wahl

Industry on Campus agreement is not so common." Although almost all universities have contacts with industrial companies, being fully integrated is quite unusual – "not on the side lines, but right in the thick of it."

Wahl is keen to exchange ideas with the excellence cluster of the Center for Integrative Neuroscience (CIN), the Bernstein Center for Computational Neuroscience, and his colleagues in Computer Science, as well as with the University Hospitals.

He believes the greatest challenge is the development of the ZEISS Vision Science Lab as a scientifically-recognized laboratory. Despite initial doubts, he has found a team of highly skilled and motivated employees. There is continuity in the connection of Zeiss, founded in the mid-19th century, with basic research, says Siegfried Wahl, "Above all it was the influence of the physicist Ernst Abbe that made the company set scientific standards for its products."



ACADEMIC AFFAIRS

MASTER-CLASS TEACHING

Student numbers have grown steadily in recent years, putting pressure on higher education in Germany to provide more places at university level, and to come up with innovative new programs to meet the needs of a changing society. The University of Tübingen made use of the state government's Hochschule 2012 scheme to raise the number of places in Bachelor study programs. We are now seeing the knock-on rise in demand for Master's courses – met by the state of Baden-Württemberg's Master 2016 scheme, which created additional places in Master's degree programs at the University of Tübingen. At the same time, we are casting our net wider to find talented people – supporting women researchers in their teaching careers, and helping high school students to explore the many options open to them at our University.

INNOVATIVE NEW MASTER'S PROGRAMS

Islamic Theology in a European Context

This one-year Master's degree was launched at the Center of Islamic Theology (ZITH) at the University of Tübingen in 2014. Islamic Theology in a European Context is interdisciplinary, providing students with an extensive knowledge of historical and current issues. Courses address subject areas such as Islam and Religious Pluralism – Muslim Perceptions of the 'Religious Other,' The History and Current Development of Islam in Europe, European Challenges in Sharia Law, the Development of Hadith and Koran Studies in Europe as well as the theory and practice of interreligious dialogue.

The program is complemented by a Summer Academy, held in conjunction with academic institutions including the Lay Center in Rome, Marmara University in Turkey, the

University of Sarajevo, and the University of Ez-Zeitouna in Tunisia. The aim of the Summer Academy is to communicate the methods, content and prospects for inter-religious dialogue to the students and enable them to put these to the test.

Candidates must be able to speak Arabic, English and German and have achieved an average grade of 2.5 in their Bachelor's degree in Islamic Theology, Islamic Studies or related religious and social sciences. The Master's degree course enables students to carry out research at an advanced level, preparing them for a doctorate later on. It also communicates general intercultural and inter-religious skills, which provide a bedrock for professional careers in the non-academic world.



Nanoscience

The state of Baden-Württemberg's Master 2016 scheme enabled us to launch a new two-year Nanoscience Master's degree in 2014. Nanoscience is an interdisciplinary subject, including physics, chemistry and biology. The fields of nanoscience and nanotechnology are growing at a rapid pace. This Master's degree aims to communicate to students how they can successfully work in these fields, both analytically and practically. The program is aimed at graduates with a Bachelor's degree in fields related to Nanoscience or with a first degree in biology, chemistry or physics where there has been a major focus on nanoscience.



CONTINUED RISE IN ENROLLMENTS

The University of Tübingen reached yet another record high of 29,155 students enrolled in the winter semester of 2013-14. More than 4,000 freshmen arrived in the winter semesters of 2013-14 and 2014-15, while the

proportion of international students (12.3-13.3%) and female students (57.8-58.3%) remained steady. The sharp rise in student numbers in recent years is expected to tail off, with enrollments remaining at the current high level.

Student numbers at a glance

Enrollments

Winter semester (adjusted figures)	Total		Female		International Students	
Overall enrollments	28,481	16,487	57.9%	3,672	12.9%	
First-year enrollments	4,010	2,448	61.0%			

By Faculty

Faculty	Winter semester, October 2014
Protestant Theology	580
Catholic Theology	315
Law	2,697
Medicine	3,706
Humanities	9,121
Economics and Social Sciences	5,009
Science	7,628
Center of Islamic Theology	99
Total	29,155

FOCUS ON WOMEN

The University's Equality and Diversity Office celebrated its 25th anniversary in 2014 and was able to look back on a quarter century of promoting equal opportunities for University students and teachers. The office has been expanded in recent years. This reflects a growing rise in expectations of the University as an employer, particularly for women academics, but also for students with families. The University has anchored equal opportunities measures both in its institutional strategy and in its successful effort to be audited and certified as a "family-friendly university."

Wrangell program – Training researchers and teachers

Four Tübingen researchers were selected for sponsorship under the Margarete von Wrangell program in 2014. The program was established in 1997 to support junior women researchers and ultimately to raise the number of women professors. It is named after Margarete von Wrangell, who studied in Tübingen and became Germany's first woman professor in 1923.

Each researcher receives five years of funding for a position which is integrated into the relevant university or college. Tübingen's latest Wrangell program participants are: Dr. Katrin Giel, Psychosomatic Medicine; Dr. Lynn Heller, Mathematics/ Geometry; Dr. Enkelejda Kasneci, Technical Informatics; and Dr. Julia Schulze-Hentrich, Medical Genetics.

Dr. Enkelejda Kasneci has been a Wrangell Fellow since early 2014. The 33 year old researcher at Tübingen's Institute of Computer Science says "It is not just about financing; it is also important to be able to receive coaching and to build networks – these things are of great help."

Enkelejda Kasneci's doctorate in Technical Informatics incorporated work with the Tübingen Eye Hospital. She investigated how glaucoma and stroke patients saw objects in traffic. "Patients with advanced restricted vision on both sides are usually banned from driving," says Kasneci. However, she found that many such patients are able to compensate for their deficient vision using additional eye and head movements. "Just how they compensate is an individual process," she says. Kasneci developed methods of analyzing eye movement to determine whether a patient can see a certain object or not. She found that many people have their driving licenses withdrawn although they are able to compensate for faults in their vision, and says such decisions would be better made on a case-by-case basis.



Dr. Enkelejda Kasneci

Enkelejda Kasneci is building upon this in her postdoc project, in which she is investigating whether attention can be drawn to objects which present a danger. She looks at the path scanned by the eyes to see whether certain elements get more attention than others. "In the next step I am interested to see how the edges of the patient's field of vision can be extended." She hopes her findings will improve the quality of patient vision and lead to improved rehabilitation strategies.

Kasneci now has three doctoral students in her research group. She says the need for programs aimed at women researchers remains: "The ten applicants funded under the 2014 Wrangell Program were selected from a field of 60. That means that there are at least 50 more women in the state of Baden-Württemberg who would like to work towards a professorship."

