

University for
Continuing
Education Krems



Research Report

2022/23

University for Continuing Education Krems.

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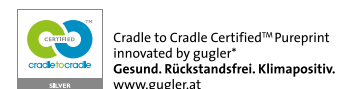


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Research Driven by Responsibility

As a public university, the University for Continuing Education Krems fulfills its societal responsibility through research and teaching. We are convinced that research and innovation are driving forces for the transition of our society towards a sustainable future.

Our transdisciplinary approach provides the basis for expanding scientific knowledge by linking different areas and sectors and by transforming research results into solutions and knowledge-based policies.

Our research contributes to overcoming challenges such as population ageing and its manifold implications for health and societal cohesion, the energy transition, the protection of cultural heritage, migration processes, or the management of complex (eco)systems.

In this sense, it is our goal to promote international collaborations and to extend our participation in European research programs and networks, in particular Horizon Europe. With our current PhD programs "Regenerative Medicine", "Migration Studies", as well as "Technology, Innovation and Cohesive Societies", we are dedicated to supporting the development of young researchers.

"We are convinced that research and innovation are driving forces for the transition of our society towards a sustainable future."



Without our staff, the thriving drive to push our research forward at the University for Continuing Education Krems would not be possible. It is their profound expertise, their commitment, and the fulfillment they derive from working as scientists that allows us to address present challenges with research-based solutions.

With this in mind, we would like to invite you to have a closer look into the research at the University for Continuing Education Krems and to meet the people behind it.

Viktoria Weber
Vice-Rector for Research and
Sustainable Development

Facing the Challenges of Our Time

Our times are marked by a multitude of societal challenges—even after the pandemic. These challenges are characterized not just by increasing urgency, but also by their interdependencies. Ecological issues for example have implications for our energy supply or food security, influencing areas as diverse as the preservation of cultural heritage to migration. Digital transformation, in turn, not only determines how we design work processes, but also influences almost every other area of life, from education to medicine and production to culture. Demographic changes are challenging not only our health systems.

Societal impact

Like all public universities, the University for Continuing Education Krems has a responsibility to society to step up to these far-reaching challenges and through its research to contribute to overcoming them. To be effective in society and to be able to counter dynamic processes, research requires a clear profile.

Clear research profile

By broadening its research to the five main fields, Digital Transformation, Health and Innovation in Cohesive and Sustainable European Societies; Evidence-based Health Research; Cultural Heritage; Preventive and Regenerative Medicine and Continuing Education Research, the University for Continuing Education Krems is able to provide answers to current challenges. Anchoring research in the three faculties and their departments ensures that it is subject to continuous development. For work in specific areas, Research Labs have been established. Recently the Research Labs Aquatic Ecosystem Research and Health as well as the Research Lab Sustainable Cultural Heritage Lab were launched. To meet grand challenges such as biodiversity, the university has pooled resources with the Biodiversity Hub. In cooperation with the

research community, it actively contributes to meeting this challenge through transdisciplinary research.

International networks and basic research

In recent years, research at the University for Continuing Education Krems has once more successfully contributed to driving forward the strategic expansion of international activities. Thus, participation in European research networks has continued to increase. Our researchers have been able to gain a strong foothold in the European research program Horizon Europe, which is reflected in a growing number of EU-funded research projects, some of which are coordinated by the university, and in the greater volume of third-party research funding that has been acquired. The number of submissions to the Horizon Europe program is growing steadily, and a high “above threshold” rate for unfunded projects attests to the quality of the submissions.

The goal of research at the University for Continuing Education Krems is bridging basic research and application in a transdisciplinary approach. Within this framework, it has also been possible to increase the number of basic research projects, in particular the number of FWF-funded projects.

New PhD program

In addition to the two existing PhD programs Regenerative Medicine, and Migration Studies, a third PhD program in Technology, Innovation, and Cohesive Societies has been launched following accreditation by AQ Austria. Furthermore, research has been strengthened by the tenure track model, which is undergoing further development. Additionally, the interfaculty research groups help to deepen interdisciplinary collaboration at the university. They are being continued with the group on Sustainable Health Care.

Science and society

Transdisciplinarity is a core characteristic of research at the University for Continuing Education Krems. Transdisciplinary research actively incorporates knowledge and experience gained from practical application in a variety of fields into the knowledge-generation process. Complex challenges that require the development of comprehensive process-oriented solutions in particular, are amenable to transdisciplinary approaches of co-creation between research and practice. The transdisciplinary labs, or Td-Labs for short, at the Faculty of Business and Globalisation form a space to systematically explore solutions to issues as diverse as food security, sustainability and democracy research in a way that is concentrated and focused.

Creating awareness of research using contemporary means and resources is part of the University for Continuing Education Krems’ responsibility to society. In addition to taking part in formats such as the Long Night of Research or Girls’ Day, the university has developed its own formats. These include the Research Summit discussion format which brings together interested members of the public with the scientific community. A number of research projects have picked up on the trend toward actively involving the public in the research process and incorporate citizen science as an integral part of their projects; examples include the ÖkoLeita project to explore ecosystem services or the United by Crisis project to study early Neolithic excavations.

“The Faculty of Health and Medicine is characterized by its eagerness to address medical issues and provide novel therapy approaches. By closely collaborating with hospitals, institutes, and businesses in the field, the faculty ensures strong knowledge and skills transfer across disciplines. This cooperation enables the faculty to effectively confront the current and future challenges that arise within the health system.”

Stefan Nehrer

Dean of the Faculty of Health and Medicine



“It is especially in times of strikingly complex societal challenges with a global impact that innovative methods are needed to deal with emerging multifactorial events. Therefore, the Faculty of Economics and Globalisation emphasizes a transdisciplinary approach in its research, combining the broad spectrum of disciplines with concrete issues and practical knowledge derived from society. This allows us to gain a deep understanding to analyze these problems that subsequently lead to solutions with a high degree of societal acceptance.”

Barbara Brenner, Gerald Steiner

Deans of the Faculty of Business and Globalisation



“The Faculty of Education, Arts and Architecture unites a wide range of different scientific disciplines by means of their methods and working cultures. A common thread of its multi-perspective examinations lies in its sustainable way of approaching solutions, which then are used in the field of continuing further education research as well as searching for answers in green mobility or cultural heritage protection. We always bear the societal relevance of our research in mind when collaborating in national and international frameworks using the various forms.”

Stefan Oppl

Dean of the Faculty of Education, Arts and Architecture



Research with Societal Impact

The University for Continuing Education Krems is deeply involved in tackling current and future challenges. Its research builds on the link between university and society, creating highly transdisciplinary bridges between basic research and practice. The University for Continuing Education Krems addresses various current and recent challenges, as shown by the following examples of research.

Effects of the COVID-19 pandemic

The COVID-19 pandemic had a massive impact on a number of population groups. Its effects on the mental health of young people in particular required a swift scientific response. Furthermore, it also became apparent that there is a need for public health policy to improve pandemic management.

- The Department for Psychosomatic Medicine and Psychotherapy conducted several observational studies examining mental health, especially among adolescents.
- The research project "Becoming Equipped to Tackle Epidemics Right" at the Department for Evidence-based Medicine and Evaluation aims to optimize future epi- and pandemic preparedness in Austria.

Aging societies require new therapies

Life expectancy is increasing in most countries worldwide, accompanied by an increase in non-communicable diseases such as dementia, musculoskeletal disorders and those requiring extracorporeal therapies. Medicine is countering these developments with regenerative methods, the use of biomedicine and preventive medicine measures.

- The Department for Biomedical Research focuses on extracorporeal therapies, in particular on adsorption technologies for organ support, blood compatible biomaterials, the blood-biomaterial interface, the structural and functional characteristics of extracellular vesicles.
- The Department for Health Sciences, Medicine and Research focuses on regenerative medicine, in particular on tissue regeneration, cartilage replacement, inflammation, blood products and biotribology.
- The Department for Clinical Neurosciences and Preventive Medicine focuses on the prevention of neurological diseases, in particular stroke, dementia and other neurodegenerative diseases.

Unintended consequences of digitization

The digitalization of communication, especially the rapid spread of social media, has led to the mass dissemination of misinformation on many sensitive topics, such as democratic processes like elections or health. Counter-strategies require research on a wide range of issues.

- The project "Detection of Misinformation Using Artificial Intelligence" at the Center for Infrastructural Security aims to give both government end users (authorities, ministries) and representatives of news and media organizations a tool for analyzing digital content on the Internet using Artificial Intelligence. Politically motivated disinformation, such as election interference, should thus be prevented.
- The Interdisciplinary Research Group "Strengthening Critical Health Literacy in Times of Digital Transformation" is developing a low-threshold training program for laypersons to convey the most essential quality characteristics of reliable health information.

Education gaps and the labor market

Experts have identified discrepancies between the need for digital literacy and skills for participation in the labor market and in society in general on the one hand and the availability and suitability of courses and training programs in adult further education on the other. Measures are to be taken to close this gap.

- The project "Roundabouts for Digital Transformation: Connecting HRM, CGC/PES, VET and Workers in Participative Planning, Learning, and Training for Sustainable Employment", conducted at the Department for Continuing Education Research and Educational Technologies, aims to develop academic training programs. The project will develop, test, and implement innovative methods for interconnecting and coordinating individual training needs and labor market demand, and coproducing further education programs, actively involving workers, employers, and providers of training in a dynamic process.

Managing migration more effectively

The basic social constant of migration presents policymakers in Europe with the task of organizing migration movements effectively and efficiently. In order to understand all facets and possible forms of migration and to implement robust concepts, policymakers need profound insights from research.

- The project "Quantifying Migration Scenarios for Better Policy" conducted at the Department for Migration and Globalisation seeks to produce comprehensive, multi-perspective and robust quantitative migration scenarios to support various areas of European migration policy. It furthers the understanding of conceptual foundations of European migration flows and their key drivers in origin, destination and transit countries, focusing particularly on mobility of third-country nationals and decision-making among migrants.

Cultural heritage under pressure

The effects of the climate crisis, especially in the form of natural disasters, are increasingly endangering built or collected cultural heritage. This calls for special strategies of protection geared to the requirements of cultural heritage, but also for the further development of concepts for its sustainable use. In a first step, the knowledge base on this subject must therefore be enhanced.

- Climate change, combined with worldwide energy and resource deficiency problems, presents serious threats in our day and age. However, few studies have been published on how climate change affects our built cultural heritage. The "S.O.S Heritage" project aims to build the capacity of professionals managing Historical Buildings (castles, monuments, historic houses) in properly assessing and managing risks resulting from climate change.

Main field of research:
Preventive and Regenerative Medicine



Preventive and Regenerative Medicine

- Regenerative Medicine
- Sepsis and Pathogen Diagnostics
- PhD Program Regenerative Medicine
- Psychosomatic Medicine and Psychotherapy
- Neurosciences and Prevention



According to the “Global Burden of Disease Study”, more than half a billion people worldwide suffer from chronic osteoarthritis. In addition to increased life expectancy, the causes of joint diseases include weight gain and lack of exercise on the one hand, but also more frequent sports injuries. Medicine’s response: a paradigm shift from repair to regeneration, as well as deploying increasingly digital technologies in diagnosis and therapy. The Department of Health Sciences, Medicine and Research is addressing these challenges and developments, focusing its research on the mechanisms of action of blood products, the use of artificial intelligence primarily to facilitate diagnosis, and the development of new regenerative therapies in the field of cartilage and bone regeneration, for example by using 3D printing. The research and development of new treatment methods is based on close cooperation with regional, national and international partners from universities, hospitals and the corporate sector.

AI in Orthopedic Radiography Analysis

The project Artificial Intelligence in Orthopedic Radiography Analysis aims to further develop AI technology for orthopedic use. Based on clinical problems, computer-aided detection and deep learning technology will be used to analyze standard 2D X-rays. Fully automated measurements will be further developed, optimized and compared to state-of-the-art techniques.

The goal is to investigate an AI-supported modular software platform for standardized, objective analysis and early detection of joint diseases using radiological images. This approach has the potential to set a new standard in the diagnosis of musculoskeletal disorders while increasing the sustainability of the health system. The AI platform enables faster, more reproducible, and more precise diagnosis than a visual interpretation by physicians.

Preoperative planning and early detection

AI technology is capable of facilitating the early detection of pathologies and degenerative changes. This would make it possible to commence therapies at an earlier point in time, allowing patients to benefit from early treatment. The expected outcomes of this project are AI models that can perform automated measurements of the knee, hip and spine and which are non-inferior to current state-of-the-art methods. We have already demonstrated that AI technology is on a par with orthopedic surgeons when measuring clinically-relevant parameters on the hip and knee. Practical applications for the software could include preoperative planning, for example for high-tibial osteotomy surgery and cases of femoroacetabular impingement. However, it could also be used as an early detection tool for osteoarthritis and leg malalignment that could alert clinicians performing regular x-rays.

Artificial Intelligence in Orthopedic Radiography Analysis

FUNDING

GFF NÖ (Life Science Call 2020)

DURATION

2022–2025

DEPARTMENT

Health Sciences, Medicine and Research

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Stefan Nehrer, Kenneth Chan

COORDINATION

University for Continuing Education Krems

PROJECT PARTNERS

IB Lab GmbH
NÖ Landesgesundheitsagentur (Clinic
Baden/Mödling und University Clinic Krems)

Reducing the Failure Rate of Partial Joint Implants

Additive Manufacturing (AM) creates functional parts with complex shapes from digital models that are suitable for low production volumes and use in complex components. The project will investigate the tribological behavior of articular cartilage and adjacent metal implants in a test fluid of synovial fluid components. The aim is to reduce the failure rate of partial joint replacements.

Lowering the costs of partial implants and the technique itself could significantly reduce customization costs. Furthermore, providing patients with customized implants would increase the satisfaction rate. A more profound knowledge of the biotribological behavior of AM partial implants to preserve the integrity of the surrounding articular cartilage would also delay the need for total knee arthroplasty. This project facilitates the development of additive-manufactured (AM) partial implants and investigates the enhanced surface functionalization of AM partial implants to eliminate metal release.

Improving the rehabilitation process

We aim to develop a functional prototype of a partial metal implant and we will biotribologically test various materials for surface modifications against cartilage, providing new insights into friction and wear. Investigating the role of synovial fluid components in the biotribology of AM partial implants should support us in developing a novel artificial synovial fluid. In the future, this approach could be used as a post-operative treatment to improve the rehabilitation process.

Assessing the Viability of Additive Manufacturing for Partial Replacement Technologies

FUNDING

GFF NÖ (Life Science Call 2020)

DURATION

2022–2024

DEPARTMENT

Health Sciences, Medicine and Research

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Stefan Nehrer, Christoph Bauer

COORDINATION

AC2T research GmbH

PROJECT PARTNER

FOTEC Forschung- und Technologietransfer GmbH

Improving Quality of Life with Knee Osteoarthritis

Osteoarthritis (OA) is a degenerative joint disease that affects millions of people worldwide. Symptoms of OA include pain and stiffness, which lead to impaired physical function and reduced quality of life. The main objective of the current research is to examine the impact of a nutrition therapy combined with an exercise therapy in OA patients.

As one of the most common joint diseases worldwide, OA presents great health and socio-economic challenges for individuals and health care systems. An increasing body of evidence shows that lifestyle-associated factors such as body weight, physical inactivity, and a “poor” diet play an important role in the development and progression of OA. While the damage to joints cannot be reversed, OA symptoms can usually be managed. This research expands upon evidence indicating therapeutical benefits of exercise and dietary interventions in OA, in part by favorably modulating inflammatory processes.

Towards a cost-effective therapy

It is anticipated that the expected results arising from this project will be important in defining the therapeutical value of a dietary intervention concomitant with an exercise training program to improve the quality of life in OA patients. A particular aim of this research is to examine the efficacy of and adherence to the “New Nordic Diet” as a feasible and cost-effective “adjuvant therapy” to exercise to self-manage symptoms in OA. A focus will be on regional food products from Austria. The project itself is based on a transdisciplinary approach involving close collaborations in the field of physiotherapy, dietetics, nutritional sciences, and medicine.

Nutrition and Movement to Improve Quality of Life with Knee Osteoarthritis

FUNDING

GFF NÖ (Life Science Call 2020)

DURATION

2022–2025

DEPARTMENT

Health Sciences, Medicine and Research

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Stefan Nehrer, Oliver Neubauer

COORDINATION

University of Applied Sciences St. Pölten

PROJECT PARTNERS

University of Applied Sciences St. Pölten
University for Continuing Education Krems
University of Vienna

Improving Minced Cartilage

Minced cartilage is a treatment option for small cartilage defects that has become increasingly popular in recent years.

Autologous cartilage is harvested from the defect area, cut into small pieces with a mincing device (e. g., scalpel or shaver), and reimplanted into the cartilage defect. To date, standardization of the mincing process is lacking, and it remains unclear how it affects the viability of the chondrocytes.

The project aims to investigate how the mincing process affects the viability of chondrocytes and to compare cartilage mincing methods (scalpel vs. shaver, different shaver sizes, shaver blades, and shaver settings). Furthermore, the project aims to optimize the mincing process by combining cartilage with therapeutic substances, such as hyaluronic acid and platelet-rich plasma. The aim of this project is to establish a standardized procedure based on scientific data.

Standardizing the mincing cartilage procedure

This project will help surgeons apply minced cartilage. It will become clear if and how mincing of articular cartilage affects the viability of chondrocytes. Recommendations regarding shaver sizes, blades, and settings will be given (e. g., rotational speed). Studies will show whether co-administrating the minced cartilage with therapeutic substances improves chondrocyte viability. This project aims to reappraise and standardize the minced cartilage procedure.

Minced Cartilage in Regenerative Medicine

FUNDING

Translation and Industry Cooperation with KARL STORZ SE & Co. KG

DURATION

2021–2024

DEPARTMENT

Health Sciences, Medicine, and Research

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Stefan Nehrer, Lukas Moser, Christoph Bauer

COORDINATION

University for Continuing Education Krems

PROJECT PARTNERS

Karl Storz SE & Co. KG

Knowledge and Technology-Transfer & Dissemination

Science-to-Science:

→ **ICRS Berlin, Update Sportmedizin, Neuroorthopädie Symposium**

→ **Scientific Program Co-Chair of the 16th ICRS World Congress:** The main theme was the “R” in ICRS: repair, regenerate, restore, replace, rehabilitate, research, review, redefine, rethink being the keywords of this congress. The goal was to redefine processes and technology in the context of a more complex translational approach and unite the efforts in research and clinical facilities in moving forward.

→ **Co-organizer of the 14th International Symposium on Neuroorthopaedics & Rehabilitation at the University:** The congress addressed the very current topic of The Underestimated Pain – Prevention & Early Treatment.

→ **Organizers of the Symposium Update Sports Medicine:** The multi-faceted program covered a broad spectrum reaching from the prevention of sports injuries and sports damage to the musculoskeletal system to the prevention of problems associated with lifestyle and sports in the field of internal medicine and pediatrics.

Science-to-Business:

→ **Cooperation with Company Karl Storz SE & Co. KG** to develop new instruments for cartilage procedures, which are already in use.

→ **Cooperation with OrthoSera GmbH** to develop new blood-derived products for osteoarthritis. A prototype for commercialization was developed (hypACT).

Science-to-Public:

→ **Contribution to “Die lange Nacht der Forschung 2022”** raising the question Additive Manufacturing (3D Printing) in Regenerative Medicine and Orthopaedics – How can cartilage and meniscus tissue be replaced by 3D printed materials?

→ **Participation at the Lower Austrian Research Festival in Vienna** with the question “How can we keep our joints working?”

→ **Participation in the Initiative of PRAEVENIRE:** “Gesundheitstage 2022” in Stift Seitenstetten with a keynote lecture in Sports Injuries – Do they Have to Be? and summit talks in Alpbach with a keynote lecture on healthy joints From the Very Beginning – Throughout Life.

Further Projects

→ **Implantable Meniscus Scaffolds**

Trauma- or disease-related meniscus defects remain demanding in orthopedic treatments. Allografts or clinically used biomaterials to restore or regenerate meniscus tissue are challenged by mechanical instability and lack of integration into the surrounding host tissue. Tissue engineering approaches can mimic anatomy and functionality of native tissues. In this project, an interdisciplinary team performs computational structure analysis, biomaterial fabrication, 3D bioprinting, biomechanics, biotribology, cell biology and high-resolution imaging to create implantable meniscus scaffolds.

Funding:

GFF NÖ (Life Science Call 2020)

Project lead:

Stefan Nehrer

Participating researchers:

Jennifer Fritz, Anna-Christina Moser, Alexander Otahal

Partners:

Medical University Vienna

University of Applied Sciences Technikum Vienna

Ludwig Boltzmann Institute for Traumatology

University Clinic Krems

Selected Publications

→ **Smolle, M. A.; Goetz, C.; Maurer, D.; Vielgut, I.; Novak, M.; Zier, G.; Leithner, A.; Nehrer, S.; Paixao, T.; Ljuhar, R.; Sadoghi, P. (2022):** Artificial intelligence-based computer-aided system for knee osteoarthritis assessment increases experienced orthopaedic surgeons' agreement rate and accuracy. *Knee Surgery, Sports, Traumatology Arthroscopy*, doi: 10.1007/s00167-022-07220-y. Online ahead of print.

→ **Kuten Pella, O.; Hornyák, I.; Horváthy, D.; Fodor, E.; Nehrer, S.; Lacza, L. (2022):** Albumin as a Biomaterial and Therapeutic Agent in Regenerative Medicine. *Int. J. Mol. Sci.*, 23(18), 10557, doi: 10.3390/ijms231810557.

→ **Chen, K.; Stotter, C.; Klestil, T.; Nehrer, S. (2022):** Artificial Intelligence in Orthopedic Radiography Analysis: A Narrative Review. *Diagnostics*, 12, 2235, doi: 10.3390/diagnostics12092235.

→ **Bauer, C.; Moser, L. B.; Jeyakumar, V.; Niculescu-Morza, E.; Kern, D.; Nehrer, S. (2022):** Increased Chondroprotective Effect of Combining Hyaluronic Acid with a Glucocorticoid Compared to Separate Administration on Cytokine-Treated Osteoarthritic Chondrocytes in a 2D Culture. *Biomedicines*, 10(7), 1733, doi: 10.3390/biomedicines10071733.

→ **Stotter, C.; Nehrer, S.; Klestil, T.; Reuter, P. (2022):** Autologous chondrocyte transplantation with bone augmentation for the treatment of osteochondral defects of the knee: Treatment of osteochondral defects of the femoral condyles using autologous cancellous bone from the iliac crest combined with matrix-guided autologous chondrocyte transplantation. *Oper Orthop Traumatol.*, 34(3), 239–252, doi: 10.1007/s00064-021-00751-6.

→ **Niemeyer, P.; Albrecht, D.; Aurich, M.; Becher, C.; Behrens, P.; Bichmann, P.; Bode, G.; Brucker, P.; Erggelet, C.; Ezechieli, M.; Faber, S.; Fickert, S.; Fritz, J.; Hoburg, A.; Kreuz, P.; Lützner, J.; Madry, H.; Marlovits, S.; Mehl, J.; Müller, P.E.; Nehrer, S.; Niethammer, T.; Pietschmann, M.; Plaass, C.; Rössler, P.; Rhunau, K.; Schewe, B.; Spahn, G.; Steinwachs, M.; Tischer, T.; Volz, M.; Walth, Zinser, W.; Zellner, J.; Angele, A. (2022):** Correction: Empfehlungen der AG Klinische Geweberegeneration zur Behandlung von Knorpelschäden am Kniegelenk. *Published Erratum Z Orthop Unfall*, doi: 10.1055/a-1798–7819. Online ahead of print.



Extracorporeal therapies and the blood-biomaterial interface: these topics are at the center of research at the Department for Biomedical Research. In particular, research revolves around blood compatible materials, cell culture models to study endothelial activation under septic conditions, the influence of anticoagulation on the blood compatibility of extracorporeal therapies, as well as the multiple roles of extracellular vesicles and their biological activity. An interdisciplinary team, highest quality standards, the continuous development of the spectrum of methods, as well as a network of partners from industry, academia and clinics provide an excellent basis to transfer research into clinical application.

Characterization and Capture of Extracellular Vesicles

This project focuses on the key technical challenges of working with extracellular vesicles (EVs), such as their detection and isolation. The methods employed are based on electrostatic interactions, by taking advantage of the presence of phosphatidylserine (PS) in the EV lipid bilayer, i. e. by the overall negative charge of the EVs, and immobilized protamine, a highly cationic peptide.

Extracellular vesicles (EVs) have attracted increasing attention due to their biological roles in intercellular communication and the transportation of various biomolecules, including proteins and ribonucleic acids. Cells constantly release EVs that vary in size, content, and surface-specific markers depending on their biogenesis, origin, and function. This heterogeneity adds a layer of complexity when attempting to detect and isolate EVs. Furthermore, the selective capture and detection of EVs remains challenging due to the limited quantities usually obtained from patient-derived samples.

EVs as central players

Outcomes of this project include an increased knowledge of the biophysical and molecular properties of EVs and the establishment of new methods and technical know-how in the field. Key aims involve developing new protamine-functionalized adsorbents for EV enrichment and/or depletion as well as a fast colorimetric EV detection array based on polydiacetylene liposomes functionalized with protamine.

EVs are gaining significant interest in medicine as central players in liquid biopsies, with potential applications in diagnosis, prognosis, and therapy. In this cross-disciplinary research project, we focus on EVs derived from human blood cells, as blood is a primary tissue for liquid biopsies.

Adsorption und Detektion von Extrazellulären Vesikeln durch Protamin-funktionalisierte Oberflächen

FUNDING

Province of Lower Austria and by the IWB/EFRE program (Grant agreement number WST3-F-5030664/014-2019)

DURATION

2020–2022

DEPARTMENT

Biomedical Research

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Vladislav Semak, Vladislav Semak

COORDINATION

University for Continuing Education Krems

Flow Cytometry to Characterize Extracellular Vesicles

Cells release extracellular vesicles (EVs), which play important roles in intercellular communication, as well as in coagulation and immunomodulation, under both physiological and pathological conditions. Flow cytometry is a powerful method for the characterization of EVs, but requires a high level of standardization and constant further development.

EVs are crucial mediators of immunothrombosis, the simultaneous over-activation of the innate immune system and blood coagulation, which is a major pathomechanism in sepsis and severe COVID-19. This project sought to develop standardized methods for the flow cytometric characterization of EVs and their interaction with immune cells in the circulation. This methodological advance constitutes the basis for the functional characterization of EVs for the purpose of investigating their role in the development and progression of multiple pathologies, including sepsis. In addition, the method can be used to test the suitability of EVs as diagnostic markers, and to develop methods for the recovery of well-defined EV populations.

Successful collaboration with corporate partners and universities

The results of this project enable state-of-the-art characterization of EVs in human blood and plasma. By developing high-end methods of flow cytometry, the project creates the prerequisites for successful collaboration with corporate partners and universities. These methods also form an essential part of training of young researchers, in particular as part of the PhD program Regenerative Medicine.

Advanced Flow Cytometric Characterization of Extracellular Vesicles

FUNDING

Technology Fund of the Province of Lower Austria

DURATION

2021–2022

DEPARTMENT

Biomedical Research

PROJECT LEAD

René Weiss

COORDINATION

University for Continuing Education Krems

Researching the Properties of Endotoxin

Antimicrobial peptides in human blood support the conventional humoral and cellular immune system by destabilizing bacterial membranes or inactivating endotoxins derived from bacteria. The latter effect is exerted by heparin-binding components in plasma that act as endotoxin neutralizing compounds (ENCs). The project investigates the endotoxin inactivating and antimicrobial properties of ENCs.

Antimicrobial resistance has become a major challenge due to the spread of new multi-drug-resistant microorganisms that cause life-threatening infections. To tackle this global challenge there is a need for new antimicrobial drugs, and a number of studies have focused on antimicrobial peptides (AMPs) as a new generation of drugs. AMPs, also known as host defense peptides, are important components of the innate immune system of multicellular organisms. They target invading pathogens by combining antimicrobial and immunomodulatory properties. One focus area of the study is the isolation of these plasma components and the characterization of their antibiotic effect on different bacterial strains.

Understanding pathophysiological mechanisms

The project seeks to contribute to a better understanding of the basic pathophysiological mechanisms of bacterial infections. Its results will further our understanding of the heterogeneity of sepsis patients and support the development of targeted treatment approaches. In this way, it will advance novel approaches to lowering mortality from sepsis. The project results can support the development of new diagnostic tools, in particular the development of an optimized method for endotoxin detection with a high recovery in whole blood and protein-containing media.

Heparin-binding Antimicrobial Proteins in Human Plasma

FUNDING

GFF NÖ (Life Science Call 2020)

DURATION

2022–2025

DEPARTMENT

Biomedical Research

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Jens Hartmann, Stephan Harm, Denisa Cont

COORDINATION

University for Continuing Education Krems

PARTNER

Karl Landsteiner University of Health Sciences

Oxidatively Altered Proteins

Oxidatively altered proteins play an important role in systemic and chronic inflammation. In this project, oxidatively altered plasma components are characterized and their depletion using therapeutic apheresis is investigated in vitro. Likewise, damage-associated molecular patterns are investigated for their biological effects, and their depletion by therapeutic apheresis is studied.

Sepsis is a life-threatening organ dysfunction that results from a dysregulated inflammatory response to infection. It is estimated that there are 30 million cases of sepsis worldwide and six million deaths due to sepsis annually. The excessive activation of the innate immune response that ultimately leads to sepsis occurs through components on the surface of pathogens, so-called pathogen-associated molecular patterns (PAMPS). Inflammation is associated with oxidative stress, where plasma components—especially proteins and lipids—undergo oxidative changes, some of which are irreversible and contribute to disease progression. The project seeks to gain a deeper understanding of the role played by activated neutrophil granulocytes and the PAMPs released during their activation and investigates whether oxidized plasma components can be selectively removed with membrane-adsorption-based apheresis techniques.

Targeted treatment options

The project will contribute to a better understanding of the pathophysiological mechanisms of inflammation and sepsis, thus supporting the development of targeted treatment options. This will contribute to the optimization of novel approaches with the aim of lowering mortality rates in sepsis patients.

Oxidativ veränderte Proteine und „Damage Associated Molecular Patterns“ als Targets für extrakorporale Therapien

FUNDING

Province of Lower Austria, Department of Economy, Tourism and Technology (WST-3)

DURATION

2021–2023

DEPARTMENT

Biomedical Research

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Jens Hartmann, Lucia Krajcik Lauková, Stephan Harm, Sabrina Summer

COORDINATION

University for Continuing Education Krems

Lowering Mortality from Sepsis

Sepsis is a life-threatening organ dysfunction caused by a dysregulated immune response to an infection. The aim of this project is to develop new supportive therapies for sepsis and to establish cell culture models to better understand the underlying mechanisms of endothelial activation in sepsis.

