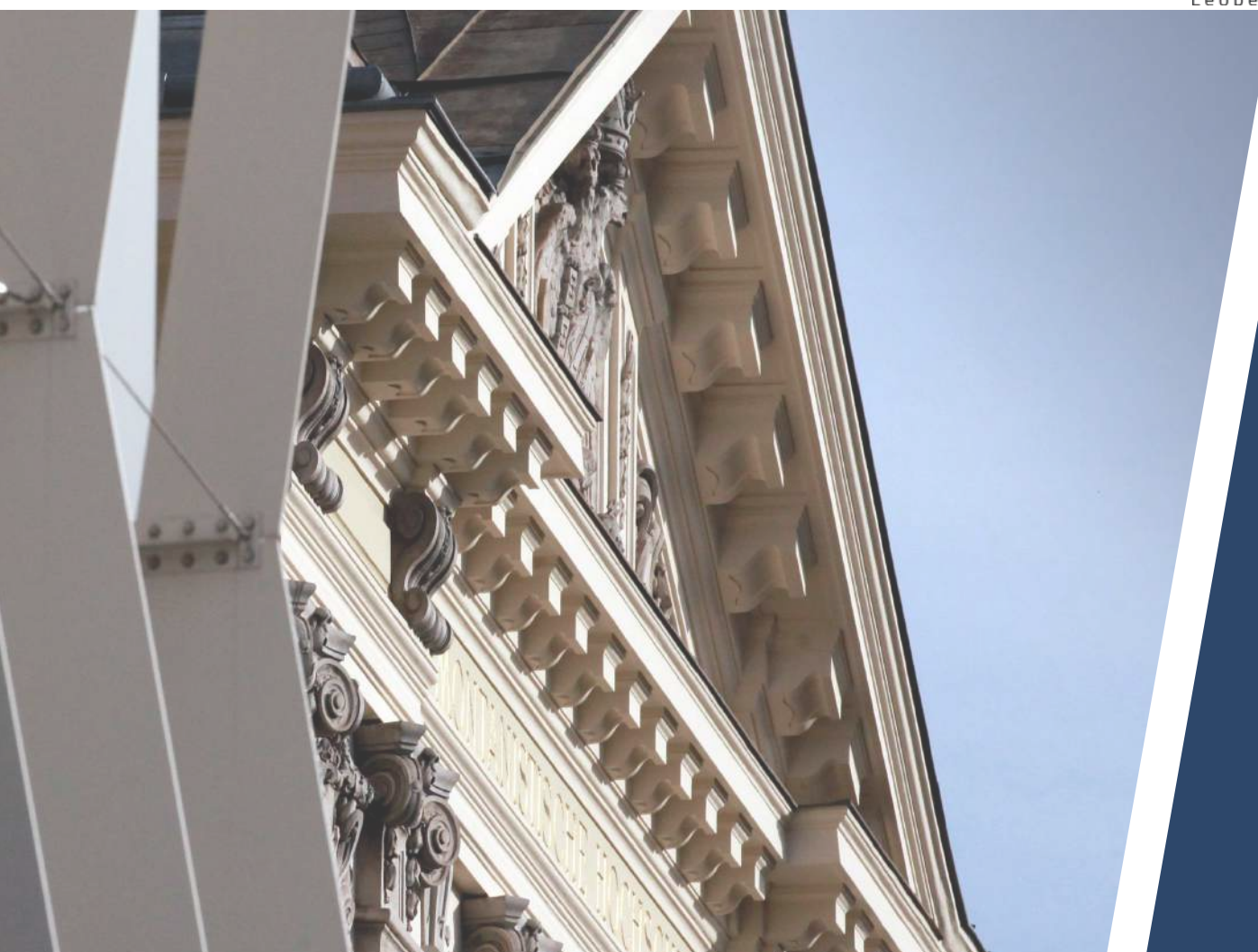


INTERNATIONAL COMPETENCE CENTRE FOR MINING-ENGINEERING EDUCATION UNDER THE AUSPICES OF UNESCO



AUSTRIAN BRANCH
AT MONTANUNIVERSITÄT LEOBEN



LEOBEN

REPORT FOR
THE ACTIVITIES OF THE AUSTRIAN BRANCH

2020



PLEASE NOTE:

THE PERFORMANCE REPORT OF THE AUSTRIAN BRANCH FOR THE CALENDAR YEAR 2020 COMPRISES OF TWO DOCUMENTS. FIRSTLY, THE “2020/A - INTERIM REPORT FOR THE FIRST HALF YEAR 2020” AS BY 30 JUNE 2020 AND SECONDLY, THE “2020/B – INTERIM REPORT FOR THE SECOND HALF YEAR 2020” AS BY 30 DECEMBER 2020.

