



Brandenburg
University of Technology
Cottbus – Senftenberg

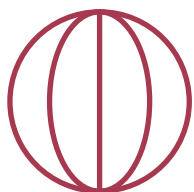
INTERNATIONAL
BTU NEWS № 2
FEBRUARY 2019



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#BTUwelcome



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THE EDITORIAL



Dear readers,

With this issue we report on the current projects, developments and activities of the BTU Cottbus-Senftenberg. A great deal has happened at our university. We celebrated our 5th anniversary, were able to start numerous new research projects and have participated in the debate on our region and structural change.

There is one project, in particular, which I would like to highlight. Our students have long been active in refugee projects, for example in the remarkable »Buddy and Mentor« initiative. Hereby BTU tutors help refugees in looking for a flat, visits to the authorities and learning the German language. This leads to friendships which also last beyond the time spent at university.

The BTU is diverse and colourful. We are well positioned internationally and cross-regionally, yet we are also firmly rooted in our region. In this issue we report on alumni who stand their ground in companies and who are entrepreneurs themselves. Through our projects in transfer of knowledge and technology we network with partners in cities as well as rural regions. However, we also network in particular through the many activities that are initiated by our students. See for yourself and read what we have put together for you!

Your feedback is very important to us and I therefore ask you to tell us what you think of the BTU News International. It is our second issue and we would like to know what you think of this medium. Do you have any ideas, requests or criticism? By taking part in this short and anonymous online survey, you will help us provide you with information and news on the BTU and beyond which is even more suited to your needs. Take part in the survey:

<https://bit.ly/2T1h88R>



I hope you enjoy reading this issue – discover many new things and tell others about them!

Best wishes,

Christiane Hipp
Prof. Dr. rer. pol.
Acting President of the BTU Cottbus-Senftenberg

#BTUwelcome

Students and scientists from all nations are welcome at the BTU Cottbus-Senftenberg. For international scientists, post-doctoral researchers, PhD students as well as newly appointed professors the Welcome Centre is the central advisory and service point.

A familiar atmosphere and the assistance of motivated students help refugees to start their studies at the BTU. The university has been taking part in the DAAD project »Welcome - students committed to refugees« with the »Buddy and Mentor« initiative since 2016.

International and German students
at the BTU campus in Senftenberg



BTU INTERNATIONAL

WORLDWIDE IDEAS FOR THE FUTURE

In July 2018, 350 international students from 80 countries met at the BTU in Cottbus for the DAAD scholarship holder meeting

At the DAAD scholarship holder meeting, students of many different subjects and from all over the world discussed »Innovation: from the idea to application«. The meeting was opened by DAAD Secretary General Dr. Dorothea Rüländ and former BTU president Prof. Dr.-Ing. Jörg Steinbach.

Scholarship holders from 80 countries, many of whom study and research in technical fields, met to benefit from the success of the others. During the three days, participants discussed topics such as artificial intelligence, internet security and sustainable mobility. In addition, they also shared ideas and opinions on new approaches in architecture for example how building on water can be successful. Jörg Steinbach used his opening address to revisit his time as a professor for systems and safety technology and presented, by means of clear examples, the basics of chemical safety technology to the listeners.

»An exchange of experiences across borders and international cooperation is of considerable significance for the positive potential of basic as well as applied research to develop for society,« said DAAD President Prof. Dr. Margret Wintermantel. »At this scholarship holder meeting we wanted to discuss this with the outstanding talents.«

»We were pleased to be able to welcome the DAAD scholarship holders at our university. 2,000 students from 111 countries study at the BTU at three sites. Our internationalisation is a great opportunity to help shape the socio-political transformation of Lusatia. We are teaching stu-

dents in twelve courses given in English and offer subject-specific supervision with study course coordinators in the international courses. We want to continue to set important trends in the future in the international promotion of young academics, cooperation and mobility of scientists and, in doing so, further develop our profile as a high-achieving research university,« said former BTU president Prof. Dr.-Ing. Jörg Steinbach.

»The scholarship holder meeting offered the opportunity to discuss and jointly further develop new ideas and technological changes from many different subject-specific and cultural perspectives. This international discourse in research is a considerable gain for our scholarship holders as well as for the scientific and innovation location of Germany,« said Secretary General Dr. Dorothea Rüländ.

All scholarship holders live, study and research in Germany for at least one year, most in engineering and well as in mathematics and natural sciences.

DAAD - The German Academic Exchange Service

The German Academic Exchange Service (DAAD) is the organisation of the German universities and their students for the internationalisation of the education system. It offers students, researchers and lecturers access to the best study and research opportunities by awarding scholarships. Furthermore, it also promotes transnational partnerships and cooperation between universities and is the national agency for European university cooperation. With this, the DAAD supports the goals of the foreign cultural and education policy, national science policy and development cooperation. For this purpose, it maintains a network of more than 70 foreign offices and 450 lectureships worldwide as well as the international DAAD- Akademie (iDA). In 2017 DAAD, including the EU programmes, granted funding to 140,000 German and foreign students around the world. The budget stems largely from the federal funds of various ministries, the European Union as well as companies, organisations and foreign governments.



◀ Students from the whole world and of many different subjects met in Cottbus

MY NATIONALITY IS HUMAN

Medical technology student Maeen Al-Fahad is committed to helping refugees in the »Buddy and Mentor« initiative – a project which was awarded the Welcome Prize of the Federal Ministry of Education and Research in September 2018

»My name is Maeen Al-Fahad. I am a scholarship holder from Yemen studying medical technology at the BTU at the Campus Senftenberg. I like working with people from different cultures. Cultural diversity is a heritage of mankind. My motto: »My nationality is human«.

Together with students of Urban and Regional Planning, Architecture, Social Work, World Heritage Studies as well as Land Use and Water Resource Management, he helps refugees. The »Buddy and Mentor« student initiative has already been supporting refugees since 2015. This was then professionalised through the DAAD project »Welcome – students committed to refugees«, which is financed by funding from the Federal Ministry of Education and Research (BMBF).

»It is important to us that the refugees do not feel alone and we are their contact partner for as long as they need us. In our initiative we advise them, offer help with application letters and the filling in of forms, compile information material and translate. In weekly tutorials we help participants prepare for language exams and especially for life and studies at a German university. We highlight ways to earn money outside their studies and help them find somewhere to live,« reports Maeen Al-Fahad on the many services offered. And there is more: they also organise various events to help the refugees meet other students at the BTU Cottbus-Senftenberg – events in which refugees, those interested in studying and existing students can take part. Excursions to the region around Cottbus and the cultural insights offered on visits to Berlin or Dresden are especially popular.

Alongside this there are also a range of sporting opportunities in which young people, in particular, can show their skills without any language barriers. Language cafes, too, bring people together: refugees, international students, immigrants and Germans can all get to know each other and form friendships in a relaxed and informal atmosphere with a cup of coffee or tea. In a special women's language cafe, women can also meet and discuss daily issues and worries that concern them. This comprehensive package belongs to the three most notable projects nationwide and was therefore awarded the Welcome Prize of the BMBF.



^ The organisational team with Maeen Al-Fahad (2nd from left), Fatyma Al-Hakim (3rd from left) and Martin Jürgens (5th from left) together with project coordinator Narine George (6th from left) are dedicated to helping refugees in Cottbus with their daily lives and ensuring that they feel at home. They have now been awarded the Welcome Prize for their work

In the end, the initiative »BTU welcome – Buddy and Mentor« impressed everyone and Maeen Al-Fahad and his team were very pleased with the 1st prize at the award ceremony on 10 September 2018 in Berlin. They plan to use the prize money of 10,000 € to make the women's language cafe permanent and establish a university group in which academics have a platform for exchange. »With this we may even get more women interested in technical studies at the BTU.«



BTU students played against a fan selection of the football club FC Energie Cottbus. The aim was to show that fairness is embodied in sport, work and in society in Cottbus

BTU DEDICATED TO MAKING COTTBUS A VARIED AND COLOURFUL TOWN

Acting BTU President Prof. Dr. Christiane Hipp and FCE trainer Claus-Dieter Wollitz emphasise the importance of a positive image for Cottbus for all institutions

On 10 November 2018, an association of institutions in Cottbus invited spectators and participants to the second German-international friendly match under the motto »Cottbus is colourful«. A tournament with the B junior team of FC Energie Cottbus (FCE), and a selection of German and international students of the BTU, had already been held in the Lausitzarena in February. The 1st FCE team also took part and, in giving autographs, helped promote Cottbus as a cosmopolitan and friendly town.

Approximately 300 spectators and fans took up the invite and, in doing so, supported the campaign promoting a peaceful coexistence in our town and a positive image for Cottbus. The association and event had been prompted by disputes between local residents and refugees, as well as xenophobic demonstrations which had resulted from this. The initiators of the event included the BTU Cottbus-Senftenberg and 1st FCE, as well as the Cottbus city administration, LEAG, Carl-Thiem-Klinikum, Staatstheater Cottbus, Cottbuser Aufbruch, Sportstättenbetrieb Cottbus and the Stadtmarketing- und Tourismusverband Cottbus e.V. FCE trainer, Claus-Dieter Wollitz, said, »As a true Lausitz local it was matter of fact for me that, with the FCE, we support such a campaign for Cottbus and the region. Our town is different to how it is sometimes portrayed in the media«. The players who took part in mixed teams under the motto »Cottbus is colourful« came from ten nations. Four teams took part and competed against each other in a friendly game in the Lausitz Arena including BTU students from Syria, Nigeria and Brazil. »We wanted to make a stand for the friendship of people in Cottbus«, said Hussein Al Hussein, who comes from Syria and is studying Culture and Technology at the BTU. He and his friend, Computer Science student, Mohammed Alghetheth, therefore quickly knew that they wanted to take part in the tournament. Tim Oestreich, a process Engineering student, also did not need long to consider this and said, »For me, it's a mat-

ter of fact that we, at the BTU, should be committed to promoting a peaceful and co-operative coexistence in Cottbus, and I wanted to make a stand for this by taking part in the friendship tournament. As could be seen, sport, and football in particular, offer a great platform for taking this idea to the public and bringing people together.«

In November, BTU students played against a fan selection of FC Energie Cottbus. With fine weather and a cloudless sky, our footballers were able to enjoy the thrill of professional football for themselves for the first time and played in the stadium in which many of them usually cheer on the third league Cottbus team. There was, therefore, considerable anticipation for the game already well in advance. Our players, who came from many different countries including Nigeria, Syria, Brazil, Germany, Morocco and India, gave it their all. In the first-half, they saved their strength and went into the break with 0:1 to the other team. In the second-half, however, they mobilised all their reserves and won 2:1 against the fan selection of FCE with huge applause. It was an exciting and, above all, fair match that our sportsmen were able to win, and deservedly so. However, much more important than the win, was to show all involved that fairness is embodied in sport, work and in society in Cottbus.

With the reading of the »Cottbus Declaration«, the half-time break of the following match was also under the motto »Cottbus is colourful«. In front of 2,000 spectators in the stadium, Prof. Dr. Christiane Hipp, Acting President of the BTU Cottbus-Senftenberg, and, as representative for the university, one of the first signatories, read, »This declaration is for all citizens who embody and assert our basic law and the fundamental rights contained in this. Those who disregard law and order and violate peaceful coexistence must feel the consequences – irrespective of nationality or origin.«

A PIECE OF AFRICA IN COTTBUS - A VERY SPECIAL CULTURAL FESTIVAL

On the 30 June 2018 the main campus of the BTU Cottbus-Senftenberg hosted an African cultural festival

Students from eight countries, Tunisia, Morocco, Zimbabwe, Mozambique, Kenya, Ghana, Nigeria and Ethiopia organised a joint festival of the cultures of the various African states. Guests were able to enjoy popular music, various dance styles and, of course, also traditional food and drink. Ropafadzo Chiwome, one of the organisers, hoped that the African festival would, »Strengthen cultural awareness in our community and promote Africa's image. We wanted our guests to enjoy various interactive experiences and imagine the synergy that is possible when Africans work together – their progress in particular in development, research and innovation as well as in human rights, leadership, tourism and much more.«

The Environmental and Resource Management student Delasi de Souza described it as, »Africa is more than just a safari adventure. It is a collection of centuries-old values, diverse cultures, fascinating languages, delicious food and warm people.« »The main idea of this festival is to celebrate African unity and cultural diversity with seminars, food, clothing and music and, in doing so, show our guests as well as the whole world, Africa's positive side,« said Collins Izuchukwu Igboji, director of the festival planning committee.


With a cultural procession across the campus, all BTU students were invited to the celebrations after which African art and antiques were presented. The scientific part began with a lecture on the cooperation of all African states with the working group Panafricanismus München e.V., which regularly organises congresses on this subject. A presentation of current scientific research projects by BTU doctoral candidates from Africa presented measures in various fields from adapting the African agriculture south of the Sahara to climate change to the development of microalgae bio fuels in Nigeria.

After this foray into the world of science, guests were able to sample the delicacies from food stands in Cottbus that are, meanwhile, famous. The more than one hundred guests were able to enjoy spicy samosas, Moroccan pancakes as well as delicious Ethiopian coffee. This was a major draw for visitor Dina Chen who said: »I've always found it difficult to find traditional African restaurants and now I've finally been able to try African cuisine in Cottbus.« The culinary experience was accompanied by traditional dancers and drummers with tribal dances and music. This was followed by a quiz on Africa in which visitors were able to learn interesting new facts. Who knew, for example, that the Ethiopian calendar has 13 months and lies around seven and a half years behind the Gregorian? This means that today it is 2011 in Ethiopia!

The highlight was formed by the country presentations, which also featured a fashion show in the Audimax. Here the stairs were used as a runway and no effort was spared in showing off the full diversity of African fashion. Visitor Bharti Teotia commented, »Coming from India where the fashion really is diverse, it was surprising for me to see all the pan-African colours and it was great to experience such a big night of African culture.«



△ The organisers came from eight different countries, here: Tunisia, Morocco, Kenya and Mozambique (Photo: Zeido Zeido)

The festival ended with an after-party in the Eventclub 13, which was very popular with the students who danced to the beats of African music until the early hours. Everyone agreed that the African students who voluntarily helped with this festival certainly succeeded in bringing a little bit of African culture to Cottbus. 

International Relations Office
JANINE WEHRSTEDT



△ Festival visitors enjoyed the samples (Photo: Zeido Zeido)



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RESEARCH

BEST DOCTORAL THESIS

Sara Toktam Obergassel came to the BTU to complete her doctoral studies and wrote the best thesis of 2017

Dr.-Ing. Sara Toktam Obergassel has been awarded for writing the best doctoral thesis at the BTU Cottbus-Senftenberg in 2017. Her work, entitled »Design and Analysis of Integrated CMOS High-Voltage Drivers in Low-Voltage Technologies«, was awarded the grade »summa cum laude«. Her work was selected from a total of five submissions.

Sara Toktam Obergassel carried out research for her thesis with the Chair of Microelectronics, Professor Dirk Killat, focusing on high-voltage circuits for power management. Dr. Obergassel provided a clear and precise summary of her scientific discovery, describing how cascaded transistors can be controlled in a driver to achieve maximum current while minimising the on-resistance. She developed a system to mathematically model the drive and design the circuit used to drive n-stage cascaded transistors. She also observed parasitic bipolar transistors to develop her own models and create precise simulations of them. She then used this design methodology to create and implement a triple-stacked CMOS high-voltage driver in 65 nm TSMC technology with I/O standard transistors.

Microchip-based semiconductor technologies (CMOS) are undergoing rapid development. The number of transistors on a microchip doubles almost every two years, while the transistors themselves are becoming constantly smaller and the voltage being processed by them is now under 2.5 volts. However, the supply voltage of batteries, interfaces and other components is usually over 2.5 volts. One way to cope with this is to use special high-voltage transistors, but this technology involves disproportionately high costs. This DFG-funded project was carried out in cooperation with the University of Ulm; a further objective was to find a scalable method to allow every new generation of CMOS technology to process high voltages at analogue interfaces with an easily applicable design and low resistance.



< Dr.-Ing. Sara Toktam Obergassel with her thesis supervisor Prof. Dr.-Ing. Dirk Killat

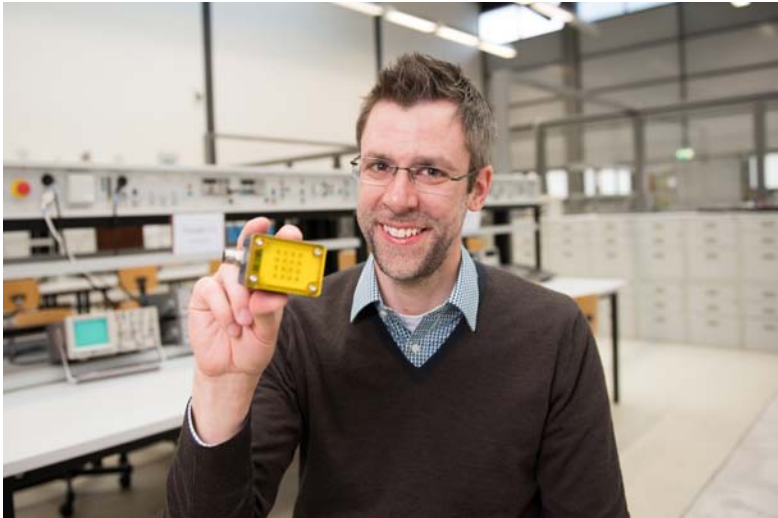
GUARDIAN ANGEL TECHNOLOGY IN HOSPITAL ROOMS

The »Guardian« project finds lots of new uses for the contactless detection of vital signs

Prof. Alexander Kölpin can't resist a mischievous grin as he places the centrepiece of the »Guardian« project on his desk. The small case is not much larger than two matchboxes but is supposed to contain something that can be distributed throughout several hospital rooms. »It's basically just a small radar module with a data transmission port«, explains Kölpin. »What makes it so special is the highly sensitive technology it contains. This enables the contactless detection of the slightest of movements over a distance of several metres.«

Kölpin brought the project with him from the Friedrich-Alexander University Erlangen-Nuremberg to the BTU following his appointment in summer 2017. He's set his sights on the pulse waves that propagate through our veins with every heartbeat. The inconspicuous box contains a radar system that emits electromagnetic waves at a frequency of 24 gigahertz. The transmitted waves are only a fraction as strong as the transmission power of a mobile phone and well below the legal limits. The waves are reflected off a patient's body and received by the radar. Interferometric measurements (based on the superposition of electromagnetic waves) can be taken to discriminate between differences in distance of just a few micrometres. These changes in distance are then analysed using special algorithms that extract the motion components caused by heartbeat vibrations on the patient's body surface. »In principle, no more technology is required. Once the system has provided us with high-resolution data, we can use the appropriate procedures to draw conclusions about respiration, cardiac function and even arteriosclerosis«, says Professor Kölpin.

