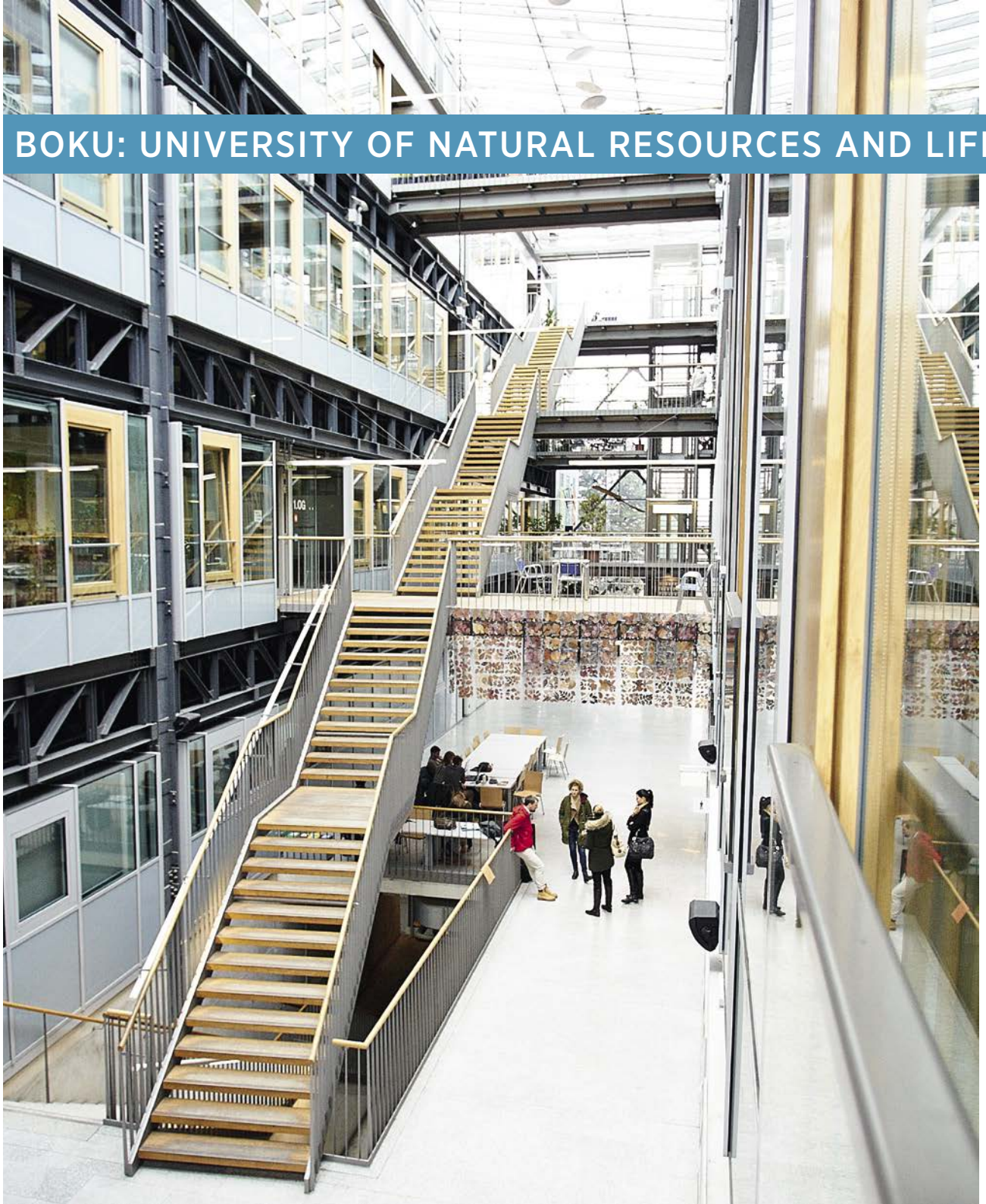
BOKU STRATEGIC PLAN 2018

University of Natural Resources
and Life Sciencies, Vienna

universität des lebens

BOKU: UNIVERSITY OF NATURAL RESOURCES AND LIFE SCIENCES, VIENNA



The University of Natural Resources and Life Sciences, Vienna (BOKU) was founded in 1872 out of concern for the sustainable management of natural resources. With the establishment of an outstanding agricultural and forestry education, the new „Hochschule für Bodencultur (Higher School of Soil Culture)“ was commissioned to ensure the future security and best possible use of renewable resources.

We have remained true to this founding mission – and yet BOKU has changed notably over the past decades: the small university, originally designed for 350 students, has become a dynamic university with nearly 13,000 students. New fields of knowledge have been added to the traditional fields of expertise: Today, the BOKU deals with topics such as molecular biology, nanotechnology, food security, risk assessment or water management. The topics have become diverse - no wonder that BOKU is also called “University of Life”.

