

EBERHARD KARLS  
UNIVERSITÄT  
TÜBINGEN



2017

# ANNUAL REPORT

University of Tübingen





# CONTENTS

|   |    |   |    |
|---|----|---|----|
| <b>RESEARCH</b> .....   | 7  | <b>SPONSORSHIP AND FUNDING</b> .....  | 23 |
| <b>A STRONGER RESEARCH LOCATION</b> .....                             | 8  | <b>INVESTING IN THE FUTURE</b> .....  | 24 |
| <b>Excellence Initiative measures show sustained benefits</b> .....   | 8  | <b>Major sponsorships in 2017</b> .....   | 24 |
| <b>M3 – A new institute for microbiome and cancer research</b> .....  | 9  | Eberle Foundation underwrites new research prize.....                           | 24 |
| <b>Exploring our early prehistory</b> .....                           | 10 | Baden-Württemberg Foundation backs three neurorobotics projects .....           | 25 |
| <b>DFG-backed research</b> .....                                      | 10 | <b>Welcome additions</b> .....  | 26 |
| New or extended: Collaborative Research Centers .....                 | 10 | Endowed professorships .....  | 26 |
| Strategies to combat liver cancer.....                                | 10 | <b>In brief</b> .....   | 27 |
| <b>Research Units</b> .....   | 12 | <b>Money well spent</b> .....   | 28 |
| Investigating the mechanisms of genetic epilepsy .....                | 12 | Third-party funding .....   | 28 |
| Reinhart Koselleck project to optimize functional MRI .....           | 13 |   |    |
| <b>European Research Council funding</b> .....                        | 14 | <b>NETWORKS</b> .....   | 31 |
| ERC grants in 2017 .....  | 14 | <b>ARM-IN-ARM WITH OUR PARTNERS</b> .....                                       | 32 |
| Current European Research Council Grants .....                        | 16 | Tübingen joins international partners in medical training in Africa .....       | 32 |
| <b>New programs and projects</b> .....                                | 17 | Pharmaceutical Institute supports Malawi in the quest for safer medicines ..... | 32 |
| Bundling patient data .....   | 17 | German-Israeli biochemistry collaboration .....                                 | 32 |
| Tübingen doctors in five EU rare-disease research networks .....      | 17 | Wider cooperation with Brazil .....   | 33 |
| Baden-Württemberg state funding for “small disciplines” .....         | 18 | Guest professorship for Brazilian culture and communications .....              | 33 |
| Biodiversity projects part of major DFG initiative .....              | 18 | Baden-Württemberg Foundation boosts exchanges from developing countries .....   | 33 |
| <b>Academic career paths</b> .....                                    | 18 | DAAD backs international exchanges .....  | 33 |
| Research Training Groups .....  | 18 | Our partners around the world .....   | 34 |
| Heinz Maier Leibnitz Award for social psychologist Mandy Hütter ..... | 19 | <b>Partners at home</b> .....   | 36 |
| DFG-backed Research Training Groups .....                             | 20 | Leibniz ScienceCampus on cognitive interfaces .....                             | 36 |
| PhD networks .....  | 20 | Ensuring crop yields in changing climates .....                                 | 36 |
| Doctorates completed 2016 - 2017 .....                                | 21 | The Natural and Medical Sciences Institute .....                                | 37 |
|   |    | Key research partners in Germany .....  | 38 |
|   |    | Baden-Württemberg funding for business start-ups .....                          | 39 |



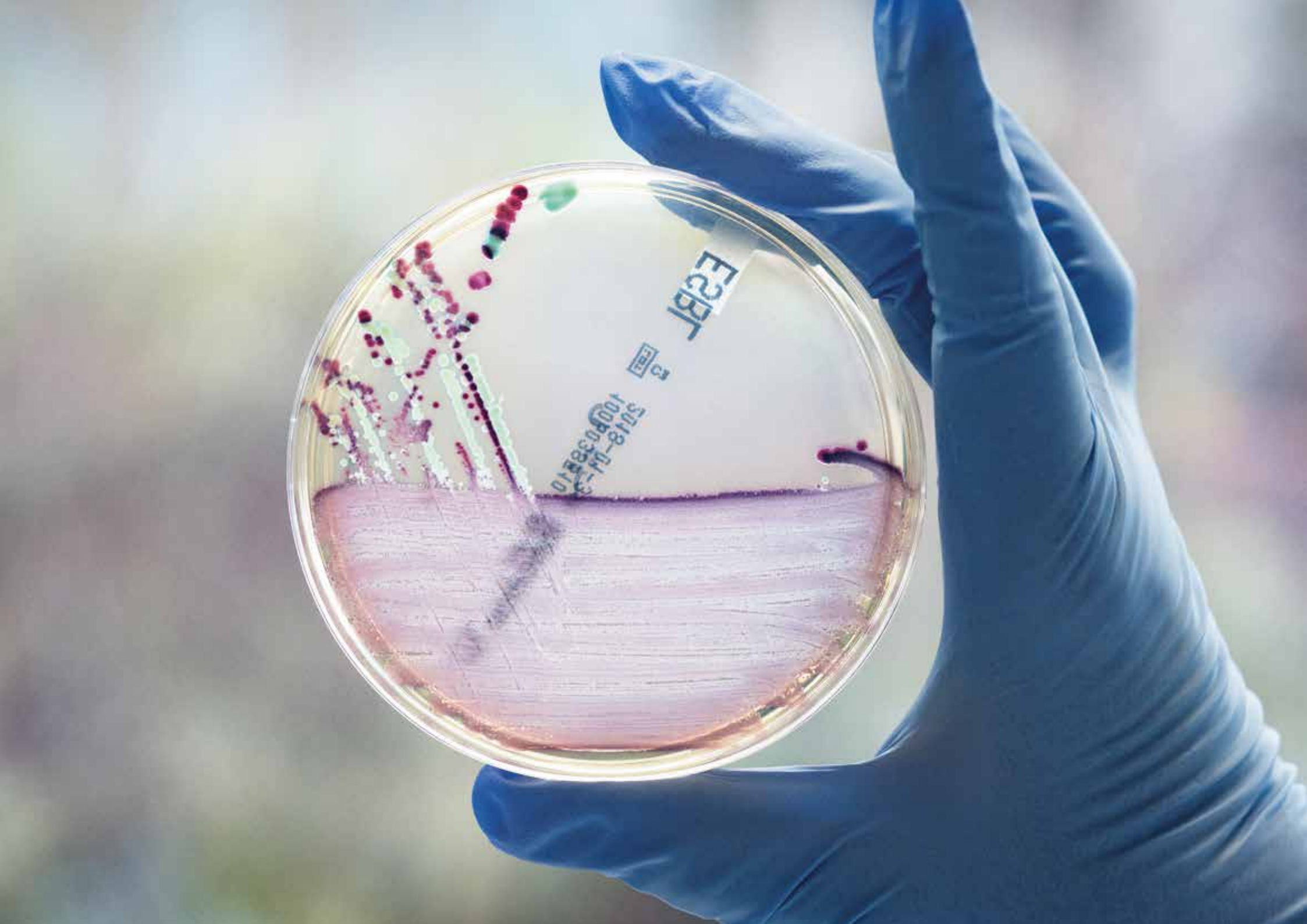
|   |    |
|---|----|
| <b>TEACHING AND ORGANIZATION</b> .....                        | 41 |
| <b>CREATING STRUCTURES FOR INNOVATION</b> .....               | 42 |
| <b>Enrollments remain high</b> .....                          | 42 |
| Student numbers at a glance .....                             | 42 |
| Teaching-degree studies reorganized .....                     | 43 |
| Master's program in Cultures of the Global South .....        | 43 |
| Development of new programs .....                             | 43 |
| 2017 University Teaching Prize for refugee math project ..... | 43 |
| Student Commitment Prize for "Loud Europeans" .....           | 43 |
| <b>University management</b> .....                            | 44 |
| The President's Office .....                                  | 44 |
| Steady development .....                                      | 44 |
| Professors at the University of Tübingen in 2017 .....        | 45 |
| <b>CELEBRATING KNOWLEDGE</b> .....                            | 47 |
| <b>FOCUS ON COHESION</b> .....                                | 48 |
| <b>Building the future on the past</b> .....                  | 48 |
| Ice Age art caves declared UNESCO World Heritage sites .....  | 48 |
| Anniversaries .....   | 49 |
| <b>Distinctions and Awards</b> .....                          | 50 |
| <b>Prominent speakers</b> .....                               | 51 |
| State premier speaks at the 12th Global Ethics Lecture .....  | 51 |
| Crime writers at the 2017 Writers' Lectureship .....          | 51 |
| Sociologist Bruno Latour delivers Unselde Lecture .....       | 52 |
| Media Lecture by Georg Mascolo .....                          | 52 |
| Tübingen marches for Science .....                            | 53 |
| Tribute to Honorary Senator Martin Roth .....                 | 53 |
| Imprint .....   | 54 |



## WELCOME TO TÜBINGEN

At the University of Tübingen centuries of academic tradition blend with the latest research across a broad spectrum of disciplines. Our status as one of Germany's Universities of Excellence reflects our commitment to quality research and teaching in medicine, the sciences, the humanities, economics and the social sciences, theologies, and law.

We invest both in state of the art infrastructure and in people with innovative ideas. Our contacts across Germany and around the world help make Tübingen an attractive place to work and study both for Germans and for those arriving from other countries. *Attempto! – I dare! –* is our motto: We face the future with the courage to take bold steps and the means to ensure they succeed.



E2BT



5/18-01-20  
1008038210

# RESEARCH



## A STRONGER RESEARCH LOCATION

Our Excellence status has provided special funding which has made it possible for us to introduce key structural reforms – and to lay the groundwork for sustained development over the coming years. We have been successful in supporting and attracting innovative researchers. We have therefore also been successful in obtaining sponsorship for groundbreaking research from the German Research Foundation and the European Research Council.

### EXCELLENCE INITIATIVE MEASURES SHOW SUSTAINED BENEFITS

Tübingen was selected as one of Germany's Universities of Excellence in the German Excellence Initiative of 2012. We were successful in all three funding lines with our institutional strategy, excellence cluster and graduate school. The Werner Reichardt Center for Integrative Neuroscience excellence cluster has been going since 2007 and will be further sponsored by the University when the Excellence Initiative funding runs out in 2019. The same applies to our successful Graduate School LEAD (Learning, Educational Achievement, and Life Course Development) which will be backed up by the state of Baden-Württemberg and private sponsors such as the Hector Foundation.

Our institutional strategy, Research – Relevance – Responsibility, has been implemented and further developed. Our measures are grouped thematically into five platforms:

- Personalized medicine,
- Discovery and development of pharmaceutical agents,
- Medical technologies,
- Environmental systems analysis and
- Education – society – norms – ethical reflection.

We used Excellence Initiative funds to better integrate areas of research across the University and to create innovative new professorships. We set up core facilities to provide centralized services. They include the QBIC (Quantitative Biology Center) for the life sciences, LISA+ (Center for Light-Matter Interaction, Sensors and Analytics) for the materials sciences, and the eScience Center for the humanities and social sciences.

Cooperation with industry is an additional focus in our institutional strategy. Our Industry Liaison Office coordinates projects with businesses. And we have introduced industry-on-campus professorships for companies whose employers give

their researchers time off to pursue new and promising ideas in both basic and applied research in our academic setting.

We have also used Excellence Initiative funding for our institutional strategy to promote gender equality and to provide better opportunities for junior researchers. We are further building our international networks and hosting an increasing number of guest researchers with measures including our International Distinguished Guest Professors program.

Our solid achievement is reflected in the rankings. The University of Tübingen was placed at 94 in the Times **Higher Education World University Ranking 2018**, where we are consistently among Germany's top ten. A number of individual subjects at the University of Tübingen were rated excellent in international Rankings. The **QS Ranking** placed Tübingen and Heidelberg joint 13th worldwide in the field of Theology, Divinity & Religious Studies. QS put Tübingen Archaeology at no. 18, with Anthropology, History, and Pharmacology also in the top 100.

*An impression of the  
M3 research institute  
at the Schnarrenberg  
medical campus.*



## M3 – A NEW INSTITUTE FOR MICROBIOME AND CANCER RESEARCH

A new institute for microbiome and cancer research is under construction at Tübingen's medical campus. "M3" stands for "malignome, metabolome, and microbiota." Microbiota include all microbes which can live in or on the body, and a metabolome is the complete set of small-molecule chemicals found within a biological sample. Malignant tumors are the third "M" to be the focus of research at the new institute. More than 53 million euros will be invested in the center. The institute will link up tumor research with that into microbiota and metabolic changes, thereby opening up paths to new and better cancer treatments. Professor Nisar Peter Malek, medical director of Internal Medicine I at the Tübingen University Hospitals, is the designated director of the institute.

Researchers have begun to realize the major role played by the human microbiome in the functions of the organism and the development of disease. Billions of microbes live in human beings, and influence the human metabolism by producing metabolites. We have to see the human body as a superorganism. Communication and regulation of this complex system are carried out via a myriad of metabolic products, which become active in the immune system as well as in disease processes such as inflammatory reactions. A better understanding of these connections opens up options to alter biological processes – and to develop personalized medicine.

The University recognized that the revolutionary biomedical developments of recent decades – the mapping of the human genome and the introduction of high-throughput analysis – have not led to effective cancer treatment in all areas. The new institute will seek to answer the many open questions surrounding the genesis and development of many types of cancer. More than 200 scientists in 18 research groups will work on three main areas, dealing with the development of new model systems, mathematical modelling and system biology analysis, and experimental treatments. Along with experts from cancer research, the M3 institute will include specialists from the fields of infection and diabetes research, bioinformatics, systems biology and pharmacology from the Universities of Stuttgart and Tübingen. They will work closely with the Max Planck Institute for Developmental Biology in Tübingen.

## EXPLORING OUR EARLY PREHISTORY



The Senckenberg Center for Human Evolution and Palaeoenvironment at the University of Tübingen (HEP) was adopted into the Leibniz Association in May 2017 as part of the Senckenberg Nature Research Society. Federal and state government funding of 2.8 million euros supports the new Leibniz institute, Tübingen's second after the Knowledge Media Research Center, founded in 2001.

HEP was launched in 2008 and investigates human evolution under changing environmental conditions. Its scientific analysis of fossils provides information about ecosystems during our evolutionary history.



*Among the Senckenberg Center's tasks are palaeogenetic research in the cleanroom and the maintenance of several collections. Top: the Palaeontological Collection*

Working groups at HEP:

- Early Prehistory and Quaternary Ecology – Professor Nicholas Conard
- Paleoanthropology – Professor Katerina Harvati
- Palaeontology – Professor Madelaine Böhme
- Biogeology – Professor Hervé Bocherens
- Paleogenetics – Professor Johannes Krause, also a Director at the Max Planck Institute for the Science of Human History
- Geoarchaeology – Professor Christopher Miller
- Micropalaeontology – Assistant Professor Annett Junginger

## DFG-BACKED RESEARCH

### New or extended: Collaborative Research Centers

The University of Tübingen gained two highly sought-after DFG-sponsored Collaborative Research Centers in 2017 – one focusing on the movement of pollutants in water, the other on the science of vision (see following page); Tübingen also joined a transregional research group seeking groundbreaking new treatments for liver cancer.