Sepsis is one of the leading causes of death worldwide and a major economic burden due to treatment costs, high mortality, and long-term consequences. A better understanding of the underlying mechanisms is therefore pivotal to enable individualized therapy. Efficient and sensitive diagnostic tools are required to start targeted therapy as quickly as possible. Understanding which factors influence the activation and barrier function of the endothelium under septic conditions is as crucial as knowing whether its depletion by extracorporeal blood purification systems counteracts endothelial damage leading to organ dysfunction.

Mechanisms and treatment of sepsis

Together with the University Clinic St. Pölten the effect of inflammatory mediator depletion from the circulation of sepsis patients is studied to increase our knowledge of the molecular mechanisms of sepsis. Endothelial cell lines with pathogen receptors that can be turned on and off by light are developed in order to study the mechanisms and pathways of endothelial activation. Physiologically relevant cell culture models for sepsis are being established, especially with regard to the activation of the endothelium and the loss of its barrier function under septic conditions. The project provides evidence for the positive effect of extracorporeal adsorption therapies as a supportive treatment option in sepsis.

Inflammation, Sepsis and Regeneration: Development of Efficient Diagnostic Methods and New Therapeutic Approaches in Inflammation and Sepsis

FUNDING

GFF NÖ (Grant agreement number K3-F-744/005-2019)

DURATION

2020–2024

DEPARTMENT

Biomedical Research

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Tanja Eichhorn, Michael Bernhard Fischer, Susanne Krenn, Marie Ebeyer-Masotta, Marwa Mostageer, Viktoria Weber

COORDINATION

University for Continuing Education Krems

PARTNER

IMC University of Applied Sciences
Karl Landsteiner University of Health Sciences

Further Projects

→ MSC-mediated T-cell Switch

Rheumatoid arthritis is a common autoimmune disease. Most treatments are limited to alleviating the symptoms. Novel therapeutic strategies focus on stem cells, but their benefits are still controversial. This project will elucidate inflammatory patterns linked to different disease stages and their impact on stem cell function and the activation of inflammatory T-cells. The aim of this project is to clarify whether exposure of stem cells to the inflammatory environment in rheumatoid arthritis patients alters their immune-regulatory function and promotes the activation of inflammatory T-cells.

Funding:

Austrian Science Fund (FWF) – ESPRIT program
(Grant agreement number ESP 317-B)

Project lead:

Sabrina Summer, PhD

Partner:

Dr. Michael Bonelli, Medical University of Vienna, Division of Rheumatology

Knowledge and Technology-Transfer & Dissemination

Science-to-Science:

→ **Organization of the 48th ESAO Congress:** The annual conference of the European Society for Artificial Organs (ESAO) brought together communities of experimental and clinical research in the field of artificial and bioartificial organs.

→ **Co-organization of the yESAO meeting and workshops** as a platform for young researchers in the field of artificial and bioartificial organs as well as organ support, to enforce networking, experience transfer from senior scientists to young researchers, and additional competencies.

→ **Co-organization of the joint meeting of the Austrian and German Societies of Extracellular Vesicles** to foster the exchange of information in the field of extracellular vesicle research.

→ **Organization of monthly webinars of the ESAO Artificial Organs & Regenerative Medicine:** Clinical Challenges, Emerging Technologies for Improved Medical Care.

Science-to-Public:

Participation in:

→ **“Die lange Nacht der Forschung 2022”** with four topics: “Sepsis: Kampf im eigenen Körper”, “Unser Immungedächtnis: Die Familie der T-Zellen”, “Die Corona-Schutzimpfung: Was geschieht in meinem Körper?”, and “Infektionstestung im Rahmen der COVID-19 Pandemie”.

→ **“Wissenschaftsfest NÖ”** titled “COVID-19: Was geschieht in meinem Körper?”

→ **Girls’ Day 2022** provided 20 female students with an introduction to scientific work in biomedical laboratories.

Selected Publications

→ **Ebeyer-Masotta, M.; Eichhorn, T.; Weiss, R.; Semak, V.; Lauková, L.; Fischer, M.B.; Weber, V.** (2022): Heparin-functionalized adsorbents eliminate central effectors of immunothrombosis, including platelet factor 4, high mobility group box 1 protein, and histones. *Int J Mol Sci*, 23, 1823, doi: 10.3390/ijms23031823.

→ **Ebeyer-Masotta, M.; Eichhorn, T.; Weiss, R.; Lauková, L.; Weber, V.** (2022): Activated platelets and platelet-derived extracellular vesicles mediate COVID-19-associated immunothrombosis. *Front Cell Dev Biol*, 10, 914891, doi: 10.3389/fcell.2022.914891.

→ **Pilecky, M.; Harm, S.; Bauer, C.; Zottl, J.; Emprechtinger, R.; Eichhorn, T.; Schildböck, C.; Ecker, M.; Willheim, M.; Weber, V.; Hartmann, J.** (2022): Performance of lateral flow assays for SARS-CoV-2 compared to RT-qPCR. *J Infect*, Jan 14: S0163-4453(22)00011-1, doi: 10.1016/j.jinf.2022.01.013.

→ **Eichhorn, T.; Huber, S.; Weiss, R.; Ebeyer-Masotta, M.; Lauková, L.; Emprechtinger, R.; Bellmann-Weiler, R.; Lorenz, I.; Martini, J.; Pirklbauer, M.; Orth-Höller, D.; Würzner, R.; Weber, V.** (2023): Infection with SARS-CoV-2 is associated with elevated levels of IP-10, MCP-1, and IL-13 in sepsis patients. *Diagnostics*, 13(6): 1069.

→ **Sauerwein, K.; Geier, C.B.; Stemberger, R.F.; Rossmann, R.; Akyaman, H.; Illes, P.; Fischer, M.B.; Walter, J.E.; Eibl, M.M.; Wolf H.M.** (2022): Functionally impaired antibody response to booster vaccination with BNT162B2 SARS-CoV-2 mRNA vaccine in COVID IgG responders. *J Allergy Clin Immunol*, Dec 2: S0091-6749(22)01618-9, doi: 10.1016/j.jaci.2022.11.013.

→ **Semak, V.; Eichhorn, T.; Weiss, R.; Weber, V.** (2022): Polyzwitterionic coating of porous adsorbents for therapeutic apheresis. *J Funct Biomater*, 13(4), 216, doi: 10.3390/jfb13040216.



Demographic change and the spread of diseases will challenge our society in the future and will place great pressure on health systems. For this reason, procedures and therapies in regenerative medicine are a very promising field, even for diseases that have hitherto been difficult or impossible to treat. First cell therapies, for example to regenerate skin or cartilage, are already being clinically applied and a growing number of cellular therapies are undergoing clinical testing. This underscores the great potential and the impact on society that regenerative medicine holds.

Regenerative Medicine deals with regenerating dysfunctional cells, tissue or organs by means of biologic replacement, in addition to stimulating own regeneration and repair processes.

The University for Continuing Education Krems with its Faculty of Health and Medicine offers an integrated and structured PhD program incorporating taught and research elements to provide high-level training in theoretical and practical aspects of regenerative medicine.

The PhD program Regenerative Medicine aims to further develop the ability to conduct scientific research independently and to train and support next generation scientists.

Combined with an expertise that ranges from basics in regenerative medicine to extracorporeal therapies and from stem cells to bone and cartilage regeneration, we offer a strong interdisciplinary research environment to support the development of our students towards independent researchers and scientists.

The PhD program Regenerative Medicine includes topics such as:

- Organ support and extracorporeal blood purification
- Pathophysiology of sepsis and in inflammatory mechanisms
- Interaction of blood and/or tissue with biomaterials
- Regeneration of articular surfaces (cartilage transplants, therapy with growth factors, mesenchymal stem cells)
- Immune regulatory mechanisms of mesenchymal stem cells
- Tissue and organ replacement/regeneration using stem cells
- Neuro-rehabilitation

→ Inflammation, Sepsis and Regeneration: Development of Efficient Diagnostic Methods and New Therapeutic Approaches in Inflammation and Sepsis

Name: Katrin Colleselli

Title of the dissertation: Establishment and Characterisation of TLR-2/1 and 2/6 Knock-out and Light-inducible TLR Knock-in in Monocyte Cell Line(s)

Name: Marie Ebeyer-Masotta

Title of the dissertation: Endothelial Activation under Septic Conditions

Name: Anna Stierschneider

Title of the dissertation: Shedding Light on the Molecular and Regulatory Mechanisms of TLR4 Signalling in Inflammation and Cancer: Development of Optogenetically Manipulated Cell Lines Allowing Spatiotemporally Precise and Reversible Photoactivation of TLR4

Project description: In this project physiologically relevant cell culture models are developed to characterize the role of the endothelium in sepsis in order to explore new approaches for the treatment of sepsis and the effect of the removal of inflammatory mediators through extracorporeal adsorption therapies in septic patients.

Funding: Land NÖ, FTI Program

→ Artificial Intelligence in Orthopedic Radiography Analysis

Name: Kenneth Chen

Title of the dissertation: Artificial Intelligence in Orthopedic Radiography Analysis

Project description: The project "Artificial intelligence in orthopedic radiography analysis" aims to further develop the AI technology for orthopedic use. Based on clinical problems, computer-aided detection and deep learning technology will be used to analyze standard 2D xrays. Fully automated measurements will be further developed and optimized and compared to state-of-the art techniques.

Funding: GFF NÖ

→ Heparin-binding Antimicrobial Peptides in Human Plasma

Name: Denisa Roxana Cont

Title of the dissertation: Heparin-binding Antimicrobial Peptides

Project description: The aim of this project is to investigate endotoxin-neutralizing mechanisms in human whole blood. One focus is the influence of the anticoagulation on the effect of endotoxins and on endotoxin-neutralizing factors in whole blood. Furthermore, Host Defense Peptides are isolated from human whole blood and their influence on the activity of endotoxins will be investigated.

Funding: GFF NÖ

→ 3D-printed Ceramic-based Partial Implants for Knee Hemiarthroplasty. Assessing the Viability of Additive Manufacturing for Partial Replacement Technologies – PrintPartialImplant

Name: Rosa Maria Eder

Title of the dissertation: Preserving Cartilage Integrity after Hemiarthroplasty via Functionalized Additive Manufactured Partial Implants

Project description: Additive Manufacturing is a technique that allows the direct fabrication of functional parts with complex shapes from digital models and is particularly suitable for low production volumes and for complex components requiring high machining costs. These characteristics make additive manufacturing particularly promising as a technique for manufacturing partial replacement technology tailor made to individual patients.

Funding: GFF NÖ, Technologieförderung

→ Regulating Functional Meniscus Tissue Regeneration by 3D-bioprinted Complex Geometrically Precise Hybrid Scaffolds

Name: Jennifer Fritz

Title of the dissertation: Functional Meniscus Tissue Regeneration by 3D-bioprinting with Silk-based Bioinks

Name: Anna-Christina Moser

Title of the dissertation: Meniscus-3D-SilkPrint

Project description: Treatment options for meniscal injuries range from nonsurgical interventions such as physical therapy, to surgical interventions. In cases where preservation is no longer a viable option, meniscal transplantation with implants or scaffolds is often considered to restore knee biomechanics. We aim to fabricate extremely controllable 3D architectural scaffolds for an in-depth understanding of meniscus tissue formation through the process of differentiation. The influence of bioprinted scaffolds on extracellular matrix formation is evaluated non-invasively with time-lapsed micro-computed tomography.

Funding: GFF NÖ, Life Science Call 2020

→ 3D-printed and Injectable Hydrogels in an Ex vivo-Cartilage Defect Model

Name: Forough Rasouljan

Title of the dissertation: 3D-printed Hydrogels and Injectable Hydrogels in an Ex vivo-Cartilage Defect Model

Project description: The lack of tissue grafts and other soft tissue reconstruction options has intensified the search for novel, biological methods of soft tissue regeneration. Since the technology of 3D-Biofabrication is a novel approach and has evolved significantly over the last years, we will try to develop a biomaterial in the project that offers the possibility to reduce the treatment burden of soft tissue injuries. In this project, a printable and injectable hydrogel will be produced from a combination of decellularized extracellular matrix of bovine cartilage, hyaluronic acid and silk fibroin.

Funding: Land NÖ, FTI Program

→ Characterization of Specific Antibodies in Viral and Bacterial Infection: a Relationship between Isotype Affinity and Avidity

Name: Kai Sauerwein

Title of the dissertation: The Role of Specific Antibodies in the Protection against Infectious Agents Causing an Exaggerated Pro-inflammatory Host Response

Project description: The immune response to a viral or bacterial infection can cause severe damage to tissue and organs. This project aims to establish a link between the protective function of specific immunoglobulins and their influence on tissue regeneration. The thesis: A well-controlled immune response neutralizes the viral or bacterial infection, helping to make regeneration more effective.

Funding: Immunologische Tagesklinik GmbH



The mental stress of the population, especially of children and adolescents, but also of the older generation—keyword aging society—is increasing, not least as a result of the pandemic. The Department for Psychosomatic Medicine and Psychotherapy focuses its research on the psychotherapeutic care of these different population groups, on the demands on psychotherapy as well as on topics related to psychosomatic medicine. Psychotherapy practice, psychotherapeutic effect factors as well as psychotherapy training are empirically researched. Further focal points of the research are pain, sleep and digitalization in psychotherapy and its evaluation.

Self-help for Mental Health Problems in Adolescents

This project was created in response to the massive increase in mental distress among Austrian adolescents during the COVID-19 pandemic. It aims to mitigate these negative effects through an online self-help program that provides mental health education and evidence-based recommendations designed to empower adolescents who are showing signs of mental health problems to help themselves.

istOkay was launched following several studies that revealed the negative impact of the COVID-19 pandemic on the mental health of children and adolescents and that emphasized the need for action to counteract this development. The project addresses the question of how adolescents whose mental health came under particular strain during the COVID-19 pandemic can be supported as efficiently as possible and whether their mental health improves after they complete an online self-help program. In the long term, the project also aims to support and relieve the psychosocial landscape by intercepting psychological stress among young people.

Improving mental health

Within the framework of an intervention study, investigators seek to establish whether the self-help program can contribute to reducing symptoms such as depression, anxiety, sleep disorders, and stress in adolescents, as expected. The project encompasses aspects of health sciences, public health, computer science as well as psychology and cognitive behavioral therapy.

Development of an Online Self-help Program for Mental Health Problems for the 14–20 Age Group

FUNDING

Province of Lower Austria

DURATION

2022–2023

DEPARTMENT

Psychosomatic Medicine and Psychotherapy

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Christoph Pieh, Elke Humer, Teresa O'Rourke

COORDINATION

University for Continuing Education Krems

PARTNERS

Medical University of Vienna
University of Ulm
Psychiatric University Clinic Zürich
Federal School Representatives
State School Representatives of Lower Austria

Mental Health and COVID-19

The Covid Intervention Study (CIS) is designed as an open support program for all persons over the age of 18 suffering from stress and anxiety symptoms caused by the COVID-19 pandemic and other crises. The goal of this project is to investigate the efficacy of short-term psychosocial group interventions developed specifically for this trial and to strengthen the mental wellbeing of the participants.

The COVID-19 pandemic negatively affected the mental wellbeing of the Austrian population. This randomized controlled trial aims to mitigate symptoms of stress experienced by study participants and to improve their mental wellbeing. In doing so, it will make an important contribution to mental health in Austria.

The aim of this project is to improve the mental health of participants using the Positive Mental Health Scale (PMH) questionnaire to measure the main outcome. Particular emphasis is placed on establishing whether short-term, manual-based psychosocial group interventions improve the mental wellbeing of study participants and whether significant differences in effectiveness are reported between the manuals of the three approved therapy schools (behavioral therapy, integrative therapy and existential analysis & logotherapy) specifically developed for this randomized controlled trial.

Towards customized psychotherapeutic programs

Cross-linking of the therapeutic clusters in the frame of this randomized controlled trial will contribute to a better understanding of short-term manual-based therapeutic approaches. The results of this approach can then be translated into customized psychotherapeutic programs for improving mental health while at the same time decreasing specific costs in Austria. Additionally, this project will raise public awareness of mental illness and reduce barriers to seeking professional help.

Manual-based Psychosocial Group Interventions for Coping with the Covid-19 Pandemic and other Crises

FUNDING
equity financed

DURATION
2022–2024

DEPARTMENT
Psychosomatic Medicine and Psychotherapy

**PROJECT LEAD/
PARTICIPATING RESEARCHER(S)**
Thomas Probst, Rafael Rabenstein, Carina Dinhof, Andrea Jesser, Elke Humer, Yvonne Schaffler, Sonja Pasch

COORDINATION
University for Continuing Education Krems

Further Projects

→ **Examination of psychological wellbeing in the elderly**
The demographic increase in the proportion of older people in society also increases the need to establish specific prevention programs. In the project, a group of older people (65+) receive a logotherapeutic intervention in 8 double units of 1.5 hours each, which are offered in groups of 5–10 people to improve wellbeing. The expectation is that the project will deliver differentiated information on the effect of a preventive program to improve the quality of life in old age. Ideally, this program will find its way into practice and enable many older people to live better and healthier lives.

Funding:
Private (association)
Project lead:
Elke Humer
Participating researcher:
Andrea Jesser
Partner:
ABILE – Viktor Frankl Education Austria

Knowledge and Technology-Transfer & Dissemination

Science-to-Science:

→ **Organization and hosting of EAPM 2022**, a 4-day conference on psychosomatic medicine and psychotherapy with more than 400 attendees www.eapm2022.com

→ **Impact of the COVID-19 pandemic on mental health. 7. EUFEP Kongress. Covid-19 Pandemie.** "Spannungsfeld zwischen Wissenschaft und Praxis, Tulln".

Science-to-Public:

→ **Mental health of young people during COVID-19. Pint of Science Festival:** Pint of Science is an international science festival where researchers share their latest findings.

→ **Impact of COVID-19 on the mental health of adolescents.** "Praevenire Gesundheitstage 2022, Seitenstetten".

Selected Publications

- Delgadillo, J.; Deisenhofer, A. K.; Probst, T.; Shimokawa, K.; Lambert, M. J.; Kleinstäuber, M. (2022): Progress feedback narrows the gap between more and less effective therapists: A therapist effects meta-analysis of clinical trials. *Journal of Consulting and Clinical Psychology*, 90, 559–567.
- Dale, R.; Jesser, A.; Pieh, C.; O'Rourke, T.; Probst, T.; Humer, E. (2022): Mental health burden of high school students, and suggestions for psychosocial support, 1.5 years into the COVID-19 pandemic in Austria. *European Child & Adolescent Psychiatry*, in press.
- Humer, E.; Gächter, A.; Dale, R.; Probst, T.; Pieh, C. (2022): The association of health behaviors and mental health during COVID-19. *General Hospital Psychiatry*, 78, 143–144.
- Nußbaumer-Streit, B.; Jesser, A.; Humer, E.; Barke, A.; Doering, B. K.; Haid, B.; Schimböck, W.; Reisinger, A.; Gasser, M.; Eichberger-Heckmann, H.; Stippel, P.; Gartlehner, G.; Pieh, C.; Probst, T. (2022): A web-survey assessed attitudes toward evidence-based practice among psychotherapists in Austria. *Scientific Reports*, 12, 9374.
- Schaffler, Y.; Kaltschik, S.; Probst, T.; Jesser, A.; Pieh, C.; Humer, E. (2022): Mental Health in Austrian Psychotherapists During the COVID-19 Pandemic. *Frontiers in Public Health*, 10, 1011539.
- Jesser, A.; Schaffler, Y.; Gächter, A.; Dale, R.; Humer, E.; Pieh, C. (2022): School students' concerns and support after one year of COVID-19 in Austria: A qualitative study using content analysis. *Healthcare*, 10, 1334.



Neurological and neurodegenerative diseases are becoming increasingly common worldwide. The Department for Clinical Neurosciences and Preventive Medicine meets this challenge with its research and focuses on the prevention of neurological diseases, in particular stroke and neurodegenerative diseases with a progressive course. Another focus is on innovative therapeutic strategies to restore neuronal functions. Research focuses on the maintenance of cognitive performance and the use of non-pharmacological therapeutic interventions following stroke and other neurological and neurodegenerative diseases. Within the framework of numerous international collaborations, research focuses on clinical neuroscience related to cognition, sensorimotor function, and neural function recovery.

Reducing the Incidence of Dementia

It is estimated that one third of dementia cases could be avoided with effective prevention strategies as demonstrated by a Finnish Geriatric Study ("FINGER"). Multicomponent lifestyle interventions that consisted of services for controlling metabolic and vascular risk factors, a healthy diet, a physical and cognitive activity program reduced the risk of developing dementia.

Currently, 55 million persons worldwide are affected by dementia. These numbers will double every 20 years. In Austria, approximately 150,000 persons are living with dementia. Family members and support providers are subject to stress and have a higher risk of falling ill themselves. The potential for prevention and risk reduction is enormous, offering increased life quality. Thus, prevention could save medical costs and prevent human suffering. The project's main goals are identifying structures to enable risk reduction services and the development of a treatment protocol specifically adapted for Austria. The benefit of cultural activities was examined in connection with prevention strategies and the factors that provide the strongest motivation to maintain an active lifestyle.

Science-based practical guidelines

The project results will provide important insights into the Austrian communities to find optimal structures necessary for the implementation of broad preventive strategies in the population. Necessary cultural adaptations to the FINGER protocol are identified and suggestions for an adequate adaptation made. The addition of cultural education and practical guidelines for its implementation will be suggested as well as methodologies for motivating persons to engage in a more active lifestyle.

Risk Reduction and Prevention of Dementia through Sustained Lifestyle Changes

FUNDING

Province of Lower Austria, Abteilung K3

DURATION

2021–2022

DEPARTMENT

Clinical Neurosciences and Preventive Medicine

PROJECT LEAD

Stefanie Auer

COORDINATION

University for Continuing Education Krems

Further Projects

→ Stroke in Very Elderly Patients

There is an increasing number of very elderly patients suffering from severe acute illnesses and with special risks and needs. This project will perform a comprehensive data analysis of a very large data set from the Austrian Stroke Unit Registry to obtain insights into the specifics of the course and management of strokes in the elderly. The key questions are which factors influence post-stroke outcomes in very elderly stroke patients and how do they differ from those in younger age groups. The study will also analyze which significant differences in treatment effects can be observed between the highest age group and younger patients.

Project lead:

Karl Matz

Participating researcher:

Yvonne Teuschl

Partners:

Österreichische Schlaganfallgesellschaft
Gesundheit Österreich Gesellschaft

Knowledge and Technology-Transfer & Dissemination

Science-to-Science:

→ **Organization of the 21st Krems Conference** on current topics in neurorehabilitation; focus on pharmacological treatment options and Functional Electrical Stimulation in central nervous system disorders.

→ **Organization of the webinar series Modulating the Nervous System** on ways to restore neuronal function.

→ **Organization of the webinar series, Will it be like before...?** Webinars on adaptation and re-entry after stroke.

Science-to-Public:

→ **Organization of the 1st action day on brain health/ prevention of Alzheimer's and dementia.**



Selected Publications

- Cummings, J.; Sano, M.; Auer, S.; Bergh, S.; Fischer, C.; Gerritsen, D.; Grossberg, G.; Ismail, Z.; Lanctôt, K.; Lapid, M.I.; Mintzer, J.; Palm, R.; Rosenberg, P.B.; Splaine, M.; Zhong, K. & Zhu, C. (2023): Reduction and prevention of agitation in persons with neurocognitive disorders: An international psychogeriatric association consensus algorithm. *International Psychogeriatrics*, 1-12. doi:10.1017/S104161022200103X.
- Sano, M., Cummings, J., Auer, S., Bergh, S., Fischer, C., Gerritsen, D., Grossberg, G., Ismail, Z., Lanctôt, K., Lapid, M.I.; Mintzer, J.; Palm, R.; Rosenberg, P.B.; Splaine, M.; Zhong, K. & Zhu, C. (2023): Agitation in cognitive disorders: Progress in the International Psychogeriatric Association consensus clinical and research definition. *International Psychogeriatrics*, 1-13. doi:10.1017/S1041610222001041.
- Brainin, M.; Teuschl, Y.; Martins, S. (2022): Polypill: Benefits Seen for Stroke and Other Outcomes. *Stroke*, 53(8), 2695–2701.
- Pinter, M. (2022): Functional Electrical Stimulation to Improve Mobility. -In: Schick, T. (ed.): *Functional Electrical Stimulation in Neurorehabilitation. Synergy Effects of Technology and Therapy*. 95–105, Springer, Cham.
- Teuschl, Y.; Banacher, C.; Brainin, M.; Dachenhausen, A.; Matz, K.; Pinter, M. M. (2022): COVID-19-related delays of botulinum toxin injections have a negative impact on the quality of life of patients with dystonia and spasticity: a single-center ambulatory care study. *J Neural Transm*, 129(1), 49–53.
- Höfler, M.; Kieslinger, T. (2022): Inhibition of Return in visual search does not rely on spatial working memory. *Advances in Cognitive Psychology*, 18, 2–8.
- Bernegger, A.; Mikšová, D.; Posekany, A.; Krebs, S.; Ferrari, J.; Greisenegger, S.; Gatteringer, T.; Lang, W.; Kiechl, S.; Sykora, M.; Austrian Stroke Unit Registry Collaborators (2022): Time trends in stroke severity in the years 2005 to 2020: results from the Austrian Stroke Unit Registry. *J Neurol*, 269(8), 4396–4403.
- Matz, K.; Apetroe, A.; Chemelli, A.; Brunner, C.; Nasel, C. (2022): Flow dynamics in acute ischemic stroke due to embolic occlusion of a fetal posterior cerebral artery treated with endovascular thrombectomy - report of two cases. *Radiol Case Rep*, 17(5), 1727–1733.

Main field of research:

Digital Transformation, Health and Innovation in Cohesive and Sustainable European Societies



Digital Transformation, Health and Innovation in Cohesive and Sustainable European Societies

- Digitalization
- Innovative and Sustainable Solutions in Complex Systems
- PhD Technology, Innovation, and Cohesive Societies
- Study of Democracy, Law and Europe
- Sensor Technology and Energy Efficiency
- Migration and Globalisation
- PhD Migration Studies
- Sustainable Habitats
- Food Chains and Ecotoxicology



Digitalization brings about societal change. The Department for E-Governance and Administration researches and teaches the impact of digital and societal change on the strategy, organization, and processes of changing socio-technical and legal governance structures, with an explicit link to computer science. The focus is on the interrelationships between human and digital systems, with the aim of identifying vulnerabilities and rebound effects of technologies in digital ecosystems. The department thus covers research areas such as data governance and ecosystems, evidence-based policymaking, digital transformation of law, e-participation and co-creation, future of work, smart cities, and cybersecurity. To foster academic and practical exchange, the department draws on an extensive international network and well-established internal collaboration.

Transdisciplinary Research for Sustainable Tourism

Efficient data use is the key focus of the project dTS to develop future-oriented tourism regions in terms of digital sustainability and transdisciplinarity. Hence, dTS mainly combines AI and agent-based simulations to explore resilient and sustainable regional tourism in Austria based on the example of visitor flow control in two use-case regions.

The post-COVID-19 developments and other influencing variables such as climate change have demonstrated how sensitively the tourism ecosystem reacts to disruptive events. To strengthen the resilience of tourism, dTS combines sustainable concepts and digitalization. With these technologies, Austria has the potential to position itself as an innovative and sustainable destination at an international level. These innovations and underlying technologies increase flexibility and adaptive capacity to mitigate and overcome impacts on business models and the ecosystem.

AI-supported movement simulation

Researchers from multiple scientific disciplines work together with experts from practice in the tourism domain as equal partners. This transdisciplinary approach provides the basis to create a scalable and portable model for resilient and sustainable tourism. Two use cases at different technological maturity levels are being examined. The result will draw the design of a scalable data exchange and simulation platform capable of serving as a pre-stage for a data space for visitor flows. The target groups' authentic movement and behavior patterns are learned and understood using artificial intelligence and agent-based simulations to incorporate these findings into a sustainable and gentle mobility concept.

Data-driven Tourism for Sustainability

FUNDING

Austrian Research Promotion Agency (FFG) – program “ICT of the Future”
Federal Ministry of Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK), managed by the Austrian Research Promotion Agency (FFG)
9th Call (2020), Call topic: Data-driven Technologies (grant agreement number FO999887513)

DURATION

2021–2024

DEPARTMENT

E-Governance and Administration

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Thomas Lampoltshammer, Joanna Höfinghoff, Anna-Sophie Novak, Verena Schmid, Jessica Voigt Quintino Pereira, Walter Seböck

COORDINATION

University for Continuing Education Krems

PROJECT PARTNERS

Datenvorsprung GmbH
Fuscher Freges GmbH
Graz University of Technology
nexyo GmbH
Salzburg University of Applied Sciences
TSG Tourismus Salzburg GmbH

Smart Protection System for Railway Infrastructure

Ensuring the security of large railway systems poses a considerable challenge for operators. Given the sheer size and scale of rail infrastructure, installing a permanent monitoring system is scarcely a feasible option. MOBILIZE is intended to demonstrate temporary and portable technical security solutions for large-scale systems.

Protecting the route network and parking facilities at train stations is an ever-present topic for railway operators. The incidence of vandalism against safety-relevant systems or warnings by security agencies is likely to increase in the future. Burglaries and damage to property can lead to immense economic losses and delays in rail traffic. Unfortunately, these acts also prove how difficult it is to protect large railway infrastructure against terrorist incidents.

Better results with combined sensors

Unlike existing systems, MOBILIZE will apply a classification of people and events by fusing multiple sensors. Radar sensors and acoustic sensors with low energy requirements will constantly monitor the environment. To significantly reduce false alarms, thermal imaging cameras, LiDAR scanners and drones equipped with sensors are selectively activated to check the alarm hypothesis. There is a wide spectrum of challenges to be dealt with: usability, integration into the operational procedures of railway operators as well as the legal framework must all be examined before such a concept can be implemented in practice. In the medium term, the plan is to make new products resulting from the project commercially available.

Mobile Multi-sensor System to Increase Operational Safety in the Railway System

FUNDING

Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology – program “Mobility of the Future”

DURATION

2021–2023

DEPARTMENT

E-Governance and Administration

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Walter Seböck, Bettina Biron, Thomas Lampoltshammer, Anna-Sophie Novak, Bettina Pospisil, Ingeborg Zeller

COORDINATION

AIT Austrian Institute of Technology GmbH

PROJECT PARTNERS

INRAS GmbH
JOANNEUM RESEARCH Forschungsgesellschaft mbH
Mungos Security & Cleaning GmbH & Co KG
PKE Holding AG
RIEGL Research Forschungsgesellschaft mbH

Further Projects

→ Co-created Digital Public Services

The aim of the inGov project is to develop and deploy an Integrated Public Services (IPS) holistic framework and digital tools that will support IPS co-creation and governance. The project will enhance and redesign existing EU solutions such as EIF (European Interoperability Framework), EIRA (European Interoperability Reference Architecture), and fundamental characteristics of data entities in a context-neutral fashion. Pilot projects in Austria, Croatia, Greece, and Malta have led to the development of mobile and digital prototypes to be evaluated with stakeholders during three cycles.