And yet, where does BOKU stand today and what are our contributions to solving societal challenges? How do we successfully compete for the best minds? How do we cope with the influx of interested students while at the same time improving the quality of research and teaching?

The current, 159-page, „BOKU Strategic Plan 2018“ provides answers. It offers a precise status quo assessment and an outlook as well as describing concrete measures by which we aim to achieve our goals. The following summary describes BOKU‘s specific qualities, gives an insight into BOKU‘s philosophy and provides an overview of our most important projects until the year 2021.

WHY OUR WORK IS SIGNIFICANT

One viable way to assess the value of a university is seeing how it is viewed by young people - we are pleased to say, we have passed the test. Our work has aroused great interest and, increasingly, young people wish to study at BOKU – because they believe that there is hardly a more important and rewarding topic than the sustainable and intelligent use of natural resources.

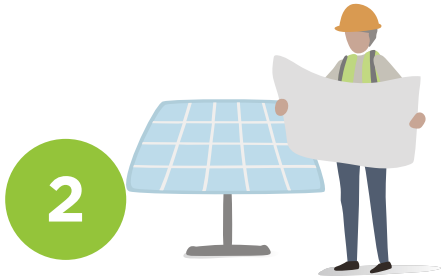
In view of global developments, these challenges will become even more pertinent: the world's population is growing and so are the demands on the safety and quality of food and materials. The United Nations has formulated a list of 17 particularly pressing development goals for the 21st century. The topics known as Sustainable Development Goals (SDGs) include food and energy security, inclusive education and the sustainable use of water. The operational implementation of the 17 SDGs almost perfectly reflects BOKU's core competences in research, teaching and knowledge transformation:

- the conservation and development of habitat and quality of life
- the management of natural resources and the environment
- safeguarding food security, nutrition and health

Among universities in Austria, BOKU holds the topic leadership on four of the 17 SDGs – more than any other Austrian university – and for a further nine SDGs BOKU is ranked among the best universities in the country.

This acknowledged subject competence enables BOKU to fulfil and expand its role as one of the leading life science universities in Europe. Important tools include the EU Strategy for the Danube Region, BOKU's participation in the Danube Rectors Conference, ICA-CASEE, the European Forest Institute – Regional Office for Central Eastern Europe (EFI-EAST), and the university's commitment within the framework of the Euroleague for Life Sciences.

Conservation and development of habitat and quality of life



Management of natural resources and the environment

Safeguarding food security, nutrition and health

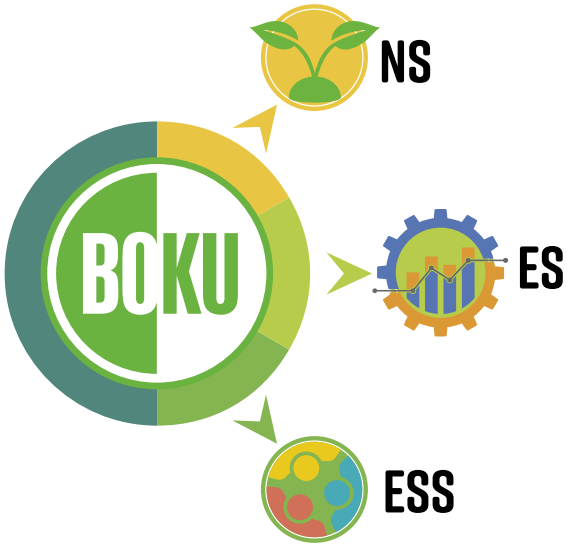
WELL BUILT: THE ORGANISATIONAL STRUCTURE OF A VERSATILE UNIVERSITY

From biology to molecular biology, from law and economics to nanotechnology to hydraulic engineering as well as agriculture and forestry: we have brought this diversity of subjects, disciplines and traditions into a modern, flexible structure. Our strength is interdisciplinary, networked and international action – especially in Europe, the US, in China, but also with a regional focus in the mountainous regions of Asia, Africa and Latin America. This enables research and teaching at the highest level; at the same time, BOKU fulfils its social responsibility in the sense of sustainable development in these regions: we are training the next generation of local leaders and decision-makers. For this purpose, the Centre for Development Research has been established, which together with relevant university departments performs these tasks in Bhutan, Nepal, Ethiopia, Kenya and in Latin American countries, among others.

The founding idea of BOKU was based on the combination of natural sciences, technology and social sciences. This created the basis for a solution-oriented, holistic approach that aims at thinking in product or value-added chains. This trans- and interdisciplinary BOKU philosophy has been the basis for research and teaching since 1872 and today is a decisive competitive advantage in the successful addressing of the key societal questions that we face.

