MONTAN UNIVERSITÄT LEOBEN

FOCUS ON INTERNATIONALISATION

Report 2021

Miro

Preface

Global action as an essential part of university culture has become indispensable in the 21st century. Through the compilation of this publication, it has become evident that the inspiring international spirit is exceptionally welcome and at home at the Montanuniversität Leoben (MUL) and that it enriches all of us, as well as the institution itself, in many ways. In recent years, the MIRO (Montanuniversität International Relations Office) and numerous other dedicated members of the ComMULity have been actively working to expand and advance the global orientation of our teaching, research and innovation. Together, we have therefore created an extremely solid starting position for the future. Now, for the first time, we can pause for a moment, look back, remember, and rejoice in what we have already accomplished. However, it is now also time to consolidate, to learn from what we have experienced and to derive effective strategies for the future that will further pave the way for the success we have already achieved.

Together, strengthened by the Rectorate and derived from the university's new development plan, we now intend to launch a participatory strategy process to further develop what we have achieved so far by the end of the year, thus increasing our visibility worldwide and promoting our transnational networks more intensively for the fruitful development of our university in all areas. Take this report today as inspiration for your future activities and for new ideas that we may put into action together tomorrow!

Thank you to all those who have worked diligently to realize this report and make it possible in the first place, and to all those who have so generously shared their experiences with us to preserve them here.

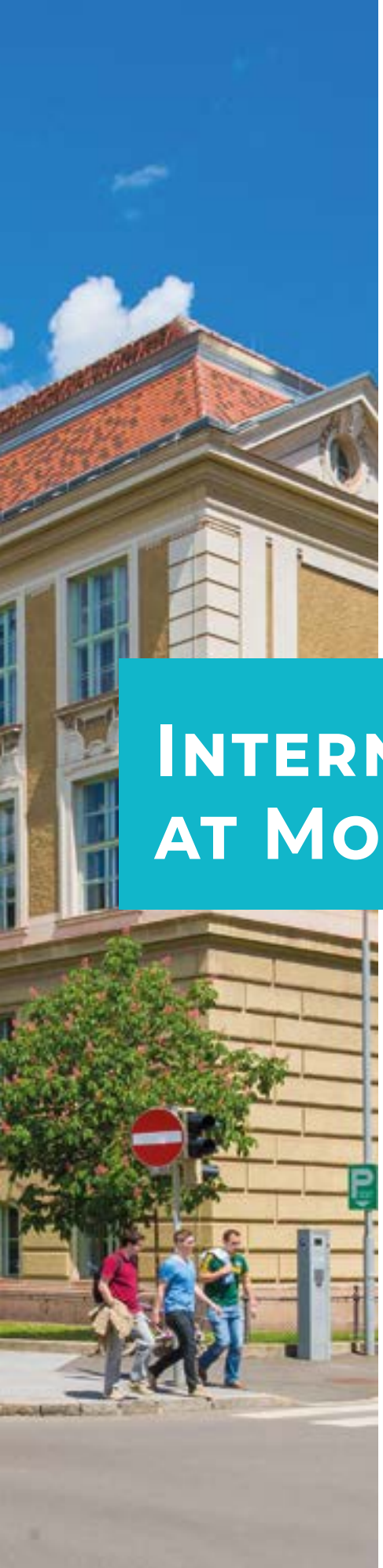
I look forward to working with all of you to blaze future trails in the world and accompany Montanuniversität Leoben into a global future!

Yours,

Susanne Feiel

Susanne Feiel, MA
Head of International Office

Table of contents



Internationalisation at Montanuniversität

INTERNATIONALISATION AT MUL

Why internationalisation?

The core mission of a university is to produce new knowledge to contribute to the fruitful development of society. In today's world, the prosperous advancement of the population depends on how well global societal challenges facing humanity can be solved, such as climate change and the environment, responsible consumption and production, or resource and energy efficiency.

These challenges are global in scale; they reach across all nations and are interdisciplinary and systemic in nature. Effective collaboration among all global actors is therefore critical to address the daunting culmination of man-made challenges. Against this backdrop, it goes without saying that successful and all-encompassing internationalisation is therefore an essential part of a university's identity and performance. To meet the challenges, it needs well-educated people from all disciplines and corners of the world who can do so. An institution must be able to offer its researchers, teachers and learners an environment that prepares them well for the necessary international cooperation and a holistic and global perspective on our social situation.

Montanuniversität Leoben is committed to teaching and research focused on internationality as a cornerstone of its excellence and successful positioning in the international scientific community. Through its high-quality and innovative teaching and research embedded in an international context, it contributes to global development goals and supports its students and employees in developing into cosmopolitan, innovative and critically thinking citizens. In this way, they acquire the competence to act responsibly in domestic and international working environments, be it in teaching, research or non-university working environments.

Structures and needs of internationalisation

The internationalisation of an institution is a challenging and complex task because it involves many different aspects and levels that must be considered and coordinated.

On the one hand, internationalisation must respect and work with existing structures, reaching out and involving research, teaching, and innovation. In doing so, it must implement measures that accompany researchers in international collaboration so that they are consistently well-connected, have adequate linguistic and cultural skills to operate successfully in international groups and settings, and receive the necessary support that allows them to focus on their work and not on administration. Educators must be able to draw on internationally acquired knowledge, have the cultural and linguistic ability to professionally communicate their field to multicultural audiences, and incorporate a variety of diverse perspectives. Approaches to innovation should be focused on global perspectives and incorporate new and culturally diverse ideas for innovation. The world can be structured in many different ways!

On the other hand, internationalisation must involve the structural aspects of the institution, meaning it must permeate the administration and infrastructure, an often neglected but critical component of successful internationalisation. Researchers,

lecturers, innovators and students can only successfully carry the university and position it internationally in the top field if they, in turn, are carried in their efforts to work internationally. By providing them with a field of action that supports them in every aspect of their performance without having to deal with the structural challenges often associated with it, the institution promotes global engagement and optimal outcomes.

This requires centralized services whose administrative staff internalize the international dimension, identify positively with it, and bring with them the necessary skills to foster this development. The international office is just one key department that centralizes, provides, and serves as a focal point for services whenever possible. But more than that, all other departments together are crucial to create a natural international environment and a welcoming culture within the institution that automatically has a positive impact on all internationalisation efforts. This starts with the provision of all papers and services in English, continues with professional communication in necessary target group oriented foreign languages and ends with a comprehensive professional knowledge and cultural relations with all international customers.

This internal image of the institution must also be complemented by an external image that incorporates the environment in which the university is embedded locally, regionally and nationally. This environment, and the external welcoming culture that accompanies it, is significant for effectively reaching out to the world and welcoming the international community to the institution. This includes the adequacy of the community‘s infrastructure and services, the community‘s cultural readiness and capacity, the legal situation for international members and guests of the university, the physical environment and recreational opportunities, mobility services, other services, and much more.

Professor Peter Moser, Vicerector of international relations

Finally, the visibility of the institution to its target audiences in the global community is a critical factor to consider - its global positioning in terms of what it stands for and how to attract the international community to the location. This visibility aspect is therefore a key factor behind successful internationalisation that must be put into practice wisely.

THE STRATEGIC PERSPECTIVE

The strategic perspective of internationalisation is concerned with deciding how and with whom the university should engage internationally and with what content. Building international relationships with project partners and strategic partner institutions is an aspect that is also dual in nature: on the one hand, it is often an evolutionary bottom-up process; on the other hand, it is important to consolidate and strategically build partnerships that are consistent with institutional goals and therefore top-down.

In order to develop a comprehensive internationalisation strategy, all of the aspects mentioned above must be taken into account. Most importantly, it needs the commitment of the institution and the involvement and perspective of all of its stakeholders to be able to work together to develop an honest strategy that everyone will stand for and live by. In the coming months and years, the core goal of the Rectorate, together with the International Office and other contributors, is to develop such a comprehensive strategy in a participatory and moderated manner. The goal is a path along which everyone will find their place and which will lead Montanuniversität Leoben to the wider world and make it known there, thus making it a home for precisely this world.

Overall, it can be stated that the internationalisation measures at MUL have borne fruit in recent years and that this is also clearly reflected in the figures. What is needed now is a more in-depth examination of the topic and a well-considered and thought-out further development of the activities that have been started, geared to the future. In coordination with the new development goals of the university and building on the successes already achieved, the future path will be guided by the following framework:

STRATEGIC POSITIONING

- **Intensification of the international external image of Montanuniversität Leoben.**
  Increasing global visibility through targeted marketing and digitalization measures.
- **Making the university more attractive for international students.**
  Increase in new international admissions to MUL and thus, in the long term, an increase in the number of graduates in the master's and doctoral programs.
- **Targeted development of international partnerships**
  Intensification of the cooperation with those international universities, that offer the most suitable conditions for teaching and research with the corresponding departments at MUL.

- **Securing international student mobility**
  Stabilization of the annual incoming activities at minimum of 200 mobilities per academic year. Completion of at least one outgoing mobility of each student.

- **Promotion of internationalisation@ home**
  Promotion of intercultural understanding and communication skills of staff in central service departments of the university through targeted training and support of international mobilities in these areas.

- **Active shaping of future internationalisation standards**
  Participation in Austrian, European and international committees on relevant internationalisation issues.

SPECIFIC MEASURES...

...IN TEACHING

- **Expansion of the international study programs:**

  Introduction of an English bachelor's degree program

  English as the language of instruction in most master's programs

  Establishment of an international doctoral program with a "PhD" degree.

...IN RESEARCH

- Continuation of the application of international educational projects within the framework of EIT Raw Materials and Horizon Europe

- Measures to increase the number of ERC grants at the university
- Strategic expansion of research partnerships in key topics of the future

...IN MOBILITY

- Expansion of Erasmus mobility and project participation under the Key Actions: Capacity Building, Knowledge Alliances, Erasmus Mundus
- Continuation of the Correspondents project for increased media presence in various social media channels.

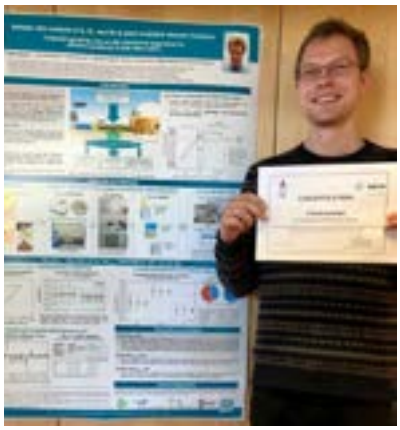
- Strengthening of short-term mobility formats such as summer schools and development of digital mobility formats.
- Establishment of a standardized recognition system for academic achievements at focus universities on the basis of equivalency catalogs.
- Implementation of a modern digital mobility management system for the administration of partnerships and mobilities:

...IN QUALITY ASSURANCE

- Completion of the international processes in Montanuniversität's QM system

Highlights 2019-2020

International Awards



Poster Award EWCPS 2019

Stefan Wagner, PhD student at the Chair of General and Analytical Chemistry, was honored with a poster award at the “European Winter Conference on Plasma Spectrochemistry” (EWCPS) 2019, which took place from February 4-8 in Pau, France. The contribution addressed the development and combination of the diffusive gradients in thin films (DGT) technique with isotope ratio mass spectrometry for the direct analysis of S, Sr and Pb isotopes in environmental samples. Hosting more than 550 scientists from all around the world, the EWCPS is one of the most important international conferences on the subject of plasma spectrometry.

Adjunct Professorship 2019

Professor Helmut Zsifkovits (Chair of Industrial Logistics) has been appointed Adjunct Professor at the Faculty of Arts, Business and Law, School of Business of the University of the Sunshine Coast, Australia. USC is a public university with faculties of Arts and Business and Science, Health, Education and Engineering, with about 17,000 graduate and undergraduate students. Collaborations in the areas of research and curriculum development have high priority.

Travel Grant of the Society of Vacuum Coaters 2019

Martin Rausch, PhD student at the Chair of Functional Materials and Materials Systems, was awarded a Travel Grant offered by the Society of Vacuum Coaters at its 62nd Technical Conference, held in Long Beach, CA, USA, from April 27 to May 2, 2019. These travel grants are provided to support the work of young scientists on vacuum-based coating technologies. Martin Rausch’s PhD thesis focuses on the development of thin metal films for flexible displays and the magnetron sputtering behavior of multi-element systems.

Lee Hsun Lecture Award

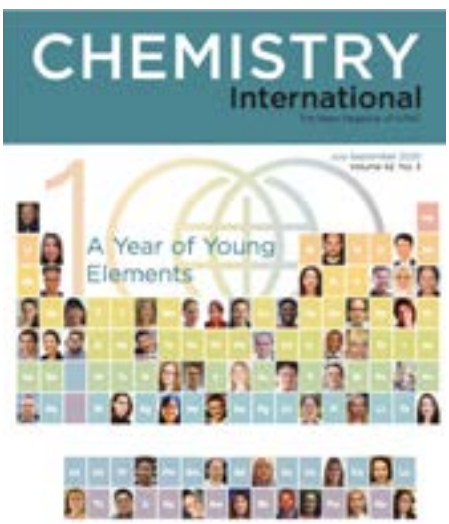
On May 6, 2019, Professor Helmut Clemens, Department of Materials Science, was awarded the Lee Hsun Lecture Award by the Institute of Metals Research of the Chinese Academy of Sciences in Shenyang, China. The prize is awarded to individuals who have made significant contributions to the field of materials science; in Helmut Clemens' case, for his fundamental work in the field of intermetallic titanium aluminides and their structural and mechanical characterization.

International DKG Award

Professor Robert Danzer, Professor Emeritus of the Chair of Structural and Functional Ceramics, was honored with the "International DKG Award" at the D-A-CH Ceramic Session on May 7, 2019 at Montanuniversitaet Leoben. He received the award, presented for only the second time, in recognition of his life's work.

Patronage for chem. element ASTATINE in the "Periodic Table of Younger Chemists"

On the occasion of the 100th anniversary of IUPAC (International Union of Pure and Applied Chemistry) and the International Year of the Periodic Table, IUPAC and IYCN (International Younger Chemists Network) announced the creation of a periodic table of younger chemists in 2019. In the course of this, Dr. Johanna Irgeher from the Chair of General and Analytical Chemistry was selected by IUPAC to represent the chemical element astatine in the Periodic Table of Younger Chemists. The resulting periodic table represents the diversity of careers, creativity and commitment of young chemists.



Barbara Medal of Honor of the Czech Tunnelling Association

During the triennial Czech Tunnelling Congress in Prague, Professor Robert Galler was awarded the Barbara Medal of Honor of the Czech Tunnelling Association for special services to the Czech Tunnelling Association ITA-AITES and his worldwide activities in the context of his tasks as board member of the ITA-CET-International Tunnelling Association - Committee for Education and Training on June 3, 2019.

Adjunct Associate Professorship

Dr. Manuel Woschank from the Chair of Industrial Logistics, was appointed “Adjunct Associate Professor” at the Faculty of Business, Management and Economics at the University of Latvia (UL) in July 2019. UL is a state university with approximately 14,000 students and over 11,000 Scopus-indext publications, in the fields of materials science, engineering, management and economics, among others.

Henry Clifton Sorby Award

Professor Helmut Clemens, Chair of Physical Metallurgy and Metallic Materials, was awarded the Henry Clifton Sorby Award 2019. This is the highest award of the American Society for Materials (ASM) in the field of microscopic microstructure research. Clemens received this award for his experimental and theoretical work in the field of cross-scale analytical methods and their linkage with complementary methods. The award was presented at the Materials Science & Technology 2019 meeting in Portland, Oregon, USA.

Goldstein Scholar Award of the Microa- na- lysis Society

In August 2019, Sanja Vranjes-Wessely, MSc received the Goldstein Scholar Award of the Microanalysis Society. This award, sponsored by the Meteoritical Society and the publishing house Springer, serves to promote career advancement for early career members of the MAS. Sanja Vranjes-Wessely is currently a doctoral student in the project “Geomat” - an interdisciplinary project of the Chairs of Petroleum Geology and Materials Physics. The award helped her test the applicability of helium ion microscopy for the structural characterization of organic-matter-rich rocks at the University of Bielefeld (Faculty of Physics).

Poster Award CANAS 2019

During the Colloquium Analytical Atomic Spectroscopy CANAS 2019, held at the TU Bergakademie Freiberg, Christoph Walkner from the Chair of General and Analytical Chemistry was awarded a poster prize. The research project is being carried out in cooperation with the companies Breitenfeld Edelstahl AG and Dr. Korp Technological Consulting.

“Best Oral Presentation” in the field of “Structural Materials” at EUROMAT-conference 2019

At EUROMAT 2019 in Stockholm, Europe‘s largest conference in the field of materials science, Dr. Christina Hofer (Department of Materials Science), was awarded the “Best Oral Presentation” prize. Her lecture entitled “Application of Transmission Kikuchi Diffraction in Atom Probe Specimen Preparation to Address Current Topics of Steel Research” was selected from several hundreds of lectures and several symposia in the entire field of structural materials.

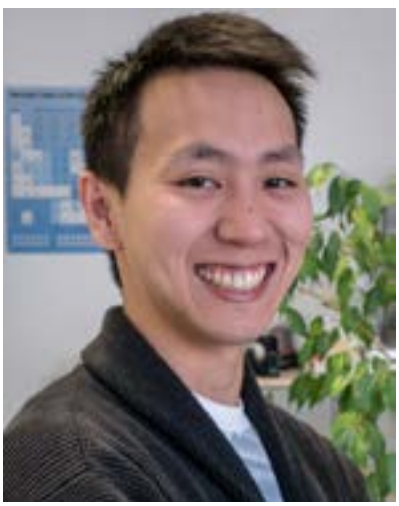
Proof of Concept Grant

Professor Jürgen Eckert, Head of the Chair of Materials Physics and Director of the Erich Schmid Institute of Materials Science at the Austrian Academy of Sciences (ÖAW), received a EUR 150,000 Proof of Concept Grant from the European Research Council (ERC) in 2019.

The coveted grant supports further exploration of the potential of thin-film metal glasses as novel durable and protective ("tribological") coating materials that can be used to improve the performance of tools, dies, molds and components in a wide range of applications.

Georg-Sachs- Prize of the German Society for Materials Science (DGM)

On November 27, 2019, as part of the centenary celebrations of the German Society for Materials Science (DGM) in Berlin, the prestigious Georg Sachs Prize was awarded to Priv.-Doz. Dr. Verena Maier-Kiener, Senior Lecturer and Group Leader for Mechanical Properties and High Performance Materials at the Chair of Physical Metallurgy and Metallic Materials. This award recognizes her outstanding scientific achievements in recent years in the field of thermally activated plasticity on single-crystalline and ultrafine-grained body-centered cubic materials.



TACT 2019 Silver Student Award

Ao Xia from the Chair of Functional Materials and Materials Systems received the Silver Student Award at the TACT 2019 International Thin Films Conference in Taipei, Taiwan, hosted by the Taiwan Association for Coating and Thin Film Technology (TACT), for his contribution on the characterization of the structure and properties of MoNbTaVW high entropy alloy thin films. The films were produced by different physical vapor deposition (PVD) methods varying the deposition angle and, by adding nitrogen as process gas, synthesizing nitride films.

AVS Dorothy M. & Earl S. Hoffmann Travel Grant

Mehran Golizadeh from the Chair of Functional Materials and Materials Systems received the AVS Dorothy M. and Earl S. Hoffman Travel Grant at the AVS 66th International Symposium & Exhibition in Columbus, Ohio. With this award, the American Vacuum Society (AVS) recognizes and encourages excellent scientific and technological work by doctoral students in scientific areas of interest to AVS. Mehran Golizadeh was awarded for his contribution on the characterization of the surface of eroded AlCr cathodes where a modified layer formed due to exposure to the arc plasma.

"Certificate of Excellence in Reviewing" from Acta Materialia, Inc

The Board of Directors of Acta Materialia, Inc. awarded the Certificate of Excellence in Reviewing to Dr. Stefan Pogatscher of the Chair of Nonferrous Metallurgy in recognition of his outstanding achievements as a reviewer in 2019. "This is a special award, as a lot of time goes into reviewing publications, and the journals 'Acta Materialia' and 'Scripta Materialia' have been among the leaders in the field of metallurgy for a long time," Pogatscher said.

International Association of Advanced Materials - IAAM Medal 2020

The International Association of Advanced Materials, based in Sweden, awards the IAAM Medal annually for special achievements in the field of materials science. At the 32nd Advanced Materials World Congress from February 2-5, 2020 in Sydney, the award went to Professor Harald Raupenstrauch from the Chair of Thermal Process Engineering and his team.

R.F. Bunshah Award and Honorary Lectureship of the Advanced Surface Engineering Division of the American Vacuum Society

The R.F. Bunshah Award of the Advanced Surface Engineering Division of the American Vacuum Society was presented to Professor Christian Mitterer. The award is the highest recognition of the division, which is usually presented as a lifetime achievement award to well-established scientists. Up to now, Christian Mitterer is the youngest scientist to date to be honored with this award. The award was presented for his "seminal contributions to the materials science of coatings based on borides, nitrides, carbonitrides, oxides and metal alloys".

"Curriculum Innovation Award"

Dr. Manuel Woschank (Chair of Industrial Logistics) received the "Curriculum Innovation Award" at the 5th North American International Conference on Industrial Engineering and Operations Management (IEOM) in Detroit in recognition and appreciation of his contributions, dedication, and lifelong achievement in the industrial engineering and operations management profession. The conference included 500+ technical presentations from more than 50 countries.

Best Track Paper Award – IEOM 2020

Corina Pacher, MA MA (Resources Innovation Center Leoben) and Dr. Manuel Woschank (Chair of Industrial Logistics) received the Best Track Paper Award for the contribution "Fostering Transformative Learning Processes in Industrial Engineering Education" at the 5th North American International Conference on Industrial Engineering and Operations Management (IEOM) in Detroit. The paper was selected among 500+ accepted papers from more than 50 countries.

Elected President of the European Certification Board for Logistics (ECBL)

At its last board meeting, the European Certification Board for Logistics (ECBL) elected Professor Helmut Zsifkovits (Chair of Industrial Logistics) as president. This is the first time an Austrian has held this position. ECBL is based in Brussels, develops standards for qualifications in logistics on a European level and certifies logistics experts. In addition to European member organizations, the ECBL network now also includes countries such as South Africa, Morocco, Egypt and Indonesia.

SAS Atomic Spectroscopy Student Award 2020

In 2020, Dr. Anika Retzmann from the Chair of General and Analytical Chemistry was honored with the SAS Atomic Spectroscopy Student Award. The award ceremony took place during the virtual SciX2020 conference and Anika Retzmann presented her work on “Bone Under The Analytical Eye: Isotopic Analysis - From Anthropological Studies Of Archaeological Humans To Modern Biomedicine” to the international audience. With about 1500 international scientists, the SciX conference is one of the most important international conferences in the field of analytical chemistry on atomic spectroscopy.

Honorary Doctorate from Freiberg University of Technology

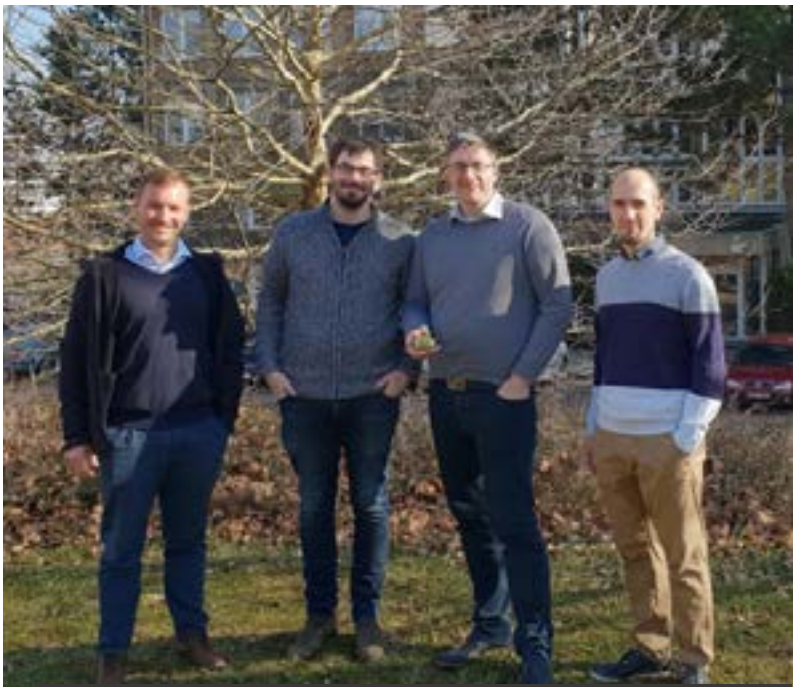
The University of Technology Bergakademie Freiberg has awarded Professor Peter Moser the academic degree and the dignity of honorary Doctor of Engineering in recognition of his many years of scientific cooperation in the field of raw materials technology, economics and policy and for his special services to the further development of the internationalisation of education and training in the field of raw materials.

More Highlights...