SCHOOL STUDENTS GET A HEAD START AT UNIVERSITY



Benjamin Brindle

Lectures in the morning, school in the afternoon

Some especially gifted school students start their university studies years before completing their high school diploma. Every year, some of them attend first-year lectures in Mathematics at the University of Tübingen. They take part in study groups and complete written examinations. If they enroll as a student after completing their high school diploma, they can gain credit for certificates gained at an earlier stage.

Benjamin Brindle is one of them. Even in primary school he was brilliant in math. His teachers encouraged him, and now, at age 15, he is in tenth grade at school – and studying Mathematics at the University of Tübingen. He

attends the lectures and joins in all the practical work. That he works together with the regular students several years older than himself is “absolutely no problem,” says Professor Loose.

Loose explains that these school students are outstanding talents. “Our most famous one was undoubtedly Simon Brendle who started here as a 15 year old after winning a national math competition. He completed his doctorate in Mathematics at age 19.” Brendle, now 31, is a professor at Stanford University and is considered one of the world’s leading thinkers in the field of Geometric Analysis.

Benjamin Brindle has two more years of school to go. Apart from math, he likes physics and chemistry. He doesn’t yet know what he wants to do later on. “Mathematics is certainly my priority,” he says, “but I still have time to think about it.”

Encouraging girls to study science

The Science Faculty offered three-day introductions to science and math studies to female teens in the fall breaks of 2013 and 2014. Girls in their final two years of school were invited to attend lectures, inspect the labs, and put their questions to staff in the fields of Chemistry, Computer Science, Mathematics and Physics. The aim was to motivate more young women to opt for these subjects, where they are underrepresented but which offer good job prospects.

The program was organized by junior women researchers from the departments involved, along with student groups and the Dean’s Office. The high school students attending gave the program a positive evaluation; as a result, the Faculty plans to make it an annual event.



Girls studying at high school are encouraged to visit the University’s Science Faculty and ask questions at an annual event in the fall.

IN BRIEF

2014 Ars legendi Faculty Prize for Medicine

Professor Bernhard Hirt received half the €30,000 Ars legendi Faculty Prize for Medicine in recognition of his outstanding achievements in teaching. The award is given by the Stifterverband für die Deutsche Wissenschaft, a non-profit foundation promoting cooperation between industry and science, and the German Medical Faculty Association.



Hirt teaches anatomy as part of Tübingen's courses in medicine, dentistry, medical engineering, molecular medicine and medical engineering IT. The prize singles out the impressive and intelligent way that he is able to link clinical and pre-clinical material within the entire spectrum of medicine, and highlights the Sectio chirurgica MOOC, which Hirt conceived. The video-supported, interdisciplinary and inter-professional macroscopic dissection course attracted the Stifterverband's MOOC Production Fellowship award in 2013.

Student Prize for teaching ambulance

Students from the Faculty of Medicine received the 2014 Prize for Student Commitment for their work on a simulator for emergency medicine. The students, from the Emergency Medicine working group, developed the new simulation mobile intensive care unit as a teaching ambulance. The equipment on board includes a defibrillator, a respirator, an ultrasound machine and a patient simulator. It offers students and emergency personnel the opportunity to practice emergencies in a realistic environment and to carry out life-saving error analyses. The project – known as SIMON – was financed by the Faculty's "Tübinger Profil" funding program.

Professor Bernhard Hirt conceived and has now improved the Sectio chirurgica MOOC, teaching surgical techniques to medical students.



The teaching ambulance SIMON allows medics to practice emergency situations.



Tobias Schmohl receives the Teaching Prize from the Vice-President of Academic Affairs, Professor Karin Amos.

Teaching Prize for online writing course

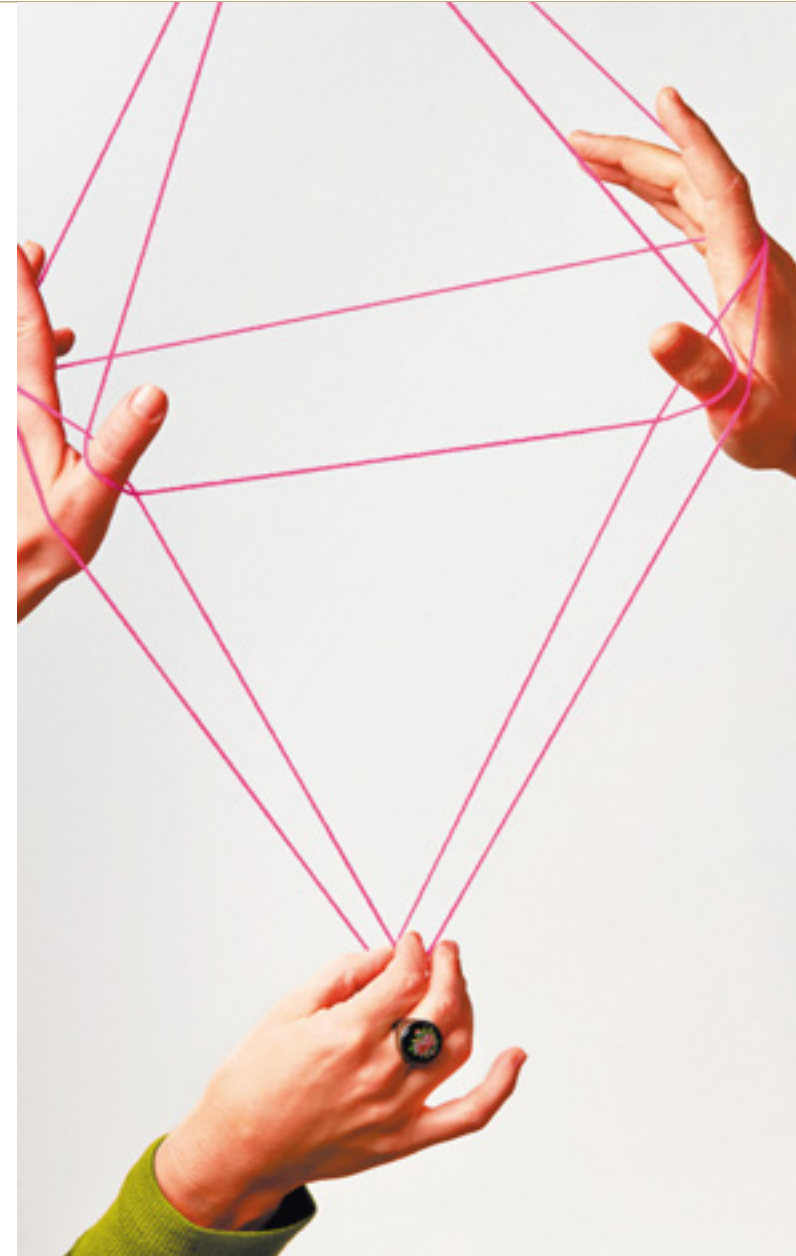
The 2014 Teaching Prize went to Tobias Schmohl for his internet-based class in writing competence for students of all Faculties. Participants learn to structure a piece of writing and to use rhetorical devices to get their message across. The class was based on the blended learning principle, with basic elements taught each week and supplemented by face-to-face teaching twice per semester. Tobias Schmohl initiated an information page, on which course participants could reflect on the set tasks and benefit from peer feedback. This was also useful to the course's teachers. The Teaching Prize of €2,500 was presented at the Dies Universitatis event on 16 October 2014.