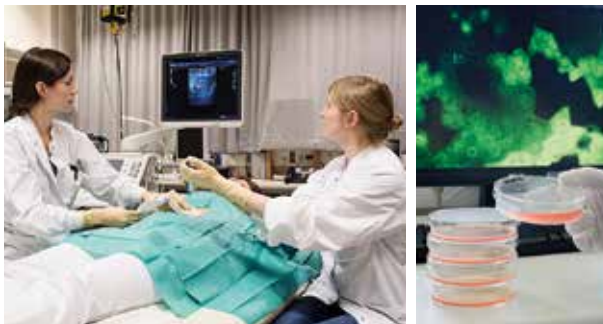
### Strategies to combat liver cancer

The University of Tübingen is working with the University of Heidelberg and the Hannover Medical School in the new Collaborative Research Center, **Liver Cancer – New mechanistic and therapeutic concepts in a solid tumor model (SFB Transregio 209)**. The DFG is providing 10.5 million euros over four years. The Collaborative Research Center is headed by Professor Peter Schirmacher from Heidelberg, and Tübingen's spokesman is Professor Nisar P. Malek.

Cancer of the liver is the fifth most frequent cancer and kills more than 750,000 people each year. It is often diagnosed at a late stage and is hard to treat. The incidence of certain liver cancers has increased dramatically in western industrialized countries due in part to rising numbers of obese patients, who are more likely to suffer chronic liver inflammation – a precursor to cancer.

The latest research has enabled a comprehensive insight into the genetic and epigenetic changes in liver cells as a tumor develops. The scientists have identified several of the affected metabolic pathways. In this transregional Collaborative Research Center, they aim to describe the complex overall mechanisms. One working group will concentrate on the mechanisms in tumor formation in cases of chronic viral infections and liver infections such as the Hepatitis B and Hepatitis C viruses. A second group is focusing on changes in the tumor cells and on the relationship between the tumor and the surrounding tissue. The third group looks at the development of urgently-needed new treatments for liver and gall bladder cancers, and includes innovative procedures such as immunotherapy and the design of new medication to influence pre-cancerous conditions.

*Doctors taking a liver biopsy and liver cells under the microscope*



### Collaborative Research Centers at the University of Tübingen

| Title   | Spokesperson   | Duration   |
|---|--|--|
| CAMPOS – Catchments as Reactors: Metabolism of Pollutants on the Landscape Scale (SFB 1253) | Professor Dr. Peter Grathwohl<br>Center for Applied Geoscience – Hydrogeochemistry   | 1 Jan. 2017 - 31 Dec. 2020<br>New                                      |
| Robust Vision – Inference Principles and Neural Mechanisms (SFB 1233)                       | Professor Dr. Matthias Bethge<br>Werner Reichardt Center for Integrative Neuroscience/<br>Institute of Theoretical Physics | 1 Jan. 2017 - 31 Dec. 2020<br>New                                      |
| Molecular Coding of Specificity in Plant Processes (SFB 1101)                               | Professor Dr. Klaus Harter<br>Center for Plant Molecular Biology   | 1 April 2014 - 31 Dec. 2021<br>Extended                                |
| ResourceCultures: Socio-cultural Dynamics in the Treatment of Resources (SFB 1070)          | Professor Dr. Martin Bartelheim<br>Institute of Prehistory and Medieval Archaeology  | 1 Oct. 2013 - 30 June 2021<br>Extended                                 |
| Threatened Orders (SFB 923)   | Professor Dr. Mischa Meier<br>Institute of Ancient History   | 1 July 2011 - 30 June 2019   |
| Construction of Meaning: The Dynamics and Adaptivity of Linguistic Structures (SFB 833)     | Professor Sigrid Beck<br>Institute of English Languages and Literatures  | 1 July 2009 - 30 June 2021<br>Extended                                 |
| The Bacterial Cell Envelope: Structure, Function, and Infection Interface (SFB 766)         | Professor Dr. Professor Wolfgang Wohlleben<br>Interfaculty Institute of Microbiology and Infection<br>Medicine             | 1 July 2007 - 30 June 2019   |
| Immunotherapy: Molecular Basis and Clinical Application (SFB 685)                           | Professor Dr. Hans-Georg Rammensee<br>Interfaculty Institute for Cell Biology  | 1 July 2005 - 30 June 2017<br>Concluded after max.<br>funding duration |

### Transregions with Tübingen involvement

| Title   | Tübingen spokesperson   | Duration  |
|---|---|---|
| Plasticity and Sleep<br>(SFB/TRR 654)   | Professor Dr. Jan Born<br>Institute of Medical Psychology and Behavioral<br>Neurobiology                    | 1 July 2005 -<br>30 June 2017<br>Concluded after max.<br>funding duration |
| Liver Cancer – New mechanistic<br>and therapeutic concepts in a solid tumor model<br>(SFB-Transregio 209)                                   | Professor Dr. Nisar Malek<br>Internal Medicine Department I   | 1 July 2017 -<br>30 June 2021   |
| The Skin as a Sensor and Effector Organ<br>Orchestrating Local and Systemic Immune Responses<br>(SFBTransregio 156)                         | Professor Dr. Professor Martin Röcken<br>Department of Dermatology  | 1 July 2015 -<br>30 June 2019   |
| Biological Design and Integrative Structures.<br>Analysis, Simulation and Implementation<br>(SFBTransregio 141)                             | Professor Dr. Professor Klaus G. Nickel<br>Geoscience – Applied Mineralogy                                  | 1 Oct. 2014 -<br>30 June 2018   |
| Pathophysiology of Staphylococci in the Post-genomic Era<br>(SFBTransregio 34)  | Professor Dr. Professor Andreas Peschel<br>Interfaculty Institute of Microbiology and Infection<br>Medicine | 1 July 2006 -<br>30 June 2018<br>Concluded after max.<br>funding duration |
| Control of Quantum Correlations in Tailored Matter:<br>Common Perspectives of Mesoscopic Systems and Quantum<br>Gases<br>(SFBTransregio 21) | Professor Dr. Reinhold Kleiner<br>Institute of Physics  | 1 July 2005 -<br>30 June 2017<br>Concluded after max.<br>funding duration |

## RESEARCH UNITS

### Investigating the mechanisms of genetic epilepsy

Epilepsy is one of the most common chronic diseases of the central nervous system. It may be caused by brain damage resulting from injury, infection, or other influences – but it can also be due to genetics. A new DFG-backed research unit is focusing on the mechanisms which lead to the genetic form of the disease. It will receive 3.8 million euros over three years, and involve scientists from the Universities of Tübingen, Bonn, Cologne, Kiel, Luxembourg and Oslo. The spokesman is Professor Holger Lerche of the Hertie Institute for Clinical Brain Research and the Tübingen University Hospitals.

The discovery of new genetic defects in recent years has helped to decode disease mechanisms and to enable first steps in personalized treatments. Most of the mutations which lead to epilepsy are still unknown. One common characteristic of genetic epilepsy is the typical age distribution at which the disease first manifests itself – two-thirds of patients show symptoms by the time they are 20.

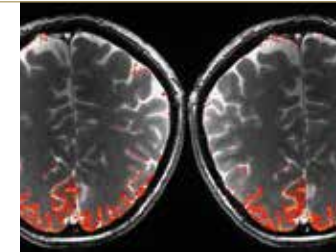
The new DFG research unit will investigate the theory that genetic epilepsy is based on a combination of three varying factors: the genetic mutation, which may for instance alter the excitability of nerve cells; developmental factors as the brain matures in infants and children, which interact with the mutations; and the processes set off by the mutations – which may change the structure of nerve cell bundles in the brain and indirectly favor the development of the disease. The researchers are seeking to identify critical periods in the various forms of epilepsy at which it is possible to intervene and to design individualized treatments for the different genetic defects.

## Research Units and Centers of Advanced Study

| Institute   | Title   | Spokesperson  |
|---|---|---|
| Center of Neurology and Hertie Institute for Clinical Brain Research                      | Epileptogenesis of genetic epilepsies (FOR 2715)  | Professor Dr. Holger Lerche                                   |
| Institute of Ancient History  | Migration and Mobility in Late Antiquity and Early Middle Ages (FOR 2496)   | Professor Dr. Mischa Meier                                    |
| Interfaculty Institute of Biochemistry  | Macromolecular complexes in mRNA localization (FOR 2333)  | Professor Dr. RalfPeter Jansen                                |
| Interfaculty Institute of Biochemistry  | VIROCARB: Glycans Controlling Non-Enveloped Virus Infections (FOR 2327)   | Professor Dr. Thilo Stehle                                    |
| Translational Gastrointestinal Oncology   | Targeting Therapeutic Windows in Essential Cellular Processes for Tumor Therapy (FOR 2314)                        | Professor Dr. Lars Zender                                     |
| Institute of Linguistics and Senckenberg Center for Human Evolution and Palaeoenvironment | Words, Bones, Genes, Tools Tracking Linguistic, Cultural and Biological Trajectories of the Human Past (FOR 2237) | Professor Dr. Gerhard Jäger<br>Professor Dr. Katerina Harvati |
| Interfaculty Institute of Biochemistry (IFIB)   | cGMP Signaling in Cell Growth and Survival (FOR 2060)   | Professor Dr. Robert Feil                                     |
| 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 Dr. Hans-Peter Thier                                |

## Clinical Research Unit

| University Hospitals                   | Title   | Spokesperson                |
|--|---|-----------------------------|
| Cardiology and Cardiovascular Medicine | Platelets Molecular Mechanisms and Translational Applications (KFO 274) | Professor Dr. Meinrad Gawaz |



Reinhart Koselleck project to optimize functional MRI

Physics Professor Klaus Scheffler of the Max Planck Institute for Biological Cybernetics and the University of Tübingen's Center for Integrative Neuroscience in 2017 obtained funding under the DFG's Reinhart Koselleck program for a project to improve magnetic resonance imaging (MRI). The DFG is providing 1.2 million euros over five years. Koselleck projects are intended to give researchers with a remarkable scientific track record the time and money needed to explore innovative projects in which success cannot be guaranteed.

MRI is a non-invasive imaging technique which can portray the entire human or animal brain with a resolution down to the millimeter. What it cannot show, however, is the electrical signal activity which brain cells use to communicate with one another. Up to now, doctors had to use invasive techniques to measure that. But MRI can be used to show changes to blood oxygen levels in parts of the brain. Oxygen consumption reveals general activity by cells, and in MRI measurements has frequently been considered the same as neural activity. This allows researchers to conclude which areas of the brain are active in various situations. Klaus Scheffler's goal is to better understand the signals detected using MRI scanning, thereby obtaining more detailed information on brain and neuron activity – and making an important contribution to better quantitative evaluation of the method.

Top: Image of the human brain. The red areas show the activation of the visual cortex during the presentation of a changing pattern.

## EUROPEAN RESEARCH COUNCIL FUNDING



Professor Harald Baayen



Dr. Claudio Tennie

### ERC grants in 2017

University of Tübingen linguist Professor Harald Baayen received an ERC Advanced Grant in 2017 – and no less than four researchers obtained new ERC Starting Grants.

ERC grants are individual funding; they run for five years and are given on the basis of outstanding research achievement and excellent project ideas. Starting Grants provide up to 1.5 million euros and go to junior researchers with several years of experience following their doctorates; researchers with seven to ten years of experience after their doctorates may apply for Consolidator Grants of up to two million euros; and highly experienced top researchers can apply for an Advanced Grant of up to 2.5 million.

**Professor Harald Baayen** of Quantitative Linguistics at the University of Tübingen's Institute of Linguistics took an **ERC Advanced Grant** for his "Wide Incremental learning with Discrimination nETworks (WIDE)" project. It is sponsored with 2.5m euros over five years. Baayen aims to deepen our understanding of how we produce and understand words in everyday speech. An outstanding linguistics researcher, Baayen, came to Tübingen in 2011 as a prestigious Alexander von Humboldt Professor.

Words in day-to-day conversational speech may differ substantially from how they appear in writing: German "würden" ('would') is often pronounced as "wün," Dutch "natuurlijk" ('naturally') can reduce to "tk", and Mandarin 要不然 (jao pu zan, 'otherwise') to "ui." Current theories assume that the sound waves that reach our ears are reduced to sequences of abstract sound units, much like the sequences of letters that make up written words. However, how to align highly reduced forms such as "wün", "tk" and "ui" with their full, unreduced variants, the supposed gatekeepers to meaning, is an unsolved computational problem.

The WIDE project makes the radical proposal to eliminate letter-like sound units altogether, and instead to zoom in on the rich details of the speech signal itself. Given tens of thousands of features representing the richness of the speech signal, it is anticipated that artificial neural networks can learn, by trial and error, to identify which meanings are conveyed.

**Dr. Claudio Tennie** of Tübingen's Institute of Prehistory, Early History and Medieval Archaeology received one of four **ERC Starting Grants** to Tübingen researchers, garnering 1.5 million euros over the next five years for his project, "STONECULT – Do Early Stone Tools Indicate a Hominin Ability to Accumulate Culture?" Tennie, a behavioral scientist, seeks to determine if the cognitive abilities of apes are sufficient for the manufacture and use of early stone tools – or whether human-like skills are required.

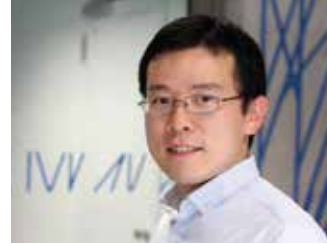
Tennie explores whether it was cultural or genetic adaptation which made it possible for humans to spread around the globe. According to his theory, humans did not only learn as individuals to adapt to differing environmental conditions – they were also able to integrate the knowledge of other individuals into their own skill sets, and to pass them on. This "cumulative learning," the theory goes, is what made it possible for more complex and interdependent knowledge structures to arise – making humans unique among the species.



Dr. Radu Iovita

Palaeoanthropologist **Dr. Radu Iovita** of the Institute for Early Prehistory and Quaternary Ecology examines new excavations in Kazakhstan in his project “A Silk Road in the Palaeolithic: Reconstructing Late Pleistocene Hominin Dispersals and Adaptations in Central Asia (Palaeosilkroad),” shedding light on the settlement of central Asia. Parallel to working in Tübingen, Iovita is an assistant professor of Anthropology at New York University.

Goods were traded along the ancient route between east Asia and the Middle East thousands of years ago; this led to a cultural and genetic exchange. During the last Ice Age, three human subspecies lived in central Asia and southern Siberia. Iovita and his team hope to discover how humans survived in the region during extreme climate cycles. This may explain how homo sapiens managed to become the only surviving type of our species.



