Göttingen
Campus

THE GÖTTINGEN CAMPUS

A STRONG ALLIANCE

CONTENT

“ONE OF THE BEST PLACES TO LIVE AND BREATHE SCIENCE”

The Göttingen environment stands for international cutting-edge research. To ensure that this continues in the future, ten research institutions have combined forces in one place at the Göttingen Campus. A three-way conversation with Prof. Ulrike Beisiegel, Prof. Herbert Jäckle and Prof. Heyo K. Kroemer about shared objectives, learning processes and future plans.

INTERVIEW BY VERONIKA RENKES, 2015

Prof. Beisiegel, you are President of Göttingen University and Chair of the Göttingen Campus Council with the task of advancing the development of the Göttingen Campus. Can these roles be combined?

Beisiegel: Both roles fit very well together. The University is not only the centrepiece of research and teaching within the academic system, but also at the heart of Göttingen. The non-university research institutions in Göttingen are excellent and they are important partners for us. Consequently, in the first instance the Göttingen Research Campus was founded to facilitate collaborative projects between non-university institutions and ourselves. This highlighted the need to set up a coordinated panel, the Göttingen Campus Council (formerly Göttingen Research Council), where we discuss strategic orientation with our partners and make decisions.

Prof. Kroemer, how does the University Medical Center Göttingen benefit from being a member of the Göttingen Campus along with nine other research institutions?

Kroemer: At the University Medical Centre we have closely linked research, teaching and patient care, and now we are recording medical advances at a pace that we have not yet experienced. Our specific focus is the translational element of basic research into clinical application and patient treatment. This form of translational medicine is a success both with internal University groups as well as at the Max Planck Institutes and other non-university institutions.

Prof. Jäckle, why is it attractive for Max Planck Institutes, which represent international leading research, to be partners within a local research network?

Jäckle: We have the opportunity here to entice the best students to Göttingen and to be jointly involved in their training. We can optimally combine our resources for dual career opportunities, career development for early career academics and for retention negotiations. That means efficiency and compatibility apply for practically every relationship.

What differentiates the Göttingen Campus from other urban centres with a similar concentration of research institutions?

Jäckle: A major advantage is easy access – our

From left to right:
Prof. Heyo K. Kroemer, Speaker of the Board and Chairman of Research and Teaching at the University Medical Centre Göttingen (UMG)

Prof. Ulrike Beisiegel, President of the University of Göttingen

Prof. Herbert Jäckle, Managing Director of the Max Planck Institute for Biophysical Chemistry in Göttingen

facilities are just a short walk apart. It is also incredibly important that in Göttingen mutual trust has emerged among the individual research institutions. Everyone has recognized that although we have different mandates from the taxpayer, our individual tasks ideally complement each other.

Beisiegel: It is also beneficial that the Göttingen Campus has evolved over a longer time period. The academics personally set up the initiatives. Thus, structures could evolve, coupled with establishing a basic level of trust. The high concentration of research institutions contributes to a unique academic atmosphere across the city.

How has the collaborative work developed over the years at the Göttingen Campus?

Beisiegel: Thanks to the exceptional research collaboration between university and non-university research institutes, over the past five years even more collective Collaborative Research Centres have emerged. Today, our research structures are characterized by a high level of efficiency. One telling aspect of the development is that the former Göttingen Research Campus is now simply called the Göttingen Campus. We also use shared infrastructure and closely cooperate in research-oriented teaching and support for early career academics.

Jäckle: Collaborative activities emerged from personal contacts and by taking a step-by-step approach to working together. It was a process beginning at the bottom and filtering through to the top. Initially, there were joint International Max Planck Research Schools and early career academics at Göttingen's Max Planck Institutes, who had not completed their Habilitation, were entitled to submit applications for their doctorate. Afterwards we established joint institutions such as the European Neuroscience Institute. We also appointed University professors as Max Planck Fellows. They have labs at the Max Planck Institutes and can use our infrastructure.

Kroemer: The intensive collaborative work leads to entirely practical and constructive results such as the cross-institutional and legally binding arrangement

between the Max Planck Society and the University Medical Centre. This enables us successfully to conclude retention negotiations for prominent researchers. We would not achieve this as a single institution.

What are the shared objectives that unite you and your network partners?

Kroemer: We are incredibly interested in the translational aspects of basic research into patient care. One example is the findings of Nobel Prize Laureate Stefan Hell, which enable seeing structures that were not visible before.

Jäckle: Our concern is also to win the competition for the best minds – whether in research or teaching, nationally and internationally, from undergraduates to professors or the Max Planck Director.

Where are there clear delimitations of collaborative efforts?

Beisiegel: We emphasize that we are a Campus made of independent and diverse institutions. Our diversity is important both for our students and for our researchers. As a university, of course, we have a specific interest in teaching. Here, not all partners are always involved, even if they are actively committed to research-oriented teaching.

Jäckle: Important aspects to us are independent appointments, the establishment of specific research interests at each institute and our loyalty to the Max Planck Society. We cannot always take our partners into consideration when it comes to the acquisition of equipment and infrastructure measures. Our teaching obligations must remain flexible. Our actual mandate is research and we are assessed exclusively in terms of our research success. Hence, the time left for teaching is minimal, but we are happy to participate.