But these aren't the only possible applications. Over the course of their research, Kölpin and his team have discovered that everyone has their very own distribution of pressure waves in their body. Therefore, the technology could also be used for access controls in a similar way to fingerprints. We could also conceivably create systems to monitor the breathing and pulse of infants without the need for complicated wiring. »One huge advantage that our system has over things like cameras is the fact that we can see past smoke to detect whether there are still living persons in a building in the event of a fire and we can see past clothes and blankets to monitor the health of vulnerable patients.« But the technology will probably be most beneficial in hospitals. Prof. Kölpin's team is



Prof. Dr.-Ing. Alexander Kölpin wants to use radar modules like this to revolutionise medical monitoring

running tests on its practical uses. The radar system could be used to not only monitor patients and raise the alarm in an emergency, but also to diagnose arteriosclerosis, heart defects and other conditions. »The quality of the data obtained allows highly reliable diagnoses to be made for a variety of medical issues«, explains Professor Kölpin with delight. After all, this puts the Starship Enterprise's vision of contactless health scanners within reach.

Chair of Electronics and Sensor Systems
PROF. DR.-ING. ALEXANDER KÖLPIN

FROM MICROSPEAKERS TO EXPLOSIVES

Future technologies at the Fraunhofer Institute for Photonic Microsystems in Cottbus

More and more gadgets like smartphones, fitness watches and hearables are designed to support users with many aspects of their lives. Many of their functions rely on acoustic signals. These allow hearables – microcomputers with a wireless interface and sensors – to relay music or language (e.g. for simultaneous translation) directly into our ears. High demands are placed on such integrated microspeakers: they should be cheap to manufacture and only a few millimetres in size with perfect sound quality and low energy consumption. Since the beginning of 2018, scientists at the Fraunhofer Institute's new Department of Integrated Silicon Systems (Fraunhofer IPMS-ISS) have been working on the development of such systems on the Main Campus in Cottbus.

The Fraunhofer IPMS-ISS belongs to the Fraunhofer Institute for Photonic Microsystems (IPMS) in Dresden, which has been investigating silicon-based micromechanical and microPhotonic systems for over 25 years. Its services span the entire development chain for CMOS-compatible MEMS products and technologies, from product conception and process development to the production of demonstrators and prototypes and pilot production in state-of-the-art cleanrooms in line with industrial standards.

Professor Dr.-Ing. Dr. rer. nat. habil. Harald Schenk is the head of the parent institute in Dresden and holds the Chair of Micro and Nano Systems at the BTU Cottbus-Senftenberg. He initiated the collaboration between both institutions in 2012 by establishing the MESYS (Mesoscopic Actuators and Systems) research group, leading to the emer-

gence of this new department. Dr. Sebastian Meyer is set to take over the management of the new Fraunhofer IPMS-ISS department, where his focus will initially be on two areas. The scientists are continuing the work carried out by the MESYS research group in the field of »Monolithically Integrated Actuator and Sensor Systems« and are developing new actuators and sensors that can be used in microspeakers, micropumps and micro positioning units. They will also be looking at possible applications in the fields of robotics, biotechnology, medicine and optics. The actuators can be used in microtweezers to manipulate cells and in the autofocus function of smartphone cameras to take sharper Photos.

The second area of research is »Terahertz Micromodules and Applications«. The scientists plan to use terahertz radiation, which lies between infrared radiation and microwaves on the electromagnetic spectrum and penetrates many materials like paper, plastic, organic tissue and clothing. Its low Photon energy means it is not ionising and therefore does not interfere with the sample material. The researchers at the Fraunhofer IPMS-ISS want to exploit this to develop compact and mobile test systems that would allow non-destructive examinations to be carried out directly on site. This would make it possible, for example, to quickly check the quality of coatings like car paint and detect any material defects. This would make complex random sampling a thing of the past. Terahertz micromodules have a wide range of possible applications. In the fields of pharmaceuticals and cosmetics or environmental safety, for example, they can be used to detect harmful and hazardous substances and they can be used for diagnosis and imaging in biotechnology and medicine.

The research carried out at the Fraunhofer IPMS-ISS is laying the foundations for new high-tech applications. The scientists are working alongside the BTU Cottbus-Senftenberg to translate their research results into industrial applications and make a decisive long-term contribution to the local economy and the development and sustainability of the region and society.



^ Miniaturised speakers for hearables, hearing aids and earphones
(Graphic: Fraunhofer IPMS)

Chair of Micro and Nano Systems

PROF. DR.-ING. DR. RER. NAT. HABIL. HARALD SCHENK

PLASTICS WITH BIOLOGICAL PROPERTIES

A new project group at the Fraunhofer Institute wants to »breathe life« into polymers

Over the past few decades, work has been carried out to successfully give materials additional properties. Dirt and water-repellent car paints and shape-memory metals are arguably some of the most famous results achieved in this field of materials research. They're also a reflection of the growing demand for materials with combined properties. While lotus-effect coatings used to be copied from nature, biological functionality is now integrated directly into materials. Researchers from the BTU and the Fraunhofer Institute for Applied Polymer Research (IAP) have joined forces to create a project group for the biofunctionalisation of polymeric materials. The project group wants to combine plastics with biological building blocks like proteins, enzymes and sugar molecules to examine new materials with a wide range of applications and, above all, to enable their industrial production.

The Fraunhofer IAP has been operating its Biopolymer Processing Centre on the BASF site at Schwarzheide – in direct proximity to Campus Senftenberg and led by DI Thomas Büsse – since 2013, where it has found more than just perfect local conditions. The knowledge acquired by the Fraunhofer IAP for the integration of biological and physical-chemical material functions will be complemented by Prof. Dr. Klaus-Peter Stahmann's expertise in the fields of enzyme production and peroxygenases and Prof. Dr. Katrin Salchert's knowledge of surface biofunctionalisation. Prof. Dr. Johannes Ganster forms the link between the institutions as the acting leader of the project group. AS the director of the IAP Biopolymer research division he is responsible for the Processing Centre at Schwarzheide and holds the joint Chair of Biopolymers and Plastics Processing.

»We can integrate sugar molecules to produce things like bacteria-resistant materials. You'd just have to wipe them down with water to make them germ-free again«, says Professor Ganster, who's about to hand over the leadership of the project group to the holder of a newly established junior professorship. But the researchers don't want to settle for biofunctionalised surfaces. Penetrating the entire polymeric material should prevent its specific effectiveness from being lost through surface wear. The researchers would like to combine polymeric materials not only with antimicrobial proteins, but also with those which increase surface adhesion and repel water or oil.



^ Biological molecules could be integrated directly into plastic packaging in the future to extend the shelf life of food (Photo: Fraunhofer IAP; Photographer: Till Budde)

And highly interesting products can also be developed with enzymatically active surfaces and polymers with integrated protein channels for the filtration of liquid media. As such, the Fraunhofer research group, which started work in 2018, is meeting demands on the free market. In the long run, this could strengthen both the research centre and the regional economy. The continuous acquisition of third-party funds and the development of marketable technologies are not only creating new jobs for highly qualified professionals, but also new prospects beyond lignite mining.

Chair of Biopolymers and Plastics Processing/Fraunhofer IAP
PROF. DR. RER. NAT. JOHANNES GANSTER
 Chair of Technical Microbiology
PROF. DR. RER. NAT. HABIL. KLAUS-PETER STAHMANN
 Chair of Enzyme Technology
PROF. DR. RER. NAT. KATRIN SCHEIBNER
 Chair of Natural Products Chemistry
PROF. DR. RER. NAT. KATRIN SALCHERT

FUNGI AS THE BASIS OF CELL-FREE PROTEIN SYNTHESIS

BTU and Fraunhofer IZI-BB combine their expertise to create high-quality proteins

Marasmius rotula is the Latin name for the pinwheel mushroom. This fungus is widely found in the northern hemisphere. Dr. Stephanie Friedrich collected fruiting bodies that had developed on a meadow in her garden near Senftenberg and isolated *M. rotula* at her workplace, the Enzyme Technology research group led by Prof. Katrin Scheibner. Scientists have been investigating peroxygenases here for several years. These are enzymes that are produced by fungi and have a high potential for exploitation in the pharmaceutical and chemical industry. Peroxygenases were first discovered in fungi by Prof. Scheibner and Prof. Martin Hofrichter from TU Dresden. This group of enzymes promises high industrial turnover and great innovation potential for the development of drugs. The market for protein-based pharmaceuticals is expected to reach \$ 250 billion by 2020. And proteins look set to generate similar figures in the chemical industry. Purified proteins are required for industrial synthesis and the development of drugs.

Researchers from the BTU, the Fraunhofer IZI-BB in Potsdam-Golm and the International Institute (IHI) Zittau at TU Dresden would like to join heads on the »PZ-Syn« project (»fungal-based cell-free synthesis platforms«) to exploit the catalytic potential of peroxygenases and enable their large-scale production.



△ The pinwheel mushroom (*Marasmius rotula*) produces important enzymes for the pharmaceutical and chemical industry (Photo: Dr. Stephanie Friedrich)

What makes peroxygenases so interesting in the medical field is their similarity to complex liver enzymes. They stimulate the same degradation processes as those stimulated by the human liver to break down drugs. Metabolites (the degradation products of these drugs) can sometimes trigger strong side effects. The pharmaceutical industry is therefore very much interested in testing as many of these drug metabolites as possible.

»Unlike other proteins – especially those that don't contain haem iron – unspecific peroxygenases are not often heterologously expressed in their active form, which means they're not often expressed in a host organism like bacteria,« explains Katrin Scheibner. They currently have to be isolated where they naturally occur – in fungi. Alternatively, we could use a cell-free method to exploit the catalytic potential of peroxygenases, i.e. without a host organism. This would eliminate the need to expensively purify cultivation components and we would no longer be dependent on living cells. Dr. Stefan Kubick and his team at the Bioanalytics and Bioprocesses Department of the Fraunhofer Institute for Cell Therapy and Immunology (IZI-BB) are leading the way in the field of large-scale automated cell-free protein synthesis.

If the BTU and the Fraunhofer IZI-BB manage to synthesise peroxygenases, a huge range of drug metabolites could be produced. Their similarity to metabolites produced by liver enzymes can then be verified using the liver cell lines cultivated by Prof. Dr. Jan-Heiner Küpper, who holds the Chair of Molecular Cell Biology at the BTU. »By creating cell-free synthesis platforms that function in such a similar way to the human liver, we'll be able to develop a new generation of pharmacological test systems.«

The joint project got under way in the second quarter of 2018. The Fraunhofer IZI-BB is also planning to establish a new outpost on Campus Senftenberg as part of the collaboration. The aim is to quickly obtain industrial orders for the production of interesting proteins to drive the development of the Fraunhofer outpost in Senftenberg.

Chair of Enzyme Technology

PROF. DR. RER. NAT. KATRIN SCHEIBNER

Chair of Molecular Cell Biology

PROF. DR. RER. NAT. HABIL. JAN-HEINER KÜPPER

Technische Universität Dresden / International Institute Zittau

PROF. DR. RER. NAT. HABIL. MARTIN HOFRICHTER

Fraunhofer Institute for Cell Therapy and Immunology, Branch Bioanalytics and Bioprocesses

DR. RER. NAT. STEFAN KUBICK

NETWORK OFFERS CAREER SUPPORT AFTER DOCTORAL STUDIES

We interview the Acting President of the BTU, Prof. Dr. Christiane Hipp, about a network running throughout Brandenburg to drive forward the career development of post-doctoral researchers

BTU NEWS: The network is a joint project coordinated by the four universities in Brandenburg with the aim of providing the next generation of post-doctoral researchers with qualifications and networking opportunities. What do you hope to gain from this collaboration?

→ **PROF. HIPPI:** By creating a network of offers from all the universities in Brandenburg, we particularly hope to make our qualification programmes more attractive and varied. We also want to intensify and promote the exchange of young researchers beyond the boundaries of their respective universities and specialist subjects. We are convinced this new network will help prepare young scientists even better for their careers.

BTU NEWS: Who will the network benefit?

→ **PROF. HIPPI:** The services provided by the network should be accessible to all post-doctoral researchers, tenure-track professors and first-time professors working at scientific institutions in Brandenburg. Young researchers in the network won't just be able to access qualification opportunities at their own institution, they also have access to an extensive portfolio of scientific and artistic programmes offered by all participating universities. For example, researchers can access humanities-oriented interdisciplinary qualifications at the University of Potsdam and the European University Viadrina, as well as artistic programmes at the Konrad Wolf Film University of Babelsberg, and industrial and business-oriented courses at the BTU.

BTU NEWS: How will the network help post-doctoral researchers to launch their careers?

→ **PROF. HIPPI:** The careers network will provide a mixture of general and specialist support. We divide our general support into four main thematic areas based on the various conceivable career goals of our young researchers. The first of these areas prepares young researchers for a traditional academic career, as we give them university teaching skills and the managerial skills required to take on leading positions in academia. The second area prepares people for a career in business or the foundation of their own business, as the BTU offers »Professional Skills Courses« which run over several days, as well as certification programmes that run over several months. Young researchers can also receive personal potential reports, careers advice and coaching. In addition, the qualifications offered by the network prepare participants for an academic role in science management, including the skills required to organise and manage scientific institutions. Furthermore, we also provide targeted support for careers in science communication and policy consultancy. As of next year, the network will also provide specialist funding for young research groups and research fellowships, in order to attract excellent young scientists to Brandenburg and keep them here.

Thank you for the interview!



Prof. Christiane Hipp is convinced the new network will help prepare young scientists even better for their careers

After completing their doctoral studies, young researchers can choose to go down a variety of career paths both within and outside of science. The BTU is helping post-docs to choose a career path, develop management and leadership skills, and qualify for managerial positions in universities and non-university careers in research, business and self-employment. Future generations of post-docs will be able to use Brandenburg's network to get some ideas about their career development. The network will bring together the qualification programmes offered at all four universities in Brandenburg.

Acting President of the BTU Cottbus-Senftenberg
PROF. DR. RER. POL. CHRISTIANE HIPPI

ACHIEVING MORE AT LOW TEMPERATURES

The project »LowTEMP« is looking to use low-temperature processes to connect district heating with renewable energies

Prof. Dr.-Ing. Matthias Koziol and his team on the Chair of Urban Technical Infrastructure at the BTU Cottbus-Senftenberg are working on a large-scale project with numerous partners from the Baltic Sea region. Their aim is to use existing district heating networks for the development of sustainable heat supply solutions and to implement their findings in the participating municipalities. The LowTEMP research project (Low Temperature District Heating in the Baltic Sea Region) will be co-financed by the European Regional Development Fund until 2020. It's been given a total funding volume of around 3.77 million Cottbus-Senftenberg and the BTU is set to receive 297,000 €.

District heating is widespread throughout the Baltic Sea region and is used to supply over 50 percent of households in some countries. Low-temperature district heating is one way to optimise existing district heating systems and develop sustainable networks in the future. Lowering temperatures can help to reduce heat loss and enable the use of renewable energies and heat sources. As such, the enormous potential of low-temperature district heating can be exploited to make buildings more energy efficient in the long run.

Local and regional authorities, district heating companies, energy agencies, research institutes and national associations from the energy and district heating sector in the Baltic Sea region are all collaborating on the LowTEMP project to optimise the heat supply by integrating low-temperature district heating solutions. In order to achieve this objective, the project managers and partners are being provided with the knowledge and strategic tools required to plan, finance and install low-temperature district heating systems. They also plan to achieve their goals by establishing a platform for district heating knowledge, carrying out sustainability impact assessments, identifying business models and financing structures and developing a training programme to share and promote knowledge of the topic among stakeholders and responsible authorities.

District heating in the Berlin-Brandenburg metropolitan area is based on conventional supply temperatures. The main source of energy is coal. If the state of Brandenburg is to meet its objectives for energy saving and CO₂ reduction, one option is to lower the grid temperature and use renewable energies for the district heating supply. The BTU is going to develop approaches for the implementation of such concepts and pass these on to the regional authorities. As part of this project, the Chair of Urban Technology is developing pilot energy strategies with a focus on the situation and energy-related development goals of the participating municipalities. These will act as guidelines for the creation of further energy strategies in other places. Those working on the project are also planning to analyse life-cycle costs and develop calculation methods to identify funding gaps and schedule larger investments in the field of low-temperature energy supply.

Chair of Urban Technology
PROF. DR.-ING. MATTHIAS KOZIOL
STEFAN SIMONIDES

LowTEMP Partner Meeting at Holbæk Town Hall, Denmark (Photo: Joanna Muszynska, ATENEKOM, Berlin)



NEW DFG PRIORITY PROGRAMME AT THE BTU

Senate of the German Research Foundation convinced by concept for the investigation of property-controlled forming processes

The German Research Foundation (DFG) announced in March 2018 that it would be launching 14 new priority programmes with a total funding volume of 80 million Cottbus-Senftenberg over a period of three years, starting in 2019. One of these priority programmes is called »Property-Controlled Forming Processes«, which is being coordinated by Prof. Dr.-Ing. Markus Bambach, head of chair of Mechanical Design and Manufacturing at the BTU Cottbus-Senftenberg.

This interdisciplinary priority programme will bring together experts from the fields of metal forming, materials engineering, metrology and control engineering. The researchers are planning to use feedback mechanisms to quickly and individually adapt forming processes to varying material and process properties. »Most forming processes are now open-loop controlled. The property-determining microstructure is not measured and controlled during the process. This means that the property-controlling process variables are not adjusted during the process«, explains Prof. Bambach. This leads to unnecessary waste and requires more time and energy.