Funding:

EU – Horizon Europe
DT-GOVERNANCE-05-2018-2019-2020
(Grant agreement number 962563)

Project lead:

Noella Edelmann

→ Cross-Border E-Governance

The project mGov4EU advances the practical use of inclusive mobile government services in Europe. Innovative electronic identity management, data storage, and the exchange of electronic documents in a cross-border context are key elements supporting the implementation of the Single Digital Gateway Regulation (SDGR) and the eIDAS Regulation. The project aims to mobilize the existing eIDAS interoperability infrastructure and introduce user-friendly mobile authentication with single sign-on and privacy-preserving identity and consent management for cross-border e-government processes.

Funding:

EU – H2020 (H2020-EU.3.6. – SOCIETAL CHALLENGES – Europe in a Changing World – Inclusive, Innovative and Reflective Societies)
(Grant agreement number 959072)

Project lead:

Thomas Lampoltshammer, Department for E-Governance and Administration

→ Detecting Fake News with AI

Defalsif-AI focuses on audiovisual media forensics, text analysis and their multimodal fusion with the help of artificial intelligence (AI) methods. The project specifically addresses the threats posed by disinformation which are investigated in an exemplary joint effort between research, the public sector, and industry, with all their work activities linked by means of transdisciplinarity. The primary project deliverable is a proof-of-concept tool that analyzes a variety of sources including news sites and social media. The tool identifies trends, clusters, or anomalies in the dissemination of information online.

Funding:

Austrian Research Promotion Agency (FFG) – Austrian security research program KIRAS by the Federal Ministry of Agriculture, Regions and Tourism (BMLRT)
(Project Grant agreement number 897670)

Project lead:

Walter Seböck

Knowledge and Technology-Transfer & Dissemination

Science-to-Science:

→ **Co-organization of the EGOV-CeDEM-ePartConference 2022:** This conference brings together communities from the fields and communities of Electronic Government (EGOV), Electronic Participation (ePart), and E-Democracy and Open Government (CeDEM).

→ **Presentation: Sustainable Co-creation in the Public Sector:** A Case Study in the Government of the Province of Lower Austria. ICEGOV 2022, 4 October 2022, Noella Edlmann

→ **Presentation: "Wie lehren wir nach der Pandemie? Zurück in die Präsenzuniversität oder Willkommen im Meta-(Uni)vers".**

→ **"ÖFG Österreichischer Wissenschaftstag 2022: Wissen – Kompetenzen – Bildung. Universitäre Bildungsideale im Wandel?",** 21 October 2022, Prof. Peter Parycek

Science-to-Business:

→ **Presentation: "Was macht uns digital fit?", "Forum Digitalisierung",** 25 October 2022, Dr.phil. Heidrun Maurer

Science-to-Public:

→ **Presentation: "21st Century Skills – von Skills, Kompetenzen und Fähigkeiten". "2. SDG Dialogforum Österreich Aktuelle Chancen und Perspektiven zur Umsetzung der Agenda 2030",** 6 October 2022, Assistant Prof. Thomas Lampoltshammer

→ **Presentation: The Long and Difficult Road to Peace. War in Ukraine: Recent Developments – Scenarios for Peace – Consequences for Austria,** 5 December 2022, Heidrun Maurer

→ **Presentation: "Perspektiven in Zeiten der Unordnung",** 20. Sicherheitskonferenz Krems, 19 October 2022, Assistant Prof. Walter Seböck, Assistant Prof. Thomas Lampoltshammer.

→ **Presentation: "Co-Lösungslabor: Kompetenzen für eine zeitgemäße, bürger*innenorientierte Verwaltung", innovate,** 24 November 2022, Valerie Albrecht

Selected Publications

- Virkar, S.; Alexopoulos, C.; Tsekeridou, S.; Novak, A. S. (2022): A user-centred analysis of decision support requirements in legal informatics. *Government Information Quarterly*, 101713.
- Viale Pereira, G.; Schuch de Azambuja, L. (2022): Smart sustainable city roadmap as a tool for addressing sustainability challenges and building governance capacity. *Sustainability*, 14(1), 239.
- Mayrhofer, M.; Parycek, P. (2022): Digitalisierung des Rechts - Herausforderungen und Voraussetzungen. *Verhandlungen des 21. Österreichischen Juristentages IV/1*. Manz'sche Verlags- u. Universitätsbuchhandlung, Wien.
- Seboeck, W.; Biron, B.; Lampoltshammer, T. J.; Scheichenbauer, H.; Tschohl, C.; Seidl, L. (2022): Disinformation and Fake News. -In: Masys, A. J. (ed.): *Handbook of Security Science*. 1/22, Springer, Cham.
- De Luca, G.; Lampoltshammer, T. J.; Parven, S.; Scholz, J. (2022): A Literature Review on the Usage of Agent-Based Modelling to Study Policies for Managing International Migration. *Social Sciences*, 11(8), 356.
- Pinto, F.; Macadar, M. A.; Pereira, G. V. (2022): The potential of eParticipation in enlarging individual capabilities: a conceptual framework. *Information Technology for Development*, 1–23.





Decision-makers are confronted with a growing complexity, which is further increased by far-reaching social transformation processes. Systemic thinking is required, which at the same time can react flexibly to unexpected developments. The consideration of sustainability is just as necessary in the development of solutions as the integration of knowledge from science and practice alike. The Departments for Knowledge and Communication Management and for Management and Economics focus on transdisciplinarity, the consideration of digital transformation, a comprehensive understanding of innovation and communication processes and the handling of uncertainties and unintended side effects in the research of solutions for complex systems as support for decision makers. The application areas range from globally relevant systems to transformation processes at the organizational and company level.

The Value of Nature Services

The aim of the project ÖKOleita is to create a shared improved cross-sectoral understanding of ecosystem services (ES) and how they relate to biodiversity, diverse habitats and natural processes. ES include, for example, the cooling of land surfaces by tree shade or providing the 80% pollinator-dependent agricultural sector with sufficient landscape structures and maintaining schemes.

An intact natural environment provides many benefits, such as fresh air, clean water, food, materials, and protection from natural hazards. The concept of ES was developed to integrate these comprehensive benefits by raising awareness and to provide guidance for decision makers to ensure that ES are used sustainably. Within an inter- and transdisciplinary process, 17 representative ecosystem services based on 28 indicators were selected for the whole of Lower Austria and integrated in the Biodiversity Atlas.

Citizen science approach

In the Wachau region, biotope mapping is linked to ES and their capacities scored. Accordingly, a place-based approach of scoring the capacities of selected ecosystem services was developed, to be used in an everyday context. For that purpose, cards were developed as communication tools focusing on readable landscape features for a shared understanding of underlying ecosystem functions and processes. Living Lab Workshops were organized to utilize citizen scientists' local knowledge about natural processes and human interaction with nature, which was integrated into the development of our communication tools.

ÖKOsystemLEIsTungen als GestAltungselement in NÖ

FUNDING

Province of Lower Austria, FTI Program, thematic field "Ecosystems and Ecosystem Services", lead project

DURATION

2021–2023

DEPARTMENTS

Building and Environment
Knowledge and Communication Management

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Christine Rottenbacher, Georg Neubauer,
Andrea Höttl, Tanja Lumetsberger, Ilija Steffelbauer,
Gerald Steiner

COORDINATION

University for Continuing Education Krems

PROJECT PARTNERS

Coopnatura
Environmental Agency Austria
University of Vienna

Transdisciplinary Research on Phosphorus Supply

Phosphorus is a non-substitutable component of all living organisms, a crucial resource for future food security and a major international trade good. The Phosphate Data and Knowledge Hub (P-DaKH) aims to become a global clearing house for all relevant information pertaining to the phosphate cycle from mine to field and beyond.

World population growth has become a challenge and will remain so in the future in terms of global food security. About 95 percent of phosphoric acid, the key component in fertilizers, is made from sulfuric acid digestion of phosphate rock; about half of the sulfuric acid produced globally is used for fertilizers. First, the current conditions must be understood to improve the system of phosphate production, distribution, and usage. To do so, P-DaKH is dedicated to collecting, analyzing, and providing reliable data on all stages of the complex phosphate cycle, and to providing policymakers, business leaders, and the public with scientific insights and expert knowledge from practice.

Future-oriented database

P-DaKH is intended to take a leading role in global sustainable mineral resources management to make the dynamics between supply and demand understandable. A new data hub should provide unbiased and transparently generated open data on phosphate resources and reserves. Unlike the common data banks of national geological surveys, mining agencies and other institutions, the P-data bank will focus on the dynamics of future reserves and resources. This is unique and distinguishes P-DaKH from every other initiative globally. To produce socially robust orientations, a transdisciplinary approach in the form of a mutual-learning process, including a targeted interdisciplinary process and a facilitated stakeholder discourse, will be applied.

Phosphate Data and Knowledge Hub

FUNDING

Global Phosphorus Institute (GPI)

DURATION

2022 ongoing

FACULTY

Business and Globalisation

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Gerald Steiner, Matthias Raddant,
Roland W.Scholz, Friedrich-Wilhelm Wellmer,
Michael Mew

INCOMING RESEARCHERS

Iman Asadi
Md Humayain Kabir

COORDINATION

University for Continuing Education Krems

PROJECT PARTNER

Global Phosphorus Institute (Morocco)

New Understanding of Green Mobility

A good 1.5 million business trips are made by car in Austria daily, revealing considerable potential for reducing CO₂ emissions. But how do companies and organizations manage to use climate-friendly alternatives, quantify how much CO₂ they save and set specific savings targets? The CARBON DIET project seeks to provide answers by testing the concept of individual mobility budgets.

Conventional mobility paradigms can be summed up using just three words: faster, everywhere, anytime. Immediate and drastic measures are needed to achieve the national CO₂ reduction targets. The Federal Environment Agency's status report on mobility 2018 makes it clear that greenhouse gas emissions in transport can be reduced with the help of technological innovations. Yet as things stand, it will only be possible to achieve half the reductions required by 2050 by means of innovation.

App-based CO₂ assessment

The transition to a sufficiency-oriented understanding of mobility could form one of the key levers in the mobility turnaround. This approach focuses on a conscious use of mobility to achieve an equitable use of space, energy, and the environment. CARBON DIET involves different disciplines such as psychology, sociology, mobility research as well as MaaS (mobility as a service) development and combines them in an app-based CO₂ assessment tool. The idea of the mobility budget follows the principle of goal-setting theory from organizational psychology. The test application is to include both the measurement and CO₂ assessment of journeys made and support the planning of future journeys with the aim of achieving reduction targets.

CARBON DIET

FUNDING

Austrian Research Promotion Agency (FFG) – program “Mobility of the Future”; Federal Ministry of Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK), managed by the Austrian Research Promotion Agency (FFG)

DURATION

2021–2023

DEPARTMENT

Arts and Cultural Studies

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Thomas Wernbacher, Constantin Kraus,
Alexander Pfeiffer, Simon Wimmer

COORDINATION

AIT Austrian Institute of Technology

PROJECT PARTNERS

Graz University of Technology
Upstream Mobility
yverkehrsplanung

Transformation to Circular Waste Management

The interdisciplinary project team of UrbanWaste deals with the separate collection of waste in public places in Vienna and Krems. Factors influencing the separation behavior of residential users are investigated by means of surveys, interviews, and observations. Concrete recommendations are then developed for action to optimize the resource use of public waste.

The upsurge in single-use and packaging waste becomes particularly apparent in public spaces such as parks, places and playgrounds. As part of the European Green Deal, the European Commission adopted the new Circular Economy Action Plan in March 2020 to reduce waste generation and increase recycling rates. The project UrbanWaste contributes to overcoming this societal challenge by searching for ways to transform linear waste management systems into circular ones. Recycling rates need to be improved to achieve the greenhouse gas reduction targets set at national and city levels in the waste management sector.

Directing the waste flow

This requires a deep understanding of how people deal with waste in public places. In a second step, the project will investigate how flows of municipal solid waste can be altered and designs for infrastructural measures will be developed. These findings will be tested in the course of empirical research on solid waste flows, consumer behavior and industrial design in two Austrian case study cities, namely Vienna and Krems. Knowledge and methodologies from waste management, social psychology, and industrial design are integrated in the project. Finally, a planning tool to support decision makers in enhancing source segregation in cities will be developed.

The Future of Urban Waste Management: Integrated Modelling in View of Circular Economy and Environment

FUNDING

Vienna Science and Technology Fund (WWTF) – Environmental Systems Research “Urban Regions” Call 2020 and the Province of Lower Austria (Grant agreement number ESR20-019)

DURATION

2021–2024

DEPARTMENT

Management and Economics/Danube Business School

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Barbara Brenner, Barbara Hartl, Daria Drdla, Eva Hofmann

COORDINATION

Technical University of Vienna (TU Wien)

PROJECT PARTNER

University of Applied Arts Vienna

Transdisciplinary Answers to Societal Challenges

The Transatlantic Research Lab on Complex Societal Challenges was initiated during the early stages of the COVID-19 pandemic in March 2020 as an ad hoc collaboration group with weekly meetings. In the years that followed, it developed scientific contributions to solutions for complex societal challenges, from the pandemic to polycrises, based on a systems science approach.

What started out as a loose platform for scientific exchange and collaboration, evolved into a permanent working format. The Lab aims to apply interdisciplinary and systems science-based approaches to complex challenges through joint research and publications, in order to provide science-based contributions to overcoming present and future societal challenges. This complexity consists of four dimensions, as current challenges are interconnected, show non-linear effects, are characterized by uncertainty and involve multiple stakeholders.

Dealing with complexity

Examples of such critical real-world situations are climate change, energy transition, food security, viral/zoonotic threats, and mobility to name but a few. The One Health concept is an appropriate answer to these complex challenges because it addresses the interconnectedness of human, animal, and environmental health in a holistic and collaborative manner. The Lab has increasingly incorporated transdisciplinary and complexity-science methodologies. To deepen its understanding the Lab joins forces with experts from practice. The main output of the Research Lab are scientific publications, including a fast response to superspreading and a description of how to prepare for the next waves at the beginning of a pandemic.

Transatlantic Research Lab on Complex Societal Challenges

FUNDING

Self-financed

DURATION

2020 ongoing

DEPARTMENT

Knowledge and Communication Management

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Gerald Steiner, Lukas Zenk

COORDINATION

University for Continuing Education Krems

PROJECT PARTNERS

Arizona State University (USA)
Complexity Science Hub Vienna
Harvard University (USA)
Konrad Lorenz Institute for Evolution and Cognition Research
Medical University of Vienna
Santa Fe Institute (USA)
TU Bergakademie Freiberg (Germany)
World Climate Forum (Germany)

Further Projects

→ Refining Habitat Classification Methods

The project SeMoNa Reloaded investigates possibilities to support the resource intensive process of classifying and monitoring natural areas and green infrastructure in urban areas through a (semi-)automated method of processing combined remote sensing and sentinel data. In areas with poor data availability, this advanced habitat classification method will be used and evaluated by means of field visits to classify whether it can be applied successfully. In addition, the potential of this approach to monitor habitats continuously over several years will be assessed and different interest groups involved.

Funding:

Austrian Research Promotion Agency (FFG) – ASAP 18th Call (2021, KP)

Project lead:

Tanja Lumetsberger, Department for Knowledge and Communication Management

→ Supporting Green Shopping – Green eCommerce

The e-commerce sector is experiencing unabated growth nationally, with spending reaching a new record of 9.6 billion Euro in 2021. The overall goal of “Green eCommerce” is the conception and evaluation of innovative add-ons for existing online shops, based on logistical (e-transportation, deliveries from regional producers), technology-driven (e.g., AI-supported chatbots, tools for virtual try-on) and behavioral interventions (e.g., gamified loyalty system; nudging strategies to choose sustainable delivery options) with the goal to reduce the return rate.

Funding:

Austrian Research Promotion Agency (FFG) – Mobility of the future – Goods mobility

Project lead:

Thomas Wernbacher

→ Migrant Digital Entrepreneurship – MDE

Digital transformation and migration trends are significant and inevitable elements of modern societies. The understanding of the role of migrant startups—including the required competence basis—is of high academic and practical relevance. The system mechanisms need to be considered as a driving force within the innovation system, which includes stimulating effects on regional innovation system development. Here the project distinguished between vertical dimensions—individual, organization, and region—and horizontal dimensions—society and culture, economics and finance, and human and knowledge.

Funding:

NÖ Forschungs- und Bildungsges.m.b.H. (NFB), FTI-Call 2017: Digitization (basic research projects)

Project lead:

Gerald Steiner, Liliya Satalkina, Department for Knowledge and Communication Management

→ Addressing Complexity with Improvisation

The world is ruled by systems of increasing complexity, a circumstance that can lead to unexpected situations. The relevant competences and organizational frameworks that would enable us to deal appropriately with the unforeseen are often lacking. The Organizational Improvisation project examines the ability to improvise to respond in real time and make creative use of the resources available at a given moment. The project will also investigate the key factors that determine peoples’ ability to improvise and ways to foster these skills in individual training or basic organizational conditions.

Funding:

Austrian Research Promotion Agency (FFG) – BRIDGE

Project lead:

Lukas Zenk, Department for Knowledge and Communication Management

Knowledge and Technology-Transfer & Dissemination Department for Knowledge and Communication Management

Science-to-Science:

→ **The Master of Science in “Transition, Innovation and Sustainability Environments”** is a newly designed European program towards mastering societal transition processes. The focus of TISE is on sustainable and resilient societal, business and industry processes and structures.

Science-to-Business:

→ **Utilizing the knowledge diversity of various stakeholders is indispensable to generate sustainable solutions for complex problems.** In the research project “Collective Mind”, we developed a web-based software prototype that leads from individual knowledge elicitation to an interactive knowledge representation of the group knowledge.

Science-to-Public:

→ **First Global Transdisciplinarity Conference 2021. Science Society Collaboration:** On the Quest for Sustainable and Cohesive Societies. Focusing on mutual learning the conference commenced in fall 2020 with a series of virtual pre-meetings with a selected group of international scholars from diverse disciplines, linked by a strong commitment to science-society-collaboration (SSC) and knowledge integration.

Knowledge and Technology-Transfer & Dissemination Department for Management and Economics

Science-to-Science:

→ **Attendance of the Academy of Management Annual Meeting**, the American Accounting Association Annual Meeting and the Americas Conference on Information Systems.

→ **Department for Arts and Cultural Studies**, Center for Applied Game Studies

Science-to-Science:

→ **Best Poster Award at ECAIR Conference 2022**, Talk at MAD Conference 2021 and 2022

Science-to-Business:

→ **Integration of the Mobility Budget into the Wien Mobil App** (Upstream – next level mobility GmbH)

→ **Exhibition of the Green eCommerce-project** as part of the “Energy Transition” theme at the Technisches Museum Wien from spring 2023 onwards

Selected Publications

Department for Knowledge and Communication Management

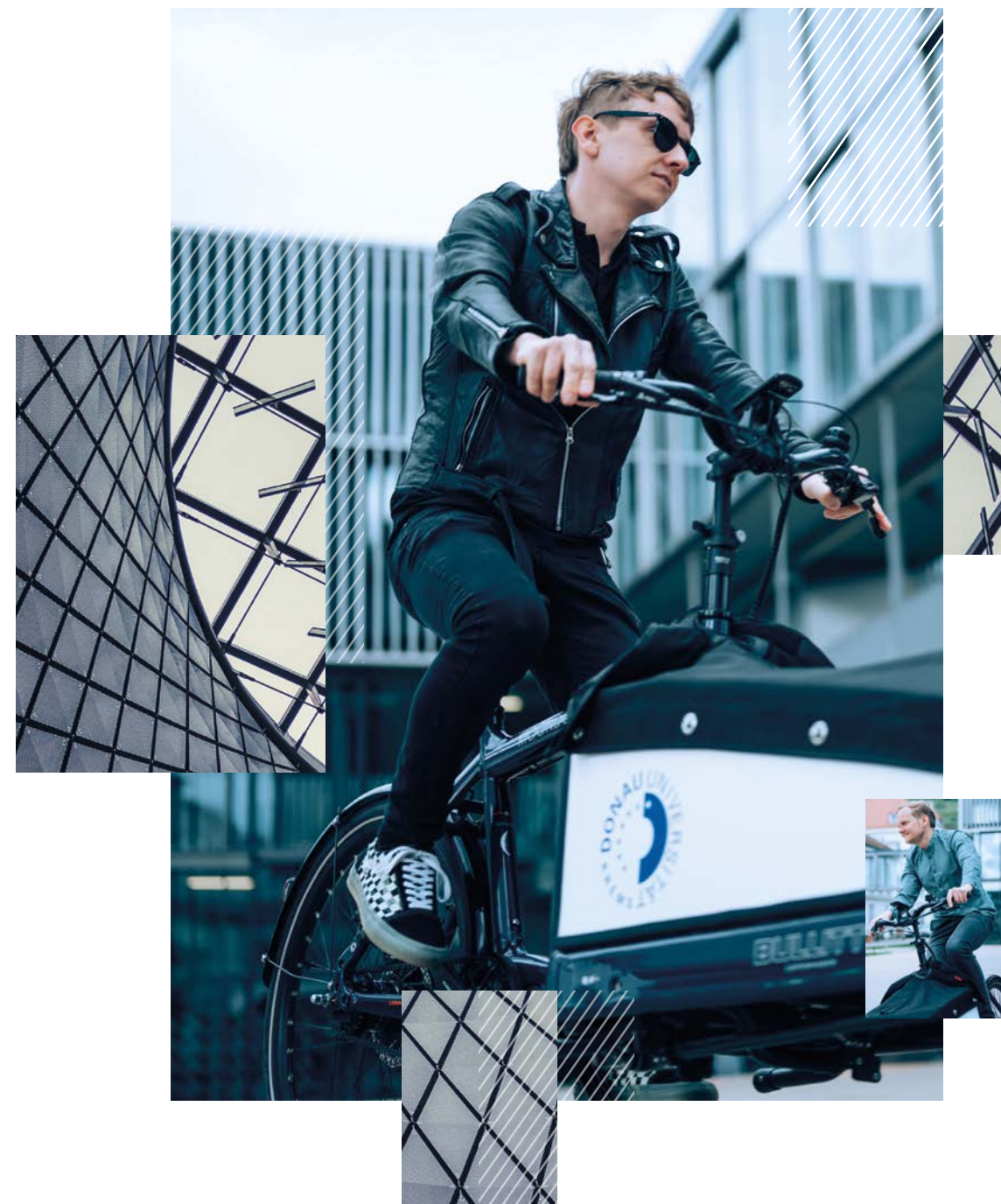
- Scholz, R.W. & Steiner, G. (2023): Process ownership in science–practice collaborations: the special role of transdisciplinary processes in sustainable transitioning. *Sustainability Science*, 18 Issue 1: 1-18.
- Scholz, R.W. & Steiner, G. (2022): The role of transdisciplinarity for mineral economics and mineral resource management: coping with fallacies related to phosphorus in science and practice. *Mineral Economics*, 35, Issue 2: <https://doi.org/10.1007/s13563-022-00331-5>.
- Satalkina, L.; Zenk, L.; Steiner, G. (2022): Transdisciplinary multistage system modeling: migrant entrepreneurship in the digital economy. *Kybernetes*, 51(13): 219–240.
- Zenk, L.; Hynek, N.; Schreder, G. & Bottaro, G. (2022): Toward a system model of improvisation. *Thinking Skills and Creativity*, 43: 100993.
- Raddant, M.; Takahasi, H. (2022): Interdependencies of female board member appointments. *International Review of Financial Analysis*, 81: 10.1016/j.irfa.2022.102080.
- Schernhammer, E.; Weitzer, J.; Laubichler, M. D.; Birmann, B. M.; Bertau, M.; Zenk, L.; Caniglia, G.; Jäger, C. C. & Steiner, G. (2022): Correlates of COVID-19 vaccine hesitancy in Austria: Trust and the government. *Journal of Public Health*, 44(1), e106–e116. <https://doi.org/10.1093/pubmed/fdab122>.

Department for Management and Economics

- Bates, R.; Brenner, B.; Schmid, E.; Steiner, G.; Vogel, S. (2022): Towards meta–competences in higher education for tackling complex real-world problems – a cross disciplinary review. *Int J Sustain High Educ*, 23 (8), 290–308.
- Ernst, B. A.; Banks, G. C.; Loignon, A. C.; Frear, K. A.; Williams, C. E.; Arciniaga, L. M.; Gupta, R. K.; Kodydek, G.; Subramanian, D. (2022): Virtual charismatic leadership and signaling theory: A prospective meta-analysis in five countries. *Leadersh Q*, 33 (5), 101541.
- Heim, R.; Huber, J. (2022): Nudging and RCTs in Finance: A review of recent literature. -In: Füllbrunn, S.; Haruvy, E. (Hrsg.): *Handbook of Experimental Finance*, 395–407, Edward Elgar Publishing, Cheltenham, United Kingdom.
- Hofmann, E.; Hoelzl, E.; Sabitzer, T.; Hartl, B.; Marth, S.; Penz, E. (2022): Coercive and legitimate power in the sharing economy: Examining consumers' cooperative behavior and trust. *J Econ Psychol*, 93, 102565.
- Strunk, K.; Faltermaier, S.; Ihl, A.; Fiedler, M. (2022): Antecedents of frustration in crowd work and the moderating role of autonomy. *Comput Hum Behav*, 128, 107094.
- Wabnegg, M. (2022): Steuerung von Innovation - ein Widerspruch? Controlling - Zeitschrift für erfolgsorientierte Unternehmenssteuerung, 34(1), 46–50.

Department for Arts and Cultural Studies, Center for Applied Game Studies

- Wernbacher, T.; Millonig, A.; Pfeiffer, A.; Wimmer, S.; Kraus, C.; Platzer, M.; Kaltenecker, S.; Getzinger, G.; Hüller, F. (2022): CARBON DIET: Opportunities for a climate-friendly level of mobility through the definition of fair individual mobility budgets. *Proceedings of the 16th annual International Technology, Education and Development Conference (INTED) 2022*, 16: 6514-6522.
- Millonig, A.; Rudloff, C.; Richter, G.; Lorenz, F.; Peer, S. (2022): Fair mobility budgets: A concept for achieving climate neutrality and transport equity. *Transportation Research Part D: Transport and Environment*, 103, 103165.
- Wernbacher, T.; Pfeiffer, A.; Kraus, C.; Wimmer, S.; Platzer, M.; Seewald, A. and Winter, T. (2022): Green eCommerce: Promotion of climate-friendly online deliveries by means of user-oriented interventions in existing online shops.
- Millonig, A.; Wernbacher, T.; Pfeiffer, A.; Wimmer, S.; Kraus, C.; Platzer, M.; Kaltenecker, S.; Getzinger, G.; Hüller, F. and Mayer, J. (2022): Opportunities for a climate-friendly level of mobility through the definition of fair individual mobility budgets. *Academic Conferences International, Proceedings of the 4th European Conference on the Impact of Artificial Intelligence and Robotics*.





The PhD program “Technology, Innovation, and Cohesive Societies” focuses on inter/transdisciplinary research with a closely coupled interface between social sciences and informatics. A special feature of the PhD program is the connection of the research fields digital transformation, innovation, and business informatics with the dynamics and impacts on the social and economic micro- and meso-levels of organizations. This includes understanding the potential impact of new technologies and innovations on the resilience of organizations.

The focus of the PhD program is primarily on the study of digital transformation phenomena in society, business, administration, and politics and can be divided into five areas:

- Transformation of organization, culture, and work, including the impact of digitalization on organizational culture, work, and business models;
- Sustainable digitalization, including digital circular economy, efficient and effective use of resources;
- Governance and regulation, including the platform economy, data use, and sustainable provision of digital infrastructure;
- Democracy and participation including changes in political mixed-media communication and the digital culture of participation;
- Data and artificial intelligence, including evidence- and algorithm-based decision-making, data-driven innovation, data analysis, and systems modelling.

→ **SEER: Socioeconomics Effects of a Systems Approach European Green Deal Implementation and Reform**

Name: Milan Petit

Title of the dissertation: Strengthening the science-policy interface: How to improve European Green Deal Just Transition policies focused on the labor market using a complexity approach

Project description: The labor market is essential for the successful implementation of the European Green Deal, as it requires a lot of work and social support. For the European Green Deal to be successful, labor market policies should be integrated with housing, education, and industrial policies.

Funding: Stiftung Umwelt und Nachhaltigkeit

→ **The Future of Urban Waste Management: Integrated Modelling in View of Circular Economy and Environmental Impacts**

Name: Daria Drdla

Title of the dissertation: Sustainable Business Model Innovation towards Circularity

Project description: Our aim is to capture how business model innovation leads to sustainable business models (SBM) and circular business models (CBM). We aim to develop an integrative framework for business model innovation based on a systematic literature review. The project investigates activities and tools that help to reduce uncertainty and increase the successful implementation of SBM and CBM within organizations. Following a multi-method approach comprising a qualitative investigation and a quantitative survey of organizations in the DACH region the project sets out to analyze how SBMI, Sustainable Business Model Innovation, is applied in practice.

Funding: Vienna Science and Technology Fund (WWTF)

→ **Collaborative Competences for Innovative Public Servants. Facilitating Collaborative Innovation in the Public Sector through Formal and Informal Competence Development**

Name: Valerie Albrecht

Title of the dissertation: Collaborative competences for innovative public servants. Facilitating collaborative innovation in the public sector through formal and informal competence development

Project description: Most of the research on collaborative innovation so far focuses on involving citizens in co-production and co-creation projects. The question remains which knowledge and competences public servants need to contribute. Therefore, this project investigates these collaborative competences and how public servants attain them. The project will follow a qualitative-explorative approach to the current discussion of collaborative competences, informal knowledge transfer to build collaborative competences, and the formal transfer of knowledge and development of abilities.

Funding: GFF NÖ



Democracy, law and Europe are closely related and form a broad field of research, to which three organizational units at the University for Continuing Education Krems contribute. The Department for Law and International Relations, the Department for European Policy and the Study of Democracy, and the Research Lab Democracy and Society in Transition focus their research on the application and further development of law on the one hand, and on political processes and the development of the European Union on the other. Topics include, in particular, the globalisation of commercial law, the private insurance industry and its dynamic development, intellectual property law and cultural heritage law, law and the data economy, the institutional state of Europe, the role of the EU, the future of European democracy and the question of citizen participation and representation in Europe, as well as the current challenges posed by technological innovation, digitalization, and societal change.