Cooperation meeting at MUL with TU Dortmund University, 2019, Chair of Economic- and Business Management


MIRO Exhibit booth, Teconomy 2019


Delegation visit to the MUL from Zambia, 2019



Brno, research stay at the Institute for Materials Physics, Academy of Sciences of the Czech Republic, 2019, 2nd from left Dr. Florian Arbeiter

Zambia, research stay, Professor Harald Raupenstrauch

Summer School CirCOOL at MUL, 2019

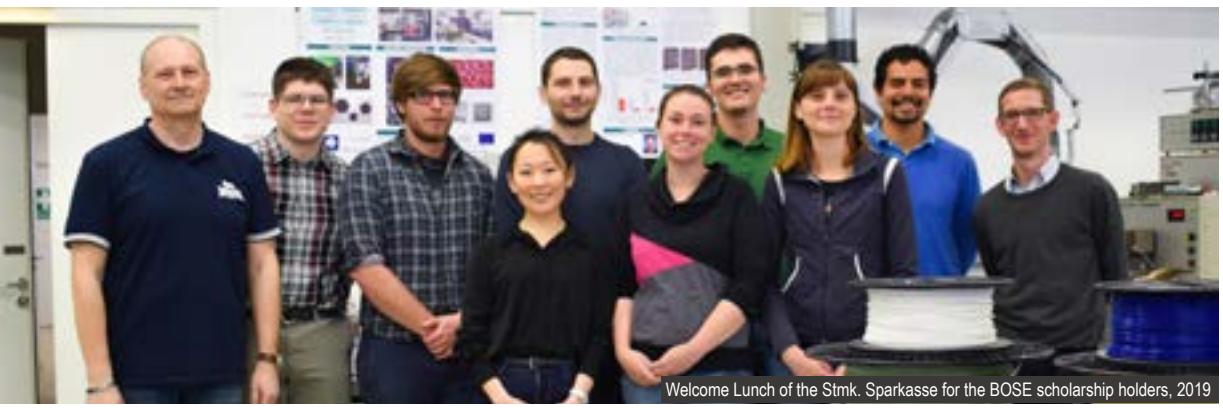
Colorado, contract signing Joint Degree Program Colorado School of Mines, Vicerector Peter Moser and Susanne Feiel, MA

Brescia, research stay at the University of Brescia, 2019 Dipl.-Ing. Anja Gosch

Tokyo, research stay, 2019 f.l.t.r. Prof. Dr. Niccolò Giannetti, Lisa Kuo, Rodolfo Panerai and Dr. Christoph Ponak

Pennsylvania, Signing of Student Exchange Agreement PennState University

MIRO study abroad fair, 2019

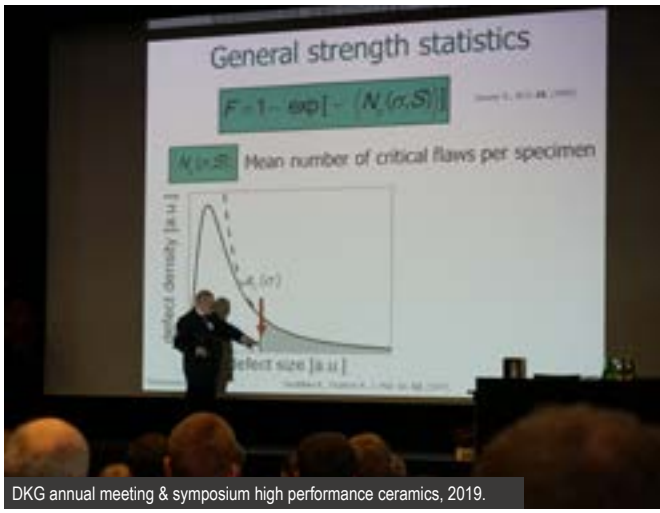


Welcome Lunch of the Stmk. Sparkasse for the BOSE scholarship holders, 2019

Welcome Lunch at Stmk. Sparkasse for BOSE Scholarship holders, 2019

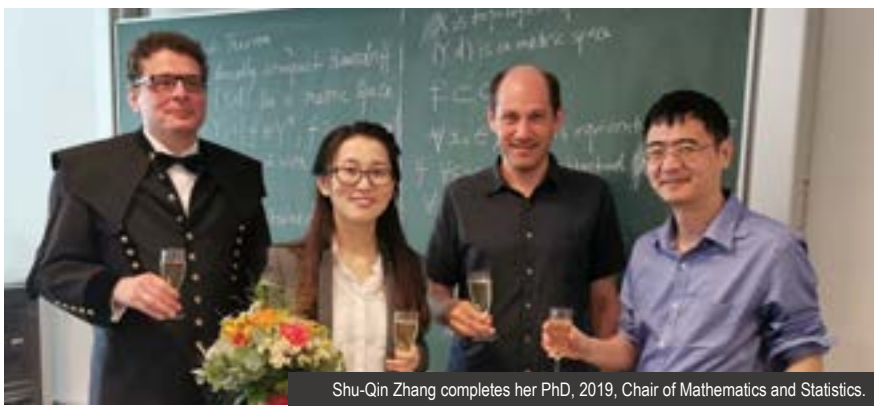
Potluck Dinner with international students at student dorm MINEROOM, 2019

Wuhan, cooperation visit to Wuhan University of Science and Technology, Vicerector Peter Moser, Susanne Feiel , MA



DKG annual meeting & symposium high performance ceramics, 2019.

Graz, Intensive Incoming English Course Fieldtrip, ZSBK, 2019



Shu-Qin Zhang completes her PhD, 2019, Chair of Mathematics and Statistics.

Sofia, MUL exhibition stand, Integral trade fair, 2019

MIRO study abroad fair, 2019

Delegation visit to MUL, Braude College, 2019

Japan & South Korea, participation in business trip, 2019, 1st from left Professor Nikolaus Sifferlinger

SME 4.0 „Industry 4.0 for SMEs - Smart Manufacturing and Logistics for SMEs in an X-to-order and Mass Customization Environment, 2019

MIRO Free Friday Carneval, 2020

Sinopoly Summer School at MUL, 2019

Pau, European Winter Conference on Plasma Spectrochemistry, Chair of General and Analytical Chemistry

Wuhan, Metallurgy Innovation Symposium, 2019, Chair of Ferrous Metallurgy

St. Helena Island, Geomagnetic Field Reversals: Morphology and Consequences, 2020, Chair of Applied Geophysics

Virtual Recy&DepoTech, 2020, Chair of Waste Recycling Technology and Waste Management

San Diego, MUL Workshop on small scale medical testing, Materials Science World Congress TMS, 2020

Thailand, Research Visit , University of Chiang Mai, 2020, Professor Helmut Zifkovits

International Research

- ERC Grants
- European Institute of Innovation & Technology (EIT)
- Resources Innovation Center (RIC)
- MUL Projects 2019-2020

International research at Montanuniversität

As one of Austria's 22 public universities, Montanuniversität plays an important role not only in teaching, but also in research. Excellent research is created here through the dedicated cooperation of various participants, which is preferably not limited to university-internal or Austrian partners. In fact, multilateral cooperation between universities and also research institutions is a cornerstone for innovative and result-rich projects to succeed in the long term. For many decades, Montanuniversität Leoben has maintained intensive contacts with researchers, universities, research institutions and companies worldwide.

The staff of Montanuniversität itself is also international: Of the approximately 1350 employees, more than 200 have foreign origins; nearly 50 different nationalities are represented. The cross-border personal contacts of the employees and the internationality within the institution create an optimal starting position for fruitful worldwide research activities and successful intercultural cooperation.

National – EU – Worldwide

In 2019 and 2020, a total of over 1200 ongoing research projects (individual project volume > EUR 10,000) were conducted at MUL: This included projects with federal, European as well as international funding. In addition to national funding opportunities, which are advertised, managed and processed by agencies such as the Austrian Research Promotion Agency (FFG) and the Austria Wirtschaftsservice Gesellschaft (aws), there is also the possibility to submit project proposals on an international level. An important role is played by multilateral initiatives with regional approaches and strategies (e.g. in the Danube region, Alpine region, Western Balkans) as well as international networks such as the Africa UniNet, of which MUL is a member.

These initiatives are supported and promoted by the Federal Ministry of Education, Science and Research (BMBWF). In addition, there are numerous other European funding opportunities, such as the COST Action and the Research Fund for Coal and Steel (RFCS), through whose financial support our university also carries out projects successfully.

Horizon 2020

The most important program for research and innovation at the EU level is Horizon 2020 (also H2020, since 2021 Horizon Europe). The EU framework program provided a budget of almost 75 billion euros for the 7-year program period 2014-2020.

Funding opportunities ranged from basic research to innovative product development. The H2020 program also funded, among others, the ERC grants, Marie Skłodowska- Curie Actions (MSCA), CERN and the EIT. In all of these areas, Montanuniversität has been extremely successful in obtaining funding in recent years.

ERC Grants

The European Research Council (ERC) grants are a funding program for cutting-edge research that, at 14.1 billion euros, made up a large part of the total H2020 budget.They offer outstanding researchers the opportunity to work on open topics and in as interdisciplinary a manner as possible.

The grants are aimed at researchers of any nationality who want to realize particularly high-risk but pioneering fundamental research projects in Europe and must be seen as a special award for researchers, as well as an international competitive indicator of a university. Successful MUL ERC projects are, for example:

ERC Consolidator Grant

for Assoz. Prof. Dr. Daniel Kiener, Chair of Materials Physics

Project **TOUGHIT**

Tough Interface Tailored Nanostructured Metals,

with a total budget of EUR 1 960 985

ERC Consolidator Grant

for Univ.-Prof. Dr. Raul Bermejo Moratinos,
Chair of Structural and Functional Ceramics

Project **CeraText**

Tailoring Microstructure and Architecture to Build Ceramic Components with Unprecedented Damage Tolerance,

with a total budget of EUR 1 985 000

ERC Starting Grant

for Assoz.Prof. Dr. Stefan Pogatscher,
Chair of Nonferrous Metallurgy

Project **TRANSDESIGN**

Design of Phase Transition Kinetics in Non-Equilibrium Metals,

with a total budget of EUR 1 499 679

European Institute of Innovation and Technology - EIT

The European Institute of Innovation and Technology (EIT) is also a component of the H2020 program. It is an independent EU body that fuels Europe's innovation capacity by nurturing entrepreneurial talent and supporting new ideas to become the leading European initiative that empowers innovators and entrepreneurs to develop world-class solutions to social challenges and create growth and skilled jobs.

To this end, the EIT has established several knowledge and innovation communities - so-called Knowledge & Innovation Communities (KICs) - that leverage this spirit of innovation and entrepreneurship in their specific thematic area by initiating collaboration between universities, research institutions and businesses. Montanuniversität Leoben is a member of two of these KICs, namely the EIT RawMaterials and the EIT Climate-KIC, which are run by the Resource Innovation Center (RIC) Leoben.

Resources Innovation Center - RIC Leoben

The Resources Innovation Center - RIC Leoben bundles resource innovation and sustainability activities of Montanuniversität along the life cycle of materials and acts as an interdisciplinary coordinator and catalyst for topic and project development with internal as well as external stakeholders. It has access to an extensive European network that now includes more than 2000 partners. Of paramount importance for the RIC is the work in the Knowledge and Innovation Community (KIC) EIT RawMaterials; a pan-European network of 300 partner institutions from science, industry and education in the raw materials sector, of which Montanuniversität can proudly call itself a founding member.

Since the start of activities in 2015 and by using partner synergies of the network, for example, not only within the community, a significant number of projects have been funded, H2020 research projects, European Regional Development Fund projects in the raw materials sector and research and education projects with the participation of MUL have also been applied for and won. In this KIC, RIC, together with various chairs of the university and external partners is engaged in the development of innovation projects in the areas of Securing Sustainable Raw Materials Supply, Circular Economy and Sustainable Material Solutions, as well as a number of training projects for the aforementioned area.

Membership in the EIT Climate-KIC, in which the topics of Urban Transitions and Sustainable Production Systems are being advanced in order to limit the effects of climate change and promote a climate-resilient society, is also of great importance. An additional area besides the KICs in the activity portfolio of the RIC Leoben is the Sustainable Development Goals of the United Nations, which are contributed to by many different initiatives. Currently, RIC's portfolio includes more than 30 ongoing, almost entirely international, projects.

These activities have a direct positive impact on the performance indicators (KPIs) of the university and therefore represent an extensive added value for the structural development of the university and its internationalisation in research.

MUL Projects 2019 & 2020

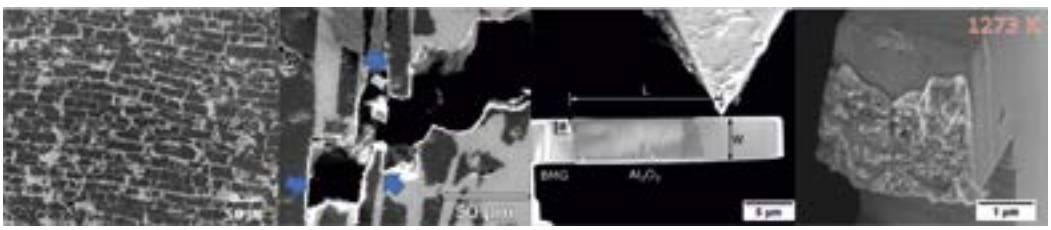
In 2019 and 2020, MUL's international research activities resulted in more than 220 active projects with many partners far beyond Austria's borders. Of these, more than 100 projects were funded by various EU grants.

On the following pages, 29 selected multilateral MUL research projects are briefly presented with the intention of giving a small, varied insight into the colorful project partner landscape and diversity of topics. Since such short excerpts can by no means describe the underlying research work with all relevant aspects, please refer to the appendix for further project information and contact persons. A link is provided by the reference number ►A... at the end of each article.

Inspiring Sea Shell

Department of Materials Science and Engineering, University of California, Berkeley (USA), Materials Sciences Division, Lawrence Berkeley National Laboratory (USA), Research Institute of Advanced Materials, Department of Materials Science and Engineering, Seoul National University (KOR), International Center for Young Scientists, National Institute for Materials Science (JAP), School of Mechanical and Manufacturing Engineering, UNSW Sydney (AUS), Advanced Analysis Center, Korea Institute of Science and Technology (KOR), Japan Aerospace Explanation Agency (JAP), Institut für Materialphysik im Weltraum, DLR (DEU)

Chair of Materials Physics



Mother of pearl is famous not only for its appealing colorful appearance, but also for its outstanding mechanical properties. The unique combination of high strength and good fracture resistance ensures the survival of mollusks and has spurred the design of various bio-inspired materials.

Typically, hard ceramic building blocks are combined with a soft compliant binder phase, mostly polymers, to a brick-and-mortar structure. Such materials indeed mimic the beneficial property combinations of their biological idols. But they also suffer from the same intrinsic shortcoming: due to the limitations imposed by the organic binder, the thermal resistance of these composites is very limited. Attempts to overcome this by employing a metallic binder instead mostly failed during the synthesis.

In a recent article published in Nature Communications, an international research team involving scientists from the USA, Korea, Japan, Australia and Austria succeeded in the creation of such bio-inspired ceramic-metal composites. With the specific design of the metallic melt and processing conditions utilized, a simple synthesis was achieved. Moreover, during fabrication, the resulting interfaces can be tailored to optimize the final material properties with respect to strength or toughness. …► A1

SUMEX - SUstainable Management in EXtractive Industries

Boliden AB (SWE), European Aggregates Association (UEPG) (BEL), European Federation of Geologists (EFG) (BEL), Öko-Institut e.V. (DEU), Regional Council of Andalusia (ESP), Tallinn University of Technology (EST), University of Lapland (FIN), Wageningen University (NLD), Wirtschaftsuniversität Wien (AUT)

Chair of Mining Engineering & Mineral Economics and the Industrial Liaison Department of Montanuniversität Leoben

The project supports the set-up of a European sustainability framework to improve the permitting procedure along the extractive value chain, to guarantee timely decisions, a transparent governmental regulatory regime, appealing financial and administrative conditions and sustainable natural environmental and social conditions. The main mission of SUMEX is to assist policymakers and other stakeholders in seizing this opportunity. The overall goal of the project is to identify good practices for an open access toolkit, which will help a broader community of practice (CoP) to build on the state-of-the-art and form the basis for the future capacity building. ...►A2

C-PlaNeT Circular Plastics Network for Training

Aristotle University of Thessaloniki (GRC), Friedrich-Alexander University Erlangen-Nürnberg (DEU), Ghent University (BEL), KU Leuven (BEL), Technical University of Denmark (DNK), Technische Universität Berlin (DEU), Technische Universiteit Eindhoven (NLD)

Chair of Polymer Processing & Chair of Waste Processing Technology and Waste Management

C-PlaNeT is a consortium of top-class universities, research institutes and companies in Belgium, Germany, the Netherlands, Austria, Great Britain, Switzerland, Denmark and Greece.

Bringing polymers into the circular economy is one of the great challenges of our time. C-PlaNeT is laying the foundation for a new plastics economy through a European joint PhD program that will train 15 Early Stage Researchers (ESRs) to become part of a new generation of scientists, engineers and policy makers for the EU's circular economy, which must include the design, processing, use and reuse of plastics. Each ESR who develops his/her research skills together with a supervisor and co-promotor represents a piece of the puzzle while benefiting from being part of a project team with 14 other ESRs and their supervisors covering other parts of the life cycle and challenging each other in terms of life cycle thinking and a more sustainable future for plastics. The Chairs of Polymer Processing and Waste Processing Technology and Waste Management of MUL are involved, each of which will supervise a PhD student in Leoben. Both ESRs will spend 6 months at partner institutions (at Ghent University and the Technical University of Denmark) and MUL will also host two ESRs (from Ghent University and KU Leuven) for 6 months. ...►A3

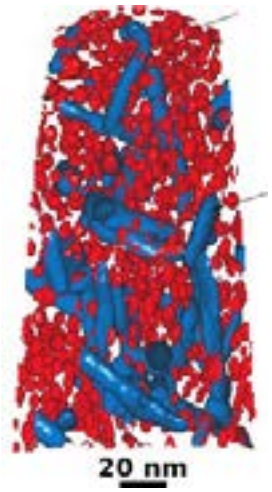
INITIAL

AUBERT & DUVAL - Usine des Ancizes (FRA), Liebherr-Aerospace Lindenberg GmbH (DEU), ONDERZOEKSCENTRUM VOOR AANWENDING VAN STAAL NV (BEL), RWTH Aachen University, Institut für Eisenhüttenkunde (DEU)

Chair of Physical Metallurgy and Metallic Materials

This project targets the implementation and development of corrosion-resistant high-strength maraging steels. Macroscopically, this project aims to study the process-structure-property correlations of these novel high-strength maraging steels with Ni-Ti-Al -based intermetallic nanoprecipitation.

These objectives will be achived via a combination of 3 waves of generic laboratory materials processing and 2 industrial trials. Via the laboratory processing in combination with extensive dilatometry, the project aims at understanding the isolated effect of single intermetallic phases (mainly Ni-3Ti and NiAl) and other elements, e.g. Mo and Cr on strength and other properties e.g. toughness and/or corrosion. The two industrial trials target improving processability and robustness. …►A4



ICDP-DIVE

Universität Lausanne (CHE), University of Georgia (USA), Universität Triest (ITA), Consiglio Nazionale delle Ricerche (ITA)

Chair of Applied Geophysics

Together with colleagues from the universities of Lausanne (CH), Georgia (USA), Trieste (IT), and the Italian National Research Council, geophysicists from Montanuniversität Leoben are preparing to drill a borehole through the boundary of the Earth's crust and the mantle, also known as the "Moho", to learn more about the nature of this transition.

It has been the dream of geoscientists since its discovery in 1910 by seismologist Andrija Mohorovicic, who studied seismic waves, excited by an earthquake near Zagreb. Since the continental Moho has an average depth of about 30 km, no drilling equipment could withstand the corresponding temperature (600°) and pressure (1 GPa) conditions. However, tectonic movements related to the Alpine orogeny led to a shallowing of this boundary to only 3-4 km depth in the Ivrea-zone between the Matterhorn and Lake Maggiore. The Drilling the Ivrea-Verbano Zone (DIVE) project has been accepted by the International Continental Scientific Drilling Program (ICDP), which Austria has been a member of since 2001.

To prepare the drilling, seismic surveys were conducted in the area in 2019/2020 by MUL in cooperation with the University of Lausanne and GFZ Potsdam (DE). These data are currently undergoing advanced image processing to provide detailed site characterization. …►A5

ROBOMINERS

Associacao Portuguesa dos Industriais de Marmores e Ramos Afins (PRT), Federation Europeenne des Geologues (BEL), Geoloski Zavod Slovenije (SVN), Geo-Montan Geologus Ltd (HUN), Institut Royal des Sciences Naturelles de Belgique (BEL), K-UTEC AG (DEU), La Palma Research Centre SL (ESP), Polska Academia Nauk Instytut Gospodarki Surowcami Mineralnymi i Energia (POL), Resources Computing International Ltd (GBR), Tallinn University of Technology (EST), Tampere University of Technology (FIN), Universidad Politécnica de Madrid (ESP), University of Miskolc, Faculty of Earth Science Engineering (HUN)

Chair of Mining Engineering and Mineral Economics, RIC Resources Innovation Center

Development of a bio-inspired, modular mining robot for small and difficult to access deposits: Although there is currently no shortage of raw materials, access to a large part of the existing deposits is severely limited using conventional exploration methods and mining technologies. The general intention of the ROBOMINERS project is research into new technologies, that enable access to new raw material deposits.

The EU-funded project is being carried out in cooperation with 14 partners from 11 European countries, including prestigious European universities, small and medium-sized companies and NGOs. The aim of this project is to provide conceptual proof of the feasibility of this technology with a technology readiness level (TRL) 4. The technology could give the EU access to mineral raw materials from domestic sources that are otherwise inaccessible or considered uneconomical. ...▶A6

NEW-MINE

Partner (sponsored): ETH Zürich (CHE), Italcementi (ITA), KTH Stockholm (SWE), KU Leuven (Koordinator) (BEL), MU Leoben (AUT), Renewi (BEL), RWTH Aachen (DEU), Universität Gent (BEL), Universität Linköping (SWE), U Padua (ITA) *Partner (not sponsored):* Bergischer Abfallwirtschaftsverband (DEU), FCC Environment (AUT), JMR (Group Machiels) (BEL), ScanArc (SWE), Stadler Anlagenbau (DEU), Universität Antwerpen (BEL), Universität Cranfield (GBR)

Chair of Polymer Processing & Chair of Waste Processing Technology and Waste Management

The “EU Training Network for Resource Recovery Through Enhanced Landfill Mining” (NEW-MINE) was a European research project carried out by ten funded partners (“beneficiaries”) and seven non-funded partners (“partner organizations”) from a total of seven countries, dealing with the recovery of raw materials from landfills.

The aim of such Marie Skłodowska-Curie projects is the structured training of doctoral students, with a focus on international exchange. Only doctoral candidates who have not previously lived in the same country may be employed. In addition, international research stays (“secondments”), both with industrial partners and with scientific partners, are an integral part of the project.

Montanuniversität Leoben supervised two PhD students focussing on mechanical waste treatment, especially sensor-based sorting, as well as two guest scientists who worked on the immobilization of heavy metals in waste-based glass ceramics and geophysical exploration, respectively. It also led a work package that included the geophysical exploration of landfills and the mechanical treatment of excavated waste. ...▶ A7

Electroconductive polymers in the nanometer range

Institute of Physical Chemistry „Rostislav Kaishev“ of the Bulgarian Academy of Sciences Sofia (BGR)

Institute of Physics

Successful bilateral research cooperation in the field of atomic force microscopy roughness characterization of solid surfaces:

Within the framework of this S&T project, the expertise of the Bulgarian partner group in the field of electrochemistry and scanning electron microscopy was successfully combined with the long-standing know-how of scanning probe microscopy at the Institute of Physics in Leoben. A first joint publication on this recently appeared in the international journal Electrochimica Acta under the title: “PEDOT-supported Pd nanocatalysts - oxidation of formic acid”. The foundation for the long-standing collaboration was laid more than 30 years ago, when the two project coordinators met during bilateral German-Bulgarian training events for doctoral students.

Since the start of the project in August 2019, joint research meetings have been held in both Sofia and Leoben, which was possible before the outbreak of the corona pandemic. The project will run until July 2022. ...►A8

Professor Vessela Tsakova and Professor Christian Teichert

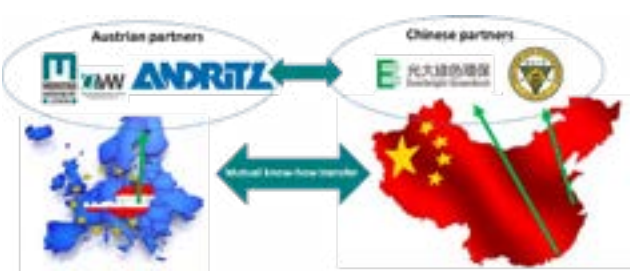
DASCE TEC

ANDRITZ AG (AUT), Everbright Greentech Management Shenzhen Ltd und die Southeast Universit China (CHN))

Chair of Waste Processing Technology and Waste Management

China is facing enormous challenges in waste management due to it’s rapid economic development and urbanization. The Chinese market for general combustible industrial solid waste has huge potential for the development of innovative methods and processes to enhance waste recovery that support the transition towards a circular economy.

The fundamental goal of the DASCE TEC project, it’s full name being “Development and application of safe, clean and efficient incineration technology for combustible industrial solid waste”, is the establishment of a strategic partnership between Austria and China in the area of research, development and applied technology by mutual know-how transfer (e.g. gaining knowledge about the waste management system in Europe/China and possible treatment technologies and incineration options based on fluidized bed combustion). The project consortium consists of one industrial partner and one scientific partner from Austria and China, respectively. The duration of the project is 24 months, starting in October 2020. ...►A9



Nano 4 CSP

BFP Advanced Technologies, Athen (GRC), National Centre for Scientific Research „Demokritos“, Institute of Nanoscience and Nanotechnology, Athen (GRC), The Cyprus Institute, Energy, Environment and Water Research Center, Nicosia (CYP)

Chair of Functional Materials and Materials Systems

The objective of the project is to reduce operation and maintenance costs as well as water consumption while increasing the efficiency of concentrated solar power plants. Concentrated solar thermal power generation is a promising technology that can successfully address future energy needs in a renewable and sustainable way. Despite the penetration level achived by the technology, the levelized cost of electricity still remains high as compared to conventional power plants. As the reflector is the first component to interact with the sunlight in the energy harnessing process, its efficiency is critical to the system's performance. A loss in reflectivity leads directly to an increase in the levelized costs of electricity; thus, mirror washing and water costs represent a significant operational problem.

Using surface modification and coating technologies, self-cleaning surfaces for reflectors will be developed within the current project. These will be achieved by hydrophobic and hydrophilic transparent and erosion-resistant thin films based on titanium dioxide, which should also yield self-cleaning properties due to the photocatalytic effect. ...►A10

Susmagpro

Project consortium consisting of 19 project partners and one associated partner from nine European countries coordinated by Pforzheim University of Applied Sciences

Chair of Polymer Processing & Industrial Liaison Department of Montanuniversität Leoben

Sustainable recycling, reprocessing and reuse of rare earth magnets in a circular economy:

SUSMAGPRO
SUSTAINABLE RECOVERY, REPROCESSING AND REUSE

The multidisciplinary consortium includes leaders from industry and academia in the field of rare earth elements, sustainable processing, reuse, recycling and recovery systems.

They uniquely cover the entire value chain from collectors of magnet-containing scrap to manufacturers of high-tech products based on recycled permanent magnets, thus guaranteeing successful implementation of the very ambitious work program.