If forming processes aren't able to adapt to process fluctuations and changes in workpiece properties, this can delay the development of new materials and products and cause costly reworking and the production of scrap.

Around 90% of the steel produced around the world undergoes at least one forming stage during the processing of the final product. Around one third of the produced steel is estimated to get lost through the production of scrap and machining. The growing demand for resource efficiency and sustainability is creating a need for fewer rejects and property-controlled forming processes that allow the shape and properties of products to be kept within given tolerances despite inevitable fluctuations. »Developing property-controlled forming processes can be quite a challenge, as the effect of the forming tool on the workpiece is highly non-linear and distributed across space and time«, explains Prof. Bambach. If we want to control a material's properties, we have to understand forming processes as spatially distributed and time-varying systems and then examine their controllability. The priority programme



Prof. Dr.-Ing. Markus Bambach is coordinating the DFG priority programme »Property-Controlled Forming Processes«, which will start in 2019

also stands out for its targeted promotion of young scientists and gender equality concept. The specific project proposals submitted within the framework of the priority program are currently being evaluated. This will determine the projects to be carried out, their implementation and the amount of funding available.

Chair of Construction and Manufacturing
PROF. DR.-ING. MARKUS BAMBACH

TREATED WASTEWATER FOR AFRICA'S AGRICULTURE

DAAD scholarship holder, Isaac Mbir Bryant, is working on a biogas digester that kills pathogens in wastewater and produces methane – something, which he hopes will help the people of his homeland, Ghana, to solve their wastewater problems

He is wearing a black suit and has short hair. A Ghanaian, Isaac Mbir Bryant, presented his research topic at the DAAD scholarship holders meeting at the Brandenburg University of Technology (BTU Cottbus-Senftenberg). For the past three years, the doctoral candidate has been working on finding a solution to the wastewater problem in his home country, Ghana.

»In Ghana, we hardly have many possibilities for purifying wastewater like in Europe and other developed countries. Most household wastewater is currently discharged into the environment without any pre-treatment, which creates a huge environmental problem. I really wanted to do something about this«, says the doctoral candidate at the Chairs of Biotechnology of Water Treatment and Waste Management. »The farmers in the cities irrigate their vegetables with untreated wastewater, which means pathogens get into food leading to many people falling sick. I have experienced this myself. I ate contaminated salad and when I regained consciousness, I was in hospital as cholera patient. I could have lost my life through that. If that could happen to me, it can happen to others. This is what motivated me to find solutions to the wastewater problems in Ghana«.

Isaac Mbir Bryant wants to use biogas digester for wastewater treatment in a slum in Ghana. »About 7,600 people live in the slum in which I constructed the biogas plant. If every household was connected to such

a biogas plant it would really help the people there, however, it is very expensive and would have to be supported by the state.« My supervisors, Prof. Dr. Marion Martienssen and Dr.-Ing. Marko Burkhardt, respectively, supported me financially and materially to construct and test the facility in the slum.

In his test facility, biomass, food waste and wastewater (black water) are converted into biogas with high methane content which the residents could use for cooking. Bryant's method works with high temperatures of up to 65 degrees throughout in a single-stage biogas digester. This kills pathogens such as *Vibrio cholerae*, for example. The wastewater (black water) that is treated in this way can be used for urban agriculture, for example, watering of crops. Bryant spent a year working in the laboratory testing his concept together with his second supervisor, Dr.-Ing. Burkhardt, before he built the biogas plant in Ghana for a pilot study. One year later, he is now in Cottbus again working on his dissertation.

His love for Natural Sciences developed early on in his childhood days: »I come from a small town called Kissi in the Central Region of Ghana where I grew up in the countryside. There were oranges, coconuts and fruits everywhere; these made me appreciate and love nature. In my basic school at that time, we had only one teacher who taught every subject and made Natural Science appealing to me, thus it motivated me to pursue my career in science «.



^ In the laboratory on the main campus: DAAD scholarship holder Isaac Mbir Bryant from Ghana testing wastewater samples

How biogas plants works

The fermentation process in biogas plants occurs in airtight, heat insulated and heated fermenting vessels – so-called fermenters. These are regularly filled with fresh substrate. The bacteria in the fermenters convert the substrate into biogas and other fermented products. At the same time, the untreated water is purified with the high temperature which is created in the biogas plant.

Chair of Biotechnology of Water Treatment

PROF. DR. RER. NAT. HABIL MARION MARTIENSSEN

Chair of Waste Management

DR.-ING. MARKO BURKHARDT

CONSERVING BIOLOGICAL DIVERSITY WITH THE RIGHT STRATEGY

Research project highlights the economic dimension of different biodiversity conservation measures under climate change

In the Ecoclimb (Economics of climate adaptation for biodiversity conservation) project, researchers are seeking effective procedures for a suitable species protection strategy under climate change. The project is co-ordinated by Prof. Dr. Frank Wätzold of the Chair of Economics in particular Environmental Economics and is supported by Dr. Astrid Sturm and Charlotte Gerling. Many other partners are also involved in the project including Dr. Klaus Keuler and Dr. Kai Radtke of the Chair of Environmental Meteorology and Dr. Dr. Martin Drechsler, Dr. Karin Johst and Johannes Leins of the Department of Ecological Modelling, at the Helmholtz Centre for Environmental Research UFZ.

Climate change is a major threat for biological diversity. The existing habitats of many species will be partially or fully lost, for example, through rising temperatures or decreasing rainfall whereas areas which were previously unsuitable for certain species will become more attractive for living in. Ecologists have developed two types of climate-change adaptation strategies for the protection of biological diversity: the support of migration possibilities to new habitats through suitable land use measures, and the improvement of the quality of existing habitats to create climate refugia. However, economic research on climate change adaptation has largely ignored biodiversity conservation issues.

It is therefore planned that Ecoclimb will conduct pioneer research in this new field of »Economics of climate adaptation for biodiversity conservation«. »In Ecoclimb, we want to develop exemplary methodically-innovative, dynamic, ecological-economic models to analyse how three important policy instruments for biodiversity protection – namely, incentive payments for nature protection measures, compensation measures and land purchase for nature protection – can be developed with a view to ecological effectiveness and cost efficiency in climate change«, says Prof. Wätzold. Hereby, the strategies »Support of migration possibilities« and »Creation of climate refugia«, in particular, will be considered. The researchers want to identify and compare approaches from ecological and economic research concerned with risk and uncertainty and integrate this into new description models. Using the examples of endangered grassland species in Lower Saxony and Schleswig-Holstein, the models will then be tested for their suitability with the help of practice partners, such as the Stiftung Naturschutz Schleswig-Holstein and the Naturschutzstiftung Heidekreis (both nature protection associations). The researchers will then develop a decision-making aid, amongst other things, from the findings, as well as a learning software for practice partners and students. So-called »Policy Briefs«, with poli-



^ The stethophyma grossum, or large marsh grasshopper, is dependent on continuous moist ground for depositing its eggs. Ecoclimb wants to find out whether artificial refugia should be created for this grasshopper, or if resettlement in wetlands should be enabled (Photo: Daniel Konn-Vetterlein)

tically-relevant findings, are also part of the project. To fulfil the challenges of the ecological-economic modelling and to cover the considerable need for communication and co-ordination, the project has been integratively set out. This means that both scientific partners – the BTU and the UFZ – are involved in all the work packages, at least through discussion input.

The project is being funded by the Federal Ministry of Education and Research (key funding area »Economy of climate change«) with 568,000 €, of which the BTU receives 378,000 €.

Chair of Economics in particular Environmental Economics
PROF. DR. RER. POL. FRANK WÄTZOLD
CHARLOTTE GERLING

Neemrana Fort Palace in Rajasthan, which is today used as a hotel (Photo: Photographer Pranshu Dubey | © Neemrana Hotels)

WAKING UP DEAD BUILDINGS

After a lecture about the Neemrana »non-hotels« in India, the Chair of Architectural Conservation is now developing a cooperation

In India, a centuries-old civilisation has been kept alive with temples and burial sites still being built in exactly the same way today as they were thousands of years ago. The restoration of lesser-known buildings or those that aren't protected can hereby benefit from the combination of traditional knowledge and the progress that has been made in restoration and building techniques. This approach is also followed by the Neemrana project: the limestone and mortar constructions are joined together by steel girders and new additions are carried out in reinforced concrete. Glass is used for the interior to leave the medieval facades untouched. On 21 June 2018 a public guest lecture by Aman Nath, the Chairman of the Neemrana »non-hotels«, steered attention to India and illustrated what Neemrana is doing there. The event was organised by the Chair of Architectural Conservation in cooperation with the DFG Research Training Group »Cultural and Technological Significance of Historic Buildings«.

The 24 Neemrana »non-hotels« were formerly derelict historic buildings in India, which Aman Nath set about restoring. To the question of why the hotels are called »non-hotels« he responded, »When I did the first project, it looked far from being a hotel. Nor was it originally conceived to be one. In fact, Neemrana Fort Palace was designed first to keep people out and we have worked on redesigning it to welcome people in. So, I labelled it a »non-hotels«. It also gives it a unique identity.«



The initiative has been honoured by UNESCO, the Indian travel industry and other prestigious national organisations. Aman Nath does, of course, also see challenges in having hotels in cultural heritage sites: »The challenges are many but that is what excites passion. To have it all laid out on a plate is only to do with decadence. India may seem exasperating to outsiders, however, its workforce is so clever that I think they can better your ideas.«

Aman Nath has already written 14 illustrated books on art, history, architecture and photography, of which two have won national awards. These are also used as official gifts by the Indian President and Prime Minister. His book »Jaipur« was the first Indian book to be marketed internationally by Christie's. Aman, who studied history and is an entrepreneur by nature, has recently completed the book »Changing Skylines«, a company and family biography of the Shapoorji Pallonji group, one of the biggest construction companies in India.

Since his visit, the Department of Architectural Conservation at BTU has been working on developing a formal cooperation with Neemrana Hotels for research and technology transfer in the field of sustainable cultural heritage management, using Neemrana's »non-hotels« as case studies. The project will combine two of the BTU's profile-defining research fields »Smart Regions and Heritage« and »Energy Efficiency and Sustainability«. In this context, an Indo-German exchange programme spanning several years is also being conceived.



Department of Architectural Conservation
PROF. DR. PHIL. LEO SCHMIDT
SMRITI PANT

Albrecht Wiesener, Smriti Pant, Alexandra Lotz, Prof. Leo Schmidt, Aman Nath, Gajendra Pratap Singh and Sophia Hörmannsdorfer (l-r) after the lecture on the main campus

SCIENCE AROUND THE WORLD

The Fulbright Scholar Sally Donovan analyzes the charcoal production in Brandenburg and Connecticut on a global scale at BTU

Sally has been fascinated with landscapes since she was a child. Growing up in the Midwestern USA, human landscapes, especially land used for farming, played an important role in shaping her academic career.

»I first learned to observe the landscape during family road trips to northern Minnesota. Driving from our home in Minneapolis, I remember peering out the back window of our minivan and noting how the scenery transitioned from city streets to cornfields to the forested wilderness.«

As her studies continued, Sally discovered landscapes not only change across geographic space, but they also evolve through time.

»In high school, my studies of Minnesota history deepened my interests in the landscape. Through studying the War of 1862, a period of violent conflict between the Dakota people of Minnesota and settlers, I discovered untold narratives of Minnesota's landscape. I realized familiar soccer fields and farmland today used to be remnant forts and historic battlegrounds. This realization reshaped my perception of the Minnesota landscape and sparked my interest in landscape history.«

Today, as Fulbright Scholar at BTU, Sally is combining her interests in landscape history and environmental science to study the longterm ecological effects of historic charcoal production in Brandenburg.

»Historic charcoal production has had a significant effect on forest ecosystems in Brandenburg. For centuries, charcoal craftsmen, known as colliers, clear-cut the region's forests to produce charcoal fuel for smel-

ting iron. This process, which involved slowly burning wood in earthen kilns, referred to as relic charcoal hearths (RCHs), introduced lasting environmental disturbances that continue to affect soil health in forests throughout Brandenburg today.«

Despite ongoing research, the full effects of historic charcoal production are still not well understood, particularly changes to soil physical properties. Alongside Thomas Raab's geopedological research team at BTU, Sally is working to better understand how historic charcoal production affects heat transfer in soil, which will help to shed light on patterns of water and nutrient availability in RCH soils.

Beyond Brandenburg, charcoal operations exist in many countries around the world. Before her time at BTU, Sally studied the geochemical effects of historic charcoal operations in Connecticut, USA.

»Similar charcoal operations existed in Connecticut. These remnant structures have recorded a history of colonial charcoal production and impacted the region's forest soils and vegetation for more than one hundred years.«

At BTU, Sally will build on her previous findings to compare the history of charcoal production in the U.S. and Germany and contribute to understanding the ecological significance of RCHs on a global scale.

»By bringing together history and science, my research encourages international dialogue and forges research connections through a shared interest in people, plants and landscapes. Almost every landscape has a human history, and the sites of charcoal production in Germany, which are highly accessible and readily abundant, present a convenient and functional example for studying the long-term effects of human landscape modification worldwide.«



Fulbright Scholar at the Chair of Geopedology and landscape development
SALLY DONOVAN

< The research of the Fulbright Scholar Sally Donovan deals with the ecological significance of historic charcoal production. She holds a typical soil sample, taken from a site of historic charcoal production in the Tauerische forest north of Cottbus. The scientists take the samples in a cylindrical form to best preserve the soil structure

ARTIFICIAL INTELLIGENCE IN THE FACTORY OF THE FUTURE

An interview with BTU professor Ulrich Berger and doctoral candidate Marlon Lehmann of the automation technology department

BTU NEWS: The subject of artificial intelligence has been in the media for some time. What is happening in this field at the moment?

→ **PROF. BERGER:** From automobile manufacturers and toys to operation theatres – artificial intelligence has arrived in our daily lives to optimise production, entertain children and for precise surgical procedures. Technology is transforming and becoming more efficient. If we look at online portals for holiday and hotel reviews, for example. The better the technological environments, the more they are used. The consumer requests information and products more individually and more precisely. Furthermore the proximity to the customer has increased. Smaller quantities are being produced and products are often delivered to customers already the same day. Competitiveness is key.

BTU NEWS: Are machines becoming independent?

→ **PROF. BERGER:** With the aid of a complex algorithm, machines can, meanwhile, process and connect visual, haptic and acoustic information in real time. Camera systems, image recognition systems, for example, can today already recognise whether components have faults in produc-

tion. Intelligent algorithms are used here, which recognise whether a component deviates from the norm. Another important point is that the storage capacity is extremely high so it is possible that robots in powertrain manufacturing, for example, use their historic data to recognise which solutions already existed for a fault. They then provide humans with options for the further course of action – in real time.

BTU NEWS: What is the role of neural networks in artificial intelligence?

→ **MARLON LEHMANN:** Research has been conducted in artificial neural networks since the middle of the last century but it was only the development of the required computing power that brought the breakthrough. In the past few years they have developed into the state-of-the-art method of artificial intelligence – often associated with the term deep learning. Whether speech recognition, facial recognition or medical diagnosis, deep learning is being increasingly used in all areas of our lives. With this, artificial neural networks are taking a leading role in the current debate on the most powerful algorithms.

BTU NEWS: How has the work changed?

→ **PROF. BERGER:** Today the work of humans is no longer continuous but erratic. They program, observe and evaluate statistics. Monotony is decreasing and autonomy is increasing but humans also need to be receptive for this. Businesses are also facing challenges. Work-life balance is the key. People want to do their own thing.

BTU NEWS: How can humans maintain a clear overview in dealing with machines?

→ **MARLON LEHMANN:** In the first step we are working on providing closed intelligent modules which can, by means of an algorithm, filter out the relevant decision-making possibilities and provide humans with manageable options for the further course of action. The goal hereby is to keep interfaces as simple and intuitive as possible. Humans have the overview, the machine, the detailed knowledge. The decision-making must remain with humans – they assume the role of the supervisor and keep an overview of everything. Humans are provided with the necessary background information and must assess the consequences of a decision.



^ Prof. Ulrich Berger (r) and doctoral candidate Marlon Lehmann are certain that humans will still be making the decisions, also in the future. The basis for this is the necessary background information through artificial intelligence

Thank you for the interview!



NETWORKED EUROPE-WIDE WITH CLIMATE-KIC

Knowledge and innovation association promotes green technologies

The Climate-KIC Network, of which the BTU is a member, is dedicated to the promotion of green technologies. This involves support for start-ups, research promotion and the establishment of a well-functioning network. The Climate-KIC programme also involves summer schools, in which young researchers can meet and receive specific training. Dumisani Chirambo studied Environmental and Resource Management at the BTU, as part of a PhD programme, and is researching ways of developing renewable energy in his homeland of Malawi. Last summer, he attended the Journey Summer School in Zürich.

BTU NEWS: How did you get in touch with the Climate-KIC program and its different offerings?

→ **DUMISANI CHIRAMBO:** My PhD coordinator Dr. Birte Seffert informed us PhD candidates about Journey Summer School in November last year. It seemed like a good chance to see climate change from a business perspective rather than the academic perspective that I am used to. So I got in touch with Ing. Sergi Costa, who was more familiar with the Climate-KIC programmes. He gave me some tips on the issues to make more prominent and the parts that were not very clear. After submitting my application to Climate KIC, I then had a Skype interview with Fabienne Lang, the Education Manager for Climate-KIC in Zürich. So after that let's just say the rest is history.

BTU NEWS: Why did you choose to apply for Journey Summer School?

→ **DUMISANI CHIRAMBO:** Firstly, it was the idea of learning how to create businesses that are related to improving climate change mitigation and adaptation- that is Climate Entrepreneurship. I am basically an academic. However, Climate Entrepreneurship is also very important as businesses and social enterprises have the potential to address many of the challenges related to climate change mitigation and adaptation. Secondly, the opportunity to meet various young brilliant minds from various European Universities who have an interest in Climate Entrepreneurship. Establishing good friendships and professional networks is very important in life.

BTU NEWS: What is the Summer School about, how is it structured?