COMBINED, THE TWO DOCUMENTS FORM THIS PERFORMANCE REPORT OF THE AUSTRIAN BRANCH FOR THE ENTIRE YEAR 2020.

IMPRESSUM

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PICTURES: MONTANUNIVERSITÄT LEOBEN, SAINT PETERSBURG MINING UNIVERSITY,

FOTO FREISINGER LEOBEN

LEOBEN, DECEMBER 2020



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LINKEDIN & RESEARCHGATE: INTERNATIONAL
COMPETENCE CENTRE
FOR MINING-ENGINEERING EDUCATION
UNDER THE AUSPICES OF UNESCO

TABLE OF CONTENT

FOREWORD BY THE RECTOR OF MONTANUNIVERSITÄT LEOBEN	4
DIRECTOR'S MESSAGE	5
INTRODUCTION TO THE AUSTRIAN BRANCH	6
PARTNERS & PARTNERSHIP MANAGEMENT	10
OVERVIEW KEY ACTIVITIES	14
EXPERT FORUM ON DIGITALISATION IN THE RAW MATERIAL SECTOR	15
ONLINE RESEARCH AND EDUCATION SERIES	16
VICE-RECTOR PROFESSOR PETER MOSER	18
DEAN, D.Sc. (TECH), M.Sc. (BUS) RIINA SALMIMIES	19
PROFESSOR ANETTE KOLMOS	20
D.Sc. SAEED RAHIMPOUR GOLROUDBARY	21
DIPL.ING. ROBERT OBENAU-EMLER	22
OUTLOOK TO JANUARY 2021	23
RECTOR WILFRIED EICHLSEDER AT "ADVANCED ENGINEERING COMPETENCIES – THE FUTURE OF THE RAW MATERIALS INDUSTRY"	24
STUDENT ACHIEVEMENTS	25
SOCIAL MEDIA & PUBLIC OUTREACH	26
MOBILITY AND MEASURES TO INCREASE MOBILITY	29
ESTABLISHMENT OF THE PREMISES & FILM STUDIO FOR TEACHING VIDEOS	30
PRE - JUMPSTARTER WORKSHOP	31
EVENT „METAL DAYS“ / INTERNATIONAL SUMMMERSCHOOL „CIRCOOL“	32
RESEARCH STRATEGY DEVELOPMENT AND JOINT RESEARCH TOPICS AND ACTIVITIES	33
PRESENTATION AT THE CHAIR OF MINING ENGINEERING AND MINERAL ECONOMICS	33
MEETING WITH THE VICE-RECTOR OF SCIENCE AND INNOVATION OF SPMU	34
PARTICIPATION IN CONFERENCES/SEMINARS/EVENTS	35
ATTENDANCE IN CONFERENCES/SEMINARS/EVENTS	37
ANNEX	40
LIST OF ABBREVIATIONS	44

FOREWORD BY THE RECTOR OF MONTANUNIVERSITÄT LEOBEN



Montanuniversität Leoben is part of the International Competence Centre for Mining-Engineering Education under the auspices of UNESCO for over a year by now.

As the University's Rector, I am especially proud of being part of this important cooperation focused primarily on attaining the Sustainable Development Goals at national and international level in the field of mineral resources.

I also appreciate the center's aim of creating best conditions for further training of qualified specialists and scientific personnel in the field of mining.

The center's activities in the year 2020 were characterised by setting up a framework for our future projects, for example by participating in an International Working Group with the outcome of a resolution to develop a unified international system of mineral resource sector specialists' competences, based on existing national systems and aimed at developing higher level competences.

I am looking forward to bring important projects like this into focus of our UNESCO center's future work and to charge the center with the operational responsibility for such a common international degree accreditation.

Based on their educational and professional experience, Mining University of St. Petersburg and Montanuniversität Leoben will certainly be the best partners to run such significant projects.

A handwritten signature in blue ink, which appears to read 'W. Eichlseder'. The signature is stylized and written in a cursive-like font.

Wilfried Eichlseder, Rector of Montanuniversität Leoben

DIRECTOR'S MESSAGE



Inaugurated in December 2019, the Austrian branch's first year of operation was a dynamic one. Despite the unforeseen circumstances of the COVID-19 pandemic, we took the opportunity to contribute to the implementation of the Sustainable Development Goals (SDGs) of the United Nations in the field of mineral resources.