Dr. Chang Liu

**Dr. Chang Liu**, junior research group leader at the Center for Plant Molecular Biology since 2015, received his Starting Grant for the genetics project: “Chromatin Packing and Architectural Proteins in Plants (CHROMATADS).”

If you were to unwind the DNA from a plant cell nucleus, it would be several meters long. It is so tightly packed up and folded that it fits into a nucleus with a diameter of a few micrometers. This DNA is called chromatin. In the living cell, chromatin has a three-dimensional structure. While some regions are very tightly packed, others are looser and open to regulatory factors. Some regions are attached to other regions which may be located far along the DNA strand. This structure determines which genes are active and being read at any given time, which in turn is key for cell functions. These structures and their functions in plants had barely been investigated. Now Liu is applying the latest technology incorporating molecular biology and bioinformatics. The research area promises new discoveries in functional plant genomics, about chromatin structure and the regulation of transcription – the way genes are read. In a long-term perspective, this project will benefit the structure-informed engineering of crops.



Dr. Surjo Soekadar

Medical researcher **Dr. Surjo Soekadar** of the Department of Psychiatry and Psychotherapy is working in the project “Building Next-Generation Brain/Neural-Machine Interfaces for Restoration of Brain Functions (NGBMI)” to further develop brain-computer interfaces for the treatment of neurological and psychiatric disorders.

These devices are able to “read” electrical, magnetic, or metabolic brain activity and translate it into a control signal for external machines such as robots, computers, or prostheses. Soekadar proved in a recent study that quadriplegics who cannot move their fingers at all can eat and drink independently using a brain-controlled exoskeletal hand prosthesis. He also showed that regular use of such a system can lead to specific restructuring processes in the brain and spinal cord which boost recovery following a stroke or damage to the spine. Soekadar aims to further develop this technology in order to restore damaged motor functions.



## Current European Research Council Grants

### Advanced Grants

| Name  | Project   | Duration    |
|---|---|-------------|
| Professor Dr. Harald Baayen<br>Institute of Linguistics                       | Wide Incremental learning with Discrimination nEtworks (WIDE)                               | 2017 - 2022 |
| Professor Dr. Hans-Georg Rammensee<br>Interfaculty Institute for Cell Biology | Mutation-driven Immunoediting of Human Cancer? (Mutaediting)                                | 2014 - 2019 |
| Professor Dr. Gerhard Jäger<br>Institute of Linguistics                       | Language Evolution: The Empirical Turn (EVOLAEMP)   | 2013 - 2018 |
| Professor Dr. Bernd Pichler<br>Department of Radiology                        | Multiparametric Tumor Imaging and Beyond: Towards Understanding in vivo Signals (IMAGELINK) | 2013 - 2018 |

### Consolidator Grants

| Name  | Project  | Duration    |
|---|--|-------------|
| Professor Katerina Harvati<br>Geoscience Department–<br>Paleoanthropology | Human Evolution at the Crossroads (CROSSROADS)   | 2017 - 2022 |
| Professor Dr. Lars Zender<br>Translational Gastrointestinal<br>Oncology   | Functional in vivo Analysis of Cholangiocarcinoma Development, Progression and Metastasis (CholangioConcept) | 2015 - 2020 |
| Dr. Thorsten Stafforst<br>Interfaculty Institute<br>of Biochemistry       | Site-directed RNA Editing to Manipulate RNA and Protein Function (RNArepair)                                 | 2015 - 2020 |
| Professor Dr. Todd Ehlers<br>Department of Geoscience–<br>Geodynamics     | Extreme Tectonics and Rapid Erosion in Mountain Environments (EXTREME)                                       | 2014 - 2019 |

### Starting Grants

| Name   | Project   | Duration    |
|--|---|-------------|
| PD Dr. Surjo Soekadar, Department of Psychiatry and Psychotherapy, Applied Neurotechnology   | Building Next-Generation Brain/Neural-Machine Interfaces for Restoration of Brain Functions (NGBMI)                                   | 2018 - 2023 |
| Dr. Chang Liu, Center for Plant Molecular Biology  | Chromatin Packing and Architectural Proteins in Plants (CHROMATADS).  | 2018 - 2022 |
| Dr. Radu Iovita, Early Prehistory and Quaternary Ecology   | A Silk Road in the Palaeolithic: Reconstructing Late Pleistocene Hominin Dispersals and Adaptations in Central Asia. (PALAEOSILKROAD) | 2017 - 2022 |
| Dr. Claudio Tennie, Institute of Prehistory and Medieval Archaeology   | Do Early Stone Tools Indicate a Hominin Ability to Accumulate Culture? (STONECULT)  | 2017 - 2022 |
| Assistant Professor Dr. Cynthia Debono Spiteri, Institute of Prehistory and Medieval Archaeology, partnering Professor Dr. Philipp W. Stockhammer, LMU München | Transformations of Food in the Eastern Mediterranean Late Bronze Age (FoodTransforms)   | 2016 - 2021 |
| Dr. Stephan König Geoscience Department – Isotope Geochemistry   | From the Origin of Earth's Volatiles to Atmospheric Oxygenation (O2RIGIN)   | 2015 - 2020 |
| Professor Dr. 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 |
| Professorin Daniela Thorwarth, University Department of Radiation Oncology   | Biologically individualized, Model-based Radiotherapy on the Basis of Multi-parametric Molecular Tumor Profiling (BIO-IRT)            | 2014 - 2018 |
| Professor Dr. Ana J. GarcíaSáez, Interfaculty Institute of Biochemistry  | The Quantitative Bcl2 Interactome in Apoptosis: Decoding How Cancer Cells Escape Death (APOQUANT)                                     | 2013 - 2019 |
| Professor Dr. 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 |
| Professor Dr. Jan Wehkamp University Hospitals, Inner Medicine 1, Hepatology, Gastroenterology, Infectiology   | The Influence of Environmental Factors on Antimicrobial Activity of Human Intestinal Defensins (DEFENSINACTIVITY)                     | 2013 - 2018 |
| Professor Dr. Andreas Kappler, Geoscience Department   | Microbial Formation of Minerals by Communities of Fe(II)oxidizing Bacteria in Modern and Ancient Environments (MICROFOX)              | 2013 - 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 |

## NEW PROGRAMS AND PROJECTS

### Bundling patient data

The DIFUTURE consortium processes medical data to help develop targeted treatments.

The University of Tübingen is a partner in this national project to merge and evaluate digital patient data. DIFUTURE (Data Integration for Future Medicine) is one of four consortia sponsored by Germany's Ministry of Education and Research for four years in a 150-million euro initiative.

DIFUTURE data integration centers are being set up at three research-oriented medical schools to evaluate patient data. At the University of Tübingen scientists from Medical Informatics, Medicine and Bioinformatics are involved. They bring experience in the administration and analysis of high throughput data sets such as those produced by genome analyses; they also have clinical expertise in conditions like multiple sclerosis, Parkinson's, cancer, circulatory disorders, strokes, and rare diseases. Coordinator of the eight-million euro Tübingen section of the project is Professor Oliver Kohlbacher, director of the Center for Quantative Biology. DIFUTURE is led overall by Professor Klaus Kuhn of the Technische Universität München.

The project pays great attention to data protection while integrating information into forms which can be applied in practice; a start has already been made with data from multiple sclerosis patients.

### Tübingen doctors in five EU rare-disease research networks

The European Commission has established 24 international European Reference Networks on rare and complex diseases; Tübingen researchers are involved in five of them. Tübingen's experts in rare diseases head the network on rare neurological disorders: Dr. Holm Graessner and Professor Ludger Schöls. The networks will promote communication among researchers and increase translational research – putting the latest findings into clinical practice; this will improve care for patients with rare diseases in Europe.

Rare diseases affect fewer than five people in 10,000. Yet some 30 million people in the European Union, including many children, are affected by one of the 6,000 to 8,000

rare diseases. Often patients do not even get a diagnosis because they lack access to the scientific or medical competence. Given the small number of patients affected per disease, EU-wide cooperation is valuable to better diagnostics, treatment and care.

The Tübingen Center for Rare Diseases has specialists in five networks:

- rare neurological diseases,
- rare eye diseases,
- congenital disorders and rare intellectual development disorders,
- rare hepatological disorders
- and child cancer.

In addition to finding better treatments for rare conditions, the networks will help to reduce inequalities in patient care across Europe.



### Baden-Württemberg state funding for “small disciplines”

The state of Baden-Württemberg granted funding in 2017 to two University of Tübingen projects – one in Prehistory and Medieval History, and another in Historical and Cultural Anthropology – in subjects which are small in terms of staff and student numbers yet which play an important role in securing a broad horizon in academia. Such “small disciplines” are to be strengthened via a structural fund of three million euros. The Tübingen projects will receive funding until mid-2019.

In **Archaeology of the future – directly communicating knowledge**, Tübingen researchers will receive around 196,000 euros and work with the prehistoric lake-dweller village museum in Unteruhldingen to develop communication units for museums and schools, transporting knowledge to the general public via innovative materials and methods.

Some 250,000 euros is earmarked for the project **Connected learning, research, communication**, in which five academic institutions and museum have joined up to reinforce Historical and Cultural Anthropology. They will use comprehensive existing collections as resources for teaching and knowledge transfer. Partners in the project are Tübingen’s Institute of Historical and Cultural Anthropology, Freiburg’s Institute of Cultural Anthropology and European Ethnology and Center for Popular Culture and Music, the Landesmuseum Württemberg (Stuttgart) and the Badische Landesmuseum (Karlsruhe).

### Biodiversity projects part of major DFG initiative

In the fifth phase of its Biodiversity Explorations program, the DFG has given grants to projects run by three biologists at the Institute of Evolution and Ecology. The program investigates the connections between the use of land, biodiversity, and ecosystem processes, among other things to assess the effects of the loss of species on the productivity and stability of ecosystems. The projects not only deliver scientific findings, they also yield recommendations for better land use.

**Katja Tielbörger’s** project examines the link between heterogeneity in land use intensity and plant diversity on various scales. **Oliver Bossdorf** (in collaboration with **Dr. Hernán Burbano**, of the Max Planck Institut for Developmental Biology) looks into the changes to blooming times and the genetic diversity of early-flowering plants in deciduous forests. **Johannes Scheepens** is interested in the phenotypical plasticity of plants – that is, their ability to adapt their form depending on environment conditions.

*Meadows in the Swabian Jura, a typical research area in the Biodiversity Explorations program*



## ACADEMIC CAREER PATHS

### Research Training Groups

The DFG offers doctoral candidates structured qualification programs via its research training groups. The groups are organized thematically and are sponsored for a maximum of nine years.

The research training group **Ambiguity – Production and Reception** (GRK 1808) was extended for four and a half years, and in 2017 two new research training groups were approved at the University of Tübingen.

The projects in the research training group **MOMbrane: The multifaceted functions and dynamics of the mitochondrial outer membrane** examine how the membrane works as a border between these cell organs and the rest of the cell; it is involved in a multitude of metabolic processes. Mitochondria are especially numerous in muscle and nerve cells and provide energy-rich molecules to the cell. The mitochondrial outer membrane also raises the alarm in the case of old or damaged mitochondria, helps with the exchange of proteins and lipids with other parts of the cell, and in immune responses. Despite its significance, the mitochondrial outer membrane has yet to be exhaustively investigated.

Spokesman for the new research training group, which is sponsored from April 2018 for four and a half years, is Professor Doron Rapaport of the Interfaculty Institute of Biochemistry. The Tübingen research training group is working with colleagues from the Weizmann Institute in Rehovot, Israel.

Tübingen is involved in two projects in the research training group **Statistical Modeling in Psychology (SMiP)** – one run by Mandy Hütter, Professor of Social Cognition and Decision Sciences, the other by Rolf Ulrich, professor of Cognition and Perception. This group involves cooperation between five universities – of Freiburg, Heidelberg, Koblenz-Landau, Mannheim and Tübingen. It was launched in October 2017 and overall will receive four million euros in funding over four and a half years.

It involves a number of areas of psychology, including that of memory, decision-making, attention, social psychology, and organizational psychology. The doctoral researchers develop statistical models for their respective fields so as to conduct in-depth analyses to answer the key questions in each area.



### Heinz Maier Leibnitz Award for social psychologist Mandy Hütter

Tübingen psychologist Mandy Hütter received the Heinz Maier Leibnitz Award in 2017; it is one of the most important in Germany awarded to junior researchers. Winners are selected by a panel of experts from the German Research Foundation and the Ministry of Education and Research.

As much as we may want to, we can't simply look inside a person's head to find out how he or she forms opinions; and just asking is problematic – at least when it comes to research. This is because people themselves often don't know which influences and processes lead to their beliefs – and because the reply may be influenced by the respondent's desire to give the "right" answer. "When we research the formation of opinions or prejudices, we have to reproduce reality in the laboratory to a degree," says Professor Mandy Hütter. And that is harder than it sounds. Psychologists must design experiments to exclude influence factors in order to come to a valid analysis of how attitudes are learned – all without the subject realizing that this is happening.



*Professor Mandy Hütter*

The experiments are usually conducted on a computer. This helps to precisely control the learning situation and to reduce outside influence to a minimum. Professor Hütter frequently uses images, which are simple and informative. Her field overlaps with both social psychology and cognitive psychology. She not only investigates how people arrive at their opinions, but also which factors underlie moral decisions, as well as the phenomenon of group judgements. She seeks to find out how the information available to the individual – and false assumptions – combine, and how this can affect democratic processes.

Hütter studied psychology in Tübingen and Amherst, Massachusetts. She has headed an Emmy Noether junior research group at the University of Tübingen since 2015. Now 33, she obtained a DFG-sponsored Heisenberg Professorship and was appointed to a full professorship of Social Cognition and Decision Sciences in late 2017.