The aim of SUSMAGPRO is to identify, separate, process and reuse NdFeB magnets on a pilot scale throughout Europe.

In this way, a circular business model is being developed in the spirit of the circular economy. Instead of sending the critical resources to landfills or exporting NdFeB-containing waste to other parts of the world, SUSMAGPRO will use the latest technologies to extract the elements from magnetic scrap and reintegrate the metals into new products for the European market via a shortened cycle.

The focus is on applications in automotive rotors, water pumps, loudspeakers and wind turbines. For these tasks, the specialized know-how of all partners is needed to make the project goal a success. ...►A11

illuMINEation

ams AG (AUT), Boliden Mineral AB (SWE), DMT GmbH & CO. KG (DEU), DSI Underground Austria GmbH (AUT), Epiroc Rock Drills AB (SWE), Fundacion Tecnalia Research & Innovation (ESP), GEOTEKO Serwis Sp. z o.o. (POL), IMA Engineering Ltd Oy (FIN), Instytut Chemii Bioorganiczney Polskiej Akademii Nauk (POL), Joanneum Research Forschungsgesellschaft MBH (AUT), KGHM Cuprum sp. z o.o. (POL), KGHM Polska Miedz SA (POL), Lulea Tekniska University (SWE), Minera de Orgiva SL (ESP), Retenua AB (SWE), RHI Magnesita GmbH (AUT), Universidad Politécnica de Madrid (ESP), Worldsensing SL (ESP)

Industrial Liaison Department of Montanuniversität Leoben & Chair of Mining Engineering and Mineral Economics, RIC Resources Innovation Center

Coordinated by the Industrial Liaison Department and the Chair of Mining Engineering & Mineral Economics of Montanuniversität Leoben, nineteen project partners teamed-up in the EU-funded illuMINEation project. The consortium's aim, is to set the scene for a paradigm shift in mining via the adoption of pioneering innovations & extensive utilization of digitalization in mining, in order to achieve the next level of safety, environmental and economic performance.

The project's goal is to develop a robust Industrial Internet of Things platform including smart data processing and novel visualization capabilities. ...▶A12

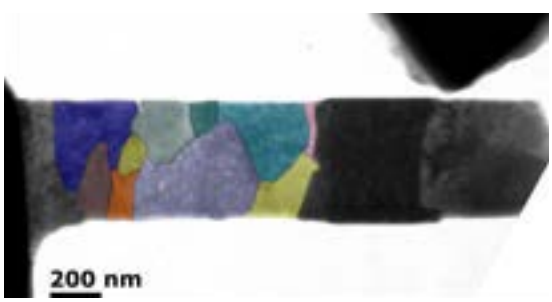
FIT4NANO - Great potential for the smallest structures

EU network project with 80 working groups from 30 countries

Chair of Materials Physics

The EU network project "Focused Ion Technology for Nanomaterials - FIT4NANO"aims to bring together researchers and companies from all over Europe to jointly develop the technology for creating nanostructures with finely focused ion beams and open up new applications.

The finely focused ion beam (FIB) is a very useful tool in nanotechnology and analytics. Until now, scientists have mainly used FIB technology to prepare samples for certain microscopic techniques, such as troubleshooting in the semiconductor industry. But FIBs can do much more.



A focused ion beam instrument is similar to a scanning electron microscope, but uses ions instead of electrons. Focused ion beams are an indispensable tool in the field of micro- and nanomechanics, and also offer great potential for many other applications in nanotechnology.

For example, it can be used to flexibly structure surfaces at the nanoscale or specifically change local material properties. Our technology could be significant for quantum technology, the semiconductor industry, for modifying two-dimensional materials or Li-ion batteries. And FIBs will also play an important role in future medical applications; for example, the interaction of SARS-CoV-2 with so-called vero-cells used in the production of vaccines can be studied by means of helium ion microscopy. ...▶A13

Fines2EAF

Max Aicher Umwelt GmbH (DEU), MFG Metall- und Ferrolegierungsgesellschaft mbH (DEU), Politecnico di Milano (ITA), Rheinisch-Westfaelische Technische Hochschule Aachen (DEU), Sidenor Investigacion y Desarrollo SA (ESP), Stahl- und Walzwerk Marienhütte GesmbH (AUT),University of Oulu (FIN)

Chair of Nonferrous Metallurgy

The Fines2EAF project aims to increase the value of steelmaking residues by internal recycling and (re)use in the form of cement-free bricks. The benefit of successful implementation on an industrial scale includes the utilization of residues instead of landfilling, the internal recovery of metals and due to the conservation of resources a contribution to environmental protection. The approach followed is the development of an innovative recipe for cement-free bricks on the basis of primary and secondary raw material fines and alternative binder systems using a hydraulic stamp press.

Industrial testing to investigate the use of manufactured bricks from various residual materials in EAF steelmaking.

The main challenge is to achieve sufficient cold compression strength of the bricks for low-abrasion handling and sufficient self-reduction behavior to deliver a satisfying metallurgical performance.

The project is funded by the Research Fund for Coal and Steel from the European Union and planned for a period of 3.5 years. …▶A14

Trendsetting Limpet Tooth

Department of Energy Science, Sungkyunkwan University (KOR), Department of Material Science and Chemical Engineering, Hanyang University (KOR), School of Engineering, Brown University (USA), Chair of Solid Mechanics, University of Wuppertal (DEU), Wuppertal Center for Smart Materials & Systems, University of Wuppertal (DEU), Electron Microscopy Research Center, Korea Basic Science Institute (KOR), School of Mechanical and Aerospace Engineering, College of Engineering, Nanyang Technological University & Institute of High Performance Computing, A*STAR (SIN)

Chair of Materials Physics

Limpets have a hard life. To feed, they scratch algae from rocks in the middle of the sea surf using an array of teeth arranged similar to a conveyor belt, the radula. As expected, this way of harvesting is particularly challenging for the involved teeth. It should therefore come as no surprise that Mother Nature developed these limpet teeth into the strongest known biological materials.

An internationally composed research team involving leading experimental and computational scientists, which among other aspects also spans a 14-hour time difference, has recently succeeded in unraveling the fascinating nanoscale origins of the extraordinary properties of the limpet teeth and to provide a constitutive model describing this material behavior.

A primary aspect is rooted in the particular microstructure of the teeth, where elongated ironhydroxide nanocrystals are embedded in a silica matrix. Upon loading, the nanorods rotate in a locally coordinated manner, causing an auxetic material behavior. Simply speaking, this biomaterial gets thicker upon pulling on it, so the tooth can tolerate and mitigate the contact loads occurring upon food harvesting particularly well.

Transferring this biological building principle to technical nanocomposites, for example by nanoscale additive manufacturing approaches, could enable completely new materials with unseen damage tolerance in the future. …▶A15

Enact-SDGs

AGH Universität für Wissenschaft und Technologie (POL), Nationale Technische Universität Athen - NTUA (GRC), Technische Universität Kosice (SVK), Technische Universität Bergakademie Freiberg - TUBAF (DEU), Universität Trento (ITA), Hub Innovazione Trentino S.c.a.r.l. (ITA),Nationale Technologieplattform für Forschung, Entwicklung und Innovation von Rohstoffen (SVK), Arbeitgeberverband des polnischen Kupferbergbaus (POL), Griechischer Verband der Bergbauunternehmen -GMEA (GRC), MYTILINEOS S.A. (GRC), Panhellenic Association of Graduate Mining and Metallurgical Engineers -PSDMMM (GRC)

Chair of Chemistry of Polymeric Materials, RIC Resources Innovation Center

The Enhancing the skills of ESEE RM students towards the achievement of SDGs (EnActSDGs) project aims to develop an action plan for the reorientation of current commodity curricula to incorporate sustainable development principles into the educational programs of three universities in Eastern and Southeastern Europe. They include AGH University of Science and Technology, the National Technical University of Athens, and the Technical University of Kosice.

A preliminary assessment of the study programs of the participating universities is presented. This is done using a set of evaluation criteria defined in collaboration with selected stakeholders.

EnAct-SDGs aims to develop a sustainable network and ecosystem between the participating universities, research institutes and industry in order to be able to integrate sustainability principles into the educational programs of the beneficiary universities.

The goal is to provide graduates with all of the skills necessary to implement the Sustainable Development Goals (SDGs). ...▶A16

RFCS - MinSiDeg

DK Recycling und Roheisen GmbH, Duisburg (DEU), K1-MET GmbH, Linz (AUT), Thyssenkrupp Steel Europe AG, Duisburg (DEU), VDEh Betriebsforschungsinstitut GmbH, Düsseldorf (DEU), voestalpine Stahl Donawitz GmbH, Leoben (AUT)

Chair of Mining Engineering and Mineral Economics

Minimization of blast furnace sinter degradation and segregation: Mechanical stress put on sinter in conveying plants, coolers, screens and bunkers between the sinter plant and blast furnace lead to the degradation of sinter. The resulting fines must be screened out before being charged into the blast furnace and have to be sintered again, causing high costs and CO2 emissions. Additionally, segregation effects during transport and storage lead to fluctuations in the particle size distribution and gas flow in the blast furnace.

The project team with Professor Nikolaus Sifferlinger (2nd from left), Dr. Michael Prenner (project leader, 5th from left) and Dipl.-Ing. Michael Denzel (dissertant, 6th from left)

This project has received funding from the EU, is scheduled for 3.5 years and is being carried out in cooperation with partners from Germany and Austria. The Conveying Technologies team at the Chair of Mining Engineering and Mineral Economics manages two important tasks. In doing so, the breakage behavior of sinter should be analyzed and a suitable DEM model developed. Furthermore, degradation and segregation effects should be minimized by innovative conveying technologies. ...▶A17

CERA – CERTIFICATION OF RAW MATERIALS

Project consortium: Leiden University (NLD), Luleå University of Technology, Research Institutes of Sweden (SWE), TÜV NORD CERT GmbH, DMT (DEU) *Advisory board:* Euromines (BEL), Fairphone (NLD), University of Southern Denmark (DNK), Volkswagen (DEU), United Nations ECE and the EU Joint Research Centre -JRC (BEL)

Chair of Geology and Economic Geology, RIC Resources Innovation Center

Currently, more than 100 certification schemes exist for the mining of mineral raw materials, increasing exponentially when considering the entire value chain. Some certificates are specific to a single geographical region, process or humanitarian concern, and others to a single mineral. Existing certification processes are complex, expensive and inconsistent, resulting in a diffuse approach to how sustainability and ethics are defined from country to country, mineral to mineral, and company to company. The CERA certification scheme is the first global scheme of its kind to universalize and standardize the evaluation of social, environmental and ethical practices across the raw materials value chain. Using blockchain to create the first traceability mechanism of its kind, CERA can guarantee the sustainability of a product from mineral exploration to the finished product.

The project was funded by EIT Raw Materials and started in 2017. The project consortium was composed of some of the leading European raw materials research institutions and technical service providers mentioned above, and was accompanied by the project advisory board. …►A18

I AM RRI

AIT Austrian Institute of Technology (AT), CENTRO RICERCHE FIAT SCPA (ITA), Deskartes OY (FIN), EYE-D Innovation APS (DNK), Fundacion Tecnalia Research & Innovation (ESP), Grado Zero Espace SRL (ITA), Interesansa - Institut za razvoj in izdelovalne tehnologije – zavod (SVN), Lancaster University (GBR), Lithoz GmbH (AUT), Materalia (FRA), Nordlandsforskning AS / Norland Research Institute (NOR), Ortho Baltic (LTU), Technische Universiteit Delft (NLD), TTY-SAATIO / Tampere University of Technology (FIN), voestalpine Additive Manufacturing Center GmbH (DEU)

Industrial Liaison Department of Montanuniversität Leoben

I AM RRI investigates webs of innovation value chains in additive manufacturing (AM) and identifies openings for responsible research and innovation (RRI). The aim is to develop a complex network model of AM innovation chains and their associated processes, which is directed toward “Responsible, Research and Innovation” (RRI) at all levels.

The I AM RRI project is designed to: establish a knowledge base and dynamic model of the complex webs of innovation value chains in additive manufacturing; identify the openings they offer for responsible research and innovation (RRI); provide good practice guidelines; perform use cases in the automotive and medical applications of AM to build understanding and collect data; and provide knowledge on the research network formation and network splitting.

In-depth investigation of the AM innovation network, accompanied by open stakeholder and foresight processes, will establish a comprehensive knowledge base and thorough understanding of the network’s components, processes and interconnections at a European, national and regional level. …►A19

DigiTeRRI

AIT Austrian Institute of Technology GmbH (AUT), Grand E-nov (FRA), Karlstads Universitet (SWE), Materalia (FRA), Nordlandsforskning As (NOR), Paper Province (SWE), Standort Und Marketing Bruck An Der Mur GesmbH (AUT), Universite De Lorraine (FRA), Värmlands Läns Landsting (SWE), Wedo Project Intelligence Made Easy Sl (ESP), Zentrum Für Angewandte Technologie Leoben GmbH (AUT)

Industrial Liaison Department of Montanuniversität Leoben

DigiTeRRI has been developed to empower three traditional industrial regions to harness the opportunities presented by digitalization.

The project co-creates a framework and roadmaps for a responsible transition to self-sustaining, digitalized industrial R&I ecosystems. It addresses the challenges in the interplay between business, academia, government and society –the quadruple helix – to initiate openness, democratic accountability and responsiveness in a process that will in turn promote resilience within these new, digitalized R&I ecosystems.

An RRI approach concerning key issues such as gender equality, science education, open access, public engagement and ethics during the digitalization process will help to support both organizations and citizens in adapting to the transformation that is revolutionizing research, industry, the economy and society. …►A20

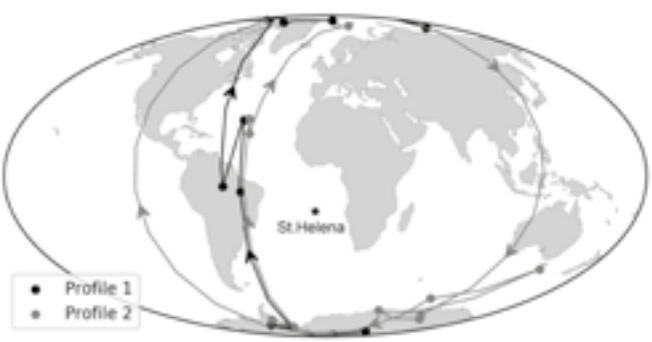
Geomagnetic Field Reversals

Geological Survey of Norway, Trondheim, (NOR), Montanuniversität Leoben, Leoben, (AUT), St. Helena Research Institute, Jamestown, St. Helena Island (GBR), University of Liverpool, (GBR), Zentralanstalt für Meteorologie und Geodynamik, Wien, (AUT)

Chair of Applied Geophysics

Over the last centuries, the strength of the geomagnetic field has dropped dramatically, triggering speculations about an upcoming reversal of the Earth's magnetic field. To study such a geomagnetic field reversal, a sequence of Miocene lava flows on St. Helena (South Atlantic) was sampled in two profiles in 2019 in cooperation with colleagues from the University of Liverpool and the St. Helena Research Institute.

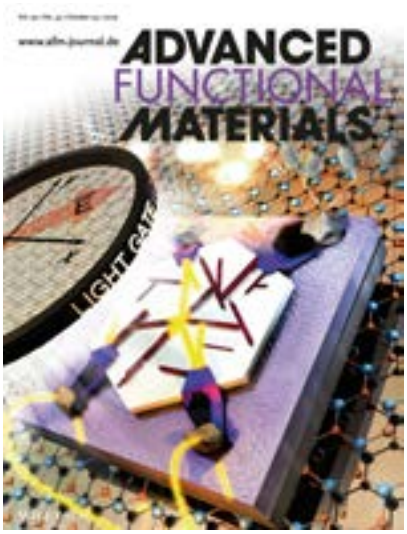
The paleomagnetic record optained shows a change from reversed to a normal polarity field. Age dating is currently being performed at the Geological Survey of Norway and will allow for a correlation with the geomagnetic polarity time scale. Along with determinations of paleointensities, modeling of the polarity reversal will contribute to our knowledge of the geomagnetic field's morphology. …►A21



"Light gates" for organic nanoelectronics

Aix-Marseille University (FRA), Karl Franzens Universität Graz (AUT)

Institute of Physics



The research topic of this French-Austrian cooperation was in the field of light-induced charge carrier transport in organic semiconductor nanostructures on two-dimensional substrates.

In addition to the researchers from the partner group at Aix-Marseille University, who synthesized the polar semiconductor molecules used, theoretical physicists from the University Graz were also involved, contributing essential density functional calculations. The combination of special scanning probe methods made it possible to switch the conductivity of crystalline organic nanowires in discrete directions using polarized light, thus opening up the realization of so-called "light gates" for flexible organic nanoelectronics.

In the future, such structures could be used, for example, in proprietary "electronic skins" in medicine: These films, which are worn on the skin, can be used to continuously retrieve medical data or administer medication. A pleasing highlight of this project was the publication in the renowned journal "Advanced Functional Materials", with the special distinction of also being selected for the cover picture. …►A22

SME 4.0

Chiang Mai University (THA), Freie Universität Bozen (ITA), KMU Unternehmen Elcom sro (SVK), Massachusetts Institute of Technology (USA), SACS Engineering College (IND), Technische Universität Košice (SVK), Worchester Polytechnic Institute (USA)

Chair of Industrial Logistics

The SME 4.0 project investigates the potential of Industry 4.0 technologies for small and medium-sized enterprises and focuses on smart production (lead: Free University of Bolzano), smart logistics (lead: MUL) and smart organization and management models (lead: Technical University of Kosice). In phase 1 of the project, the necessary requirements, and potential barriers for the successful implementation of Industry 4.0 technologies in SMEs were systematically investigated and validated worldwide by conducting expert workshops and field studies. In phase 2, selected technologies were tested by using multivariate analyses, simulations or in laboratory operations and subsequently implemented and evaluated in the form of case studies in several companies. The three topics were investigated by more than 40 researchers from eight international institutions in six countries. In total, 78 secondments (212 person-months) were carried out. The results are freely available in over 70 publications in the form of books, conference papers and journal papers as open access publications. …►A23

Emerging Environmental Contaminants in India

Indian Institute of Technology at Kanpur IITK (IND)

Chair of General and Analytical Chemistry

"Magnitude and Pathways of Anthropogenic Platinum Group Elements: Emerging Environmental Contaminants in India":

In this three-year scientific & technological collaboration between the Indian Institute of Technology in Kanpur and Montanuniversität Leoben, which started in 2018, the heavy metal pollution through catalytic converters in the road dust of New Delhi is being investigated. The quantification of the magnitude of pollution through the noble metals platinum, palladium and rhodium is of particular interest. Mutual visits by Professor Indra Sen in Leoben and Professor Thomas Meisel in Kanpur until before the outbreak of the corona pandemic have culturally enriched and strengthened the cooperation. Initial research results have already been successfully published in Spectrochimica Acta Part B: Atomic Spectroscopy. … ►A24

CARACOAT

Universität Paderborn: Lehrstuhl für Technische und Makromolekulare Chemie, Kunststofftechnik Paderborn (DEU)

Chair of Chemistry of Polymeric Materials

In the CARACOAT project an anti-adhesive organosilane-based coating was developed and applied as a demolding aid in polymer processing. The reduced ejection forces (up to -90%) and the covalent attachment to the substrate allowed conventional demolding aids (e.g. silicone spray) to be replaced and prolonged the service lifetime of tools in selected applications (e.g. rubber injection molding).

In addition, the applicability of the coating in selected fields in the food sector and its potential to prevent the calcination of cooling channels were investigated. In cooperation with the University of Paderborn, the impact of the organosilane coating on corrosion inhibition was studied using impedance spectroscopy. Furthermore, the long term stability and the coating's effect on the ejection force in selected injection molding applications were investigated.

Another success of the project was the development of a simple and rapid method for the renewal of the organosilane coating. The organic components of the coating are removed (pyrolyzed) by flame treatment, while the inorganic components remain on the substrate, building a silica network. The "glassy" residue inherently provides hydroxyl groups, which are available for the attachment of a secondary organosilane coating (recoating). …►A25

PolyMetal

Austria (Steiermark/Kärnten) / Slovenia
SVN: Gorenje d.o.o. (lead partner), Fakultät für Polymer-Technologie (FTPO), Intra lighting d.o.o. AUT: Montanuniversität Leoben (MUL), Polymer Competence Center Leoben GmbH (PCCL), Richard Hiebler GmbH

Industrial Liaison Department of Montanuniversität Leoben

Cost-efficient polymer materials with optical and haptic properties of metals:

In the Interreg project "PolyMetal", solutions for cost-efficient plastics for components with optical and haptic ("cool touch") properties of metals are targeted in transnational research cooperation. The central project objective is to develop new polymer-based solutions for components that can replace stainless steel or aluminum for sophisticated design in various industries. This will be achieved through cross-border cooperation, networking and joint R&D activities of SMEs and R&D institutions from less developed, border areas of Austria and Slovenia with one of the leading European manufacturers of household appliances.

By disseminating the acquired knowledge to SMEs, students and research institutions, the R&D base in this technological and economic field with enormous potential will be strengthened. ...► A26

Organic/2D material devices

Institute of Physics, University of Belgrade (SRB)

Institute of Physics

The aim of the project was to combine the expertise of the partner groups in order to investigate organic model devices based on graphene (Gr)/hexagonal boron nitride (hBN) van der Waals (vdW) heterostructures. hBN can act as an ultrathin gate dielectric, whereas Gr is suitable as an electrode for functional organic semiconductor layers. The electrical, (dielectrical), adhesive and frictional properties of the vdW substrates and how they can be controlled were the main focus of interest. Controlling these properties is important in to improve the device performance of 2D and 2D/organic hybrid electronic devices and widening the field of applications for 2D materials. The main tools for the micro- and nanoscale investigations are advanced atomic force microscopy-based methods.

Dr. B. Vasić (IPB) und Dr. M. Kratzer (MUL)
Background: Graphite flake on SiO_2

During the multiple, mutual visits, joint measurements were carried out and their results discussed.

In a first joint publication originating from the project, it could be demonstrated that the work function of few-layer Gr films can be modulated via a single step chemical treatment. ...► A27

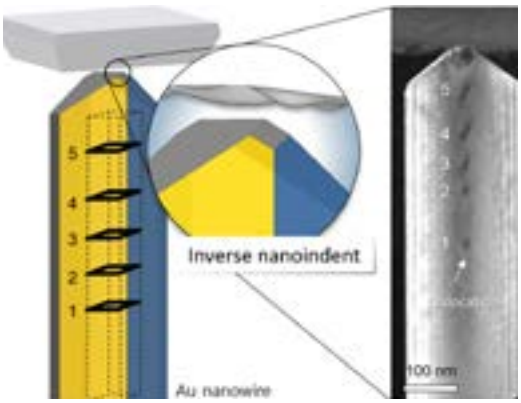
Nanoindentation processes in full view

Department of Materials Science and Engineering, Pohang University of Science and Technology -POSTECH (KOR),Institute for Basic Science –IBS (KOR), Department of Materials Science and Engineering, Friedrich-Alexander-Universität Erlangen (DEU), Department of Chemistry - KAIST (KOR), Department of Energy Science, Sungkyunkwan University –SKKU (KOR)

Chair of Materials Physics

The microelectronics revolution is one of the most influential drivers of current industrial developments. To probe the mechanical properties of ever-shrinking materials and components, nanoindentation has come to be an omnipresent and indispensable method.

In a recent combined experimental and computational approach, an international team of scientists was able to resolve the dynamic atomistic processes taking place at the elastic-plastic transition during nanoindentation for the first time. Furthermore, they could determine the rate-limiting processes governing the so-called pop-in event, as well as the origins for the observed transitions in dislocation mechanisms succeeding this event based on the dynamics of so-called prismatic dislocation loops. In the future, these fundamental insights will enable modifications to established nanoindentation models in order to better describe the most common small-scale mechanical characterization technique. ...►A 28



Mixed-dimensional van der Waals heterostructures

Tomsk Polytechnical University, Tomsk, Russia

Institute of Physics

The bilateral project supported by the Austrian Science Fund (FWF) and Russian Foundation for Basic Research (RFBR) is a framework for our collaboration with Professor Raul D. Rodriguez's group from Tomsk Polytechnical University in Russia. The goal of our project is to establish new pathways for the fabrication of 2D material nanoribbon-based devices and their integration with plasmonic nanoparticles.

The project is expected to bring breakthroughs in self-assembly-based nanofabrication. In the a longer term, the project could lead to the development of novel concepts in photovoltaics, sensor technology and memory devices. The Leoben group is designated for 2D material-based device fabrication and the self-assembly of molecular masks needed to produce nanoribbon networks. Our partners from Tomsk use our nanoribbon devices as templates for the deposition of metallic nanoparticles, creating plasmonic nanobelts.