Our basics – also better known as the „Three Pillars Model“:

- ***Natural sciences*** help us gain a deeper understanding of life processes and the relationships between the elements of soil, water and the atmosphere.
- ***Engineering sciences*** apply findings from the natural sciences in practice, but are also the driving force behind new approaches and research questions. They research application-oriented production, recycling and disposal processes and deal with life-cycle-oriented planning, construction and evaluation.
- ***Economics and social sciences*** deal with questions of economics, politics, sociology and natural resource law and life sciences.



The consistent implementation of this „three-pillar model“ enables the processing of value chains and cycles and thus contributes to the development of a “knowledge-based bioeconomy” as well as aiding the creation of a national and EU bioeconomy strategy “Innovating for Sustainable Growth: A Bioeconomy for Europe”, as defined in 2012.

Within this grid are also our eight fields of competence that are to be understood as *scientific fields of work*:

- Soil and land ecosystems
- Water - atmosphere - environment
- Habitat and landscape
- Renewable resources and resource-oriented technologies
- Food - nutrition - health
- Biotechnology
- Nano-sciences and nanotechnology
- Resources and social dynamics

These topics can be found in research, development and services of all 15 departments, which also serve the teaching for 8 Bachelor and 26 Master programmes. It is these fields of work that form the basic structure of our university.

Research is conducted in manageable units that incorporate their work into the strategy of their respective departments. The resulting opportunities for interdisciplinary cooperation within BOKU and the rapidly increasing interest in the sustainable use and processing of renewable resources in recent years have made BOKU one of the leading “Life Sciences” universities in Europe.

NATURAL SCIENCES

ENGINEERING SCIENCES

ECONOMICS AND SOCIAL SCIENCES

Haroun Moalla

KNOWLEDGE WITHOUT BORDERS OR: THREE PILLARS IN A FLEXIBLE NETWORK

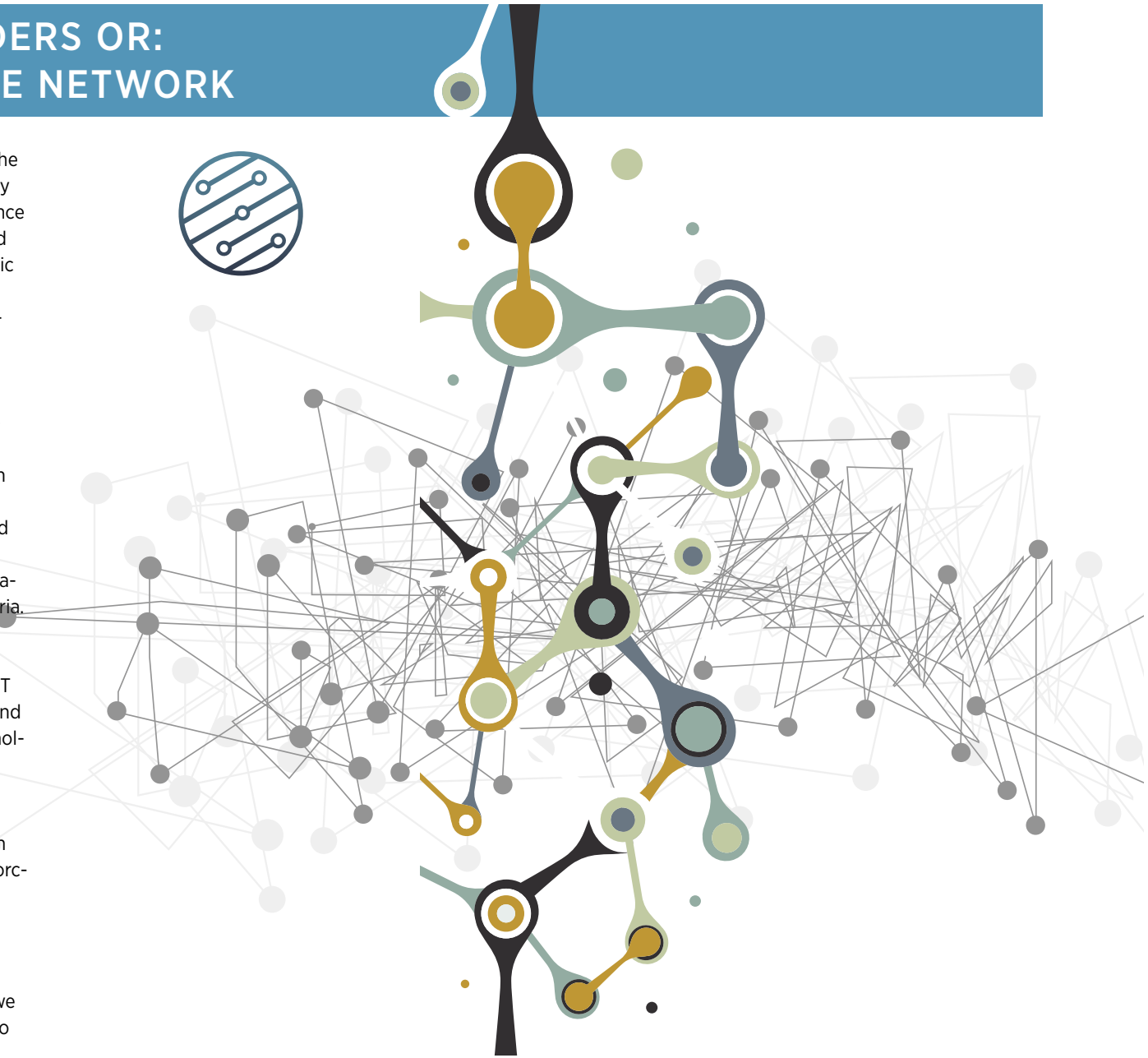
The challenges of the present can only be overcome with the expertise of several disciplines. That is why we deliberately keep the boundaries among the pillars, areas of competence and departments, permeable: Depending on the task, we network and work in an interdisciplinary manner. In doing so, we conduct both basic and applied research - thus, basic research driven by curiosity and inquisitiveness provides new ideas for applied technologies. And conversely, problems from technology can inspire new questions in basic research.