## DFG-backed Research Training Groups

| Title  | Spokesperson  | Duration                       |
|--|---|--------------------------------|
| MOMbrane: The multifaceted functions and dynamics of the mitochondrial outer membrane (GRK 2364)   | Professor Dr. Doron Rapaport<br>Interfaculty Institute of Biochemistry  | 1 April 2018 - 30 Sept. 2022   |
| Research training group Mannheim – Freiburg – Heidelberg – Koblenz-Landau – Tübingen<br>Statistical Modeling in Psychology (SMiP) (GRK 2277) | Professor Dr. Edgar Erdfelder<br>University of Mannheim<br>Professor Dr. Mandy Hütter<br>Professor Dr. Rolf Ulrich<br>University of Tübingen<br>Faculty of Science      | 1 Oct 2017 - 31 March 2022     |
| Research training group Frankfurt – Tübingen<br>Doing Transitions –<br>The Formation of Transitions over the Life Course (GRK 2105)          | Professor Dr. Andreas Walther<br>University of Frankfurt am Main<br>Professor Dr. Barbara Stauber<br>University of Tübingen<br>Faculty of Economics and Social Sciences | 1 January 2017 - 30 June 2021  |
| Research training group Stuttgart – Tübingen<br>Spectral Theory and the Dynamics of Quantum Systems (GRK 1838)                               | Professor Dr. Marcel Griesemer<br>University of Stuttgart<br>Professor Dr. Professor Stefan Teufel (deputy spokesman)<br>University of Tübingen<br>Faculty of Science   | 1 Oct 2013 - 31 March 2018     |
| Research training group Stuttgart – Tübingen<br>Integrated Hydrosystem Modelling   | Professor Dr. Olaf Cirpka<br>Faculty of Science   | 1 April 2012 - 31 March 2021   |
| Ambiguity – Production and Reception (GRK 1808)  | Professor Dr. Matthias Bauer<br>Faculty of Humanities   | 1 Oct 2013 - 30 September 2022 |
| Molecular Principles of Bacterial Survival Strategies (GRK 1708)   | Professor Dr. Karl Forchhammer<br>Interfaculty Institute of Microbiology and Infection<br>Medicine  | 1 April 2012 - 31 March 2021   |
| Religious Knowledge in Pre-modern Europe (800-1800) Transfers und Transformations – Ways to the Modern Knowledge Society (GRK 1662)          | Professor Dr. Annette Gerok-Reiter<br>Faculty of the Humanities<br>Professor Dr. Volker Leppin<br>Faculty of Protestant Theology  | 1 April 2011 - 31 March 2020   |



## PhD networks

... are generally formed by three to five professors from different disciplines whose five to seven doctoral students are examining one topic from different perspectives.

The PhD networks each provide up to seven grants for three years. Successful PhD networks can form the basis of bigger research projects and may lead to research training groups sponsored by the German Research Foundation.

| Title   | Spokesperson  | Duration                           |
|---|---|------------------------------------|
| Theory of Balance –<br>Forms and figures in media, art, and literature  | Professor Dr. Eckart Goebel<br>Institute of German Language and Literature      | 1 November 2017 - 31 October 2020  |
| The persistence of gender binaries                                      | Professor Dr. Marion Müller<br>Institute of Sociology                           | 1 December 2017 - 30 November 2020 |
| Entangled Temporalities in the Global South                             | Professor Dr. Sebastian Thies<br>Institute of Romance Languages and Literatures | 1 December 2017 - 30 November 2020 |
| Individual response to physical activity – A transdisciplinary approach | Professor Dr. Ansgar Thiel<br>Institute of Sports Science                       | 1 December 2017 - 30 November 2020 |
| New nanoparticles – From synthesis to application in the life sciences  | Professor Dr. Erik Schäffer<br>Center for Plant Molecular Biology               | 1 December 2017 - 30 November 2020 |
| Integrative Augmented Reality (IAR)                                     | Dr. Siegfried Wahl<br>Research Center for Ophthalmology                         | From 1 February 2018               |

### Doctorates completed 2016 - 2017

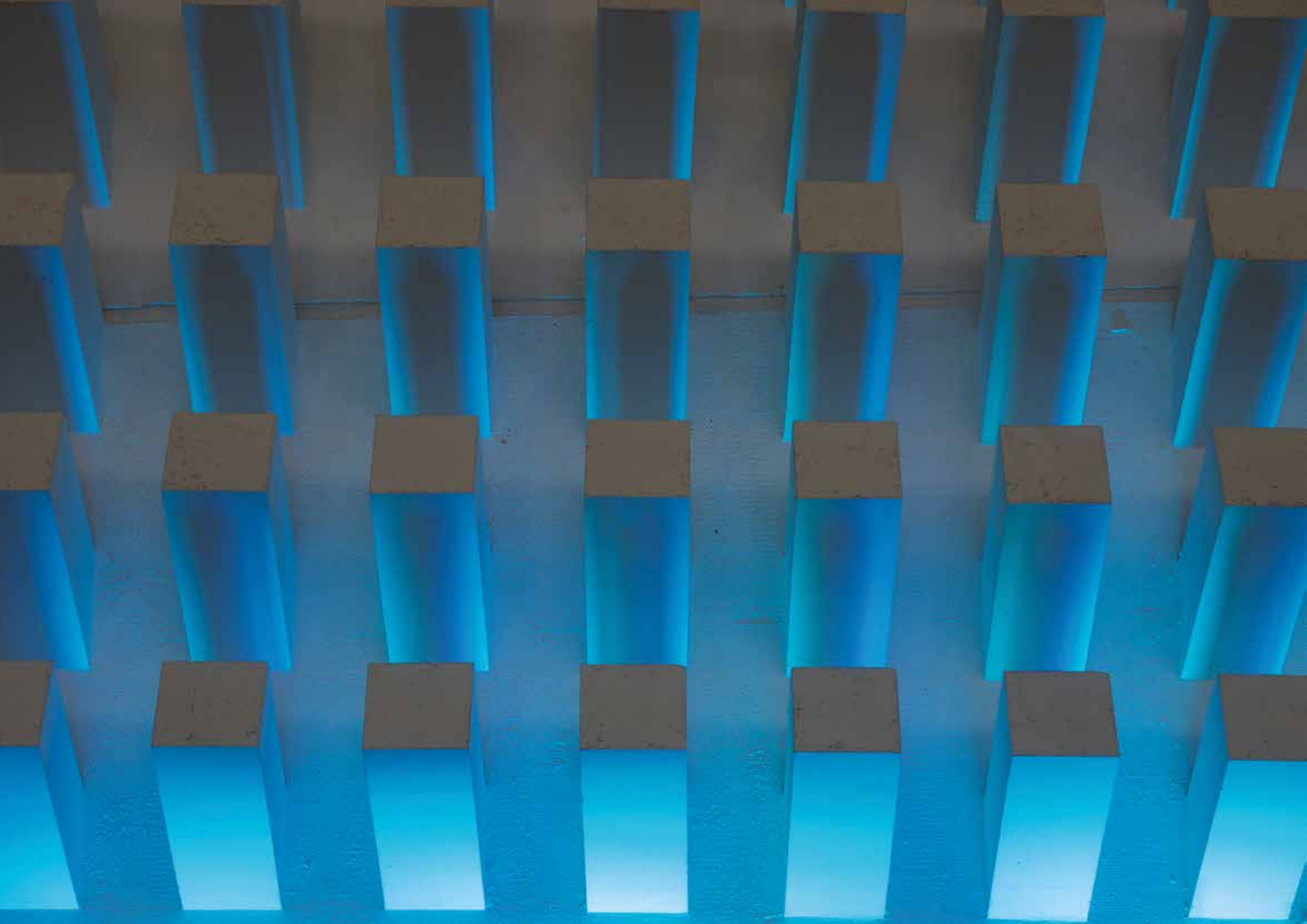
| Faculties                                | female              | male       |
|--|---------------------|------------|
|  | Protestant Theology | 1          |
| Catholic Theology                        | 0                   | 3          |
| Law                                      | 14                  | 23         |
| Faculty of Medicine                      | 170                 | 136        |
| Faculty of Humanities                    | 33                  | 34         |
| Faculty of Economics and Social Sciences | 25                  | 19         |
| Faculty of Science                       | 107                 | 159        |
| <b>Total</b>                             | <b>350</b>          | <b>380</b> |
|  | <b>730</b>          |            |

As of 19 January 2018

### Habilitations completed in 2017

| Faculties                                | female              | male      |
|--|---------------------|-----------|
|  | Protestant Theology | 1         |
| Catholic Theology                        | 1                   | 1         |
| Law                                      | 0                   | 1         |
| Faculty of Medicine                      | 10                  | 29        |
| Faculty of Humanities                    | 1                   | 6         |
| Faculty of Economics and Social Sciences | 0                   | 2         |
| Faculty of Science                       | 2                   | 1         |
| <b>Total</b>                             | <b>15</b>           | <b>40</b> |
|  | <b>55</b>           |           |

As of 22 January 2018



# SPONSORSHIP AND FUNDING



## INVESTING IN THE FUTURE

We extend our thanks to the many individuals and foundations who support our research and teaching, often strengthening areas which would not otherwise be able to contribute to the University's profile. We take great care to spend our funding wisely – both by investing directly in research and teaching and in the structures which support and coordinate them. The various funding formats reinforce one another to make Tübingen an even more attractive place to study, work, and conduct research.

### MAJOR SPONSORSHIPS IN 2017

#### Eberle Foundation underwrites new research prize

The Dr. Karl Helmut Eberle Foundation is supporting research and innovation at the University of Tübingen with the 300,000-euro **Eberle Innovation Prize**, which was awarded for the first time in November 2017. It goes to researchers whose work has high innovative potential.

The first Eberle Innovation Prize at the University of Tübingen went to Professor Robert Feil and Dr. Susanne Feil of the Interfaculty Institute of Biochemistry jointly with Professor Bernd Pichler of the Werner Siemens Imaging Center for finding ways to reduce animal testing. In the prizewinning project, "Non-invasive visualisation and tracking of specific cell populations via positron emission tomography," the sci-

entists and medical researchers worked together to develop new methods for investigating diseases such as Alzheimer's and diabetes. The methods they apply require fewer and less stressful animal tests. An additional goal was to get results which could be more easily applied to the development of these diseases in humans.

The Eberle Foundation asserted that reducing animal testing in research was an important contribution to ethics in science, and that the practical application of these methods to common conditions like diabetes, Alzheimer's, and cancer were important in the decision to sponsor the project.



*At the presentation of the Dr. K. H. Eberle Innovation Prize (left to right): Eberle Foundation board members Dr. Georg Freiherr von Schönau and Dr. Alexandra Zoller, the recipient, Professor Bernd Pichler, Foundation board member Dr. Peter Unmüßig, University President Professor Bernd Engler, artist Ralf Ehmann, Foundation board member Hansjörg Abt, the University Vice-President for Research and Innovation, Professor Peter Grathwohl, and the Eberle Foundation chairman, Thomas Schwind*

### Baden-Württemberg Foundation backs three neurorobotics projects

Three University of Tübingen projects are being sponsored by the Neurorobotics research program run by the Baden-Württemberg Foundation. Together, the projects will receive some 1.5 million euros over a three-year period.

The **RetNetControl** project seeks to improve bionic eyes. It examines physiological activity in retinal neural networks, including how activity in those networks could be better controlled. Visual prostheses to date have “replaced” the retina using relatively simple stimulation patterns. Now the working group headed by Dr. Philipp Berens of the Research Center for Ophthalmology, the Center for Integrative Neuroscience (CIN), and the Bernstein Center for Computational Neuroscience is using theoretical models of retinal cells to test alternative stimulation patterns. Using these predictive models, the working group led by Dr. Günther Zeck of the Natural and Medical Sciences Institute and the Bernstein Center will test to what extent blind retinas can be stimulated to respond comparably to healthy retinas. Their findings will be used to design better prosthetic eyes for the blind.

In the **NemoPlast** project, researchers headed by Professor Alireza Gharabaghi at the Department of Neurosurgery and CIN investigate man-machine interfaces to promote motor plasticity in stroke patients. The scientists are developing a neurorobot linking an exoskeleton with a non-invasive brain stimulator to help patients with limited movement to exercise. The exoskeleton is steered by brain activity and supports the movement of a paralyzed hand and arm. At the same time, the stimulator activates the inactive neural networks and the links between the brain and the muscles in order to strengthen the arm in a targeted and lasting way. This integrated neuroprosthetic approach is aimed at long-term restoration of patients’ motor functions.



The research project **KONSENS-NHE** seeks to develop a context-sensitive neuro-driven exoskeletal hand to enable patients to regain everyday abilities and autonomy following paralysis due to brain or spinal injuries. The project brings together the expertise of the Universities of Tübingen, Stuttgart and Reutlingen in the fields of brain-machine interaction, robotics, and informatics. Over the next three years, the team aims at producing a brain-controlled robot hand which will vastly improve the quality of life for victims of paralysis. The technology is based on the Brain/Neural-Computer Interaction System developed by the project’s coordinator, Dr. Surjo Soekadar and his Applied Neurotechnology team at the University Hospitals. Electrical signals in the brain are measured on the head using polyamide electrodes and combined with other biosignals such as eye movements. Merely thinking about a finger movement leads to a characteristic brain signal – this can be translated into a command for the exoskeletal hand, which then moves the flesh-and-blood hand in real time.

*Systems like this brain-controlled robotic hand exoskeleton are being further developed in the KONSENS-NHE project.*

## WELCOME ADDITIONS

### Endowed professorships

| Field  | Name                                   | Sponsor  |
|--|--|--|
| <b>Faculty of Humanities</b>                                   |  |  |
| Chinese Studies: Financial Ethics                              | Professor Dr. Matthias Niedenführ      | Karl Schlecht Foundation   |
| General Rhetoric and Science Communication and Public Outreach | Professor Dr. Olaf Kramer              | Klaus Tschira Foundation   |
| <b>Faculty of Economics and Social Sciences</b>                |  |  |
| Financial Literacy and Economic Didactics                      | Professorin Dr. Taiga Brahm            | Dieter von Holtzbrinck Foundation  |
| <b>Faculty of Medicine</b>                                     |  |  |
| Neurodegenerative Diseases                                     | Professor Dr. Thomas Gasser            | Hertie Foundation  |
| Cell Biology: Foundations of Neurological Diseases             | Professor Dr. Mathias Jucker           | Hertie Foundation  |
| Clinical Neurogenetics   | Professor Dr. Ludger Schöls            | Hertie Foundation  |
| Functional Neurogenetics                                       | Professor Dr. Philipp Kahle            | Hertie Foundation  |
| Neurology/ Epileptology  | Professor Dr. Holger Lerche            | Hertie Foundation  |
| Preclinical Imaging and Imaging Technology                     | Professor Dr. Bernd Pichler            | Werner Siemens Foundation  |
| Occupational and Social Medicine                               | Professorin Dr. Monika Rieger          | Südwestmetall Employers' Federation  |
| Clinical Pharmacology  | Professor Dr. Matthias Schwab          | Robert Bosch Foundation  |
| Infectious Diseases of the Circulatory System                  | Professor Dr. Harald Langer            | Lichtenberg Professorship (VW Foundation)  |
| Neuroplasticity of the Developing Brain                        | Professor Dr. Martin Staudt            | Schön Kliniken GmbH, Behandlungszentrum Vogtareuth                                 |
| Molecular Biology of Degenerative Retinal Disorders            | Professor Dr. Marius Ueffing           | Tistou und Charlotte Kerstan Stiftung Vision 2000 – Sehen – Kunst – Sinnesfunktion |
| Molecular Diabetology  | Professorin Dr. Cora Weigert           | Sanofi-Aventis Deutschland GmbH  |
| Personalized Diabetes Therapy                                  | Professor Dr. Andreas Peter            | Böhringer-Ingelheim  |
| <b>Faculty of Science</b>                                      |  |  |
| Didactics of Biology (Tübingen School of Education)            | Professor Dr. Christoph Randler        | Gips-Schüle Foundation   |
| Didactics of Chemistry (Tübingen School of Education)          | Professorin Dr. Claudia Bohrmann-Linde | Gips-Schüle Foundation   |
| Didactics of Physics (Tübingen School of Education)            | position not yet filled                | Vector Foundation  |

## IN BRIEF

In October 2017 **Karl Schlecht received the University Prize**. The University paid tribute to the sponsor of the Global Ethics Institute and the China Center Tübingen, Karl Schlecht, in October 2017. President Professor Bernd Engler thanked the engineer and entrepreneur for his support for teaching and research at the University of Tübingen.