In the first project year, the collaboration resulted in two peer-review publications, revealing how nanoparticles can decorate 2D semiconductor edges, and how twisted graphene layers in graphite affect its reactivity. ...► A29

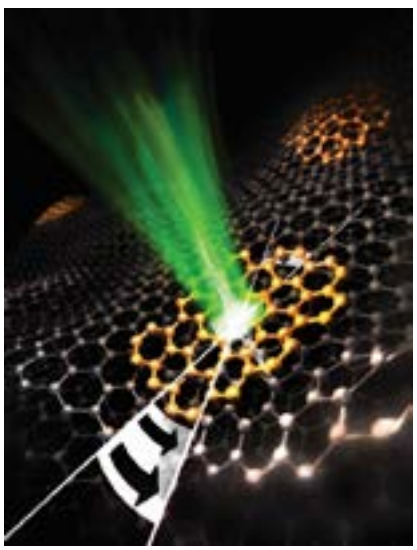


Illustration of twisted graphene layers on graphite probed by Raman spectroscopy
[10.1016/j.carbon.2021.01.152]

International Education

- International Students
- Joint Study Program @MUL
- CirCOOL - International Summer School
- UNESCO Branch Leoben
- European University EURECA-PRO
- RIC Leoben-Competence center for Education

International Students

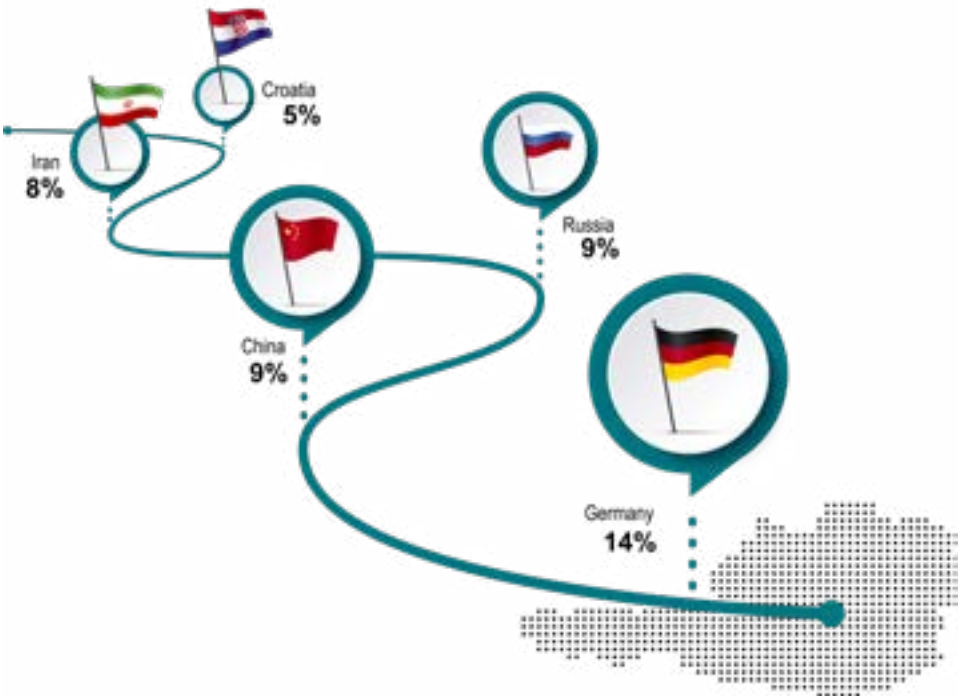
Montanuniversität Leoben sees itself as a cosmopolitan educational institution that, in addition to the already established and renowned German-language teaching, has also developed a high-quality English-language educational program of international interest in recent years.

In addition to individual English-language master's programs at MUL, a whole series of joint master's programs have been established together with prestigious international universities. After successful studies at at least two of the respective universities involved in the program, these programs offer double degrees, mostly at the master's level.

Currently, the international joint programs offered at MUL range from environmentally friendly mining, sustainable materials recycling, petroleum engineering, building materials and ceramics science, applied geosciences, materials science and materials engineering to plastics technology. Geographically, the partner network spans from the USA in the west to many participating European countries and Russia and China in the east.

In addition, knowledge about the circular economy is also imparted in the international summer schools at MUL, for example with the CirCool program, and participants from abroad are also given an insight into Austrian lifestyle and culture.

Details on all of these programs are compiled on the following pages. In addition, two other very special highlights for international education at MUL are also highlighted: On the one hand, the establishment of the Austrian branch of the International Competence Centre for Mining Education under the auspices of UNESCO in 2019 with the aim of joint educational and research activities and on the other hand, the acquisition of a European university alliance with the excellence initiative EURECA-PRO, European University on Responsible Consumption and Production, as the only university in the lead and the only technical university in Austria.

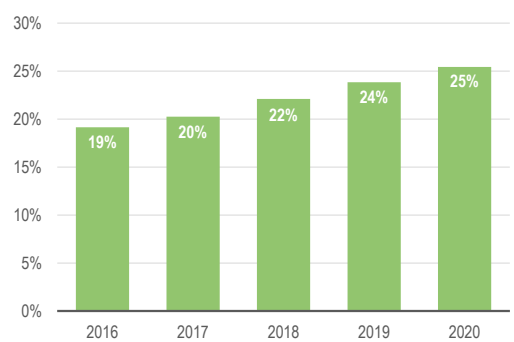


Top 5 home countries of international students at the MUL

But first, a brief overview of the development and composition of the audience landscape at our university in recent years.

International students

Thanks to the consistent internationalisation efforts and valued partnership cultivation, the number of international regular students at MUL increased steadily and reached a temporary maximum of almost 900 in 2019, before the outbreak of the corona pandemic.



Percentage of international students at MUL

As the graph shows, the percentage of international guests increased to 25%.

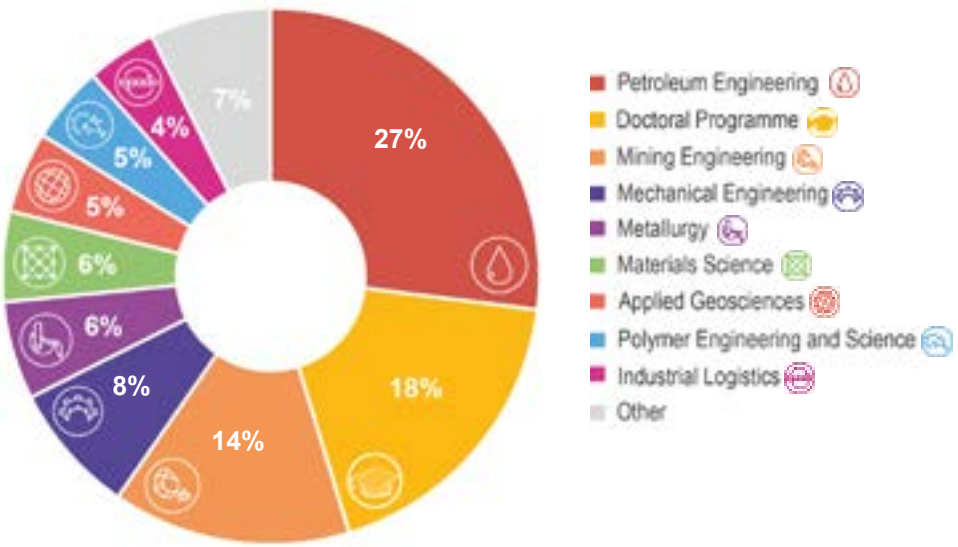
The percentage of female international students also increased steadily over the years, climbing to 27% in 2020.

In the period under review from 2018/2019 to 2020/2021, international students from over 100 different nations were registered at MUL. 2/3 of them came from third countries and only about 1/3 from the EU.

Most of the international students registered at the MUL came from Germany, China, Russia, Iran and Croatia.

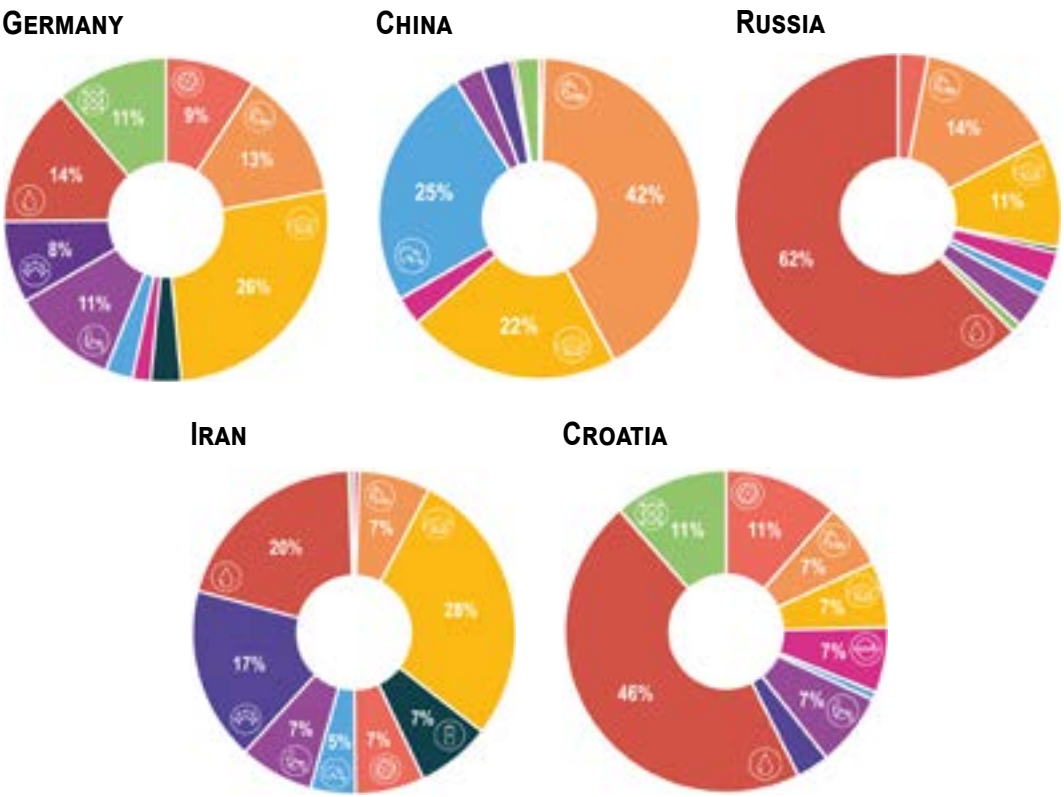
A first look at the most popular field of study among our foreign guests shows petroleum engineering as the clear favorite with 27%. Of great interest is also the doctoral program in mining sciences, which is taken by almost every 5th student. In addition, mining, mining engineering and metallurgy are among the most frequently enrolled courses, as the pie chart on the next page shows.

A second detailed look reveals the strong



Most popular study programs for international students at the MUL

dependence of the country of origin in the choice of studies. For example, Russians and Croats mainly study petroleum engineering, while Chinese are mainly interested in mining and Iranians and Germans mainly pursue the mining doctorate.



Most popular study programs for international students at MUL by home country

International Master of Science in Advanced Mineral Resources Development (AMRD)

Partner universities:
TU Bergakademie Freiberg (DEU), Dnipro University of Technology (UKR), China University of Mining and Technology Bejing (CHN), Amirkabir University of Technology Tehran (IRN), Instituto Superior Técnico der Universidade de Lisboa (PRT), Universidad Politécnica de Madrid (ESP), St. Petersburg Mining University (RUS)

AMRD is a Joint Master's Degree Program between Montanuniversität Leoben and TU Bergakademie Freiberg and their partner universities Dnipro University of Technology, Ukraine, China University of Mining and Technology Bejing, China, Amirkabir University of Technology Tehran, Iran, Instituto Superior Técnico, Universidade de Lisboa, Portugal, Universidad Politécnica de Madrid, Spain and St. Petersburg Mining University, Russia.

The aim of the AMRD master's study program is the acquisition of knowledge and competence in developing sustainability and environmentally friendly methods in mining and mine remediation under economic considerations.

The master's program covers 120 ECTS points. This corresponds to the usual study period of four semesters. All students complete the first semester at Montanuniversität Leoben, the second semester at TU Bergakademie Freiberg and the second year at one of the partner universities. This study order is compulsory for all students.

Contact:
▶ amrd@unileoben.ac.at

The program always starts in Leoben, Austria, in October of every year.

Application & Graduation

The application requirements for the AMRD program are a bachelor's degree in mining engineering, geoengineering, applied geoscience or related fields and proof of English language proficiency by means of a recognized language test (TOEFL, IELTS).

Students completing this Joint Master's Degree Program are awarded the degree "Master of Science" (MSc.) by the partner universities Montanuniversität Leoben and TU Bergakademie Freiberg and by the third university.

The scientific profile of this master's program enables the graduates to pursue a worldwide career in relevant mining and mine remediation companies, public administrations or international organizations.

International Master in Sustainable Materials (SUMA)

Partner universities:
Katholieke Universiteit Leuven (BEL), Università degli Studi di Trieste (ITA), Grenoble INP (FRA), Università degli Studi di Milano (ITA)

In October 2018, a new collaborative International Master's Program on Sustainable Materials started at Montanuniversität Leoben. It aims to train tomorrow's resource engineers in a global world, combining the best educational programs in the field of sustainable materials in Europe.

The major goal is to stimulate entrepreneurship, leadership and innovation, by training the students to become leaders boosting tomorrow's circular economy. To guarantee the quality of the program, it has undergone the evaluation of the European Institute of Innovation & Technology and been awarded the EIT label for excellent educational programs. Together with its partner universities, KU Leuven, INP Grenoble and both the University of Trento as well as Milano-Bicocca, the focus lies on circular economy, materials processing and recycling, materials substitution, eco-design and innovation. The education program involves the selection of two institutions, an internship and a master's thesis, resulting in a double degree from both universities. Every year, a summer school is organized where all students can come together to solve an industry challenge and network.

The graduates of the SUMA program will automatically be part of the largest European raw materials network with more than 120 partners, including industry experts, researchers and higher education professionals.

Contact:
- Priv.-Doz Dr. Stefan Steinlechner
- suma-info@unileoben.ac.at
- www.master-suma.eu

Joint International Master in Petroleum Engineering (JIMP)

Partner universities:
Colorado School of Mines (USA), Ufa State Petroleum Technological University (RUS), Gubkin Russian State University of Oil and Gas (RUS)

Two master's degrees in two different countries, all in one go! Those seeking a challenge and international recognition for their knowledge of petroleum engineering will be interested in one of the Joint International Master's Programs offered by DPE. The programs are taught entirely in English, no matter where the students have chose the partner university. The cooperation between DPE and partner universities enables prospective students to specialize in "Reservoir Management" at Colorado School of Mines in the US, "Global Energy Transportation and Storage" at Ufa State Petroleum Technological University, or "Advanced Well Construction and Operation Technology" at Gubkin Russian State University of Oil and Gas in Russia. As of 2019/20, 37 students from all over the globe were enrolled in this exclusive degree program, with 97% being international and 22% women.

To enroll in this unique and exciting experience, students have to be accepted by both institutions through an application and interview process.

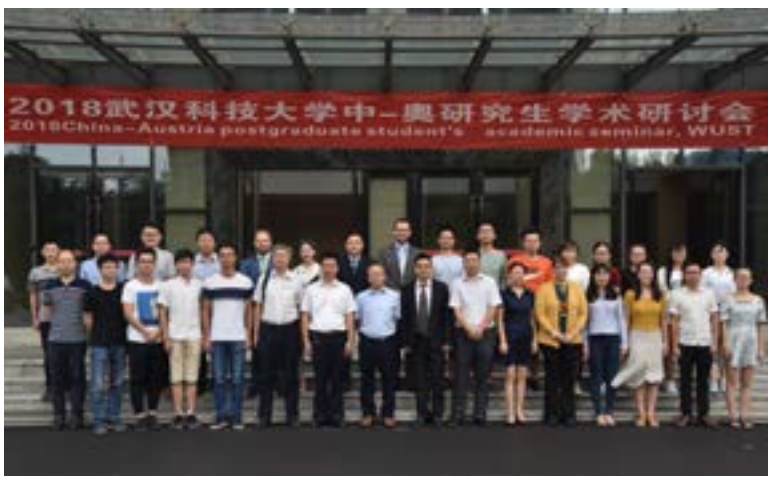
Academic achievements, English skills, and other factors play a key role in the admission process. If the admissions committee requires supplementary courses, students will be invited to attend either the summer school or a selection of bachelor courses. Upon completing the prerequisites, students will be able to enter the program. Unique to DPE, the international student coordinator assists international students in multiple ways, from helping them with the visa process to hosting events for sports and cultural activities.

Contact:
▶ www.dpe.ac.at

International Master of Science in Building Materials and Ceramics (BMC)

Partner university:
Wuhan University of Science and Technology (CHN)

The double degree program “International Master of Science in Building Materials and Ceramics” is based on a good cooperation in research and teaching between MUL and Wuhan University of Science and Technology. An agreement between the partner universities ensures that students do not have to pay tuition fees. During the China - Austria postgraduate student’s academic seminar in September 2018, the alignment of the curriculum was finalized in Wuhan, China. In 2019, the program was implemented at MUL and can be studied since the winter semester 2019/2020.



The master‘s program provides students with broad and profound knowledge of the structure, properties, manufacture and application of products in the building materials and ceramics industry (mineral binders and building materials, refractory materials, ceramics and glass) as well as mineral processing. The program opens a global field of work and is held in English in order to attract students from all over the world. Graduates of this double master’s degree program are prepared for multinational action in a multicultural work environment and they possess all the knowledge and skills necessary for the economic use of technical and scientific fundamentals, in particular problem-solving competence, social competence and leadership competence.

Course of study

This joint master‘s program is a double degree program with a duration of four semesters, split between two partner universities:

- The 1st and 2nd semesters are held at Wuhan University of Science and Technology
- The 3rd and 4th semesters are held at Montanuniversität Leoben

Upon successful completion of the program, the two partner institutions award their respective academic degrees to the participating students as follows:

- Montanuniversität Leoben confers the academic degree “Master of Science“ (MSc)
- Wuhan University of Science and Technology confers the academic degree “Master of Engineering“ (ME)

Contact:
Priv.-Doz. Dr.mont. Shengli Jin
shengli.jin@unileoben.ac.at

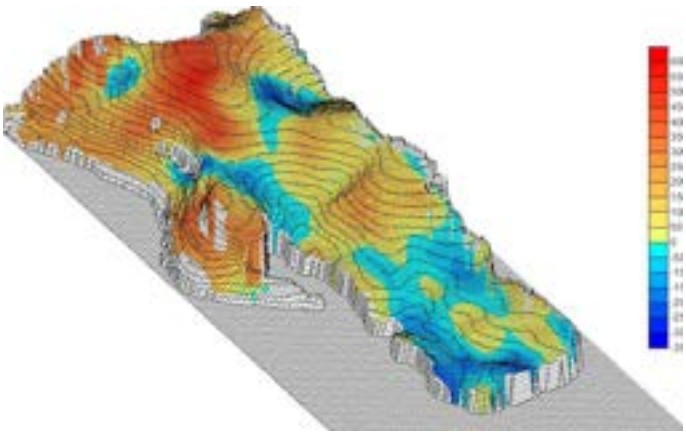
International Master of Applied and Exploration Geophysics (IMAGE)

Partner university:
Universitá di Pisa (ITA)

The Departments of Earth Sciences and Physics, Università di Pisa (UP) and the Chair of Applied Geosciences and Geophysics, Montanuniversität Leoben established a Joint Master's Program in Applied and Exploration Geophysics starting in fall 2018. The study program is in English, and it covers theoretical and practical aspects of reflection and refraction seismology, signal analysis, inverse problems, potential fields, rock physics, reservoir and borehole geophysics, near-surface geophysics, and mining and engineering geophysics.

UP has had an MSc program in Exploration and Applied Geophysics since 2007, with ENI, Halliburton/Landmark and Enel Green-Power as industry partners. MUL converted its MSc program in Applied Geosciences to English back in 2016 already. MUL has a close collaboration with OMV and DMT. The research focus at both universities is on seismic processing and inversion, and on rock physics, with an emphasis on exploration and environmental applications.

Students can enroll at either university. During their studies, they spend at least one term at the partner university. Graduates are awarded diplomas in Applied and Exploration Geophysics from Montanuniversität Leoben and from Università di Pisa, respectively.



Contact:

- Univ.-Prof. Dipl.-Geophys. Dr.rer.nat. Florian Bleibinhaus
- geophysik@unileoben.ac.at

Advanced Materials Science and Engineering (AMASE)

Partner universities:
UdS - Universität des Saarlandes (DEU), Luleå tekniska universitet (SWE), Université de Lorraine (FRA)
Universitat Politècnica de Catalunya (ESP), Università degli Studi di Padua (ITA)

The International Master's Program "Advanced Materials Science and Engineering" (AMASE) is going to start at Montanuniversität Leoben in October 2021.

The AMASE study program is an engineering degree in the field of materials science and technology in an international university environment with intensive networking of research and teaching between the six partner universities (4 semesters / 120 ECTS).

amase
Advanced Materials Science and Engineering

The core areas are the understanding of solid-state physics, including the material classes metals and their alloys, ceramic materials, glasses, polymers, composite and hybrid materials as well as functional materials.

In addition, knowledge of the manufacturing and processing of these materials as well as materials testing and cross-scale examination and analysis methods will be imparted. The students are granted a high degree of flexibility due to the different combination options with regard to the choice of the first and second universities.

The students spend the first two semesters at one of the partner universities and the third semester at a second university. In the fourth semester, the student writes the master's thesis either at the second or the entrance university. A particularity of the AMASE program is that students need to study in two different languages (English, German, French or Spanish) by selecting the corresponding universities. Language courses, as well as training in intercultural communication and complementary skills, will be provided during the course.

AMASE was submitted as a "Joint European Master Program in Advanced Materials Science and Engineering" under the Erasmus Mundus Joint Master Degrees project call in February 2020 and approved by the European Commission. The project funding not only enables the implementation of the master's program at the partner institutions, but also ensures Erasmus Mundus full-time scholarships for students from all over the world.

Contact:

- Univ.-Prof. Dr. Raul Bermejo Moratinos
- raul.bermejo@unileoben.ac.at, office@eusmat.net
- www.amase-master.net

Undergraduate Education Program in Polymer Science and Engineering (SinoPoly)

Partner university:
Sino-German College der East China University of Science and Technology (CHN)

Based on the long-standing cooperation between East China University of Science and Technology (ECUST) Shanghai and MUL, the first bachelor's degree program between the two universities was sealed and successfully launched in 2018 after extensive preparations and approval by the Chinese Ministry of Education.

The "Undergraduate Education Program in Polymer Science and Engineering" enables bachelor students of the Sino-German College of ECUST to come to MUL for three semesters after five semesters of study at ECUST and a preparatory summer school in Leoben.

The aim is to offer particularly talented students from the Sino-German College of ECUST the opportunity to get to know MUL as exchange students and complete their bachelor's degree in polymer engineering. The three semesters in Leoben include not only selected courses in polymer engineering and in-depth language training, but also writing a bachelor's thesis. All of these academic achievements at MUL are recognized by ECUST as the final thesis for the Chinese bachelor's degree. However, since this does not include the simultaneous awarding of the BSc by MUL, SinoPoly in this form does not belong to the double degree programs. In addition, it is planned in this hybrid study program that professors from Leoben will teach selected courses in block form at ECUST.

The program is limited to a maximum of 20 exchange students per year. Since the selection of students who are allowed to come to Leoben requires appropriate language and subject knowledge, the students already receive intensive German lessons during their studies in Shanghai as preparation.

In October 2020, the time had come: the first applicants for the degree program, which started in 2018 at ECUST, were

tested on their professional and language skills in a video conference. Out of the 16 applicants, 10 were able to convince the examination committee and were given the opportunity to begin their training in Leoben starting in the summer semester of 2021. Congratulations and welcome!

Contact:
- Univ.-Prof. Mag.rer.nat. Dr.techn. Wolfgang Kern
- wolfgang.kern@unileoben.ac.at

CirCOOL - International Summer School

Participants of the CirCOOL Premiere 2018

As an innovative and interdisciplinary international summer school, CirCOOL celebrated its premiere in July 2018 with the title “CirCOOL 2018 - The Value Life Cycle of Materials in the Circular Economy” and was also held the following year with the same topic and was a complete success.

The name CirCOOL is derived from circular school and when pronounced correctly sounds similar to the English word for circle. The CirCOOL program aims to create awareness of the circularity of materials within the circular economy, as well as the fact that our society is based on materials and must use them with care.

The two-week program organized by MIRO (Office of International Relations and InterUniversity Cooperation of MUL), “CirCOOL” consists of seminar units as well as excursions to industrial companies and leisure activities in and around Leoben.

Digital CirCOOL 2020 - The Life Cycle of Polymers

Due to the Covid-19 pandemic, it was decided to convert the third edition of the CirCOOL International Summer School in 2020 to a digital format. The program focused thematically on polymers as an essential building block of life as we know it. The production of polymers is an interdisciplinary field with elements from physics, geology, chemistry, chemical engineering, recycling technology, and other disciplines - and simply (Cir)COOL. After a general introduction, the focus was on the historical development of polymers, how they are created, how they are used and how


Participants CirCOOL 2.0 - The Life Cycle of Materials in the Circular Economy, 2019

Participants of the first Digital CirCOOL 2020

they are disposed of, recycled or reused, and what role they play in the sustainable development of our society.

10 participants from Russia, Belgium, China and Romania took part in the program via ZOOM. In addition to the live sessions, the participants received information material and tasks during so-called “preparation days” in order to prepare for the program. Furthermore, the students had the opportunity to get to know each other, which had a positive effect on the interactivity of the online units.

Lecturers from the chairs of Geosciences, Petroleum Engineering, Chemistry of Polymeric Materials, Polymer Processing, Waste Processing Technology and Waste Management and Process Technology of Industrial Environmental Protection gave the participants an understanding of the individual disciplines within the polymer cycle. A workshop on „Circularity and sustainability of materials in today‘s world“ by the Resource Innovation Center Leoben called on participants to reflect critically on society and its relationship with polymers.

These sessions were accompanied by a virtual city and campus tour and a German crash course by ZSBK (Center for Languages, Education and Culture). The feedback of the participants was consistently positive and the majority could imagine participating in further summer schools in the future or even enrolling as regular students at MUL.

Digital CirCOOL 2021 - The Aluminium Cycle

The program will of course continue in 2021 and this year will again focus on a specific field in the circular economy. Titled “The Aluminium Cycle”, the program will highlight the extraction, processing, sustainable handling and future of light metals in our society. The summer school also includes virtual field trips to the industry and a cultural program.

Due to the global situation, CirCOOL will once again take place in a digital format. We hope to welcome participants in person at our university again in 2022.

CirCOOL participants:

- 50 Participants
- from 11 different cuntries
- 27 ♀ and 23 ♂

Contact

- international@unileoben.ac.at

UNESCO - Austrian Branch International Competence Centre for Mining-Engineering Education

Montanuniversität Leoben has been cooperating successfully with Saint Petersburg Mining University for more than 15 years.

This cooperation culminated in December 2019 in the foundation of the Austrian branch of the International Competence Centre for Mining-Engineering Education under the auspices of UNESCO at Montanuniversität Leoben.

In general terms, the International Competence Centre for Mining-Engineering Education is a category II centre of the United Nations Educational, Scientific and Cultural Organisation (UNESCO). It is headquartered at Saint Petersburg Mining University (SPMU), established in March 2018.

Ceremonial signing at the opening of the Austrian branch, Leoben: from left to right: Rector Eichlseder, Vicerector Moser, Rector Litvinenko, 2019, photo credit: Foto Freisinger.

The focus of activities is on higher technical and continuing vocational education and training as well as research, within the scope of the mineral resources sector and the achievement of the Sustainable Development Goals (SDGs).