The art of literary translation

Tübingen University's Institute of Slavic Languages and Literatures headed by Professor Schamma Schahadat is working with culture authorities and universities to present the art of literary translation in six European cities. The project, Translating Cube – Six Sides of European Literature and Translation, is sponsored by the German government and the Robert Bosch Foundation throughout 2014 and 2015 with a total of €150,000. Project partners include the Villa Decius Krakow, the Literaturhaus Stuttgart, the University of Ljubljana, Charles University in Prague and Berlin's Literaturwerkstatt. The project turns those cities into places for a European dialogue, with authors and literary translators from Germany, Poland, the Czech Republic, Slovenia, Austria, Croatia, Switzerland and Ukraine meeting and discussing their work.

The Translation Cube project is associated with the EU's TransStar project. The aim is to train a new generation of literary translators, who share their views and cultural ideas via the Translation Cube, demonstrating that Europe is more than just an abstract idea. The project also showcases artists from the fields of literature, performance and translation, such as Serhij Zhadan, Yoko Tawada and Esther Kinsky, as well as innovative young talents Nora Gomringer, Sylwia Chutnik and Ulrike Almut Sandig.

www.transstar-europa.com/projekt/ubersetzungswurfel/





UNIVERSITY STRUCTURE

BUILDING UPON EXCELLENCE

The University's scientists and academics are carrying out Excellence Initiative projects – and the University administration is already looking to the future. The University aims to secure and build upon the additional strength it has gained in research – well beyond the Excellence Initiative funding period ending in 2017. Our new Vice-President of Research has taken on new status and tasks, and we are setting up an office to implement strategies to make our top level research more international. We have taken steps to ensure high-quality study programs and to modernize our internal financial controlling system – so that we will be better able to plan for the future.

UNIVERSITY MANAGEMENT

The President's Office

President	Professor Bernd Engler	Institute of English Languages and Literatures
Executive Vice-President	Dr. Andreas Rothfuss	
Vice-President of Academic Affairs	Professor Karin Amos	Institute of Education
Vice-President of Research	Professor Peter Grathwohl	Applied Geoscience
Vice-President of International Affairs	Professor Heinz-Dieter Assmann	Faculty of Law

Left to right: Professor Heinz-Dieter Assmann, Professor Karin Amos, Professor Bernd Engler, Dr. Andreas Rothfuss and Professor Peter Grathwohl





Professor Peter Grathwohl

New Vice-President of Research – Peter Grathwohl

Environmental geoscientist Professor Peter Grathwohl began a six-year appointment as Vice-President of Research in October 2014, replacing retiring Professor of Physics Herbert Müther, who had held the post since 2006. Grathwohl is focusing on strengthening ties with Tübingen’s independent research institutes and building the Tübingen Research Campus. This includes expanding the University’s core facilities for researchers of all disciplines, and strengthening ties with industry.

Peter Grathwohl studied Geology in Tübingen, completing his doctorate in 1988. He conducted research at Stanford before completing his habilitation in Tübingen in 1995. In 1996 he became a professor of Hydrogeochemistry in Tübingen, where he served as Vice-Dean and Dean of his Faculty. Grathwohl’s research focuses on the behavior of toxins in water, soil and in the air. He has coordinated the EU project AquaTerra, been spokesman for the research cluster Water Earth System Science and for the Tübingen research platform Environmental Systems Analysis.

University Board

External members

Chairman	Professor Wilhelm Rall	Stuttgart
	Professor Andreas Busch	Bayer Pharma AG, Berlin
	Dr. Albrecht Hauff	Georg Thieme Verlag KG, Stuttgart
	Professor Antonio Loprieno	University of Basel
	Christiane Neumann	Leibniz Association, Berlin
	Bettina Würth	Adolf Würth GmbH & Co. KG, Künzelsau

University internal members

	Prof. Dr. Stefan Laufer	Pharmazeutisches Institut
Deputy chairman	Professor Stefan Laufer	Pharmaceutical Institute
	Professor Stefanie Gropper	Institute of German Language and Literature
	Christin Gumbinger	Student representative
	Dr. Thomas Nielebock	Institute of Political Science
	Professor Barbara Remmert	Faculty of Law



Christiane Neumann

New University Board members

Secretary-General of the Leibniz Association, **Christiane Neumann**, became a new member of the University Board in December 2014, succeeding Nobel Laureate Professor Christiane Nüsslein-Volhard, director of the Max Planck Institute for Developmental Biology. The University of Tübingen enjoys close ties with the Leibniz Association via its two Tübingen institutes, the Knowledge Media Research Center and the Senckenberg Center for Human Evolution and Paleoenvironment.



Professor Stefanie Gropper

The new internal member of the University Board as of December 2014 is Professor **Stefanie Gropper** of the Institute of German Language and Literature, taking the place of Professor Ingrid Hotz-Davies. Stefanie Gropper has been a Professor of Scandinavian Studies in Tübingen since 1996, focusing on medieval Scandinavian literature. She was the University's Vice President of Academic Affairs from 2006 to 2013.



NEWS

University now system accredited

On 29 September 2014, the University of Tübingen became system accredited and therefore qualified to accredit Bachelor's and Master's programs. This is an additional quality assurance system which all study programs will have to pass. System accreditation tests whether a program meets the standards set by the German Culture Ministers' Conference and the accreditation council as well as University and state requirements.

Under state law, all Bachelor's and Master's programs must be regularly accredited. This task used to be carried out by an external agency. System accreditation means courses can go through the University's own internal quality assurance system and then straight to the responsible state ministry for approval. The granting of system accreditation by Germany's relevant agency, ACQUIN, followed a two-year application and inspection period.

Green certificate renewed

In 2011, Tübingen became the region's first university to be certified under the Eco Management and Audit Scheme EMAS. In 2014, Tübingen University was reevaluated and its EMAS certificate extended to July 2017. The University is committed to sustainability, efficient use of resources and reducing environmental impact. The following measures contributed to improved results in these areas:

- an approximately 15% reduction in heating fuel consumption in 2012 and 2013,
- cuts to paper consumption of approx. 27% from 2009 to 2013,
- stabilization of electricity consumption.

www.uni-tuebingen.de/emas



The University has significantly reduced its paper use in recent years using measures such as double-sided printing.