Societal Seismograph of Changes Towards Democracy

The Austrian Democracy Lab (ADL) explores the satisfaction with democracy and the lessons for the future of democracy. Its main idea is to enhance debates about democracy and its stability. Due to the constant discussion about conspiracy theories, another part of the project took a closer look at the population's attitudes towards science.

Many people have turned away from politics as well as the media due to the feeling of living in an ongoing crisis and lacking being heard by politicians and others. Meanwhile, fake news and conspiracy theories have growing numbers of adherents. Therefore, it is important for social cohesion to understand the tightened situation between conspiracy theories and academic work. On the one hand this project aims to raise public awareness as well as that of the stakeholders concerning the current situation. On the other, it offers recommendations for the future state of democracy.

In whom people trust

The ADL findings show that popular trust in democracy still exists, whereas confidence in politicians has been declining. The perception the population shares is of having been left alone, having lost basic human and civil rights, and financial support in the wake of the COVID-19 measures and due to the current crisis. Surveys as well as interviews have led to the same results. In parallel with the loss of trust towards political players, the understanding of academic work has decreased exceptionally, particularly in the field of health. Yet, people still show interest in discussions on democracy, enthusiastically contributing ideas for the future, as another part of the ADL proved.

Austrian Democracy Lab

FUNDING

Stiftung Forum Morgen (Province of Lower Austria)

DURATION

2018–2022

RESEARCH LAB

Democracy and Society in Transition

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Christina Hainzl, Daniela Ingruber, Sarah L. Nash

COORDINATION

University for Continuing Education Krems

PROJECT PARTNERS

University of Graz

Trust in Science and Health Care Policies

Amid a health crisis that is unique in its dimension and impact, the importance of expertise, evidence-based action and, above all, trust in science is becoming clear. This part of a large-scale study examines how science is viewed by the population and shows correlations between trust in science and other factors such as education level, age, and political attitudes.

Even if public discourse suggests otherwise: About three quarters of respondents said they trust science in the health sector. This picture changes when it comes to trust in decisions: Only slightly more than half of the respondents believed that health policy decisions were evidence-based. The study shows that the higher the level of education, the greater the trust in science. Satisfaction with how scientists present results correlates with respondents' self-assessment on the political left-right axis: the more right-wing respondents rank themselves, the less satisfied they are with the communication.

Correlations of views

49 percent of respondents agree with the statement "Science in Austria functions independently of political and economic influence". The most skeptical group is the 45- to 64-year-olds, 57 percent share the opinion "Science is not independent", two-thirds of those over the age of 64 are convinced that "Science is rather or completely independent". Whereas 57 percent said that health policy decisions were evidence-based, 64 percent complained the health policy measures communication was not clearly understandable. For this study 2,571 online interviews were conducted in March 2022; respondents cover the representative age range of 14 to 75 years.

Artistic-philosophical Symposium

Under the heading "Perspectives on Living Together: On Democracy", the Austrian Democracy Lab (ADL) organized a symposium together with the School of Philosophy and the "Künstlerhaus/Gesellschaft bildender Künstlerinnen und Künstler Österreichs". With this symposium, the Austrian Democracy Lab project was brought to a worthy finish in December 2022. The subject of democracy was addressed artistically, philosophically and in terms of political science right from the opening evening on. The ADL project team presented their research results, for example, the effects of the so-called Ibiza affair and the pandemic policy on the approval of democracy in Austria. The scientific lectures were accompanied by the art project "Democracy and Senses". This multi-sensory approach combined drawings, installations, democracy-inspired fragrances, and the sense of taste. The Spectaculum of Young and Wild Philosophy covered two days, juxtaposing a wide variety of perspectives on coexistence. Animated films by international artists were shown in cooperation with Tricky Women/ Tricky Realities.

Bringing Democracy in Europe into the Picture

The European Regional Democracy Map (ERDM) is an innovative digital platform and data hub that provides information on regional democracy and EU involvement for more than 300 regions in Europe. An interactive map and detailed region profiles visualize data on regional electoral systems and election results, on regional government and EU involvement.

Regionalization and European integration are two parallel phenomena observable in contemporary Europe. While national politics attract more attention in research, the regions are—with some exceptions—almost terra incognita. Therefore, the project offers comparative research on regional democracy and the involvement of European regions in EU structures and processes. Its research is directed to the manifold diversity existing within the regions in terms of political, institutional, and economic strength.

Exchanging information with the general public

As research findings in political science often lack an adequate science2public communication, the European Regional Democracy Map includes easily accessible data visualizations that offer low-threshold access to the public. The project outcome includes an innovative digital platform featuring an interactive map and detailed region profiles, as well as a printed handbook. Since the interpersonal exchange is immanent to the topic, events inviting experts and other attendees have been organized to make discussion on diversity of regional democracy and EU involvement possible.

European Regional Democracy Map

FUNDING

Stiftung Forum Morgen (as part of the funding of the research project REGIOPARL) and University of Bergen (Norway)

DURATION

2021–2024

DEPARTMENT

European Policy and the Study of Democracy

PROJECT LEAD

Sarah Meyer

COORDINATION

University for Continuing Education Krems

PROJECT PARTNER

University of Bergen (Norway)

Further Projects

→ Connecting the EU with Society

The European Documentation Centre (EDC) acts as a service point in respect of EU documents and information on EU integration, law, and policy. Becoming the first “next generation” EDC in Austria in 2021, it also contributes to societal discourse on EU issues. A series of events, including a high-level online citizens’ dialogue on European higher education in March 2022 in the context of the Conference on the Future of Europe, has already deepened the exchange with citizens. As an information interface between the EU institutions and the university, the EDC supports its users by providing (online) access to official EU publications.

Scientific lead:

Gabriel M. Lentner

Operational lead:

Susanne Fraczek

Knowledge and Technology-Transfer & Dissemination Department for European Policy and the Study of Democracy

Science-to-Science:

→ **Organization of the Conference “Mapping Regional Involvement in EU Affairs”**, University for Continuing Education Krems, 20–21 October 2022.

→ **Organization of Panels at the ECPG 2022**, University of Ljubljana: Fighting over Gender and Equality in the EU; It’s all about Sex? Opportunities and Challenges of (In)Visibility; Identity and Queer Politics, The State of the European Union (Session).

Science-to-Public:

→ **Elisabeth Donat has contributed to the Podcast “Irgendwas mit EU”** by the European Parliaments representation in Austria.

→ **Participatory Art project “Outer Space Transmitter”** in the context of the REGIOPARL project.

Research Lab Democracy and Society in Transition

Science-to-Public:

→ **Symposium “Perspektiven des Zusammenlebens: Zur Demokratie”** – cooperation with Künstlerhaus Wien and the School of Philosophy. 20 November–4 December 2022

Selected Publications

Department for European Policy and the Study of Democracy

→ **Donat, E.; Lenhart, S.** (2022): Europeanization of Citizens vis-à-vis regional Politicians – The case of the German-speaking Community of Belgium in the Euregio Maas-Rhine. *Journal of Contemporary European Studies*, Online First.

→ **Ajanovic, E.; Hunklinger, M.** (2022): Voting Right? Analyzing Electoral Homonationalism of LGBTIQ* Voters in Austria and Germany. *Social Politics: International Studies in Gender, State & Society*, 19 (1), 24–49.

→ **Donat, E.; Lenhart, S.** (2023): Das Stadt-Region-Nation-Europa Verhältnis aus Sicht regionaler Politiker*innen in Deutschland, Spanien, Belgien und Österreich – eine provokative Auseinandersetzung mittels Fokusgruppendifkussionen. -In: Ganter, L.; Hardtke, T.; Hodaie, N.; Stock, M. (Hrsg.): *Provinz postmigrantisch. Rurale Perspektiven auf Politik, Alltag und Literatur*, 81–104.

→ **Meyer, S.; Böhm, L.; Dermizakis, A.; Kernstock, L.; Kventon, O.; Steindl, P.; Weilguni, M.; Uengin, J.** (2022): Austria in the Conference on the Future of Europe. -In: *Europäisches Zentrum für Föderalismus-Forschung Tübingen (EZFF) (Hrsg.): Jahrbuch des Föderalismus 2022. Föderalismus, Subsidiarität und Regionen in Europa*, 130–145.

→ **Wöhler, V.; Vogl, S.; Schels, B.; Mataloni, B.; Malschinger, P.; Asteithner, F.** (2023): Methodische Grundlagen und Forschungsdesign der Panelstudie. -In: Flecker, J.; Schels, B.; Wöhler, W. (Hrsg.): *Junge Menschen gehen ihren Weg. Längsschnitnanalysen über Jugendliche nach der Neuen Mittelschule*, 29–56.

→ **Hunklinger, M.; Wöhl, S.** (2022): Gender, Diversity and Social Cohesion in Europe. *Momentum Quarterly*, 11 (2), 77–78.

Knowledge and Technology-Transfer & Dissemination Department for Legal Studies and International Relations

Science-to-Science:

→ **Stockhammer, N.** (2022): *Hedayah International CVE Conference – Keynote*: “Lessons from P/CVE-Efforts” as Keynote Speaker (24 May 2022) in Granada/Spain.

Presentations Center for Intellectual Property, Media- and Innovation Law, Prof. Clemens Appl:

→ **12th Annual Conference on Innovation and Communications Law (CICL)**: “Society in Transition: Challenges and Implications for Innovation and Communications Law”.

→ **International Scientific Conference on Current Issues of Innovation and Communication Law**, 19–21 May 2022.

→ **IP-DAY 2021/2022**, Austrian Symposium on Intellectual Property Law 2021 and 2022

→ **Forum Wettbewerbsrecht 2022**, Austrian Symposium on Fair Trading and Antitrust Law, 28 November 2022

→ **16. Österreichischer IT-Rechtstag**, Austrian Symposium on Information Law, 5–6 May 2022

Science-to-Business:

→ **8th Krems Insurance Forum 2022**: Liability, Legal Protection Insurance and Insurance Distribution Law 2022, 8 November 2022, Audimax

Science-to-Public:

→ **Ratka, T.** (2022): *Initiator and co-publisher (with R. Rauter) of “Manz RDB Keywords”*: Publicly accessible legal dictionary/wiki of 500 legal terms: independent contribution of 50 technical terms of corporate and company law. Awarded the Manz Author Prize 2022 in the category Online

→ **Cooperation between the Center for Intellectual Property, Media and Innovation Law and the Austrian Patent Office within the Framework of the IP Academy**: regular three-hour intensive seminars on copyright law. Furthermore, lectures are held within the framework of “AWS First” for start-ups and courses on intellectual property and data protection are offered for students in cooperation with various schools (e.g. TGM Vienna).

Selected Publications

Department for Legal Studies and International Relations

→ **Lentner, G. M.; Zasheva, D.** (2022): *Bridgestone v Panama: Denial of Justice in a Trade Mark Dispute and the Locus Standi of a Licensee in International Investment Arbitration*. *ICSID Review*, 37(3), 645–653.

→ **Stockhammer, N.** (2022): Strukturelle Ursachen für Extremismus, Radikalisierung und Terrorismus. Eine multifaktorielle Ätiologie. -In: Sandrisser, W.; Karner, S. (Hrsg.): *Europäische Werte. Ihre Bedeutung für Freiheit, Sicherheit und Integration*. Graz/Wien: leykam wissenschaft, 253–273.

→ **Varro, D.** (2022): *Leerstandsabgabe in der Steiermark, Salzburg und Tirol - Ein systematischer Vergleich und kritische Beleuchtung*. taxlex, 263.

→ **Ratka, T.** (2022): Die institutionelle Perspektive der Universität für Weiterbildung Krems zur Anerkennung non-formal und informell erworbener Kompetenzen Bestandsaufnahme und Ausblick. -In: Fellner, M.; Pausits, A.; Pfeffer, T.; Oppl, S. (Hrsg.): *Tagungsband zum Validierung und Anerkennung non-formal und informell erworbener Kompetenzen an Hochschulen. Rahmenbedingungen, Erfahrungen und Herausforderungen an der Universität für Weiterbildung Krems am 16.4.2021*, Waxmann Verlag, Münster, 95–106.

Research Lab Democracy and Society in Transition

→ **Hainzl, C.; Grimm, M.** (Hrsg.) (2022): *Antisemitismus in Österreich nach 1945*. Hentrich & Hentrich.



A prerequisite for the advancing digitalization of economy and society is the development and research of integrated sensor systems, with particular emphasis on the use of artificial intelligence. With its strongly internationally oriented research, the Department for Integrated Sensor Systems contributes to advancing trends in sensor technology and development in a wide range of application fields. These include the reduction and replacement of rare earths in the context of the energy transition and e-mobility, implementation in industrial processes, automation and building technology, and the analysis of hygienic standards of drinking water. The department operates specialized experimental laboratories. Methodologically, it relies on neural networks, artificial intelligence, digital twins and optimization methods.

Christian Doppler Laboratory for Magnet Design

High-performance magnets play a crucial role in promoting sustainable energy generation and clean transportation within green technologies. Consequently, climate policy significantly influences the demand for essential materials. To keep the risk in rare earth supply low, magnets are developed that do not contain heavy rare earths such as terbium and dysprosium, while reducing the neodymium content.

Permanent magnets have taken a pivotal position in today's technology, as they have become indispensable in various everyday applications, including sound transducers, air conditioners, electric bicycles, wind turbines, hybrid and electric cars, and hard disk drives. Furthermore, the growing implementation of green technologies, particularly in energy generation and transportation sectors, is driving an even higher demand for permanent magnets. In response to this increased demand, the project aims to create cost-effective magnets that do not rely on critical elements.

The newly established CD Laboratory focuses on materials development and design with a particular emphasis on artificial intelligence (AI) and related areas such as machine learning, neural networks, and big data. These topics hold significant importance in European research. The laboratory generates fresh knowledge and provides young researchers with the opportunity to learn and apply these cutting-edge technologies. In addition to magnet design advancements, the laboratory is actively developing machine learning methods.

Simulation of the magnetic fields

To support computer-aided magnet design, machine learning methods are being integrated with physical models across all relevant length scales. The Department for Integrated Sensor Systems has developed

software that allows researchers to study magnetization processes at the smallest magnetic units, core-shell grains, using the computational power of many computers simultaneously. These micromagnetic simulations are used to calculate the coercivity, the opposing field strength required for demagnetization, and this data is fed into a regression model that links the coercive field of a grain with its size, shape, and rare earth content.

Christian Doppler Research Laboratory for Magnet Design Through Physics Informed Machine Learning

FUNDING

Austrian Federal Ministry of Labour and Economy, the National Foundation for Research, Technology and Development and the Christian Doppler Research Association

DURATION

2020–2027

DEPARTMENT

Integrated Sensor Systems

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Thomas Schrefl, Qais Ali, David Böhm, Leoni Breth, Felix Lasthofer, Clemens Wager

COORDINATION

University for Continuing Education Krems

PARTNERS

National Institute of Advanced Industrial Science and Technology – AIST (Japan)
Toyota Motor Corporation (Japan)
University of Tokyo, Institute for Solid State Physics (Japan)
Wolfgang Pauli Institute Vienna (Austria)

Sustainable Magnet Production for Green Technology

Rare earth elements (REE) are essential components of permanent magnets and a prerequisite for the green and digital transformation in Europe. The REsilience project aims to build a more resilient and sustainable supply chain for magnetic materials and rare earth products. New market opportunities for critical raw materials that are more sustainably produced in Europe should be created.

Electric vehicles, wind turbines and sensor applications are just some examples of how permanent magnets are used. The market for these magnets has an enormous downstream leverage: the EU mobility industry is expected to grow to around € 500 billion by 2030. Despite being the world leader in electric motor manufacturing, the EU is completely dependent on imports of REE. The project partners will therefore categorize REE by geographic location, quantity, chemical composition, ethical and sustainability indicators, ramp-up scenarios and pricing, considering all value streams from virgin to secondary materials. A new production system will be built to ensure a more resilient and sustainable supply chain for RE elements in Europe.

Formulas for high-tech magnets

A newly developed software will be used to determine optimal mixing ratios to ensure consistently high product quality while making maximum use of secondary materials for high-tech applications. Combined with new and improved technologies for alloy production and powder preparation, especially of secondary materials, the yield and stability of processes will be increased. This will enable an increase in the share of secondary materials in the production of rare earth magnets while reducing waste, the consumption of energy associated with virgin material extraction, and environmental damage.

Resilient and Sustainable Critical Raw Materials REE Supply Chains for the E-mobility and Renewable Energy Ecosystems and Strategic Sectors

FUNDING

EU – Horizon Europe, A DIGITISED, RESOURCE-EFFICIENT AND RESILIENT INDUSTRY 2021 (Grant agreement number 101058598) and UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding grant agreement number 10038960 as part of Horizon Europe HORIZON-CL4-2021-RESILIENCE-01-07.

DURATION

2022–2026

DEPARTMENT

Integrated Sensor Systems

PROJECT LEAD/

PARTICIPATING RESEARCHER(S)

Thomas Schrefl, Johann Fischbacher

COORDINATION

University of Pforzheim (Germany)

PROJECT PARTNERS

CARESTER (France)
Circularise (The Netherlands)
HyProMag GmbH (Germany)
HyProMag Ltd (United Kingdom)
Inserma (Spain)
Jožef Stefan Institute (Slovenia)
KOLEKTOR (Slovenia)
Mkango (Poland)
REIA (Belgium)
RISE (Sweden)
Steinbeis Europa Zentrum (Germany)
TU Bergakademie Freiberg (Germany)
TU Delft (The Netherlands)
University of Birmingham (United Kingdom)
University of Leiden (The Netherlands)
Valeo (France)

Better Understanding through a Digital Twin

Permanent magnets are a critical component of electric motors and generators in a broad spectrum of applications. Limited global resources necessitate the development of magnets with reduced or no rare earth content. This project aims to produce a digital twin of a rare earth-free MnAl-C permanent magnet, which comprises experimental data and micromagnetic simulations.

The most powerful permanent magnets in the world today are usually made of rare earth elements like Nd-Fe-B. However, the limited availability of rare earths means there is a clear need to develop alternative permanent magnets. One promising candidate is MnAl-C. Although it contains no ferromagnetic elements, tau-MnAl-C meets all requirements for high-performance permanent magnets. As tau-MnAl-C is free of critical elements, the long-term use of this material is environmentally sustainable. Its low physical density predestines tau-MnAl-C for use in transport and aerospace applications.

Improving micromagnetic simulations

Creating the digital twin of a permanent magnet makes important contributions to the digitalization of materials science, environmental sustainability, clean energy and electromobility. The approach can be applied to the optimization of rare-earth magnets and also to the development of novel rare-earth-free magnets. A digital twin can be used for real-time performance monitoring of a magnet in an application. The project is about to clarify whether a digital twin of a permanent magnet can fully represent the magnet's physical structure, magnetic properties, and its magnetic and thermal history.

Towards the Digital Twin of a Permanent Magnet

FUNDING

Austrian Science Fund (FWF) – DACH (Grant agreement number I 5266-N), German Research Foundation (DFG) (Grant agreement number 326646134)

DURATION

2022–2025

DEPARTMENT

Integrated Sensor Systems

PROJECT LEAD/

PARTICIPATING RESEARCHER(S)

Markus Gusenbauer, Stefan Stanciu

COORDINATION

Leibniz Institute for Solid State and Materials Research (IFW) Dresden

Pushing the Boundaries of Structural Magnet Design

How can the quantity of rare earth elements in permanent magnets be reduced while maintaining the magnet's performance? The DeNaMML project makes use of a neural network that will be trained to predict the influence of material composition and nanostructure on magnetic strength. The project team will provide guidelines for producing eco-friendly permanent magnets.

High performance permanent magnets are key to various sustainable technologies, but currently depend on a considerable fraction of rare earth content. These metals are environmentally and economically challenging to mine. Demand for them is expected to increase five-fold before 2030 which makes a reduction of the rare earth content a pressing issue. The conventional design of magnetic materials requires a great deal of manual work and computing resources. New methods for the development of magnet materials need to be found.

Accelerated design development

By using a new machine learning-based approach the project will speed up the development of new magnets. Machine learning applications require a large amount of training data, which is usually expensive and limited due to the length of experiments. The project will therefore examine which higher order optimization methods can be used to train a neural network with relatively small training sets to still achieve high accuracy. The project will push the boundaries of nano-structural design strategies for permanent magnets towards the theoretical limit by finding optimal material distributions and compositions. These findings will provide new guidelines to produce competitive, eco-friendly permanent magnets for green technologies.

Design of Nanocomposite Magnets by Machine Learning

FUNDING

Austrian Science Fund (FWF)
(Grant agreement number P 35413-N)

DURATION

2022–2026

DEPARTMENT

Integrated Sensor Systems

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Harald Özelt, Heisam Moustafa

COORDINATION

University for Continuing Education Krems

PROJECT PARTNERS

University of Vienna

Guiding E-Drivers to Green Energy

E-mobility is a readily available solution for avoiding carbon emissions in the transport sector. However, e-mobility does not reduce CO₂ emissions unless the power generation mix is dominated by renewable energy sources. The project eAlloc investigates anytime optimization to guide e-drivers to charging stations when renewable energy is available.

The energy transition requires the broad use of renewable energy. Due to volatility, "smart" systems have to be developed to balance supply and demand just-in-time. In the field of e-mobility, acceptance is a key factor, since relatively long charging times can be annoying. The requirement to use carbon-neutral renewable energy makes supply challenging, since renewable energy is not always available. Drivers' considerations must also be taken into account.

Tackling complex decisions

The project focuses on devising algorithms for anytime multi-objective optimization for balancing a fluctuating renewable energy supply with predictable electric vehicle charging needs and drivers' objectives. A core outcome will be anytime optimization algorithms to provide an infrastructure for matching the demands of the smart grid with those of e-mobility charging. Existing algorithms for anytime multi-objective optimization are currently limited to two objectives. The aim of this project is to improve algorithms with a view to extending the actual state-of-the-art towards multi-stakeholder dynamic real-world situations. To ensure the suggestions are accepted and followed by e-drivers, dedicated user interfaces will be developed that will provide drivers with explanations on request.

Dynamically Optimizing the Allocation of e-cars to Charging Sites

FUNDING

Klima- und Energiefonds KLI.EN – Zero Emission Mobility 3rd Call; managed by the Austrian Research Promotion Agency (FFG) (Project number 885026).

DURATION

2022–2024

DEPARTMENTS

Integrated Sensor Systems
Continuing Education Research and Educational Technologies

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Hermann Kaindl, Martin Dobiasch, Gerald Franzl, Stefan Oppl, Thilo Sauter, Albert Treytl

COORDINATION

University for Continuing Education Krems

PROJECT PARTNERS

LINZ NETZ GmbH (LN)
LINZ STROM GAS WÄRME GmbH
PowerSolution Energieberatung GmbH
Robert Bosch AG
TU Wien

Further Projects

→ Enhanced Energy Management

This project investigates a distributed decision-making system in building energy management. The findings should be capable of including top-down decisions, e.g., enforced by the smart grid or multi-building energy management, peer-to-peer decisions between buildings or independent stakeholders, and also bottom-up decisions to react to individual building needs. The overarching goal is to optimize the use of renewable energy production and storage assets across buildings. The envisaged outcome is the design and prototypical implementation of decision-making across multiple buildings.

Funding:

Klima- und Energiefonds KLI.EN – Energy Research eMISSION (managed by the Austrian Research Promotion Agency (FFG))

Project lead:

Thilo Sauter, Department for Integrated Sensor Systems

→ Atmospheric Weather Sensors

The electric field sensors recently developed at the University for Continuing Education Krems are potentially cost-efficient enough to attempt the realization of large-scale networks. The new sensor systems for measuring electric fields in the atmosphere will be adapted for outdoor usage and will be installed at a dedicated monitoring site in Wiener Neustadt to collect field data. Continuous monitoring of the local electric field is key for thunderstorm warning systems that comply with international standards. Ideally, the project's field data will help to assess the severity of developing storms at an early stage.

Funding:

GFF NÖ – FTI Program, Call 2019: Climate Change

Project lead:

Wilfried Hortschitz, Department for Integrated Sensor Systems

→ Basic Magnet Research

Numerous applications such as air conditioning, mobility or power generation depend on permanent magnets. The measured coercive fields in modern permanent magnets reach only a small fraction of the theoretical values. A quantitative theory of coercivity will be developed in this project with consideration given to the local atomic structure, the spatial variation of the intrinsic magnetic properties, and the physical microstructure of the magnet. Understanding defects at the atomic scale and their relation to the magnet's quality, helps to improve the production process and to obtain stronger permanent magnets.

Funding:

Austrian Science Fund (FWF) – WEAVE

Project lead:

Markus Gusenbauer, Department for Integrated Sensor Systems

Knowledge and Technology-Transfer & Dissemination

Science-to-Science:

→ Schrefl Thomas, *Inverse Design of Nd-substituted Permanent Magnets*, a talk at the IOP Physics and Green Economy Summit, 25 November 2021

Science-to-Business:

→ *European and US patent application for "Measuring an Electric Field"*, PCT/EP2018/081516 and WO 2019/120795 (2022)

Science-to-Public:

→ *Keynote Prof Hubert Brückl, Sensing with Electrons – Biology Meets Magnetism*, a ceremonial act at the University Bielefeld, 25 October 2022

Selected Publications

- Brückl, H.; Shoshi, A.; Schrittwieser, S.; Schmid, B.; Schneeweiss, P.; Mitteramskogler, T.; Haslinger, M. J.; Muehlberger, M.; Schotter, J. (2021): Nanoimprinted multifunctional nanopores for a homogeneous immunoassay in a top-down fabrication approach. *Nature Scientific Reports*, 11, 6039.
- Chakkarapani, L. D.; Arumugam, S.; Brandl, M. (2021): Layer-by-layer sensor architecture of polymers and nanoparticles for electrochemical detection of uric acid in human urine samples. *Materials Today Chemistry*, 22, 100561.
- Bratukhin, A.; Franzl, G.; Karameti, D.; Treytl, A.; Sauter, T. (2022): Probability-based, Risk-adjusted Energy Consumption Optimisation in Industrial Applications. *Proceedings in IEEE 27th International Conference on Emerging Technologies and Factory Automation*, 1–8.
- Gusenbauer, M.; Kovacs, A.; Özelt, H.; Fischbacher, J.; Zhao, P.; Woodcock, T. G.; Schrefl, T. (2021): Insights into MnAl-C nano-twin defects by micromagnetic characterization. *Journal of Applied Physics*, 129(9), 093902.
- Mohapatra, J.; Fischbacher, J.; Gusenbauer, M.; Xing, M. Y.; Elkins, J.; Schrefl, T.; Liu, J. P. (2022): Coercivity limits in nanoscale ferromagnets. *Phys. Rev. B*, 105(21), 214431.
- Özelt, H.; Qu, L.; Kovacs, A.; Fischbacher, J.; Gusenbauer, M.; Beigelbeck, R.; Praetorius, D.; Yano, M.; Shoji, T.; Kato, A.; Chantrell, R.; Winklhofer, M.; Zimanyi, G.; Schrefl, T. (2022): Full-Spin-Wave-Scaled Stochastic Micromagnetism for Mesh-Independent Simulations of Ferromagnetic Resonance and Reversal. *npj Computational Materials*, 8, 35.



The Department of Migration and Globalisation understands migration as an integral part of complex processes of internationalization, globalization and social change. Research at the department contributes to promoting a general understanding of migration as a complex societal phenomenon and as a social reality. Our research activities are organized in three thematic clusters: Migration Policies and Governance focuses on the emergence and development of migration governance systems and rules, as well as the actors, content and processes underlying the wide range of migration-related policies involved in the recruitment, admission, selection, control or deterrence of migrants, and the effects of migration policies. The cluster Migration Processes and Drivers aims to understand drivers of spatial and social mobilities in the context of (de)globalisation and economic and political (dis)integration processes. The third research cluster, Integration and Social Cohesion, explores the various facets associated with the integration of migrants into host societies and into different sectors of society, including labour markets, education, housing and health, as well as more general aspects of civic participation and legal integration.

Clearing the Fog around Irregular Migration

The MlrreM project examines estimates and statistical indicators on the irregular migrant population in Europe as well as related policies, including the regularization of irregular immigrants. Covering 20 countries in Europe, North America and North Africa, 15 of which will be examined in more depth, it draws on the expertise of a wide range of relevant stakeholders and researchers.

The project addresses the uncertainty and contested nature of evidence on irregular migration by fostering a shared understanding of basic features of the phenomenon and the policy options. Although irregular migration has consistently been a central issue in public and policy debates, where numbers often play an important role, quantitative data are actually scarce, and contested. Therefore, MlrreM seeks to obtain more accurate information regarding the size and characteristics of the population in an irregular situation using newly developed innovative estimation methods.

Strong stakeholder involvement

MlrreM also examines the different legal and policy frameworks defining migrant irregularity and ways leading into and out of irregularity. A specific focus will lie on regularization policies and their impact. A core mission of the project is to engage relevant stakeholders, including NGOs, service providers, and policymakers on local, national and EU levels. Together with expert groups that will be set up on irregular migration data and regularization, respectively, and that will involve key stakeholders the project will synthesize findings into a Handbook on data on irregular migration and a Handbook on pathways out of irregularity.

Measuring Irregular Migration and Related Policies

FUNDING

EU – Horizon Europe (Grant agreement number 101061314); UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee. The Canadian research component of this project is undertaken, in part, thanks to funding from the Canada Excellence Research Chairs Programme of the Government of Canada.

DURATION

2022–2025

DEPARTMENT

Migration and Globalisation

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Albert Kraller, Jill Ahrens, Heidrun Bohnet, Lydia Rössl, Theresa Schütze

COORDINATION

University for Continuing Education Krems

PROJECT PARTNERS

Complutense University of Madrid (Spain)
European University Institute (Italy)
Migration Policy Institute Europe (Belgium)
Free University of Brussels (Belgium)
Hellenic Foundation for European and Foreign Policy (Greece)
International Center for Migration Policy Development (Austria)
Maastricht University (The Netherlands)
Osnabrück University (Germany)
Platform for International Cooperation on Undocumented Migrants (Belgium)
University of Milan (Italy)
University of Potsdam (Germany)
University of Turku (Finland)
University of Warsaw (Poland)

ASSOCIATED PARTNERS

Toronto Metropolitan University (Canada)
University of Leicester (UK)
University of Oxford (UK)

University Institute of Lisbon (Portugal)

Foundations of EU Return Policies

FAiR's aim is to generate insights into the factors that foster the Europe's return and alternatives to return policies. The project analyses the drivers of enforced return and improves the human rights monitoring of returnees. Furthermore, it tests the public acceptability of alternatives to return policies and assists international actors in reaching agreements on return.