→ **DUMISANI CHIRAMBO:** Climate-KIC runs about five to eight summer schools every year. They start at different times and participants are



^ Young researchers from universities from the whole of Europe attended the Climate-KIC Journey Summer School

based at different venues. The summer school I was selected to aimed at providing practical and theoretical knowledge on what businesses or innovations there are in Climate Entrepreneurship. The first two weeks in Copenhagen were mostly about visiting various companies and businesses which were addressing different environmental issues such as food waste. Week three and four in Zurich it was more about us students identifying a viable business that could address an environmental challenge. The last week in Wroclaw was about developing those business ideas into something more concrete. So the various teams developed business plans that were reviewed by actual experts in the field.

BTU NEWS: How was your experience in Zürich, what was your main benefit from the program?

→ **DUMISANI CHIRAMBO:** The Journey Summer School has been a very memorable experience. On the professional side, I learnt a lot of skills that I did not have before. And as a former participant of the Journey Summer School, I am now an Alumni of Climate-KIC. This means that I can now access a lot of Climate-KIC resources as well as other people in the network if I require help or support in anything. I made a lot of friends too. Some of the people I met live here in Germany and others from far afield. So if one wants to travel and meet new people whilst learning about Climate Entrepreneurship, this could be a good place to start at.

Thank you for the interview!



ECONOMY & KNOWLEDGE TRANSFER

EVEN QUICKER WITH NEW HANDLEBARS

The BTU-Chair of Lightweight Design with structured Materials has developed and produced a customised track-bike cockpit for the LKT Team Brandenburg.

When tenths of a second are enough to determine victory or defeat, all sorts of tweaks are made to make athletes faster – and cycling is no different. The renowned cycling expert, Heiko Salzwedel, returned to Cottbus in the spring of 2018. Cyclists from various countries like Russia, Denmark, Australia and, most recently, Great Britain, have won numerous medals under his guidance. The coach has brought lots of knowledge to Cottbus – and lots of wishes.

Prof. Holger Seidlitz, Chair of Lightweight Construction with Structured Materials, explains how the cooperation with the LKT Team Brandenburg came about: »He's used to working with the very best equipment. He wasn't satisfied with what the market had to offer in terms of cockpits, which consist of handlebars, a stem, armrests, extensions and connecting components. That's what brought him to the BTU.« The BTU had already worked with the sponsor, Lausitzer Klärtechnik (LKT), on other successful projects over the years.

The scientists had already worked on the development of high-end cycling equipment for a long time. The LKT Team is now benefiting from their wealth of experience: »You can see they're both experts, and the

overall package is also fantastic. We have everything here in Cottbus – that's what brings us together. It's great that top-level sport and technical excellence can be combined in our region«, says LKT Team Manager, Steffen Blochwitz.

The specific aim of the development work was to optimise the handlebars and construct the entire cockpit to make it adaptable to individual athletes and able to withstand the immense force exerted at the beginning of a race. The end result was a product made of carbon that brilliantly meets all the requirements: Improved aerodynamics, ergonomic handles, perfect grip in the arm rests and increased rigidity give the athletes greater speed and make the bikes safer. »We've managed to optimise the aerodynamics, which means that we have reduced the power required to push the handlebars through the air by 24% compared to the original model. The handlebars are now also lighter and more rigid, allowing a cyclist's power to be optimally transferred onto the track at the beginning of a race«, explains Jonas Krenz.

The young cyclists came to the BTU on a warm summer's day in August to inspect and test the new cockpit. The scientists had meticulously ensured that each set of handlebars matched the exact dimensions and requirements of each cyclist. The cyclists then completed their first test lap at the university sports facilities. Niklas Vogt saw a lot of happy faces and received lots of praise from people, like this year's German Champion in the team pursuit, Richard Banusch: »The power transfer is fantastic – just what I was looking for.« Philip Weber also gave his opinion: »There's a Formula 1 car beneath the handlebars. As it has been tailor-made for me, it has considerably improved my position on the bike.« The World Cup meet from 30 November to 2 December had a very special attraction in front of a home crowd in the Berlin Velodrome, as athletes from the Cottbus team competed against the best cyclists from around the world.

Chair of Lightweight Construction with Structured Materials
PROF. DR.-ING. HOLGER SEIDLITZ
JONAS KRENZ
NIKLAS VOGT

< Richard Banusch (left) and Philip Weber during their first test-ride with the new handlebars at the BTU sports facilities



BTU RESEARCHERS DEVELOP HIGH-PERFORMANCE PLASTICS

There is a growing demand for ultra-light and high-strength plastics in the industry. Scientists at Campus Senftenberg are working on three projects to develop pioneering technologies

The amount of plastic components in motor vehicles, trains and planes is growing. Plastics can be used as a construction material to reduce the weight of vehicles, helping to save energy and fuel. There's a growing demand for high-performance materials with new properties. Scientists are currently working alongside Prof. Dr.-Ing. Matthias Ziegenhorn from the Chair of Engineering Mechanics and Machine Dynamics and Prof. Dr.-Ing. Ralph Schacht from the Chair of Electronic Circuit Technology to develop technologies that allow the production of materials with high strength, conductivity and lightness.

Polyester fibres are refined in innovative processes to enable plastic functionalisation

BTU scientists are collaborating with industrial partners on the »Graphene Electrical Fibres« project to develop new materials from polyester fibres, which are combined with nanoparticles like graphene to create new properties. This makes it possible to produce materials that are extremely strong, conductive and light. Using them for road, rail and air travel could help to reduce weight and save fuel. The project partners are TREVIRA GmbH Guben, a manufacturer of textile polyester products, and AERTEC Solutions GmbH, a manufacturer of aviation technology.

Precisely designed high-performance plastics could replace metal components

The team of researchers, led by Prof. Ziegenhorn, are currently investigating high-performance plastics that are thermally-stable and difficult

to melt. The BTU is working alongside the Fraunhofer Institute for Applied Polymer Research (IAP) on a »3D High-Performance Composites« project to develop durable high-performance plastics for 3D-printing and a new tool to flexibly calculate expected material properties. The project partners are working together to investigate thermosetting plastics which maintain their dimensional stability when subjected to changes in temperature. Thermosetting components are less dense, more thermally-stable and usually reduce costs, which means they might replace metals used near heat sources, such as in vehicle engine compartments. BTU scientists can now use their calculation tool to predict mechanical properties with mathematical and physical accuracy depending on production parameters. This will enable the systematic application of these materials and the development of optimal printing processes, helping to meet the requirements of Industry 4.0.

Contactless temperature measurements predict the service-life of safety-relevant vehicle components

Prof. Ziegenhorn and his team are working alongside InfraTec GmbH on the »THEMECS Sensor« project to develop a process to simultaneously measure the temperature and displacement of components. Mechanical stress causes temperature changes in components like brakes and tyres. An infra-red camera can be used to identify patterns on the surface of components, revealing their changes in temperature and shape. The aim of this work is to practically verify the service-life of materials. The project partners are InfraTec GmbH, a manufacturer of thermal imaging cameras, and ZwickRoell GmbH & Co. KG, a manufacturer of testing machines.

All three projects have received funding of 1.6 million Cottbus-Senftenberg and are being backed by the European Regional Development Fund, the Brandenburg Investment Bank, and the Central Innovation Programme for SMEs (ZIM). The projects will run for a period of three years.

Chair of Engineering Mechanics and Machine Dynamics
PROF. DR.-ING. MATTHIAS ZIEGENHORN
 Chair of Electronic Circuit Technology
PROF. DR.-ING. RALPH SCHACHT

< Functionalised polymer fibres enable new applications in the transport sector (Photo: TREVIRA GmbH Guben)



MORE TRANSPORTATION OF GOODS BY RAIL

The BTU project Smart Cargo Station uses the benefits of passenger transport for goods transport

Road transport today is dominated by lorries the consequence of which is overloaded and damaged roads, a high risk of accident, badly paid work, polluted air and a high consumption of fossil fuels. European politics are demanding that the once dominant mode of transport, the railway, be used as an alternative. But how are the goods supposed to get onto the rails? The Smart Cargo Station (SCS) provides the answer.

Despite a favourable primary energy balance, rail can only arduously claim its market share of goods transport in Germany of 17 per cent per tonne kilometre. Many potential customers can no longer be accessed via rail – the laying of an own, private rail connection for all commercial or industrial enterprises is usually unprofitable. As a result, most transport occurs via roads with disadvantages for the environment and society. An alternative to long distance transport with HGV is combined transport (CT), which involves the transportation of goods in standardised (swap) bodies via road and rail as well as on water. These bodies are available in large numbers for almost all kinds of goods. The changeover of the transport modes currently occurs in terminals and is associated with loss of time and additional costs. In addition, there are only few terminals and the journeys to get to these are often too long.

Combined transport is only really economically viable with greater cargo loads and for longer journeys – something that only rarely applies to goods customers in smaller and mid-sized enterprises. Many regions along the European goods transport corridors have also been left behind by combined transport because trains don't stop for loading or unloading away from the terminals. Up until now there hasn't been a concept for getting the goods to the trains quickly, securely and conveniently and on the shortest way possible.

Transport stops near residential areas enable passengers to quickly enter, exit or change from one mode of transport into the next but there isn't an equivalent for goods transport. This is where the Smart Cargo Station comes in. The core of the project is formed by an innovative solution that totally forgoes time consuming shunting and train composition processes. Instead, the cargo handling occurs during a short stop at a main platform. Hereby cargo movers – specially adapted trucks – are used for the handling of the containers instead of cranes and these also enable them to be moved horizontally. In the Smart Cargo Station, goods trains only have short stops for the changing over of the containers before they continue their journey. The construction of additional loading platforms for this isn't required, which saves time and money. Shorter distances to the customer are covered by road transport. The Smart Cargo Station also complements the existing railway network with a further new component in the decentral location. Extendible modules can be integrated into existing railway facilities and do not require any expensive intervention in the signal box technology. Fallow areas, which have arisen due to the demolition of railway tracks, can be used for this.

More goods on the railways: this is not only a political slogan but a scientific and technical research goal at the BTU Cottbus-Senftenberg funded by the Karl-Vossloh-Stiftung. The project was presented at the InnoTrans 2018 in Berlin in September.

The InnoTrans is the world's leading trade fair for transport technology held every two years in Berlin. BTU professors of Railway Engineering as well as Soil Mechanics and Foundation/Geotechnical Engineering of the Institute of Construction Engineering were represented at the InnoTrans 2018 Berlin-Brandenburg joint stand.

The Chair of Railway Engineering offered specialist tours for students.

www.innotrans.de

Chair of Railway Engineering
PROF. DR.-ING. HANS-CHRISTOPH THIEL
CHRISTIAN MENZEL



< In the Smart Cargo Station project, goods handling occurs cost and time efficiently at a main platform (Photo: Christian Menzel)

REGIONALLY NETWORKED LIGHT-WEIGHT CONSTRUCTION

BTU News spoke to the transfer scout of the »Innovation Hub 13« project Marco Lubosch

BTU NEWS: You are a transfer scout in the field of lightweight construction for the Federal Ministry of Education and Research (BMBF) project »Innovation Hub 13«. What are you working on?

→ **MARCO LUBOSCH:** A transfer scout doesn't have a typical working day. Our work involves the whole research and development transfer. On the one hand, scouts have to document current developments with the project partners and bring these to the attention of potential users in industry. For this we need to be well positioned in our fields in terms of the subject matter and informed on the opportunities and boundaries of new technologies. The work also involves being a contact partner for the needs of regional industry so that the requirements and application fields can be brought to the attention of the research institutes.

BTU NEWS: Transfer scouts work at the BTU and the Technical University of Applied Science Wildau. What is the cooperation amongst one another like?

→ **MARCO LUBOSCH:** The interesting and new thing about the idea of the »Innovation Hub 13« is the cross-institute cooperation of the transfer scouts. When big research institutes get together this leads to synergy effects for the facilities but particularly also for the industry partners. The cooperation on the specialist, subject-related level is primarily initiated by the transfer scouts and the short path between us and good networking within their institutes is therefore extremely important.

BTU NEWS: Where do you think the challenges are?

→ **MARCO LUBOSCH:** In smaller companies, in particular, we often see that they are so caught up in their daily business that they are unable to give much thought to developments for the next few years. As transfer scouts we ensure that smaller companies are not left behind here and highlight current technological developments for them. The big challenge for us will be to reach the many smaller businesses in the region. Information portals and a wide range of events will intensify the contact here.

BTU NEWS: What will the next steps be?

→ **MARCO LUBOSCH:** Alongside the technology scouting, our work also includes close cooperation with chambers, associations and promoters of trade and industry. We are currently working on developing close partnerships with all important institutions in Brandenburg and Saxony. Besides visiting companies, we also try to take part in as many public events as possible in order to talk to interested people. On 17 October we organised the 3rd BTU Transfer Day at which we presented a series of current developments from the fields of lightweight construction, life science and digital integration.



^ Marco Lubosch (r) talks to doctoral candidate Andreas Neumann about the new forging press at the Pantha Rhei research centre

BTU NEWS: What are the current trends in lightweight construction in the region?

→ **MARCO LUBOSCH:** Here the aim is to produce, through weight reduction and by using as little or as light cost-efficient material as possible, components that still have excellent properties with regard to strength and rigidity. Lightweight construction is particularly relevant in areas where components are quickly accelerated or used across long distances, for example, in aerospace and vehicle and machine construction. However, it is currently the wealth of new manufacturing processes that makes lightweight construction particularly interesting. Alongside classic processes, such as welding, forging, mechanical processing, surface treatment and much more, the BTU is also involved in the development of additive and hybrid manufacturing processes. In additive manufacturing the workpiece is, for example, constructed layer by layer out of a coiled welding wire or powder bed. These manufacturing processes have the big advantage that they don't need an original shape apart from a computer model and geometries such as hollow spaces can be realised. The combination of different manufacturing processes, in particular, means that the benefits of individual technologies can be combined in hybrid manufacturing processes. Forging, for example, leads to a better microstructure for greater loads. If the process is combined with an additive welding process and then mechanically processed, you have whole new opportunities for making components lighter and more stable.

Thank you for the interview!

Innovation Hub 13 - fast track to transfer
www.innohub13.de

Transfer scout lightweight construction
MARCO LUBOSCH

START-UP IDEA - NEW ENERGY FROM LUSATIA

An independent energy supply outside the public electricity network – this is the business idea behind the start-up edrøm

The Cottbus start-up project edrøm has made the supply of remote areas with electricity its business idea. Wherever the power network is not available or connection to this too difficult and costly, the start-up team offers an alternative – the edrøm generator. Applications involving this can be seen in the leisure industry in the power supply of caravans, mobile homes and yachts as well as in remote holiday homes, for example, in the forests and archipelagos of Scandinavia and also in industry. Hereby the company founders are considering lights, power supply for building sites, traffic control systems and much more.

For this, the three founders and BTU graduates behind edrøm, German Linz, Ivo Gebhardt and Jeronimo Lindauer, developed an innovative generator. In contrast to standard generators with diesel or petrol engines, the machine is based on the Stirling cycle – a technology that is more than 200 years-old. In the early 19th century Scottish clergyman Robert Stirling wanted his invention to replace steam machines as their operation with exploding pressure tanks was too risky.

The clever feature about his invention is that the Stirling engine is heated from the outside, which enables the use of different fuels and makes electricity generation, in contrast to the classic generators, clean and quiet. The edrøm generator can burn gaseous fuels such as camping gas as well as liquid fuels such as diesel or petrol. Bioethanol, biodiesel and biogas can also be converted into CO₂-neutral electricity without any conversion needed. This »any fuel« ability is particularly interesting for caravan owners who can choose between camping gas and diesel from the vehicle tank. As the heating of the process is continuous, the device is as quiet as a modern dishwasher which means it can also be installed inside the caravan. Hereby the founders see solar power from the caravan roof as a complement to their generator as this is not always possible. Often the shade of a tree or a cloudy day is all it takes for the power to fail and the lights to go out in the caravan.

The start-up project is currently being funded as part of the EXIST programme, which enables the team to develop the product further and ad-



^ This generator enables energy generation outside the main power network for caravans, yachts and industrial applications (Photo: edrøm)

apt this to customer requirements to then be able to enter the leisure and recreation market in 2019. The founders are seeking investors for the follow-up financing. EXIST – start-ups from universities and research is a funding programme of the German Federal Ministry for Economic Affairs and Energy, which is co-financed by the European Social Fund (ESF). To receive the EXIST start-up grant, applicants should not have left university more than 5 years ago and must also present a detailed business plan. All details on the funding programme are published on exist.de. It was 12 months until edrøm received confirmation and this time was used for preparation, developing the business idea and the application procedure not forgetting the time between the application submission up to the decision-making which is often 12 weeks. The BTU Cottbus-Senftenberg start-up service was an immense help in the application process and offered plenty of advice.

www.b-tu.de/gruendungsservice

www.edrom.de

GERMAN LINZ

ESF project »Start-up service«

Chair of Planning and Innovation Management

KATRIN BAUMERT

MELTDOWN IN COMPUTER SECURITY

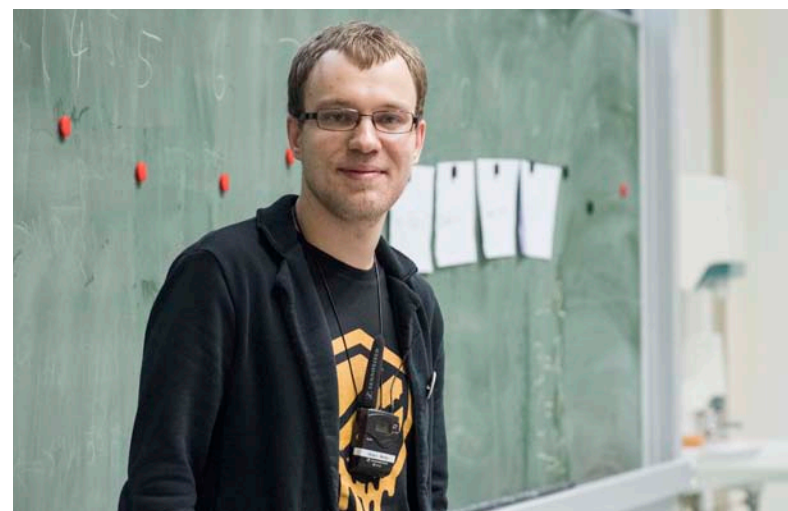
With Meltdown, BTU graduate Thomas Prescher discovered one of the most serious IT security flaws of recent decades

When Thomas Prescher tells the story of how he discovered the Meltdown IT security flaw, his story often begins with a relaxed evening with burgers and beer. This is also how the story begins which the 31-year-old told on the 23 January 2018 to a packed lecture hall at the BTU. Back in his former university, the BTU graduate explains, together with his colleague, Werner Haas, how a processor works and how, inspired by a simple thought experiment, he attempted to discover a computer secret which he should not even really reveal.