*President Professor Bernd Engler (left) awards the University Prize to Karl Schlecht of the Karl Schlecht Foundation.*

Professor h. c. Karl Schlecht was born in 1932 in Filderstadt-Bernhausen. He is the founder of the cementation pump manufacturer Putzmeister AG. He established the charitable Karl Schlecht Foundation in 1998. It has supported the personal development of young people and rising managerial staff via many projects and partnerships. The Foundation's goals are to improve leadership in business, society, and politics by spreading humanist values and to establish ethical awareness across the economy.

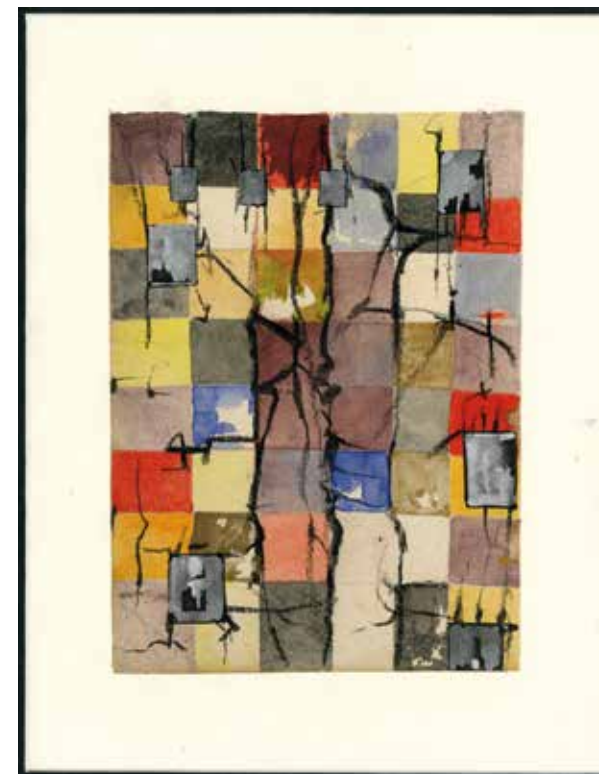
The Stuttgart-based **Karl and Anna Buck Foundation** promotes research in Chemistry at the University of Tübingen.

One of the projects is in the field where organic chemistry overlaps with molecular electrochemistry. This class of chemical compounds could be used to develop organic solar cells. Another Buck-sponsored project is in solid state chemistry and theoretical inorganic chemistry; it focuses on the synthesis of molybdenum-halogen compounds and their photo-physical properties.

The Karl and Anna Buck Foundation has been promoting scientific research, health services, professional training and students of Medicine, Medical Technologies, Chemistry, Biotechnology, and other Life Sciences since 2000. It was established by Karl Buck, founder of the Buck Chemie chemicals company.

Celebrated **Swiss street artist Harald Naegeli** donated 64 large-format works to the University's Institute of Art History. They complement the collection of Naegeli's etchings in the University's possession since 1998.

*Harald Naegeli  
Etude, 10 December 2014  
Ink and watercolour, silver-goldbronze on charcoal  
Drawing on historical paper from around 1718*



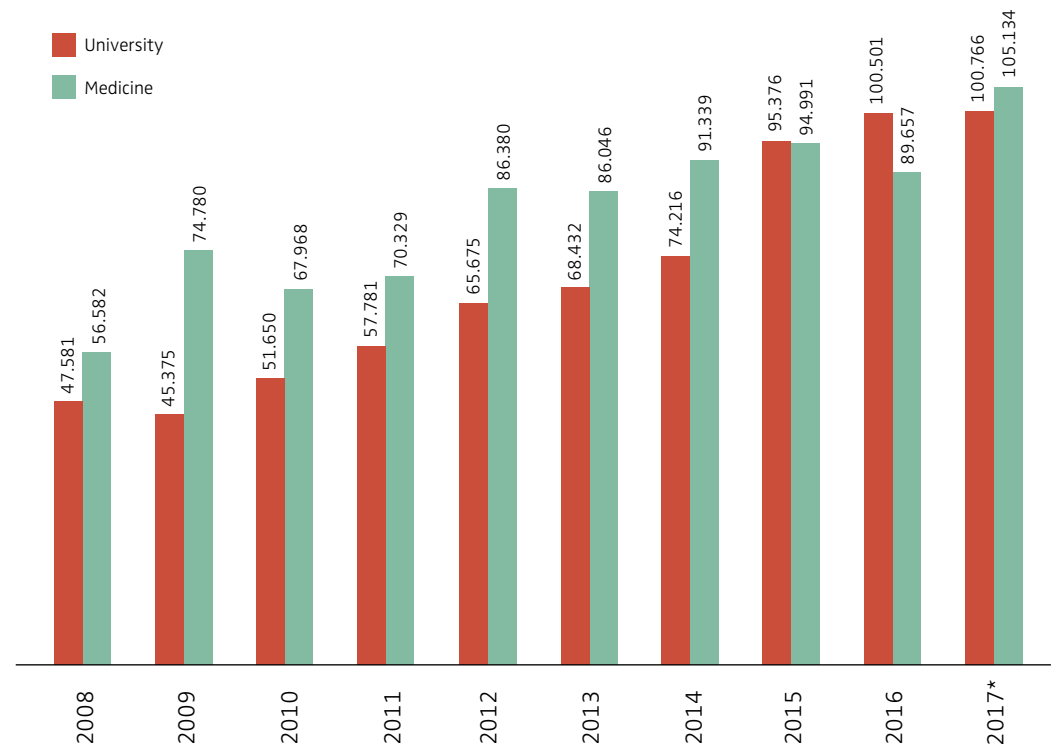
## MONEY WELL SPENT

The University of Tübingen's effective use of Excellence Initiative and other funding has further boosted the scope and quality of our research. This in turn has made us an attractive location for further research and teaching investment, both from government and private sources.

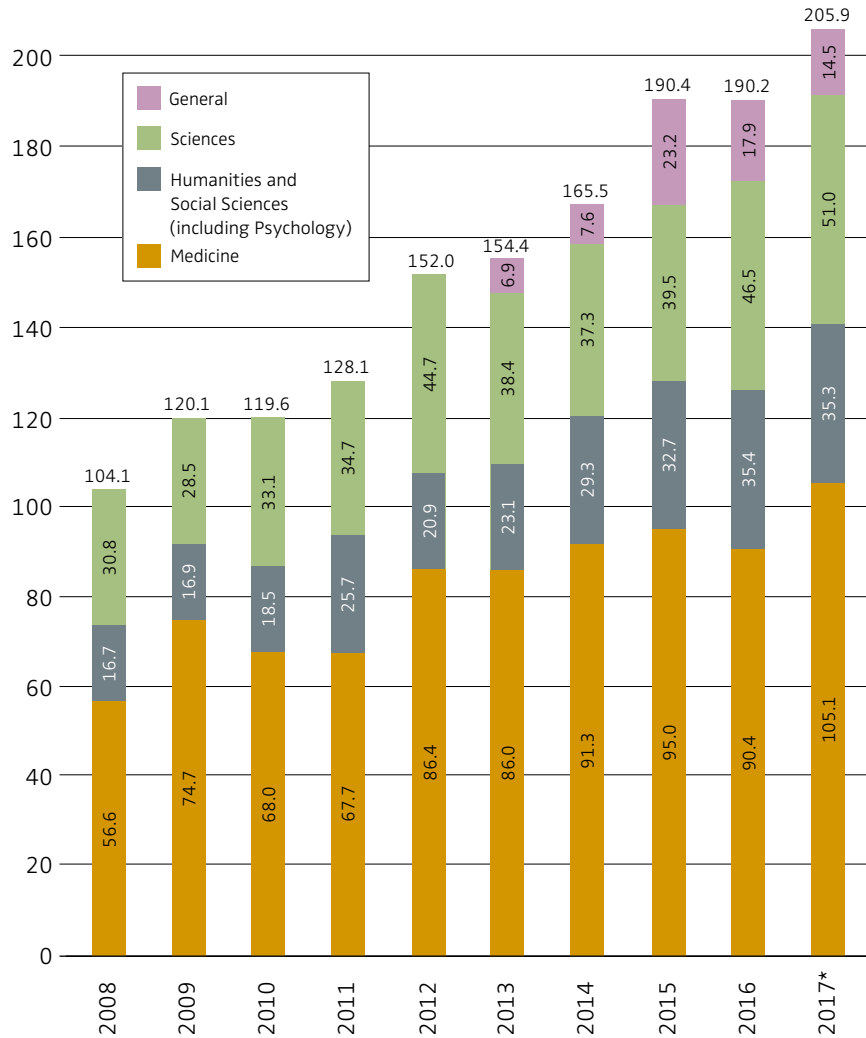


### Third-party funding trends

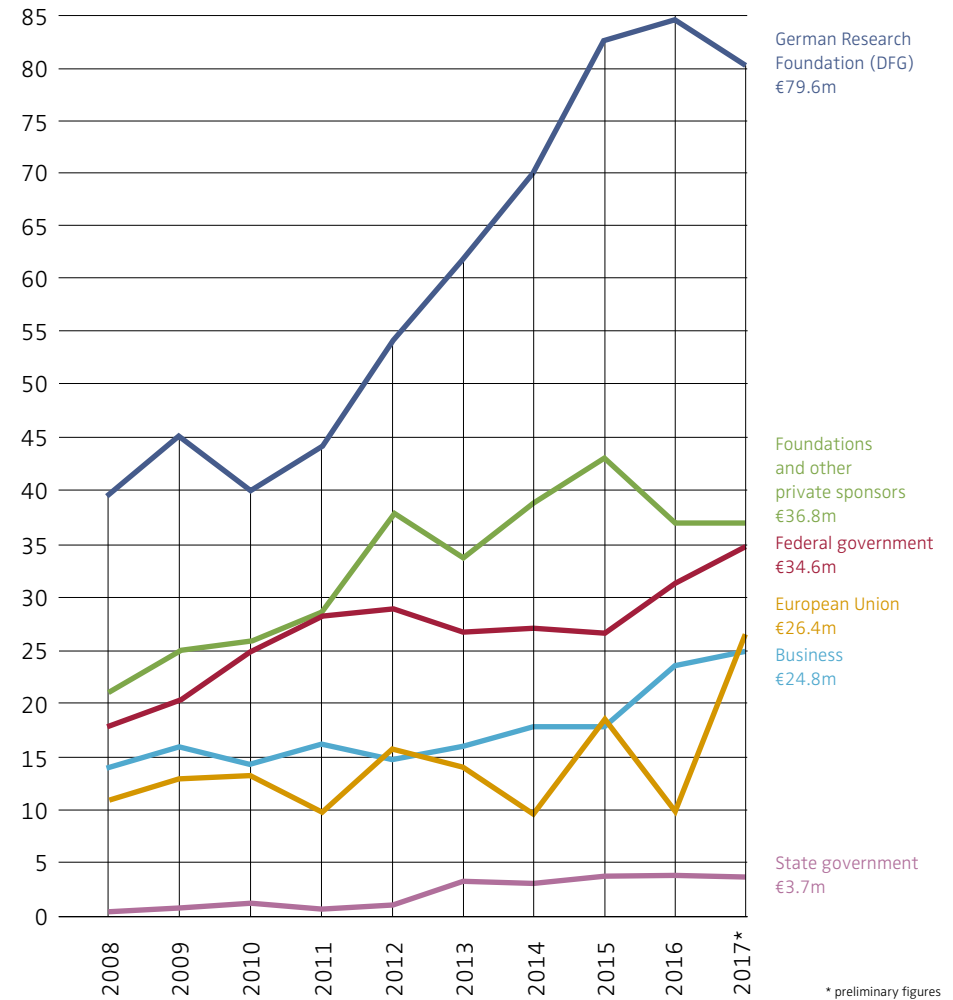
in millions of euros, 2008 - 2017



Third-party funding attracted by the Sciences, Humanities, and Medicine in millions of euros, 2008 - 2017



Sources of third-party funding in millions of euros, 2008 - 2017



\* preliminary figures



# NETWORKS



## ARM-IN-ARM WITH OUR PARTNERS

The University of Tübingen is expanding and maintaining its partnerships with education and research institutions at home and abroad. Internationally, we are making the most of global communication and generous government funding to send our people, expertise and research out into the world and gathering further experience of life outside Germany by hosting students and researchers from abroad. Domestically, we are working with key institutions on a wide range of innovative projects.

### Tübingen joins international partners in medical training in Africa

In July 2017, the University of Tübingen and its University Hospitals joined with international partners to contribute to the founding of a new school for public health in Lambaréné, Gabon. The government of the central African country and the Centre de Recherches Médicales de Lambaréné (CERMEL) are working with the German Center for Infection Research (DZIF) and the Medical University of Vienna to establish the school. It will be built on the CERMEL campus in Lambaréné, 240 km southwest of the capital Libreville, and will train future doctors and medical staff for health services in Gabon.

The University of Tübingen has worked with CERMEL for many years. Professor Peter Kremsner of the Tübingen Institute of Tropical Medicine is CERMEL's director. In 2016, the University and its partners established a research professorship at CERMEL – the first of its kind in an African country.

*A new training center in Lambaréné will strengthen Gabon's health care system in the long term.*



### Pharmaceutical Institute supports Malawi in the quest for safer medicines

Counterfeit medications present a major danger to patients in developing countries. Professor Lutz Heide of Tübingen's Pharmaceutical Institute has been helping to combat fake and adulterated medicines in the southeastern African country of Malawi for many years. With funding from the German Academic Exchange Service (DAAD) and the Gesellschaft für Internationale Zusammenarbeit (GIZ), Tübingen's cooperation with the Pharmaceutical Institute at the University of Malawi has been taken to new levels. The supply of effective medicines is to be boosted by training new pharmacists.

Tübingen and Malawian researchers work together to analyze medicaments with quality problems. Malawian students come to Tübingen each year to take the course "Pharmacy in development cooperation and disaster relief." Tübingen students travel to Malawi, some completing a semester of studies in the country. There is also an exchange of qualified academics, and joint symposia on research and teaching.