With this document, my team and I want to present our work in the year 2020. We are happy to deliver a variety of activities– from online and offline events, over the development of educational programmes up to marketing and information dissemination, along with the establishment of the Austrian branch itself and the commencement of its operations.

I would like to cite Ms. Peggi Oti-Boateng, Director of Science Policy and Competence Development at UNESCO, during the opening ceremony of this years Forum-Contest for students & young researchers:

“This centre's work is more urgent than ever before, as the world battles with sustainable development, with climate change, unfavourable exploitation of natural resources. [...] What we celebrate today, is international collaboration in science and engineering where we try to build peace in the minds of people, using expertise of engineering.”

A handwritten signature in blue ink, appearing to read 'P. Moser'.

Peter Moser, Vice-Rector of Montanuniversität

1. INTRODUCTION TO THE AUSTRIAN BRANCH

ABOUT US



From left to right: Rector Eichlseder, Vice-Rector Moser, Rector Litvinenko at the signing ceremony of the Austrian branch

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 (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.

From our perspective, international cooperation, working across borders and disciplines are the most important ingredients for developing innovative solutions and new ideas for the sustainable development of society globally.

This is why we are very proud to be a major partner in this global raw materials initiative dedicated to education, research and work with young people.

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

These centres and institutes form a vast network of associated centres in the fields of water, renewable energy, science policy, biotechnology, geosciences, the basic sciences and remote sensing.

Furthermore, through capacity building, the exchange of information in their particular discipline, theoretical and experimental research and advanced training, they provide a valuable contribution to the implementation of UNESCO's strategic programme objectives and actions in education, sciences, culture and communication at the global, regional and national levels.



From left to right: Rector Eichlseder, Rector Litvinenko, Vice-Rector Moser at the signing ceremony of the Austrian branch

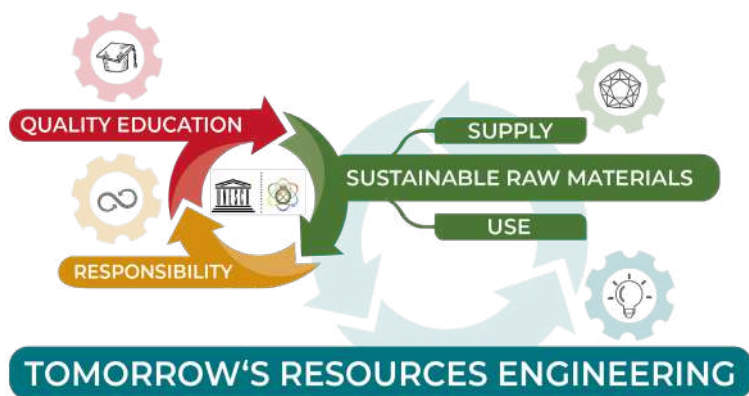
CONTEXT OF OUR WORK

Society is currently facing a series of major challenges, one of the most important being the drastic global population increase and simultaneous economic growth of developing nations. Additionally, a technological and energy revolution is looming at the global doorstep.

All of this brings with it a mineral intensity in a high volume and variety. This leads to the fact that in addition to the visionary concept of the low carbon circular economy, the supply of mineral raw materials from primary resources is needed to cover the increasing demand.

Therefore, our task is to develop new innovative solutions for the careful extraction and efficient use of primary resources and the recovery of minerals from secondary sources.

In order to do so, we create conditions for the education of resource engineers within the framework of new international study programmes as well as the continuing education of qualified personnel in mining engineering. In addition to that, we create favourable conditions for the global mobility of students, post-graduate students, teachers and scientists.



Another focus of our centre is on research and development activities for the efficient and environmentally friendly use of resources.

OUR MISSION

Our mission is to educate today's engineers for a sustainable tomorrow.

This goes hand in hand with the promotion and support of UNESCO's overarching objective of sustainable development at the national and international levels with regard to the mineral resources and mining sector. Our work is related to the following Sustainable Development Goals (SDGs):



SDG 4- Quality Education



SDG 12- Responsible Consumption and Production



SDG 7- Affordable and Clean Energy



SDG 13- Climate Action



SDG 9- Industry, Innovation and Infrastructure



SDG 17- Partnerships for the goals

The particular aims of the mission are:

- Creation of conditions for excellence in education and the continuous education of qualified specialists;
- Creating favourable conditions for the global mobility of students, post-graduate students, teachers and scientists;
- Development of an international network of researchers working around the topic of sustainable raw material supply from primary and secondary resources.