On the evening of 27 November 2017, after burgers and beer, Thomas Prescher sat down at his computer and wrote four lines of code. »I quickly realised that I was accessing data which I shouldn't really be seeing«, says the operating systems expert and explains how he approached Intel with his findings. It was not long before he received a response saying that the problem was already known and he was only part of a group of IT experts who had discovered Meltdown independently of one another. Confidentiality was agreed on this until 9 January to give Intel and others time to make improvements. However, on 3 January, Meltdown and Spectre were publicly revealed, and Thomas Prescher was bombarded with questions from the media.

Despite this, he made time for a lecture at his old university which was where the foundation for his successful career and, ultimately, also the Meltdown discovery was laid. Prescher began his Computer Science Studies here in 2006. Alongside the good supervision which he had expected of a smaller university, it was particularly Professor Jörg Nolte who had a lasting influence on the young student. »Jörg Nolte really influenced the way I approach things today and that I really want to understand and fully establish problems.« However, Prescher not only attributes his authoritative basic knowledge to his professor, but also to his first professional experience. He got an internship at Intel thanks to good contacts with industry and this led to his first job with Intel in Braunschweig after he completed his diploma.

»At Intel I worked on processor architecture and new storage technologies with Werner Haas. When the site in Braunschweig closed after one year, I had the choice of either accepting an offer in America or staying in Germany and working with Fireeye.« He chose Fireeye, where he was part of a team which developed malware recognition based on virtualisation. Two years later, Prescher and Werner Haas, his supervisor from his time at Intel, along with others, founded the company, Cyberus Technology. The company is currently developing a malware analysis platform which can be used by experts to understand new malicious software as quickly as possible. Hereby, Prescher, as a software architect, is responsible for the technical development. Thomas Prescher answers the question of what he particularly remembers whilst looking back on his studies with: »The day on which we were granted access to an Intel 48-core processor for research. This really got the ball rolling.«



IT expert Thomas Prescher studied Computer Science at the BTU >

»IT DOES NOT ALWAYS HAVE TO BE THE BIG INNOVATION«

The start-up service puts ideas for becoming self-employed to the test

In 2019, the foundation will be laid for a new start-up centre in Cottbus, close to the main campus, which will offer students, graduates and employees of the BTU a contact-point for putting their start-up projects into practice. The BTU start-up service already offers support to the founders of the future.


This service is intended for all employees, students and alumni of the BTU whereby, in the current funding period, alumni can benefit from the advice offered for up to five years after graduating (up to seven years in the new period which is planned from 2018). The start-up service is managed by Prof. Dr. Magdalena Mißler-Behr and her team. It is based at a Chair which is associated with the project's objective: »Our main job is to raise awareness of setting up your own business and start-ups. Generally, we do this with our information events and workshops, as well as more specifically with cross-departmental teaching events in which we can convey much more specifically, and over a longer time period, what setting up a business involves and what it doesn't.« After all, not all ideas can be realised successfully. »One of the most important tasks, therefore, includes the initial consultation in which we can see what is behind an idea, where there is a lack of stringency and where any gaps exist.«

The start-up service hereby puts ideas to the test. You can also contact the team to ask about any concerns you may have about whether this is the right thing for you. Prof. Mißler-Behr explains that the most important thing in this is the will, perseverance and motivation. If these three factors are combined with a concrete and marketable idea, prospective founders can take the next step. With the aid of coaching, external specialists then help the future founders prepare for the personal and business challenges which a start-up brings: »An important concern of ours is also to help those with suitable ideas receive an EXIST start-up grant. If this is successful, the business idea can be put into a business plan with the aid of further coaching,« explains Mißler-Behr.

Founders, such as Stefan Mehner and Martin Noack, have benefitted from the start-up service which, in their case, resulted in CHEEEZBUDE, a mobile Photo box for all kinds of events. »It doesn't always have to be the big innovation that leads to success. Sometimes, all it takes is minor improvements and an adapted concept.« In this context, Prof. Mißler-Behr also



^ With her start-up service team, Prof. Dr. Magdalena Mißler-Behr supports individuals in putting their business ideas into practice

views company succession as an alternative to a start-up. Bringing managing directors and possible successors together is, therefore, just as much a future-related subject for the start-up service, as start-ups as a future perspective for postdoc candidates and summer schools. In this way, start-ups and everything this involves move more into focus. 

The regional start-up centre near the campus (RCGC) is planned as a central place for start-ups, knowledge transfer and regional business promotion. The new centre, over an area of 5,000 square metres on the site of the former swimming pool on the street Siemens-Halske-Ring, will accommodate co-working spaces, a modern and functional working environment, as well as skilled contact partners. The close proximity to the main campus, and the intensive collaboration with the BTU, will lead to a place in which science and society can network productively.

Chair of Planning, Innovation and Entrepreneurship
PROF. DR. RER. POL. MAGDALENA MISSLER-BEHR

INTERNATIONAL BIOTECHNOLOGY INNOVATION DAYS

Pitching competition to promote spin-offs and start-ups in the biotech sector

The Senftenberg Innovation Forum marked its tenth anniversary in 2018 with its renamed three-day programme on biotechnology and medical research. The International Biotechnology Innovation Days (IBID) were held in May, giving participants the chance to exchange ideas at an open-access conference with four scientific sessions, bioinformatics workshops, an industrial exhibition and poster presentations. The conference was complemented by a range of cultural side events.

IBID 2018 was jointly organised by the Institute of Biotechnology at the BTU Cottbus-Senftenberg, the Helmholtz Centre for Materials and Coastal Research in Teltow, the Technical University of Applied Sciences in Wildau, the University of Wrocław, the Ludwig Maximilian University in Munich, Brandenburg Medical School, BioResponse e.V. and the Healthcare Industries Cluster of Berlin and Brandenburg. The organisers managed to attract several well-known specialist speakers to the Konrad-Zuse Media Centre, including Prof. Dr. Martin Vingron, Head of Bioinformatics at the Max Planck Institute for Molecular Genetics in Berlin.

Two data science workshops on the first day introduced the topic of statistical data analysis, focusing on digitalisation and machine learning. The next two days were all about the specialist speakers. They covered a wide range of topics, from tumour biology, oxygen sensors and biomarkers in translational medicine to medical bioinformatics, the digitalisation of research and autoimmune diagnostics.

In order to further promote the transfer of knowledge at IBID 2018, the organisers also held a pitching competition in cooperation with the German Start-Ups Association. »Everyone with a brilliant idea for a new biotech company was invited to present their business model. We wanted to use the competition to let people flesh out their vague ideas and to give promising concepts more publicity and maybe even attract the odd investor,« explains Dr. Stefan Rödiger from the IBID 2018 organisation team. There was also a prize for the best idea. The winner was presented with 500 Cottbus-Senftenberg in prize money, which was awarded by IBID and the town of Senftenberg.

The event was also attended by representatives of the transfer project »Innovation Hub 13 – Fast Track to Transfer«. The project was jointly de-



^ Experts from the world of biotechnology meet at IBID 2018 in Senftenberg (Photo: Berlin Partner/ Franziska Dinter Photography)

veloped by the BTU and the Technical University of Applied Sciences in Wildau. It emerged from the German government's »Innovative Universities« initiative and focuses on three main areas, including life sciences, offering support to innovative ideas by providing specialist advice, training and infrastructure. Close contact with the transfer scouts involved in the project also establishes a direct link to companies in the region.

Chair of Multiparameter Diagnostics
DR. STEFAN RÖDIGER
 Chair of Molecular Cell Biology
DR. SARAH KAMMERER

STUDY & TEACHING

UNESCO CHAIR FOR THE BTU

The Chair of Interculturalism has held the UNESCO Chair in Heritage Studies since 2003

With its commitment in cultural heritage research, unique in Germany, the BTU Cottbus-Senftenberg was already able to convince the UNESCO to establish a UNESCO Chair in Heritage Studies in Cottbus in 2003. With this, the BTU is part of a very select network of twelve chairs nationwide and benefits from international renown and varied networking opportunities. Worldwide, there are more than 700. The UNESCO chair is established in the Chair of Interculturalism, which is directed by Prof. Dr. Anna Amelina who was confirmed as the chair holder by the UNESCO at the beginning of May 2018. Amelina was appointed to the BTU in May 2017.

With the establishment of the UNESCO Chair in Heritage Studies, the UNESCO defined a comprehensive need for heritage research in 2003, which incorporates world heritage, immaterial heritage and document heritage as an overall concept. With this it also formulated, at the same time, the aspects of our material and immaterial heritage as well as its elements relating to nature. The establishment of the UNESCO chair at the BTU was also the result of the commitment of Prof. Marie-Theres Albert at the time – together with her colleagues – in the successful establishment of the World Heritage Studies master's course. Albert held the Chair of Interculturalism until 2015.

With the opportunity to do doctoral studies in this field with the Heritage Studies PhD programme, the BTU has been making an additional important contribution in the training of young academics and research in this field since 2010. With the renewed awarding, the UNESCO acknowledges the outstanding research work of the Chair of Interculturalism and Prof. Dr. Anna Amelina as the new chair holder. The UNESCO Chair in Heritage Studies will initially be granted for four years and can be extended upon application.

Anna Amelina has been the director of the Chair of Interculturalism at the BTU since May 2017. Her areas of specialisation in research include social sciences-based heritage studies, cultural sociology and the sociology of knowledge, globalisation and trans-nationalisation research as well as gender and migration research. Heritage studies is a continuously growing international research field, which examines the origin and transformation of (world) cultural heritage in a global, national and local context. In the heritage research field, several departments work together across the faculties at the BTU. These include: building, cultural and architectural history and environmental and social sciences. The UNESCO awarding enables the Chair of Interculturalism to pursue three associated research interests. These are the analysis of immaterial and material forms of (world) cultural heritage in the context of the current globalisation processes, which are often affected by conflict, the research of museums and the museal representation of identities and conflicts as well as the analysis of the cultural heritage of marginalised social groups. »We are very pleased that, in this context, we are able to further strengthen the research of global world heritage discourse and the development of inclusive (cultural) heritage approaches,« said Anna Amelina, »the participation in the programme of the UNESCO chairs enables the BTU Cottbus-Senftenberg to have a long term international cooperation on a global level and ensures visibility of its master's and doctoral study courses in the field of (world) heritage studies.«



△ Prof. Dr. Anna Amelina has been acknowledged by the UNESCO

Chair of Interculturalism
PROF. DR. ANNA AMELINA

»THERE ARE MANY YOUNG AFRICANS DOING GREAT THINGS«

BTU student Collins Izuchukwu Igboji from Nigeria wins the 2018 DAAD Award

This year's DAAD Award goes to Collins Izuchukwu Igboji from Nigeria. He is studying for a Master in Environmental and Resource Management, and he is one of the best international students on the programme. His outstanding academic achievements are complemented by his great intercultural commitment to the BTU Cottbus-Senftenberg. He has actively helped to shape university life by participating in events like Cottbus Open and the African Cultural Night. He is also the President of the Nigerian Students Association at the BTU.

BTU NEWS: What does the DAAD award mean to you?

→ **COLLINS IGBOJI:** I am honoured to be this year's winner of the prestigious DAAD award. As a Pan-Africanist, I appreciate this award greatly because of the opportunity it gave me to tell the other side of the African story. Whenever I walk down the street and see an African child depicted as a symbol of hunger and poverty on billboards, I feel bad and motivated as well. These billboards always challenge me to work hard and also learn from my environment, so that I can contribute to building the Africa of tomorrow – the Africa we want. I believe this award has offered me the privilege to project Africa in another light other than a continent of hunger and poverty flying all over the media. I want the world to also know that there are many young Africans doing great things both within and outside Africa.

BTU NEWS: Could you tell us something about your student commitment and university projects?

→ **COLLINS IGBOJI:** As a student, I have been actively involved in both social and academic activities within and outside the university. I have served as the public relations officer of the Nigerian Students Association at the BTU and I am currently the president of this association. Through this association, I have contributed my quota by organising social and sports activities with the support of good team members at different times. Last year, we participated in Cottbus Open, organised a seminar for Nigerian students and wrapped it up with the maiden edition of the Nigerian cultural night. I took this to the next level this year by assembling a team of enthusiastic African students to organise and execute the first ever African cultural festival at the BTU with ten African countries in participation and many students in attendance. Under my watch this year again, Nigeria had a good outing at Cottbus Open and also played a friendly football game against the Latin American students. Academically, I am currently working on a contract as a research associate on the Chair of Environmental Sociology for a German-Nigerian project on agricultural mechanisation.



△ Collins Izuchukwu Igboji (centre) receives the DAAD Award from Prof. Dr. Christiane Hipp and Prof. Dr. Michael Schmidt during the matriculation ceremony

BTU NEWS: What do you like most about your studies and the BTU Cottbus-Senftenberg?

→ **COLLINS IGBOJI:** The interdisciplinary nature of the ERM programme attracted me first to the degree. As a Master degree student here, I have been impressed by the high quality of the modules taught in this programme, covering all the pressing environmental challenges of the 21st century and, most importantly, how to tackle them. For someone like me with a background in Botany in my Bachelor's, the flexibility of the programme gave me the opportunity to select the modules that I know will be helpful to achieve my interest, which is the phytoremediation of oil-polluted soils – a major environmental problem in my home country, Nigeria. I must also quickly add that the friendly attitudes of the lecturers and the students mean a lot to me. Coming to the BTU has been one of the best decisions I have ever made. The international status of the university has given me the opportunity to meet students from other countries and learn more about their countries and culture. I feel at home here because of the great number of Nigerians and other Africans. Also, both the teaching and non-teaching staff are very open and approachable. I must quickly commend the services of the staff at the International Relations Office, whose services are top-notch and very professional. In fact, I have never left the IRO with an unresolved problem since I arrived in Cottbus.

BTU NEWS: Talking about the future: What comes next?

→ **COLLINS IGBOJI:** After my Master degree, I intend to get enrolled in a PhD programme, which will preferably be on a project centred around the phytoremediation of oil-polluted sites and/or bioenergy. As a flexible person and someone passionate about African development, I will not mind working with any international developmental agency or project anywhere in Africa to gain some experience.

Thank you for the interview!



AS GUEST DOCTORAL CANDIDATE AT THE BTU

Amilcar Vargas spent four months researching in Cottbus and shared his experiences with Master's students

»When I was 18 years old, I travelled to Tlacotalpan, a small town in Mexico, to get to know my grandmother's birthplace. Here I saw the UNESCO list placard and it dawned on me that I was on a world cultural heritage site. This changed my life forever«, recalls Amilcar Vargas. From then on, heritage management became his passion. After successfully completing his studies in Mexico, including in Archaeology, he went to Barcelona where he did two master's courses in his favourite research field. He learned the Spanish city's dominant language, Catalan, in less than a year, and was therefore able to fully focus on his studies and research.

In the meantime, the ambitious academic is in the final phase of his doctoral thesis. This also brought him to Cottbus to the BTU where he was a guest doctoral candidate for four months in the Heritage Studies PhD course (Heritage Management) at the Chair of Environmental Planning with Professor Michael Schmidt. Amilcar Vargas heard about the BTU for the first time in May 2014 at a world cultural heritage conference in Qatar. »Here I got to know a few master's students from the university who told me about the PhD programme in Heritage Management and I thought that this programme, in the BTU's international environment, would be a good option for my research stay.«

Amilcar Vargas has been working on his doctorate on »Social participation in heritage management of world cultural heritage sites«, using the example of three archaeological sites in his homeland of Mexico, at Barcelona University since January 2016. With his research, he wants to provide suggestions for an improved implementation of the UNESCO guidelines for the better participation of the local population, for example, with the use of experiences gained from conservation areas in Mexico. During his stay at the BTU, he attended the PhD programme courses and gave lectures for students of the World Heritage Studies master's programme. His stay at the BTU was funded by the German Academic Exchange Service (DAAD).

»I was really surprised by the many offers and possibilities at the BTU. I received support, for example, from the Graduate Research School (GRS) to take part in conferences and workshops. That's a major benefit which not all universities offer in this form.« The varied offer is complemented by informative newsletters from the Welcome Centre and a whole range of recreational activities. At the BTU Ball, Amilcar Vargas could be seen with a smile on his face – regardless of whether he was dancing or chatting, he is obviously very much at home in this multicultural environment.

And what will he do once he has his doctoral title under his belt? »There are various options – a career in the academic world being one of them. I also work as an advisor and manager for EU projects at my university. I've been able to gather a lot of experience on various international internships upon which I could base my career.«

He will certainly have many positive memories of his stay at the BTU and would also like to enable this exchange for other doctoral candidates and students from his university in Barcelona in the future. Together with his professor, Michael Schmidt, he wants to work on an agreement between both universities to improve the exchange. And soon, his time here in Cottbus will be over. On an enjoyable and relaxed evening with his new friends, Amilcar played Mexican music from his homeland as a farewell.



◀ Amilcar Vargas is writing his doctoral thesis at the University of Barcelona. During his stay in Cottbus, he also gave lectures for the master students in World Heritage Studies

PHD IN HERITAGE STUDIES

The PhD programme, unique in Germany, has been training young researchers for the past eight years

What are the challenges facing cultural and natural heritage protection in the context of globalisation, crises and armed conflicts? What solution strategies exist from a building, urban planning, political, legal and social scientific perspective, and could innovative technologies be used more than previously for heritage protection? The Heritage Studies PhD programme, which was introduced at the BTU in 2010, is dedicated to interdisciplinary research questions such as these. It originated from the World Heritage Studies master's programme and is offered as an international PhD programme in English. It is of particular interest for master's graduates from the fields of Architecture and Urban Planning, Heritage Management and Social Sciences, as well as the Environmental and Media Studies disciplines.