### German-Israeli biochemistry collaboration

The German Research Foundation (DFG) approved a new Tübingen project under its German-Israeli Project Cooperation scheme. Professor Doron Rapaport from the Interfaculty Institute of Biochemistry and an international team will receive a total of 1.65 million euros over five years for their project, called "MitoBalance: Uncovering the mechanisms underlying mitochondrial proteostasis." Professor Rapaport's collaborating partners work at the universities of Kaiserslautern and Cologne in Germany, and from the Hebrew University and the Weizmann Institute of Science in Israel. The German-Israeli Project Cooperation scheme was initiated by the German government in 1997 to promote outstanding, innovative German-Israeli research in any area of science and academia.

Mitochondria are organelles, which play an essential role in the metabolism and physiology of cells in plants and in humans and other animals. But new research shows that they are also important actors in cell signal pathways, and that they play a key role in processes like cell aging and programmed cell death. Mitochondrial defects can lead to a wide variety of muscular, metabolic, and neurodegenerative diseases.

The international team will research how a mitochondrion coordinates with its surrounding cell in the processes in which it forms, uses, and dismantles proteins. One of the

questions to be answered is how proteins are placed in the right location and in the right amount within the cell. And how mitochondria alert other parts of the cell when cell stress occurs due to wrongly folded or aggregated proteins – so that the nucleus can act to counter it?

Professor Doron Rapaport is also the speaker for a new DFG research training group focusing on mitochondria, MOM-brane: The multifaceted functions and dynamics of the mitochondrial outer membrane.

### Wider cooperation with Brazil

The University of Tübingen struck a deal with Brazil's higher education agency CAPES to work more closely in research and teaching, and to boost the exchange of students and academics. CAPES president, Professor Abilio A. Baeta Neves and Professor Bernd Engler, president of the University of Tübingen, signed the framework agreement in October 2017. It is to run for an initial five years. In Brazil, CAPES is responsible for international collaboration as well as supporting advanced Master's students, doctoral candidates and postdocs.

The first focus will be on the development of new pharmaceuticals jointly by Tübingen's Center for Academic Drug Discovery & Development (TüCAD2) and the Interfaculty Center for Pharmacogenomics and Pharma Research (IZEPHA) in Stuttgart und Tübingen with Brazilian research laboratories.

Tübingen has a tradition of working with Brazilian research partners. The Baden-Württembergische Brasilien-Zentrum was founded in 2000, and works in particular with institutions of higher education in the Brazilian state of Rio Grande do Sul.

### Guest professorship for Brazilian culture and communications

Summer semester of 2017 saw Professor Fernando Resende of the Universidade Federal Fluminense become the first holder of the Guimarães Rosa guest professorship in Tübingen. The post is funded by the German Academic Exchange Service (DAAD) and the University of Tübingen, and is named after one of the most influential communicators of Brazilian literature in Germany, the writer João Guimarães Rosa.

The guest professorship forms an interdisciplinary interface between literature, culture, language and media studies. It is also intended to provide added impetus to Portuguese as a subject here, and to boost our new Romance Languages Master's and doctoral degrees.

*Professor Bernd Engler, CAPES president Professor Abilio A. Baeta Neves, and the director of the baden-württembergischen Brasilienzentrum, Professor Stefan Laufer (left to right)*



### Baden-Württemberg Foundation boosts exchanges from developing countries

The Baden-Württemberg Foundation provides scholarships both for Tübingen students to attend partner institutions abroad and for students at those universities to come to Tübingen as part of our exchange programs. In the academic year 2017-18, these amounted to some 267,700 euros – sponsoring about 50 students in each direction.

Also that year, the Baden-Württemberg Foundation added an extra one million euros to its statewide funding to promote exchanges for students and doctoral candidates with countries in Africa, the Caribbean and the Pacific, in line with the state of Baden-Württemberg's guidelines on international development.

Tübingen's Faculty of Medicine, Institute of Tropical Medicine, Institute of Evolution and Ecology, Pharmacology, and the Institute of Romance Languages successfully applied for a total of 112,000 euros of that funding. That enabled doctoral researchers from countries including Rwanda, Gabon, Togo, Cameroon, Ivory Coast and Burundi to receive scholarships in 2017-18.

### DAAD backs international exchanges

The German Academic Exchange Service (DAAD) has a range of programs to support greater international contacts at German institutions of higher education. Tübingen exchanges received some 4.4 million euros of DAAD funds in 2016. Among the individual grants, 174 international students, doctoral candidates, and visiting academics received DAAD sponsorship to come to Tübingen. 138 students, PhD candidates and researchers from Tübingen went abroad on DAAD money. Overall, individual funding here came to nearly 1.9 million euros. Funding for projects and for group programs such as ERASMUS, Bachelor-Plus, PROMOS and ISAP amounted to some 2.5 million euros.

## Our partners around the world

The University of Tübingen maintains regular exchange programs with some 260 institutions of higher education around the globe, as well as with our six partners in the Matariki Network of Research Universities. We also have three branches in Asia and we are highly active in the European Union's Erasmus Program, involving partnership deals with 345 European institutions. Our seven Faculties also have 105 cooperation agreements with institutions worldwide.

More than 850 students annually take advantage of the many exchange schemes we offer. Numbers on the map indicate how many Tübingen students studied in which continents. In total, more than 1,600 Tübingen students traveled abroad for their studies in 2017.

### University of Tübingen branches

European Center for Chinese Studies,  
Peking University - **BEIJING**  
Tübingen Center for Japanese Studies,  
Dōshisha University - **KYOTO**  
Tübingen Center for Korean Studies,  
Korea University - **SEOUL**

#### North America

##### Canada

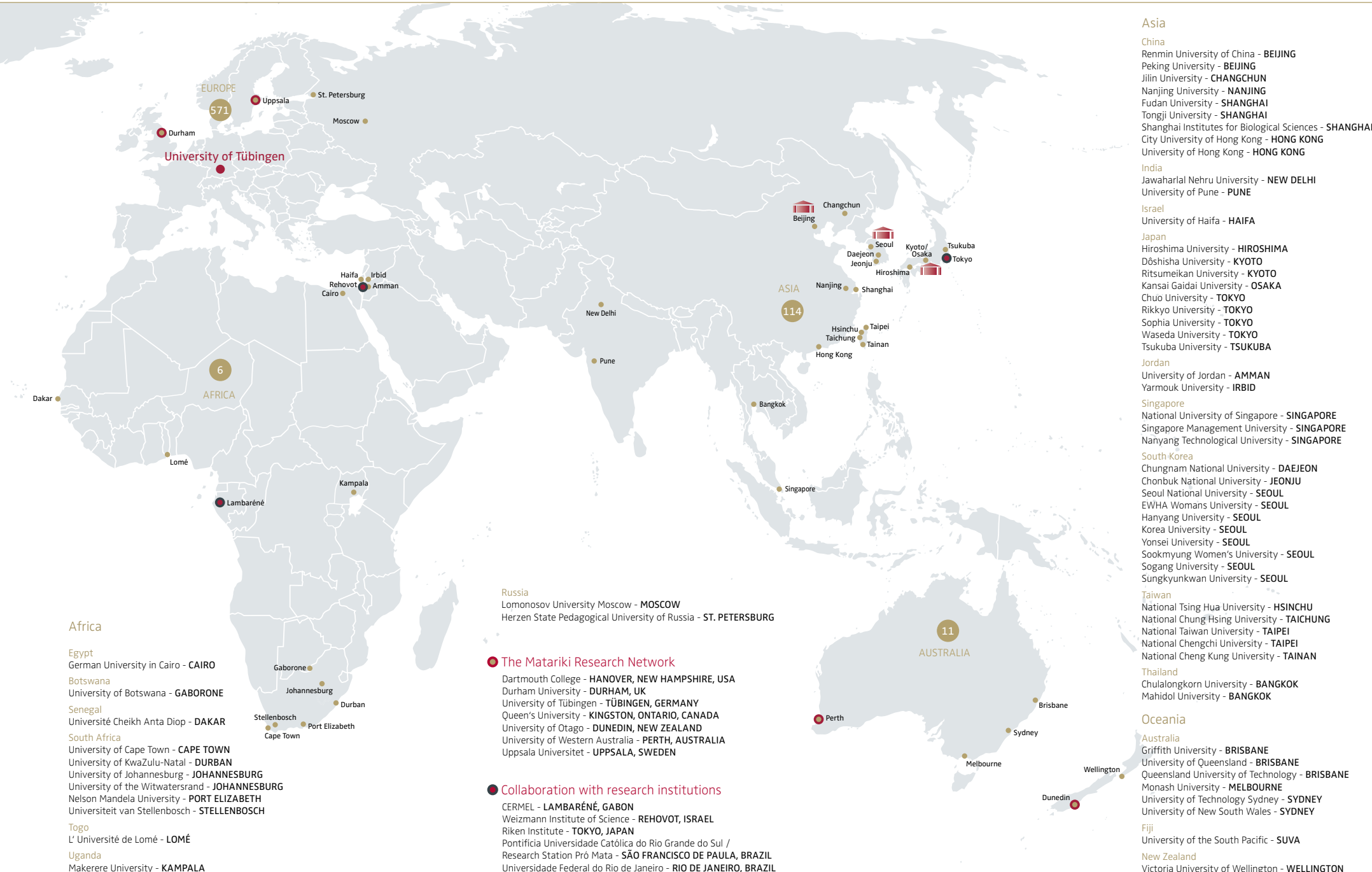
University of Alberta - **EDMONTON, ALBERTA**  
McGill University - **MONTRÉAL, QUÉBEC**  
McMaster University - **HAMILTON, ONTARIO**  
Ontario Colleges and Universities - **ONTARIO\***  
Université Laval - **QUÉBEC, QUÉBEC**  
Mount Allison University - **SACKVILLE, NEW BRUNSWICK**

##### United States of America

University of Alaska - **FAIRBANKS, AK**  
Northern Arizona University - **FLAGSTAFF, AZ**  
Arizona State University - **TEMPE, AZ**  
University of Arizona - **TUCSON, AZ**  
California State Universities - **CA\***  
University of California San Diego - **SAN DIEGO, CA**  
University of Denver - **DENVER, CO**  
Connecticut State Universities and Colleges - **CT\***  
Yale University - **NEW HAVEN, CT**  
Georgetown University - **WASHINGTON, D.C.**  
University of Hawai'i at Mānoa - **HONOLULU, HI**  
Drake University - **DES MOINES, IA**  
Roosevelt University - **CHICAGO, IL**  
Butler University - **INDIANAPOLIS, IN**  
Valparaiso University - **VALPARAISO, IN**  
Bellarmine 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**  
North Carolina State Universities - **NC\***  
University of North Carolina at Chapel Hill - **CHAPEL HILL, NC**  
Princeton Theological Seminary - **PRINCETON, NJ**  
Hobart and William Smith Colleges - **GENEVA, NY**  
State University of New York - **STONY BROOK, NY**  
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**

\* national exchanges





- Asia**
- China**  
 Renmin University of China - BEIJING  
 Peking University - BEIJING  
 Jilin University - CHANGCHUN  
 Nanjing University - NANJING  
 Fudan University - SHANGHAI  
 Tongji University - SHANGHAI  
 Shanghai Institutes for Biological Sciences - SHANGHAI  
 City University of Hong Kong - HONG KONG  
 University of Hong Kong - HONG KONG
- India**  
 Jawaharlal Nehru University - NEW DELHI  
 University of Pune - PUNE
- Israel**  
 University of Haifa - HAIFA
- Japan**  
 Hiroshima University - HIROSHIMA  
 Dōshisha University - KYOTO  
 Ritsumeikan University - KYOTO  
 Kansai Gaidai University - OSAKA  
 Chuo University - TOKYO  
 Rikkyo University - TOKYO  
 Sophia University - TOKYO  
 Waseda University - TOKYO  
 Tsukuba University - TSUKUBA
- Jordan**  
 University of Jordan - AMMAN  
 Yarmouk University - IRBID
- Singapore**  
 National University of Singapore - SINGAPORE  
 Singapore Management University - SINGAPORE  
 Nanyang Technological University - SINGAPORE
- South Korea**  
 Chungnam National University - DAEJEON  
 Chonbuk National University - JEONJU  
 Seoul National University - SEOUL  
 Ewha Womans University - SEOUL  
 Hanyang University - SEOUL  
 Korea University - SEOUL  
 Yonsei University - SEOUL  
 Sookmyung Women's University - SEOUL  
 Sogang University - SEOUL  
 Sungkyunkwan University - SEOUL
- Taiwan**  
 National Tsing Hua University - HSINCHU  
 National Chung Hsing University - TAICHUNG  
 National Taiwan University - TAIPEI  
 National Chengchi University - TAIPEI  
 National Cheng Kung University - TAINAN
- Thailand**  
 Chulalongkorn University - BANGKOK  
 Mahidol University - BANGKOK
- Oceania**
- Australia**  
 Griffith University - BRISBANE  
 University of Queensland - BRISBANE  
 Queensland University of Technology - BRISBANE  
 Monash University - MELBOURNE  
 University of Technology Sydney - SYDNEY  
 University of New South Wales - SYDNEY
- Fiji**  
 University of the South Pacific - SUVA
- New Zealand**  
 Victoria University of Wellington - WELLINGTON

- Africa**
- Egypt**  
 German University in Cairo - CAIRO
- Botswana**  
 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 University - PORT ELIZABETH  
 Universiteit van Stellenbosch - STELLENBOSCH
- Togo**  
 L' Université de Lomé - LOMÉ
- Uganda**  
 Makerere University - KAMPALA

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

- 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, AUSTRALIA  
 Uppsala Universitet - UPPSALA, SWEDEN

- Collaboration with research institutions**  
 CERMEL - LAMBARÉNÉ, GABON  
 Weizmann Institute of Science - REHOVOT, ISRAEL  
 Riken Institute - TOKYO, JAPAN  
 Pontifícia Universidade Católica do Rio Grande do Sul /  
 Research Station Pró Mata - SÃO FRANCISCO DE PAULA, BRAZIL  
 Universidade Federal do Rio de Janeiro - RIO DE JANEIRO, BRAZIL

## PARTNERS AT HOME

### Leibniz ScienceCampus on cognitive interfaces

The Leibniz Association's ScienceCampus focusing on cognitive interfaces was founded in Tübingen in 2010 as an interdisciplinary research network. Digital technologies enable us to access a vast flood of information, which can be seen as a human-machine interface which may be used in learning situations and in working life. ScienceCampus researchers investigate how these contact points must be designed to optimally promote knowledge gain and exchange, understanding, decision-making and problem-solving.

A number of the projects deal with information design, or which data from an individual or group may be made available and how this information can best be presented to improve knowledge-intensive processes.

The research network pools Tübingen expertise in psychology, informatics, didactics, medicine and education science in the area of digital education. The ScienceCampus is headed by Professor Ulrike Cress, director of the Knowledge Media Research Center, and Professor Bernd Engler, the University's president. It is funded by the state of Baden-Württemberg and the Leibniz Association.

### Ensuring crop yields in changing climates

Another key regional research alliance which the University of Tübingen is part of involves stabilizing crop yields in the face of global warming. The project also includes the Tübingen Max Planck Institute for Developmental Biology, and is headed by the University of Hohenheim.