Kroemer: The University Medical Centre is also a major business enterprise. This has a big influence on how we define our activities. There are naturally limits to cooperation in this field. However, this does not restrict the collaborative work in research and teaching.

How do you ensure that, firstly, all partners work towards the same goals and, secondly, have an equal say in decisions?

Beisiegel: We reach agreement within the Göttingen Campus Council and we consult each other on our strategic considerations. This is the forum where we communicate quite openly, flexibly and on a mutually trusting basis – even when we go our separate ways. The fact that all ten partners keep the same objectives in mind is simply due to the success of our collaborative effort.

A cross-institutional network thrives on the fact that everybody can identify with it. What internal measures are in place to ensure that your researchers and staff focus not purely on their own field of work?

Kroemer: The working environment can be organized in a way that makes it attractive to work together with other Campus institutions. We support this at the executive level and, if necessary, we also make resources available for this. Often, this is not even necessary because the collaborative effort creates new added value. At the Campus, in general, academics enjoy close collaborative links that are then supported by management or administrative staff.

Jäckle: The point is to provide a continual convincing case for being stronger together than when acting independently. We ideally complement each other's skills and only on this basis can we convince the best students and postdocs that we have a small but beautiful research Campus in Göttingen where research endeavours thrive everywhere.

What defines the "Göttingen spirit" for you? This is often mentioned in connection with the newly formed Göttingen Campus.

Beisiegel: The academic successes and excellent research conditions together contribute to this feeling, along with a good social environment. Here academic research is not only practised collectively, but positive social conditions and contacts are also cultivated. This combination has convinced me that the "Göttingen

"The high concentration of research institutions contributes to a unique academic atmosphere across the city."

spirit" is alive and well. It includes family-friendly working conditions, diversity, nursery facilities and our brilliant Welcome Centre for our international guests. In summary, the Göttingen Campus is one of the best places to live and breathe science.

Kroemer: I can only support this message. Additionally, we attempt to provide excellent conditions for our academics and staff who work in difficult prevailing circumstances – in particular, with regard to clinical work.

Jäckle: In Göttingen there are frequent meetings. They allow establishing trust and respect and breaking down any envious attitudes about resources. Here we engage in our own identity building or, as they say in Munich, "mia san mia" ("we are we").

The next Excellence Initiative is around the corner: what consequences did you draw from the failure of Round Three, and what joint strategy are you pursuing for 2017?

Beisiegel: The international panels of experts gave a very positive assessment for the strategy presented back then by the University and the Research Campus. We successfully implemented major parts of our strategy, albeit at a slower pace and with fewer funding resources. This is a good basis for the further development of our strategic plan now. To this end we have jointly identified pivotal academic research interests, and we will also bring these together within a cross-institutional organizational structure.

Jäckle: What we have learned and intend to change is that we are always acting together, yet this time we all need to pull in the same direction. We are doing good work and we are putting what we say into practice. We have also taken on board that we have to voice what we are doing loud and clear – not merely conversing in whispers, as we did in the past. We cannot rely on the fact that others will understand us in any case.

Kroemer: We are consistently developing the many positive things that emerged from the Excellence Initiative. We have developed a joint Campus strategy and regarding the Clusters of Excellence in particular, we will present a Campus-wide approach.

Research institutions also have social responsibility: what are you doing in the light of the migrant crisis?

Beisiegel: We are facing up to this responsibility. For example, our annual conference "Science for Peace and Sustainability" focuses this year on the subject of "Migration". In addition, along with other universities in Lower Saxony, we are involved in language courses for refugees and in making university places available.

Kroemer: We are directly involved in medical healthcare. We are integrated in initial medical examinations of refugees and have also started academic research on this. We are analyzing the palliative medical situations of migrants in flight and we are providing the full spectrum of our University Medical facilities to support them.

Jäckle: Currently, we are planning a joint programme with the Southern Lower Saxony Educational Cooperative (Bildungsgenossenschaft Südniedersachsen eG) and facilitate training opportunities for refugees at our institutes.

The interview was conducted by Veronika Renkes who is an academic journalist in Berlin.

EXPERTISE ACROSS A WIDE RANGE OF DISCIPLINE

At the Göttingen Campus, approximately 5,900 researchers are active in a wide range of academic disciplines. We present six of them here.

EXPERTISE ON MIGRANT ISSUES

Prof. Christine Langenfeld is a busy woman. As the Chair of the Expert Council of German Foundations on Integration and Migration (SVR), an independent Expert Council, she works on behalf of those individuals who seek protection in Germany – currently a hot topic. At the University of Göttingen she is the Director of the Department of State Law at the Institute of Public Law where her research areas include migration law, basic rights and human rights protection as well as European law. Her expertise makes a full contribution to refugee issues and other areas of migration and integration policy.

The expert in state law had already gained international experience during her study year in Dijon. She was awarded the Augsburg Research Prize for her habilitation thesis on "Integration and Cultural Identity of Immigrants in the Federal Republic of Germany". "It is a huge bonus that the Max Planck Institute has arrived in Göttingen to conduct research into multireligious and multiethnic societies", says Langenfeld. "It shows how attractive the University is as a place for interdisciplinary research in the fields of migration, diversity and integration."