The programme strengthens the training of young researchers at the BTU, as well as cultural heritage research, in its interdisciplinary nature and global discussion. The Heritage Studies course is unique in Germany. In the rest of Europe, and the world, too, there are only few universities which are dedicated to this field in study, teaching and research. It hereby makes a special contribution to the visibility of the BTU and strengthens the research field of Smart Regions and Heritage. So far, ten doctoral candidates have successfully completed the course and are today working in Germany or abroad in the fields of cultural heritage research, project management or as consultants.

Today, 19 doctoral candidates from twelve countries are taking part in the programme. Alongside their individual research, they also complete an accompanying curriculum, incorporating 30 credit points, which is especially orientated to the needs of doctoral candidates in an interdisciplinary working environment. With this, the PhD programme offers valuable structuring, not only for international doctoral candidates. It conveys key knowledge and skills for student research and future careers, as well as their integration into a community of teachers and researchers. Doctoral candidates are currently researching a wide range of subjects: the key areas include management, governance and participation in the field of cultural and natural heritage, as well as risk analysis and assessment, the impact of war, infrastructure projects and urban planning developments. Hereby, they also examine questions relating to economic valorisation and the financial securing of cultural and natural heritage, as well as opportunities which arise for heritage protection through new technological developments.

The research approaches are regularly presented and discussed and work progress is supervised in research groups, as well as at the supervising chairs and within the network of all doctoral candidates. The curriculum hereby supports the doctoral candidates in choosing,



^ In the Heritage Studies PhD programme, doctoral candidates examine many fields, for example, world cultural heritage sites, such as the historic peninsula of Istanbul (Photo: Getty Images / jp uyttersprot)

adapting and further developing suitable theories and methods. A special focus lies on the presentation of transferrable skills: two modules strengthen skills in the writing and publishing of scientific materials, as well as in writing applications for third-party funded projects. In addition, the doctoral candidates also benefit from the Graduate School's funding opportunities, the support of the Welcome Centre and supervision through the programme co-ordination in the Office for Young Researchers.

Lecturers of faculties 1, 2, 5 and 6 currently participate in the structured Heritage Studies PhD programme which leads to a »PhD in Heritage Studies« of the Faculty of Architecture, Civil Engineering and Urban Planning. The application and admittance requirements include the independent development of a proposal, minimum master's level 2, and 3 as well as evidence of qualified English language skills. Anyone interested in working as a supervisor should contact the co-ordinator, Dr. Birte Seffert (seffert@b-tu.de).

www.b-tu.de/en/heritage-studies-phd/steckbrief

Young Researchers Coordinator
DR. PHIL. BIRTE SEFFERT



◀ The project participants celebrate the completion of their prototype of bamboo with fresh coconut water (Photo: Clara Rellensmann)

WHEN PHOTOS BECOME A THREAT TO ANCIENT BUILDINGS

Master's students at the BTU are developing concepts for a more sustainable tourism infrastructure in the historic royal town of Bagan in Myanmar

When the final rays of the sun bathe everything in a warm light and give the landscape, people and buildings a warm golden glow, cameras are always at the ready to capture the unforgettable moment. This is also the case in the historic royal town of Bagan in Myanmar. Between the 11th and 13th century, more than 3,000 Buddhist structures were constructed here in a steppe-like landscape. The sacred buildings of brick, which range from small temples to monastery complexes, and several huge, gold-adorned buildings extend across an area of 25 square kilometres. Today, an increasing number of tourists are climbing on the temples in search of the best vantage point for the perfect picture of the sunset.

However, this pursuit of the perfect Photo can damage the building structures – a problem which the BTU master's students in Architecture, Urban Planning and World Heritage Studies decided to examine at the end of last year. Clara Rellensmann, research associate with Professor Leo Schmidt at the Chair of Architectural Conservation, organised the teaching event, including a trip to Myanmar, together with Alexander Römer, founder of the ConstructLab collective. »With the political reforms of 2011, Bagan is again listed in travel guides which has, in turn, led to a huge increase in visitors. This also requires a tourism infrastructure which will not have a negative impact on the cultural significance of the temple grounds, as it is planned that Bagan will become a world cultural heritage site. The objective of the project, and associated trip, was therefore to conduct a study on the development of a viewing platform, appropriate for a landmark building, which will ease the burden on Bagan's historic building substance in the long-term and make a contribution to sustainable tourism at the site«, said Clara Rellensmann, when describing the project.

The seminar group visited the site from 20 November to 1 December 2017 where they worked with the archaeology department of the Burmese Ministry of Culture, as well as members of the association of Burmese architects. For everyone involved, it was important to identify the needs and requirements of the necessary tourism infrastructure in Bagan, in association with local partners and stakeholders. In addition, the participants also gained a comprehensive understanding of the architecture in Myanmar, including the traditional building materials and techniques, during the study trip.

On the final day of the field trip, the students, and their local partners and specialists for bamboo scaffolding, built a prototype which was completed just in time for the sunset and could be tested. »The students were really enthusiastic about taking part in such a practice-orientated project and, in doing so, got to know a whole new cultural context which was new for most«, recalls Clara Rellensmann. The findings of the study were documented in a Reader and provided for the partners in Myanmar. The Reader can also serve as a basis for discussion for further partnerships – using this, topics were, for example, determined for a summer school in Myanmar, financed by the DAAD, for autumn 2018. This was primarily aimed at local students, although ten BTU students and Clara Rellensmann visited Myanmar again as, »the intercultural exchange last November was very beneficial for both sides and it is something which we would like to continue.«

Chair of Architectural Conservation
CLARA RELLENSMANN

ECOLOGICAL EXCURSION TO NAMIBIA

A new module at BTU's Department of Ecology offers the unique opportunity for students to experience animals and plants in one of the most arid countries of the world

Tropical and subtropical drylands cover more than 40% of the earth's land surface and approximately 66% of the African continent. Namibia, as the north-western neighbor to South Africa, has one of the most arid climates in the world with a hyper arid zone along the Atlantic Ocean. Animal and plant species need to adapt to the water scarcity, resource shortage and extreme temperatures in these ecosystems. Ecology courses in the international study program Environmental and Resource Management (ERM) at BTU address these adaptations in several B.Sc. and M.Sc. modules. In February 2018 the Department for the first time offered a student excursion to Namibia for BTU students. With eleven years of experience supervising this excursion (previously with Giessen University), the new Head of the Department of Ecology, Prof. Dr. Klaus Birkhofer, took the first group of BTU students to Namibia.

This year's excursion focused on the central and western semi-arid and arid parts of the country, visiting such stunning ecosystems as the Kalahari or Namib desert and experiencing the great escarpment as well as the Atlantic Ocean coastline. The range of animal species observed during hikes, student projects and game drives included charismatic flagship species such as lions, cheetahs or white rhinos. However, the excursion also focuses on the smaller majority including such fascinating creatures as sociable weaver birds, chameleons, tok tokkie beetles or thicketail scorpions. Students received authentic information from supervisors and rangers, discussed challenges and opportunities for biodiversity conservation, experienced nature firsthand through food web projects and observational studies and witnessed amazing natural phenomena such as fog in the desert or the arrival of an ephemeral river close to the camp sites. A student seminar during the winter semester and prior to the excursion prepared participants for the trip and provided important information.

A particularly enjoyable experience during this excursion is the teambuilding aspect between a group of individuals that have not collaborated be-

fore. While the excursion is generally very safe (as indicated by successful trips with more than 140 students in the last 11 years), minor challenges have to be faced and solved occasionally. The spirit of the team and the problem-solving mentality that develops in such situations creates a bond between students and supervisors that only forms between enthusiastic, open-minded individuals during such experiences. The Department of Ecology will try to offer this excursion annually between February and March with an accompanying seminar offered in the winter semester prior to the excursion (next excursion planned for March 2019). The excursion is part of the ERM study program with priority access for ERM B.Sc. and M.Sc. students. Students from other study programs at BTU with a keen interest in nature are also welcome to apply to the Department (handke@b-tu.de). The excursion is usually organized for a two-week-period in February/March and costs for participants are around 1,700 € (including flights, accommodation, travel and all meals).

STATEMENTS FROM 2018 PARTICIPANTS AT BTU

Christos Konstantinos Paxinos:

»The excursion to Namibia was an amazing experience and a great way to learn about the ecology as well as the culture and traditions of Namibia. I feel blessed to have been in this country with the versatile landscapes of dense vegetation, shrub lands, desert with sand dunes, mountain areas and the coastline of the Atlantic Ocean. We were lucky to observe a significant number of animals. It was awe-inspiring to look in the eyes of a pride of lions from 10-meter distance (from inside a car!), to walk towards a group of five white rhinos, and to hear hyenas »whooping« during the night. Sleeping out and looking for the first time at the sky in the Southern hemisphere as well as letting the wind at Spitzkoppe communal camp blow in my face while seeing the sunset, were two more highlights.«

Christian Freund:

»Our excursion to the arid and semi-arid ecosystems of Namibia provided a deeper look into the interaction between how species adapt and survive in an environment where water is scarce. The incredible animal and plant species and the beauty of the pristine nature in Namibia are unique and the excursion was a worthwhile adventure!«

Department of Ecology

PROF. DR. RER. NAT. KLAUS BIRKHOFFER

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Excursion campsite at Spitzkoppe Community Restcamp (Photo: Prof. Dr. Klaus Birkhofer)



DAAD GERMAN SCIENCE DAY IN CAIRO

BTU Cottbus-Senftenberg participated in the DAAD German Science Day in Cairo together with Berlin and Munich universities

On 18 July 2018 the BTU presented itself at the 7th DAAD German Science Day for Outstanding Doctoral and Postdoctoral Candidates, which was held in Cairo, for the first time – and this in good company together with the FU Berlin, TU Berlin, Berlin Mathematical School, TU Munich and Marburg University, which are also represented in the Egyptian capital with their own offices.

With an outside temperature of 40 degrees, 500 students considering doctoral studies as well as post-doctoral students – 150 more than in 2017 – came to the Conrad Hotel Congress Centre on the Nile to learn about and receive advice on the German educational system, opportunities in doctoral studies and a scientific career as well as financing models. This was also the perfect opportunity for the universities to present themselves to a broad public, promote subject-specific offers and get to know potential students in individual talks.

With Dr. Birte Seffert (research department, Office for Young Academics) and Anca Claudia Prodan (PhD) of the Chair of Interculturalism, the BTU Cottbus-Senftenberg was particularly promoting the structured doctoral study programmes and doctoral course Heritage Studies, which both distinguish the BTU in a German-wide comparison. The event, which was held in a full conference room and was opened by Dr. Roman Luckscheiter, the outgoing head of DAAD Cairo, began with a podium discussion. Dr. Seffert responded to the question concerning the BTU's unique features by highlighting the university's research strengths as well as its familiar atmosphere, good supervisor relationships, favourable living costs as well as the offers of the Graduate Research School

and the Welcome Centre for international academics and their families – which was all well received by the audience. When it came to the question of what universities expect from doctoral candidates all agreed: good preparation and independent research for suitable supervisors as well as their research projects and also complete and clear application documents. Advice was also given on good preparation for research in Germany. Hereby special emphasis was given to learning the German language and finding out about the German educational system, which requires doctoral candidates to have a high degree of own initiative.

In short presentations, the universities then promoted doctoral studies at their facility and listeners were able to ask questions. Anca Claudia Prodan of the Chair of Interculturalism (UNESCO Chair in Heritage Studies Prof. Anna Amelina) gave a talk on »Heritage Studies – An Emerging Field of Research«.

Anyone interested in these studies and particularly suitable applicants were also given the opportunity, after registering in advance, for individual advisory consultations. Here the great interest in a small young technical university, such as the BTU, could be seen in, amongst other things, the many questions – on specific research topics, potential supervision opportunities and financing options – which were asked throughout the day, for example, on the BTU stand, in the corridors or during the coffee breaks. The first applications were already received a few days after the event.

The German Science Day for Outstanding Doctoral and Postdoctoral Candidates was organised within the framework of the regional DAAD initiative COSIMENA (Clusters of Scientific Innovation in the Middle East and North Africa). Through the establishment of thematic clusters and networks between researchers and universities in Germany and the countries of the Near East and North Africa, this seeks innovative ideas and solution approaches for global challenges in the fields of water, energy, health, agricultural science, economics, urban planning and cultural heritage.



△ Dr. Birte Seffert during her talk on doctoral study terms at the BTU (Photo: DAAD)

PhD Programmes & Cotutelle
DR. PHIL. BIRTE SEFFERT
 Coordinator

IT'S IN THE MIX

The Graduate Research School supports young researchers and provides impulses

Prof. Dr. Thomas Raab has been the head of the Chair of Geopedology and Landscape Development since 2010. Since 2015, he has also been the Director of the BTU's Graduate Research School (GRS). We spoke to him about the objectives of the GRS and what distinguishes it.

BTU NEWS: Prof. Raab, why was the GRS established and what is your personal motivation as director?

→ **PROF. RAAB:** The GRS was established to provide improved support for young researchers at the BTU with specific funding opportunities and a qualification programme. At the same time, the GRS also aims to contribute to improving research achievements at the BTU, especially through the preparation of joint projects, for example, of the DFG research training group. The existing »Cultural Significance of Historic Buildings« group and the »Heritage Studies« and »Dependable Systems« PhD programmes are good examples of this. Within the framework of the International Graduate School (IGS), which was practically the predecessor of the GRS, we developed the concept for the new graduate school – in which the current director of the GRS, Robert Rode, played a major role – within a group of very dedicated professors. To be able to see how positively our ideas are met both in the BTU, as well as outside the university, determines, for me, most of the motivation.

BTU NEWS: What makes the GRS so special?

→ **PROF. RAAB:** In comparison to other graduate schools, the unique characteristic of the GRS is certainly the combination of funding opportunities for individuals and bigger projects. Similar to many other institutions, the GRS offers support with taking part in conferences. We also award grants to individuals. However, it is through the promotion of joint projects in the form of »Clusters« that we really distinguish ourselves from the many other university funding institutions. With these clusters, currently six in total, we want to form a critical mass in the key areas of the BTU. We develop young researchers in the individual clusters and form the basis for bigger funding applications with the DFG, the EU and the BMBF from which the doctoral candidates, as well as the BTU, benefit equally.

BTU NEWS: How could I do my doctoral studies at the GRS?

→ **PROF. RAAB:** It is a widespread misconception that you can do your doctorate at the GRS. We offer an additional and diverse support programme as part of doctoral studies and promote a total of 27 grant-holders in our clusters. This year, we also awarded eight grants from the state graduate funding programme (GradV). Every year, the GRS approves more than 100 mobility grants and approximately 15 teaching and research assistantships for international doctoral candidates. Furthermore, in the past few years, the GRS has also financed nine post-doctoral fellowships. With



→ Prof. Dr. phil. Thomas Raab is the head of the Graduate Research School (GRS) at the BTU

themed workshops and formats, such as the »BTU Young Researchers' Days«, we also enable young researchers to take additional qualifications and network beyond the confines of academia.

BTU NEWS: What feedback have you received from the doctoral candidates at the BTU as regards your work in the GRS?

→ **PROF. RAAB:** We, and especially Robert Rode who, as director, is closer to the individual doctoral candidates, receive very positive feedback. Besides the financial support which is, of course, welcomed by everyone, it is particularly the networking with the other researchers which students really appreciate in this structured doctoral studies programme. However, we do not rest on our laurels as a result of this good feedback! With further evaluations, both internally, as well as from external sources, we will continually develop the offers of the GRS, also in the future.

Thank you for the interview!



»COLLEAGUES BECAME FRIENDS«

Amilcar Vargas spent four months researching in Cottbus and shared his experiences with master's students

In December 2017, a high-profile German-Egyptian delegation travelled to Aswan in Egypt to take part in the Fifth International Conference on Heritage Conservation and Site Management on sustainability within the context of tourism. At the opening ceremony in which several Egyptian ministers were involved, the importance of this cooperation between Germany and Egypt also from a political viewpoint was emphasised. Prof. Hosam Refai, Dean of the Tourism Faculty of Helwan University said, »This study programme is perhaps the most successful international cooperation of all Egyptian universities.«

This joint study programme is, indeed, a recipe for success for a productive cooperation. Its launch in 2013 was enabled by the German Academic Exchange Service, DAAD, which financed numerous grants for Egyptian students as well as several guest professorships. The varied support from the German Archaeological Institute was also particularly valuable and continues to be so. The grant awarded by the Gerda Henkel Stiftung is, meanwhile, indispensable for the continuation of the international joint master after the end of the three-year start-up financing as without this the Egyptian students would be unable to finance their compulsory semester in Cottbus.

The former BTU President Prof. Jörg Steinbach was very pleased that so many students took part in the conference. In his address to them he said, »You are working in one of the key countries of heritage. Make the most of it and be aware of the responsibility you carry for all of us!« The master study programme and the associated PhD programme, meanwhile, enjoy immense popularity. Prof. Leo Schmidt, Study Programme Leader said, »In 2013 we started with eleven Egyptian students in the first year.

From the second year, students then came from Germany and the whole world and in Cairo as well as Cottbus we are able to choose the best from the many applicants. The most recent year includes 26 students of which eleven are from Helwan University and 15 from the BTU. Hereby the following nationalities are represented: China, Bangladesh, Ecuador, USA, Ghana, Chile, India, Peru, Mexico, Russia and Pakistan. We already have many successful graduates. The best thing about the programme is certainly that it offers young people the chance to look beyond the boundaries and limitations of their countries of origin and cultures and develop a career in cultural heritage which connects internationally.«

In close association with the international programme which is taught partly in Cairo and partly in Cottbus, there is, meanwhile, a »National Track« which occurs solely in Egypt. Funded by the DAAD and supported by the BTU with teaching content, Helwan University is with this also able to offer the content of the study programme to students who are unable to afford a semester abroad. There are also grants for students from Syria and other areas of conflict who have refugee status in Egypt. A key area of this National Track is, therefore, also »Post-Conflict Rehabilitation of Cultural Heritage« which primarily aims to qualify students for the rehabilitation of their countries which are torn apart by armed conflict.