Today's globalized world requires cooperative migration governance. Over the years, the EU and its member states have looked for cooperation from non-EU countries to secure the return of irregular migrants from Europe. Sustainable cooperation in migrant return and readmission demands legitimacy to gain the support, loyalty, and adherence of those that must comply with the rules. EU or bilateral schemes of cooperation on return are perceived as illegitimate and do not secure compliance.

Finding alternatives to return

The project FAiR analyses how EU+ countries can formulate, implement, and monitor effective and legitimate EU-wide and bilateral return policies with non-EU+ countries. Moreover, the (dis)advantages of alternatives to return policies are considered including the question which alternatives enjoy public support in EU+ countries, as there is few data available. Similarly, there is limited evidence on whether alternatives to return policies generate additional irregular migration, and whether such effects depend on the type of alternative being offered. The cooperation of universities, policy-oriented actors, and practitioners in the analysis of the problem and the identification of possible solutions reflects the transdisciplinary approach.

Finding Agreement in Return

FUNDING

EU – Horizon Europe, Culture, Creativity, and Inclusive Society (Grant agreement number 10109482)

DURATION

2023–2026

DEPARTMENT

Migration and Globalisation

PROJECT LEAD/

PARTICIPATING RESEARCHER(S)

Mathias Czaika, Appointed PhD researcher

COORDINATION

Erasmus University Rotterdam (The Netherlands)

PROJECT PARTNERS

Foundation for Access to Rights (Bulgaria)
Institute for Social Research (Norway)
Institute of Law Studies of the Polish Academy of Sciences (Poland)
International Centre for Migration Policy Development (Austria)
Koç University (Türkiye)
Migration Policy Group (Belgium)
Platform for International Cooperation on Undocumented Migrants (Belgium)
Samuel Hall East Africa Limited (Kenya)
University of Geneva (Switzerland)
University of Milan (Italy)

Preventing Radicalization in European Prisons

The project aims to contribute to preventing and decreasing radicalization and violent extremism in European prisons and the detention system by means of assessing the effectiveness of existing prevention / de-radicalization / disengagement programs and interventions. It targets on juveniles and young adults considered vulnerable and at risk of radicalization leading to violent extremism.

It is perceived that radicalization in prisons leading to violent extremism, is one of the challenges society faces. Research shows that especially young offenders detained in prison are vulnerable to the influence of others. Therefore, keeping answers and explanations simple when describing their situation are easily acceptable and subsequently can be a potential breeding ground for radicalization. On the other hand, the time spent in detention can be useful, an "engine powering positive change", helping detainees in changing their mind-set and behavior.

Knowledge for successful interventions

The project investigates successful radicalization prevention programs and interventions measures young inmates have benefited from. Furthermore, it focuses on the knowledge that prison staff and probation officers need to detect early signs of radicalization, and the training and educational needs to provide successful interventions. An overview of existing radicalization prevention programs in Europe will be developed and later accessible for prison and probation administrators, staff, front-line operators, and policymakers. The dissemination of the result involves expert discussions and the planning for training curricula for prison staff and probation officers.

Strengthening Approaches for the Prevention of Youth Radicalization in Prison and Probation Settings

FUNDING

EU – Justice Programme (JUST)

DURATION

2021–2023

DEPARTMENT

Migration and Globalisation

PROJECT LEAD/

PARTICIPATING RESEARCHER(S)

Manfred Zentner, Friedrich Altenburg, Daniela PISOIU, Federica Zardo

COORDINATION

University of Campania "Luigi Vanvitelli"

PROJECT PARTNERS

Albanian Ombudsman (Albania)
Peace Institute – Institute for Contemporary Social and Political Studies (Slovenia)
Prodos Consulting (Italy)
University of Barcelona (Spain)
University of Palermo (Italy)

Life Realities of Syrian Refugees in Europe

The SYREALITY project studies how life aspirations and plans change in the face of war and how and why they influence refugees' migration movements. Taking on a longitudinal perspective and using a participatory, multi-method, and multi-sited research design, the project focuses on Syrians who have been living in four European capitals since 2011.

As according to UNHCR statistics Syrian refugees still constitute the largest group within the estimated total of forced migrants in 2022, Syrian displacement is key to understanding forced migrants' complex (im) mobility trajectories in a protracted refugee situation. The project will focus on two central aspects: How do broader life aspirations and social class influence (im)mobilities in a context of forced displacement? And how does legal status and the context of reception in different European cities impact forced migrants' life aspirations and wellbeing?

Drivers of (im)mobility

To answer these questions the project brings together literature from sociology, migration and refugee studies, and psychology. SYREALITY follows a mixed-methods research design in Vienna, Berlin, Amsterdam, and Athens, combining a cross-national individual survey, life history interviews and cognitive maps to understand the changing nature of the challenges refugees face, the opportunities that are open to them, and their itineraries over time. With its transdisciplinary approach the project will contribute new perspectives to the literature on drivers of (im)mobility in a context of displacement. The SYREALITY project also aims to provide important insights into how the well-being of displaced populations in Europe can be improved.

Syrian Imaginations of Europe Meet Reality

FUNDING

Austrian Science Fund (FWF) – Elise Richter program (Grant agreement number V 823-G)

DURATION

2022–2026

DEPARTMENT

Migration and Globalisation

PROJECT LEAD

Lea Müller-Funk

COORDINATION

University for Continuing Education Krems

Understanding EU Migration Funding

The EU has substantially expanded the range of funds dedicated to programs and projects in the realm of migration and asylum. The MigFund project measures how, to what extent and why EU financial instruments have changed since the supra-nationalization of this policy area in the early 2000s. Furthermore, it investigates whether these EU funds are mere moneyboxes or reflect a broader understanding.

Over the years, and especially after the crisis in 2015, how to handle migration became a key political issue within the EU which led to better funding for this area. There are increasing calls for greater transparency in EU funding for migration, asylum, and integration policies. Policymakers, NGOs, international organizations, think tanks, and analysts are struggling to “follow the money” and understand how EU funds are evolving, how they are being used, and evaluated. The project addresses the need for a better understanding of the development of the EU funding landscape for migration and asylum.

Evaluation of EU funds

The project seeks to categorize and map these EU funding tools. It will measure how and to what extent they have changed since the Europeanization of this policy area in the early 2000s. One result will be the first open-access database on EU funds for migration and asylum that will support think tanks and analysts in evaluating EU tools based on standardized and comparable data. This database will serve political debates, as well as the general public, in understanding how the EU budget is programmed and implemented in the realm of migration. Additionally, the combination of parallel causes that are driving change in EU financial instruments for the governance of migration and asylum will be identified.

Analysing Change in EU Funds for Migration and Asylum

FUNDING

FWF Austrian Science Fund – ESPRIT program (Grant agreement number ESP 144-G)

DURATION

2023–2026

DEPARTMENT

Migration and Globalisation

PROJECT LEAD

Federica Zardo

Further Projects

→ Integration Knowledge for Practice – SPRING

SPRING was a two-year project focusing on the integration of refugees and other recently arrived migrants. It collected and reviewed evidence on integration policy practices. Moreover, it promoted new approaches to evaluation and learning, engaging both with academic experts on integration and “communities of practice”. Key project outputs include a portal bringing together a synthesis of research evidence for practitioners, a review of selected good practices based on a rigid analytical framework, a self-assessment tool and a toolkit for policymakers.

Funding:

EU – Horizon 2020

Project lead:

Albert Kraler, Department for Migration and Globalisation

→ Future Scenarios of European Migration – QuantMig

Managing migration has become a key issue of European policymaking. The QuantMig project aims to transform the methodology of setting and analyzing migration scenarios for the 21st century. Scenario building is about considering the complexity of these factors and the associated uncertainties. On a practical level, the project addresses the question of how to improve and harmonize migration data in Europe. The project is unique for its integrated approach, as it incorporates both the conceptual and theoretical levels and uses statistical modeling for scenarios and simulations.

Funding:

EU – Horizon 2020

Project lead:

Mathias Czaika, Department for Migration and Globalisation

Participating researchers:

Heidrun Bohnet, Akira Soto-Nishimura, Federica Zardo

→ Integration in Small Towns – Whole-COMM

Whole-COMM analyses the integration of post-2014 migrants and related policies in small to medium-sized towns and rural areas. The project examines communities from a holistic perspective and by means of a systematic comparative study across 10 countries and 49 localities. The project aims at a better understanding of the dynamics and mechanisms involved in the interaction between integration policy, social cohesion, and fragmentation at a local level, thus making a contribution to political debate.

Funding:

EU – Horizon 2020

Project lead:

Albert Kraler, Department for Migration and Globalisation

→ Effective Migration Management – MIGNEX

The management of migration and the interactions between migration and development are the subject of ongoing research in the MIGNEX project. MIGNEX is driven by one overarching objective: To contribute to more effective and coherent migration management through an evidence-based understanding of the linkages between development and migration. Fieldwork has been completed in ten home and transit countries as the foundation for in-depth analyses. Through an evidence-based understanding of interdependencies, it is assumed that the management of migration can be made more coherent and thus effective.

Funding:

EU – Horizon 2020

Project lead:

Mathias Czaika, Department for Migration and Globalisation

Participating researcher:

Zina Weisner

Knowledge and Technology-Transfer & Dissemination

Science-to-Science:

→ **Organization of the 7th Bi-annual Conference on Migration Research in Austria** from 26–28 September 2022 at University for Continuing Education Krems in cooperation with ÖAW/KMI and University of Vienna.

→ **Organization of the PhD Conference on Migration Research in Austria** on 28 September 2022 at Danube University Krems in cooperation with University of Graz, University of Salzburg, University of Innsbruck, and University Salzburg.

→ **Participation of the academic staff at the IMISCOE annual conference** from 29 June–1 July 2022 in Oslo with presentations by Ali Ahmad Safi, Lea Müller-Funk, Simona Schreier, Zina Weisner and Mathias Czaika.

→ **Faculty Talk: Online Discussion about “Transnational Identity and Belonging”** with key notes from Ludger Pries, Ruhr-University Bochum, Cengiz Günay and Verdran Dzihic, OIIP, Vienna.

→ **Online interdisciplinary research seminar series** on various current migration topics, e.g. Migration, Displacement and Mobility in the Ukraine; Afghanistan, Afghan Diaspora, Militant Mobilization and Exile; Asian Scientists on the Move as well as Delivering and (Re-) Producing Social Inequalities in a Diverse Society.

Science-to-Public:

→ Youth in Urban Space:

2 surveys and 20 group discussion with young people and youth workers in Vienna, Helsinki, Milan, and Stuttgart within ERASMUS+ Project Youth in Urban Space to develop guidelines on how out-reach and mobile youth work can react on the impact of the Corona pandemic and encourage the use of public space by young people.

→ Dialogforum Migration and Integration:

In 2022, the Department for Migration and Globalisation has once again held the Dialogforum with the topic Refugee Entrepreneurship – What We Know, What Exists, What We Need. This important platform for the dissemination of knowledge and exchanges between scientists, politicians and practitioners was held in yearly follow-ups since 2010.

→ “Symposium Dürnstein”:

The department acts on behalf of the University for Continuing Education Krems as a cooperation partner for the annual platform concerning issues such as migration.

→ DELMI-Report:

Mathias Czaika together with Rainer Münz have prepared policy recommendation for the topic Climate Change, Displacement, Mobility and Migration: The State of Evidence, Future Scenarios, Policy Options.

Selected Publications

→ Czaika, M.; Reinprecht, C. (2022): Why do people stay put in environmentally stressful regions? Cognitive bias and heuristics in migration decision-making. *Regional Environmental Change* 22, 84, doi: 10.1007/s10113-022-01934-y.

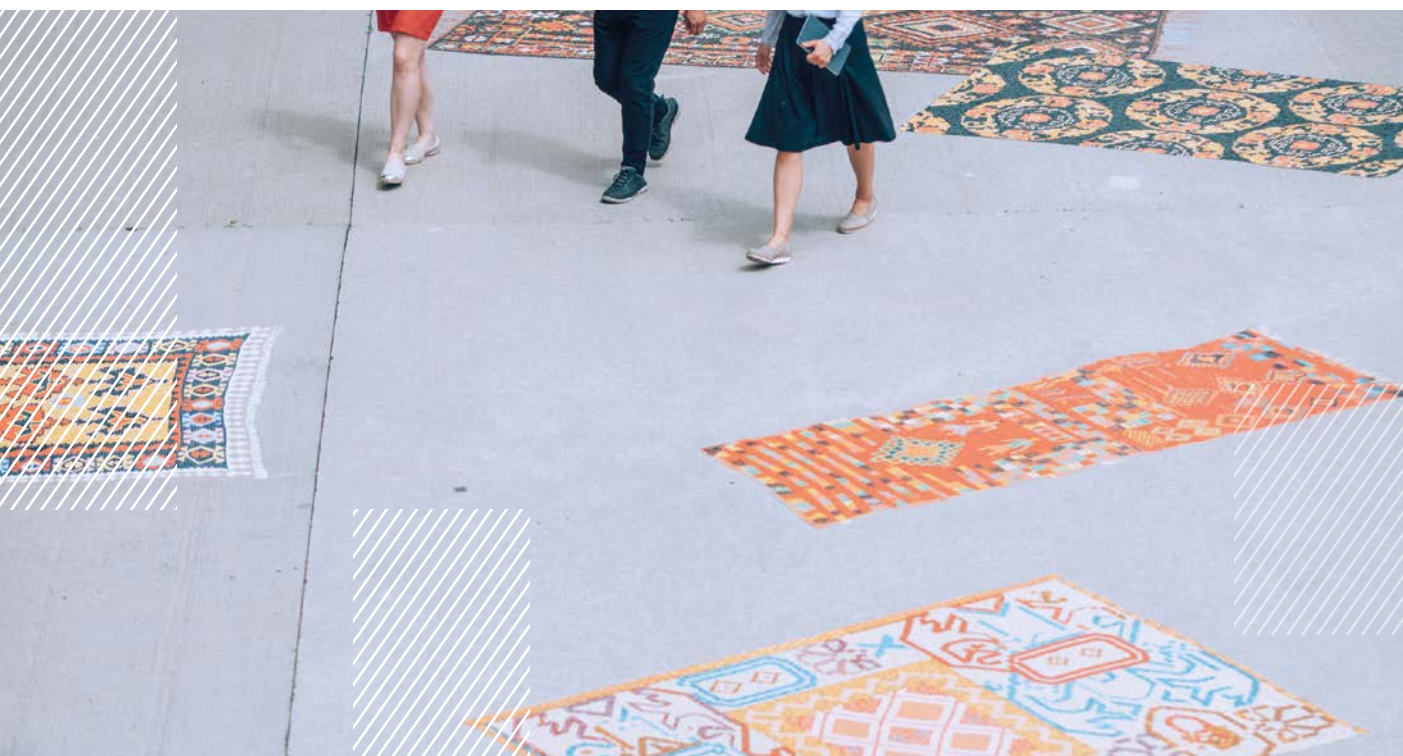
→ Deters, H.; Zardo, F. (2022): The European commission in Covid-19 vaccine cooperation: leadership vs coronationalism? *Journal of European Public Policy*, 1-21, doi: 10.1080/13501763.2022.2064900.

→ Ferreira, N.; Kea, P.; Kraler, A.; Wagner, M. (2022): The EU and protracted displacement: providing solutions or creating obstacles? *Journal of Ethnic and Migration Studies*, 48(18), 4436–4455.

→ Müller-Funk, L.; Fransen, S. (2022): ‘I will return strong’: The role of life aspirations in refugees’ return Aspirations. *International Migration Review*, doi: 10.1177/01979183221131554.

→ Czaika, M.; Reinprecht, C. (2022): Migration Drivers: Why Do People Migrate? -In: Scholten, P. (ed.): *Introduction in Migration Studies*, 49–82.

→ Zardo, F.; Wolff, S. (2022): Decentering the study of migration governance in the Mediterranean. *Geopolitics*, 27(3), 687–702.



Migration Studies is one of the most dynamically evolving research areas in social sciences and is characterized by its interdisciplinary research perspectives. The aim of the PhD program Migration Studies is to gain a better understanding of migration and integration process, the role of states in these complex societal processes, the drivers and barriers of migration, the challenges and opportunities experienced by emigration and immigration countries to ensure well-being and social cohesion.

→ "Migration and Social Peace" – Interdisciplinary Environmental Research

Name: Dino Pitoski

Title of the dissertation: The Complex Network of Human Migration: Inputs for European Migration Policies

Project description: This project examines two interrelated aspects of migration; primarily, migration flows, and secondarily, migration factors. Within the aspect of migration flows, the research concentrates on exposing the comprehensive means to analyse and report on migration at the level of human settlements: cities, towns and villages in the context of internal migration in Austria and Croatia. Within the aspect of migration factors, the research is dedicated to systematizing knowledge on the various economic, demographic, cultural, political, (etc.), factors evidenced in scientific literature as defining the migration flows: the so called "migration drivers". For policymakers, this identification allows to know, and subsequently influence the causes that bear the most effect on migration.

Funding: Asylum, Migration and Integration Fund – Federal Ministry of Internal Affairs (BMI)

→ Afghan Diaspora in Europe: The Agents of Peace and Development

Name: Safi Ali Ahmad

Title of the dissertation: Afghan Diaspora in Europe: The Agents of Peace and Development

Project description: The Afghan migration of the last forty years is due to invasions, the civil war and the rule of the Taliban government. This led to the emergence of Afghan diaspora communities and transnational organizations in many European countries. The project examines the ways in which diaspora organizations and their members participate in the development of their "homeland".

Funding: GFF NÖ

→ Smart Migration and Asylum Governance

Name: Shaddin Almasri

Title of the dissertation: Refugee Inclusion—for Whom? The Political Economy of Nationality-Based Refugee Aid and Inclusion Policy

Project description: This research project examines the recent history of international cooperation in refugee assistance. It critically analyzes how problems arise for refugees in host countries, as these aid structures often designate certain nationalities of refugees as beneficiaries of support, inclusion and protection measures, leaving other populations out of consideration. It looks at the recent cases of the Jordan Compact, the Ethiopian Job Compact and the EU-Türkiye refugee agreement. This project contributes to a new understanding of these often-criticized aid deals and their impact on refugees.

Funding: Federal Ministry of Internal Affairs (BMI)

→ Smart Migration and Asylum Governance

Name: Gabriele De Luca

Title of the dissertation: Assessing Extraterritorial Interventions on the Basis of Agent-Based Modelling

Project description: The focus of the PhD research is on upstream migration policy interventions measured in or by countries of origin and transit. It also explores how such measures affect migration decisions and what this means for the design of effective governance and cooperation. The methodology used to conduct the research is agent-based modeling for social sciences.

Funding: Federal Ministry of Internal Affairs (BMI)

→ Measures for a More Successful Social Integration of Young Syrian Refugees into Host Societies: A Comparative Study of the Social Integration and Sense of Belonging of Young Syrian Refugees in Austria

Name: Christina Khoury

Title of the dissertation: Measures of a More Successful Social Integration of Young Syrian Refugees in Austria

Project description: This project examines the social integration of young Syrian refugees in Austria. Different perspectives of social integration are addressed in three sub-projects that examine the impact of social integration on mental wellbeing and the role of state policies and practices in influencing well-being and social integration of refugees.

Funding: GFF NÖ

→ Return and Reintegration Processes: A Focus on Nigeria

Name: Simona Janine Schreier

Title of the dissertation: From Returning Back to Reintegration? A Focus on Nigeria

Project description: Assisted voluntary return of migrants is omnipresent in politics as it is one of the attempts to reduce irregular migration. To obtain deeper insights into the concept of return and reintegration, this project examines the national specificities and general processes between Austria and Nigeria as a country of origin of migrants in relation to their return and reintegration.

Funding: GFF NÖ

→ Quantifying Migration Scenarios for Better Policy?

Name: Akira Soto-Nishimura

Title of the dissertation: Connecting (anti-)Immigrant Attitude to Migration Policy, Internal Migration, and International Migration

Description of the Project: This project is devoted to the effect of anti-immigrant attitudes on migration policy and the effect of migration drivers on the inflow of different legal categories of migration (student, family, labor, asylum, and irregular migrants) to Europe. The method of analysis for both aspects of the project relies on scale datasets and sophisticated statistical techniques, such as pseudo poisson regressions. As part of the analysis of migration drivers, a quantitative assessment of the literature on migration drivers was conducted to determine how robust migration drivers are in terms of the statistical significance and effect direction.

Funding: EU – Horizon 2020

→ Labour Market Integration of Refugees in Welfare States: Austria in International Comparison

Name: Isabella Skrivaneck

Title of the dissertation: Refugees and their impact on integration and welfare systems. Lessons from Austria

Project description: This dissertation project takes the integration measures for refugees that have evolved in Austria since 2015 as a starting point to examine the complex structures and interactions between different levels of governance, policy areas and actors. It analyses when, how and why integration policy represents a new distinct policy field in Austria, focuses on the specific role of federal states in this regard and discusses the implications of these developments for the Austrian welfare state model.

Funding: Anniversary Fund of the Oesterreichische Nationalbank

→ Smart Migration and Asylum Governance

Name: Zina Weisner

Title of the dissertation: The Migration-Development-Security Complex from a Multi-Level Governance Perspective

Description of the Project: The project aims to contribute to a better understanding of the impact of (external) policies in the field of migration and asylum. In particular, it examines the local impacts and repercussions of EU external migration governance on the protection of migrants and refugees. Specific case studies include the practices and policies of the European border regime and the impact of EU aid policies for managing migration in third countries.

Funding: Federal Ministry of Internal Affairs (BMI)



The research performed by the Department for Building and Environment revolves around the environmental challenges facing the building sector, above all climate change, but also those of rapid growth in land use and the effects this has on settlement structures, not only in Europe, but also in Asia and on the African continent. Aspects considered include economic, ecological and social sustainability in construction, economic and ecological life cycle assessment, building climate adaptation and utilization of existing buildings in the context of climate change. The research objective is to develop clear recommendations for practical action by applying the principle of sustainability and transdisciplinarity.

Inclusive Housing for People with Mental Health Needs

The project investigates inclusive housing projects in Austria and assesses their suitability for rural and small-town contexts in Lower Austria. Against the background of the UN-Convention on the Rights of Persons with Disabilities and in cooperation with individuals with complex mental health needs as citizen scientists, the project aims to develop scenarios for inclusive housing projects.

International and European developments in de-hospitalization and de-institutionalization have led to the closure or downsizing of former hospital units and the development of community-based mental health support models. Yet, expectations that community care would lead to full integration have not yet been met. Many people still either live in various forms of sheltered and group-based housing or inhabit community-based “ghettos’ for the mentally ill” where social contacts are minimal. In Lower Austria, figures for 2019 indicate that 40 percent of adults with complex mental health needs were still living in institutionalized settings with more than 17 residents. Hence, the project aims to establish which socio-spatial framework conditions enable vulnerable people in Lower Austria to enjoy self-determined living and social inclusion.

Scenario planning together with citizen scientists

The project will collect and map data on relevant spatial contexts and socio-structural factors and also interview individuals about their biographical housing pathways, what housing means to them and their current living conditions. Learnings from the analysis of collaborative housing projects in Austria and neighboring regions will be translated into concrete scenarios for potential, inclusive housing projects in Lower Austria. With staff of a local care provider as citizen scientists at its core, this process engages with individuals who have complex mental health needs and their families as well as with relevant stakeholders.

Socio-spatial Framework Conditions for Inclusive Housing for Persons with Complex Mental Health Needs in Rural and Small-town Areas

FUNDING

GFF NÖ (FTI-Strategie Niederösterreich 2027, FTI call Projects/Basic Research)

DURATION

2023–2026

DEPARTMENT

Building and Environment

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Tania Berger, Elisabeth Huber

COORDINATION

University for Continuing Education Krems

PROJECT PARTNERS

St. Pölten University of Applied Sciences
Berta von Suttner Privatuniversität St. Pölten

Qualifying Construction Experts to Meet Climate Targets

What competences are required in the building sector in Austria to achieve the national and EU energy and climate targets and to systematically implement the Energy Performance of Buildings Directive (EPBD)? As part of this project, a national and broadly coordinated qualification roadmap for the construction sector will be developed by an interdisciplinary team in close cooperation with relevant stakeholders.

The building sector is responsible for approximately 40 percent of energy consumption and 36 percent of greenhouse gas emissions in the EU. The education and training of professionals in building design and refurbishment must take this into account so that climate protection targets can be achieved. Within the framework of the project, a national education and training roadmap for the Austrian building sector is being developed. This should ensure that professionals working in the planning and construction of buildings are equipped with the skills needed to achieve the climate targets for 2030 and beyond.

Developing a national qualification plan

At the center of the project is an analysis of the current national status quo, respectively the specification and quantification of the demand for skilled labor in the construction sector, and the development of a national qualification plan for professionals in the building sector to achieve the energy targets by 2030 and beyond. The project will also bring together the most important Austrian stakeholders in the field of education and training in the construction sector by establishing a national skills platform. To successfully implement the project involving stakeholders in the process of redesigning and relaunching the national qualification platform is crucial.

Reboot BUILD UP Skills

FUNDING

EU, Programme for the Environment and Climate Action (LIFE), LIFE-2021-CET-BUILDSKILLS — LIFE-2021-CET

DURATION

2022–2024

DEPARTMENT

Building and Environment

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Christina Ipser, Gregor Radinger, Christina Ipser, Gregor Radinger, Filiz Keser-Aschenberger

COORDINATION

Austrian Energy Agency

PROJECT PARTNERS

Austrian Energy Agency
University for Continuing Education Krems
TU Graz, Graz University of Technology
Austrian Institute for Research on Vocational Education and Training
Styria Energy Agency

Strategies on Cooling Buildings

The project CoolBRICK aims to define passive cooling strategies for buildings, by maximizing natural night ventilation while utilizing brick masses as heat storage. At two identical small buildings different control strategies for night ventilation and opening situations are evaluated “in situ” to help drafting guidelines for a real-life setup of such systems.

The rise of average temperatures and more frequent extreme heat periods are a consequence of climate change, challenging the resilience of buildings. Night temperatures as a basis for highly energy-efficient ventilative cooling reduce indoor temperatures and thus maintain the well-being of the occupants. The project pursues to answer how different control strategies for automated night ventilation systems achieve the highest cooling potential. In addition, the usable transient heat storage capacity of solid brick constructions shall be determined.

Knowledge for new standards

One of the outcomes of the project is the comparison of the effectiveness of different control strategies for ventilative cooling in order to develop a cooling guideline that takes into account the potential of outdoor night temperatures. This groundwork provides a basis for the proposed adaptations to ÖNORM B 8110-3. In parallel, the results of the storage mass management for brick walls form an input for the updating process of this standard to enable calculations with higher accuracy. Finally, the exact effects of opaque building components on solar heat gains are also part of the standard update for the calculation of heating and cooling demand of residential and non-residential buildings.

Development of Normative Calculation Approaches for Passive Ventilative Night Cooling Strategies – Utilization of Brick Storage Masses

FUNDING

Austrian Research Promotion Agency (FFG) – Collective Research; Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology

DURATION

2020–2024

DEPARTMENTS

Building and Environment
Integrated Sensor Systems

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Markus Winkler, Thomas Bigler, Aleksey Bratukhin, Albert Treytl, Klaus Winiwarter

COORDINATION

Austrian Association for Building Materials and Ceramic Industries

PROJECT PARTNERS

Austrian Brickworks Association
Salzburg University of Applied Sciences
Velux Austria
ZAB – Zukunftsagentur Bau

Knowledge and Technology-Transfer & Dissemination

Science-to-Science:

→ **Forum Building Science:** Annual conference on current developments and research results concerning the work of the Department for Building and Environment

Science-to-Public:

→ **In the frame of LECTURES 4 FUTURE** at the Vetmeduni Vienna, summer term 2022 (Prof. Günther Schaubberger), Gregor Radinger and Christine Rottenbacher held the two courses "Vernakuläre Architektur in Österreich im Kontext des historischen Klimawandels" and "Aktuelle Konzepte zur Erfassung von Ökosystemleistungen".

Selected Publications

- Singh, B.; Berger, T.; Parmar, M. (eds.) (2023): Negotiating Resilience with Hard and Soft City, Routledge, Oxfordshire.
- Berger, T.; Chundeli, F.; Pandey, R.; Jain, M.; Kumar Tarafdar, A.; Ramamurthy, A. (2022): Low-income residents' strategies to cope with urban heat. Land Use Policy, 119, 106192.
- Brachtl, S.; Ipsier, C.; Keser Aschenberger, F.; Oppl, S.; Pakoy, E. K.; Radinger, G. (2023): Physical home-learning environments of traditional and non-traditional students during the COVID pandemic: exploring the impact of learning space on students' motivation, stress and well-being. Smart Learning Environments, 10, 7/2023.





Research on aquatic ecosystems is the primary mission of WasserCluster Lunz. As part of that mission, its Aquatic Lipid Research and Ecotoxicology research group (LIPTOX), established through the University for Continuing Education Krems, focuses specifically on aquatic food webs. Aquatic organisms ingest dietary nutrients, but also toxic substances. LIPTOX investigates the source and composition of the diets found in different bodies of water. Of particular interest are questions as to which foods have the most nutrient-rich and physiologically required compounds, especially lipids and their fatty acids, and which diets convey the fewest potentially toxic substances. This is important for aquatic organisms, but also for humans as end users at the top of the food chain. WasserCluster Lunz is a joint research center of the University for Continuing Education Krems, the University of Vienna, and the University of Natural Resources and Life Sciences, Vienna.

Evolving Cognitive Skills in Wild Fish

In cooperation with international project partners, the project 4FatQs investigates the importance of dietary omega-3 fatty acids for wild fish to develop cognitive skills. Thus, the project will provide knowledge regarding the management of wild fish populations as well as for the welfare of fish in aquaculture.

The aim of the FWF funded project 4FatQs is to understand how the availability of n-3 LC-poly-unsaturated fatty acids (PUFA) in diet affects the development and evolution of the brain of salmonids living in an experimental system of a wild European riverine. The project follows the framework of four essential equations (adaptive function, phylogenetic comparison, underlying mechanisms, ontogenetic and development history) proposed by Nikolass Tinbergen. The researchers examine how diet quality influences the density of neurons and in which ways these alternations are related to cognitive skills of individuals.

Answering fundamental questions

The findings will substantially advance our understanding in the field of cognitive and ecological research, being the first study that will link—at an individual level—available vital dietary biomolecules with brain biochemical and cellular composition, cognitive skills, personality traits and ecological niche of wild animals. Apart from answering fundamental ecological and evolutionary questions, the knowledge acquired during this project is applicable to managing wild fish populations as well as to the welfare of fish in aquaculture. Furthermore, it is of interest for researchers specialized in disciplines such as physiology, functional ecology, evolutionary biology, and invasion and conservation biology.