UNDERSTANDING THE AUDITORY SYSTEM – RESTORING HEARING

Prof. Tobias Moser is the Director of the Institute for Auditory Neuroscience at the University Medical Centre Göttingen (UMG). He is a leading international researcher on synapses in the auditory system and a top-level researcher on the physiology and pathophysiology of the auditory system. His research team succeeded in using optogenetic stimulation of the auditory nerve. This method promises new research approaches, and substantial performance improvements of the cochlear implant.

Moser studied medicine in Leipzig and Erfurt. He is Chair of the Collaborative Research Centre "Cellular Mechanisms of Sensory Processing". In addition to his close contacts within the UMG and University, he works in close cooperation with "satellite groups" at the German Primate Centre and at two Max Planck Institutes of the Göttingen Campus.

Tobias Moser has received several awards for his studies, such as the renowned Gottfried Wilhelm Leibniz Prize and an Advanced Grant of the ERC in 2015. Recently, the medical researcher was appointed as a Max Planck Fellow.

MODERN CHINA WITH A SPECIAL EMPHASIS ON GLOBAL HISTORICAL PERSPECTIVES

Well-travelled and proficient in other cultures: before his arrival at the University of Göttingen in 2015, and since then holder of the endowed professorship of Volkswagen AG "Modern China with a Special Emphasis on Global Historical Perspectives", **Prof. Dominic Sachsenmaier** was Professor at Duke University in North Carolina and at the University of California in Santa Barbara.

His professorship is within the Department of Chinese Studies. He also belongs to the Centre for Modern East Asian Studies (CeMEAS) which closely collaborates with the Max Planck Institute for the Study of Religious and Ethnic Diversity in Göttingen, the German-Chinese Institute for Intercultural German Studies and Culture Comparison and the German-Chinese Institute for Legal Studies – both cooperative institutions of the Universities of Göttingen and Nanjing.

Sachsenmaier's special research interests include China's transnational and global connections in the past and present. His current research focus is on Sino-European cultural contacts in the 17th century. In Göttingen he makes a significant contribution to interdisciplinary research and teaching in Chinese Studies, and participates in the study of transregional and global perspectives.

FROM A SMART IDEA TO THE NOBEL PRIZE

Prof. Stefan Hell has cleared up an old dogma dating back almost 150 years: namely, that the maximum resolution of light microscopy is restricted to about 200 nanometers due to the Abbe diffraction limit. Even as a young physicist he was convinced that this limit could potentially be overcome – a revolutionary idea. Hell was proved right: the Stimulated Emission Depletion (STED) Microscopy developed by him today achieves a resolution up to ten times higher than before. In principle, it is unlimited.

Nevertheless, at the outset Hell had to fight for a long time to gain academic recognition. Initially, he could not find any funding for his idea in Germany. He went to Turku, Finland, yet did not lose sight of his goal. His staying power was rewarded: in 1997 as group leader at the Max Planck Institute for Biophysical Chemistry (MPI-BPC) in Göttingen, he was given the chance to put his idea into practice.

The breakthrough came in 2000: in no time at all STED actually revolutionized light microscopy – meanwhile, the method has been adopted worldwide. It opens up previously unimaginable insights into the nano cosmos of living cells and new possibilities for biomedical research. Today, Stefan Hell is a multi award-winning Director at the MPI-BPC. In 2014, he received the Nobel Prize for Chemistry for his pioneering work.

MARKING AND VISUALIZING BIOMOLECULES

Since the award of the Nobel Prize to Prof. Stefan Hell everyone is talking about high resolution microscopy. To ensure the beneficial use of these types of techniques, the molecules under examination must be marked as precisely as possible. This involves chemistry and therefore also **Prof. Claudia Höbartner**. After her activities as research group leader at the Max Planck Institute for Biophysical Chemistry in Göttingen, since autumn 2014 she has directed the working group for "Biomolecular Label Chemistry" at the University's Chemistry Faculty. This was set up in the context of the Cluster of Excellence "Microscopy within the Nanometer Range and Molecular Physiology of the Brain".

A research focus for the Austrian chemist is the synthesis of new sensors for fluorescence spectroscopy and the development of new methods to couple detection molecules to proteins and nucleic acids. Synthetic RNA and DNA molecules play an important role here with new functional properties. Höbartner is also interested in the structure and chemical mechanism of these molecular tools. "An intensive exchange of ideas with colleagues leads to the creation of even more new ideas, so that we can continually improve our own methods and other existing methods available in different labs", she emphasizes about the benefits of working at the Göttingen Campus.

IMMIGRATION RIGHTS AND CULTURAL DIVERSITY

In light of the present refugee crisis, the key issues are legal and political. What rights do refugees actually have, what influence do they have on the host society? These issues are a research focus for **Prof. Ayelet Shachar**, the newly appointed Director at the Max Planck Institute for the Study of Religious and Ethnic Diversity in Göttingen, where she will head the department for ethics, law and politics.