In his speech, Prof. Michael Schmidt, Dean of the Faculty of Environmental Sciences at the BTU and co-founder of the study programme, recalled the immense support from Prof. Sabine Kunst, Brandenburg's minister of science at the time, Prof. Friederike Fless, the President of the German Archaeological Institute, and Dr. Dorothea Rüland, General Secretary of the German Academic Exchange Service who initiated the conception of the study programme and enabled its launch.

Michael Schmidt explained the challenges in establishing this joint degree programme for both universities: »Each page of the joint exam regulations had to fulfil the legal requirements of each country and this was by no means easy. Equally complex was the development of the content and the teaching of this to the students with their very different backgrounds. However, through this very challenging process which we could only manage together, colleagues became friends and of this I am very proud!«

Study programme Heritage Conservation and Site Management

PROF. DR. PHIL. LEO SCHMIDT

PROF. DR. DR. H.C. (N.M.U, UA) MICHAEL SCHMIDT



< The conference was opened by two Egyptian ministers, three university presidents, the president of the German Archaeological Institute and a high-ranking representative of the DAAD (Photo: Helwan University)

THE NEW INTERNATIONAL ORIENTATION STUDIES

The BTU Cottbus-Senftenberg is offering a structured orientation programme for international students

Since October 2017, international students have been able to prepare for their studies at the BTU Cottbus-Senftenberg within the framework of a structured orientation programme. The one-year programme hereby initially focuses on German language and reading skills, »refresher« basic knowledge in subjects such as mathematics, physics and biology, and finally also offers an introduction to various study modules.

Prof. Dr.-Ing. Matthias Koziol, Vice-President of Academic Affairs at the BTU Cottbus-Senftenberg, explains: »In recent years, our university has fully repositioned itself in study preparation both for German and international students. We have succeeded in developing really attractive offers for diverse target groups. Initial feedback from participants shows that structured programmes are preparing a sound basis for successful study entry.«

The surprisingly high demand for this from international students has been particularly welcome. Student numbers were originally limited to a maximum of 60 people, with 72 students already taking part, which meant that the three study groups have now increased to four. The target group for the College International Orientation Studies are students whose language skills are at level B2 according to the joint European reference framework for assessing language skills – i.e. students who are independent users of the language.

Anja Oswald, language lecturer in Orientation Studies says: »The International Orientation Studies students came to the BTU with a good previous knowledge of German upon which we build in the language courses. The new feature of the International Orientation Studies is that the German language examination for admittance to higher education is taken after only one semester. We therefore adapted our teaching and learning materials accordingly to provide intensive and specific preparation for this exam. The students are highly motivated and I am particularly pleased that they have already formed learning partnerships and that additional offers are being used and initial learning progress can be seen.«

The College International Orientation Studies aim to prepare international students for future learning materials of the MINT courses at the BTU Cottbus-Senftenberg in the best way possible in terms of language, as well as subject and method and, in doing so, ease entry into aca-



For Lala Aslanova, the International Orientation Studies represent a dream come true as she has always wanted to study in Germany

dem life. This follows a three-pillar training concept, the key elements of which include language skills, study-related key skills and specialist MINT skills. The structure of the orientation studies is distinguished by an innovative building-block system which enables an immediate response to individual student strengths and weaknesses. Study entry tests, for example, assess participant language and subject-related skills and knowledge and establish course recommendations. College International hereby pools sub-aspects of the College+ Orientation Studies and the »Bridge to Studies«. The latter is a further two-semester study preparation course offered by the BTU which helps prepare students from abroad for study entry for courses taught in German – in particular with regard to language and culture.

LALA ASLANOVA FROM AZERBAIJAN

»I feel really welcome in the International Orientation Studies. I've always dreamt of studying in Germany. After taking my bachelor's degree in my home country, I'd like to do a further Bachelor's course at the BTU Cottbus-Senftenberg. I chose to do the Orientation Studies as I am interested in two courses at the university and don't yet know which one I will choose. I hope to choose the right one for me next semester when testing the study modules.«

CAMPUS & UNIVERSITY LIFE

»WITH MUSIC WE CONNECT CULTURES«

An interview with Krzysztof Świtalski, director and conductor of »Collegium musicum«

The academic orchestra »Collegium musicum« was established 20 years ago. As an open ensemble, it is a gain for the cultural life of Cottbus and always welcomes new members (particularly, at the moment, string players). The initiators behind it were the founding dean of the instrumental and singing pedagogy course Prof. Tibor Istvánffy, who was the conductor, and Prof. Albrecht Gnauck, holder of the chair of ecosystems and environmental informatics at the BTU in Cottbus at the time, who was concert master. Since the winter semester 2016/17, the orchestra has been directed by Krzysztof Świtalski who gave us a few insights into orchestra life.

BTU NEWS: How is the university orchestra assembled?

→ **KRZYSZTOF ŚWITALSKI:** The orchestra members are mainly students of the instrumental and singing pedagogy course but also other students and music-loving novices from Cottbus and the surrounding regi-

on. The young musicians are supported by professional instrumentalists, mainly music teachers, and professional musicians. The orchestra currently has 20 to 25 musicians depending on the type of instruments required - for baroque music, for example, we only need a smaller number of musicians and for romantic music, in contrast, a bigger number. After concerts students often ask me if they can join us. We are particularly interested in string players at the moment, such as violins and violas. Next semester we're planning a symphony and then we will require more wind instrument players. We meet every Wednesday at 7.00 pm and practice together. The orchestra is very international and we have musicians from here in Germany as well as from France, China, Korea, Columbia, Venezuela and Bolivia - I come from Poland. With music we connect cultures with one another. Our university is cosmopolitan, which is something that is very important to me and I am very pleased that this is also reflected in the »Collegium musicum«.

BTU NEWS: What does music mean for you?

→ **KRZYSZTOF ŚWITALSKI:** I have been working in this profession for 20 years and have played and conducted in many European countries. You could say that I feel very closely associated with music. I have broad training and, alongside conducting and playing the violin, I also studied pedagogy, German and social work. I am now planning on writing my dissertation on »Social competencies in musicians« here at the university in Cottbus. Music is always in my life and I asked about an orchestra as soon as I arrived at the BTU. Prof. Tibor Istvánffy saw that I was a professional musician and so I was soon able to assume solo parts. It is an honour for me to now continue his work.

BTU NEWS: What can visitors of your concerts expect?

→ **KRZYSZTOF ŚWITALSKI:** We want to offer something for all music lovers and so our repertoire ranges from baroque and classical music by well-known German composers to more informal music such as operetta arias, songs from musicals and film music. There are also often solo performances, for example, at our concert for the BTU's 5th jubilee at which our soloist Lara Kobela sang for the second time. Lara, a student of Prof. Simone Schröder, was already very well received by the audience at her first performance. We are already planning and rehearsing for the new semester and Prof. Wolfgang Glemser will, for example, play Mozart's piano concert in B flat minor. In the future we would also like to perform at other venues in and outside Cottbus.

Thank you for the interview!



FIVE YEARS BTU - THE FIRST SUCCESSFUL MILESTONE

In the short time since its refounding, the BTU Cottbus-Senftenberg has positioned itself well. Important milestones have already been achieved and now the focus is on further targets

On 2 July 2018 the BTU Cottbus-Senftenberg celebrated its 5th jubilee and guests from the worlds of politics, business and the community came to congratulate, including Minister President Dr. Dietmar Woidke, who praised the development of the university as a great achievement. With view to its future, he said, »I wish the BTU much success in further strengthening the excellent, also internationally recognised, research in particular in future-related fields, such as energy efficiency and sustainability and smart regions. I am convinced it will continue to make a valuable contribution to the structural development of the industry and energy region that is steeped in tradition. « Minister of Science Martina Münch also views the BTU as a driving force for the structural development of Lusatia. As the university today has more funding and greater scope for action than before its refounding, it is now also able to act flexibly and goal-driven. Hereby it is planned that the close interrelationship of science and industry, which has already begun, will be developed further and the knowledge transfer strengthened. This goal was also emphasised by the former minister of economic affairs

Albrecht Gerber who views the Brandenburg University of Technology as being extremely important for the knowledge transfer for the modernisation of businesses in the state. With projects such as the »Innovation Hub 13«, the BTU, together with the TH Wildau, has created a central platform for new impetus for this.

Since its refounding, the university administration, as well as many other persons concerned in the senate, faculty councils, other committees and structural units, have positioned the young university on a secure foundation. Taking legal framework conditions into consideration, fundamental goals and the orientation of the BTU were developed in an intensive process. An initial university development plan (HEP) summarises the results of this. Approved by the science council, the HEP serves as a guideline for the organisation and profiling until 2020. In the brief time since its founding, almost all courses at the BTU have also been adapted to the new framework, the new model of the orientation study course has been successfully introduced and the cooperative study programme has also been a success. The commitment of many has led to an increase in the number of new students in the winter semester 2017/18 and the number of international students of the total student population is almost 27 per cent.

After the ceremonial part of the event, guests were able to enjoy a colourful programme on the main campus with campus tours, live experiments from »Science on Tour« and »Kids university«, a reading for children »Are bacteria really little monsters?«, various talks on the wonders of physics, ten years of Geoflow experiments on the International Space Station (ISS) and »Air drives – where is the journey going?«. The eventful day ended on a cultural note with a concert by the academic orchestra »Collegium musicum« led by Krzysztof Świtalski (see also page 40).



< Prof. Katrin Salchert, Peter Lange, Prof. Matthias Koziol as well as members of the executive committee Prof. Christiane Hipp, Minister of Economic Affairs Albrecht Gerber and Minister of Science Martina Münch (l-r) enjoyed the jubilee celebrations



< Alumni get-together

ALUMNI CONFERENCE »SUSTAINABLE LAND USE«

The Environmental and Resource Management (ERM) course celebrated its 20th anniversary

Alumni, students and past and present lecturers met in summer 2018 for the alumni conference »Sustainable land use«. With more than 150 participants, the event, which marked the 20th anniversary of the Environmental and Resource Management course, was a real success. The organisational team had prepared an interesting meeting that started with the subject-related part and ended in festive celebrations with many diverse cultural impressions.

An introductory workshop, which brought together all the alumni who came mainly from African countries as well as Madagascar, China, Thai-

land and Brazil, was followed by the specialist part of the conference. For this, high-profile speakers and scientists from South Africa, USA, Belgium and Germany came to discuss sustainable ecological land use issues with the alumni. The presentations by the alumni on their current areas of work in aquatic and terrestrial systems, maintaining biological diversity as well as climate protection and adaptation led to further discussions on a wide range of subjects. With viewpoints, progressive approaches as well as personal assessments, the directors of the chairs involved: Ecology, Prof. Klaus Birkhofer, Environmental Economics, Prof. Frank Wätzold as well as Soil Protection and Recultivation represented by apl. Prof. Dirk Freese added to the podium discussion which followed and was moderated by Prof. Eike Albrecht, Chair of Civil and Public Law.

Excursions on agroforestry and recultivation took the participants to the forest and the Spreeauen. Current ERM students had arranged a colourful cultural programme for the 20th anniversary celebrations with musical contributions from Iran, India, Ghana and Australia. Reviews of the history of this course, which remains very successful, also led to a few moving moments. Former professors Albrecht Gnauck (Environmental Informatics) and Günter Busch (Waste Management) as well as the coordinator of the ERM course Mohamed Elhag were, for example, awarded the »ERM cristal globe of appreciation«. The campus concert »Laut gegen Nazis« (Making a Stand against Nazis) formed a fitting end to the celebrations. Anyone who wanted even more culture after this was able to visit the Cultural Night on Saturday evening and the cultural festival »Cottbus Open« on Sunday, which ended a week of lasting impressions, interesting events and unique experiences. Katja Jäger, main organiser of the alumni conference, was very pleased with the event: »A big thank you to all supporters who helped make this event possible.«



International Relations Office
KATJA JÄGER
coordination Alumni Conference

< Musical presentation by Iranian students for the 20th anniversary celebrations

»ENCOUNTERS IN WHICH FRIENDSHIPS ARE FORMED«

The BTU Cottbus-Senftenberg has had a language cafe for one year now, which is popular with Germans and international students as well as refugees and locals from Cottbus

Tea, coffee and water are provided next to which lie many card games, some of which have also been lovingly made by hand. The rays of the sun fall onto the faces of the first visitors who are joined by more and more young and old, men and women. In the end, it is 25 people in total – all united by their desire to talk about the German language and culture. Some are native speakers whilst others have only been learning German for a short while.

One of them is Laura Catalina González from Columbia who came to Cottbus three months ago to study and also wants to do some voluntary work. The agency for voluntary work in Cottbus recommended the language cafe and, in doing so, opened up new doors. »My course is in English and in my free-time I speak a lot of Spanish. I was therefore specifically looking for a way of coming into contact with the people and culture of my host country and this works really well in the language cafe. Activities here often include games in which you forget your fear of speaking. These are two hours in the week in which I really enjoy myself and, at the same time, learn much more than just the German language.«

This makes Laura Brandt very happy. The BTU graduate from Bremen is the initiator behind the language cafe, which was established at the university a year ago. »There was already a language cafe in the Sandowkahn community centre and I had the idea to bring the project to the university and also to the students. Through my international study course, I realised that many other students wanted to learn German but

don't have much opportunity to actually speak it.« After completing her World Cultural Heritage studies, Laura Brandt now lives and works in Berlin from where she also visits Cottbus now and again. Here she meets Khaleel Sukhmani from Syria, for example. The 26-year-old surgeon has been part of the organisational team for a few months. He has been in Germany for almost a year and already speaks very good German and is now waiting for his studies to be recognised here. »At the beginning I was more interested in the language aspect of the language cafe but now I also want to get to know the different cultures and meet my new friends.« Julia Kaiser, coordinator of the project of the Paritätischer Landesverband BB e.V., supervises the organisational teams of the language cafes at the university and in Sandow and Sachsendorf. »Our goal: build up, accompany and let go. The language cafes will also continue once the project ends in January 2020. They thrive off the fact that new people are always joining them – more German speakers are welcome. They are meeting places in which new things come about, for example friendships.«

Judith Lippelt, Laura Brandt, Khaleel Sakhnini, Laura Catalina González, Jessica Berkes and Julia Kaiser (l-r) are the organisational team of the language cafe, which is open Wednesdays from 5.00 pm to 7.00 pm at the International Meeting Centre (IBZ) of the BTU where people from Cottbus and the whole world meet every week



BTU ON TOUR: PROSPECTIVE STUDENTS IN CHILE

Maria-Andreea Ciurci is a BTU alumna who presented her university to the Chilean pupils of the German school in Valparaíso on a study information day

The BTU Cottbus-Senftenberg International Relations Office has been working with German schools abroad – partly directly and partly with the support of dedicated international students and alumni – for more than ten years. Maria-Andreea Ciurci's visit to a school in Valparaíso, in Chile, illustrates just how well this works and how alumni and recruiting work often interlinks in an international context. Maria-Andreea, who is from Romania, completed a master's degree in World Heritage Studies at the BTU. Her husband works in Valparaíso and so she regularly visits Chile where she also worked for a while. On one of her trips there, she visited her alma mater, the German school in the colourful town by the Pacific, complete with a PowerPoint presentation, promotional videos, as well as brochures and flyers of her former university. »On the 26 September, I attended the »3. Study Information Day of the German School in Valparaíso«. Firstly, I gave a 15-minute presentation after which I was given a desk where students could ask me further questions and I could share the promotional materials. I think about 100 students attended the event, all in their final year. Furthermore, some Chilean and other German universities also talked about their institutions and programmes.

I gave the presentation in Spanish and, to my surprise, the students were quiet and paid attention. When I talked about the scholarship, they were even more interested, even the event organizer explained to them again that there is a scholarship dedicated especially to them. After that, almost everyone approached me to ask about what they could study and the ones who asked the most questions were the ones interested in engineering studies. They told me that they liked how university life appears in the short video and they were curious about living and studying there. When they asked me about the living costs, I was able to tell them that it was much cheaper than many other places they know. The pupils also liked the fact that the BTU is a small university. I was even told that teachers encourage students to go to small universities because in Chile they are only interested in the big, famous ones and then they get lost and fail in their studies.

I asked around why more students did not continue their studies in Germany and I learned that one of the main reasons is that the students from this school do not want to live that far away from their families. There were even cases in the school where family members also had to move to Germany for them. Another reason why students from other schools might not apply to study in Germany is the high visa costs.

Finally, I would like to say that it was a good day in the Chilean school. I had a lot of fun representing the university and talking to the pupils. The BTU materials helped me to feel very confident when I was there.«

Maria-Andreea Ciurci left feeling that the visit had been a success. She enjoyed her studies at the BTU Cottbus-Senftenberg and still feels closely associated with the university. Christin Handrek, from the International Relations Office, emphasises the importance of the alumni networks for student recruitment: »There is no better advertising than satisfied and happy students who enthusiastically recommend the BTU and who also maintain their alumni network, even after the end of their studies. This is precisely why we must do all we can, in all areas of the university, to make sure that our students really enjoy their studies at the BTU.«



➤ BTU alumna, Maria-Andreea Ciurci (front left), travelled to the German school in Valparaíso in Chile for the study information day (Photo: Maria-Andreea Ciurci)

Advisor for International Recruitment and International Alumni Work

ANGELA BUHL

Project employee

CHRISTIN HANDREK

START UP YOUR CAREER IN GERMANY

The BTU model project for strengthening university welcome culture enters its second round

In January 2018, a total of 28 STIBET II projects were launched at German universities. The model projects, funded by the DAAD from Foreign Office resources, aim to help strengthen the welcome culture of universities. This is now entering its second round in which new, as well as already existing projects, are taking part. One of these is the BTU project »Start up your Career in Germany« which is able to build on the experiences gained in the first project round (2015-2017).

In this, the project, which was launched in 2015, aimed to familiarise international students at the BTU with the German employment market and help prepare them for the job application process. This resulted in the successful interlinking of the International Relations Office and the Career Centre at the university. In addition, the support offered to international students in entering the German employment market also improved. By the end of 2017, various workshops aimed at helping students prepare for the employment market, as well as application training, had been held in which 200 international students took part. Approximately 50 students also annually took part in the regular job application folder check which was accompanied by information events on entering the German job market with more than 100 participants in total and excursions to local businesses.