WORKING FOR THE UNIVERSITY

Andrea Schaub – Building strategic partnerships

“International contacts have always been important to the University – and they will be more important in the future,” says Dr. Andrea Schaub. As head of the new staff unit for International Research Relations and Strategies, she aims to promote partnerships with universities worldwide. Dr. Schaub also heads the University’s Excellence Initiative office. She came to the President’s Office from the Neuroscience excellence cluster, the Center for Integrative Neuroscience, in November 2012.

Now it is her job to develop strategic partnerships and the infrastructure for international researchers: “They appreciate the support of the Welcome Center in seeking accommodation and in getting set up, but in matters of employment contracts, salaries, and the University structure, they often have difficulties,” says Schaub. She feels it is important that the good initial support is continued seamlessly at the hosting institutes. “It works well at many institutes, but even they sometimes have problems or questions with which they need help.” Among other things, she is planning general information sessions on Germany’s higher education and research systems, as well as greater cooperation between the University, the Max Planck Institutes, the Helmholtz Centers and the research institutes of the Leibniz Association within the



Dr. Andrea Schaub

new Tübingen Research Campus. “We have to think about how to attract the best PhDs and postdocs if we are to stay competitive,” Schaub says. “We need to make Tübingen better known as a top research location; and we are up against places like Berlin and Munich, which have a big-city bonus.”

Andrea Schaub came up with one of three winning entries in the DFG’s International Research Marketing competition in December 2014. The “World Tour 2015” will see her accompanying key Tübingen researchers on their quest to strengthen and forge new research partnerships at strategic locations around the globe.



Thomas Bonenberger

Thomas Bonenberger – Change manager for software transition

“Information,” says Thomas Bonenberger when asked what his most important task is; “When change is about to happen, you can’t have too much information.” A longtime member of the Faculty of Economics and Social Sciences, Bonenberger is currently assisting the University’s finance department in its switch to a new software system. The software, SAP, is used in all aspects of book-keeping and budgeting. “It provides standardized reports and makes comparison and planning easier. It improves financial planning for the President’s Office, but also at the faculty and institute levels,” says Bonenberger.

It fell to Bonenberger to adapt the University's practices to SAP structures. "The software is oriented towards companies with complex hierarchical structures. And although we are starting with the University reference model, which is closer to our needs, we still have a lot to sort out." It often depends on the cost whether a process is adapted to the software or vice versa. Consultation takes place in a committee with the Executive Vice-President and the faculties. It is a big help that Thomas Bonenberger understands the University's internal processes, "and some of its pitfalls," he adds with a grin.

A key part of change management is improving organization, says Bonenberger. "The administration of finances has been a fiddly extra part of the work of many people," he says – pointing out that it makes more sense to concentrate the task among far fewer workers. Tackling as many tasks as possible via a central system "saves time which many people would rather invest in research and teaching," Bonenberger says. He admits that introducing SAP will not change everything overnight, "but we are going the right way."

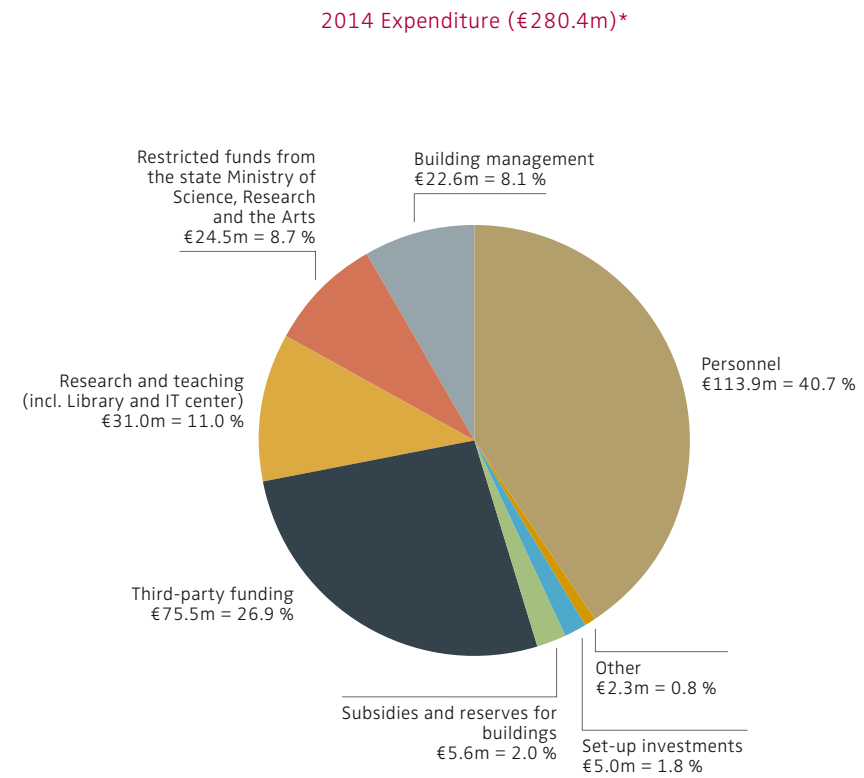
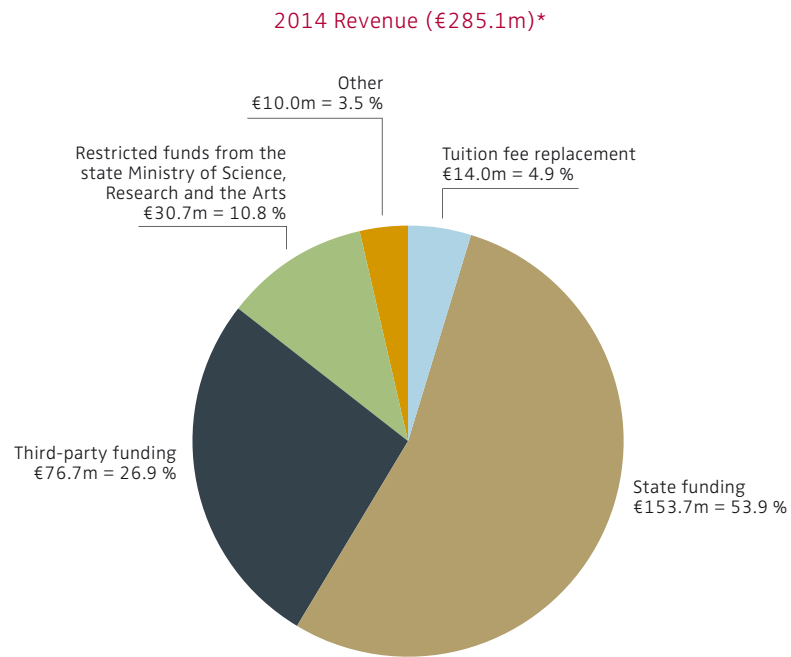
Professors at the University of Tübingen

including junior and assistant professors
as of: 30 June 2014

Faculty / Institution	2014		
	total	male	female
Protestant Theology	13	11	2
Catholic Theology	13	11	2
Center of Islamic Theology	4	3	1
Law	24	22	2
Medicine	106	93	13
Humanities	93	63	30
Economics and Social Sciences	55	40	15
Science	167	142	25
Knowledge Media Research Center	8	4	4
Central institutions	2	2	0
Total	485	391	94