The research interests of the Professor of Law and political scientist include the theoretical conception of nationality, immigration rights and cultural diversity as well as new rules governing mobility and social inequality. Before joining the Max Planck Society, Prof. Shachar held the Canada Research Chair in Citizenship and Multiculturalism at the University of Toronto. Her research results have influenced political debates and, for example, were cited by the Archbishop of Canterbury and Canada's Supreme Court. Together with partners at the Göttingen Campus she will dedicate her work to subjects such as migration, religious pluralism and global justice.

TEN STRONG PARTNERS

At the Göttingen Campus the concentration of research institutions is unrivalled within Germany.

Close proximity is a basis for trust: the faculties, institutes and labs at the Göttingen Campus are often just a few steps away from each other

University of Göttingen
University Medical Center Göttingen
German Aerospace Center
German Primate Center
Göttingen Academy of Sciences and Humanities
MPI for Biophysical Chemistry
MPI for Dynamics and Self-Organization
MPI for Experimental Medicine
MPI for Solar System Research
MPI for the Study of Religious and Ethnic Diversity

UNIVERSITY OF GÖTTINGEN
GEORG-AUGUST-UNIVERSITÄT GÖTTINGEN PUBLIC LAW FOUNDATION

UNIVERSITY OF GÖTTINGEN

Founded in 1737, the University of Göttingen is a research university of international renown with a strong focus in research-led teaching. It regards its great research tradition and subject diversity as constituting particular strengths. A wide range of academic disciplines including medicine are represented in the 13 faculties, the exception being engineering sciences. Since 2003, the body legally responsible for the University of Göttingen has been a Foundation under Public Law.

UNIVERSITY MEDICAL CENTER

The University Medical Center Göttingen (UMG) is one of the largest university hospitals in Germany. The faculty of Medicine and University Hospital form a unity in which excellent research, teaching and patient care take place under one roof. The internationally recognised priority research areas Neuroscience, Cardiovascular Research and Oncology have a strong foundation in basic science and are oriented on the medical need of our patients.

MAX PLANCK INSTITUTE FOR BIOPHYSICAL CHEMISTRY

At the Max Planck Institute for Biophysical Chemistry, researchers investigate how cells, organelles and biomolecules fulfill their diverse tasks. To look deeper into the nanocosmos of living cells, a wide range of methods is used and developed at the institute including high-resolution microscopy, nuclear magnetic resonance tomography, mass spectrometry or computer simulations.

MAX PLANCK INSTITUTE FOR THE STUDY OF RELIGIOUS AND ETHNIC DIVERSITY

The Max Planck Institute for the Study of Religious and Ethnic Diversity is one of the foremost centers for the multi-disciplinary study of diversity, in its multiple forms, in today's globalized world. Pressing new challenges animate rigorous scholarly investigation pursued by researchers through a variety of disciplinary perspectives, including anthropology, sociology, political science, and law.

MAX PLANCK INSTITUTE FOR DYNAMICS AND SELF-ORGANIZATION

The Max Planck Institute for Dynamics and Self-Organization (MPIDS) is engaged in research on dynamic aspects of structure formation and self-organization. Many aspects of turbulent flows, neuronal networks, granular matter and complex fluids reveal striking similarities, hinting at similar underlying principles. At the MPIDS these are under intensive investigation by scientists with different background and from different disciplines.

MAX PLANCK INSTITUTE OF EXPERIMENTAL MEDICINE

Researchers at the Max Planck Institute of Experimental Medicine study the genetic, molecular, and cellular processes that control the formation, function, and integrity of the nervous system and their malfunction in brain diseases. The focus is on nerve cell development and function, neuroplasticity, and functional glia-neuron interactions – with equal emphasis on the biology of these processes and their perturbation in diseases such as stroke, multiple sclerosis, leukodystrophies, schizophrenia, or autism.

MAX PLANCK INSTITUTE FOR SOLAR SYSTEM RESEARCH

The research focus of the Max Planck Institute for Solar System Research is on our immediate astronomical surroundings – the planets and moons of our solar system, its comets and asteroids, as well as the Sun – and also on the interior of distant stars. Scientists model these bodies in their computer simulations, but they are also involved in numerous satellite missions such as Rosetta, Solar Orbiter, and PLATO.

GERMAN PRIMATE CENTER

The German Primate Center (DPZ) – Leibniz Institute for Primate Research conducts biological and biomedical research on and with primates in the fields of infection research, neuroscience and primate biology. In addition, it operates four field stations in the tropics and is a reference and service center for all aspects of primate research.

GÖTTINGEN ACADEMY OF SCIENCES AND HUMANITIES

The Göttingen Academy of Sciences and Humanities is a learned society rich in tradition and a non-university research institution. It brings together outstanding academics across national and disciplinary boundaries. As a research institution, it is in charge of long-term-projects of international importance in the area of fundamental research in the humanities. The Göttingen Academy organizes public events and offers in-depth insights into particular areas of knowledge.

GERMAN AEROSPACE CENTER

The German Aerospace Center (DLR) in Göttingen is the cradle of modern aerodynamics. The first state run research center for aviation was founded here in 1907. Today 480 employees are working for the next generation of airplanes, spacecraft and high-speed trains. Important foundations of modern aviation were laid here. Ludwig Prandtl developed his theory of flying, von Ohain tested the forerunner of the first jet engine and the „swept wing“, which is an essential part of any fast-flying airplane, was invented in Göttingen.