To foster an exchange of research ideas and to strengthen our competitiveness, we are always on the lookout for suitable partnerships - such as currently with the Technical University of Munich (TUM), the Austrian Institute of Technology (AIT), the Nanyang Technological University in Singapore or CITEC Brno. We also cooperate with industry: here we find constructive support, demand and synergies. For example, we conduct research together with business partners in the Christian Doppler laboratories, the COMET Competence Centres and the Research Studios Austria.

The most significant joint venture of BOKU is the Austrian Centre of Industrial Biotechnology (acib), which has been one of the five COMET K2 competence centres since 2010. More than 20 scientific partners and more than 50 industrial partners work on issues of industrial biotechnology in this joint research network.

The Council for Sustainable Logistics (CNL) is a unique Europe-wide initiative launched in 2014; it brings together 15 of the largest Austrian companies in the fields of trade, logistics and manufacturing to join forces with BOKU in the field of sustainable logistics.

At BOKU we take a flexible, interdisciplinary approach that is relevant both to basic and application-oriented research, and we create and implement new ideas together with our partners. There is also what we call the special BOKU spirit. It not only influences what we do, but also how we do it.



THE BOKU SPIRIT

At BOKU, we have long since overcome the old cliché, in which universities resemble isolated ivory towers. Today, we share our insights with society, contribute to public debates and cultivate contacts with stakeholders in science, business and politics.