The project entered the second round in spring 2018 and will receive funding from the DAAD until the end of 2020. Successful elements from the first project phase, which remain necessary, will be continued – the very popular workshops, as well as the twice-weekly job application folder check will, for example, remain as fixed elements in the follow-up project. In addition, new elements which contribute to successful career entry will also be taken into consideration – for example, language preparation for the job application process and daily working life, the transfer of general key skills, promotion of measures for improving study success, as well as strengthening social interaction outside one’s own peer group and university.

»Whilst, so far, the focus in the project has been on the successfully-implemented »Career Service« pillar, with the follow-up financing we now want to focus on the »Volunteering and social networking« pillar, as social integration and a well-functioning network contribute to improved language skills and increasing employability«, explains Aleksandra Bobowski-Tosiek from the International Relations Office and the project co-ordinator. »The international students will also be informed about the many association activities and social initiatives which already exist in Cottbus, Senftenberg and the surrounding region«, explains the project co-ordinator. An annual »Association Day« is also being planned at the BTU, as well as the creation of a generation-spanning format whereby international students and town residents can meet.

The 2018-2020 project phase is under the motto: WIKI - WELCOME, IMMERSION, CAREERS, INTEGRATION. With the use of the Sorbian word Wiki (market), the project supervisors have consciously spanned the bridge between the employment market and the region, as the most important objective of the project remains the integration of the international students at the BTU into the regional employment market.



^ The International Office has published a flyer for the model project for strengthening the university welcome culture

International Relations Office
ALEKSANDRA BOBOWSKI-TOSIEK

»MY MONUMENT IN COTTBUS«

International students at the BTU presented their own personal views of the city in an exhibition held at Cottbus Town Hall and the University Library, reflecting on their exploration of their new home

What makes our city so special? Which special places awaken memories inside us and make our hearts beat faster? How do our friends from other countries view Cottbus? The »My Monument in Cottbus« exhibition was created by BTU students from the departments of World Heritage Studies and Conservation and Site Management, presenting Cottbus monuments from the perspective of mainly international students and their countrymen. They have only been feeling at home in Cottbus for a relatively short space of time and have established various connections to the city's cultural heritage. The exhibition was initially presented in the foyer of the town hall (Neumarkt 5) and then in the University Library (IKMZ).

The idea came from project leader, Prof. Dr. Britta Rudolff, who was inspired by the stories and experiences of her students: »We used to have theoretical discussions in seminars about how relationships are built with cultural heritage sites, especially those that are not found in a person's home country, but rather in places which become that person's

home for a certain period of time. Our discussions raised the issue of whether and how our international students and other citizens establish relationships with monuments in Cottbus, and whether these become part of their own cultural heritage over time.« The exhibition is, therefore, a very personal effort to demonstrate the diverse and complex role of monuments, and to show that integration can also be achieved through shared monuments. Students and other citizens were asked to select one monument each and to describe why they value it and consider it part of their cultural heritage. »We all value monuments for the personal experiences with which we associate them and the memories they give us. That is why the exhibition puts this very personal perspective of Cottbus monuments in the foreground«, explains Britta Rudolff.

Numerous boards and two videos were used to show a variety of monuments and other places that could attain monument status, including residential and commercial buildings, parks and memorials, and lots of other places that lead visitors through the various parts of the city. In addition to their own observations, which the students made while exploring their new home, they also looked for more information about Cottbus' history and culture, and interviewed residents from around the world to present diverse views on the local cultural heritage. The organisation of the exhibition strengthened ties between the international students and the city's inhabitants. This deeper understanding of the culture, traditions and spirit of Cottbus has inspired the students to continue their careers in architectural conservation with the knowledge that interesting and dynamic heritage can be found in every corner of the globe. The exhibition was supported by the City of Cottbus, Gebäude-wirtschaft Cottbus GmbH and the Institute for Heritage Management GmbH.



Chair of Cultural Management

ASSOCIATE PROF. DR. PHIL. BRITTA RUDOLFF

◀ International Master's students at the BTU presented their view of the city in the »My Monument in Cottbus« exhibition (on the right: Prof. Britta Rudolff)

CINEMA INSTEAD OF LECTURES FOR A WEEK

Students Antje Ewald, Jana Stolle and Damien Laing worked at the 28th Cottbus FilmFestival and, in doing so, gained valuable insights into the city's cultural life

Antje Ewald used to live opposite a cinema when she was a child. This cinema in Jüterbog only had one room, but for the little girl, it was a magical place which led to a great love of the cinema. After her A-levels, she went to the BTU Cottbus-Senftenberg where she studied culture and technology. The subject sounded really promising and offered an insight into many very different fields. She also liked Cottbus – the town was a good size and was not too far from home and there were also several cinemas there. She even soon found a job in one of them.

Then came the Cottbus FilmFestival: »In my studies, one of the first tasks set by Professor Christer Petersen of the Chair of Applied Media Sciences was a film viewing in the cinema Weltspiegel. I can remember walking there through the rain with my Google Maps print-out. That was probably the first time that I did anything together with the other students outside classes and, looking back, it was a really great idea.« Antje Ewald became, and remains, fascinated by the Eastern European film festival – so much so, that in 2014, she joined the festival's management as an assistant and has been supporting the whole team ever since. What does her work involve? Everything that most people take for granted. »I make sure that the posters are up, for example, that the letters are standing upright, that the magazine is out, the light turns blue, the lines are sprayed and that the event assistants get their work plans.«

This year the thirty event assistants also included the BTU students Jana Stolle and Damien Laing. The job is highly coveted, as you get to be part of the festival and can experience the atmosphere and gain an insight behind the scenes. The festival, which had more than 200 contributions and brings Eastern European film to the town, was already being held for the 28th time. Festival-goers were given the unique opportunity to watch Eastern and Central European productions which often have their world, international or German premiere in Cottbus. The festival is visited by more than 20,000 people each year. Since Jana Stolle from Lower Saxony moved to Cottbus to study here, she has also become a keen visitor to this film festival. Culture plays a large role in her life. »I come from a small village and, even when I was young, I used to travel to town to go to the theatre and cultural events. Later, I looked for a study course that would ex-



Alongside their studies at the BTU, Damien Laing, Antje Ewald and Jana Stolle (l-r) also work at the 28th Cottbus FilmFestival

plain the world to me. I wanted to understand exactly how society and its individual areas work and interact with one another and, in the Culture and Technology Studies, I found exactly the right course for me.« Jana Stolle's voluntary activities are equally important. As a child, she distributed flyers for her local citizens' association, was class spokesperson and, as a youth leader, gave sports courses. Today, she is cultural advisor in the students' council at the BTU, and was even honoured for her special commitment in numerous university committees at the BTU's 5th anniversary. However, during this week in November, most other projects were put on hold for the time being, as Jana Stolle worked on the film festival where she was looking forward to many interesting experiences from the various meetings and encounters.

Damien Laing from Australia also eagerly anticipated the exchange between the regional and international visitors. He recently moved to Cottbus and is spending his semester abroad at the BTU in the Urban and Regional Planning Department. He travelled to the tranquil town in Lausitz with his girlfriend who is studying World Heritage Management – both come from the metropolis of Melbourne. »We love Cottbus. It is small but really interesting and offers many opportunities. You can also always find people who are open to project ideas.« It was sheer luck that he ended up working at the film festival: »I wrote to the organisers because I wanted to become involved in the Cottbus arts scene. I was then sent an employment contract and translated film descriptions into English and worked as event assistant in the town hall.« He really enjoys seeing how people from different countries are connected through common interests and, for him, this is exactly what distinguishes the Cottbus FilmFestival.

NEWS

BTU SCIENTIST ELECTED ONTO THE ICOMOS BOARD

In December 2017, the General Assembly elected Clara Rellensmann, an academic associate on the Chair of Architectural Conservation at the BTU, onto the 20-member board of the ICOMOS. The International Council on Monuments and Sites (ICOMOS) is an independent association of experts responsible for the conservation of material cultural heritage, such as monuments, historic city areas, cultural landscapes and archaeological sites. ICOMOS has around 10,000 members worldwide, split amongst 110 national committees and it's one of three bodies that advise UNESCO on world heritage matters. Clara Rellensmann is by far the youngest member of the board and represents the next generation of emerging professionals.



< Clara Rellensmann at a board meeting in Delhi

DBU SCHOLARSHIP FOR AGROFORESTRY RESEARCH

Gábor Zamožny comes from Hungary. In September 2017, he received a scholarship from the German Federal Environmental Foundation (DBU) to conduct research in the Chair of Soil Protection and Recultivation, dealing with the topic of innovative land use with a particular focus on agroforestry, where he was supervised by Dr. Christian Böhm. Gábor Zamožny collaborated on a number of projects and diligently pursued his personal goal of creating an agroforestry guide in Hungarian. He translated an agroforestry video created at the BTU into Hungarian – much to the delight of agroforestry enthusiasts in his country.

He also solved problems with his own field investigations. »I wanted to learn more about the natural nutrient cycle in agroforestry systems.« He did this by collecting various leaves and carrying out various measurements and analyses. His measurements reveal that short-rotation agroforestry systems are generally influenced by leaf litter within 10 metres of copses and leaf litter has a greater influence on poplars than on robinia trees. Gábor Zamožny enjoyed his time at the BTU so much that he decided to extend his scholarship and continue researching in Lusatia until late June.

Agroforestry is an environmentally friendly and diverse form of agriculture where arable crops and woody plants are cultivated and harvested together in one area. The combination of livestock farming and woodland cultivation is one form of agroforestry. This form of land use has many po-

sitive effects on the environment, as it protects soil against erosion and increases habitat diversity in agricultural areas. Various research projects have been carried out over the past 20 years in the field of soil protection and recultivation to study different agroforestry systems.



< Gábor Zamožny enjoyed his time at the BTU so much that he decided to extend his scholarship

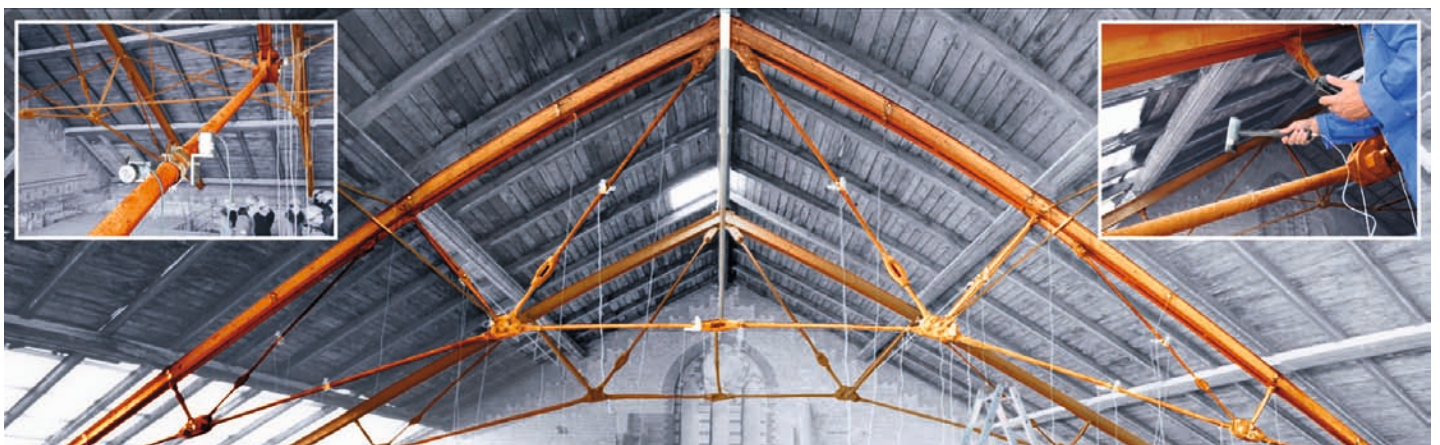
STEEL CONSTRUCTION RESEARCH PRIZE FOR BTU DOCTORAL THESIS

Dr.-Ing. Mai Hoa Luong has won the DAST Research Prize 2018 with her dissertation on the topic »Determining the stress state in half-timbered-style iron and steel structures with the aid of vibration-based experimental investigations«. »With the presented method it is possible to pragmatically estimate, without destruction, the overall stress load of existing and also complex constructions, the supporting parameters of which are only partly known and, with this, create the prerequisites for effective reconstruction and strengthening. This lays the foundation for building redevelopment and preserving listed supporting structures,« said the jury explaining their decision.

Mai Luong completed her doctoral studies at the BTU Cottbus-Senftenberg in cooperation with the Bauhaus University Weimar as well as the Federal Institute for Materials Research and Testing. From 2011 to 2017

she was a research associate at the BTU with Prof. Dr.-Ing. Lorenz at the Chair of Construction History and Structural Preservation. Since January 2018 Mai Luong has been employed at the German Institute of Structural Engineering. The award presentation took place on the day of »Stahl. Architektur«, the second congress day of the 39th German Steel Construction Congress on 12 October 2018 in Duisburg. Cooperation partner is the magazine »Stahlbau« published by Ernst & Sohn.

The DAST Research Prize has been awarded since 2016. The promotion prize of the German Steel Construction Association has already been awarded every two years since 1974 and is open to architecture and construction engineering students who can submit their work. The prize money is a total of 8,000 €, the distribution of which is decided by a jury.



^ Presentation of the method for establishing the stress state (graphic: Thi Mai Hoa Luong)

WINNER AT INTERNATIONAL DESIGN CONTEST

Doctoral students of Prof. Dr.-Ing. Alexander Kölpin, Head of the Chair of Electrical Engineering and Measurement Technology at the BTU, have won the design contest »High Sensitivity Radar« at the International Microwave Symposium (IMS) in Philadelphia, USA, for the second time in succession. Last year the area of specialisation was minimal electricity consumption, this year it was maximum distance resolution. Doctoral candidates Fabian Michler, Benedict Scheiner and Fabian Lurz, who Prof. Kölpin supervises at FAU Erlangen, approached the new task with a new concept and were up against four other international groups. They were the only group that was able to record, with their self-built system, vibrations with only ten micrometre hub within a few seconds, which corresponds to approximately a quarter of the thickness of a human hair. The system works with a radar signal at 24 gigahertz and uses only an average of 2.5 milliwatt with a weight of eleven grams. It is optimised at low cost: components only cost €35.



^ Prof. Dr.-Ing. Alexander Kölpin (r) with his doctoral candidates Fabian Michler (centre) and Benedict Scheiner (l) at the event (Photo: Chair of Electrical Engineering and Measurement Technology)

CERTIFICATES FROM THE INTERNATIONAL ORIENTATION STUDIES PROGRAMME

Ashkan Aghaalian from Iran and Shir Lavie from Israel are students on the International Orientation Studies Programme that was launched in the winter semester of 2017/18. They now proudly present their certificates after successfully completing their first semester. The structured orientation programme is aimed at prospective students from around the world and it's proven to be quite a success with lots of applicants. The programme thoroughly prepares international students for their studies at the BTU Cottbus-Senftenberg. Students start the one-year course by acquiring speaking and reading skills in German. They then refresh their knowledge of basic subjects like mathematics, physics and biology before finally getting a taste of various study programme modules.

»A friend from back home told me about his studies at the BTU. I became curious and decided to do a Master's in Construction Engineering. The programme has prepared me really well for my studies,« says Ashkan Aghaalian. Shir Lavie agrees and is looking forward to her preparatory courses next semester: »I'd like to try out Biotechnology and Medical Informatics and then study one of those subjects here.« She likes the small university in Lusatia with its family atmosphere. »It's easy to meet new people. And there are lots of students with different nationalities. That's what I like.« She and her classmate Ashkan are a perfect

example of our friendly togetherness – even though they come from enemy states. Their newly acquired language skills and technical knowledge are also essential requirements for their integration. Ashkan Aghaalian has even managed to make contact with civil engineering companies in the region and started working at Zechbau GmbH in Cottbus as a student trainee in March 2018.



△ Ashkan Aghaalian (left) and Shir Lavie are delighted to receive their DHS certificate

COOPERATION WITH THE UNIVERSITY OF ARCHITECTURE AND CONSTRUCTION IN BAKU

In March 2018, a delegation of civil and mechanical engineers visited the Azerbaijan University of Architecture and Construction (AzUAC), where they met the Rector of the University and the deans of various faculties. The visit took place during a series of Erasmus+ courses held on the topic of energy efficiency at the Technical University, located just down the road. Contact was first made with the AzUAC in 2015 and this should now develop into a successful cooperation. Dr. Andrea Straub, representing the Faculty of Architecture, Construction Engineering and Urban Planning, took the first step by asking the Rector of the AzUAC to sign a Memorandum of Understanding (MOU) that had also been signed by the President of the BTU. Both universities have now reaffirmed their support for the exchange of students, doctoral candidates and lecturers. They've also promised to develop bilateral study programmes, strengthen academic cooperation for their mutual benefit and hold joint academic conferences, workshops and summer schools. The talks were held in a very hospitable atmosphere. The visit was concluded with a trip to the civil engineering laboratories and informal conversations about research interests. By signing the MOU, we'll be able

to continue our successful collaboration with Azerbaijani universities and consolidate the international focus of the BTU.



△ Gábor Zamozny enjoyed his time at the BTU so much that he decided to extend his scholarship

MEET US AT THE GERMAN BOOTH!

In 2019 BTU Cottbus-Senftenberg will be represented at the big network fairs APAIE, NAFSA and EAIE. We look forward to meeting our partner universities, making new contacts with international colleagues, discussing current university policy topics with university representatives from all over the world and initiating new exchange programmes.

CONTACT internationaloffice@b-tu.de

EAIE 2019
CONFERENCE AND EXHIBITION
24-27 SEPTEMBER 2019
HELSINKI, FINLAND

NAFSA 2019
CONFERENCE & EXHIBITION
26-31 MAY 2019
WASHINGTON D.C., USA

APAIE 2019
CONFERENCE & EXHIBITION
25-29 MARCH 2019
KUALA LUMPUR, MALAYSIA



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