TAILOR-MADE SUPPORT

With its well-positioned support to early career academics and staff development the Göttingen Campus is attractive for early career researchers.

The best possible general conditions: the international doctoral programmes at the Göttingen Campus are organized into four discipline-oriented Graduate Schools

Graduate schools, university-run educational and didactics seminars, mentoring programmes – key areas of focus at the Göttingen Campus are support to early career scientists and academics and career development for both academic and administrative staff. "We concentrate on tailor-made support for early career academics at various phases of their qualification", explains University President Prof. Ulrike Beisiegel.

For example, the international doctoral programmes are organized into four graduate schools to reflect core disciplines of the natural and life sciences, humanities, social sciences as well as forest and agricultural sciences. The graduate schools guarantee unified quality standards for doctoral candidates and the best possible conditions for the completion of the different phases of doctoral research. They represent a key element for cross-institutional support of early career academics.

Twelve German Research Foundation (DFG) Graduate Schools, four International Max Planck Research Schools (IMPRS) and multiple collaborative doctoral programmes are integrated within these organizational structures. About 15 years ago Göttingen Graduate School programmes in the neurosciences and molecular biology were the first available interdisciplinary doctoral studies and a model for today's IMPRS.

In 2014 the University increased its funding towards more options for advanced academic researchers and support for postdoctoral students, junior professors and early career academic group leaders. "The period following the completion of the doctorate is a crucial phase for continued professional success", according to Prof. Herbert Jäckle, Managing Director of the Max Planck Institute for Biophysical Chemistry in Göttingen. For this reason, special emphasis is placed on measures to encourage the interdisciplinary skills of early career academics, providing them with support that takes on board increasingly complex daily challenges that emerge within the academic context.

Postdocs as a group are supported thanks to a commitment from members at the Göttingen Campus.

DIPL.-ING. AGR., MSC. LUCIA RAMOS ROMERO, doctoral student in the working group of Prof. Andreas von Tiedemann, Department of Plant Pathology and Crop Protection in the Faculty of Agricultural Sciences

"I chose my department because it offers leading expertise in the field of phytopathology and plant protection that is based on a modern and efficient agricultural system."

They are involved in decision-making processes, ensuring that issues such as recruitment and performance requirements become more transparent. In 2007, the University already successfully introduced junior professors with a tenure-track option. Joint appointments by the University and non-university institutions are common practice at the Göttingen Campus. They convey intense collaborative work based on an atmosphere of trust.

In addition, a modern, internationally oriented academic system requires staff in technical support and administrative roles that is highly motivated and has the best training. This also applies for colleagues with permanent academic positions. The offers and programmes for expert qualifications – including the development of senior management and academic management – support these groups and prepare them for new challenges.

PROF. NIVEDITA MANI, Director of the Free-floater Research Group for language acquisition at the Faculty of Biology and Psychology

"With excellent research conditions, an international context and interdisciplinary collaborative work the University of Göttingen offers exceptional development opportunities for junior academics."

"The infrastructure network offered by the various institutes at the Göttingen Campus facilitates the planning and implementation of new experiments at the highest level."

DR TIM SCHÄFER, postdoc and research group leader in the working group of Prof. Alec Wodtke, Institute for Physical Chemistry and Max Planck Institute for Biophysical Chemistry

PROF. HOLGER KREFT, Director of the Free-floater Research Group for biodiversity, macroecology and biogeography at the Faculty of Forest Sciences and Forest Ecology

"A junior professorship with a tenure-track option, excellent support for early career academics and an outstanding academic environment were decisive reasons for me to accept the appointment at the University of Göttingen."

Since early 2014 the University of Göttingen has offered career advice to doctoral and postdoctoral students. One-to-one interview sessions involve initial career strategy planning and clarification of the required qualifications. The mentoring programme, WeWiMento, prepares for careers in academic management, the KaWirMento programme focuses on the transition from academia to the business world.

An important guiding principle of the Göttingen Campus is the close link between research and teaching. Researchers at all Campus institutions and at all levels are committed to research-oriented teaching – from the Bachelor's degree to the PhD. Prospective students can be introduced to research at labs set up for school pupils or in programmes about how to get into research. Teachers are supported via courses in educational instruction and didactics. In the context of the growing importance of e-research, new learning and teaching formats are being set up.

"In recent years we have created Campus-wide structures, which enable early career academics to conduct independent research, to base teaching on their research and to learn skills inside and outside their areas of expertise", says Prof. Beisiegel. Prof. Stefan Treue, Director of the German Primate Centre, also agrees, "Supporting early career academics and staff development makes an essential contribution to top-level research at the Göttingen Campus".