The Importance of Dietary Omega-3 Fatty Acids for Development of Cognitive Skills in Wild Fishes through the Lens of Tinbergen's Four Essential Questions

FUNDING

Austrian Science Fund (FWF) – stand-alone project (Grant agreement number P 35515-B)

DURATION

2022–2025

DEPARTMENT

Biomedical Research

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Libor Závorka – WasserCluster Lunz, Martin Kainz

COORDINATION

WasserCluster Lunz

PROJECT PARTNERS

Charles University in Prague, University of Glasgow

Fueling Incredible Journeys

The HydroFly project examines long-distance monarch butterfly migration to determine where the fatty acids needed to fuel migration and meet physiological needs (e. g. navigation) are acquired across North America. The spatial origins of fatty acids from dietary sources along migratory routes will be investigated using H and C stable isotope tracers.

In a collaborative effort with project partners from Canada, Mexico, and the USA, the FWF-funded project HydroFly aims to advance a new biochemical analysis of component-specific stable-hydrogen and stable-carbon isotope ratios to unravel aspects of animal migration ecology that have previously proven intractable with conventional approaches such as mark-and-recapture. The project seeks to establish whether H and C stable isotopes of fatty acids in migrating monarch butterflies are reliable tracers of the provenance of their dietary resources. Furthermore, the research project explores whether H and C stable isotopes of fatty acids can be used to map dietary resources along the migration routes of monarch butterflies with a view to informing conservation efforts.

Mapping the origins of lipid resources

Results from this international project will also apply to other migratory insects and species such as birds. Fatty acid stable-isotope analyses will provide a foundation for mapping the origins of lipid resources and thereby reveal where resources are most needed to ensure long-term conservation goals. The project blends multi-disciplinary ecological, biological, geospatial and nuclear sciences expertise to solve crucial questions of migratory animal conservation.

Fueling Incredible Journeys: Stable Isotope Tracing the Origin and Allocation of Essential and Non-essential Fatty Acids Powering Continental Insect Migrations

FUNDING

Austrian Science Fund (FWF) – stand-alone project (Grant agreement number P 36013-BBL)

DURATION

2023–2026

DEPARTMENT

Biomedical Research

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Leonard Wassenaar – WasserCluster Lunz,
Martin Kainz, Mathias Pilecky

COORDINATION

WasserCluster Lunz

PROJECT PARTNERS

University of Mexico, Mexico
University of Western Ontario, Canada

Further Projects

→ Tracing Organic Materials

The aim of the HydroEcol project is to establish reproducible novel procedures to determine 2H/1H ratios for the non-exchangeable H of new international organic reference materials (e. g., wood, hair, flour, honey, amino acids, collagen), eventually leading to their widespread adoption by the global scientific community and global stable-isotope laboratories. By enabling hydrogen isotope biogeochemistry to track plants and animals, the results of the project will advance the science of ecology, paleoecology, drug authentication, environmental crime, and food traceability.

Funding:

Austrian Science Fund (FWF) – Stand-alone project

Project lead:

Leonard Wassenaar, WasserCluster Lunz

→ Improving Fish Feed Quality

The GARANT2022 project investigates how fish feed containing different types and quantities of fat affects the growth (somatic growth) of wild rainbow trout and the development of their organs. For this purpose, food containing different types and quantities of fatty acids is provided. The project examines how to improve feed quality and the somatic growth of fish and seeks to gain a better understanding of how consumers in the aquatic food chain react to feed with varying nutritional and energy content.

Funding:

GARANT Tiernahrung GmbH

Project lead:

Martin Kainz, Research Lab Aquatic Ecosystem Research and Health

Knowledge and Technology-Transfer & Dissemination

Science-to-Science:

Presentation of papers at various scientific conferences, e. g.:

→ **International Society of Limnology (SIL) conference**, Berlin, Germany, 7–10 August 2022

→ **International Society of Limnology (SIL) Austria meeting**, Illmitz, 30 September 2022

→ **Joint European Stable Isotope Users Group Meeting (JESIUM)**, 10–14 October 2022, Kuopio, Finland

→ **12th International Conference on the Applications of Stable Isotope Techniques to Ecological Studies (IsoEcol)**, 19–21 May 2022, Gaming, Austria

→ **SETAC Europe 32nd Annual Meeting**, Copenhagen, 15–19 May 2022

Invited talks by Martin Kainz in 2022 at:

→ **“D-A-CH Algen Summit”, Federal Ministry of Climate Action, Environment, Energy, Mobility, Innovation and Technology**, 11–12 October 2022, Vienna, Austria.

→ **Austrian Society of Nutrition**, 13 May 2022, Graz.

→ **The 4th Stable Isotope Course in Ecology and Environmental Sciences**, Sevilla, 22–25 February 2022.

Science-to-Public:

→ **Numerous reports on the research activities of the LITPOX research group at WasserCluster Lunz** published by sincere media corporations such as ORF, Der Standard, Kurier and others.

Selected Publications

→ Li, P.; Wang, R.; Kainz, M. J.; Yin, D. (2022): Algal density controls the spatial variations in Hg bioconcentration and bioaccumulation at the base of the pelagic food web of Lake Taihu, China. *Env. Sci. & Technol.*, doi: 10.1021/acs.est.2c05625.

→ Zheng, S.; Wang, R.; Kainz, M. J.; Liu, C.; Li, P.; Li, Z.; Yan, H.; Yin, D. (2022): How phytoplankton biomass controls metal(loid) bioaccumulation in size-fractionated plankton in anthropogenic-impacted subtropical lakes: a comprehensive study in the Yangtze River Delta, China. *Water Res.* 224, 119075, doi: 10.1016/j.watres.2022.119075.

→ Zavorcka, L.; Blanco, A.; Chaguaceda, F.; Cucherousset, J.; Killen, S. S.; Lienart, C.; Mathieu-Resuge, M.; Nemeč, P.; Pilecky, M.; Scharnweber, K.; Twining, C. W.; Kainz, M. J. (2022): The role of vital dietary biomolecules in eco-evo-devo dynamics. *Trends Ecol. Evol.*, doi: 10.1016/j.tree.2022.08.010.

→ Pilecky, M.; Zavorcka, L.; Soto, D. X.; Guo, F.; Wassenaar, L. I.; Kainz, M. J. (2022): Assessment of compound-specific fatty acid 13C and 2H values to track fish residency and mobility in a small subalpine catchment. *Env. Sci. Technol.*, 56, 11051–11060, doi: 10.1021/acs.est.2c02089.

→ Shipley, J. R.; Twining, C.; Mathieu-Resuge, M.; Preet Parmar, T.; Kainz, M. J.; Martin-Creuzburg, D.; Weber, C.; Winkler, D. W.; Graham, C. H.; Matthew, B. (2022): Climate change shifts the timing of nutritional flux from aquatic insects. *Current Biol.*, doi: 10.1016/j.cub.2022.01.057.

→ O'Mara, K.; Venarsky, M.; Stewart-Koster, B.; McGregor, G.; Schulz, C.; Marshall, J.; Bunn, S. E.; Kainz, M. J. (2022): Trophic transfer of lipids and fatty acids across habitats in tropical river food webs. *Freshw. Biol.*, doi: 10.1111/fwb.13889.

Main field of research:
Evidence-Based Health Research



Evidence-Based Health Research

→ Evidence-based Medicine, Health Care Management and Public Health



The rapid expansion of medical knowledge necessitates the careful filtering of information for scientists, decision-makers, and laypersons to ensure that evidence-based and accurate data inform sound health decision-making. The Department of Evidence-based Medicine and Evaluation rigorously and independently analyzes scientific findings for physicians, nursing staff, caregivers, patients, and healthcare decision-makers. Key priorities include generating systematic evidence syntheses, assessing health-promoting programs, and disseminating scientific findings. The Department for Economy and Health investigates incentive systems and resource use within the healthcare sector, taking into consideration demographic shifts, technological progress, and digitalization to support the healthcare system which continually faces the challenge of effectively and efficiently utilizing increasingly limited resources.

Systematic Reviews of Scientific Evidence

Cochrane Austria is carrying out this project on behalf of the European Executive Agency for Health and Digital Affairs (HaDEA) together with Cochrane Germany, Cochrane Ireland, the German Robert Koch Institute and PricewaterhouseCoopers Luxembourg. The aim of the project is to support EU member states in their decisions on national vaccination plans.

The project aims to conduct systematic reviews or rapid literature reviews of scientific evidence in the field of vaccines and/or vaccination programs, including those for COVID-19. Work includes the preparation, planning, structuring and delivery of online training in methodologies for assessing evidence and conducting reviews, syntheses and evaluations, and their subsequent translation into technical documents/guidance. The project also includes capacity-building activities, such as online meetings, staff exchanges and continuous access to strengthen collaboration and the sharing of information by the EU/EEA National Immunization Technical Advisory Groups (NITAGs) Collaboration.

Improving vaccination programs

The main aim of the project is to strengthen consistency, transparency, and methodologies in the assessment of national and regional vaccination plans, by sharing scientific evidence and tools with the support of NITAGS of EU member states.

European Health and Digital Executive Agency (HaDEA): Service Contract for Systematic Reviews of Scientific Evidence on Vaccines and Capacity Building Activities

FUNDING

European Health and Digital Executive Agency (HaDEA) based on EU4Health Work Programme 2021 topic CP-p-04.1

DURATION

2022–2026

DEPARTMENT

Evidence-based Medicine and Evaluation

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Isolde Sommer, Gernot Wagner, Dominic Ledinger, Brigitte Piso, Andreea Dobrescu, Gerald Gartlehner

COORDINATION

University of Freiburg

PROJECT PARTNERS

Medical University Freiburg (Cochrane Germany)
National University of Ireland Galway (Cochrane Ireland)
Robert Koch Institute, Germany
PriceWaterhouseCoopers Luxembourg

Becoming Equipped to Tackle Epidemics Right

The goal of BETTER is to use real-world data from the COVID-19 (coronavirus disease 2019) pandemic to model hypothetical decision-making scenarios that are applicable to future (non-COVID-19) epi- or pandemic situations. Concrete recommendations for health policy decision-makers will be developed to improve the preparedness for future public health crises due to infectious diseases.

The project examines which political and epidemiological decisions or lack thereof stakeholders perceive as having had the greatest impact on the health system, and on psychosocial, epidemiological, and economic outcomes during the pandemic. Second, the project considers decision-making scenarios and asks which decisions would have had the least harmful and greatest beneficial impacts on the health system, and on psychosocial, epidemiological and economic outcomes.

Health in all policies

BETTER will generate insights into the conditions and factors associated with the policies that shaped the course of the pandemic in Vienna, Lower Austria, and Austria as a whole. Such insights are essential to guide future planning. Specifically, the findings of BETTER will provide the most solid, up-to-date, evidence-based foundation for developing an innovative epi- and pandemic response plan. The distinction between urban and rural settings makes results highly applicable to both, the more densely populated and interconnected cityscape of Vienna and the less densely populated landscape of Lower Austria. Furthermore, the active involvement of stakeholders and citizens will provide an evidence base that extends beyond pandemic preparedness to strengthen "health in all policies".

Becoming Equipped to Tackle Epidemics Right

FUNDING

Vienna Science and Technology Fund (WWTF), Life Sciences 2022 – Public Health

DURATION

2023–2026

DEPARTMENT

Evidence-based Medicine and Evaluation

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Gerald Gartlehner, Christina Kien, Andrea Chapman, Pauline Klingenstein

COORDINATION

Medical University of Vienna
Project Partners
Medical University of Vienna
University of Technology Vienna

Tailoring De-implementation Strategies

Low-value care (LVC) involves health care practices that provide minimal or no health benefit to patients. These practices pose a significant financial and ethical problem, especially in developed countries. Awareness-raising campaigns have had only limited impact in terms of reducing LVC. The project explores how to best select and tailor de-implementation strategies.

This project has three core aims: Firstly, to evaluate the effectiveness of de-implementation strategies in relation to LVC practices, settings, and the stakeholders who are addressed. Secondly, the project investigates how de-implementation strategies can be selected and tailored from a multi-level perspective taking the inappropriate use of antipsychotics or urinary catheters in geriatric patients as examples of LVC. Thirdly, to explore how existing and previously published de-implementation projects were planned and realized.

Tackling de-implementation

To achieve these aims, the researchers are conducting an overview of systematic reviews of de-implementation studies. In addition, they are compiling qualitative systematic reviews of barriers and facilitators. They are also synthesizing the results of research on the effectiveness of de-implementation strategies in connection with the inappropriate use of antipsychotic medication or urinary catheters in geriatric patients. Focus groups and interviews carried out in Austria and Switzerland are used to investigate determinants for the de-implementation of these two LVC practices on multiple levels. Based on clinical evidence, psychological, sociological and organizational theories will also be used to understand how to tackle de-implementation.

De-implementation of Low-value Care in Geriatric Patients Using a Multi-level Perspective

FUNDING

GFF NÖ (FTI call basic science); (Grant agreement number GLF21-1-003)

DURATION

2023–2026

DEPARTMENT

Evidence-based Medicine and Evaluation

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Isolde Sommer, Christina Kien, Pauline Klingenstein, Anna Glechner

COORDINATION

University for Continuing Education Krems

PROJECT PARTNERS

University of Zurich, Institute for Implementation Science

Pharmacological Treatment of Migraine Attacks

Migraines affect 14 percent of the population, making them one of the highest cause of years lived with disability. Patients need therapies providing reliable pain and symptom relief with minimal adverse effects. The American College of Physicians has commissioned a systematic review and meta-analyses to support guidelines on the pharmacological management of acute episodic migraine attacks.

The key question of this project is: What are the comparative benefits and harms of the selected pharmacological treatments in adult patients with acute episodic migraine attacks? The systematic review evaluates the direct and indirect (through network meta-analysis) comparisons of selected pharmacological treatments in patients with acute episodic migraine attacks.

Efficacy and cost-effectiveness

Results will reflect both the efficacy (i. e., pain relief; sustained headache relief) and the safety (e. g., chest pain) of the interventions to support the American College of Physicians guideline panel in their review of the current evidence. In addition, this project also includes two rapid reviews. The results of one rapid review indicates patient values and preferences on pharmacological management of acute migraine attacks, how patients value outcomes of interest, how patients weigh benefits and harms of pharmacologic interventions for acute migraine attack, and how they use these in their treatment decision making. The other rapid review will indicate the cost-effectiveness of the various pharmacologic interventions and formulation type.

Pharmacological Management of Acute Attacks of Migraine

FUNDING

American College of Physicians

DURATION

2023–2024

DEPARTMENT

Evidence-based Medicine and Evaluation

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Gerald Gartlehner, Andrea Chapman, Andreea-Iulia Dobrescu, Emma Persad, Gernot Wagner, Arianna Gadinger, Johanna Feyertag

COORDINATION

University for Continuing Education Krems

Community Health Nursing in Lower Austria

Since 2021, community nurses have been deployed in Austria within a framework of selected pilot projects. Community health nursing aims to enhance health literacy, combat social isolation and co-plan with the client for a potential support need. A vision is to ensure that people can live independently (and, ideally, in good health) in their family homes for as long as possible.

Referencing international best practices, the project evaluates the services provided by community nurses in Lower Austria. To this end, an online survey records the nurses' service portfolios (including the distribution of their working hours), the intensity of inter-professional coordination activities and nurses' job satisfaction during the pilot phase. In addition, the study weighs the impact of communal support and assesses to what extent community nurses complement or replace other health professionals.

Learning from pilot projects

An experiment will review community health nursing's ability to improve the health status of the population served. In 13 selected communities in the Waldviertel region, five out of ten nurses will be trained in motivation-enhancing techniques to engage their clients in moderate walking behaviour. All nursing activities and client conditions will be tracked to assess the impact of this prototype intervention on falls prevention and broader health promotion.

Towards sustainable community nursing

The study aims to identify activities and collaborations that lend themselves to designing bespoke interventions and developing sustainable community nursing structures. All issues are addressed from a sociological, psychological and economic perspective.

Community Health Nursing in Lower Austria

FUNDING

NoeGUS23

DURATION

2021–2023

DEPARTMENT

Economy and Health

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Walter Hyll, Doris Behrens, Raimund Kovacevic, Marlene Kritz, Eva Krzczal

COORDINATION

University for Continuing Education Krems

PROJECT PARTNERS

This community health nursing project is carried out within the framework of the Centre for Evidence-based Health Economics, funded by NÖGUS (Lower Austrian Health and Social Fund); the study is co-financed by internal funding of the University for Continuing Education Krems.

Further Projects

→ Cochrane Public Health Europe

Cochrane Public Health Europe (CPHE) is an association of organizations from Austria, Germany and Switzerland that has represented the Cochrane Public Health Group (CPH) in Europe since 2015. Within the international network, CPH focuses on systematic reviews of the effects of public health interventions. The purpose of the cooperation is to disseminate research evidence concerning public health topics among decision-makers in the public health sector, to support other researchers in conducting public health reviews and to engage with national and European public health institutions.

Funding:
NÖGUS

Project lead:
Christina Kien, Department of Evidence-based Medicine and Evaluation

Participating researchers:
Ursula Griebler, Irma Klerings, Gerald Gartlehner

Partners:
Pettenkofer School of Public Health, Institute for Medical Information Processing, Biometry and Epidemiology, Ludwig-Maximilians-University, Munich, Germany
Health Sciences Bremen comprising the Institute for Public Health and Nursing Research, the University of Bremen and Leibniz Institute for Prevention Research and Epidemiology BIPS, Bremen, Germany
Cochrane Germany and the Institute for Evidence in Medicine (for the Cochrane Germany Foundation), Medical Center – University of Freiburg, Faculty of Medicine, University of Freiburg, Freiburg, Germany.
Cochrane Switzerland, Center for Primary Care and Public Health (Unisanté), University of Lausanne (UNIL), Switzerland and Epidemiology, Biostatistics & Prevention Institute, University of Zurich, Switzerland

→ WHO Collaboration

Since 2017, the Department of Evidence-based Medicine and Evaluation has been one of four WHO Collaborating Centers in Austria. In this capacity, through workshops and advisory meetings, the Department aims to provide methodological assistance to WHO during the guideline preparation process and to facilitate the spread of WHO guidelines throughout the German-speaking world.

Funding:
Cochrane Austria, University for Continuing Education Krems

Project lead:
Gerald Gartlehner, Department for Evidence-based Medicine and Evaluation

Participating researchers:
Andreea Dobrescu, Barbara Nußbaumer-Streit

Knowledge and Technology-Transfer & Dissemination Department for Evidence-based Medicine and Evaluation

Science-to-Science:

→ **Sommer Isolde**, Use of preprints in prevention research – a mixed methods study, 13th EUSPR-Conference “Prevention – Between Ethics and Effectiveness”, Tallinn, Estland, 30 September 2022

→ **Gartlehner G. et al.** Erstellung eines Evidenzreports zur Erarbeitung von klinischen Leitlinien zur Behandlung von schwerer Depression. American College of Physicians, Philadelphia

→ **Klerings Irma**, The impact of using search filters for non-randomised studies on rapid reviews, EAHIL (European Association for Health Information and Libraries) 2022 conference, Rotterdam, Niederlande, 6 June 2022

Science-to-Public:

→ **Interdisciplinary research group** to develop a checklist for lay citizens to assess the reliability of online health information with the aim of strengthening the critical health literacy of the population.

→ **European Forum for Evidence-based prevention and health promotion (EUFEP)**: This conference offered the opportunity to discuss preventive COVID-19 strategies on a national and international level, and the relationship between population, science, and politics in the course of the crisis.

→ **Fact checking website “Medizin-transparent.at”** to communicate the evidence behind popular health myths and health claims in media and advertisements to a lay public.

Knowledge and Technology-Transfer & Dissemination Department for Economy and Health

Science-to-Science:

Several presentations were given, e.g.:

→ **Behrens, D.A.; Resilience in Healthcare Systems:** Implications for Austria. OR2021 International Conference on Operations Research, 1 September 2021

→ **Krczal, E.; Analyzing the facilitators for innovation in primary care provision.** The case of primary care centers in Austria. ISQuas (International Society for Quality in Health Care) 37th International Conference, 8 July 2021

→ **Krczal, E.; Impact of COVID on health behavior and lifestyle of people with cardiovascular diseases.** International Conference on Integrated Care (ICIC) 2022, 24 May 2022

→ “Young OR 2022”:

1st Summer School of the Austrian Society for Operations Research in cooperation with the Department for Economy and Health for 13 PhD-students

Science-to-Business:

→ **Presentation of the Camillo Award of the Bundesverband Rettungsdienst (BVRD)** to outstanding paramedics on 28 November 2022. The University for Continuing Education Krems acts as a cooperation partner of the award in the category “Management/Leadership”, in which executives in paramedic management or service leadership are awarded for outstanding achievements in terms of quality development.

Selected Publications Department for Evidence-based Medicine and Evaluation

→ **Sommer, I.; Dobrescu, A.; Ledinger, D.; Moser, I.; Thaler, K.; Persad, E.; Fangmeyer, M.; Emprechtinger, R.; Klerings, I.; Gartlehner, G.** (2022): Outpatient Treatment of Confirmed COVID-19 : A Living, Rapid Review for the American College of Physicians. *Annals of Internal Medicine*, 29:M22-2202.

→ **Gartlehner, G.; Patel, S. V.; Reddy, S.; Rains, C.; Schwimmer, M.; Kahwati, L.** (2022): Hormone Therapy for the Primary Prevention of Chronic Conditions in Postmenopausal Persons: Updated Evidence Report and Systematic Review for the US Preventive Services Task Force. *JAMA*, 328(17), 1747–65.

→ **Gartlehner, G.; Emprechtinger, R.; Hackl, M.; Jutz, F. L.; Gartlehner, J. E.; Nonninger, J. N.; Klerings, I.; Dobrescu, A. I.** (2022): Assessing the magnitude of reporting bias in trials of homeopathy: a cross-sectional study and meta-analysis. *BMJ Evidence-Based Medicine*, 27(6), 345–51.

→ **Nussbaumer-Streit, B.; Jesser, A.; Humer, E.; Barke, A.; Doering, B. K.; Haid, B.; Schimböck, W.; Reisinger, A.; Gasser, M.; Eichberger-Heckmann, H.; Stippl, P.; Gartlehner, G.; Pieh, C.; Probst, T.** (2022): A web-survey assessed attitudes toward evidence-based practice among psychotherapists in Austria. *Scientific Reports*, 12(1), 9374.

→ **Griebler, U.; Kien, C.; De Santis, K. K.; Stratil, J.; Borchard, A.; Heise, T. L.** (2022): Dissemination of Evidence by Cochrane Public Health Europe in German-Speaking Countries: An Online Stakeholder Survey. *International Journal of Public Health*, 67, 1605265.

→ **Dobrescu, A. I.; Ebenberger, A.; Harlfinger, J.; Griebler, U.; Klerings, I.; Nußbaumer-Streit, B.; Chapman, A.; Affengruber, L.; Gartlehner, G.** (2022): Effectiveness of interventions for the remediation of lead-contaminated soil to prevent or reduce lead exposure - A systematic review. *Science of The Total Environment*, 806(Pt 1), 150480.

Department for Economy and Health

→ **Angelov, G.; Kovacevic, R.; Stilianakis, N.I.; Veliov, V.M.** (2023): Optimal vaccination strategies using a distributed model applied to COVID-19. *Central European Journal of Operations Research* 31, 499–521.

→ **Behrens, D.A.; Rauner, M.S.; Sommersguter-Reichmann, M.** (2022): Why resilience in health care systems is more than coping with disasters: Implications for health care policy. *Schmalenbach Journal of Business Research* 74: 465–495.

→ **Brice, S.N.; Harper, P.R.; Gartner, D.; Behrens, D.A.** (2022): Modeling disease progression and treatment pathways for depression jointly using Agent Based Modeling and System Dynamics. *Frontiers in Public Health* 10: 1011104.

→ **Kovacevic, R.M.; Stilianakis, N.I.; Veliov, V.M.** (2022): A distributed optimal control model applied to COVID-19 pandemic. *SIAM Journal on Control and Optimization* 60(2): 221–245.

→ **Krczal, E.; Hyll, W.** (2022): Covid-19 triggered a physically active lifestyle of people with cardiovascular diseases: results of a small Austrian qualitative study. *Frontiers in Public Health* 10: 947250.

→ **Olson, J.L.; Papatomas, A.; Kritz, M.; Ntoumanis, N.; Quested, E.; Thøgersen-Ntoumani, C.** (2022): Challenges to engaging older adults in a group-based walking intervention: Lessons from the residents in action trial. *Journal of Aging and Physical Activity* 3(5): 788–798.

Main field of research:
Cultural Heritage



Cultural Heritage

- Revitalization and Cultural Heritage
- Collections Management and Image Science

Revitalization with Cultural Heritage – the Accumoli Model

In 2016, a series of earthquakes hit Accumoli. Many locals defied economic problems and contributed to revitalize the region utilizing their knowledge, creativity, and cultural heritage. The project's objective is to record and evaluate these activities, to transfer knowledge, to develop specific reconstruction and revitalization models in the area and agronomic infrastructure.

The problems of the structurally weak province of Rieti, which are intensifying in Accumoli (central Italy), were significantly exacerbated by the 2016 earthquakes. For example, the out-migration process was massively accelerated. The aim of the project is to integrate the intangible and tangible heritage of the region into the reconstruction process of the earthquake-ravaged city and, on this basis, to ensure that the city of Accumoli and its surrounding cultural landscape are sustainable and fit for the future. The culture of the region represents a strategic element in the sustainable reconstruction.

Using the knowledge of the population

Questions of the research are those about how the architectural-cultural and immaterial heritage can be integrated into the reconstructed city through the reconstruction processes, with which methods it can be recorded and how its structures, characteristics and potentials can be used in a sustainable way in the future. Due to the location, the focus is on traditional mountain agriculture and handicrafts. The project relies heavily on transdisciplinary knowledge transfer between researchers and the local population, whose knowledge of structures, traditions, history, craft techniques and forms of cultivation is incorporated.

Accumoli 2030 per un'agricoltura etica e sostenibile

FUNDING

Regione Lazio, Comunità solidali 2020

DURATION

2021–2023

DEPARTMENT

Building and Environment

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Christian Hanus, Darya Haroshka, Charlotte Hartung Von Hartungen, Maximilian Mair, Peter Morgenstein, Fikriye Pelin Kurtul Vacek

COORDINATION

Radici Accumolesi odv, Rieti (Italy)

PARTNERS

Comune di Accumoli (Italy)
University for Continuing Education, Center for Architectural Heritage and Infrastructure (Austria)
Istituto di Istruzione Superiore "Luigi di Savoia", Rieti (Italy)
Laga insieme aps, Amatrice e Accumoli (Italy)
SHERPA coop, Massa d'Albe (Italy)
Pro Loco, Accumoli (Italy)
Istituto Professionale di Stato Servizi per L'Enogastronomia e l'Ospitalità Alberghiera "R. A. Costagnini", Rieti (Italy)

The Underestimated Value of Architectural Monuments

Increased use of architectural monuments for the creation of living space represents one of several possibilities to curb the consumption of landscape and resources in Lower Austria and to revitalize village centers. The project monumentum ad usum uses case studies to demonstrate the favorable energy balance of old buildings and thus their positive effects on climate protection.

Until now, little attention has been paid to the qualities of listed buildings, although their renovation leads to significant reductions in energy consumption. As the project discovered, old buildings consume significantly less energy than structural calculations have predicted. With a low level of intervention, the right energy source and the right design of the object, renovations of listed buildings outweigh new buildings. The results can help reduce vacancies, increase the use of existing listed buildings, and preserve and revitalize local and city centers.

Basis for investment decisions

The project aims at finding a strategy non-profit housing developers in Lower Austria can benefit from by using the potential of listed buildings and to offer non-profit developers an optimized basis for investment decisions. The project partnership with non-profit building associations in Lower Austria, the Province of Lower Austria and the Federal Office for the Protection of Monuments ensures that the results come into practice. The project outcomes will be specifically utilized in teaching at the University for Continuing Education Krems.

Utilization Potentials of Monuments for Non-profit Developers / Nutzungspotenziale von Denkmälern für gemeinnützige Bauträger

FUNDING

Province of Lower Austria, Department of Arts and Culture, NÖ Wohnbauforschung, accompanied by the Federal Office for the Protection of Monuments

DURATION

2018–2023

DEPARTMENT

Building and Environment

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Christian Hanus, Manfred Sonnleithner, Rainer Altmann, Helmut Floegl, Petra Hammer, Silvia Hofbauer, Christina Ipser, Maximilian Mair, Elisabetta Meneghini, Rudolf Passawa, Gregor Radinger, Elisabeth Resch, Bernhard Schneider, Richard Sickinger, Martin Stejskal-Ripka, Peter Strasser, Wolfgang Stumpf, Klaus Winiwarter

COORDINATION

University for Continuing Education Krems

PROJECT PARTNERS

Federal Office for the Protection of Monuments, Landeskonservatorat für Niederösterreich Österr. Verband der gemeinnützigen Bauvereinigungen, Landesgruppe NÖ Amt der NÖ Landesregierung, Abteilung Allgemeiner Baudienst (BD1) Amt der NÖ Landesregierung, Abteilung Wissenschaft und Forschung (K3)

Knowledge and Technology-Transfer & Dissemination

Science-to-Science:

→ **Cooperation between the Department for Building and Environment (UWK) and the European Commission (DG EAC):** Final meeting of the EU OMC expert group Strengthening Cultural Heritage Resilience for Climate Change in Krems (April 2022).

→ **Cooperation between the Department for Building and Environment, Europa Nostra Austria and Industrial and Engineering Heritage Committee of Europa Nostra:** The Symbolic Value of Industrial and Engineering Heritage, International Conference, July 2022.

Science-to-Public:

→ **Accademia Vicino:** The Accademia Vicino Orchestra Academy is an innovative project settled in the small village of Accumoli, which was so badly hit by the earthquakes of 2016/2017. It assembles young musicians from all over the world in the Italian Appenines to gain in-depth orchestral experience during two weeks in summer. This also sets a sign for regional cultural work, European cooperation, and cross-border solidarity.

→ **Living Danube Limes Connecting Cruise:** The aim of the EU-funded project Living Danube Limes was to make the Danube Limes visible and tangible through as many interlocking and sustainable measures as possible—such as geophysical surveys, virtual reality reconstructions, museum cooperation, events, and sustainable tourism concepts. Within the project organized was a living-history cruise on reconstructed Roman ship of the 4th century AD starting in Germany and ending at the shores of the Black Sea.

→ **The Heritage of the Pond Landscape:** On 21 October 2022, the publication The Heritage of the Pond Landscape – a future UNESCO World Heritage? was presented in the Gmünd district authority. The results were developed as part of the EU-funded KPF Interreg project The Heritage of the Pond Landscape by the Department for Building and Environment for further education and are an important step towards the inclusion of this remarkable cultural landscape in the UNESCO World Heritage List.