Furthermore, it is creating a unique global network for engineers, including:

- Headquarters: Saint Petersburg Mining University, Russia (SPMU),
- German branch: Technische Universität Bergakademie Freiberg, Germany (TUBAF),
- Finnish branch: Lappeenranta-Lahti University of Technology, Finland (LUT)
- Chinese branch: China University of Mining and Technology, People's Republic of China (CUMT),
- Armenian branch: National Polytechnic University of Armenia, Armenia (NPUA)
- Austrian branch: Montanuniversität Leoben, Austria (MUL).

The Austrian branch operates on a global mandate with a specific focus on Europe and Austria and has given priority to the topics of sustainability, the global supply of raw materials and raw materials policy.

Activities

In order to closely cooperate with our partners, thus paving the way for joint education and research activities, one focus of the Austrian branch's activities in 2020 was organizing and holding, participating in and attending international online and on-site events:

Conceptualized and coordinated by the Austrian branch, the online research and education lecture series **"Sustainable**

Development Approaches in Engineering Research and Education" was held in cooperation with LUT, SPMU and Aalborg PBL Centre (Aalborg Centre for Problem Based Learning in Engineering Science and Sustainability under the auspices of UNESCO).

Alternating every week, eight international experts shared their expertise, incorporating selected examples from the fields of mining, mineral raw materials, the sustainable supply of raw materials, materials science, recycling and education.

Receiving excellent feedback, each lecture was attended by students and researchers from more than 20 different countries. On average, 70 participants took part; at the peak there were even 120.

The Expert Forum on Digitalization in the Raw Materials Sector, organized by the Resources Innovation Center Leoben (RIC) and co-organized by the Austrian branch, focused on the progress of digitalization in exploration, mining and mineral processing: as artificial intelligence, machine learning, deep learning, augmented/virtual reality and data integration solutions are increasingly being used to collect, analyze and manage data and visualize content in real time in variable contexts.

The interest in the event – more than 130 participants from more than 20 different countries - showed the importance of the topic and the need for future cooperation in this area.

United Nations Educational, Scientific and Cultural Organization

International Competence Centre for Mining-Engineering Education under the auspices of UNESCO

With fostering innovation being one of the goals of the Austrian branch, the **"Pre-Jumpstarter Workshop"** was organized, in cooperation with EIT RawMaterials. Its aim was to prepare students and young researchers for the application process of the Jumpstarter program: an innovation contest aiming to reach out, identify and support the best ideas from researchers, professionals and early-stage start-ups, with a potential impact on the raw materials value chain.

Reception of the Russian delegation at the Expert Forum,Leoben, 2020. Photo credit: SPMU

The **"Moscow Green Economy Forum"** is an international platform devoted to the discussion and development of a green economy in the world and specifically in Russia.

Within the framework of the forum, representatives of the Austrian branch and the director of the Educational Research Center for Digital Technologies at SPMU gave a joint presentation on "Digital competences as a basis for the sustainable development of the energy sector". On the one hand, the key conditions for the development, adaptation and implementation of digital technologies in the energy sector based on the experiences at SPMU were presented. On the other hand, key milestones and policies of the European Union in the field of educational were introduced.

Supporting young researchers, eight students from MUL were selected to participate in the International Forum-Contest **"Topical Issues of Rational Use of Natural Resources",** organized by SPMU. Four of them won the award for best speaker in their category.

Engineering Geoecology

Another focus of the Austrian branch is the promotion of mobility. In this context, MUL, SPMU & TUBAF established the international Joint Master's Program **"Engineering Geoecology".**

Due to the current Covid-19 situation, the program was transformed and adapted to distance learning mode. After an online welcome day and campus tour, the students successfully started their first semester virtually at MUL.

Furthermore, the Austrian branch, represented by Rector Eichelseder, participates in an international working group; the goal is to develop a unified international system of mineral resource sector specialists' competences, based on existing national systems and aimed at developing higher level competences.

An additional key activity is the commencement of the development of a research strategy agenda together with SPMU, LUT and TUBAF.

Supporting all initiatives, steadily growing profiles on LinkedIn, Research Gate and Instagram were created to extend the (online) presence and outreach.

Contact:

- Anna Voica: Communications & Partnership Manager anna.voica@unileoben.ac.at
- Anastasia Kucheryavaya: Scientific Coordinator anastasia.kucheryavaya@unileoben.ac.at
- Maria Theresa Trettler: Organisational Support

European University EURECA-PRO

European Universities Initiative

European Universities represent a new form of cooperation between Higher Education Institutions and are bottom-up alliances with a long-term strategy of collaboration. They create a common and student-oriented education with a cross-university campus, link the knowledge triangle and create joint common management structures. The transnational alliances aim to strengthen the excellence and competitiveness of the European Higher Education Area.

With two calls, the European Commission opened the possibility to submit a project-proposal for the "university of the future". In the 2019 call, 17 European University Alliances were successful. In the second call in 2020, 24 alliances were selected, including Montanuniversität Leoben with its alliance "EURECA-PRO".

EURECA-PRO: An Alliance for Sustainability

As the first and only technical university in Austria, Montanuniversität Leoben is not only part of a European University alliance, but also coordinates the European University Alliance on **Re**sponsible **C**onsumption **a**nd **Pro**duction (EURECA-PRO). The EURECA-PRO alliance consists of 7 Higher Education Institutions, each based in an EU member state, from different disciplines. This interdisciplinary and novel approach with a thematic focus is also the flagship of the network. On the one hand, the consortium consists of technical universities, comprehensive universities and a university of applied sciences; on the other hand, EURECA-PRO makes a holistic contribution to the highly topical subject of "sustainable production and consumption" under the umbrella of the 12th UN Sustainable Development Goal (SDGs). Furthermore, the Alliance aims to ensure an effective contribution to the transformation of the European Higher Education Area with the integration of SDG4 "Quality Education".

The following institutions form EURECA-PRO:

- Montanuniversität Leoben, Austria (coordinator)
- Technical University Bergakademie Freiberg, Germany
- Silesian University of Technology, Poland
- University of León, Spain
- Mittweida University of Applied Sciences, Germany
- Technical University of Crete, Greece
- University of Petrosani, Romania

Project Kick-Off Meeting in November 2020

The network counts over 54,500 students, 9,400 staff members and 60 departments. EURECA-PRO is supported by 24 associated partners from all over Europe with a wide range of disciplines (e.g. ARTE, IIASA, UNESCO centers or student networks).

Project phases

The project implementation is divided into four phases: In November 2020, the Alliance started the pilot project phase I (2020-2023) with a virtual kick-off meeting. Phases II-IV will extend to the long-term vision in 2040. EURECA-PRO's vision is to become the global education hub and leading interdisciplinary research and innovation center in the field of responsible consumption and production of resources and goods in 2040. This will encompass technological, environmental, political, economic and social aspects and their transfer to society and industry. Innovation is the key to achieving the targeted CO_2 reduction and related sustainability practices of the EU Green Deal by 2050. In addition, responsible consumer behavior is also required. EURECA-PRO will transform this key societal challenge and provide solution-oriented approaches. Inclusive, borderless and integrated European education is the tool to produce more competent and qualified graduates who can contribute to this major societal challenge. To get there, some essential steps already take place in the first years.

Project start

In project phase I (2020-2023), several work packages with the following tasks will be implemented:

- Creation of a common European study program "responsible consumption and production", covering all 3 study cycles and curricular mobility mechanisms built into it, as well as the use of innovative pedagogical methods and educational tools. With the help of the already existing study programs and the creation of new interdisciplinary studies, EURECA-PRO will give priority to the establishment of a European Degree
- Establishment of lighthouse research missions on SDG12 with cross-institutional interdisciplinary research groups
- Creation of a digital master platform to facilitate collaboration between partner universities and students, joint management and outreach to society and industry

- Establishment of effective structures for the cross-disciplinary implementation of a “Transversal Skills Portfolio”: this includes skills in languages, cultures, mobility, sustainability, resource efficiency, digitalization
- Establishment of an innovation academy and a technology and innovation transfer center
- Establishment of a joint governance structure

Additionally, student and staff mobilities between the partners will be increased and values such as inclusion, multilingualism and European identity will be disseminated. In order to achieve the vision and mission of EURECA-PRO, university members and external stakeholders such as the associated partners are strongly involved in the project implementation.

Funding of the projects

EURECA-PRO is currently funded by the European Commission through the Erasmus+ program. Some of the partners receive additional funding at the national level; Montanuniversität Leoben receives financial support from the Federal Ministry of Education, Science and Research - via the National Agency for Education and Internationalisation (OeAD). In order to expand the research dimension and strategy of the Alliance, the consortium submitted another project proposal under the Horizon2020 funding program in the autumn of 2020, which was also successfully evaluated. The sub-project entitled “RE-EURECA-PRO - REsearch and innovation dimension of the European University on REsponsible Consumption And PROduction” will start in the summer of 2021.

More Information & Contact:

- www.eurecapro.eu
- lisa.pichler@unileoben.ac.at

MIRO and EURECA-PRO team members of MUL at the kick-off meeting.

RIC Education Competence Center

Since Montanuniversität Leoben and the Resources Innovation Center (RIC) Leoben are part of the EIT RawMaterials Community, they are strongly involved in their educational activities. These promote the exchange of in-depth expertise and applied know-how from primary to secondary and tertiary levels, including vocational training.

The educational initiatives aim to support the advancement of young people in the natural sciences both nationally and internationally, with a particular focus on promoting high-quality education in Eastern and Southeastern European countries. It is important to raise awareness of transversal skills and train them in both students and academic staff. Entrepreneurial and digital aspects in education should be strengthened and internationalisation at MUL be promoted. There are currently 11 initiatives under implementation, including: Mixed Reality Handbooks for Mining Education.

DimESEE - Dubrovnik International ESEE Mining School

Partner: University of Zagreb, Slovenian National Building and Civil Engineering Institute, University of Miskolc, Technical University of Kosice, AGH University of Science and Technology

The main objective of the project is knowledge transfer, as well as strengthening innovation capacities in the mining, recycling and waste management sectors. This is a lifelong learning project that will be implemented in close partnership with industry stakeholders in all project consortium countries.

During the four years of project implementation, the following key topics were analyzed:

- 2017 Zero waste management
- 2018 Deep intelligent mining
- 2019 Small mining sites
- 2020 Recycling

The knowledge and skills gained at DIM aim at increasing the employability of mining engineers. In the long run, the program will lead to an increase in sustainable mining and processing activities, which will result in economic growth and the creation of employment in the respective countries.

OpESEE - Open ESEE - East & South-East Europe

Partner: Aluinvent Limited Company, Dnipro University of Technology, Lappeenranta University of Technology, Ovidius University of Constanta, Technical University of Kosice, Technische Universitat Bergakademie Freiberg, Trinity College Dublin, University of Miskolc, University of Sarajevo

The aim of the OpESEE (Open ESEE - East & South-East Europe) master's degree program is to educate highly qualified mechanical and process engineers from the ESEE region with a specialization in maintenance for raw materials services for the ESEE region. To avoid brain-drain and improve the economic development of their home region it is very important that students stay and work in their home countries after having completed their high-quality education. The training focuses not only on the transfer of technical know-how, but also on the knowledge transfer of entrepreneurship and innovation. By developing real innovative business models, students are encouraged to found their own start-up business. The aim is to use the full potential of creative ideas and inventions from the ESEE region and make innovations happen where they have their origin.

MiReBooks – Mixed Reality Books

Partner: Epiroc Rock Drills AB (SWE), KGHM Cuprum (POL), Luossavaara-Kiirunavaara AB (SWE), Rheinisch-Westfälische Technische Hochschule Aachen (DEU), Technische Universität Bergakademie Freiberg (DEU), Technische Universität Graz (AUT), Technische Universität Luleå (SWE), Technische Universität Tallinn (EST), Universität Trient (ITA), University of New South Wales (AUS), VA Erzberg GmbH (AUT), VTT Technical Research Centre of Finland Ltd (FIN)

VR visit to Erzberg iron ore mine

MiReBooks produces a series of virtual & augmented reality based interactive mining handbooks as a new digital standard for higher mining education across Europe. Many current challenges are thus confronted in an innovative way, by combining classic paper-based teaching materials with MR materials and their transformation into pedagogically and didactically coherent MR handbooks for integrative classroom use. The approach will also be used in in other disciplines in the future. With MiReBooks the way of teaching will change as instructors will be able to engage their students in a more effective way and offer them an enriched content repertoire as well as an increased comprehension opportunity. Students will enter the job market skilled as digital natives and highly influence the way the industry will work and develop in this way in the future. Mixed reality is certainly a most promising way to enable users to make the most of their learning experience and thus leverage the improvement of operational efficiencies and innovation.

Raw Materials Ambassadors at Schools

Partner: University of Bologna (ITA), Bay Zoltan Nonprofit (HUN), Clausthal University of Technology (DEU), French Alternative Energies and Atomic Energy Commission (FRA), Consiglio Nazionale delle Ricerche (ITA), ECODOM , Fraunhofer-Institut (DEU), Geological Survey of Slovenia (SLO), Geological Survey of Sweden (SWE), Royal Institute of Technology (SWE), Politecnico di Milano (ITA), RWTH Aachen (DEU), Stichting Wetsus (NLD), Tallinn University of Technology (EST), Technical University of Madrid (ESP), New University of Lisbon (PRT), University of Milano- Bicocca (ITA)

RM@School 3.0 is a Wider Society Learning project to make science education and careers in the extractive sector attractive to students aged 10-19. Raw Materials Ambassadors (experts on some raw materials-related topics and trained teachers) go directly to schools and engage students in experiments with raw materials-related learning kits, field trips to industry, and science outreach activities. Students are challenged to become young Raw Materials Ambassadors (science communicators) themselves and create, for example, videos, maps, experiments, or the like that focus on topics related to commodities, specifically in the areas of exploration, mining, metallurgy, recycling, the substitution of critical raw materials and circular economy.

An annual competition is organized and hosted by Montanuniversität Leoben, in which schools from all over Austria can participate to present their projects and their role as young Raw Materials ambassadors. The school(s) with the best communication product will receive the opportunity to represent Austria at the annual European conference in Bologna, Italy, together with delegates (students and teachers) from schools all over Europe. All products realized by the students will be made available online and can be shared with a wider public.

More Information & Contact:

- https://ric-leoben.at/de/eit-raw-materials/education-de/
- mariaelena.murphy@unileoben.ac.at

International Mobility

- Student Exchange@MUL
- Correspondents Project - International Student Ambassadors
- MUL goes abroad
- Staff mobility
- Mobility programs at MUL

Student Exchange @MUL

International mobility at MUL has developed very positively in recent years. The increased activities in the international environment of MUL are now bearing visible fruit, as the upward trend in student numbers in the figures below shows.

Incoming Students

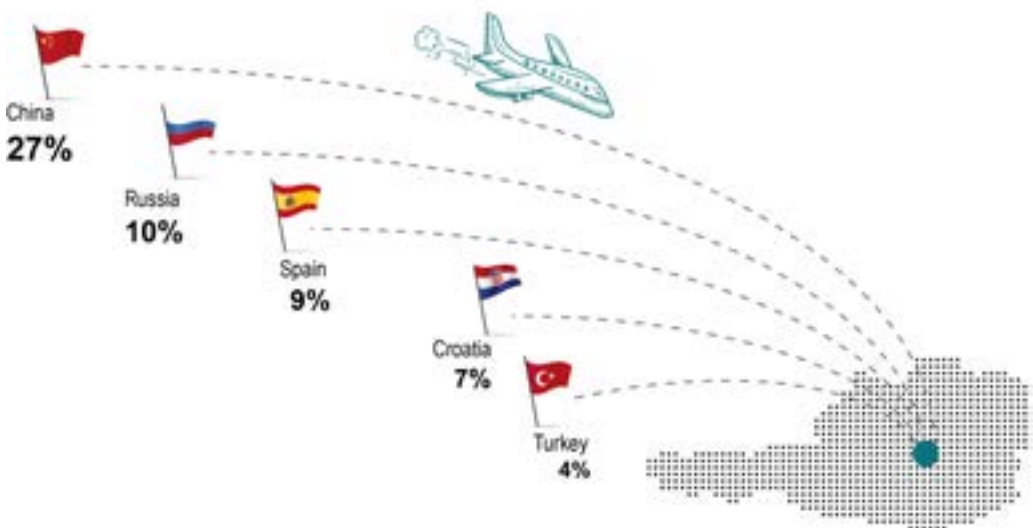
How many incoming students come to MUL each year?

An increase of more than 60% in the number of exchange students temporarily studying at our university in the period under review from 2015/2016 to 2019/2020 makes this very clear. About one third of the incoming students receive financial support from Erasmus+ programs.

The majority, however, with over 60%, are supported by university-specific mobility programs from their countries of origin.

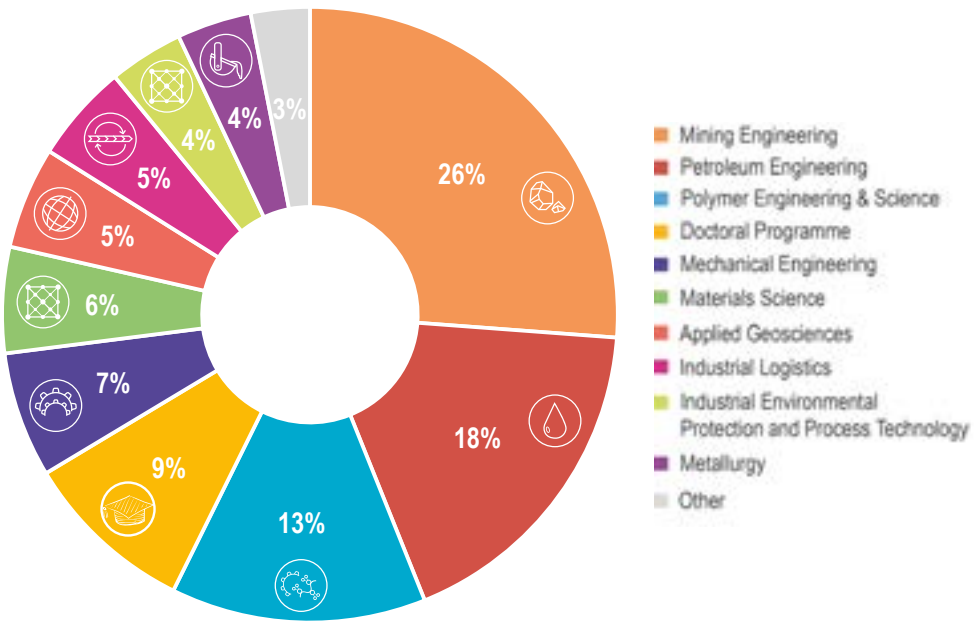
What countries do most of the MUL incoming students come from?

In the period from 2018/2019 to 2020/2021, MUL welcomed incoming students from 64 different nations. Half of them came from four nations: China, Russian Federation, Spain and Croatia.



What do incoming students study at MUL?

Courses in mining engineering, petroleum engineering and polymer engineering and science are of particular interest for the temporary stay abroad.

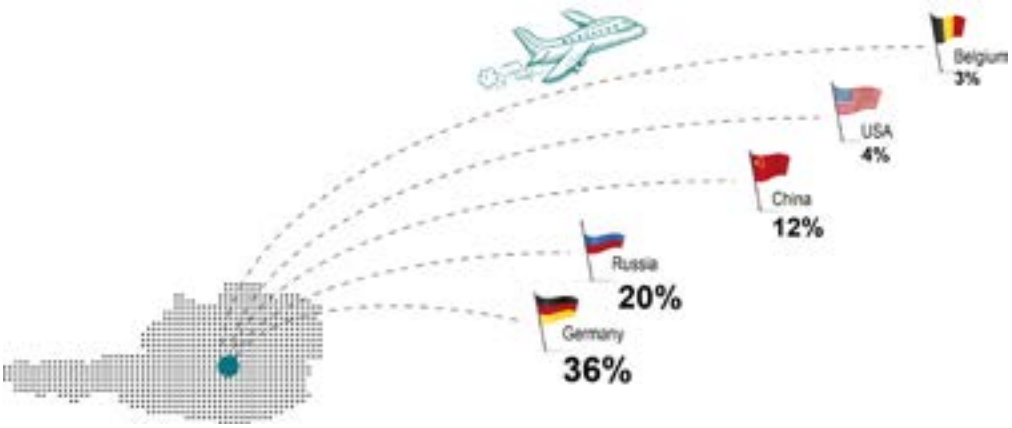


Outgoing Students

How many outgoing students gain student experience abroad each year?

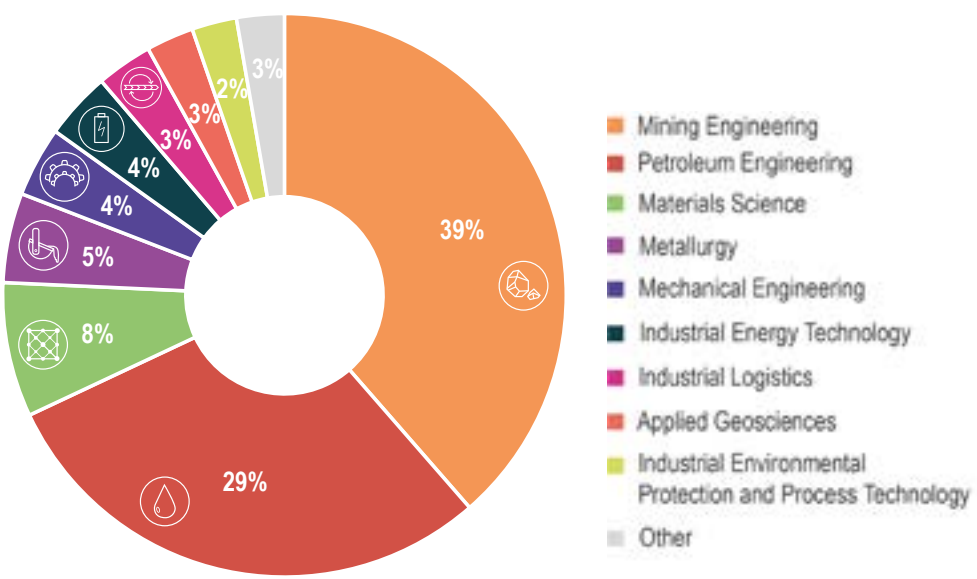
In relation to the incoming figures, the outgoing mobility of students at MUL has increased even more in recent years. MUL also supports a very large proportion of its students' mobility abroad through its own, university-specific funding programs. In addition, every third mobility has been financed with the help of Erasmus+ funding in recent years.

In which countries do most MUL outgoings spend their stay abroad?



In the period from 2018-2021, outgoing MUL students chose 44 different destination countries for their stay abroad. More than half of the outgoings went to Germany or Russia. Another quarter spent their stay abroad in China, the USA, Belgium or Italy.

Which fields of study are most of the outgoings enrolled in?



The two study programs mining engineering and petroleum engineering are not only the most attractive among incoming students, they also make up the majority of MUL outgoing students.

Experiences of Incoming Students

Carolina, Universidad Autónoma de Baja California, Mexico, year of study 20/21

Leoben was my home for a year during my academic exchange, and this small town now has a huge place in my heart. Despite the pandemic, I was able to meet and befriend people from many different countries, and some of them even became my family. I am grateful to Montanuniversität for opening its doors to me and allowing me to experience its high-quality education, as well as so many experiences that I will always cherish.

Adrián, Universidad Politécnica de Madrid, Spain, winter semester 19/20

Leoben is one of the smallest cities where I have ever lived, but in fact Leoben is really big in many other ways. I found really nice people from everywhere (literally) with interesting stories. Montanuniversität Leoben completely exceeded my expectations; the quality of the lectures and the amazing installations of the labs. This experience is something that I will surely never forget.

Mariia, Dnipro University of Technology Ukraine, year of study 20/21

The professors are amazing: friendly, nice and extremely well educated. The lectures are very interactive; they wanted us to discuss and think critically. My Erasmus exchange gave me many lessons. But the most important one is: dare to go beyond the limits of your comfort zone to open the doors to new experiences and opportunities. Studying abroad is one of the most refreshing and exciting things a student can do in their life.

Experiences of Outgoing Students

Paul, Technical University of Lulea, Sweden, summer semester 2020

At LTU there are half-semesters and you have to do 2-3 courses per half-semester, each of which is worth 7.5 ECTS. I took 3 courses in the first half-semester and 2 courses in the second one. The Swedish language course is highly recommended because you also get a lot of info on culture, food, travel, holidays, etc. If you want to see the Northern Lights, the best place is north of the Arctic Circle. Especially Abisko and the surrounding mountains are famous for it. There are also cable cars that take you to the top, where you can enjoy a better view from.

Christiane, Universidad de Guanajuato, Mexico, winter semester 2018

With 200,000 inhabitants, Guanajuato is quite large and has a lot to offer in terms of bars, cafes and clubs. It is really difficult to find a city with a similar fascinating and fabulous atmosphere. In order to study at the university, you have to take at least 5 courses OR at least 18 hours per week. I was at the university a good 4 hours a day throughout the week. My Spanish level of B2 was definitely sufficient and I was able to follow the classes without any problems.

Michael, TU Delft, Netherlands, summer semester 2020

The university has a very good reputation, the standards are high and the studies are clearly structured and organized. A typical day at the university is quite intense and characterized by coffee, but it is not too different in structure from everyday life at MUL. There are many offers through which you can enjoy student life: Student associations, lecture series, symposiums and small pubs, cafes, markets and occasional parties , or you can always go to Rotterdam, The Hague or even Amsterdam in a relatively short time.

Correspondents Project - International Student Ambassadors

The Correspondents project aims to make student experiences abroad and at MUL more visible by using social media channels. Students of Montanuniversität Leoben were able to apply as ambassadors in the fall of 2020. There are three categories of ambassadors within the project:

International Student Ambassadors (ISAs):

Regular international students who already live here act as International Student Ambassadors (ISAs), share their personal experiences of student life at MUL via social media, and support their new international peers in the orientation phase.

Incoming Exchange Student Ambassadors (IXAs):

Incoming students who are on an exchange stay at the MUL act as Incoming Exchange Student Ambassadors (IXAs) and share their personal experiences around their stay at MUL.

Outgoing Exchange Student Ambassadors (OXAs):

MUL students, who go abroad act as Outgoing Exchange Student Ambassadors (OXAs) and share their personal experiences of their stay abroad.