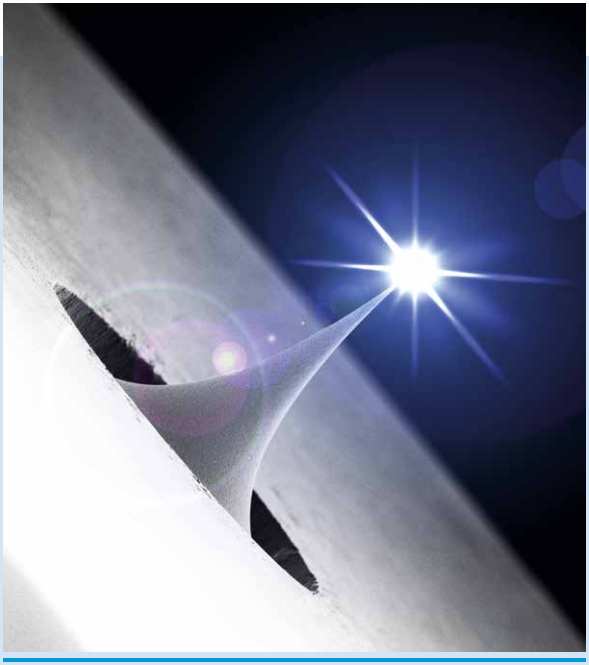
GLOBAL CHALLENGES

Academic researchers at the Göttingen Campus are working on solutions to meet global challenges now and in the future.

NANOSCALE PHOTOTONIC IMAGING

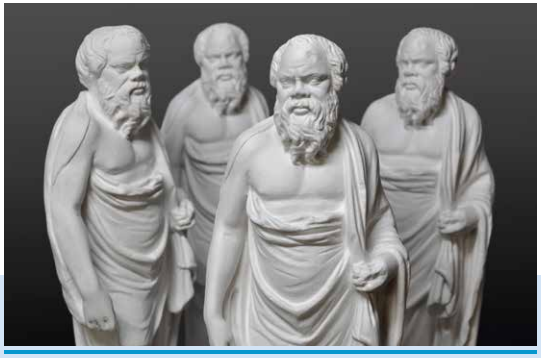
Early career academics in the Collaborative Research Centre (SFB) "Nanoscale phototonic imaging" examine complex biomolecular liquids and biological cells. For a basic understanding of their spatial arrangement, dynamics and the interdependency of macromolecules need to be visualized. A full characterization of these complex systems with the classic microscopic and spectroscopic investigative methods is not possible, therefore the researchers in Göttingen are developing new optical and imaging techniques with high resolution in space and time. Special emphasis is on high-resolution optic microscopy, the optics of short wavelengths as well as mathematical and numerical treatment of phototonic imaging.

At the Collaborative Research Centre funded since July 2007 by the German Research Foundation (DFG), in addition to the Faculty of Physics and the Faculty of Mathematics and Computer Science at the University of Göttingen, the University Medical Centre Göttingen, Göttingen's Max Planck Institute for Biophysical Chemistry and the Laser Laboratory at the University of Göttingen are co-participants. "We have achieved major advances in increasing resolution, which now enables sharper imaging of protein networks even inside living cells. In addition to specific marking of proteins in fluorescence microscopy, using X-ray microscopy and tomography we can also display the electron density", says SFB spokesman Prof. Tim Salditt from the Institute for X-Ray Physics.



Collaborative Research Centre Nanophysics: laser light at the tip of a nanoscopically small metal thorn.

"The collaborative work, particularly with colleagues in mathematics, is highly beneficial for my field of work", says Salditt. "I especially appreciate the less formalized nature of joint research. Although we write up our ideas as a research plan, often the quality only materializes by continually overturning these plans. Successful research requires a culture of freedom and responsibility that is really experienced, more especially so in our joint research projects."



Statue of Socrates: from the University of Göttingen's Cast Collection of antique sculptures

Late antique papyrus fragment: from the University of Göttingen's archive of diplomatic documents

EDUCATION AND RELIGION

The Collaborative Research Centre "Education and Religion in the Cultures of the Mediterranean and Its Environment from Ancient to Medieval Times and to Classical Islam" benefits from the diversity of humanities disciplines at the Göttingen Campus. The spectrum of participating disciplines ranges from classical and religious studies to exegetical and historical subjects within theology to Islamic Studies. Also present is research into the Christian Orient and Western medieval period as well as modern religious education.

The researchers work on the premise that research on the relationship between education and religion offers insights into cultural, social and religious dynamics that were fundamental for these cultures and religions. Their research results will also be of interest for modern debates on the relationship between education and religion.

"We take into consideration a wide diversity of realistic phenomena and constellations of education and religion in the named cultures", explains Collaborative Research Centre spokesman, Prof. Peter Gemeinhardt, Faculty of Theology. "We aim to review, categorize and compare these on the basis of superordinate questioning. We adopt an interdisciplinary and comparative study approach." This includes the study of ancient and Christian libraries as places for storing educational knowledge; another project area focuses on text interpretations in Qumran texts, the Apostle Paul and in Syrian and Coptic texts from Late Antiquity.

The analysis of tutor roles in Late Antiquity and Christianity and gender stereotypes in classical Athens allows studying how religious education was communicated, and enquiries are made into gender attributions and their social and cultural backgrounds. Other projects evaluate educational compendia and early Christian instruction for baptism. Religious discourses are the focus of a further project area: alongside texts of Cicero and Luke the Evangelist, emphasis is also on texts by the Islamist philosopher Miskawayh as well as 12th century Christian writers in the discourse of Judaism and Islam.

New methods for the treatment of cardiac insufficiency: laboratory of the Collaborative Research Centre "Modulatory Units in Heart Failure" at the University Medical Center Göttingen.