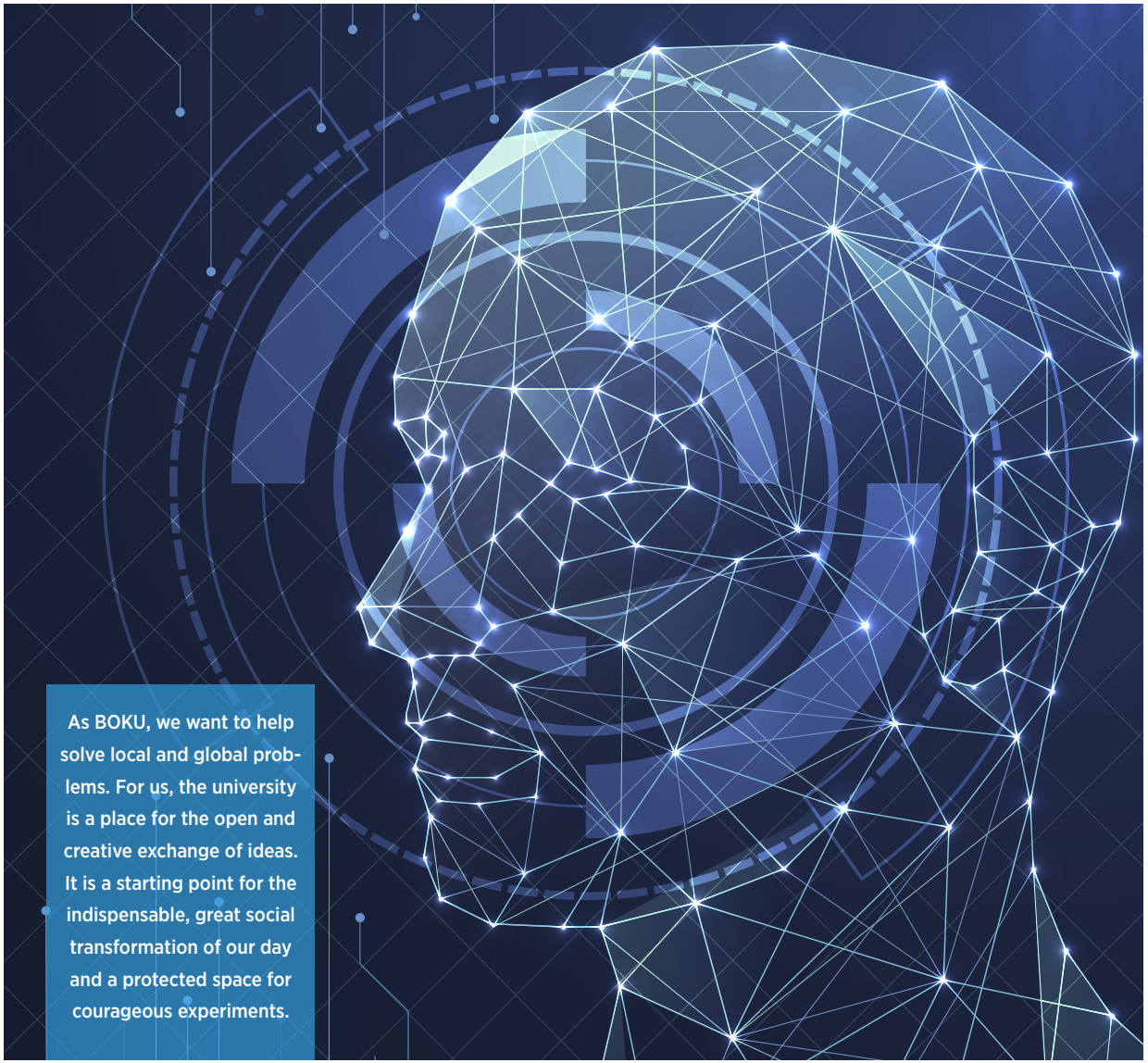
As BOKU, we want to help solve local and global problems. For us, the university is a place for the open and creative exchange of ideas. It is a starting point for the indispensable, great social transformation of our day and a protected space for courageous experiments.

The basis for this is our pursuit of excellence. To live up to this claim, we carefully select those research fields in which we are scientifically competitive on an international level.

Researchers at BOKU can prove their scientific competence with a steadily increasing number of publications in specialist journals. Since 2005, publication output has grown from 1,900 to nearly 2,500 scientific publications – with a clear trend towards high-level scientific publications (SCI); these more than doubled during this period and reached 850 in 2016 and exceeded 900 in 2017. The number of publications in collected works and other scientific journals remains constant at around annually 1050 and 600, respectively.

When it comes to attracting third-party funds and acquiring competitive EU projects, our scientists are in the leading segment of Austrian universities. From 2005 to 2016, the third-party funds increased from € 33 million to € 50.9 million, including the nine Christian Doppler laboratories. This corresponds to a third-party funding share of around 30% of BOKU's total budget.

Internationally these developments are reflected in very good university ranking scores. Thus, BOKU ranks 35th in the



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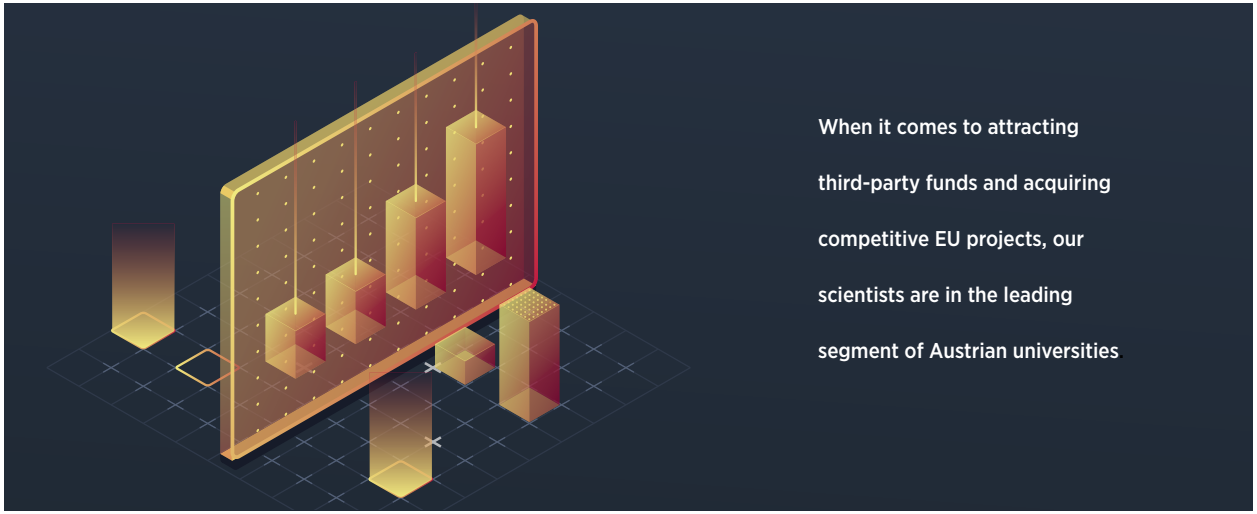