MIRO's project includes the voluntary representation of student life at MUL or at an international university. In addition to posts on Instagram, ambassadors also write blog posts for the university's own multimedia platform "comMULity." All posts are about living and studying in Leoben and everything that goes with it. In addition, outgoing students share their experiences abroad during their ambassador engagement.

Blog posts like "I don't speak German! Can I study at MUL?" or "Being an international student in Leoben" are intended to help young people from different backgrounds who are interested in studying at MUL to get information; not only from official contacts at the university, but also directly from their peers. Information can also be found on Instagram, e.g. Ambassador Nastya visits studentdorms in Leoben in her series "Where to live in Leoben" and presents them in short videos.

First generation of International Student Ambassadors at Montanuniversität (Instagram post MIRO)

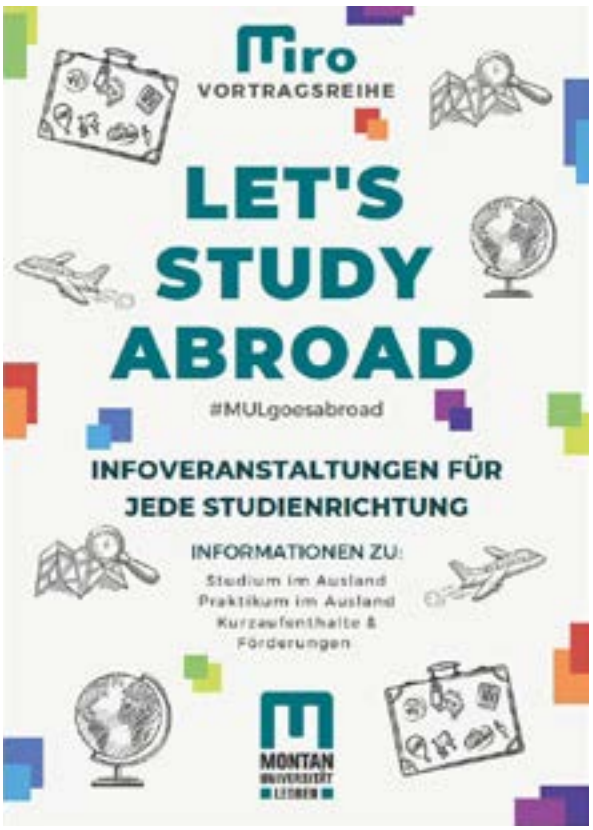
Students who are interested in an exchange can also find information this way: OXA Jakob talks on comMULity about what it is like to go on an exchange semester during a pandemic and lets us participate in his exchange semester via Instagram.

Interested students can apply to become an ambassador during the application period. After joining the team, students participate in workshops to learn various skills for their engagement. In team meetings and through communicating via the platform Slack, topics and ideas for new creative contributions are discussed and realized.

Follow us on Instagram **@miro_montanuni** and check out **www.comMULity.ac.at** to learn more from our Ambassadors.

MUL goes abroad

Nowadays, experience abroad is a key pillar of a modern academic education for young students. Studying abroad brings life experience, fosters cultural understanding and improves language skills. In 2020, MIRO initiated the project “MUL goes abroad“, which aims to encourage more students to go abroad during their studies. Collected facts about the partner university, which semester might be suitable for the stay abroad, which courses are recommended and can also be recognized, selected accommodation options, required budget and available scholarships, any VISA requirements, deadlines for applications, necessary contact information, etc. are made available in compact information brochures and are also presented to students in study program specific (returning) information sessions during the following year.



After the project had been successfully presented to the program directors, the ÖH and the student representatives, the next step was to select suitable partner universities for each field of study. The focus here is increasingly on ensuring that students have enough creditable subjects to choose from the partner universities without a great deal of organizational effort, because MIRO is already doing the preparatory work here which reduces the time for planning a semester arbroad.

The first two information sessions, for study programs Industrial Energy Technology and Materials Science, were successfully conducted (digitally) at the end of 2020, with the study program coordinators also taking part. The main idea for all planned measures is to tailor the activities to the specific study fields.
Montanuniversität becomes more attractive to potential (exchange) students, if it closely cooperates with strong partner universities and can offer its students, staff and alumni an active, international network. This is why in the next phase of the project, all chairs were contacted to help us find out, via a survey, the partners they work together the closest with or would like to collaborate with more. This will help us focus on these universities in the future and contribute to strengthening our ties with strong partners strategically and sustainably on all levels.

Contact

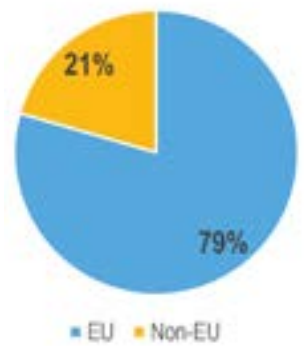
▶ outgoing@unileoben.ac.at

Staff mobility

MOBILITY OF ACADEMIC AND ADMINISTRATIVE STAFF

Increasing the mobility of university staff is an important part of the strategic goal of "internationalisation" at Montanuniversität Leoben, and in this sense, mobility stays of university staff from all areas are seen as a positive and desirable step in the course of an individual career.

In recent years, almost 80% of all staff mobilities have been completed within the EU.



Destinations of the staff training

The Erasmus+ program not only offers students the opportunity to go abroad, but also academic and administrative staff. All employees of Montanuniversität are eligible to apply for a mobility grant through the Erasmus+ program in order to spend a period abroad at a university, company or organization in an Erasmus+ program country.

The objectives are to exchange expertise, open up new perspectives, gain intercultural experience, expand and build a network and strengthen individual competences. Know-how is acquired at the host institution and applied at the home university.

In the academic years 2018/19 and 2019/20, 19 training stays and 3 teaching stays were able to be funded via Erasmus+ staff mobility. This form of international mobility has been used in many different areas. Individually organized training stays or organized staff weeks are being increasingly used by non-academic staff to get to know contacts and processes at the partner universities better and exchange experiences. The focus is on the acquisition of professional knowledge and competences required for the work at the university, especially with regard to an "added value" to be achieved for the staff and the institution.

INTERNATIONAL VISITING RESEARCHERS

In return, Montanuniversität Leoben welcomes international guest researchers for research and teaching stays of several months.

The permanent presence of foreign guests is a great enrichment for university life: The professional discussions with foreign colleagues who have a different cultural background and different educational and research experiences provide important impulses for the university's own research projects.

International staff mobilities

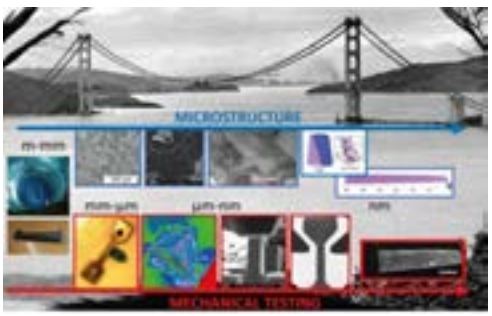
The professional exchange with international partners, the development and expansion of an international network and the gaining of intercultural experience is enormously important for employees of Montanuniversität Leoben and is seen as a positive step in the course of an individual career. What mobility in an international context can look like is shown in the experience reports of staff members from the last two years. For better readability, the academic titles have been omitted from the field reports.

Scientific visit to Texas and California, USA

During her maternity leave in 2019, Verena Maier-Kiener and her husband, together with their then eight-month-old daughter, took the opportunity to spend four weeks in the USA to interact scientifically with friends and colleagues in Texas and California. At the beginning of March, the family started with a large group from Leoben in historic San Antonio, Texas, where Verena Maier-Kiener organized a scientific symposium at the TMS meeting on the topic of „micromechanical testing in harsh environments“. Afterwards, a visit to Professor George Pharr, a pioneer in nanoindentation and micromechanics, at the university in College Station was on the agenda.

The trip then led to Goleta, California, where the Maier-Kiener family was able to spend two weeks with Professor Gianola and his group at the University of California in Santa Barbara. This resulted not only in unforgettable days in a university guesthouse near the ocean and a unique office view, but also in several scientific collaborations, including two Marshall Plan scholarships and a jointly supervised doctoral thesis, as well as several manuscripts. In April 2019, they also visited the University of Berkeley, where Peter Hosemann, a former graduate of Montanuniversität Leoben, is now a professor of nuclear engineering. Those four weeks of their trip to the USA resulted not only in an unforgettable family time, but also in a scientific exchange with fruitful discussions, which ultimately led to a continuous cooperation between the University of Berkeley and Montanuniversität Leoben.

One of the highlights from this was a workshop on „Scale bridging of mechanical tests in combination with complementary microstructure analysis“, which was organized by Professor Hosemann and Verena Maier-Kiener at the beginning of March 2020 as part of the World Materials Science Congress in San Diego.



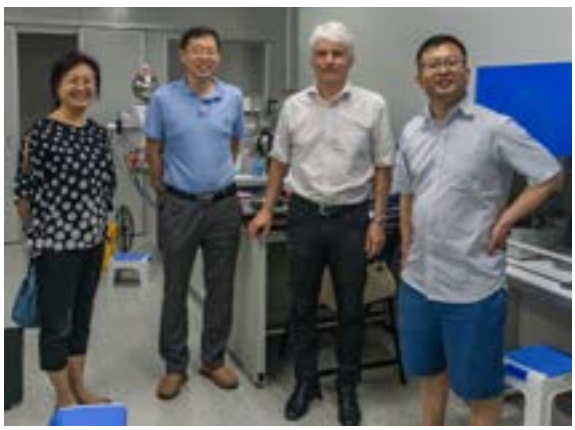
an Antonio, TX College Station, TX Santa Barbara, CA Berkeley, CA

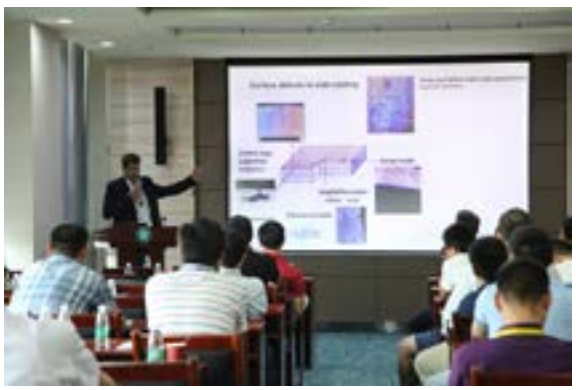
Visiting Professor in Africa

From August to November 2017, Harald Raupenstrauch worked as a visiting professor at the Department of Physics at the University of Zambia, Lusaka. There, he dealt with sustainable energy supply, especially biomass and photovoltaics, as well as energy-intensive industry in the Copperbelt (focus on energy efficiency), both in research and teaching.

Lectures in Wuhan & Beijing, China

At the invitation of the Chinese Academy of Sciences, Institute of Geology and Geophysics at Bejing (CAS-IGG) as well as the Chinese Acadamy of Sciences, Guangzhou Institute of Geochemistry (CAS-GIG) and the universities China University of Geosciences in Wuhan and Beijing, 8 lectures were held by Thomas Meisel on analytical-geochemical topics with the specialty of osmium (Os) isotope measurements in April and May 2019.



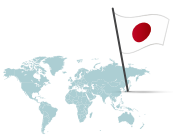


Visiting Professor at USTB Beijing, China

In September 2019, Christian Bernhard – guest professor at the USTB in Beijing since 2014 – spent a week in Beijing giving lectures about “The impact of continuous casting on the product quality with special emphasis on the casting of advanced high strength (AHSS) steels”. Afterwards, he attended the Metallurgy Innovation Symposium in Wuhan on invitation from the Wuhan University of Technology and gave a talk on “Grain boundary oxidation as a causal factor for surface defect formation in the continuous casting of steel.” For several years, the universities in Beijing and Wuhan have frequently exchanged researchers with Montanuniversität Leoben.

Annual Conference Wuhan, China

As Distinguished Professor of Wuhan University of Science and Technology (WUST), Johannes Schenk was invited to Wuhan, China, in October 2019. During this stay, he participated in the Wuhan Annual Conference of Refractories, which included the first meeting of the Academic Committee of the newly founded International Joint Laboratory of Refractories and Metallurgy at WUST. In addition, the stay could also be successfully used for a guest lecture for youth teachers and professors of WUST as well as for students of the new international metallurgy class at WUST.



University of Tokyo, Japan

From December 2018 to March 2019, Christoph Ponak spent an outgoing research stay at the Department of Materials Engineering at the University of Tokyo in Japan. He worked on the carbo-thermal reduction of steelworks slags for the recovery of valuable materials and the associated calculations with FactSage. In the course of the work in Japan, a joint publication was produced between Montanuniversität Leoben and the University of Tokyo.

Chiang Mai University, Thailand

Helmut Zsifkovits and Manuel Woschank conducted multiple secondments to Chiang Mai University as part of the SME 4.0 project, focusing on the area of Smart Logistics. Manuel Woschank dealt with the development and subsequent testing of logistics maturity models in industrial companies, Helmut Zsifkovits visited a large number of SMEs in Thailand to evaluate Industry 4.0 concepts in the smaller companies.

University of Sydney, Australia

Christina Hofer, head of the group “Advanced Micro- and Nanostructure Characterization” at the Chair of Design of Steels, spent six months in Professor Simon Ringer’s group at the Australian Centre for Microscopy & Microanalysis (ACMM) at the University of Sydney in 2019. In the framework of this collaboration, a device for in-situ tensile testing of spot welds in a scanning electron microscope in combination with electron backscatter diffraction was developed. The expertise in the field of high performance steels in conjunction with the leading-edge equipment at ACMM guarantee a fruitful, long-term collaboration.

TU Dortmund, Germany

The Chair of Economic and Business Management maintains a long-standing research cooperation with the Institute of Production Systems, Faculty of Mechanical Engineering at TU Dortmund. Within this cooperation, there is an annual doctoral seminar with a focus on Industrial Data Science in Leoben or Dortmund. The topics are theoretical input about new methods, presentations of (interim) project results and doctoral theses. Here, doctoral students/researchers receive input from peers and professors to improve their research. Both parties send their professors and elected researchers to participate for 2 days a year.

University of RomaTre, Italy

Employees of the Chair of Functional Materials and Materials Systems visited the University of RomaTre. The main objectives of the research stay at the Department of Mechanical Engineering were the exchange of knowledge on spatially resolved nanoindentation experiments on structurally and mechanically heterogeneous layered alloy films and to present the latest research activities. In addition, the study program for international students in the field of materials science at MUL could also be presented. The collaboration resulted in a successful research project proposal. The EU project entitled “Harmonisation of EU-wide nanomechanics protocols and relevant data exchange procedures” was approved for funding in November 2020.

Universita degli Studi di Brescia, Italy

Anja Gosch visited Professor Francesco Baldi and Dr. Silvia Agnelli at the Universita degli Studi di Brescia (University in Brescia, Italy) for a scientific exchange in March 2019. During her stay in Brescia, she was able to focus on fracture mechanical approaches for polymers and the associated data analysis. Furthermore, detailed investigations of fracture mechanical processes and notching procedures were discussed and experimentally verified.

Wroclaw University of Technology, Poland

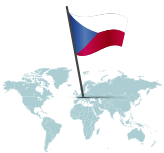
In 2019, the Processing of Composites group established an intense cooperation with the Wroclaw University of Technology, Faculty of Mechanical Engineering, Department of Mechanics and Materials Science in Poland. This cooperation an aims at the development of an integrated process monitoring. Accordingly, appropriate sensors capable of being integrated into a component are identified and tested. Visits to Poland took place in May and November 2019. Polish guests visited Leoben in October 2019 and from August until November 2020. The cooperation is still ongoing.

South Ural State University, Russia

Johannes Schenk had the opportunity to visit the South Ural State University in Chelyabinsk, Russia in March 2020 and had the honor of holding a guest lecture there.

Aside from presenting the Chair of Ferrous Metallurgy's research topics, he also introduced Montanuniversität Leoben and the double degree master study program Sustainable Materials (SUMA).

Czech Academy Of Science, Brno, Czech Republic



Florian Arbeiter (Chair of Materials Science and Testing of Polymers), visited the Institute of Physics of Materials (Czech Academy of Sciences, Brno, Czech Republic) for a scientific exchange in March 2019. During his stay in Brno, he was able to increase his knowledge of fracture mechanical lifetime estimation via finite element calculations. Furthermore, he performed nano-indentation tests on additively manufactured components. Finally, he was able to work with very experienced and friendly people on highly interesting topics.

Budapest University of Technology & Economics, Hungary

A fruitful cooperation between the Budapest University of Technology and Economics, Faculty of Mechanical Engineering, Department of Polymer Engineering in Hungary and the Processing of Composites Group in Leoben continued in 2019. Within the scope of the work, fiber optical sensors were studied regarding their use in monitoring liquid composite molding processes. Hungarian guests visited Leoben in September 2019. Visits to Budapest took place in May and November 2019.

University of Calgary, Canada

As the fourth Austrian visitor in a row, Anika Retzmann from the Chair of General and Analytical Chemistry spent a 6-month stay in 2019 as a visiting researcher at the Isotope Science Lab under the direction of Professor Mike Wieser (University of Calgary, UCal). After many years of close scientific cooperation between UCal and MUL, Thomas Prohaska and Johanna Irrgeher from the Chair of General and Analytical Chemistry at MUL were awarded the status of adjunct professor at UCal in 2018.

Worcester Polytechnic Institute, USA

Helmut Zsifkovits carried out two secondments at the Worcester Polytechnic Institute in the course of the SME 4.0 project by focusing on the area of Smart Logistics. In the process, he focused on the investigation of Industry 4.0 approaches for smart supply chains and the state of implementation, and presented the contemporary goals and outcomes of the SME 4.0 project.

Worcester Polytechnic Institute, USA

In July 2019, the first International Summer School in Axiomatic Design focusing on complex systems in Industry 4.0 took place at the renowned Worcester Polytechnic Institute (WPI) in Massachusetts, USA. Around 60 students and researchers from 4 continents, including Manuel Woschank, took part in lectures and tutorials on Industry 4.0 and Axiomatic Design on site and via live broadcast and e-learning technologies. The Summer School was coordinated by Dr Erwin Rauch from the Free University of Bozen-Bolzano in Italy and Professor Christopher Brown, renowned expert on Axiomatic Design and full professor at Worcester Polytechnic Institute in the USA.

Ceaden, Cuba

In July 2019, the Centro de Aplicaciones Tecnológicas y Desarrollo Nuclear (CEADEN) in Havanna, Cuba, invited Thomas Prohaska and Johanna Irrgeher as experts to support the set-up of an ICP mass spectrometer, including clean room facilities on site for environmental monitoring. During this one week research stay, joint efforts were made together with the colleagues on site to successfully establish a routine method for heavy metal analysis in seafood.

Mobility Programs

In addition to the ERASMUS+ funding program, which is presented in detail in the following chapter, mobility can also be well supported by several other programs. The most important one at MUL is called MULisa, which is also financed by the university itself. Further examples can be found in addition in the Austrian funding database of the OeaD, “www.grants.at”.

MULisa

The MULisa program (“MUL international study abroad”) organizes stays abroad in countries outside the Erasmus+ program. The international partner universities are located in North, South and Central America, Australia, Asia and Russia. Montanuniversität Leoben provides financial support in the form of a grant to cover the costs of studying abroad. This depends on the duration of the stay and the host country and is currently between EUR 146 and EUR 582 per month. Stays for study or research purposes, short programs and internships can be supported. The exact requirements for receiving the foreign costs grant can be found on the MIRO website and in the newsletter.

CEEPUS

The Central European Exchange Program for University Studies covers partnerships in countries in Central & Southeast Europe. MUL’s partners are:

- Croatia: University of Zagreb
- Poland: AGH Cracow
- Serbia: University of Belgrade
- Slovakia: TU Košice
- Hungary: University of Miskolc

A mobility and travel allowance can be obtained through this mobility program. In addition to the classic study visits abroad, funding is also available for short stays and excursions.

Marshall Plan Scholarship

The Marshall Plan Scholarship is run by MUL together with the Marshall Plan Foundation Vienna. Students who are planning a stay at a US university for the purpose of research or writing a scientific paper can apply for this scholarship. Depending on the duration of the stay and the level of study, the Marshall Plan Foundation pays out full scholarships of between EUR 4000 and EUR 10,000.

In the past, students have been able to spend successful stays at top universities such as the University of Berkeley or MIT through the Marshall Plan Scholarship.

Best of South-East

Best of South-East (BoSE) is a scholarship program of Steiermärkische Sparkasse in cooperation with MUL and three other Styrian universities and is aimed at students from Slovenia, Croatia, Bosnia & Herzegovina, Serbia, Montenegro and Northern Macedonia. The 12-month program includes a scholarship of EUR 750 per month, a tuition fee waiver and a self-organized summer internship.


erasmusplus

ERASMUS in Detail

- ERASMUS+
- ECHE - Erasmus Charter for Higher Education
- Erasmus+ 2021-2027
- Erasmus+ goes digital

ERASMUS+

ERASMUS – Student Exchange, Projects and Cooperation

To assume that Erasmus only has something to do with student exchanges in Europe, is only partly right, because the „Erasmus+ for Education, Youth and Sport“ program includes much more. Erasmus offers various opportunities for international exchange, networking and cooperation. In addition to student exchange, university projects in various areas such as education or digitalization are also funded.

There is also the possibility for students to receive financial support during their internships abroad and for staff during a stay at a partner university.

The aim of Erasmus is to promote cross-border mobility, multilingualism and European values. In this way, the unemployment of many (especially young) people should be combated and Europe‘s competitiveness should be increased. People in Europe and from different nations should actively participate in European society and the inclusion of all vulnerable groups should be promoted as such. The Erasmus program also tests new technology and strengthens international cooperation.

International Dimension of Erasmus

Since 2015, the EU funding program has also included countries outside of Europe. For example, under certain conditions, student exchanges between Austria and a South American or Asian country can be funded through Erasmus. It is also possible to submit projects with institutions from third countries.

Program period 2014 - 2020

In the past, Erasmus already ran for a program and budget period of seven years. In the 2014 - 2020 program period, Erasmus included the following thematic complexes and key actions:

- Key Action 1 (KA1) - Learning Mobility of Individuals
- Key Action 2 (KA2) - Cooperation to promote innovation and exchange good practice
- Key Action 3 (KA3) - Support for policy reform
- Jean Monnet Activities & Sport

Montanuniversität Leoben has also successfully participated in the Erasmus program in the field of higher education for many years. In the past, the focus was particularly on Key Action 1 and Key Action 2.

MUL IN KEY ACTION 1: MOBILITY IN PROGRAM AND PARTNER COUNTRIES

Every year, MIRO applies for funding under Key Action 1, “Learning Mobility of Individuals” to support student and staff mobilities. In Erasmus, a distinction is made between mobilities in Erasmus program countries and mobilities in Erasmus partner countries.

Program countries are the EU member states, Norway, Iceland, Liechtenstein, the Republic of Northern Macedonia, Serbia and Turkey. Every year, higher education institutions can request funding for mobility that is then carried out in any of the program countries. In 2019 and 2020, funding was successfully requested for 123 student mobilities (study visits and internships) and 39 staff mobilities (for teaching or training purposes) in program countries (so-called KA103 mobilities). The basis for an exchange is a so-called inter-institutional agreement between the higher education institutions.

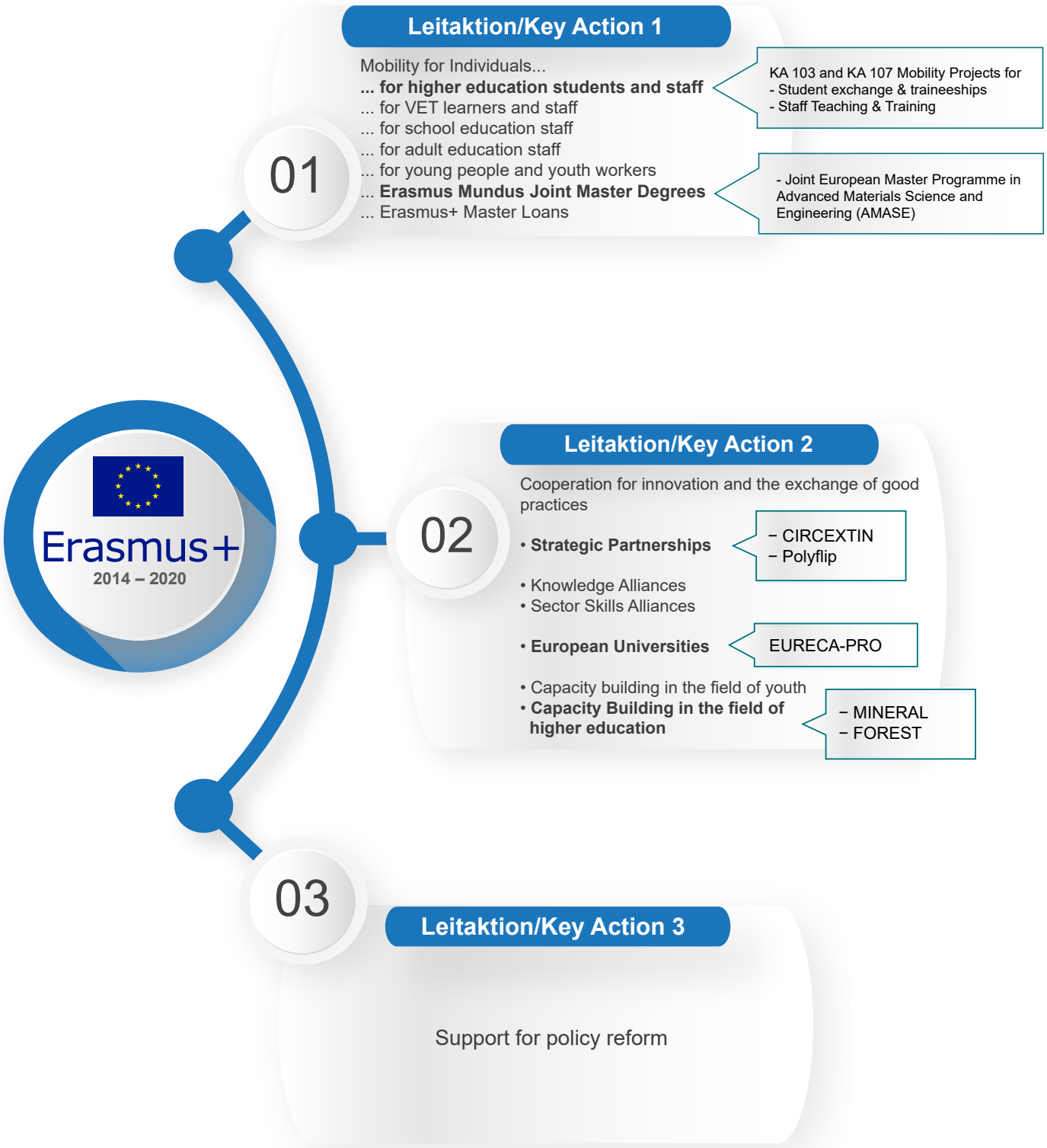
The term “partner countries”, refers to all countries outside of the program countries. In 2019 and 2020, funding was successfully obtained with the help of the departments in the following countries: Ukraine, Israel, Russia, Malaysia, Iran, Brazil, Canada, China, Mexico and Uganda (so-called KA107 mobilities).