The project, "Yield stability in dynamic environments" is sponsored by the Baden-Württemberg Ministry of Science, Research and the Arts with 900,000 euros over three years. The three partners together match that from their own coffers. The project spokesmen are Professor Uwe Ludewig of the University of Hohenheim, the University of Tübingen's Professor Klaus Harter, and Professor Detlef Weigel of the Max Planck Institute for Developmental Biology.

The goal is to find plants which will reliably produce crops even after extreme weather conditions and long dry periods. Crops bred for high yields lose genes and groups of genes – and with them, characteristics – which help plants fight stress factors such as drought and pests. Modern crops are therefore continually cross-bred with their wild distant

relatives, which still have that resistance. State-of-the-art high-throughput data analysis is used to select the most promising parent plants.

Breeding programs can take many years – and therefore may not be able to keep pace with climate change. For this reason the researchers are looking at the molecular level for further information on plant adaptivity, in order to introduce it systematically into crop breeding and cultivation.



## The Natural and Medical Sciences Institute

*NMI director Professor Hugo Hämmerle; the bridging professor of Pharmaceutical Biotechnology, Professor Ulrich Rothbauer; the future NMI director, Professor Katja Schenke-Layland; Dean of Science, Professor Wolfgang Rosenstiel; the bridging professor of Advanced Materials, Professor Jannik Meyer; and Vice-President for Research and Innovation, Professor Peter Grathwohl (from left)*

The Natural and Medical Sciences Institute at the University of Tübingen (NMI) was founded in 1985 and is an associated institute. The NMI is one of thirteen organization sponsored under the Baden-Württemberg innovation alliance, which support small and mid-sized enterprises in particular with application-oriented research. The broad-based, interdisciplinary institutes are key in the state of Baden-Württemberg's innovation and technology policy.

The NMI specializes in application-oriented research where the life sciences and the materials sciences overlap in three areas: pharmaceutical and biotechnologies, biomedical technologies, and surface and materials engineering.

With more than 200 employees in 16 working groups, the NMI offers a broad spectrum of skills, from the life sciences to materials sciences – and has many publications and patents to its credit. The working groups cooperate in interdisciplinary networks and complement one another in mixed-group project teams with external research groups from academies and commercial enterprises. This meant that in 2017 more than 50 joint research projects and 250 service projects could be advanced.

To help bridge the gap between academia and commercial practice, the University of Tübingen in 2011 set up a **Bridging Professorship of Pharmaceutical Biotechnology** and in 2017 another for **Advanced Materials**. University research groups are able to work closely with NMI scientists – in a successful model benefitting both sides.



## 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)
- Bernstein Network for Computational Neuroscience (Freiburg)
- 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)
- Forschungszentrum Jülich, member of the Helmholtz Association
- Fraunhofer Institute for Interfacial Engineering and Biotechnology (IGB, Stuttgart)
- Friedrich-Miescher-Laboratorium of the Max Planck Society (Tübingen)
- Heidelberger Academy of Sciences and Humanities
- Helmholtz Centre for Environmental Research (Leipzig-Halle)
- HEP – Senckenberg Center for Human Evolution and Palaeoenvironment (Tübingen)
- HIH – Hertie Institute for Clinical Brain Research (Tübingen)
- University of Applied Forest Sciences – Rottenburg
- Institute of Ethnic German History and Culture in Eastern Europe (Donauschwäbische Geschichte und Landeskunde)
- Institut für Rehabilitationsforschung, Qualitätsentwicklung und Strukturanalyse in der Behindertenhilfe (REQUEST) e. V. (Tübingen)
- Knowledge Media Research Center
- 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)
- Senckenberg Nature Research Society (Frankfurt am Main)
- 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

### In collaborative research centers/transregional collaborative research centers

- Plasticity and Sleep (SFB/TRR 654)
- Kiel University
- Lübeck University
- Liver Cancer – New mechanistic and therapeutic concepts in a solid tumor model (SFBTransregio 209)
- University of Heidelberg
- Hannover School of Medicine
- The Skin as a Sensor and Effector Organ Orchestrating Local and Systemic Immune Responses (SFB-Transregio 156)
- University of Heidelberg
- University of Mainz
- Biological Design and Integrative Structures Analysis, Simulation and Implementation in Architecture (SFB-Transregio 141)
- University of Stuttgart
- University of Freiburg
- Fraunhofer Institute for Building Physics (Stuttgart)
- Stuttgart State Museum of Natural History
- Pathophysiology of Staphylococci in the Post-genomic Era (SFB-Transregio 34)
- University of Greifswald
- University of Würzburg
- Control of Quantum Correlations in Tailored Matter (SFB-Transregio 21)
- Max Planck Institute for Solid State Research (Stuttgart)
- University of Stuttgart
- University of Ulm



### Baden-Württemberg funding for business start-ups

The University of Tübingen is receiving a total of 600,000 euros over three years from a funding program run by the state Ministry of Science, Research and the Arts to support those turning a good idea into a viable commercial venture.

The funding is aimed on the one hand at medical technology start-ups launched by students, researchers, and doctors. Our MedTech Start-Up School runs a 100-day program which helps participants to develop new products or service models for patient care.

On the other hand, we offer support for social innovation programs such as those run by the Global Ethics Institute. The program here seeks to formulate and develop ideas for social projects in areas such as sustainability, gender equality, education, politics and the economy. Participants devise organizational and business models for their idea – thereby learning about self-employment, working for not-for-profit organizations, and leadership roles in business and politics.

The Ministry funding also supports an innovation laboratory called Makerspace in Tübingen, where students and researchers can work on their ideas.





Rückgabe

# TEACHING AND ORGANIZATION

## CREATING STRUCTURES FOR INNOVATION

The University of Tübingen is overhauling its teacher-training programs to bring them into line with European Bachelor and Master structures – and at the same time, giving them a new orientation and flexibility for the future as society changes. We are introducing new health professional training to meet growing needs, and we are carrying out vital building projects to ensure our research and teaching takes place in the best possible conditions.

### ENROLLMENTS REMAIN HIGH

Winter semester 2017-18 student numbers were slightly down in but remain close to the historical highs of recent years.

New enrollments by German students eased by 8.7 percent. New enrollments by non-Germans fell by 10.9 percent. Tuition fees were introduced in the state of Baden-Württemberg in winter semester 2017-18. They are applicable in two cases: new enrollments by non-EU/EEA citizens, who are now charged a tuition fee of 1500 euros per semester if they are not eligible for a waiver; and new enrollment in a second degree by any person already holding a degree. That now incurs a tuition fee of 650 euros per semester.

#### Student numbers at a glance

##### Enrollments

| Winter semester 2017-18 | Total  | Female |            | International students |            |
|-------------------------|--------|--------|------------|------------------------|------------|
|                         |        | Count  | Percentage | Count                  | Percentage |
| <b>Total</b>            | 27,741 | 16,191 | 58.4%      | 3,891                  | 14.0%      |
| <b>New enrollments</b>  | 5,197  | 3,140  | 60.4%      |                        |            |

##### By Faculty or institution

| Faculty                       | Winter semester 2017-18 |
|-------------------------------|-------------------------|
| Protestant Theology           | 535                     |
| Catholic Theology             | 205                     |
| Law                           | 2,220                   |
| Medicine                      | 3,907                   |
| Humanities                    | 8,197                   |
| Economics and Social Sciences | 4,440                   |
| Science                       | 8,015                   |
| Center of Islamic Theology    | 170                     |
| Leibniz Kolleg                | 52                      |

## Teaching-degree studies reorganized

Education training is one of our core strengths. We began with the upgrading of our teaching degrees in winter semester 2015-16 with the reorganization from the previous Staatsexamen courses to the new Bachelor of Education (B.Ed.) und Master of Education (M.Ed.) degree programs. The new generation of teachers in training will usually have two school subjects of equal weighting. New elements in the courses are inclusion and heterogeneity, digital media, and education for sustainable development.

## Master's program in Cultures of the Global South

The Master's program Cultures of the Global South – Culturas del Sur Global – Cultures du Sud was launched in winter semester 2017-18. Run by the Romance Languages and English Language institutes, the focus is transregional and linked with departments both within and outside the Faculty of the Humanities – including Cultural Anthropology, Education Science, Media Studies, and History. It may be studied completely in English and French or Spanish, making it attractive to international students and giving impetus to the intercultural dialogue. A prerequisite for enrollment in this Master's program is a Bachelor's degree in a relevant literature, culture, or social studies subject. Students can compare the cultures of the global south in Latin America, Africa and Asia via a range of subjects and reflect on issues such as colonialization, migration, transculturation, globalization and geopolitical integration. A semester abroad at one of our partner institutions in Latin America, Africa and Asia allows students to examine the issues from a global south perspective.

## Development of new programs

In November 2017 Tübingen's Faculty of Medicine and Esslingen University of Applied Sciences founded a joint Health Campus to develop four new qualification programs for health care professionals.

The following are planned:

- a Bachelor's program in Nursing Care for 60 students, set to begin in winter semester 2018-19;
- a Master's program in Nursing Science;
- a Master's degree in Population-Based Medicine;
- a Bachelor's program in Midwifery Science.

These programs are designed to allow participants to obtain health care training at university level to ensure they have solid scientific knowledge in their fields.

The new Nursing Care degree will train graduates over seven semesters in general nursing as well as in one of the electives patient care, paediatric nursing, or geriatric nursing. The two institutions will cooperate with the Tübingen University Hospitals and other regional partners. Midwifery Science is also a seven-semester program. This training for health care professionals will introduce the latest scientific findings into patient care faster. The University Hospitals' Department of Gynecology and Obstetrics is an important partner.

The two Master's degree programs will each encompass three semesters and are aimed at graduates of health care-oriented first degrees. The planned English-language Master's degree in Population-Based Medicine has an international and interdisciplinary orientation. Its primary goal is to merge health care expertise and medicine from an international perspective. And the Nursing Science Master's program will teach in-depth scientific material and empirical methods.



## 2017 University Teaching Prize for refugee math project

The 2017 Teaching Prize went to Assistant Professor Carla Cederbaum and Dr. Stefan Keppeler for their course "Mathematics! Students teach refugees." The course helped prepare refugee students for university-level math using informal methods. Teaching-degree students conducting the course obtained experience with inhomogeneous classes with no common language.

<https://studierende-unterrichten-fluechtlinge.blogspot.de>

## Student Commitment Prize for "Loud Europeans"

Students running the website "Laute Europäer" took the 2017 Commitment Prize. They are using the platform to promote European unity by writing blog posts and making podcasts. The student group set up the website in winter semester 2016-17, investing their own time and money. Their goal is to have an "unbiased, informative and strong" say in the European debate.



The President and his team: Dr. Andreas Rothfuss, Professor Monique Scheer, Professor Bernd Engler, Professor Karin Amos and Professor Peter Grathwohl

## UNIVERSITY MANAGEMENT

### The President's Office

---

#### President

Professor Dr. Bernd Engler  
Institute of English Languages and Literatures

---

#### Executive Vice-President

Dr. Andreas Rothfuss

---

#### Vice-President for Academic Affairs

Professor Dr. Karin Amos  
Institute of Education

---

#### Vice-President for Research and Innovation

Professor Dr. Peter Grathwohl  
Applied Geoscience

---

#### Vice-President for International Affairs

Professor Dr. Monique Scheer,  
Ludwig Uhland Institute of Historical and Cultural  
Anthropology

---

**Professor Karin Amos** was reelected to the position of Vice-President for Academic Affairs by the Senate in May 2017. Her term of office is three years from October 2017. Karin Amos is a professor of General Education at the University of Tübingen. After working in Oakland, California, Vienna, and Frankfurt am Main, she was appointed to her current professorships at the University of Tübingen in 2006.

### Steady development

One of the University's most important policymaking bodies, the **Board of Trustees**, has a new chairman, **Professor Antonio Lopreno**, who replaces the long-serving Professor Wilhelm Rall. The Board's newest member is **Bernhard Sibold** of the Bundesbank in Baden-Württemberg.

The University is growing; this is reflected in our increasing number of professors and employees overall. And it is made visible at our Morgenstelle Campus, where more new buildings for scientific research and teaching are taking form.

After a 14-month construction period, the **Environmental and Geoscience Center (GUZ)** building was formally handed over in February 2017. Twenty working groups in three research fields will work there, close to other natural sciences disciplines.

The GUZ is a top priority in our Campus strategy, which we have been pursuing since 2008. Its goal is to streamline University institutions' organization and to ease the pressure on our historical buildings while ensuring financing for long-term renovation and building plans. The GUZ cost 64.4 million euros,



The new Eye Hospital is located next to the Ear, Nose and Throat Hospital.

with a further 8 million earmarked for equipment and fittings. The geoscientists are set to move in at the end of 2018.

Another advanced building project at Morgenstelle Campus took a big step forward in July 2017 with the handover of the future home of the **Interfaculty Institute of Biochemistry (IFIB)** after a 19-month basic construction period.

The new building is adjacent to the Center for Plant Molecular Biology (ZMBP). This will promote intense scientific communication between research groups and enable shared use of technical infrastructure. The project is expected to cost a total of 41.2 million euros.

The keys to the new **Eye Hospital and Integrated Research Center for Ophthalmology** were handed over to the Tübingen University Hospitals in March 2017. The new hospital houses all of the branches of ophthalmology at the University and makes it easier for new scientific developments to be adopted into patient treatment and care.

The Eye Hospital is located on Schnarrenberg Medical Campus, adjacent to the Ear, Nose, and Throat Hospital. The 53-million euro building was financed by the state of Baden-Württemberg, the University and University Hospitals, and the German federal government.

### Professors at the University of Tübingen in 2017

including junior and assistant professors

|                                 | 2017       |            |            |
|---------------------------------|------------|------------|------------|
|                                 | Total      | Male       | Female     |
| Protestant Theology             | 10         | 8          | 2          |
| Catholic Theology               | 14         | 11         | 3          |
| Center of Islamic Theology      | 7          | 5          | 2          |
| Law                             | 20         | 18         | 2          |
| Medicine                        | 118        | 98         | 20         |
| Humanities                      | 97         | 64         | 33         |
| Economics and Social Sciences   | 66         | 47         | 19         |
| Science                         | 189        | 147        | 42         |
| Knowledge Media Research Center | 8          | 5          | 3          |
| Central institutions            | 4          | 4          | 0          |
| <b>Total</b>                    | <b>533</b> | <b>407</b> | <b>126</b> |

As of: 30 June 2017



# CELEBRATING KNOWLEDGE



## FOCUS ON COHESION

In a troubled geopolitical year, the University of Tübingen hosted a number of prominent speakers with messages about the importance of tolerance and unity. Even as basic scientific facts were being denied, thousands of people in Tübingen joined the March for Science on Earth Day. And in a time in which it is essential to be sure of your identity, 2017 saw a number of anniversaries and further events which gave the University of Tübingen the opportunity to reflect on its traditions. Our most ancient cultural link was celebrated by UNESCO.