"QS World University Rankings by Subject" category in the field of agriculture and forestry.

For us - as one of the most renowned universities in Austria - research-led teaching is a matter of course: Thus, the contents conveyed in study programmes and continuing education are always the current state of science. Our employees also benefit from the most up to date research: each year, three or four innovative spin-offs are successfully launched at BOKU. This makes us one of the most innovative life sciences universities in Central Europe.

All this makes BOKU particularly attractive as an educational institution. It is one of the top two universities in Austria in terms of diversity of origin: 21% come from abroad, of which more than a third are from non-EU countries – mostly from countries in Asia, Africa and Central and South-Eastern Europe.

This internationalism in lecture theatres, seminar rooms, laboratories and experimental facilities contributes to a cosmopolitan atmosphere at BOKU. We attach great importance to openness to new things, promote diversity of opinion and an unprejudiced approach to other cultures.

International development research is a central concern of BOKU. We cooperate with institutions of development cooperation, the private sector and civil society and strive to strengthen the exchange of knowledge with other universities, for example through the Erasmus+ programme or joint degree studies.

All these services to society are an integral part of our work. We feel called upon to share our insights on fulfilling the Third Mission – the active and conscious acceptance of social responsibility. Only in this way can we meet the economic and social challenges of the future.

RESEARCH AND TEACHING AT BOKU – A VISIONARY PERSPECTIVE

A university is only as good as its staff in administration, research and teaching. That is why we actively seek, find and develop new talents. In every appointment, we see a chance to improve and update BOKU's focus. At the same time we sense the increasing worldwide competition for the best minds among, increasingly also non-European, institutions. An argument for BOKU as a future workplace is the newly developed career path that offers ambitious employees clear perspectives.

We set high standards for all new and all current employees researching and teaching at BOKU - quality in research is equivalent to that in teaching. The quality of teaching is therefore a central component in all qualification agreements, habilitation and appointment procedures and is persistently evaluated.

In addition, we expect our scientists to continuously improve their teaching skills via further education. Since 2015, there is the training pass for BOKU employees; it documents an employee's every measure taken for professional development.

Additionally, five principles apply to all leadership staff: they are to serve as role models and take on responsibility; they have to set explicit goals, are responsible for transparency, communication and participation in their teams and have to treat their employees with trust, appreciation and respect. As a matter of course, these standards also apply to the students at BOKU.

There are currently 211 persons with an extensive teaching authority working at BOKU (university professors, university docents, associate professors). There are also 212 permanent employees and 880 temporary research staff members. Additional support for teaching and research comprise 296 lecturers and 373 student employees as well as approx. 600 employees in the university administration.

In the next ten years, about 75 professor positions will have to be filled. In addition, the university will require an additional 42 new professor positions to attain a teacher/ student ratio of an internationally competitive level. Furthermore, 32,000 m^2 worth of teaching and learning space has to be created in order to reach the set target.

STUDY AT BOKU – LEARNING FROM THE BEST

BOKU is a very student-friendly university, a fact reflected by the sheer number of students: It has risen sharply in recent years and continues to rise. Thus, BOKU has in fact doubled its number of students over the last 7 years. In percentage terms, this is the largest increase when compared with any other Austrian university. Forecasts show that the number of BOKU students could increase further from the current 12,800 to 19,500 students in the academic year 2024/25.

This shows how highly relevant young people consider the study topics BOKU has to offer. At the same time, however, this tide poses a major challenge for research and teaching. In the foreseeable future, BOKU will not be able to provide adequate care and adequate space for such a large number of students. We therefore aim to guide and manage first year students. Experiences from other Austrian universities show that, long-term, these measures reduce the number of drop-outs and increase the number of active students and graduates.