In addition, Montanuniversität Leoben has also been participating in an Erasmus Mundus Joint Master’s project “AMASE” since 2020. An Erasmus Mundus Joint Master’s program enables a selected number of students to acquire a scholarship for their Joint Master’s program within the project duration. **(More information contribution p. 58)**

MUL IN KEY ACTION 2: INTERNATIONAL COOPERATION AND PROJECTS

In the 2020 application rounds, Montanuniversität Leoben was also very successful with several Erasmus project applications under Key Action 2, “Cooperation for the promotion of innovation and exchange of good practice”. Montanuniversität Leoben was able to successfully obtain project funding for the funding lines Strategic Partnerships, Capacity Building in Higher Education and European Universities Initiative.

Erasmus originally stands for **E**u**R**opean **C**ommunity **A**ction **S**cheme for the **M**obility of **U**niversity **S**tudents.
Since 2014, all agendas (Erasmus Mundus, Youth in Action etc) have been bundled under the common umbrella term ERASMUS PLUS **(Erasmus+)**.
In 2017, the program celebrated its 30th anniversary


Erasmus+
2014 – 2020
01
Leitaktion/Key Action 1
Mobility for Individuals...
... for higher education students and staff
... for VET learners and staff
... for school education staff
... for adult education staff
... for young people and youth workers
... Erasmus Mundus Joint Master Degrees
... Erasmus+ Master Loans
KA 103 and KA 107 Mobility Projects for
- Student exchange & traineeships
- Staff Teaching & Training
- Joint European Master Programme in Advanced Materials Science and Engineering (AMASE)
02
Leitaktion/Key Action 2
Cooperation for innovation and the exchange of good practices
• Strategic Partnerships
– CIRCEXTIN
– Polyflip
• Knowledge Alliances
• Sector Skills Alliances
• European Universities
EURECA-PRO
• Capacity building in the field of youth
• Capacity Building in the field of higher education
– MINERAL
– FOREST
03
Leitaktion/Key Action 3
Support for policy reform

ERASMUS+ PROJECTS

STRATEGIC PARTNERSHIPS:

CIRCEXTIN & POLYFLIP

With the participation of Montanuniversität Leoben, two Erasmus projects in the field of strategic partnerships were successfully obtained in 2020. “Strategic partnership for fostering circular economy approach in extractive industry related study programs” (CIRCEXTIN), which is coordinated by the Silesien University of Technology in Poland, aims to develop a comprehensive training platform that will help to modify existing study programs related to the extractive industry and increase knowledge of proper waste management, incorporating the circular economy approach.

“Development of a flipped classroom approach for (polymer) engineering study programs with the use of innovative ICT tools“ (Polyflip), led by the Faculty of Polymer Technology Slovenj Gradec in Slovenia, aims to build on good practice examples in other disciplines and educational levels as well as on current research results on this topic and to adapt and implement the flipped classroom approach to enable and promote active, student-centered and collaborative learning in (polymer technology) engineering study programs.

CAPACITY BUILDING:

MINERAL & FOREST

In 2019 and 2020, Montanuniversität Leoben intensively pursued the project partnership in the capacity building project ModernIsation of GeoLogy Education in Russian and VietNAmese Universities (MINERAL). The project deals with the modernization of geology education at Russian and Vietnamese universities. Another capacity building project, entitled “Future-Oriented chEmiSTry” (FOREST), was submitted and evaluated in 2020. FOREST aims to develop a new interdisciplinary, high-quality master‘s degree program in future-oriented chemistry at - again - Russian and Vietnamese partner universities. Furthermore, the project aims to improve the skills of teaching staff at these partner universities, establish centers of excellence in chemistry, and raise awareness of climate change mitigation techniques among local communities. In addition to MUL, the project, led by Linkoping University in Sweden, includes Vietnamese and Russian universities as well as partners from Portugal and Italy.

EUROPEAN UNIVERSITIES:

EURECA-PRO

The project proposal for a “European University on Responsible Consumption and Production” (EURECA-PRO) was also submitted and approved in 2020. Montanuniversität Leoben is the first and only Austrian public technical university to coordinate a European University Alliance. Together with six European partners, Montanuniversität Leoben will help shape a European university of the future under the umbrella of the UN Sustainable Development Goal 12. **(more info page 65)**

ECHE - ERASMUS CHARTER FOR HIGHER EDUCATION

MONTANUNIVERSITÄT LEOBEN RECEIVES ERASMUS CHARTER

Montanuniversität Leoben has been awarded the Erasmus Charter for Higher Education (ECHE) once again for the new program period (2021-2027). The ECHE is the legal basis for European higher education institutions to participate in the Erasmus+ program; this includes applying for grants for all types of mobility and project tracks. The ECHE also defines the quality framework for cooperation activities and is valid for seven years.

In the past, MUL has already been able to participate successfully in the Erasmus program through the ECHE. For the new program period Erasmus+ 2021-27, all universities throughout Europe had to apply for the renewal of the charter. The Montanuniversität Leoben International Relations and University Cooperation Office (MIRO) prepared and submitted this application in the spring 2020. The results were then published by the Executive Agency for Education, Audiovisual and Culture in Brussels at the end of December 2020. Montanuniversität Leoben was also successful and will therefore continue to participate in this unique international higher education program, which has been outstanding for over 30 years.

The policy statement of Montanuniversität Leoben as well as the certificate for the ECHE are publicly available on the homepage: https://international.unileoben.ac.at/en/going-abroad

Applying for and receiving the charter also entails a commitment to the principles of the Erasmus Charter. This means that MUL commits itself to guaranteeing the principles anchored in the program, such as non-discrimination, transparency, inclusion, equal access for all, recognition of ECTS credits, no charging of fees in the course of mobility, and the quality of mobility activities and projects. In addition, special attention should be paid to the four priorities of the new Erasmus program: Digitalization, Green Erasmus, Inclusion and Social Engagement.

ERASMUS DAYS

Every autumn, ERASMUS DAYS take place all over Europe. These events are designed to raise awareness of the program and the ECHE principles. Montanuniversität Leoben has participated in the Erasmus Days for many years.

ERASMUS+ THE NEW PROGRAM AND OUTLOOK

ERASMUS PROGRAM PERIOD 2021-2027 - THE JOURNEY CONTINUES

On January 1, 2021, the EU funding program Erasmus+ started its new program period, which will last for 7 years. However, preparations for the new program already had to be done beforehand - for example, MIRO successfully applied for the new Erasmus Charter in 2020 and also took essential first steps for the implementation of "Erasmus Going Digital".

The new Erasmus program will be accompanied by some innovations and adaptations, but tried and tested project tracks such as cross-border mobility and international cooperation within the framework of Erasmus projects will remain central themes of the program and consequently also for Montanuniversität Leoben.

People of all age groups, regardless of their social or economic background, should be given the opportunity to participate in mobility and obstacles to mobility should be further reduced. As "blended learning" solutions are increasingly established, it will be possible to implement and apply for so-called "blended intensive programs" together with other higher education insititutions. In order to meet current societal and global challenges, to address climate change and to advance digitalization, four priorities will be set in the new program: Green Erasmus, Inclusion, Digitalization and Civic Engagement.

MIRO OUTLOOK

In order to continue carrying out mobilities in Erasmus program and partner countries, MIRO will apply for funding again in the coming years. MIRO also plans to organize information events for all interested staff members at Montanuniverstität Leoben on the acquisition of funding in partner countries (international mobility).

In addition, MIRO will inform interested MUL staff members about the new program and the numerous project opportunities as well as their submission deadlines. As in the past, current projects will be subject to constant monitoring and reporting. In autumn, like every year, the Erasmus Days will take place, the MIRO team is planning joint excursions and events with the international students to make the program visible and disseminate Erasmus.

All of this takes place under the umbrella of the ECHE, which defines the principles and priorities of the Erasmus program. Another important task, that will continue to be carried out by MIRO is the implementation of the Erasmus Goes Digital Initiative.

MOBILITY 4.0

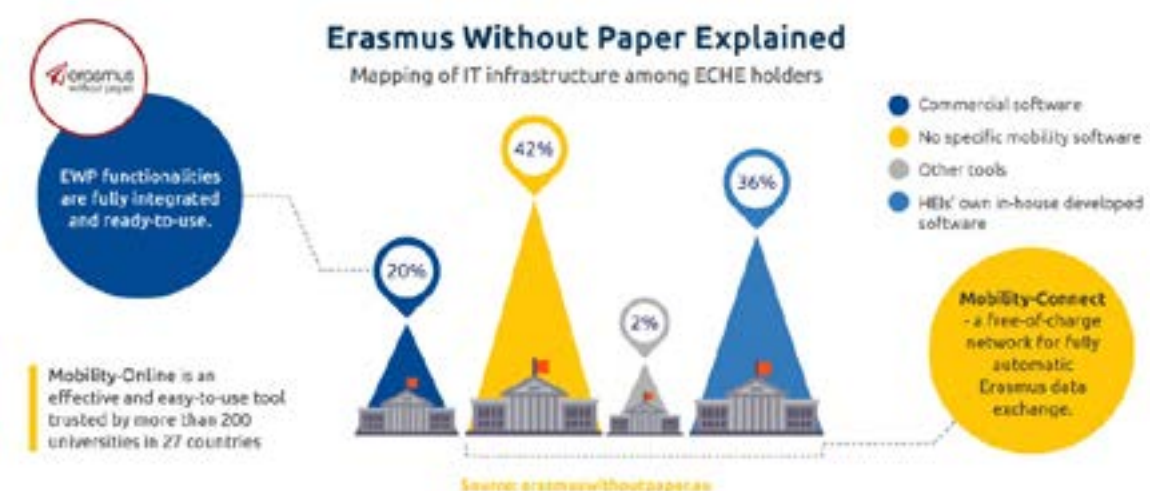
Digitalization in the Erasmus+ program is a major topic for the future of European university cooperation. At Montanuniversität Leoben, we also asked ourselves which administrative steps were still necessary in the current form or could be simplified by digitalization. As a result, we started the process of complete digitization of the mobility organization process by replacing paperwork with digital work and reduced the administrative burden for students and employees.

In 2019/20, the expansion of the digital service infrastructure at MIRO enabled further benchmarks to be implemented in the linking of mobility and digitalization. In order to automate the work processes in the area of international mobility, MIRO uses the software tool Mobility-Online. Thanks to the simplified data processing by the applicants and the accompanying transformation of the administrative process, the time required for the administration of mobilities and cooperations has been significantly reduced and optimized. Parallel to the digitization measures, internal processes were optimized in coordination with the admissions office.

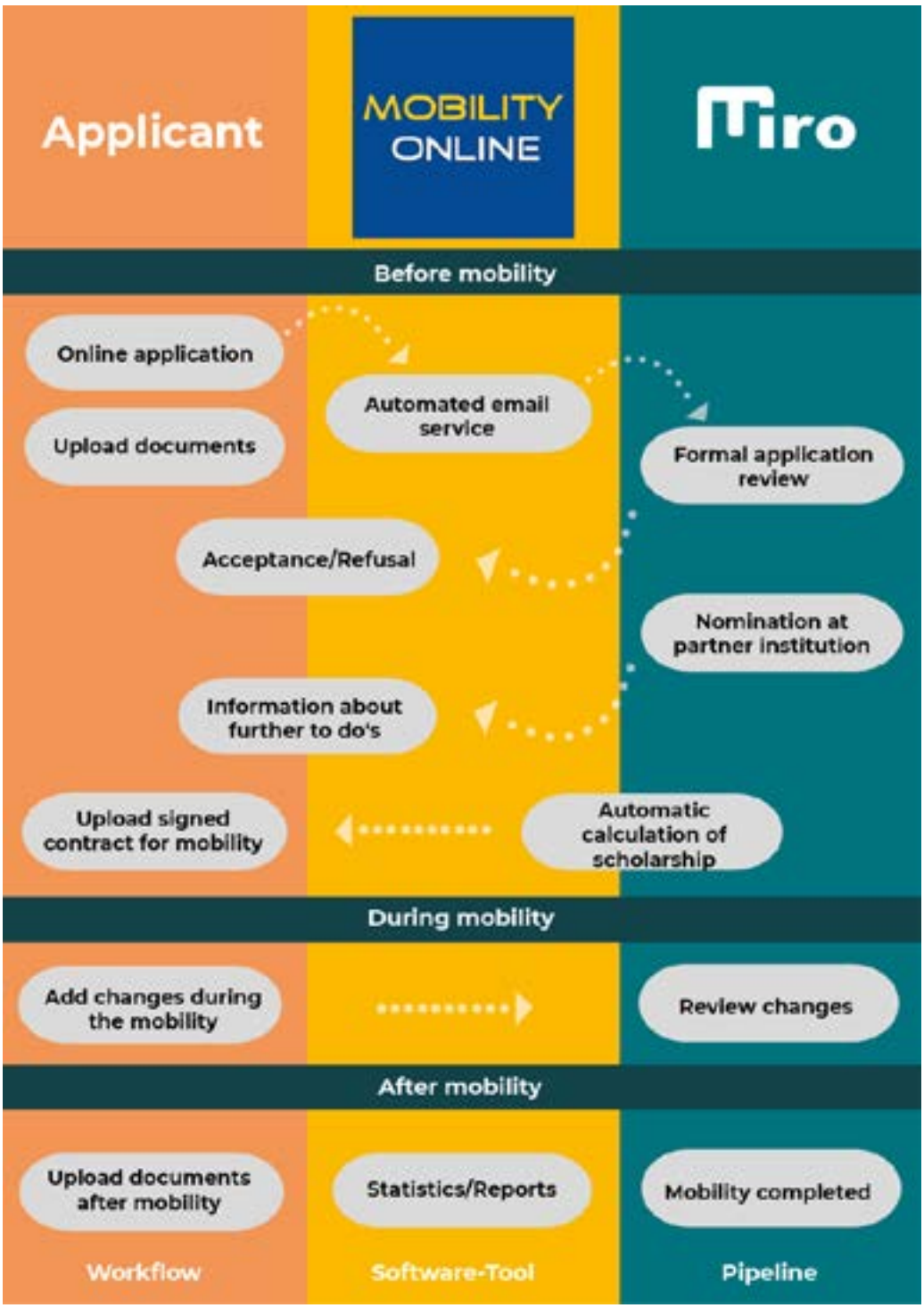
Furthermore, Montanuniversität Leoben is digitally connected to all partner universities in the Erasmus+ program via an interface, the so-called “Erasmus without paper”. Contracts and mobilities can be easily drawn up, exchanged and processed digitally. In addition, there are new mobility formats in which physical and virtual mobility are linked.

ONE-STOP-SHOP

The European Student Card Initiative will enable every student to easily and safely identify and register themselves electronically at higher education institutions within Europe when going abroad for their studies, eliminating the need to complete onsite registration procedures and paperwork. The Erasmus+ mobile app offers services to support students throughout the mobility process.

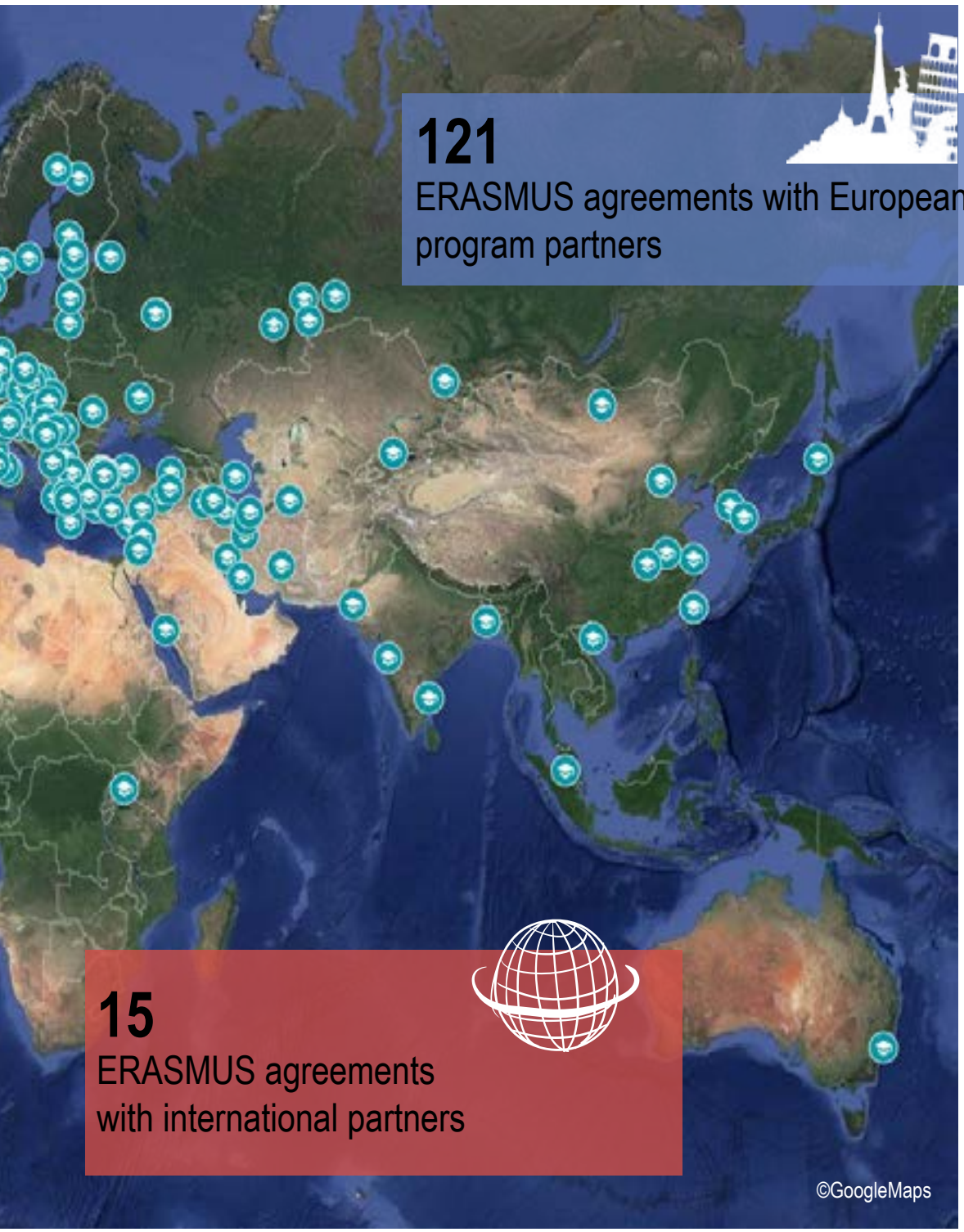


APPLICATION PROCESS IN MOBILITY-ONLINE



Cooperations, Networks & Events

Partnerships worldwide


121
ERASMUS agreements with European program partners
15
ERASMUS agreements with international partners
©GoogleMaps

Africa Uninet

Africa-UniNet is an Austrian-African research network founded in 2020 and initiated by the Austrian Federal Ministry of Education, Science and Research (BMBWF), the OeAD-GmbH - Agency for Education and Internationalisation (OeAD) and the University of Natural Resources and Applied Life Sciences in Vienna (BOKU). The aim of Africa-UniNet is to establish long-term and stable cooperation between Austrian and African higher education and research institutions. The network is intended to deepen scientific cooperation, promote new contacts and offer opportunities for innovative joint research projects.

Structure

The network currently (as of March 2021) has a total of 56 members consisting of 37 African and 19 Austrian institutions, including Montanuniversität Leoben.

As written in the Africa-UniNet statutes, the network is composed of several bodies with respective representatives. The network is headed by the president and consists of a board, the general assembly and national network meetings. Montanuniversität Leoben has been a member since 2020 and is regularly represented at the meetings.

Goals and tasks

As stated in the statutes, Africa-UniNet has the following main goals and tasks:

- Promoting cooperation between academic institutions
- Initiation of research and education projects based on common interests
- Establishment of a high-quality communication structure between Austrian and African universities as well as scientific institutions
- Creation of a platform for long-term scientific discourse
- Establishing contacts with governmental and non-governmental organizations
- Providing expertise on the higher education and research landscape in Austria and Africa
- Raising donations and third-party funds
- Other cooperative activities, e.g. in the field of further education

Financing and funding

Africa-UniNet itself is funded by the Austrian Federal Ministry of Education, Science and Research (BMBWF). The respective work programs and funding opportunities are decided by the member institutions during the General Assembly. These include funding for short research stays and visits of professors and scientists at the member institutions, life-long education measures (courses, workshops, seminars) for participating target groups, conferences, alumni activities and joint project applications.

Founded: 2020, MUL is a member since 2020
Members: 56
Member countries: Austria, Algeria, Burkina Faso, Burundi, DR Congo, Ethiopia, Gabon, Kenya, Mozambique, Nambia, Nigeria, South Africa, Tanzania, Uganda, Zimbabwe

https://africa-uninet.at

ASEA Uninet

The ASEAN-European Academic University Network (ASEA-UNINET) is a network of universities based in European and Southeast Asian countries. The aim of ASEA-UNINET is to promote equal cooperation, quality collaboration in science and cultural exchange between the participating countries and universities. The network was founded in 1994 by Austrian, Indonesian, Thai and Vietnamese universities; Montanuniversität Leoben has been a member since 1996. Today, the network counts a total of 84 members from 17 countries across Asia and Europe.

Structure and meetings

The network has a president, who is elected by the general assembly for approximately 1.5 years. Each partner institution has an ASEA-UNINET coordinator, each country a national coordinator and each continent a regional coordinator. The national coordinator for the 20 participating Austrian universities is JKU Linz.

Meetings of the national coordinators and also the general assembly take place at regular intervals. The minutes of the meetings and the annual report are published on the website for reference.

The Austrian head office and supporting unit for the Austrian universities is the OeAD-GmbH - Agency for Education and Internationalisation (OeAD) based in Vienna.

Purpose and mission of ASEA-UNINET

► The aim of ASEA-UNINET is to foster relationships between universities, governmental, non-governmental organizations and business actors implementing projects in education, science, technology, innovation and arts in the participating countries.

► The network also aims to contribute to research, particularly in the areas of sustainable development, with a focus on the United Nations Sustainable Development Goals (SDGs).

►Furthermore, the network promotes cooperation between academic institutions in the areas of staff and student exchanges and mobilities.

► Scientific, cultural and personal relations are also promoted in order to improve intercultural exchange and understanding.

Activities, projects and funding

Participating partner institutions assist in the formation of consortia and collaborations for academic activities and in the initiation of projects and programs that are of mutual interest and benefit to faculty, staff and students. Member universities also assist in obtaining grants and funding from university and national government sources, international funding agencies and the private sector.

MIRO also regularly informs the staff of Montanuniversität about current project tenders and funding opportunities within the ASEA-UNINET network.

ASEA-UNINET even has its very own song, which you can find on the homepage with the lyrics and listen to: https://asea-uninet.org/about-us/asea-uninet-song-with-lyrics/

Founded: 1994, MUL is member since 1996
Members: 84
Member countries: Austria, Czech Republic, Germany, Greece, Italy, Slovakia, Spain, Portugal Countries
Southeast Asia: Kingdom of Cambodia, Indonesia, Iran, Malaysia, Myanmar, Pakistan, Philippines, Thailand, Vietnam

https://asea-uninet.org

EURASIA PACIFIC UNINET

The Eurasia-Pacific Uninet (EPU) is a network consisting of Austrian higher education institutions and research institutions as well as partners from East, South and Central Asia and the Pacific region. The aim of EPU is to establish sustainable contacts and scientific partnerships in the countries involved. Today, the EPU network counts nearly 180 members located in 15 countries and is the largest sovereign higher education network of its kind in Europe.

EPU's mission is to promote interdisciplinary scientific exchange between its member institutions through scholarships for post-docs and doctoral students coming to Austria, as well as to support projects and summer schools. EPU promotes multilateral, scientific cooperation, joint research projects, conferences and exchanges of teachers and students.

History and structure

The network was initiated and founded in 2000 by the University of Salzburg and is funded by the Austrian Federal Ministry of Education, Science and Research (BMBWF) and administratively supported by the OeAD-GmbH - Agency for Education and Internationalisation (OeAD). As of January 1, 2010, OeAD-GmbH became the holding company of the administrative unit Eurasia-Pacific Uninet. The university network has a president (currently from the University of Veterinary Medicine Vienna) and plenary meetings are held every 3 years. Most recently, the 6th plenary meeting was held in Vienna in 2019.

EPU has grown steadily over the years and as of 2020 - after 20 years of existence - has over 180 members from 15 countries.

Goals and tasks

► EPU supports scientific, economic and cultural relations between Austria and the target countries, R&D activities of multinational companies, visiting professorships and mutual recognition of degrees and programs.

► In addition, the university network offers research grants for member institutions, contacts between government agencies, educational institutions and companies, and intercultural competence through intensive programs and courses.

► Furthermore, joint research centers, joint schools for teaching, research and training, the development of joint curricula and double-degree programs are initiated. Research activities in the form of workshops, seminars and conferences are also a focus.

Montanuniversität Leoben - as one of the 38 Austrian members - supports and promotes all goals and tasks, and MIRO regularly informs the staff members about current tenders and funding opportunities within the EPU network.

Founded: 2000
Members: 180
Member countries: Austria, China, India, the Russian Federation, Kyrgyzstan, Mongolia, Kazakhstan, Nepal, Republic of Korea, Tajikistan, Uzbekistan, Bhutan, Democratic People's Republic of Korea, Belarus and Japan

https://www.eurasiapacific.net/

CEEPUS

CEEPUS is a transnational, Central European higher education network, that consists of various subject-specific individual networks and promotes the exchange of student and teacher mobility.