### BUILDING THE FUTURE ON THE PAST

#### Ice Age art caves declared UNESCO World Heritage sites

The artists are unknown – but their works are now famous. The Ice Age figurines and musical instruments found in the upper Danube region are the world's oldest known three-dimensional art. In July 2017 the United Nations Educational, Scientific and Cultural Organization recognized six caves of the Swabian Jura as part of the World Heritage. The caves in the valleys of the Ach and Lone rivers in the vicinity of Ulm, Blaubeuren and Heidenheim were entered into the World Heritage list under the title "Caves and Ice Age Art in the Swabian Jura."

University of Tübingen archaeologists have been working in the caves since the early twentieth century, unearthing the earliest evidence of figurative art, music, and religious belief.

The ivory figurines of animals and part-humans, the "Venus" of Hohle Fels, and bone flute fragments were made during the last Ice Age, some 40,000 years ago. They are unique artifacts and invaluable to the study of human history.

Professor Nicholas Conard of the Senckenberg Center for Human Evolution and Palaeoenvironment at the University of Tübingen has headed the field work in the Swabian Jura since 1996. The first figurines of bone and mammoth ivory were found in 1931 by the Tübingen archaeologist Gustav Riek. They included the University of Tübingen Museum's iconic Wild Horse figurine. Most of the original finds from the Ice Age caves can be viewed at the Museum Alte Kulturen at Hohentübingen Castle.



## Anniversaries

The Department of Economics celebrated **200 years of Economics studies** at the University of Tübingen. It began with a Professor of Accounting in 1796; political turmoil and poor harvests in the early nineteenth century led the government to pay closer attention to the public economy. In October 1817, the Faculty of State Economics was established – with no less than five professors. The discipline has come a long way since then. Tübingen now offers research and teaching across a broad spectrum of Economics subjects, seeking a better understanding of economic causes and effects in politics and in the national, European and global economies. 200 years on, the discipline has nearly 1900 students and the University of Tübingen offers three Bachelor's and nine Master's degrees in various branches of Economics.

The University's **Tropical Medicine celebrated its 100th birthday**; in a century it has gone from Medical Evangelism to a modern center for infection and vaccines research. In July 1917 Gottlieb Olpp, Director of the German Institute of Medical Evangelism, became an associate professor in Tübingen. The Institute of Tropical Medicine itself was established in 1956 and has vital national and international ties reinforcing its infectiology and tropical diseases research. It also provides vaccinations for travelers. The Institute cooperates with scientific institutions in Benin, Brazil, Gabon, the UK, India, Congo, the Netherlands, Austria, Togo, the US and Vietnam. It coordinates major international projects and multi-centric clinical studies. Alongside patient-oriented research into chemotherapy for infectious diseases, testing vaccines for diseases such as ebola are key. The institute also uses model systems for malaria and parasitic worm infections like filariasis, schistosomiasis, and echinococcosis.

The **Faculty of Catholic Theology marked its 200th anniversary** under the motto "Not without the Others." The Napoleonic Wars left largely Protestant Württemberg with new territories which were home to Roman Catholic populations. There was a need for Catholic priests – and the first professors to train them arrived in Tübingen for the winter semester of 1817. What began as a state control measure became an opportunity for the theologians to enter into critical dialogue with the Church, the state and society – and to work with neighboring disciplines. The Faculty marked its founding with a two-day conference reflecting on the role of Catholic Theology in the modern university.



*Philologist and writer Walter Jens founded the Institute of Rhetoric in 1967.*

The **Institute of Rhetoric commemorated 50 years** since it was established in 1967 by the philosopher and writer Walter Jens. In that time, the institute has trained some 500 students and has become a European leader in its field. Over the past five decades, it has produced some influential ideas. Walter Jens was one of West Germany's leading intellectuals and had a lasting influence on political discourse in this country. The institute catalyzed major philological projects such as the *Historische Wörterbuch der Rhetorik* and made important contributions to rhetorical theory. The institute upholds a more than 500-year history in Tübingen – where the first Professor of Rhetoric was appointed in 1497. The institute's influence was reflected in the commemoration ceremony, at which the President of the Bundestag, Norbert Lammert, spoke about the role of rhetoric in democracy. The subject is no longer just about oratory – it now includes visual and digital communication, social media and the role of propaganda in various societies.



*The 40,000 year old figurine of a wild horse from the Vogelherd cave is the iconic badge of the University of Tübingen Museum.*

*Evasive about her age: The Venus of Hohle Fels is around 40,000 years old.*

## DISTINCTIONS AND AWARDS



*Lucas Prize laureate, Dr. Joachim Gauck*

The **2017 Dr. Leopold Lucas Prize** went to **Joachim Gauck**, who had recently left the post of President of Germany. The Faculty of Protestant Theology bestowed the award for Gauck's unflinching commitment to freedom and tolerance as well as for his solid academic work. The jury praised his opposition to political populism. Joachim Gauck, born 24 January 1940, served as President of Germany from March 2012 to March 2017. A former Lutheran pastor, he came to prominence as an anti-communist civil rights activist in East Germany. From 1991 to 2000, Gauck headed the office administering the archives of the former East German secret police, the Stasi. The €50,000 Prize pays tribute to outstanding achievements in the fields of theology, intellectual history, historical research, and philosophy. The Dr. 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.

At the suggestion of the Faculty of Humanities, the 2017 Lucas Prize for Junior Researchers went to outstanding Kant scholar, **Dahan Fan**. Fan was selected for his doctoral thesis on the famous German philosopher.

The **Faculty of Protestant Theology conferred an honorary doctorate on the Ecumenical Patriarch of Constantinople, Bartholomew I**, in May 2017. The Dean, Professor Michael Tilly, paid tribute to the Patriarch's many years of service to better understanding between the Eastern Orthodox and the German protestant churches. The Patriarch made contact possible between the two confessions, thereby deepening understanding and promoting academic exchange. Some 200 guests from across Europe attended the ceremony in Tübingen's Collegiate Church. In his address, the Patriarch spoke on loyalty and openness. This distinction in 2017 – the 500th anniversary of the Protestant Reformation – underscores theological contacts between the Lutheran and Eastern Orthodox Churches, which existed as early as the 16th century.



*The recipient, Professor Heiner Bielefeldt*

Theologian, philosopher and historian **Professor Heiner Bielefeldt** received the **Faculty of Catholic Theology's Alfons Auer Ethics Award** in November 2017. The Award is given biennially to a person who has made a special contribution to religious, academic or social ethics. The intention is to send a message about the importance of human rights and the resonance of the word of God in a multicultural and multireligious society. The 25,000 euro prize is sponsored by the entrepreneur Siegfried Weishaupt and is a tribute to the moral theologian Alfons Auer. It was inaugurated in 2015 and is awarded every two years. Heiner Bielefeldt is a German philosopher, historian and Catholic theologian. He is Professor of Human Rights and Human Rights Policy at the University of Erlangen. In 2010, he was appointed United Nations Special Rapporteur on Freedom of Religion or Belief.

*Patriarch Bartholomew holding his address at the University*

## PROMINENT SPEAKERS

### State premier speaks at the 12th Global Ethics Lecture

“Cohesion in times of turmoil” was the focus of the Global Ethics Lecture given by Baden-Württemberg state premier Winfried Kretschmann in February 2017. Kretschmann, a member of Germany’s Green party, stressed that society, media, and policymakers had the ability to bring a nation together in the face of terrorist attacks and other challenges – such as the hosting of refugees – as well as the power to break it apart. He said that individuals too had the responsibility to work for cohesion, and reminded his audience that turmoil – whether religious, political, industrial or digital – is part of life and must be dealt with. Social change produced winners

and losers, he said, and it is policymakers’ duty to help the losers. He added that social cohesion is only possible if everyone in society is willing to tolerate differences. He called religions one of civil society’s foundations, which in times of trouble was called upon to reject fanaticism and violence. The Global Ethics Lectures have been organized jointly by the Global Ethic Foundation and the University of Tübingen since 2000.



*Global Ethic speaker Winfried Kretschmann (right) with the Global Ethic Foundation president, Eberhard Stilz*

### Crime writers at the 2017 Writers’ Lectureship

“Poetics of Crime” was the theme of the gathering from 21 to 28 November 2017, at which the writers **Friedrich Ani**, **Arne Dahl**, **Håkan Nesser** and **Wolfgang Schorlau** discussed their work. It was the 31st Writers’ Lectureship, sponsored by Adolf Würth GmbH & Co. KG and the Würth Foundation. Crime and detective novels, roman noir, and thrillers were until quite recently all considered light reading with little or no literary value. Speaking to crowded lecture halls, the crime writers tackled the question of whether crime writing is a serious literary genre. Swedish author Arne Dahl said the crime novel was a medium which had the power to address the fears of both writer and reader. Wolfgang Schorlau stressed that good stories require good writing and said his crime stories were also social analysis. Politics, business, and the society as a whole all play a role in good crime writing. Dahl also pointed out that the boom in Swedish crime writing is linked to the still unsolved murder of prime minister Olof Palme in 1986 – which shattered Swedes’ idyllic image of their country and turned them into a nation of private detectives.



*Håkan Nesser*



### Sociologist Bruno Latour delivers Unselde Lecture

The French sociologist and philosopher Bruno Latour held the University of Tübingen's 10th Unselde Lecture in May 2017. Latour argues that human beings are not superior rulers over nature, but are closely intertwined with it. He told the crowded Audimax about his Gaia theory, which claims that global progress is an undesirable utopia. He criticises the modern world's perception of itself and the belief that nature and human culture can be kept separate – pointing out that humans are facing new natural disasters which are at least partly man-made. Latour says that humans are starting to realize that they are ultimately dependent on nature, as science reveals Gaia to be a delicate construct of interdependencies and mutual relationships. Latour also held a master class workshop at the Forum Scientiarum for doctoral candidates and postdocs from around the world. The workshop featured a "Parliament of Things," in which the Mississippi River itself and the animals living in it, the river sand, a hurricane, and an industrialist were represented in a debate on the expansion of the Mississippi Delta. Latour is director of the MediaLab at Sciences Po Paris and a guest professor at Cornell University in Ithaca, USA. Latour is known for his work in the area of investigation into the impact of science and technology, which has received the critical attention of researchers across the disciplines, particularly in the Humanities and Social Sciences. The University's Forum Scientiarum holds the Unselde Lectures in cooperation with the Udo Keller Foundation Forum Humanum and Suhrkamp Verlag publishers.



### Media Lecture by Georg Mascolo

At the 14th annual Media Lecture in June 2017, the journalist Georg Mascolo tackled the subject of "the war of the words – facts, fakes, and the new power of lies." As head of the research network for the German broadcasters NDR, WDR and the broadsheet Süddeutsche Zeitung, it is Mascolo's job to distinguish fact from fiction. He said that rumors and half-truths in a democratic society may become a serious problem if there is widespread distrust in the media. As conventional journalism becomes weaker, public relations and spin doctors get stronger. A small number of platforms and search engines are effectively monopolies which drive the news exposure of billions of people via algorithms which are not transparent or accountable. Mascolo – who was Germany's political journalist of the year in 2014 – analyzed populist propaganda, placing Donald Trump's election to the US presidency in that context. Mascolo said the crisis of confidence meant that conventional journalism would have to change – becoming more critical of its own failings. Reliable information, he said, was like education, health care, and clean water – it is a basic right. The Media Lecture is sponsored by regional broadcaster SWR and is intended to inspire future journalists.

*Top left:  
Bruno Latour (left) debates with a master  
class participant at the Forum Scientiarum*

*Bottom left: Georg Mascolo*

### Tübingen marches for Science

In response to an increasingly anti-science mood, Tübingen researchers answered the call by US colleagues and joined millions of people around the globe in a March for Science in April 2017. More than 2,700 people attended the Tübingen rally. "Attacks on science are attacks on us all, no matter where we carry out research, teaching, or where we study," said President Bernd Engler. Anyone who bullies universities and researchers, and who claims their findings are merely opinions, is endangering our future, he said. For that reason, organizers chose 22 April for the march; it is international Earth Day. "I am very glad that researchers from this University, the University Hospitals, and the non-university research

institutions joined together several months ago to organize a March for Science here in Tübingen," the President said. "Because there is no alternative to facts."

*University of Tübingen members march for Science in April 2017.*



### Tribute to Honorary Senator Martin Roth

University of Tübingen Honorary Senator and Tübingen alumnus Martin Roth passed away in August 2017. The former director of the Victoria and Albert Museum in London, the Dresden Hygiene Museum, and the Dresden Staatliche Kunstsammlungen worked to extend the influence of science and the humanities across society. Tübingen president Professor Bernd Engler said the University had lost a friend and ambassador. He called Roth a European in heart and soul, who always spoke out in favor of a free and open society.

*Professor Martin Roth*



---

## Imprint

Annual Report 2017  
University of Tübingen  
Geschwister-Scholl-Platz  
72074 Tübingen  
info@uni-tuebingen.de

Published by the President of the University of Tübingen  
Professor Dr. Bernd Engler

Editor: Janna Eberhardt, University of Tübingen, Public Relations Department

English translation and editing: Amanda Crain, University of Tübingen,  
Public Relations Department

Layout and design: Gabriele von Briel and Elke Neudert, University of Tübingen,  
Public Relations Department

Printing: Stengel und Partner, Reutlingen

Paper: Circlesilk Premium White, made from 100 % recycled fiber

Copies printed: 600

© University of Tübingen 2018

Reproduction in whole or in part with permission of the publisher only.

---

Photography and images:

Jörg Jäger Titel (both), pp. 5, 30; Paul Mehnert p. 3, 50 (left); Berthold Steinhilber/laif pp. 9, 11 (left), 17, 20; University of Tübingen pp. 9, 33; Wolfram Scheible pp. 11 (right), 9; Max Planck Institute for Biological Cybernetics p. 13; Friedhelm Albrecht pp. 10 (both), 14 (both), 15 (middle and right), 22, 40, 44, 45, 46, 51, 52 (bottom); Natalia Reagan/nataliareagan.com p. 15 (left); Simone Pfeiffer p. 18; Max Ihmels p. 19; Simona Steeger p. 24; Nicola Vitiello p. 25; Christoph Jäckle pp. 27 (left), 32; Harald Naegeli, © VG Bild-Kunst, Bonn 2017 p. 27; Verena Müller p. 43; © a3701027/fotolia p. 36; NMI pp. 37, 39; Hanna Diederichs gen. Thormann p. 53 (right); Hildegard Jensen pp. 48, 49 (left); Seminar für Allgemeine Rhetorik p. 49; Paul Mehnert p. 50 (left); Ulrich Metz p. 50 (middle); Harald Sippel p. 50 (right); Caroline Andersson P. 51 (right); David Klumpp p. 52 (top); Antje Karbe p. 53 (left)