Regarding the quality of education at BOKU, we have the highest standards: BOKU practices the Humboldt educational ideal of research and teaching being of equal importance and worth: excellent research promotes excellent teaching - and vice versa. Our students should learn to study in a self-directed and problem-oriented fashion. We encourage them right from the start to critically reflect and to approach study in an interdisciplinary, solution oriented and transdisciplinary manner. The goal is to develop systemic thinking beyond the limits of courses and disciplines. Students acquire knowledge of scientific, technical and economic fundamentals and thus become sought-after all-rounders with a broad professional scope. Therefore, a majority of our graduates find a job in their field of work shortly after graduation. A graduate survey (KOAB study) conducted by the ISTAT Institute in 2016 among all Austrian universities is evidence of this. According to this survey, three out of four BOKU students were satisfied or very satisfied with their study conditions. BOKU graduates are well prepared for the demands of their professions. The skills acquired during a given study programme correspond very well with the professional requirements (about 1.5 years after graduation). Looking back, 86% of former BOKU students would study again and 81% would choose BOKU again.

STUDY AT BOKU – LEARNING FROM THE BEST

BOKU's spirit is also well alive among students: They are a diverse, heterogeneous group, they come from all states of Austria and from various countries within and outside of Europe. Their social and cultural backgrounds vary, they represent diverse ideals and beliefs. This diversity creates opportunities and potentials that are actively promoted and used by the university.

The collegial cooperation among students, teachers/researchers and other members of the university distinguishes BOKU. Students are involved in the decision-making processes of the university. They have important responsibilities, for example in the Senate, in the Equal Opportunities Work Group, in the Study Commissions and in all evaluations, habilitations and appointments.

To promote internationalisation, BOKU relies on international, target group-specific English-language curricula. Co-operations via joint degree programmes with strategic partner institutions of BOKU serve to meaningfully combine the respective scientific strengths of the universities for studies. "Mobility windows" in BOKU curricula make it easier for students to spend semesters abroad.

Currently, BOKU offers eight bachelor's degree programmes each designed for six semesters. Graduates can join a master's programme, which usually runs for four semesters. Thus 15 German, five English and 11 international Master's programmes are offered at BOKU.

BACHELOR PROGRAMMES (6 SEMESTERS):
Food Science and Biotechnology
Landscape Architecture and Landscape Planning
Forestry
Wood and Fibre Technology
Environment and Bio-Resources Management
Civil Engineering and Water Management
Agricultural Sciences
Equine Sciences (joint programme with the University of Veterinary Medicine)

MASTER PROGRAMMES IN GERMAN (4 SEMESTERS):
Food Science and Technology
Landscape Architecture and Landscape Planning
Phytomedicine
Wild Life Ecology and Wild Life Management (joint programme with the University of Veterinary Medicine)
Forest Sciences
Wood Technology and Management
Environment and Bio-Resources Management
Civil Engineering and Water Management
Plant Sciences
Livestock Sciences
Agricultural and Food Economy
Material and Energetic Exploitation of Renewable Raw Materials (NAWARO)
Alpine Natural Dangers/Watershed Regulation
Organic Agricultural Systems and Agroecology (AgrEco-Organic)

MASTER PROGRAMMES IN ENGLISH (4 SEMESTERS):
Mountain Forestry
Biotechnology
Water Management and Environmental Engineering
Applied Limnology/Limnology & Wetland Management
Organic Agricultural Systems and Agroecology (AgrEco-Organic)

INTERNATIONAL MASTER PROGRAMMES:
Natural Resources Management and Ecological Engineering (NARMEE)
Applied Limnology/Limnology & Wetland Management
Environmental Sciences – Soil, Water and Biodiversity (ENVEURO)
Animal Breeding and Genetics (EM-ABG)
Safety in the Food Chain
European Forestry
International Master in Horticultural Sciences
Material and Energetic Exploitation of Renewable Raw Materials (NAWARO)
Viticulture, Enology and Wine Economics
Organic Agricultural Systems and Agroecology (EUR-Organic)
Sustainability in Agriculture, Food Production and Food Technology in the Danube Region

Furthermore BOKU currently offers four doctoral programmes designed to take six semesters:

DOCTORAL PROGRAMMES (6 SEMESTERS):
Doctoral Studies of Natural Resources and Life Sciences
Doctoral Studies of Social and Economic Sciences
PhD-Studies Biomolecular Technology of Proteins (BioToP)
Doctoral Studies “International Graduate School in Bio-Nanotechnology (IGS-BioNanoTech)“

One of its kind, BOKU offers structured doctoral studies: these aim to train doctoral students under internationally comparable conditions and support junior scientists.