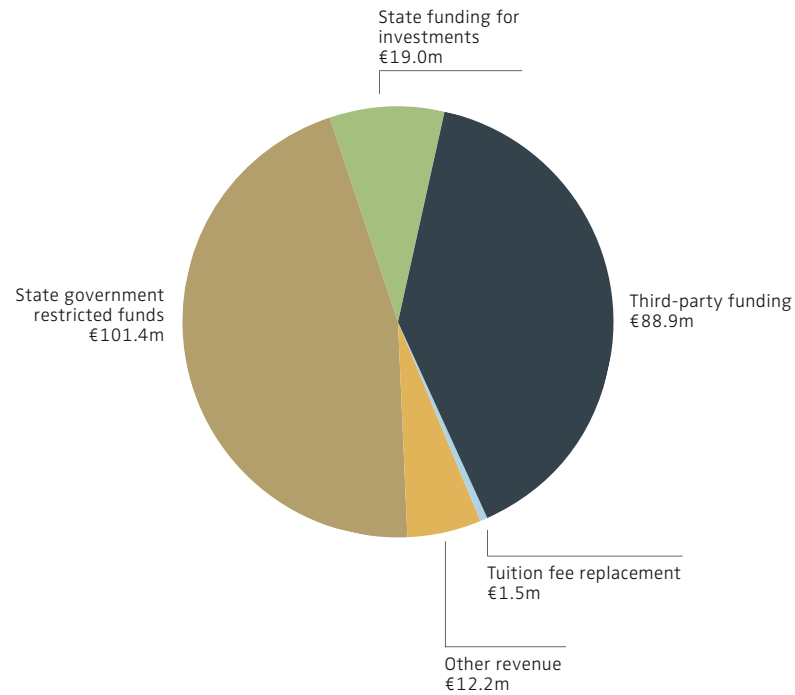
University budget (excluding Medicine)



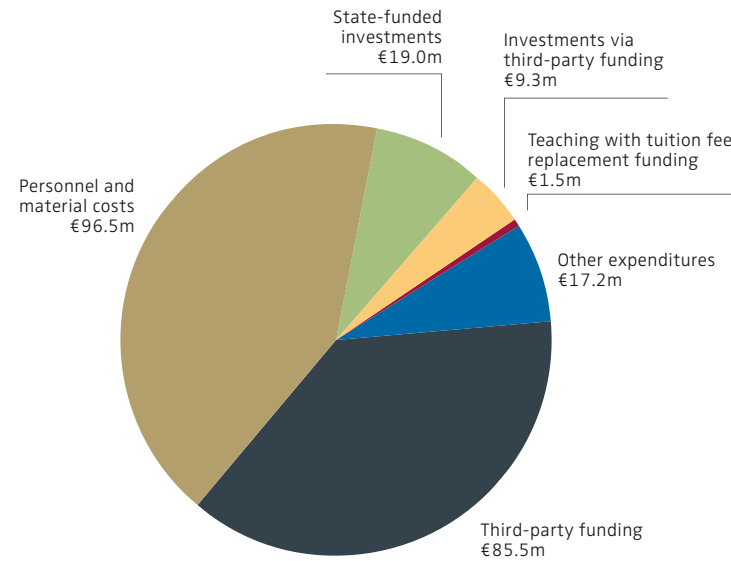
*preliminary figures

Faculty of Medicine budget

2014 Revenue (€223.0m)*



2014 Expenditure (€229.0m)*



*preliminary figures

BUILDING PROJECTS

Joint IT building for the University and its Hospitals

In November 2014, the computer centers of the University of Tübingen and its University Hospitals moved into a new building for their IT infrastructure, located near the science institutes at the Morgenstelle Campus. Covering two floors, the building has around 900 square meters of floor space. The central operational rooms, each of 210 square meters, can be fitted with up to 48 server cabinets,



providing enough capacity for tens of thousands of users. Facilities include failsafe electricity and cooling, network capacity and a modern monitoring system for the entire operation. IT infrastructure faces growing demands from disciplines which must process vast amounts of data, such as Bioinformatics and Astrophysics. There must also be safe storage of the Hospitals' digital patient files, which may contain large files such as X-ray images and laboratory data.

Emphasis was placed on economical construction while maintaining energy efficiency and reliable performance. The University Hospitals contributed half of the €6m construction costs, while the University and the state of Baden-Württemberg each contributed a quarter.

New server and software technology, which remains functional even at comparatively high temperatures, should lead to an energy saving of about 35% compared to conventional technology with convection cooling. Carbon dioxide emissions will also be reduced.

Designed especially for this purpose, the largely windowless building has a metal facade in dark brown anodized zig-zag profiled sheeting. This alternates with perforated plates underlaid with colored panels, reminiscent of the binary code used in information technology. More than 3,000 hollow-bodied modules the size of basketballs in the floor of the upper story reduce its weight and enable a free floor span of 14 meters. The building meets all the technical requirements for a future-oriented IT operation; these include an early-warning fire detection system and extinguishers which emit gases that are not harmful to humans.



Werner Siemens Imaging Center and Radiopharmacy in new premises

Also in November 2014, the Werner Siemens Imaging Center with its Preclinical Imaging and Radiopharmacy department opened the doors to a new research building. The 700 square meters are used partly as a laboratory and partly for offices. The building cost €4.9m and was sponsored by Switzerland's Werner Siemens Foundation. The foundation provided a further eight million euros for the new building's infrastructure and equipment. Combined with funds from the regional and German governments, it was fitted with ultra-modern appliances such as a visual imaging unit and a high-field magnetic resonance system.

The new Radiopharmacy unit was also inaugurated. The University Hospitals invested around six million euros in this research and healthcare center, and now has the most modern installation in all Europe, with the highest standards for patients and research.

The Werner Siemens Imaging Center employs 55 scientific and technical staff and forms a bridge between biomedical research and imaging science, which deals with the development of diagnostic technologies such as magnetic resonance tomography (MRT), positron emission tomography (PET) or combined systems. The working group of Professor Bernd Pichler, Head of the Department for Preclinical Imaging and Radiopharmacy together with Siemens carried out pioneering work on developing the world's first fully-integrated preclinical and clinical PET/MRT system, which for example enables better diagnosis

of neurodegenerative disorders such as Alzheimer's. Successful basic scientific studies on this are currently being incorporated into clinical trials. In addition the scientists are working in the fields of tumor research, immunological research and infection research.

The new Radiopharmacy unit will supply not only the University Hospitals but also other clinics and private medical practices in the region of Tübingen every day with radioactive substances for diagnostics. Using these substances with radioactive markers in PET it is possible to identify the smallest tumor sites and neurodegenerative disorders at an early stage. German and EU regulations demand top-quality pharmaceuticals production standards in compliance with Good Manufacturing Practice (GMP), and the laboratory is fully certified for this.