Currently participating countries: Albania, Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Hungary, Macedonia, Moldova, Montenegro, Poland, Romania, Serbia, Slovakia and Slovenia as well as Prishtina/Kosovo.

A network consists of at least three higher education institutions from at least two different countries. Each of the networks has a specific thematic focus. Cooperation takes place in particular with the corresponding institutes/faculties/departments of the respective universities that are active in the same thematic area.

Montanuniversität Leoben is currently involved in the following networks:

CIII-AT-1102-04-1920-RAMSIS

Raw Materials Smart Innovation Strategies in the ESEE Region

This is a thematic network entitled “Raw Materials Smart Innovation Strategies in the ESEE Region” (CEEPUS RAMSIS), which was established specifically for academic exchange in the raw materials sector. The program offers mobilities for short and long-term stays as well as financial support for short-term field trips and summer universities in the participating partner countries.

Objectives:

- Provision of innovation strategies for the raw materials sector in Central Europe
- Institutionalization of university cooperation networks in the raw materials sector in Central Europe
- Linking the ESEE regions to the EIT RawMaterials network
- Exchange of teachers and students
- Creation of network strategies with all partners

CIII-AT-RS-0038

Earth Science Studies in Central and South-Eastern Europe

Department of Applied Geosciences and Geophysics - Univ.Prof. Hans-Jürgen GAWLICK

This network focuses on improving the quality of teaching in earth sciences in Central and South-Eastern Europe. Eighteen universities from ten countries within the complex mountain belt Alps-Carpathians-Balkans-Dinarides (Austria, Albania, Czech Republic, Croatia, Hungary, Poland, Romania, Serbia, Slovenia and Slovakia) are involved in the project.

Objectives:

- Diversifying teaching topics and methods
- Active cooperation between students and teachers
- Increasing the scientific quality of both learning and teaching
- Study of geological aspects of the Alps-Carpathians-Balkans-Dinarides mountain belt

Founded: 2005
Member countries: Albania, Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Hungary, Macedonia, Moldova, Montenegro, Poland, Romania, Serbia, Slovakia and Slovenia as well as Prishtina/Kosovo

https://www.ceepus.info/

RETINA - Opening Research Laboratories to Innovative Industrial Applications

Within the SI-AT Interreg project RETINA, a cross-border network of established R&D institutions with complementary capabilities in materials science was established.

The aim was on the one hand to initiate or strengthen sustainable transnational cooperation between universities and research institutions through pilot projects, and on the other hand, to provide companies, especially SMEs in the structurally weak border areas of Austria and Slovenia, access to this research network, thus to research expertise and its infrastructure.

This was implemented by means of information events, workshops, training courses, laboratory visits and small cross-border projects between the research institutions and companies.

D-A-C-H Ceramic Session

The annual conference of the German Ceramic Society took place from May 5-9, 2019 at Montanuniversität Leoben. The main topics of the conference, which was held outside Germany for the first time, were additive manufacturing and the reliability of ceramic structures and processes. In addition to the main topics, there were lectures on ceramics for electronics and mobility, ceramic laminates and composite materials, ceramics for refractory applications, bioceramics, ceramics for chemical, mechanical and industrial engineering, silicate ceramic raw material, material and process diagnostics as well as ceramics for energy and environmental applications. A total of 260 participants were able to learn about the latest developments in the field of ceramic materials at 124 lectures. As plenary speakers, Professor Robert Danzer (Montanuniversität Leoben), Prof. Dr. Silke Christiansen (Free University Berlin) and Prof. Gary Messing (Pennsylvania State University) were welcomed. The 7th Annual Meeting of the Austrian Ceramic Society and the Ceramic Session of the Swiss Association for Materials Science and Technology were integrated into the extensive program.

In memory of Professor Dr. Hans-Walter Hennicke and in recognition of his work in ceramics education, the Hans-Walter-Hennicke Prize was awarded to young ceramists whose final examination at a university, college or technical school had not been more than a year before. The program was rounded off by a poster competition.

The event is also seen as recognition of Leoben as an important center of ceramic science in Europe.

Recy & DepoTech 2020

From November 18-20, 2020, the largest German-speaking waste management and recycling conference, Recy & DepoTech, took place for the 15th time. Due to the worldwide corona pandemic, the conference had to be held purely virtually for the first time. 508 participants registered for the first virtual conference in advance. Together with the late registrations, the number of participants rose to 570. The countries represented were Germany, Canada, Austria, Russia, Switzerland, Slovenia, the Czech Republic and Hungary.

117 pre-recorded presentations were held in four parallel sessions. The speakers came from Germany, Austria, Russia, Switzerland and Hungary. After each block of presentations, there was a live discussion between the speakers of the block. By means of a Q&A button, the participants could submit their questions to the speakers.

The opening speaker was the Austrian philosopher Prof. Konrad Paul Liessmann from the University of Vienna with the topic “Everything different? Why changes are usually difficult for us, but sometimes they are quite simple”. Probably the most current topic of the conference was dealing with crises that had already been agreed upon between Professor Liessmann and Professor Pomberger as a keynote lecture before the outbreak of the corona pandemic. The topic was further illuminated at the 5th Leoben Waste Dispute for the Environment. In addition to the lectures, 24 poster presentations were also given on all three conference days. The speakers came from Germany, Austria, Russia and the Czech Republic. The event was rounded off by 23 virtual exhibition stands in three virtual exhibition halls, where companies and institutions from Germany, Finland and Austria presented themselves and thus drummed up publicity.

The virtual networking lounge and private chat rooms provided good opportunities for participants to discuss the issues raised during the conference even more closely together and to make new contacts.

More information:

For details, please visit the conference website at www.recydepotech.at

The next conference will take place in 2022 (hopefully again physically)

ESEE: Strategy and Dialogue-Conference

Within the activities of Montanuniversität Leoben in the EIT RawMaterials, one of the strategic orientations is the region of East and South East Europe (ESEE). According to studies by the European Commission, these countries have a lower innovation index[1] than countries in Western Europe and are thus increasingly becoming a focus region for projects that can positively influence this, that goes hand in hand with the strategy of the Austrian federal government, for which this region is also in focus. „It is in the security as well as economic interest of Austria and Europe to anchor the future of the whole of South Eastern Europe in the European Union through a concrete and realistic European perspective“[2].

Due to its unique geological potential and its unique reservoir of secondary raw materials, the ESEE region is also highly relevant with regard to the European Raw Materials Strategy.The best way to strengthen the region in the long term is to involve it in the European integration process. RIC Leoben does this by actively embedding partners from the region in the European network of the EIT RawMaterials. On the one hand, this strengthens the pan-European position of the partners and, on the other hand, expands their experience with regard to project work and innovation.

A solid tool to bring together the stakeholders of the sector in the region and to combine activities and forces is the format of the ESEE Dialogue Conference Series, which successfully connects ESEE partners with each other and with the rest of Europe since 2015. It takes place in the target countries to revitalize the raw materials community there. The focus is on the multiplication effect and the empowerment of the individual partners to act autonomously.

1 European innovation scoreboard. https://ec.europa.eu/growth/industry/policy/innovation/scoreboards_en

2 Southeast Europe – A Priority of Austrian Foreign Policy. https://www.bmeia.gv.at/en/european-foreign-policy/foreign-policy/europe/southeast-europe/

In 2019, the 10th edition of the ESEE DC series took place with an anniversary conference in Leoben, with more than 100 participants and featured top-class speakers such as Milan Grohol from DG Grow of the European Commission, Robert Holnsteiner from the Federal Ministry of Agriculture, Regions and Tourism Mineral Resources Policy Department, Arnulf Grübler from IIASA or Krzysztof Kubacki from the Eastern Co-Location Center of EIT RawMaterials. The conference revolved around current raw materials policy aspects and was characterized by many discussions and interactive workshops. Another conference in 2019 was held in Zagreb under the theme „Sustainable Resource Use - Tailings / Wastes / Slags“ and reflected on the secondary raw material potential of the region.

The 12th ESEE-DC in 2020 was held as an online event in November due to the Covid-19 pandemic and focused on the topic „Brain Drain and its Impact on the ESEE Region“. This turned out to be an advantage for the topic as it made it possible to bring together people from different countries on the topic. In keynotes, Alida Vračić, Director of Populari think-tank spoke about Brain Circulation and Blaženka Divjak presented insights she gained as Minister of the Republic of Croatia during Croatia‘s EU Presidency in 2020. As Brain Drain is neither sector nor country specific, RIC Leoben opened the conference to over 100 participants from all countries and sectors for an inclusive and cross-cutting discussion.

Expert Forum "Digitalization in Mining"

As the digitalization of the raw materials sector is progressing, artificial intelligence (AI), machine learning (ML), deep learning (DL), augmented/virtual reality (AR/VR) and data integration solutions are increasingly being used to collect, analyze and manage data and visualize content in real time in variable contexts.

From January 20-22, 2020, the team of the Resources Innovation Center of Montanuniversität Leoben organized an expert forum on digitalization in the Raw Materials Sector in Leoben, together with EIT Raw-Materials and with support from KGHM Cuprum. More than 100 stakeholders, from policymakers, industry, research and higher education partners to start-up entrepreneurs and students, gathered to discuss the latest digital trends in the raw materials sector. They came from Austria, Germany, Italy, Estonia, Finland, Poland, Slovenia, Croatia, Greece, France, Belgium, Spain, Hungary and Russia.

Presentations spanned a wide range of topics, from application examples of digital tools and processes to general keynote addresses highlighting the political and societal aspects of digitalization. As an important part of the conference, young researchers had the chance to present their award-winning Master's and PhD theses. Start-up companies attracted great interest in their solutions during a trade show.

The Journey 2020 – Digital Summer School

The international summer school "The Journey" is organized by EIT Climate-KIC together with numerous partners every year. A total of 400 students and young professionals embark on a 4-week journey through Europe with the aim of developing system innovation and transformation projects for tackling climate change.

In 2020, the Journey would have stopped in Austria at Montanuniversität Leoben (MUL) for a third time, but due to the corona pandemic, it was switched to an 8-week online format.

MUL was the first stop for 40 participants from all over the world. This group called "Transalpine 2020" was supervised by RIC Leoben as coordinator and TU Graz, in cooperation with TU Munich. After a 2-week virtual stay in Leoben, the group continued to TU Munich. The participants attended numerous lectures and workshops organized and moderated by the RIC Climate Actions team:

- "Introduction to Montanuniversität" by Susanne Feiel (MUL)
- "Raw Material-Circularity and Sustainability & Virtual Reality Site Visit" by Philipp Hartlieb (MUL)
- "Shaping your mindset towards leadership for systems innovation" by Christoph Auch (Climate-KIC)
- "World Climate: Climate Change Negotiations Game" by Elisabeth Worliczek (BOKU)
- "Building a Sustainable Future" by Alexander Passer & Endrit Hoxha (TU Graz)
- "Climate Impact Forecasting Workshop" by Julia Weber
- "Sustainability to enhance your value proposition: convincing key drivers of change" by Kevin Le Blevennec (VITO)

MIRO Services

Team

Susanne Feiel
Head of Department

Caroline Fuchs
Operational Management

Karina Michelini-Rodriguez
Incoming Student Coordination & Events

Anja Zarfl
Outgoing Student Coordination & Social Media

Anja Meier
Welcome Center & Staff Mobility

international@unileoben.ac.at

+43 3842 402 7238

MULmiro

miro_montanuni

Sara Hierzer
Erasmus+ Management

Saikhantuya Buyannasan
Erasmus+ International Credit Mobility

Benjamin Dzilho
Student Assistant

EURECA-PRO

EURECA-PRO

lisa.pichler@unileoben.ac.at

Lisa Pichler
Project Management Lead

Jasmin Egger
Project Management

Agnieszka Kosciuszko
Project Management

Volkmar Kircher
Project Management Research

Lena Lackner
Student Assistant

UNESCO

unesco@unileoben.ac.at

Anna Voica
Communications & Partnership Management

Anastasia Kucheryavaya
Scientific Coordination

Maria Trettler
Student Assistant

MIRO Services

The Montanuniversität International Relations Office (MIRO) is an organizational unit at Montanuniversität Leoben (MUL) and the first point of contact for all questions and concerns regarding internationalisation.

Mobility management

A primary goal at MIRO is to support students before, during and after their stay abroad. This includes the support of international students who come to Leoben (incoming students), but of course also regular MUL students who would like to complete a stay at a partner university (outgoing students). In addition, MIRO also provides administrative support for staff such as teachers, researchers and other staff members to complete a stay abroad, whether for training or teaching purposes.

Funding administration

In order to finance these mobilities, MIRO constantly applies for mobility funding, which comes from various programs or funding pots, such as Erasmus+. Depending on the program, MIRO also takes care of the disbursement and the entire financial administration.

Welcome Center

MIRO is also home to the Welcome Center, which offers special support for international regular students and international employees and provides information on questions of immigration law.

In the course of student support, there are also regular community events for international students, which the MIRO team prepares, promotes and consequently also carries out. These include, for example, welcome events about living and studying in Leoben.

Cooperations & Networks

Another important focus is the cooperation with partner institutions worldwide. This includes the entire contract management, the establishment of new cooperations, the strengthening of existing networks as well as the support of international delegations. In addition, MIRO is responsible for the organization of international summer schools - such as CirCOOL.

Dissemination & Support

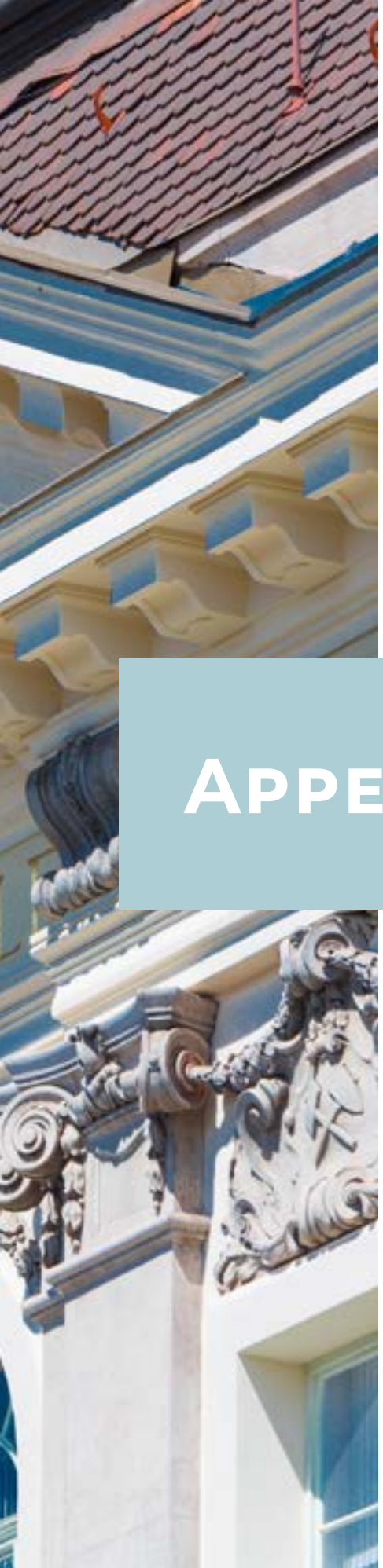
MIRO offers a wide range of information events for students and staff and represents MUL at international fairs. Furthermore, chairs are supported in the development of joint degree programs and Erasmus project applications. In order to promote and disseminate all activities, MIRO also offers a corresponding social media and online presence.

Quality Assurance of Internationalisation Standards

In addition, the staff members participate in various forums, such as Forum International, Forum Fremdenrecht or the working group of the International Offices of Austrian Universities (AG-UniInt), in order to keep an eye on current events and innovations. There is also regular exchange with the Austrian National Agency for Education and Internationalisation (OeAD) in order to ensure quality support and be able to optimally implement the goals and strategies at the national and European level.

MIRO contributes to ensuring the internationality of Leoben and to taking Montanuniversität Leoben out into the world.


K.K. MONTANISTISCHE HOCHSCHU



Appendix

Research Project Details

A1 **Inspiring shell**
Department Materials Science, Chair of Materials Physics
Assoz. Prof. Dipl.-Ing. Dr.mont. Daniel Kiener; daniel.kiener@unileoben.ac.at
Publication: http://www.nature.com/ncomms ; DOI: 10.1038/s41467-019-08753-6

A2 **SUMEX – SUstainable Management in EXtractive Industries**
Industrial Liaison Department of Montanuniversität Leoben and Department Mineral Resources Engineering, Chair of Mining Engineering and Mineral Economics
Mag.rer.soc.oec. Karin Rehatschek, karin.rehatschek@unileoben.ac.at
Dipl.-Ing. Dr.mont. Michael Tost, michael.tost@unileoben.ac.at
https://www.sumexproject.eu/
https://www.linkedin.com/company/sumex-project/
https://twitter.com/SUMEXproject
https://www.facebook.com/SUMEXproject
https://www.youtube.com/channel/UCZflrEOO5jiHoZi7MYua0Z

A3 **C-PlaNeT**
Department Polymer Engineering and Science, Chair or Polymer Processing & Department of Environmental and Energy Process Engineering, Chair of Waste Processing Technology and Waste Management
Assoz.Prof. Dipl.-Ing. Dr.mont. Thomas Lucyshyn, thomas.lucyshyn@unileoben.ac.at
Assoz.Prof. Dipl.-Min. Dr.rer.nat. Daniel Vollprecht, daniel.vollprecht@unileoben.ac.at
C-PlaNeT is a project funded by the European Union under the H2020 Marie Skłodowska Curie Actions - Innovative Training Networks (H2020 MSCA ITN) with a project duration from 01/2020 to 12/2023.
https://www.c-planet.eu/

A4 **INITIAL**
Department Materials Sciences, Chair of Physical Metallurgy and Metallic Materials
Dr.techn. Francisca Mendez Martin, francisca.mendez-martin@unileoben.ac.at

A5 **ICDP-DIVE-Project**
Department Applied Geosciences and Geophysics, Chair of Applied Geophysics
PhD Andrew Greenwood, andrew.greenwood@unileoben.ac.at

A6 **ROBOMINERS**
Department Mineral Resources Engineering, Chair of Mining Engineering and Mineral Economics
Dipl.-Ing. Michael Berner, michael.berner@uniloeben.ac.at
Details: This project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No. 820971; https://robominers.eu

A7 **NEW-MINE**
Department of Environmental and Energy Process Engineering, Chair of Waste Processing Technology and Waste Management
Assoz.Prof. Dipl.-Min. Dr.rer.nat. Daniel Vollprecht, daniel.vollprecht@unileoben.ac.at
Details: www.new-mine.eu, Funding agreement: 721185, Project duration: 09/2016 – 08/2020

A8 **Electroconductive polymers in the nanometre range**
IChair of PhysicsUniv.-Prof. Ao.Univ.-Prof. Dipl.-Phys. Dr.rer.nat. Christian Teichert, christian.teichert@unileoben.ac.at Details: WTZ-Project BG 02/2019 of the Austrian Academic Exchange Service (ÖAD)

A9	**DASCE TEC** Department of Environmental and Energy Process Engineering, Chair of Waste Processing Technology and Waste Management Mag.prim.educ. dr. Slavica Schuster Levak, slavica.schuster-levak@unileoben.ac.at
A10	**Nano 4 CSP** Department Materials Science, Chair of Functional Materials and Materials Systems Univ.-Prof. Dipl.-Ing. Dr.mont. Christian Mitterer, christian.mitterer@unileoben.ac.at Details: Nanomaterials to reduce the maintenance costs of solar thermal power plants (Nano4CSP)
A11	**Susmagpro** Department Polymer Engineering and Science, Chair of Polymer Processing & Industrial Liaison Department of Montanuniversität Leoben Mag.rer.soc.oec. Karin Rehatschek, karin.rehatschek@unileoben.ac.at Dipl.-Ing. Stefan Schuschnigg, stephan.schuschnigg@unileoben.ac.at https://www.susmagpro.eu/
A12	**illuMINEation** Industrial Liaison Department of Montanuniversität Leoben and Department Mineral Resources Engineering, Chair of Mining Engineering and Mineral Economics Dr. Gernot Loidl, gernot.loidl@unileoben.ac.at; Univ.-Prof. Dipl.-Ing. Dr.-Ing. E.h. Dr.mont. Peter Moser, peter.moser@unileoben.ac.at www.illumineation-h2020.eu www.linkedin.com/company/illumineation www.twitter.com/illumineation
A13	**FIT4NANO** Department Materials Science, Chair of Materials Physics Assoz. Prof. Dipl.-Ing. Dr.mont. Daniel Kiener; daniel.kiener@unileoben.ac.at
A14	**Fines2EAF** Department Metallurgy, Chair of Nonferrous Metallurgy Priv.-Doz. Dipl.-Ing. Dr.mont. Stefan Steinlechner, stefan.steinlechner@unileoben.ac.at Details: This project is supported by the Research Fund for Coal and Steel (RFCS) of the European Union. Grant Agreement No. 754197
A15	**Trendsetting limpet tooth** Department Materials Sciences, Chair of Materials Physics Assoz. Prof. Dipl.-Ing. Dr.mont. Daniel Kiener; daniel.kiener@unileoben.ac.at
A16	**Enact-SDGs** RIC Resources Innovation Center, Department Mineral Resources Engineering, Chair of Mining Engineering and Mineral Economics Dipl.-Ing. Hanno Bertignoll, hanno.bertignoll@unileoben.ac.at
A17	**RFCS - MinSiDeg** Department Mineral Resources Engineering, Chair of Mining Engineering and Mineral Economics Dipl.-Ing. Michael Denzel, michael.denzel@unileoben.ac.at
A18	**CERA – Certification of Raw Materials** Department Applied Geosciences and Geophysics, Chair of Geology and Economic Geology Univ.-Prof. Mag.rer.nat. Dr.mont. Frank Melcher, frank.melcher@unileoben.ac.at MSc Valentina Dietrich, valentina.dietrich@unileoben.ac.at www.cera4in1.org

A19 **I AM RRI**
Industrial Liaison Department of Montanuniversität Leoben
Dipl.-Ing. Dr.mont. Brigitte Kriszt, brigitte.kriszt@unileoben.ac.at
Details: H2020 Swafs GaNr 788361

A20 **DigiTeRRI**
Industrial Liaison Department of Montanuniversität Leoben
Dipl.-Ing. Dr.mont. Brigitte Kriszt, brigitte.kriszt@unileoben.ac.at
Dipl.-Ing. Julia Schmidbauer, julia.schmidbauer@unileoben.ac.at

A21 **Geomagnetic pole reversal**
Department Applied Geosciences and Geophysics, Chair of Applied Geophysics
Priv.-Doz. Dr.rer.nat. Elisabeth Schnepp, elisabeth.schnepp@unileoben.ac.at

A22 **“Lightgates” for organic nanoelectronics**
Chair of Physics
Univ.-Prof. Ao.Univ.-Prof. Dipl.-Phys. Dr.rer.nat. Christian Teichert,
christian.teichert@unileoben.ac.at
Dr. Dipl.inz.elektr. Aleksandar Matković, aleksandar.matkovic@unileoben.ac.at
Detail: FWF-Project I 1788-N20

A23 **SME 4.0**
Chair of Industrial Logistics, Department Economic and Business Management
Dr. Manuel Woschank, MSc, manuel.woschank@unileoben.ac.at
Details: European Research Fund Horizon 2020 as part of the Marie Sklodowska-Curie program MSCA RISE (Grant No. 734713), Project amount: 783,000 euros, www.sme40.eu

A24 **Edelmetalle in Straßenstaub**
Department General, Analytical and Physical Chemistry, Chair of General and Analytical Chemistry
Univ.-Prof. Ao.Univ.-Prof. Mag.rer.nat. Dr.mont. Thomas Meisel,
thomas.meisel@unileoben.ac.at
Details: „Magnitude and Pathways of Anthropogenic Platinum” Group elements: New environmental contaminants in India “ https://doi.org/10.1016/j.sab.2020.106052 ,Project Nr. IN 17/2018, Project duration: 07/2018 – 12/2021

A25 **CARACOAT**
Department of Polymer Engineering and Science, Chair of Chemistry of Polymeric Materials

A26 **PolyMetal**
Industrial Liaison Department of Montanuniversität Leoben and Department Polymer Engineering and Science, Chair of Polymer Processing
Dipl.-Ing. Renate Reumüller, renate.reumueller@unileoben.ac.at
assoz.Prof. Dipl.-Ing. Dr.mont. Thomas Lucyshyn, thomas.lucyshyn@unileoben.ac.at
http://www.si-at.eu/de2/polymetal/
http://www.polyregion.org/

A27 **Nanoscale electrical properties**
Chair of Physics, Dipl.-Ing. Dr.techn. Markus Kratzer, markus.kratzer@unileoben.ac.at
Details: ÖAD-WTZ Project SRB/2018

A28 **How a nano hardness impression is created**
Department Materials Science, Chair of Materials Physics
Assoz. Prof. Dipl.-Ing. Dr.mont. Daniel Kiener; daniel.kiener@unileoben.ac.at

A29 **Mixed dimensional van der Waals heterostructures**
Chair of Physics
Dr. Dipl.inz.elektr. Aleksandar Matković, aleksandar.matkovic@unileoben.ac.at
Details: 10.1016/j.carbon.2021.01.152

Legal Notice

Published by: MIRO, Montanuniversität Leoben, Franz Josef-Strasse 18,
8700 Leoben, Austria
international@unileoben.ac.at, https://international.unileoben.ac.at/
Editorial office: Dipl.-Ing. Caroline Fuchs, Anja Zarfl, Anja Meier, BA, Mag. Sara Hierzer, Jennifer Fink, BA
Text: MIRO, Chairs of Montanuniversität Leoben

Layout & setting: Dipl.-Ing. Caroline Fuchs, Anja Zarfl, Anja Meier, BA

Picture credits: All pictures MUL, except:
P. 51, 53, 72, 74, 75-86 © Freepik
p.106 © Press Leoben
We would like to thank the chairs & the public relations department of Montanuniversität Leoben for generously providing various pictures.

Printed by UNIVERSAL DRUCKEREI GmbH, Gösser Strasse 11, 8700 Leoben

Montanuniversität Leoben
Franz-Josef-Strasse 18
8700 Leoben
+43 (0) 3842 402-0
https://www.unileoben.ac.at/