"HEART FAILURE" – A WIDESPREAD DISEASE

The Collaborative Research Centre (SFB) 1002 "Modulatory Units in Heart Failure" seeks new insights into the widespread cardiac insufficiency. This is one of the most common diseases in Europe. About two per cent of Europe's population is afflicted with this condition. Despite the development of modern, effective procedures for treatment, those patients who are affected have restricted quality of life.

SFB researchers seek new methods for even better therapeutic procedures for cardiac insufficiency. To this end, they examine specific signal pathways and communication between different cells in the heart as well as the smallest functioning units in heart cells that are instrumental in the incidence of cardiac insufficiency.

Researchers from various fields of cardiovascular research, medical researchers, experts in pharmacology, biochemistry, biophysics, computer science and physics work at the Göttingen Campus in 20 individual projects. Participating researchers are from the University Medical Centre Göttingen (UMG), the Max Planck Institute for Dynamics and Self-Organization and from the Department of Nanobiophotonics at the Max Planck Institute for Biophysical Chemistry. SFB spokesman is Prof. Gerd Hasenfuß, Chair of the Heart Centre Göttingen as well as Chair of the Heart Research Centre Göttingen (HRCG) and Board member of the German Centre for Cardiovascular Research (DZHK).

"We have achieved an important milestone in research into heart conditions in Göttingen thanks to the Collaborative Research Centre", comments Prof. Hasenfuß. "We intend to develop new therapeutic procedures by improving our insights into the pathophysiology of cardiac insufficiency. For example, we are working on new medication, which targets the smallest functional units of heart muscle cells, or has an effect on messengers for cell communication. Furthermore, new pacemaker procedures should be devised to treat life-threatening arrhythmia and translated into daily clinical practice."

Uighurs courtyard house: settlement in Hotan County, Xinjiang Autonomous Region in north-western China

Preparations for official ceremonies: on the anniversary of the death of the founder of the monastery in Aidaotang, a Buddhist nuns community in Chengdu, Sichuan Province, China

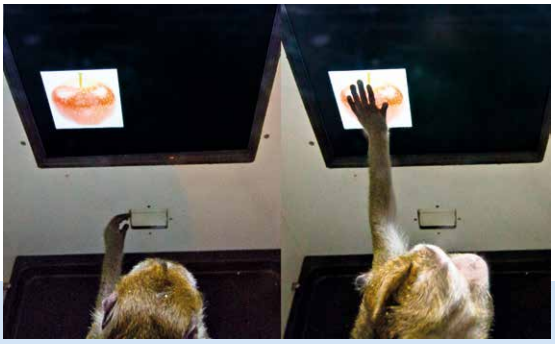
FROM ANCIENT EGYPT TO MODERN CHINA: TRANSREGIONAL RESEARCH AND STUDIES

Global Studies – this could be a title for a future study programme at the University of Göttingen. The working title summarizes a current research focus: in a globally networked world they want to carry out research on a global scale and communicate these competencies to future generations. "Our students conduct their studies with a global focus", explains Prof. Srirupa Roy from the Centre for Modern Indian Studies (CeMIS). "They want to carry out research on a comparative and interdisciplinary basis."

The Göttingen Campus offers suitable opportunities for this: on the one hand, there is a variety of subjects covering a vast range of regions, from ancient Egypt to modern China. On the other hand, it is now important to combine this specific knowledge of regional experts with that of historians, sociologists, political scientists and economists. "We aim to draw on our respective strengths and their interconnections", explains Prof. Axel Schneider, Director of the Centre for Modern East Asian Studies (CeMEAS).

This approach offers students a wide range of methodological and theoretical techniques that they can apply to their own regional expertise in their planned study programme. Modules can be combined freely and contents can be interrelated. While Prof. Roy takes a special interest in new forms of political protest in various regions of the world, Prof. Schneider intends to use the pilot project to establish a modern, comparative approach to the history of knowledge and science.

The project has excellent chances of success: since 2013 the researchers at both regional studies centres have collaborated under the auspices of the CeMIS CeMEAS Transregional Research Network (CETREN). This network is funded by the Federal Ministry of Education and Research (BMBF) and it involves researchers from within the University and from the Max Planck Institute for the Study of Religious and Ethnic Diversity in Göttingen. The researchers are integrated into an international network and draw on their various perspectives to examine, among other things, the relationship of secularity and religion and the impact of migration in India, China and Europe. Such topics may also be fed into the proposed study programme.



Decisions are called for: the primate researchers at the Leibniz Science Campus study the behaviour and intellectual capacities of primates and humans

RISKING A NEW PERSPECTIVE: AN INTERDISCIPLINARY APPROACH TO PRIMATE COGNITION

A rhesus macaque looks at images of an emotionally blank looking fellow primate. Occasionally, the look is aggressive and occasionally submissive. How does the viewer react to these signals? Which brain areas are active then? And do primates react differently than humans? Researchers at the Leibniz Science Campus are dedicated to the study of these and other social cognitive processes of "primate cognition". They investigate aspects such as information reception and processing, behaviour planning, decision making and communication. The related studies are conducted not only with primates, but also with humans – adults and children.