*The Werner Siemens Imaging Center inaugurated its new research building, here illuminated on its opening night.
The Werner Siemens Foundation provided generous sponsorship of the building and the equipment in it.*



CELEBRATING KNOWLEDGE

FRESH PERSPECTIVES

The University of Tübingen's cultural life is underpinned by many traditions. Annual events and anniversaries are celebrated and new honorary senators welcomed with enthusiasm. A key new event in 2014 was the TÜFFF research fair, designed to provide insights to the public into what our University researchers actually do – and to try some of it themselves. We frequently look abroad for inspiration; yet often we find surprising discoveries close by – such as the early Koran manuscript which came to light in the University Library, or in the tailings from an excavation, which turned out to contain a fragment of Ice Age sculpture.

PEOPLE

Writers challenge world views

One of Germany's great postwar writers and intellectuals, **Hans Magnus Enzensberger**, joined poet and professor of literature **Dirk von Petersdorff** for the Writers' Lectureship at the University of Tübingen in November 2013. Enzensberger is first and foremost a poet and essayist, but has also tried his hand at theater, reporting and translation. He is the author of several children's books, including *The Number Devil*, an exploration of mathematics. Von Petersdorff has won several prizes for his literary works, which take a new perspective on the opportunities and limitations of modern life – incorporating popular and high culture.

Four authors with African connections came to Tübingen for the 2014 Writers' Lectureship. **Taiye Selasi**, **Priya Basil**, **Chika Unigwe** and **Nii Ayikwei Parkes** represent what Taiye Selasi calls "Afropolitan Literature" – each comes from an African family or an African country, has traveled the world and has developed his or her own critical and

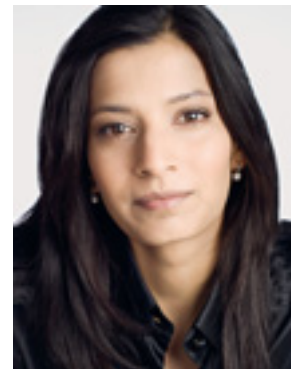
committed style. Their works examine the confrontations between generations and world views – while making new connections. Boston and Accra, Nairobi and London, Antwerp and Lagos all move closer together, highlighting both differences and similarities – and defying conventional categories. A lack of cultural context means Europeans have to work to get the jokes; the pace and rhythm

of the narrative are unfamiliar, as are many of the locations.

The University of Tübingen Writers' Lectureship is sponsored by Adolf Würth GmbH & Co. KG, and has been hosted by the Institute of German Language and Literature since 1996.



Taiye Selasi



Priya Basil



Chika Unigwe



Nii Ayikwei Parkes



Dr. Mathias Döpfner

Quality journalism in the digital age

Tübingen welcomed the head of one of Germany's big publishers for the May 2014 Media Lecture. **Dr. Mathias Döpfner** of Axel Springer Verlag spoke on "The departure from pessimism – Why journalism profits from the digital revolution," explaining why he disagrees that quality journalism is dying. Döpfner said that today there are more channels than ever for good reportage – but that print journalism must free itself from the page. He was highly critical of Google's domination of the electronic news market and accused the internet search engine of abusing its position. Yet he also said the European Union was not using appropriate means to combat the problem. The Media Lecture is sponsored by regional broadcaster SWR and the University of Tübingen and is intended to inspire young future journalists.

António Damásio on rationality and emotion

One of the world's most influential neuroscientists, António Damásio, spoke on rationality and emotions at the annual Unseld Lecture in June 2014. Damásio says that merely imagining something can lead to an emotional reaction. His work on the neural representation of emotions and their role in decision-making are widely discussed across many different scientific fields. The event included a discussion with the University of Tübingen's Sabine Döring, a professor of Philosophy, and Professor Niels Birbaumer of the Institute for Medical Psychology. Damásio and Döring also held master classes on rationality and emotion for 20 junior researchers from around the world.

Portuguese-American António Damásio, M.D., Ph.D., is David Dornsife Professor of Neuroscience at the University of Southern California, where he also heads the Brain and Creativity Institute; he is also an adjunct professor at the Salk Institute, in La Jolla, California. The Unseld Lectures are sponsored by the Udo Keller Foundation Forum Humanum in cooperation with Suhrkamp Verlag publishers.

At the Unseld Lecture, renowned neuroscientist Professor António Damásio spoke about the neural representation of emotions.



State premier visits theologians of three faiths

The state premier of Baden-Württemberg, Winfried Kretschmann, paid a visit to Tübingen's Faculties of Protestant and Catholic Theology and to the Center of Islamic Theology in October 2014. He spoke with researchers involved in an interdisciplinary project bringing together Christians, Muslims, and Jews. The project focuses on the understanding of God and its power to provide orientation in the secular societies of Europe – for all the monotheistic religions.

The Center of Islamic Theology was founded in 2012 and was the first of its kind at a German university. Its cooperation with the Christian Theologies, Jewish Studies and Oriental Studies is also unique. Among the Center's tasks is the training of teachers for Religious Instruction in schools. "It is important to the state government that Muslims in Baden-Württemberg see it as their home; at the same time we are glad to promote a lively and considered Islamic Theology," Kretschmann said. University President Bernd Engler called the Center "a place in which Muslims can investigate their own religion academically; at the same time, the Center has become an important starting-point for interreligious dialogue."



State premier Winfried Kretschmann (second left) visiting the University of Tübingen in October 2014. With him are President Engler (left), the Dean of Catholic Theology Professor Ruth Scoralick (center), the Dean of Protestant Theology Professor Jürgen Kampmann (second right) and the Director of the Center of Islamic Theology Professor Erdal Toprakyan (right).

Three new honorary senators

The University confers honorary senator status on public figures making outstanding contributions to education, the state and society. Honorary senators are ambassadors for the University, representing its interests in the spheres of politics and business as well as in society as a whole.

Dr. Dieter Kurz, chairman of the Carl Zeiss Foundation Council, became an honorary senator in November 2013. Dieter Kurz gives particular emphasis to promoting junior researchers. "We are very happy about the very fruitful exchange between science and business which Dr. Kurz supports," said University President, Professor Bernd Engler. "Both sides can benefit from it and create synergies." Kurz studied Physics at the University of Tübingen from 1969, completing his doctorate in Applied Physics in 1979. Subsequently he went to Carl Zeiss AG, where he became chairman of the supervisory board in 2001. In 2012 he became chairman of the Carl Zeiss Foundation Council and chairman of the supervisory boards of Carl Zeiss AG and the glassmaker Schott AG.