In addition, BOKU supports the cooperation of doctoral colleges and graduate schools. Doctoral colleges are closely tied to BOKU competences, successful large projects specifically, and thus guarantee a high quality training of doctoral students close to top research.

A novel service of BOKU is the Academy of Continuing Education, which was founded in 2018. Lifelong learning programmes and projects within the BOKU competences scope are offered.

ACTIVITIES

Due to our expanding study programmes and the increasing number of students, BOKU has long outgrown its original location - the "Türkenschanze" in the 18th and 19th district of Vienna. Today, BOKU is situated at several locations, each of which brings together subjects and organisational units that match up well:

- The "*Türkenschanze"*: The buildings at the Türkenschanzpark are the historical nucleus and to this day, home to BOKU's central organisational units. The Rectorate and its associated service facilities are located here. The interrelated research topics are land use and global change in reference to aspects of agriculture and forestry, climate change, spatial development, social change, natural hazards and the conservational and sustainable management of the landscape.

- The *Muthgasse:* Most Departments that are located in the 19th district of Vienna, contribute to biotechnology and food technology with the competence fields of biotechnology, nano-sciences and nanotechnology as well as food, nutrition and health. There are also facilities dedicated to water- and waste-management to be found at this location.

- *Tulln:* The BOKU, together with the University of Veterinary Medicine and the Vienna University of Technology, has operated this inter-university department for agricultural biotechnology at the site in Lower Austria, since as early as the 1990s. The location was enlarged considerably in 2011 when the newly built University and Research Centre Tulln was opened. Plant research, renewable raw materials and resource-oriented technologies are studied and researched here. A vital research partner on site is the Austrian Institute of Technology (AIT) with its Department Health & Environment as well as the competence centre Wood Kplus.

- A virtual *"Fourth Location"* encompasses external sites that play an important role in research and teaching for BOKU. These are agricultural and forestry testing sites as well as horticultural and viticultural facilities; furthermore, the Water Cluster Lunz, the observatory Hoher Sonnblick and a close to completion hydraulic engineering laboratory on the Danube in Vienna.

Introducing our new „TÜWI"-building at the Türkenschanze: certified sustainability to the core.


Wachauer Marmor

LOOKING AHEAD: HOW WE PLAN TO MOVE ON

In the past years and even decades, BOKU has discovered new topics and unveiled new areas of activity. We remain committed to promoting content and expansion while managing in an intelligent and sustainable way. In this sense, the content offered by BOKU will adhere even more closely to the strategic requirements and challenges of our time. Our overall goal is to grow in a qualitative manner: By creating new positions we aim to meet the demands of the ever increasing number of students, by swiftly replacing vacated professors' positions we guarantee successful further development in research and by tailoring the organisational structures in accordance with the gratifying growth rate of recent years we enable efficient management.

Thus our future focus is on the following issues:

- Further *developing our locations:* In recent years, substantial improvements have been achieved through new buildings and renovations as well as extensions at all three main locations. However, there is still much to be done: about 32,000 m^2 of teaching and learning space as well as additional institute space for new staff will be required in the coming years.

- *Digitisation:* Recorded lectures already provide the option for students to follow and work with lectures independent of timetable and place. This allows for synchronous and asynchronous learning. In the future, this offer will be expanded in form of a „virtual campus" applying innovative didactic teaching and learning methods. The best possible use of new forms of teaching and learning, especially the so-called „blended learning", are to optimise the learning outcomes of our students. In research we aim to set a focus on digitisation.

- *Internationalisation:* From English courses to help with applying for projects within the EU Research Framework Program HORIZON 2020: We actively support our staff and students in order to facilitate worldwide exchange and networking. Everyone benefits from this: the students, the researchers and the teachers, our employees and our partners - and of course we as a university. In order to be able to provide a truly relevant contribution to mastering the great challenges of our time, we need strong partners - worldwide.

SUMMARY

BOKU's agenda is focused on issues of the future. Thus, we strive for qualitative growth in research and teaching. Since 1872, we have fostered interdisciplinary and trans-disciplinary access to knowledge thereby systematically linking natural sciences, technical and social science subjects in research and in teaching. Thus, we are ideally suited to answer questions regarding

- Conservation and development of habitat and quality of life
- Management of natural resources and the environment
- Safeguarding nutrition and health

These topics, also known as grand challenges, require a comprehensive and systemic approach, as it is successfully practised at BOKU. Over the next few years, we expect a change in the economic and in the reward system.

The interdisciplinary and trans-disciplinary approach practised at BOKU is an ideal basis for this transformation of the value and economic system and requires highly qualified young people. We are therefore delighted about the increasing interest of many young people in BOKU topics, because all these developments are ideal prerequisites for making BOKU the innovative leader of a green economy: BOKU is fit for the future.

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