WHO WE ARE

Established in December 2019, the Austrian branch of the Centre is an integral part of Montanuniversität's strategy of internationalisation. The Centre participates in the global raw materials initiative under the auspices of UNESCO dedicated to education, research and work with young people.

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

Alongside with the rector of Montanuniversität Leoben, as head of the Austrian branch, the acting team comprises of the following dedicated and ambitious members:

VICE-RECTOR PETER MOSER



Position: Director of the Austrian branch

Tasks: Department Strategy – Establishment of the Austrian branch, strategic development of new education and research programmes with the head-quarter in Saint Petersburg; development of relations with the global mining community; contacts to the Austrian and European raw materials related institutions

Peter Moser is a professor at Montanuniversität Leoben. He completed his MSc in Mining Engineering with a specialisation in Tunnelling in 1983 and his PhD in Mining in 1989. In 2020 he received an honorary doctorate at TU Bergakademie Freiberg.

Since 2008 he holds the Chair of Mining Engineering & Mineral Economics. In 2011 he was appointed Vice-Rector, responsible for International Affairs and University infrastructure.

Through his very active involvement in the European Raw Materials landscape, such as in the European Innovation Partnership on Raw Materials High Level Steering Group or as a steering committee member in the EIT RawMaterials Community, his research and devotion currently revolve around the societal challenges regarding the sustainable raw materials supply of Europe and the globe. Professor Moser speaks German, English and intermediate French.

SUSANNE FEIEL



Position: Head of the International Department and Resources Innovation Center

Tasks: Department Strategy – coordinating the access of the Austrian branch to Austrian and European Sustainability and Research Networks

Susanne Feiel has a degree in English studies and is currently enrolled in the PhD programme at TU Bergakademie Freiberg (Germany).

Susanne Feiel is the Head of the Departments of RIC (Resources Innovation Centre) and of MIRO (Montanuniversität International Relations Office) – the department at MUL in which the Austrian branch is organisationally integrated.

Her vision is a comprehensive internationalisation of the university through long-term, stable and qualitatively strong partnerships with other universities.

Her areas of focus are education, creation of visibility for the raw materials sector as well as initiatives for sustainable development, material flow management and climate action in order to promote the development of responsible resource consumption and responsible production. Susanne Feiel speaks German and English and upper intermediate French, Italian and Spanish.

ANNA VOICA

Position: Department Operations – Communications & Partnership Manager

Tasks: coordinator of operations department administration, partnership management, organising and hosting offline and online events, marketing and social media, coordination of the Austrian branch's participation in the development of mobility activities

Anna Voica studied law and mediation. Pursuing her interest in international relations and cooperation, she studied 1 year at the Diplomatic Academy in Vienna. Applying and deepening her knowledge in diplomacy and international relations, she worked as a Liaison Officer at the Austrian presidency of the Council of the European Union in 2018. In addition to her mother tongues German and Romanian, Ms. Voica speaks English and upper intermediate French. Currently she is studying Russian.



ANASTASIA KUCHERYAVAYA

Position: Department Operations – Scientific Coordinator



Tasks: development and implementation of the Austrian branch's joint research and academic activities including the coordination of joint scientific programmes, course design and promotion of the principles of the UNESCO Competence Centre for Mining-Engineering Education to the broader audience

Anastasia Kucheryavaya obtained her Master's degree with honours in Ceramics and Refractories at D. Mendeleev University of Chemical Technology of Russia. Afterwards she worked for 7 years in Research & Development for the refractory industry in Austria, Italy and Russia gaining experience in project management and as a production and quality development manager. Since 2015 she has been enrolled in the PhD programme at Montanuniversität Leoben (Austria). Besides her mother tongue Russian, she speaks English, German and basic Italian.

MARIA THERESA TRETTLER

Position: Department Operations- Education Portfolio Development and Organisational Support

Tasks: development of an education portfolio including courses and summer schools, marketing design, organisational support in offline and online events

Maria Theresa Trettler is an active Mining Engineering student at Montanuniversität Leoben. After finishing her studies, she will specialise in sustainable and green mining.

Because of her knowledge of the university's structure and the student's interests, she actively works on the implementation of activities that are highly welcomed by students: for example, she promotes the integration of topics like environmental protection and sustainability into the daily education of future mining engineers. Further, she is co-developing the corporate design of the Austrian branch and supports the organisation and holding of events. Maria Theresa Trettler speaks German, English and is currently studying Russian.