Dr. Dieter Kurz



Professor Margot Kässmann



Professor Cornelia Ewigleben

Senior Protestant theologian **Margot Kässmann** became an honorary senator in October 2014. She is the official ambassador for the upcoming 500th anniversary of the reformation begun by Martin Luther in 1517. University President Bernd Engler praised Kässmann's efforts over the past decades to promote dialogue not only between Christians, but also between Christians and Muslims. He said she promotes tolerance, peaceful coexistence and better conditions for those disadvantaged in society. In her speech, Kässmann spoke about the influence of the reformation on the state.

Margot Kässmann spent the early phase of her training in Protestant Theology in Tübingen, where she enrolled in 1977, before going on to the Universities of Edinburgh, Göttingen and Marburg. She has worked as a Lutheran minister as well as holding a number of senior offices in the German Protestant Church.

Honorary senatorship was conferred on Professor **Cornelia Ewigleben**, scientific director of the Landesmuseum Württemberg, in December 2014. "Cornelia Ewigleben's outstanding academic expertise and tremendous personal efforts have done great service for the culture and cultural life of southwestern Germany," President Engler said. He added that she had promoted innovative museum practices to showcase the region's cultural treasures, citing joint exhibitions and permanent loans to the Tübingen University Museum's Classical and Ancient Egyptian collections.

Cornelia Ewigleben studied Classical Archaeology and History in Trier and Oxford. She completed her PhD in Classical Archaeology in Trier, working in major museums in Hamburg and Speyer before taking up her position at the Landesmuseum Württemberg in Stuttgart in 2005.

EVENTS

Science Faculty marks 150 years

Germany's first faculty of science was founded at the University of Tübingen in 1863. Today's Science Faculty celebrated its 150th anniversary on 29 October 2013 under the motto Yesterday – Today – Tomorrow. Tübingen Nobel laureates Professor Christiane Nüsslein-Volhard and Professor Hartmut Michel spoke in honor of the event.

In the nineteenth century, young gentlemen interested in science could study Medicine, attending lectures in Botany, Zoology and Chemistry along the way. As students of Philosophy, they could learn about Astronomy, Mathematics,

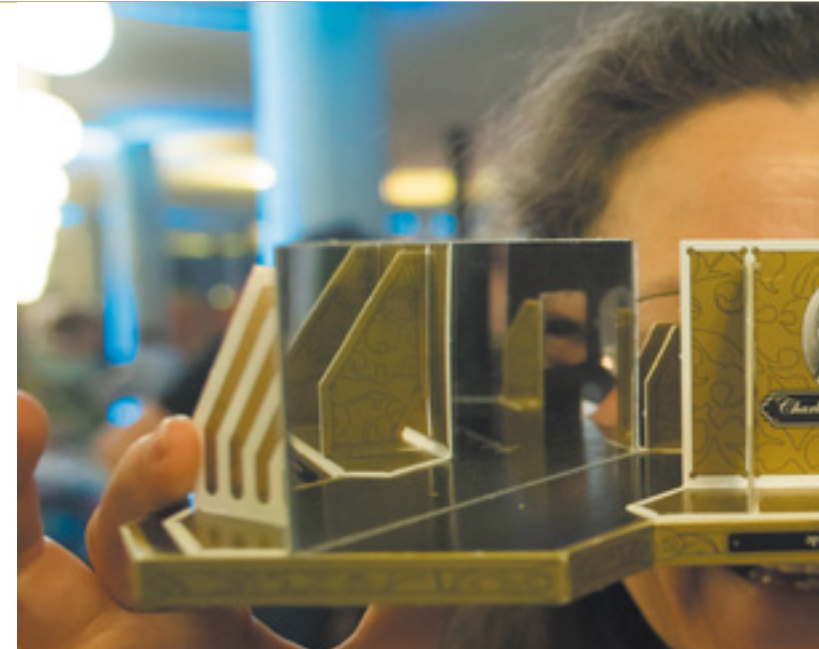


Physics and Mineralogy. But as Chemistry became more important about 150 years ago, the Dean of Medicine, a botanist called Hugo von Mohl, called for all the natural sciences to be concentrated in a faculty of their own. After more than three years of argument, it opened in October 1863.

150 years later, Friedemann Rex, Emeritus Professor for the History of Science, reminded listeners of some of the characters of science history in Tübingen: Felix Hoppe-Seyler, discoverer of red blood pigment, and Friedrich Miescher, who discovered nucleic acid. Professor Christiane Nüsslein-Volhard, Director of Tübingen's Max Planck Institute for Developmental Biology, spoke on the evolution of colored patterns on fish. Professor Hartmut Michel of the Frankfurt Max Planck Institute for Biophysics spoke about membrane proteins, their structures, functions and mechanisms.

Tübingen's Science Faculty comprises eight departments, as well as several interdisciplinary and interfaculty centers and institutes. With 167 professors, it is the University of Tübingen's biggest faculty.

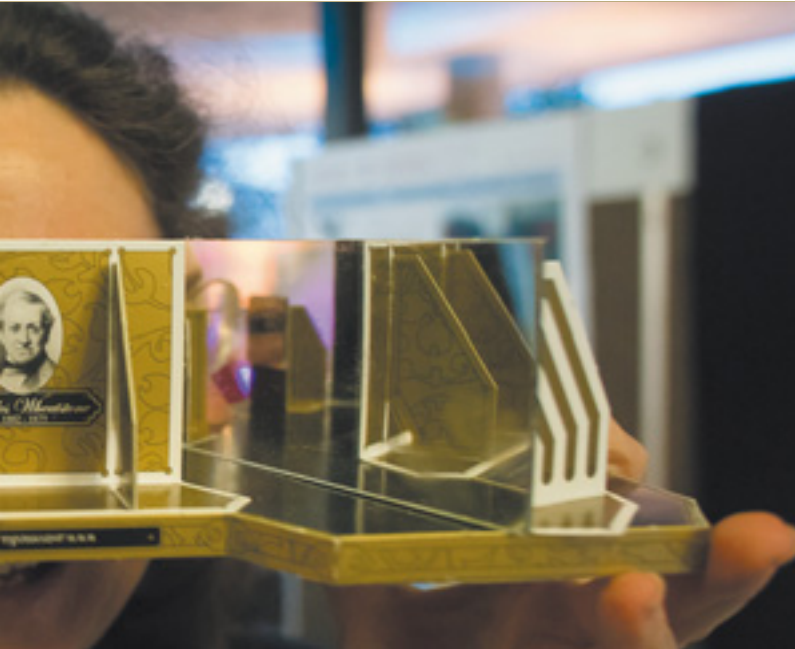
Nobel laureates Professor Hartmut Michel and Professor Christiane Nüsslein-Volhard at the Science Faculty's 150th anniversary celebration



TÜFFF research fair

Tübingen researchers invited the public to look behind the scenes at the University's laboratories, hospitals and institutes on 25 April 2014. An exciting program focused on current research with a science slam, guided tours of the labs, presentations and lectures. Visitors were able to observe experiments or carry them out themselves.