Selected Publications

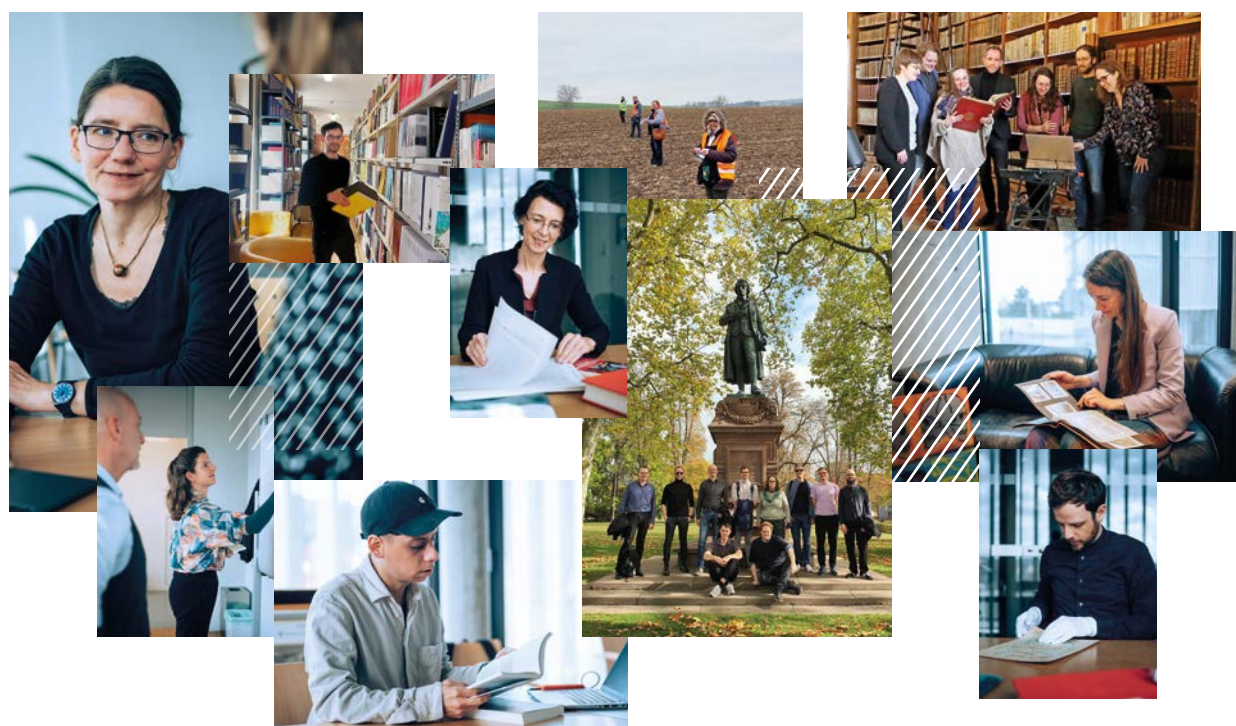
→ Bogenstätter, U.; Buchta, L.; Cikán, M.; Deržmišek, P.; Floegl, H.; Goll, J.; Gregorová, J.; Hanus, C.; Havliš, K.; Hlavenka, P.; Indrová, M.; Kallinger, W.; Neubert, J.; Peška, M.; Rohrbach, W.; Schicht, P.; Schneider, B.; Šépková, J.; Spindler, S.; Taufar, A.; Tejkal, M.; Unger, J.; Varga, M.; Veselý, J.; Žallmannová, E.; Zíka, V. (2022): Fachmethodik für Erneuerung des kulturellen Erbes. Edition Donau-Universität Krems, Krems.

→ Adámek, Z.; Bandarin, F.; Bauer, C.; Brandl, M.; Drdácěk, M.; Habsburg-Lothringen, A.-S.; Hanus, C.; Hátle, M.; Hesslerová, P.; Inácio, M.; Kainz, M.; Kirchmaier, L.; Kaupa, J.; Laureano, P.; Parilková, J.; Pereira, P.; Pokorný, J.; Regenda, J.; Rohrbach, W.; Rottenbacher, C.; Schneider, B.; Stejskal-Ripka, M.; Strasser, P.; Štys, D.; Veselý, J. (2022): Das Erbe der Teichlandschaft – ein künftiges UNESCO-Welterbe? Dědictví rybníční krajiny – budoucí památka světového dědictví UNESCO?, Edition Donau-Universität Krems, Krems.

→ ICC Austria (2022): Restauratorenblätter - Papers in Conservation Band 39. Verlag Ferdinand Berger & Söhne, Horn.

→ Kaiser, A.; Diers, L.; Kovács, G. M.; Vukosavljević, Z.; Woller, R. (eds.) (2022): Living Danube Limes. Valorising cultural heritage and fostering sustainable tourism by LIVING the common heritage on the DANUBE LIMES as a basis for a Cultural Route. Archaeolingua, Budapest.





The Department for Arts and Cultural Studies is dedicated to researching the arts and culture, with a particular focus on the influence of digitalization on preserving tangible and intangible cultural heritage, digital art, memory studies, and the use of new technologies in museums and collections. It also investigates the visualization and management of cultural data and opportunities for democratizing cultural constructions of meaning through participatory processes. Within the realm of image science, the documentation and archiving of digital arts for research and teaching pose a significant challenge. The department integrates theory and practice by working with the Lower Austrian State Collections and its own music, literature, architecture, and film collections, seeking to bridge the gap between research and application.

Researching a Neolithic Massacre

The Neolithic settlement of Asparn / Schletz (Lower Austria) is assumed to have been a regional center surrounded by smaller settlements. Numerous human remains suggest an attack on the site approximately 7,000 years ago. The research project “United by Crisis?” investigates the background of the massacre and the origin of the dead with the assistance of citizen scientists.

Archaeological findings at the Schletz-site suggest a massacre. The project aims to find out where the people that died on the site might have grown up and how the early Neolithic settlements surrounding Asparn/Schletz developed alongside the central site. How was their structure affected by the events that happened there? The project will provide answers through the localization, dating and classification of early Neolithic sites in the vicinity of Schletz as well as through the determination of Sr-isotope ratios of skeletal remains and soil samples.

Active involvement of citizen scientists

The project has a clear-cut transdisciplinary design, besides applying a variety of methods from archaeology, analytical chemistry, and anthropology, it actively involves students attending school campus Asparn/Zaya and citizens interested in the project. Against the background of the academic discussion about a “crisis situation” at the end of the early Neolithic, the project will contribute to a more comprehensive picture of the community that lived on and around the site of Schletz in that era and on who was killed in the massacre. Results will be exhibited at MAMUZ museum.

United by Crisis? A Transdisciplinary Look at the Early Neolithic Communities in the Schletz Settlement Cluster

FUNDING

GFF NÖ (FTI-Strategie Niederösterreich 2027, FTI call Basic research, “Social cohesion in transition”), (Grant agreement number GLF21-2-008)

DURATION

2022–2025

DEPARTMENT

Arts and Cultural Studies

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Jakob Maurer, Julia Längauer, Cornelia Hascher

COORDINATION

University for Continuing Education Krems

PROJECT PARTNERS

Montanuniversität Leoben
University of Natural Resources and Life Sciences
Vienna, Campus Tulln
Natural History Museum Vienna
State Collections of Lower Austria

www.united-by-crisis.at

Data Infrastructure for the Humanities

DH-Infra.at is developing an infrastructure in the Austrian Humanities to support research digitally. It thus closes a gap between standard and high-performance computing offerings in cultural heritage institutions, in research data and in software solutions by processing large amounts of data with machine learning.

Cultural heritage institutions are facing severe challenges, particularly in long-term preservation, innovative use of cultural data and applicable big data technologies. The project focuses on how to build a shared national infrastructure for the digital humanities and how future-oriented machine learning applications can be developed in the humanities at a national level. Built on the consortium of CLARIAH-AT, it offers the community the collaborative infrastructure necessary when using digitization, research data management, research software and data science.

Searching for a common Ceph system

Researchers, working in the Austrian Humanities, will be equipped with hardware and software that serves as an infrastructure to access, preserve and process the rich data collected by cultural heritage institutions using cutting edge digital methods. Further, the project is to set up a common system of Ceph storage solutions, which are particularly fail-safe, easily scalable, and especially well-suited for the deployment of Kubernetes-based infrastructures. Additionally, corresponding curated repositories will be set up based on the GAMS repository model developed by the University of Graz.

Digital Humanities Infrastructure Austria

FUNDING

Austrian Federal Ministry for Education, Science and Research – Digital Research Infrastructures

DURATION

2023–2026

DEPARTMENT

Arts and Cultural Studies

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Anja Grebe, Eva Mayr, Florian Windhager

COORDINATION

University Graz

PROJECT PARTNERS

Technical University Vienna
University of Salzburg
University of Innsbruck
University for Applied Arts Vienna
University for Continuing Education Krems
Austrian National Library
Austrian Academy of Sciences
University of Vienna

www.gams.uni-graz.at

Improving Digital Art Databases

The ImDaLi project (Tool Development for Image Data Literacy: Understanding Digital Art with complex data analysis) researches and develops digital tools for image databases: It aims at both improving the user experience when using archive platforms and testing different approaches to navigate and work with digital collections. The focus is on adequate methods for capturing, processing and analysing works in the field of media art.

Digital (art) databases are facing the challenge of an ever-growing content. Furthermore, media art is a fast-paced, ephemeral, and boundary transgressing art form. Regarding specifically the Archive of Digital Art (ADA, www.digitalartarchive.at), the project is meeting the need to enhance user engagement and to find new research questions from the data available. Hence, the project aims at finding ways, how digitally documented works of media art can properly be analyzed and how specialized tools can foster the interconnection between archives and databases.

Developing tools for digital image collections

Carrying elements of different knowledge domains such as art history, art theory, digital humanities, image sciences, information science, and more general implications like archiving strategies and preservation of cultural data, several results are to be expected. First of all, a complex image analysis tool, that is especially suited to analyze multifaceted media art works in online databases, will be developed. This application will be provided via GitHub for further use within the community. A second result will be the remodelling of the existing Bridge Thesaurus, which will make it fit for interconnection with linked open data and other archives. This remodelling will ultimately lead to better engagement of users and enhanced usage of the data.

Tool Development for Image Data Literacy: Understanding Digital Art with Complex Data Analysis

FUNDING

Efre, FTI-Strategie Niederösterreich 2021–2027

DURATION

2021–2023

DEPARTMENT

Arts and Cultural Studies, Center for Image Science

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Viola Rühse (since July 2022), Laura Ettel, Isabella Iskra, Alejandro Quinones Roa, Fabian Schober, Alexander Wöran

COORDINATION

University for Continuing Education Krems

A Joint Reappraisal of NS-Camps

The project investigates forced labour camps in the central region of Lower Austria. During the Nazi era, people labelled as outcast, excluded from the “community of people” were interned and are today no longer visible: Prisoners of War, civilian forced laborers and political prisoners. The project involves local citizen scientists searching contact with the population.

Camps of the Nazi regime still constitute forgotten and repressed history that needs to be retained in the country’s memory. To do so participatory knowledge production with the local population and self-motivated engagement with history promotes information literacy. The project therefore focuses on respective camp sites, their possible previous use, their emergence and developments during the Nazi period up to a possible subsequent use. A further question is that of the manifold contacts and contact zones with the local population and their memories of them.

Enriching the collective memory

Collaboration with local citizen scientists is a key element of the project because of the presence of memories and memorabilia in local families. Together, the construct of the “community of people” under National Socialism is to be used as a basis for a critical examination of social cohesion and its ruptures, and to raise awareness of the largely forgotten existence of numerous camps in the central region of Lower Austria. Material remains, pictorial and written sources as well as personal memories and narratives, which have also been passed on over generations, are to be incorporated into the collective memory of the country through formats of mediation and commemorative culture.

NS-„Volksgemeinschaft“ und Lager im Zentralraum Niederösterreich. Geschichte – Transformation – Erinnerung

FUNDING
GFF NÖ

DURATION
2022–2024

DEPARTMENT
Arts and Cultural Studies

PROJECT LEAD
Edith Blaschitz

COORDINATION
Injoest (Institute of Jewish History Austria)

PROJECT PARTNERS
Archive of the Province of Lower Austria, NÖ
Institut für Landeskunde
Treffpunkt Bibliothek of the Lower Austrian
Community libraries
museumkrem
Topothek Krems
Topothek St. Pölten
University for Continuing Education Krems

AI for the Arts

LiviaAI investigates the potential of artificial intelligence (AI) to identify patterns and connections between digitized objects in three Viennese art collections: the Belvedere, the Wien Museum, and the Museum für Angewandte Kunst. Building on deep learning techniques and natural language processing methods, the project will enable museum professionals to design their own AI processes without the need for the prohibitive manual data annotation work normally required to train AI models.

Managing cultural heritage data has increased in complexity and requires the development of new tools. The project was created in close cooperation with museum curators and cultural heritage experts in order to support them in gaining a better understanding of the emerging technologies’ value. The project aims include: exploring the use of AI as a tool for Digital Humanists and museum curators to study the use of classification systems across museum collections; to establish connections between online collections of three Viennese museums and make the associations more visible; to demonstrate how AI can support new online exhibition formats that emphasize serendipitous browsing, exploration of contextual connections, and playful engagement with Vienna’s collected heritage.

Results will be publicly accessible

The final results comprise the development of an AI-model which connects objects from different art collections in Vienna as well as a prototype for users to playfully interact with the model’s results. All tools and scripts developed during the project will be made publicly accessible. The project connects the fields of art and cultural history, museum studies, artificial intelligence/machine learning and digital humanities.

Linking Viennese Art through Artificial Intelligence

FUNDING
Jubilee Fund of the City of Vienna for ÖAW;
(Grant agreement number JF_2021-08)

DURATION
2022–2023

DEPARTMENT
Arts and Cultural Studies

PROJECT LEAD
Nicole High-Steskal

COORDINATION
University for Continuing Education Krems

PROJECT PARTNERS
AIT Austrian Institute of Technology GmbH, Rainer
Simon
Museum für Angewandte Kunst/MAK
Wien Museum
Belvedere Museum

www.github.com/livia-ai

Further Projects

→ In/Tangible European Heritage – Visual Analysis, Curation and Communication

In recent years, numerous digitization initiatives and cultural heritage databases have significantly improved access to cultural and historical data across Europe. However, lack of links, standardization or machine readability prevent optimal accessibility and use of the existing data. The project InTaVia, coordinated by the University for Continuing Education Krems, links data on cultural objects and actors and opens up new insights into cultural heritage through intuitive, visual interfaces. It aims for a transdisciplinary process, where digital heritage researchers engage in a mutual knowledge transfer with cultural heritage practitioners and the public on questions of European history, identity, and cultural interconnection. The main result of the project is an open information platform, which enables experts in cultural heritage research and practice to search for cultural information, curate it, visually analyze it, and communicate it. The resulting stories build on the visual analysis of cultural objects and actors and make European cultural heritage accessible for the general public as well.

Funding:

EU – Horizon 2020 (Grant agreement number 101004825)

Project lead:

Eva Mayr

Florian Windhager, Department for Arts and Cultural Studies

Participating researchers:

Johannes Liem, Nicole High-Steskal, Anja Grebe

→ Bibliotheca Eugeniiana Digital

The Bibliotheca Eugeniiana at the Austrian National Library is one of the most important baroque book collections worldwide and part of the UNESCO “Weltkulturerbe Österreich”—but despite its digitization in the Google books corpus, it has not yet been analyzed and visualized by digital means. Hence, the project aims to establish a scientific and historical understanding of the collection by creating a full digital edition and will develop a use case for the application of novel methods in the realm of provenance research by applying methods from the Digital Humanities, Machine Learning, and Data Science.

Funding:

Österreichische Akademie der Wissenschaften – Go!Digital 3.0

Project lead:

Florian Windhager, Department for Arts and Cultural Studies

Coordination:

Austrian National Library

Partner:

University for Continuing Education Krems

→ Researching the Music Collection Harrach

The PhD-project lays the focus on the music practice and network systems of the Counts of Harrach. During diplomatic assignments across Europe, the Counts collected hundreds of music manuscripts most of which were sold to the New York Public Library/USA after WWII. However, a small part survived in the library of Rohrau Castle, the dynasty’s ancestral seat in Lower Austria, as well as at the Austrian State Archive, Vienna. Primary object is to identify the cultural transfer processes behind the creation of the Harrach music collection. In addition, further insights in cultural networks of noble families are expected.

Funding:

GFF NÖ (FTI-Dissertations 2020)

Project lead:

Günter Stummvoll, Department for Arts and Cultural Studies

→ Infrastructures for Digital Arts Teaching and Research in Higher Education

The LeFo project enhances the functionality of the Archive of Digital Art (ADA), an online collection of pioneering digital and media art. Besides others, it aims in finding which thematic trends in the production of digital and media art emerge. The project develops interfaces to the ADA collection, such as Augmented Reality, data exchange with other archives, and visualizations of the content structure. The technical and functional enhancements are conceptualized and structured as re-usable components and will be available as open-source software for other history and Image Science archives.

Funding:

Federal Ministry of Education, Science and Research – Digital and Social Transformation, Selected Digitization Projects at Public Universities 2020 to 2024 (Bundesministerium für Bildung, Wissenschaft und Forschung Digitale und Soziale Transformation, Ausgewählte Digitalisierungsvorhaben an öffentlichen Universitäten 2020 bis 2024)

Project lead:

Viola Rühse, Department for Arts and Cultural Studies, Center for Image Science (since July 2022)

Knowledge and Technology-Transfer & Dissemination

Science-to-Public:

→ **The MuseumsMenschen app at Schaudepot.** An intergenerational, participatory pilot project at the intersection of analog and digital. The Art Museum in the Digital Age – 2022. International Online Conference, 17 January 2022) – with the participation of Anja Grebe and Hanna Brinkmann.

→ **Lower Austrian Provincial Exhibition Marchfeld Secrets:** The Center for Museal Collection Science was scientific cooperation partner and responsible for the exhibition catalog: Laussegger, A. (2022). Marchfeld Secrets. Man. Culture. Nature. Ausst.-Kat. Lower Austrian Provincial Exhibition 2022. Schallaburg Kulturbetriebsges.m.b.H., Schallaburg

→ **“NS-‘Volksgemeinschaft’ und Lager im Zentralraum Niederösterreich Geschichte – Transformation – Erinnerung“:** Presentation of project results and artistic concepts, 2 December 2022, Pulkau. Also in the project, Making Traces Legible in the Nazi Forced Labor Camp Roggendorf/Pulkau. Laboratory on Art, Participation and Digital Spaces, inter- and transdisciplinary approaches are developed by Edith Blaschitz in a combination of art, science, and digital technologies in a participatory process with the population as a model for similar projects.

→ **Eva-Maria Bauer, Center for Applied Music Research is representative for the field of music in the nationwide Fair Pay Process of the Ministry of Culture in 2022:** Lectures among others at the symposium Human Rights/Music Rights, Austrian Music Council, 12 November 2022, Talks about Art & Culture – Fairness in Art and Culture, Province of Lower Austria, on 22 June 2022 and “Music from the Regions – New Opportunities for New Talents”, AKM, on 5 October 2022.

→ **With The Archivist’s Dream, the Archive of Contemporaries, together with the Center for Applied Games Research, presentation of an innovative variant of the successful game format of Live Escape Rooms from June 2022:** Presentation at the annual conference of the “Gesellschaft für Musikforschung” from 28 September–1 Januar 2002 at the Humboldt Universität zu Berlin.

Science-to-Science:

→ **Conference FROG – Future and Reality of Gaming:** The annual conference was held for the first time at the University for Continuing Education Krems, Center for Applied Games Research (Head: Natalie Denk and Alexander Pfeiffer).

→ **100 Years of Cultural Heritage in Lower Austria:** The symposium 100 Years of Cultural Heritage in Lower Austria was held at the University for Continuing Education in cooperation with the Institute for Austrian Studies on 7–8 October 2022. (Direction: Anja Grebe in cooperation with the Institute for Austrian Studies).

→ **Symposium and Research Summit on the Interrelation Culture – Sustainability:** Department of Arts and Cultural Studies (Anja Grebe), Museum Neukölln/Berlin in cooperation with the Club of Rome.

Science-to-Business:

→ **CIMIX Vienna:** Participation of the Department of Arts and Cultural Studies (Olga Kolokytha and Eva-Maria Bauer: lectures) in the information and networking event of the Austrian Chamber of Commerce for the Austrian film, sound and media industry on 12–13 January 2023.

Selected Publications

→ **Bentz, I.; Gfrereis, H.; Hildenbrandt, V.; Mayr, E.; Offenberger, E.; Tropper, E.; Windhager, F.** (2022): Daten im Raum - Visualisierungen und Physikalischerungen im Medium Ausstellung. -In: DHd 2022 Kulturen des digitalen Gedächtnisses. 8. Tagung des Verbands “Digital Humanities im deutschsprachigen Raum” (DHd 2022): Tagungsband, Digital Humanities im deutschsprachigen Raum, Potsdam.

→ **Blaschitz, E.; Mayr, E.; Oppl, S.** (2022): Too Low Motivation, Too High Authority? Digital Media Support for Co-Curation in Local Cultural Heritage Communities. Multimodal Technologies and Interaction, 6. no. 5, 33, doi: 10.3390/mti6050033.

→ **Brinkmann, H.** (2022): Sehen vergleichen. Empirisch-experimentelles Forschen mit widerständigen Bildern. -In: Grave, J.; Heyder, J.; Hochkirchen, B. (Hrsg.): Vor dem Blick. Zurichtung des Betrachtens von Bildern, 231–276, Bielefeld University Press, Bielefeld.

→ **Grebe, A.** (2023): Vom Druck zurück zur Handschrift. Illumierte Lutherbibeln in der Frühen Neuzeit. -In: Greiling, W.; Schirmer, U.; Werner, E. A. (Hrsg.): Luther auf der Wartburg 1521/22: 177–199, Böhlau Verlag Wien Köln, Göttingen.

→ **Koenig, N.; Denk, N.; Pfeiffer, A.; Wernbacher, T.** (eds.) (2022): The Magic of Games. Edition Donau-Universität Krems, Krems.

→ **Kolokytha, O.** (2022): Festival management practices. -In: DeVereaux, C. (ed.): Managing the Arts and Culture: Cultivating a Field. NY and Oxon: Routledge, 263–289.

→ **Neundlinger, H.; Stattin, J.; Strasser, K.; Suter, F.** (eds.) (2022): Hier ist Literatur! Reisen zu literarischen Erinnerungsorten in Niederösterreich. Literaturedition Niederösterreich, St. Pölten.

Main field of research:
Continuing Education Research



Continuing Education Research

- Higher Education Management
- Higher Education Research
- Interfaculty Research Groups





The discourse on education and learning processes is fundamentally changing due to digital transformation. New technologies have enabled and introduced innovative learning and knowledge acquisition methods. To stay current with these advancements, the Department for Continuing Education Research and Educational Technologies has strengthened its focus on user-centered design of digital tools for teaching and learning. Additionally, the department is involved in developing and validating skills catering to target groups outside the formal education system. Research areas include didactic designs for individual and collaborative learning, fostering personal and organizational competence, and investigating technology's potential to enhance learning and innovation processes.

Educate Medical Professionals in the Realm of AI

The project TRANSFORM aims to enhance digital and social change through innovative approaches in research and advanced education. It investigates novel learning designs by piloting an agile, participatory, and learner-focused instructional design model with the goal of educating medical professionals in the realm of artificial intelligence (AI).

The impact on AI users, patients, and society must be thoroughly studied and taken into account during the development and implementation of technology. TRANSFORM plays a crucial role in this context, using a learning-focused, work-based approach to blend theory and practice, promoting the development of competences in responsible AI use in medicine. Furthermore, the potential contribution of the "Successive Approximation Model" (Allen & Sites, 2012) to establish learner-centered instructional design in higher education is examined throughout this project.

Cutting-edge learning design

The project results in a cutting-edge learning design for medical education, ready to be adopted by educators. Using an agile, multi-stakeholder instructional design approach, the alignment between learners' prior knowledge, desired outcomes, and learning activities, as well as forms of assessment, is secured, and the learning process is optimized. The project aims to enhance the competence of educators in the field of continuing medical education. It also serves as a pilot for a model of formative and summative quality assurance and development in higher education instructional design, ensuring the creation of high-quality new curricula.

Enhancing Digital and Social Change through Innovative Approaches in Research and Advanced Education

FUNDING

Austrian Federal Ministry of Education, Science and Research

DURATION

2020–2024

DEPARTMENT

Continuing Education Research and Educational Technologies

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Stephanie Nestawal, Isabell Grundschober, Martin Stark

COORDINATION

University of Linz

PROJECT PARTNER

University of Applied Arts Vienna

Further Projects

→ Increasing Programming Skills

Applying basic programming knowledge has become relevant in a growing number of fields, including universities. The project CodeAbility examines in what ways automated formative feedback is supportive for self-directed practice aimed at acquiring programming skills. It focuses on didactics to develop ideas for integrating individualized learning paths into basic programming training for non-IT-oriented disciplines. The implementation of a learning platform for programming skills that is available throughout Austria to support teachers and students is planned.

Funding:

Austrian Federal Ministry of Education, Science and Research

Project lead:

Stefan Oppl, Department for Continuing Education Research and Educational Technologies

Participating researcher:

Martin Dobiasch

Coordination:

University of Innsbruck

Partners:

Graz University of Technology
University of Klagenfurt
University of Linz University of Salzburg
TU Wien (University of Technology Vienna)

→ Individual Math Skill Training

Degrees in MINT studies continue to be in high demand on the job market. One aspect for potential students to deviate these fields of study is the required relatively high level of math skills they find intimidating. The project MathSkillTesting provides (self-)assessment tools for the popular GeoGebra software toolkit which will allow users to quickly and reliably self-diagnose their skill-levels in different areas of mathematics, and to receive individual tips about their specific learning needs based on the results of the assessment.

Funding:

Austrian Federal Ministry of Education, Science and Research

Project lead:

Stefan Oppl, Department for Continuing Education Research and Educational Technologies

Participating researchers:

Nilay Aral, Philip Duong, Florian Ecker-Eckhofen

Coordination:

University of Linz

→ Teaching Digital Skills

Regardless of age and profession, digital skills have become an undeniable factor in our life. The project DigiFit4All establishes a basis from where different target groups are approached at universities, including students, teaching, and administrative staff. It is designed to help its learners identify specific learning needs and to support acquisition through personalized open online courses; later on to augment digital learning resources with metadata, prepare them for long-term storage in a digital archive facilitating future development, and offering a broader range of use cases.

Funding:

Austrian Federal Ministry of Education, Science and Research

Project lead:

Stefan Oppl, Department for Continuing Education Research and Educational Technologies

Participating researchers:

Stefan Karlhuber, Maria Dorfer-Frick

Coordination:

University of Klagenfurt

Partners:

University of Linz
TU Wien (University of Technology Vienna)

Knowledge and Technology-Transfer & Dissemination

Science-to-Science:

→ **Presentations by Prof Attila Pausits and Corinna Geppert at the EAIR Forum 2022 Accelerating the Future of Higher Education** on the topics of the project APIKS Austria – The Academic Profession in the Knowledge-Based Society.

→ **Contribution at the APIKS conference:** General working situation and working conditions in academia on the topic Who Participates Where? Stratification in Higher Education and Social and Gender Inequalities in the Academic Profession – Comparative Evidence from Germany and Austria.

Science-to-Public:

→ **Prof Attila Pausits during the panel discussion at Alumni Day** on the questions “How should learning develop in the future? How will it change through the use of new technologies, what new (meta-)competencies will be required as a result – and in which areas of learning will there have to be particularly strong investments in the future?”

Selected Publications

→ Lessky, F.; Nairz, E.; Wurzer, M. (2022): Social selectivity and gender-segregation across fields of study: Comparative evidence from Austria. *International Journal of Comparative Sociology*, 63(4), 201–221, doi: 10.1177/00207152221099171.

→ Vellamo, T.; Kivistö, J.; Pausits, A. (2022): Steering by stealth? Influence of Erasmus Mundus Joint Master’s Programmes in European higher education policy. *European Journal of Higher Education*, doi: 10.1080/21568235.2022.2126380.

→ Carayannis, E. G.; Campbell, D. F. J.; Grigoroudis, E. (2022): Helix Trilogy: the Triple, Quadruple, and Quintuple Innovation Helices from a Theory, Policy, and Practice Set of Perspectives. *J Knowl Econ* 13, 2272–2301, doi: 10.1007/s13132-021-00813-x.

→ Fellner, M. (2022): Studieren ohne Matura: Der Dritte Bildungsweg an Österreichs Hochschulen. *Zeitschrift für Hochschulentwicklung*, Jg. 17 / Nr. 4, 23–43.

→ Lessky, F.; Unger, M. (2022): Working long hours while studying: a higher risk for First-in-Family students and students of particular fields of study? *European Journal of Higher Education*, doi: 10.1080/21568235.2022.2047084.

→ Fellner, M.; Pausits, A.; Pfeffer, T.; Oppl, S. (2022): Validierung und Anerkennung non-formal und informell erworbener Kompetenzen an Hochschulen. Rahmenbedingungen, Erfahrungen und Herausforderungen. Waxmann, Münster, New York.



The higher education system in Austria is a core element of the country's educational structure. Like in other European countries, higher education substantially contributes to the societal developments. In addition to their primary functions of research and teaching, universities must fulfill an extensive range of other duties. The Department for Higher Education Research focuses on the leadership and management of higher education institutions, giving special attention to personnel and organizational development. It also covers higher education governance and policy reforms, especially in the context of the Third Mission and the social responsibility of these institutions. Furthermore, it examines the role of higher education in lifelong learning and promotes a practical research approach aimed at transferring knowledge.

To Enhance Doctoral Studies

Commissioned by the Austrian Federal Ministry of Education, Science and Research the project investigates the effects the framework "Universitätsfinanzierung NEU" has on doctoral studies in Austria. It examines how to possibly enhance set measures especially regarding career paths and in what ways to support data informed decision making.

Doctoral students, as the next generation of scientists, are essentially important in terms of conducting research successfully and creating innovative systems in Austria. To improve and expand the doctoral studies in Austria, the Austrian Federal Ministry of Education, Science and Research have set some measures within the "Universitätsfinanzierung NEU" framework and commissioned and funded the project to examine the measure's effects, and whether these newly gained factors and circumstances can possibly be enhanced. The actual impact the set measures have will be examined, information about the career paths of doctoral students will be gathered and a closer look will be taken at potential challenges doctoral studies have to meet, especially concerning interdisciplinary PhD-programs in Austria.