The Leibniz Science Campus is a research platform based on the idea of a network: the German Primate Centre and the University of Göttingen are collaboratively involved, while the Bernstein Centre for Computational Neuroscience also participates in the research effort. The scientists began their research in January 2015. The team includes behavioural and cognition biologists, neuroscientists, psychologists and philosophers. "Our aim is to unite different disciplines, thereby illuminating the evolution of human intelligence from various perspectives", explains the spokeswoman for the Science Campus, Prof. Julia Fischer. "We are particularly interested in which influence social relationships have on various thought processes and the resulting behaviour."

To reinforce the dialogue between the natural sciences and the humanities, a group of researchers at the University's Lichtenberg-Kolleg (Göttingen Institute for Advanced Study) considers primate cognition from a humanities-oriented perspective. Lively exchanges and events such as a "philosophical café" strengthen communication between the disciplines. In addition, the Science Campus promotes early career researchers, organizes summer schools, invites guest scholars and hosts film evenings with debates involving panels of experts.

Institutional support: the Göttingen Campus offers its researchers IT and information infrastructures that are fit for the future

RESEARCH AND TEACHING INFRASTRUCTURES

A core strategic task at the Göttingen Campus is to provide and continually develop future-oriented facilities and infrastructure for research and teaching. This includes IT and information infrastructure as well as the buildings, labs, large devices, libraries and academic collections. Researchers from all academic disciplines increasingly rely on digital data and tools. They work in virtual teams and often on an interdisciplinary, cross-institutional and transnational basis. The basic condition for this is innovative information and communications technologies.

To guarantee institutional support for researchers at the Göttingen Campus, the University was among the first German universities to set up an eResearch Alliance. Since October 2014 tailor-made consultation, information and training services for research data management and additional eResearch fields have been developed for the Göttingen Campus.

"Our focus is a strategic overall plan for Göttingen, ensuring that IT and information infrastructures are coordinated, integrated and continually developed for the future across the entire Campus", explains Prof. Norbert Lossau, University of Göttingen Vice-President and responsible for information infrastructure. The eResearch Alliance is jointly managed by the Göttingen State and University Library and the Gesellschaft für wissenschaftliche Datenverarbeitung mbH Göttingen. To cater for researchers' needs as efficiently as possible, in summer 2015 the eResearch Council was established with representatives from all faculties and local research institutes.

Since 2011 the Göttingen Centre for Digital Humanities has concentrated on information infrastructure for the humanities at the Göttingen Campus. Furthermore, the 2014 Joint Science Conference decided to base the Office of the Council for Information Structures at the University of Göttingen. The Council works on strategic issues for the future and advises academic and political bodies.

STATISTICS

Over 5,900 researchers work at the Göttingen Campus.

The institutions have an overall budget in excess of 1.3 billion euros (basic funds and third-party funding).

29 Directors of non-university research institutions at the Göttingen Campus have simultaneously received joint appointments as University Professor.

ASSOCIATE PARTNERS

To promote the Göttingen Campus in all aspects, the members have joined together with regional institutions from business, academia, politics and culture.

Associate partners of the Göttingen Campus:

Georg Eckert Institute for International Textbook Research (GEI)

HAWK University of Applied Sciences and Arts Hildesheim/Holzminden/Göttingen

Herzog August Bibliothek Wolfenbüttel

KWS SAAT SE

Laser-Laboratorium Göttingen e. V.

Leibniz Institute of Plant Genetics and Crop Plant Research (IPK Gatersleben)

Nordwestdeutsche Forstliche Versuchsanstalt

Otto Bock HealthCare GmbH

PFH Private University of Applied Sciences Göttingen

PHYWE Systeme GmbH & Co. KG

Sartorius AG

Volkswagen AG

THE GÖTTINGEN CAMPUS COUNCIL (GCC)

The Göttingen Campus Council (formerly Göttingen Research Council) was established in 2006. It is the key body for the development of the Göttingen Campus. It comprises eight members from both the University and non-university research institutions. The non-university research institutions are generally represented by their managing directors. On behalf of the University, the Council is made up of the following persons with attendance and voting rights: the President as Chair of the GCC, the Vice-President for research, the Chair of the University Medical Centre (UMG) Board, a representative of the University Foundation Council and four members elected by the Senate. The latter members represent faculty or cross-faculty research centres and the subject groups humanities, social sciences as well as the natural and life sciences.

The Göttingen Campus Council is the coordinating council for the Göttingen Campus. Its tasks include the identification of specialist research interests suitable for the joint development of the Göttingen Campus. Furthermore, it is also committed to collaborative activities in research and teaching across different locations as well as the training of early career academics.

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GEORG-AUGUST-UNIVERSITÄT GÖTTINGEN

UNIVERSITÄTSMEDIZIN GÖTTINGEN UMG

AKADEMIE DER WISSENSCHAFTEN ZU GÖTTINGEN

DPZ Deutsches Primatenzentrum Leibniz-Institut für Primatenforschung

DLR

MPI for Biophysical Chemistry

MPI for Experimental Medicine

MPI for Solar System Research

MPI for Dynamics and Self-Organization

MPI for the Study of Religious and Ethnic Diversity