University research partners such as the Max Planck Institutes, the Knowledge Media Research Center and the Natural and Medical Sciences Institute in Reutlingen presented their groundbreaking work. TÜFFF showcased research in fields as diverse as Neuroscience, Psychology, Education, Astrophysics and Mathematics. More than 1,500 people of all ages came to hear some of the 40 lectures, ask questions, watch toy cars fly across superconducting surfaces, peer into the fluorescent eyes of tiny marine fish, or to hold a pickled brain in their hands!



At the TÜFFF research fair, scientists and academics were on hand to talk about their work.



Researchers as communicators

To kick off its “Rhetoric and Knowledge” series in November 2014, the Institute of General Rhetoric invited Munich astrophysicist and TV presenter Professor Harald Lesch to speak on the topic “What does the universe have to do with me?” Some 2000 people turned up, and one lecture theater after another had to be opened up for live transmission. Lesch translated abstract research results into exciting stories, switching from mathematical formulas to witty comments to make knowledge come alive. The lecture is to become an annual event, underlining the importance of communicating knowledge well. It is sponsored by the Klaus Tschira Foundation.

Thousands came to hear astrophysicist Harald Lesch talk about the universe at the first of the 2014 Rhetoric and Knowledge series of lectures.



CULTURAL HIGHLIGHTS



Professor Peter Schäfer

2014 Lucas Prize for Judaic Studies professor

The Faculty of Protestant Theology awarded the 2014 Dr. Leopold Lucas Prize to Judaic Studies Professor Peter Schäfer on 13 May. Schäfer is the Ronald O. Perelman Professor of Judaic Studies and Professor of Religion at Princeton University. He receives the award for his contribution to establishing Judaic Studies as a discipline as well as for his research on the history, literature and theology of ancient and early medieval Jewry. The Lucas Prize of €50,000 is awarded annually in recognition of outstanding achievement in the fields of Theology, History or Philosophy, focusing on individuals whose work promotes tolerance among nations and religions.

Peter Schäfer was born in Mülheim in 1943. He studied Catholic Theology, Philosophy and Judaic Studies in Bonn and at the Hebrew University in Jerusalem. He completed his PhD at the University of Freiburg, was a research fellow at the Institutum Judaicum in Tübingen before completing his habilitation thesis in Judaic Studies at Frankfurt University in 1973. His academic career took him to the United States in 1998, where he was appointed to his present professorship in 2003. He has received a number of other prizes, including the Leibniz Award and the Andrew W. Mellon Foundation Distinguished Achievement Award.

Professor Schäfer has made a significant contribution to the establishment of Judaic Studies both in its own right and in relationship to other disciplines. This, in addition to his considerable academic achievements, makes him one of today's most important Judaic Studies researchers, whose influence reaches far beyond his field of study.

The 2014 Dr. Leopold Lucas Junior Researcher Prize went to Paul Silas Peterson for his thesis on the theological work of Hans Urs von Balthasar. Peterson is from Portland, USA, and has been working at the University of Tübingen since 2006.

The Leopold Lucas Prize honors the memory of the Jewish rabbi and scholar Dr. Leopold Lucas, murdered at Theresienstadt concentration camp in 1943. The Prize was endowed by his son, Franz D. Lucas, in 1972.

Koran from early Islamic period

A section of Koran manuscript from the University of Tübingen Library was dated to the 7th century – the earliest phase of Islam – making it at least a century older than previously thought. Expert analysis of three samples of the manuscript parchment concluded that it was likely to have originated in the period 649-675 AD – 20 to 40 years after the death of the Prophet Mohammed.

Experts removed a sample of the parchment for precise dating.

The Tübingen fragment was tested by the Coranica project, which carries out palaeographic analyses to determine the age of a text via its special characteristics. Carbon-14 analysis of the Tübingen fragment was carried out by the Ion Beam Physics Laboratory at ETH Zürich. The fragment is written in Kufic script, one of the oldest forms of Arabic writing. The manuscript came to the University in 1864 as part of the collection of the Prussian consul Johann Gottfried Wetzstein.

A newly discovered fragment made complete an Ice Age figurine.



Ice Age lion gets his head back

Archaeologists from the University of Tübingen led by Nicholas Conard have found an ancient fragment of ivory belonging to a 40,000 year old animal figurine. Both pieces were found in the Vogelherd Cave in southwestern Germany, which has yielded a number of remarkable works of art dating to the Ice Age. The mammoth ivory figurine depicting a lion was discovered during excavations in 1931. The new fragment makes up one side of the figurine's head; it is now on display at the Tübingen University Museum.



MUSES AND MUSEUMS



A new room places the Ice Age Venus in a unique setting.

Blaubeuren prehistory museum overhauls permanent displays

The Museum of Prehistory in the town of Blaubeuren is close to three valleys in which Tübingen archaeologists have found the oldest musical instruments and works of sculpture known to man. On 18 May 2014 the museum inaugurated its new permanent exhibition, including finds from the region, some of them up to 40,000 years old. The Venus of Hohle Fels, a female figurine of mammoth ivory, is among them. Tübingen archaeologist Professor Nicholas Conard is the museum's scientific director



The Venus of Hohle Fels. The museum near the site where so many of mankind's earliest works of art were found was remodeled to give her a fitting home.

and consultant for the new design of the museum, which aims to introduce the visitor to life during the last Ice Age. The exhibition includes interactive elements as well as explaining how the archaeologists work.

www.urmu.de

Deceptively real antiquities

Not everything that looks old is old – the “Deceptively Genuine” exhibition at Hohentübingen Castle from November 2013 to February 2014 showcased originals of ancient motifs and copies created as early as the fifteenth century – long before the Renaissance or Classicism. The show explored how post-classical works influenced perception of ancient times, and displayed some historical copies which have been given to the University Museum over the years.



This goat's head vessel was constructed of ancient fragments and painted over - a clever forgery.



A colorful reconstruction of an archer from the temple of Aphaia in Aegina.

A museum of colorful gods

Ancient statues appear white to us today because they have lost the bright colors they were once painted in. The Institute of Classical Archaeology and the University Museum changed all that with the 2014 “Bunte Götter” exhibition, showing casts of classical sculptures painted the way they must once have looked. The show took on another dimension as winter closed in, with colored floodlights projected onto the marble statues – literally shedding light on their original nature.



An exhibition at Hohentübingen Castle was devoted to the Voelter bequest.

Exhibition of works from Voelter bequest

From November 2014 to February 2015, the Tübingen University Museum also showed nearly 40 prints bequeathed in 2011 from the collection of Professor Emeritus Wolfgang Voelter, a biochemist, and his wife, Dr. Heide Voelter. The prints included expressionist works by Max Beckmann, Erich Heckel and Max Pechstein – reflecting the beginnings of criticism of consumerism and society in the 20th century.

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