Collection of suggestions

The project's results will serve as a collection of suggestions how to improve the given situation of doctoral studies in Austria. Furthermore, the study aims to offer support when doctoral students consider their career path options, and how to expand the measures for many public Austrian universities to use. Additionally, the project supports the possibility for data informed decision making in the politic practice and will focus on interdisciplinary PhD-programs.

Survey and Analysis of the Effects Resulting from the Measures Taken for Further Development as well as Recommendations for the Qualitative Expansion of Doctoral Education at Public Universities

FUNDING

Austrian Federal Ministry of Education, Science and Research

DURATION

2022–2023

DEPARTMENT

Higher Education Research

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Attila Pausits, Corinna Geppert, Florian Reisky, Barbara Hönig

Employment Conditions of Teacher Education

This special analysis of the APIKS project investigates how staff working at university colleges of teacher education discern different aspects their working and employment conditions bear. The findings are the outset for improving working conditions at universities and for supporting the development of the Austrian university system.

This project provides analysis results of a survey about academic profession in the knowledge-based Society (APIKS) from 2021. The project focuses on university colleges of teacher education (UCTE) in Austria and examines the staff members perception on working conditions and career aspirations, teaching and research activities, internationalization, and knowledge transfer. Furthermore, it investigates the development of UCTEs from teaching-driven institutions to more research-oriented institutions.

Teaching remains number-one-ambition

The results draw a positive picture: the academic staff at UCTE in Austria show satisfaction concerning their work situation, particularly when it comes to contract conditions and describe a strong attachment to their discipline. Since in 2005 the teacher training colleges have been transferred into UCTE, the emphasis was on research activities and overall academic ambitions. However, teaching remains the number-one-ambition and preferred activity as the respondents have pointed out. They also clarified that their institutions pursue a clear internationalization strategy, especially in the field of research. Yet research cooperation between foreign academics or institutions needs to be intensified, the results suggest.

The Situation of Employees at University Colleges of Teacher Education in Austria, 2022

FUNDING

Austrian Federal Ministry of Education, Science and Research

DURATION

2021–2022

DEPARTMENT

Higher Education Research

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Attila Pausits, Corinna Geppert, Florian Reisky

Knowledge and Technology-Transfer & Dissemination

Science-to-Science:

→ Wagner, M.: *Vienna Autumn School of Methods* (Online) – Teaching in the hybrid virtual classroom as seen by students and teachers. An evaluation study (Poster presentation).

→ Keser Aschenberger, F.; Pfeffer, T., Hynek, N., Zenk, L. (2022). *Research literacy in academic continuing education: students' needs and perceptions*. Paper presented at ESREA 10th Triennial European Research Conference in Adult Education, Milano Bicocca University, Milan, Italy.

→ Oppl, S.: *Zur Implementierung der digitalen Grundbildung aus Perspektive des Schulqualitätsmanagements*. Presented at ÖFEB Kongress 2022, Graz, Austria.

Science-to-Business:

→ Grundschober, I. (2022): *Learner-centred development and implementation of the DigiCulTS Academy (2022)*. A free, self-paced learning platform for small- and medium sized business to promote digital transformation and business development.

→ Oppl, S. (2022): *Alles Digital? – eine sozio-technische Annäherung an die Zukunft der wissenschaftlichen Weiterbildung*. Keynote given at e-Learning-Tage Rheinland Pfalz, Zentrum für Fernstudien im Hochschulverbund, 2022.

Science-to-Public:

→ Grundschober, I., Nestawal, S. (2022): *Organisation of the INTERREG SK AT DigiVil final conference* (1 December 2022), and presentation of the DIGIVIL COMPASS, which was developed using a multi-stakeholder approach and transdisciplinary workshops.

→ Kil, M. (2022): *Immer außen vor und doch mittendrin – von der Notwendigkeit, die Arbeitsmotivation der (ehrenamtlichen) Kursleitung zu erhalten. forum erwachsenenbildung – Die evangelische Zeitschrift für Bildung im Lebenslauf*, H. 3 (Kursleitende auf die Agenda), 13–19.

Further Projects

→ Employment Conditions in Academic Profession

APIKS-AK is a special analysis alongside a survey conducted on academic profession in the knowledge-based Society (APIKS) in Austria in 2021. It investigates how Austrian junior and senior scientists at higher education institutions (HEI) assess aspects of their working and employment conditions as well as their tasks and fields of activity. Duration of employment, satisfaction, perceived expectations from HEI, job evaluation and career prospects by gender, field of study and HEI type are the topics analyzed within the study commissioned and financed by the Vienna Chamber of Labor.

Funding:

Vienna Chamber of Labor

Project lead:

Attila Pausits, Department for Higher Education Research

Participating researchers:

Franziska Lessky, Corinna Geppert, David F.J. Campbell

Selected Publications

→ Keser Aschenberger, F.; Radinger, G.; Brachtl, S.; Ipser, C.; Oppl, S. (2022): *Physical Home Learning Environments for Digitally Supported Learning in Academic Continuing Education during COVID-19 Pandemic*. *Journal of Learning Environments Research*, doi: 10.1007/s10984-022-09406-0.

→ Ley, T.; Tammets, K.; Sarmiento-Márquez, E. M.; Leoste, J.; Hallik, M.; Poom-Valickis, K. (2022): *Adopting technology in schools: modelling, measuring and supporting knowledge appropriation*. *European Journal of Teacher Education*, 45(4), 548–571, doi: 10.1080/02619768.2021.1937113.

→ Pishtari, G.; Rodríguez-Triana, M. J.; Prieto, L. P.; Ruiz-Calleja, A.; Väljataga, T. (2022): *What kind of learning designs do practitioners create for mobile learning? Lessons learnt from two in-the-wild case studies*. *Journal of Computer Assisted Learning*, doi: 10.1111/jcal.12672.

→ Mayr, A.; Oppl, S. (2022): *Higher Education at the Margins – Success Criteria for Blended Learning Systems for Marginalized Communities*. *Education and Information Technologies*, 1–39, doi: 10.1007/s10639-022-11282-3.

→ Dobiasch, M.; Oppl, S.; Stöckl, M.; Baca, A. (2022): *Direct Mobile Coaching as a Paradigm for the Creation of Mobile Feedback Systems*. *Applied Sciences*, 12(11), 1–24, doi: 10.3390/app12115558.

→ Tammets, K.; Khulbe, M.; Sillat, L. H.; Ley, T. (2022): *A Digital Learning Ecosystem to Scaffold Teachers' Learning*. *IEEE Transactions on Learning Technologies*, 15(5), 620–633, doi: 10.1109/TLT.2022.3198739.



Tackling the pressing issues of our time necessitates research that transcends the conventional boundaries between different academic fields. At the University for Continuing Education Krems, interfaculty research groups are at the forefront of this interdisciplinary approach. All of these research groups are directly linked to continuing education research in terms of their content. Their projects explore questions that are pertinent to the University's main research areas as a whole. The thematic cross-links comprise meta-competencies for unpredictable situations in complex environments, critical Health Literacy for Empowerment in the Era of Digital Transformation and, as the latest research topic, sustainable health care between tradition and evidence-based care.

Achieving Meta-Competences

As the environment becomes increasingly complex and uncertain, and causes societal challenges, it has become necessary to develop meta-competences to cope with this transition. This study investigates how to describe meta-competences from an interdisciplinary perspective and how they can effectively be trained and learned, especially for professionals.

One of the key objectives the United Nations (UN) has rooted in the Sustainable Development Goals (SDGs) is high-quality education, which will require further enhancement in increasingly complex and uncertain environments. The development of meta-competences beyond domain-specific competences is needed to cope with newly occurring societal challenges and real-world problems. This study investigates this phenomenon and innovative teaching designs. Through inter- and transdisciplinary approaches, it works on innovating continuing education at universities.

Implementing new Training design

Following the method of proposition-based Expert Round Tables, a scientific discourse was conducted over the course of a year to explore essential elements of meta-competences. Based on the existing literature and the different propositions, four key factors were identified for acting in complex and uncertain environments. The iterative learning, resilient improvisation, dynamic viability and sustainable innovation. Experimental courses will be conducted with selected participants and a novel training design will be implemented. Thus, participants will be enabled to acquire crucial meta-competences based on dealing with complex real-world problems.

Meta-competences for Unpredictable Situations in Complex Environments

FUNDING

Internal funds from University for Continuing Education Krems

DURATION

2021–2023

DEPARTMENTS

Arts and Cultural Studies
Continuing Education Research and Educational Technologies
Economy and Health
Higher Education Research
Knowledge and Communication Management
Management and Economics – Danube Business School

PROJECT LEAD/

PARTICIPATING RESEARCHER(S)

Lukas Zenk, Attila Pausits, Eva Maria Stöckler, Doris Behrens, Gerald Steiner, Barbara Brenner, Stefan Oppl, David Campbell, Valerie Albrecht, Milan Petit, Daria Drdla

Information without Side Effects

The project is working on the development of a validated set of quality criteria for reliable online health information and will result in a convenient checklist that will help laypersons to judge the reliability of online health information. An in-depth training video will support the use of the checklist.

The Internet has become a major source of health information. However, much of the online health information is misleading. About half of the Austrians find it difficult to judge whether online health information is trustworthy or not. The project IFG-GI ("Infos ohne Nebenwirkung") has set out to develop a checklist for laypersons to evaluate the reliability of online health information. The checklist is based on a set of validated quality criteria to distinguish between reliable and less reliable information. A training video and accompanying explanatory texts will support the use of the checklist: www.infos-ohne-nebenwirkung.at

Interdisciplinary collaboration

The project is being carried out by an interdisciplinary group of researchers from the fields of evidence-based medicine, education, and information and communication sciences. Qualitative and quantitative methods from the social sciences were used to develop the quality criteria for health information and the resulting checklist. The training videos are developed in cooperation with educational and communication scientists as well as with the Service Unit for Teaching Innovation and Digital Competence Development.

Strengthening Critical Health Literacy in Times of Digital Transformation

FUNDING

Internal funds from University for Continuing Education Krems

DURATION

2021–2023

DEPARTMENTS

Continuing Education Research and Educational Technologies
Economy and Health
Evidence-based Medicine and Evaluation
Knowledge and Communication Management

PROJECT LEAD/ PARTICIPATING RESEARCHER(S)

Ursula Griebler, Bernd Kerschner – Department for Evidence-based Medicine and Evaluation, Irma Klerings, Christina Kien, Eva Krczal, Filiz Keser Aschenberger, Benedikt Lutz, Stefan Oppl

Sustainable Health Care

The healthcare sector's footprint is inevitably large, hence the CO₂ emissions need to be reduced. This interfaculty Research Group investigates sustainable health care in the tension between the tradition and evidence-based searching for ways to allow acting for the benefits of sustainable measures being equally good or even better for patients.

The ecological footprint of the healthcare sector accounts for 4.4% of net global CO₂ emissions. As a global industrial factor, healthcare ranks 5th among the main emitters, which makes an immediate reduction of CO₂ emissions inevitable. This is not about climate protection at the expense of "health". Nor is it about buying climate protection at a high price. It is about acting where medical research shows that the benefits for patients from, often cheaper, medical interventions are equally good, if not better.

In the tension between tradition and evidence-based

The interfaculty Research Group sets its aim to address the connection between evidence-based care and the sustainability of health services, at an international level already visible but not yet systematically researched. The project covers the range from firstly identifying useless or harmful measures in the health sector, to secondly an economic evaluation in terms of "sustainability potential", to thirdly the challenge of unlearning of thought and practice patterns on a societal, organizational, and individual level. According to the complex challenges, a mixed methods approach will be chosen. This pilot project is intended to lay the foundation for future larger research projects at the University.

Sustainable Health Care – in the Tension Between the Tradition and Evidence-based

FUNDING

Internal funds from University for Continuing Education Krems

DURATION

2023–2025

COORDINATION

Department for Evidence-based Medicine and Evaluation

PROJECT LEAD

Brigitte Piso

PARTICIPATING DEPARTMENTS

DEPARTMENT FOR EVIDENCE-BASED MEDICINE AND EVALUATION

Brigitte Piso, Christina Kien, Irma Klerings, Gerald Gartlehner

DEPARTMENT FOR ECONOMY AND HEALTH

Doris Behrens, Walter Hyll, Raimund Kovacevic

DEPARTMENT FOR CONTINUING EDUCATION RESEARCH AND EDUCATIONAL TECHNOLOGIES, CENTER FOR APPLIED RESEARCH AND INNOVATION IN LIFELONG LEARNING

Stefanie Nestawal, Isabell Grundschober

RESEARCH LAB DEMOCRACY AND SOCIETY IN TRANSITION & PLATFORM FOR SUSTAINABLE DEVELOPMENT

Christina Hainzl, Sarah Nash

Figures, Data, Facts



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Figures, Data, Facts

- Services
- Recently Appointed Professors and Assistant Professors
- Research in Figures
- Science & Society
- Awards
- Outlook

Efficient research needs management, support and the integration into international funding systems. The Offices for Grant Acquisition and Research Services support researchers in turning ideas into convincing project proposals, in applying for third-party funded projects and in transferring results into practice.

Office for Grant Acquisition

The Grant Acquisition team offers support, guidance and training for researchers in the process of proposal development and submission. As a partner in the pre-grant phase it provides individual support and helps to efficiently prepare and coordinate complex applications with large funding volumes. It focuses particularly on European research and innovation programs such as Horizon Europe (2021–2027) and other project applications with a high level of complexity in the preparation phase (joint projects and excellence programs of the Austrian Science Fund (FWF), funding from the Christian Doppler Research Association, CD Labs, and others).

Team:

Katrin Kaineder
Miriam Peinhaupt
Daniela Lazo De La Vega Meyenberg
Isolde Halmer

Office for Research Services

The Office of Research Services informs, advises, and accompanies researchers in national and international funding calls and provides support in questions such as data management, open science, and technology transfer.

In addition, it supports researchers in initiating research collaborations and acts as an interface to national and international funding agencies and manages the University's internal research documentation system.

The technology transfer team is the contact point for topics such as invention disclosures, patent management, spin-offs, and support the commercial implementation of innovative ideas.

Team:

Edith Huber
Sabina Ertl
Judith Greimel
Silvia Hofbauer
Claudia Paulhart
Karin Elisabeth Siebenhandl

→ Tobias Ley

In accordance with the University Act of 2002, § 98, Tobias Ley was appointed as Professor for Continuing Education Processes in Digitally Supported Teaching and Learning Spaces with effect of 1 September 2021. He works at the Department for Continuing Education Research and Educational Technologies, where he heads the Center for Digitization in Lifelong Learning. Ley is an acknowledged expert in the fields of learning psychology, educational technology and innovation. In 2010, he received his habilitation in psychology and his PhD in psychology and knowledge management from the University of Graz.



→ Daniel Varro

In accordance with the University Act of 2002, § 99, Daniel Varro was appointed as Professor for Tax Law and Sustainable Tax Policy on 1 December 2021. The professorship is established at the Department for Legal Studies and International Relations. Daniel Varro is a proven expert in tax law who has dealt with the subject matter from an academic, legal, and law-shaping perspective. He teaches in various LL.M. programs at the University of Vienna and the Eötvös Lorand University Budapest.



→ Thore Zantop

In accordance with the University Act of 2002, § 98, the University for Continuing Education Krems appointed Thore Zantop as Professor for Sports and Exercise Medicine on 1 December 2021. The professorship is established at the Department of Health Sciences, Medicine and Research. Zantop obtained his habilitation in experimental orthopedics and trauma surgery and has been a visiting professor at the University for Continuing Education Krems responsible for the arthroscopic content of the master's courses "Sports Medicine (MSc)" and "Advanced Orthopaedics and Traumatology (MSc)".



→ Peter Strasser

In accordance with the University Act of 2002, § 99, Peter Strasser has been appointed as Professor for World Heritage and Cultural Property Protection on 1 August 2022. He received his PhD in Law in 1994 and in European Ethnology in 2018 from the University of Innsbruck. Strasser obtained his LL.M. in Public International Law from the University of Nottingham in 1995. Strasser, an outstanding expert on all legal matters concerning cultural heritage, in particular UNESCO world heritage sites, worked for UNESCO and most recently for OSCE. With the appointment, he also took over the management of the Center for Cultural Property Protection.



→ Associated Professors

Two Assistant Professors were appointed Associate Professors:

- Lukas Zenk was appointed Associate Professor for Innovation and Network Research in 2022. Zenk works at the Department for Knowledge and Communication Management.
- Karl Matz was appointed Associate Professor for Vascular Prevention. Matz works at the Department for Clinical Neurosciences and Preventive Medicine.

Research at the University for Continuing Education Krems builds on the link between university and society, creating highly transdisciplinary bridges between basic research and application as well as teaching and society. This ensures innovation and an intensive transfer of knowledge.

The University for Continuing Education Krems dedicates its research to issues of high societal relevance. With a high degree of transdisciplinarity, the University combines basic and applied research and integrates knowledge from outside the academic sector.

Research is based upon a clear profile with university-wide fields of research:

- Digital Transformation, Health and Innovation in Cohesive and Sustainable European Societies
- Evidence-based Health Research
- Cultural Heritage
- Preventive and Regenerative Medicine
- Continuing Education Research

Research is conducted at the three faculties, their departments and research labs:

- Faculty of Health and Medicine
- Faculty of Business and Globalisation
- Faculty of Education, Arts and Architecture

Research within the departments is complemented by the PhD programs "Migration Studies, "Regenerative Medicine" and "Technology, Innovation, and Cohesive Societies", as well as interfaculty research groups.

Facts & Figures

Data collected 2022

Publications total: 527
Number of scientific/art publications



- a → First edition reference books and textbooks: 26
- b → Articles first published in SCI, SSCI and A&HCI journals: 184 including international co-publications: 92
- c → Articles first published in other scientific journals: 112
- d → Articles first published in compilations: 135
- e → Other scientific publications: 69
- f → Artistic sound, image, data carriers: 0
- g → Art catalogs and other art publications: 1
- h → Articles in art catalogs and other art publications: 0

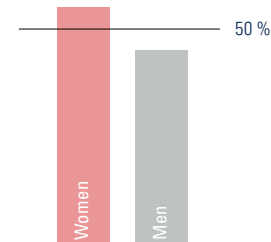
Source: Intellectual Capital Report 2022

Academic Staff

Total: 370

Women: 203

Men: 167

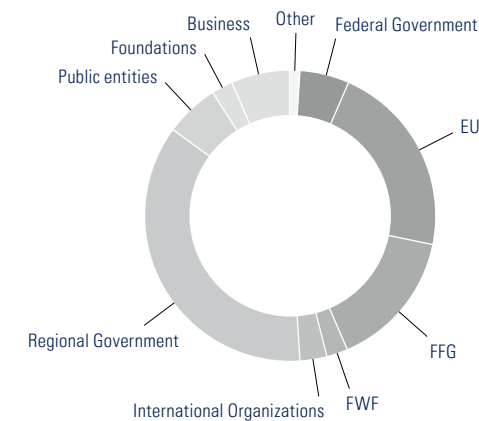


Source: Intellectual Capital Report 2022 (as per: 31 Dec 2022, actual persons)

Third-party research funding in 2022

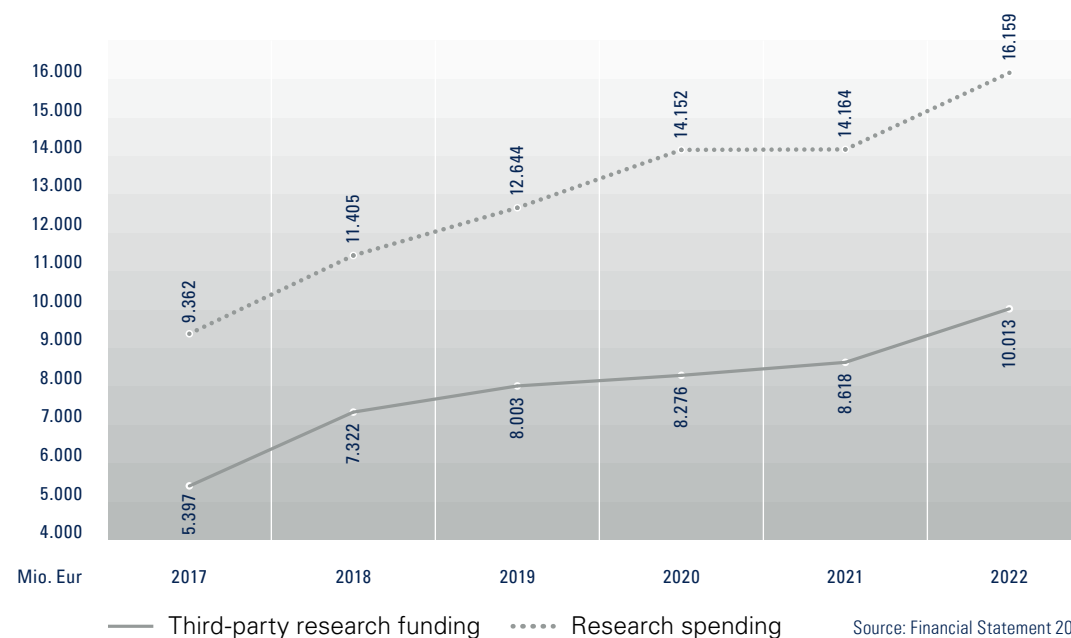
Total: 10.0 million Euros

By funding organization:



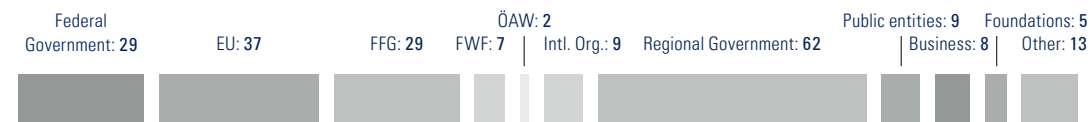
Source: Financial Statement 2022

Development third-party funding and cost of research



Source: Financial Statement 2022

Projects by funding organization total: 210



Source: Intellectual Capital Report 2022

To the University for Continuing Education Krems it is important to convey how significant science and research are for societal purposes. Thus, it engages in science communication and participates in events shaped for the dissemination of science. After returning to the possibility of face-to-face events in 2022, the University for Continuing Education Krems participated in several science communication formats, reaching a broad audience interested in research topics, with special focus on young people.



→ Girls Day 22

After an interruption due to the pandemic, the University for Continuing Education Krems again participated in the national action day "Girls' Day" on 28 April 2022. 25 female students of the 7th grade attending the Federal High School Tulln and accompanied by one teacher received an impression of career opportunities at universities from different disciplines. By means of experiments in the biomedical laboratory, the light laboratory and the MediaLab, the girls were able to experience scientific work for themselves.



→ Long Night of Research 2022

The University for Continuing Education Krems participated in this Austria-wide event on 20 May 2022, showcasing its research at 23 stations, reaching from medicine, digitalization and continuing education to biodiversity and cultural heritage. Research stations and live demonstrations illustrated how research processes work and invited people to join in.

Scientific Awards and Prizes

Between October 2021 and February 2023, researchers at the University for Continuing Education Krems have been awarded a number of prizes and awards acknowledging their work:

DECA Award

→ Albert Treytl and Markus Winkler won the DECA Award with the projects CoolBrick and CoolAir in the category "Building and Energy Efficiency" (3rd Austrian Energy Efficiency Congress), 5 October 2022.

Manz-Autorenpreis

→ Prof Thomas Ratka was awarded the Manz Autorenpreis (Award for authors) in the category Online by Manz publishing house.

Most highly cited researcher

→ Prof Gerald Gartlehner was named one of the world's most highly cited researchers by Clarivate.

Science Award of the Medical Society

→ Emma Persad received the Science Award of the Medical Society of Lower Austria.

Publication award

→ Gernot Wagner received the publication award of the Austrian Society for Medical Mycology.

Cultural award of the province of Lower Austria

→ Hanna Brinkmann received the recognition award in the framework of the cultural award of the Province of Lower Austria.

Bernd Rode Award

→ Patricia Engel received the Bernd Rode Award of the ASEAN European Academic University Network.

"neue texte" essay prize

→ Helmut Neundlinger received the "neue texte" essay prize from the Heimrad Bäcker interest group.

Best Poster Award

→ Thomas Wernbacher received the Best Poster Award at the European Conference on the Impact of Artificial Intelligence and Robotics.

Sail of Papenburg Special Award

→ The project Living Danube Limes received the Sail of Papenburg Special Award of the Association of European Border Regions.

Krems Cooperation Research Award

→ Birgit Fendl received the Krems Cooperation Research Award in the Scientific Publication category from ecoplus.

Physio Austria Award

→ Andreas Gattermeier received the Physio Austria Award in the Education category.

Second Poster Award

→ Markus Neubauer received the Second Poster Award for Basic Biomedical Research from SPORLASTIC GmbH.

MSD Health Award

→ Teresa O'Rourke and Prof Christoph Pieh received an MSD Health Award.

Best International Reviewer

→ Yvonne Teuschl was awarded Best International Reviewer by the Dutch Heart Foundation.

Research at the University for Continuing Education Krems focuses on current and future societal challenges. The five university-wide research fields provide a clear profile for addressing these challenges in a transdisciplinary manner.

Our main fields of research:

- Digital Transformation, Health and Innovation in Cohesive and Sustainable European Societies
- Evidence-based Health Research
- Cultural Heritage
- Preventive and Regenerative Medicine
- Continuing Education Research

Further internationalization with focus on Europe

The University for Continuing Education Krems continues the path to expanding participation in European research, foremost in the current EU Framework Program Horizon Europe and other funding schemes. The aim is to deepen and enhance existing international and European research networks and to form new ones. In line with this, the University aims to increase its participation in national and European programs that promote basic research in order to further enhance its connectivity to national and international research networks. This includes, among others, increased participation in funding programs targeting early stage scientists, such as those of the Austrian Science Fund (FWF) like ESPRIT or the Elise Richter-program.



Additional PhD Programs

In 2022, the third PhD program “Technology, Innovation and Cohesive Societies” was accredited and initiated. In the period covered by the current and forthcoming performance agreements, further PhD programs will be established with the aim to offer at least one PhD program in each of the University’s main fields of research.

Expanding Research Labs

The University for Continuing Education Krems established Research Labs as adequate infrastructure to address specific research questions across disciplines. These labs are located at the level of the three faculties and support research conducted in the five main fields of research.

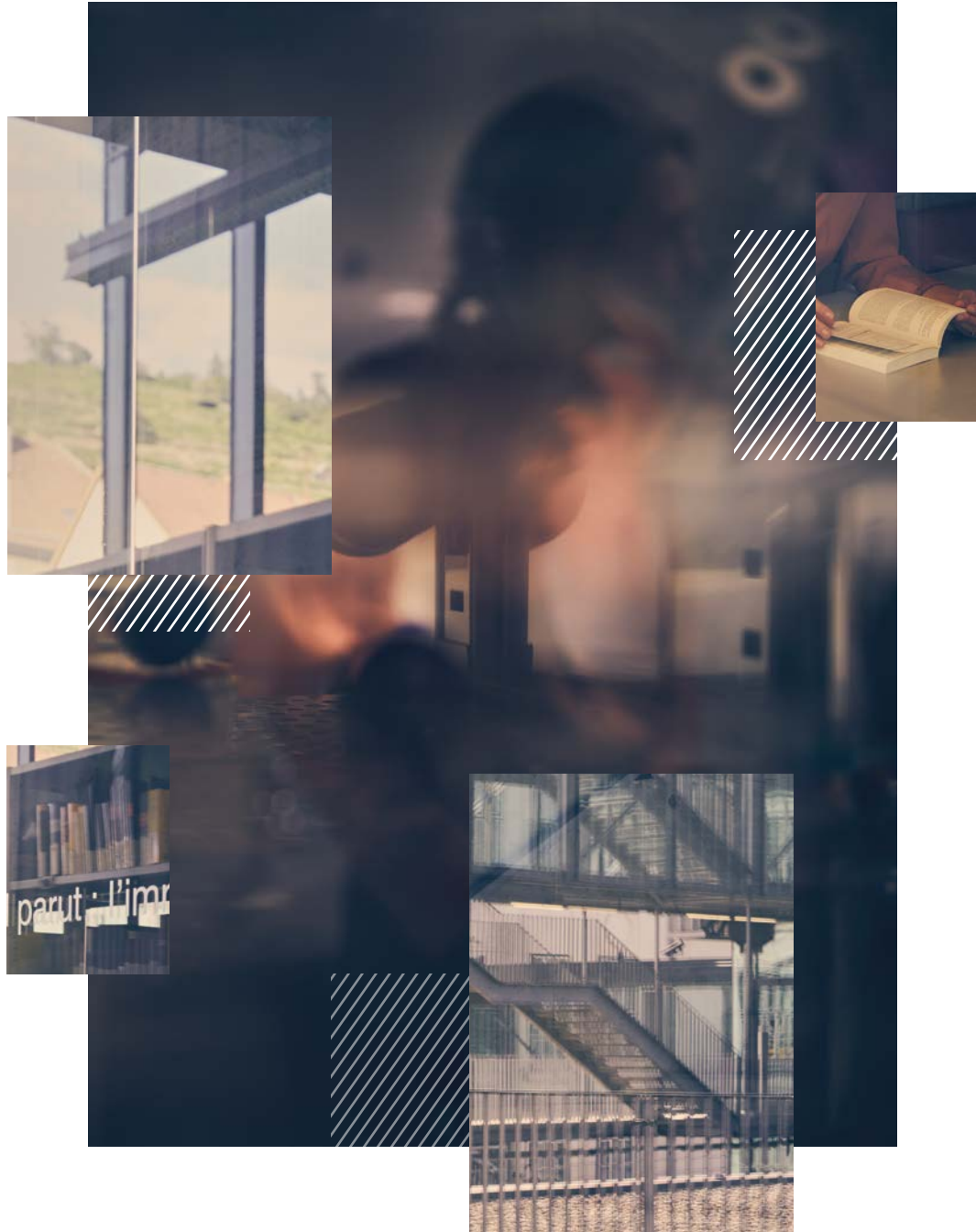
Support and Transfer

With the offices of Grant Acquisition and Research Services, the University for Continuing Education Krems has an effective structure to support research, from advising on proposal design and submission to monitoring grant tracks and documenting research. The services follow the strategically anchored further internationalization of research.

With the planned Office for Technology Transfer, the University will actively support knowledge valorization, to create social and economic value by transforming research results into sustainable solutions and policies that benefit society. Furthermore, the University continues the open access strategy of publishing and is expanding its range of electronic resources.

Measures to promote young researchers

The University for Continuing Education Krems will continue to implement measures to promote attractive and sustainable research careers to support young researchers in taking up the innovation challenges of our society. The University is therefore going to implement a comprehensive model of diverse career paths, starting in 2023. The aim is to equip young researchers with the skills needed for a career within academia and beyond.



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