PARTNERS & PARTNERSHIP MANAGEMENT

Establishing a global network of excellence is of utmost importance to us. These are the partners with whom we work to achieve this endeavour:

MIRO - ADMINISTRATIVE SUPPORT FOR INCOMING AND OUTGOING STUDENTS AND RESEARCHERS



Montanuniversität International Relations Office (MIRO) is a service facility which provides support to the Austrian branch in the application for, review and coordination of mobility programmes along with its processes regarding incoming and outgoing mobilities.

More specifically, MIRO supports prospective international students and researchers as well as their hosting institutes before their arrival, during their stay and up to their departure with information on visa and residence titles, accommodation, administrative issues, health insurance and everyday life in Leoben.

MIRO aims to provide a high quality of support and services, helping future students and researchers grow into a vibrant community, and ensuring they feel comfortable and prepared to study and live in Leoben.

At the beginning of each winter semester MIRO organises a Welcome Day for international students where they will learn everything they need to know about their study life in Leoben before the start of the semester.

MIRO's aim is to provide a high quality of support and services, helping future students and researchers grow into a vibrant community, and ensuring they feel comfortable and prepared to study and live in Leoben.

MIRO's Services:

Providing information before and during the stay on the following topics:

- Immigration (Visa and Residence Titles in Austria)
- Finding accommodation in Leoben
- Registration at the university
- Austrian health insurance system
- Residence Registration with the city of Leoben
- Confirmation of Registration for EU/EEA citizens
- Doctors who speak English or other languages
- German courses
- Services of the city of Leoben
- Activities & Events



International students on a hiking tour

Please find further information here: <https://international.unileoben.ac.at/en/>



Students enjoying their break



Traditional Austrian food served during a hike

RIC - SUSTAINABILITY AND RESEARCH NETWORKS



The Resources Innovation Centre Leoben (RIC) at Montanuniversität Leoben is home to the international partnerships of the university in the areas of sustainable science, education and industrialisation and serves as a platform for the interdisciplinary linking of the institution's expertise for integration into large-scale projects.

The main focus of the activities in the portfolio include:

- Increasing the circularity of materials in terms of the circular economy through recycling, digital technologies and industry 4.0 solutions
- Re-design of production systems with regard to material flow-optimised, energy- and resource-efficient production
- Decarbonisation and dematerialisation of industrial processes
- Development of integrated systems for a sustainable supply of raw materials and energy based on responsibly and sustainably produced raw materials and CO₂ neutrally produced hydrogen
- Development of approaches for the sustainable interlinking of abiotic and biogenic resources
- Identification of risks for the industry in the transformation process to CO₂ neutrality and design of measures through repeatable and scalable solutions.

RIC coordinates activities within the partner networks, namely:

- EIT RawMaterials: Knowledge & Innovation Community of the European Union in the mineral raw materials sector;
- EIT Climate-KIC: Knowledge & Innovation Community of the European Union in the areas of Urban Transition and Sustainable Production Systems to foster a climate resilient society;
- UniNetz: implementation of the United Nations Sustainable Development Goals in the Austrian Higher Education sector through a joint network project of all universities;
- Climate Change Centre Austria: coordinating body for the promotion of climate research in Austria.

Through the close cooperation with RIC the Austrian branch obtains the opportunity to access relevant European and Austrian networks in the raw materials sector. Further, activities are developed and implemented with our core partners:

EIT RAW MATERIALS



Montanuniversität Leoben is one of the founding members of EIT RawMaterials, a knowledge and innovation community in the field of mining, processing and recycling. In addition, the development of new, more sustainable materials and the substitution of critical raw materials are a focus of the EIT RawMaterials community. Every year, around 50 research projects with a financial volume of around €100 million are carried out.

EURECA-PRO - EUROPEAN UNIVERSITIES



European Universities is one of the flagship initiatives of the EU's ambitions to build a European Education Area. MUL is project leader for the successful Erasmus+ project "EURECA-PRO – The European University Alliance on Responsible Consumption and Production".

The UNESCO Mining-Engineering Education Competence Centre | Austrian Branch has joined and supports this project as associated partner.

SPMU - SAINT PETERSBURG MINING UNIVERSITY



Montanuniversität Leoben and Saint Petersburg Mining University have been cooperating for more than 15 years in the field of research and education. Together with major companies in the fields of mining, processing and construction, exchange programmes have been established. Recently, a new exchange programme under Erasmus+ has been launched. Professors, researchers and students meet regularly to exchange views and ideas on future sustainable mining and processing technologies.

Please find further information at: <https://en.spmi.ru/v>

TUBAF - TECHNISCHE UNIVERSITÄT BERGAKADEMIE FREIBERG



Cooperation between TU Bergakademie Freiberg (TUBAF) and Montanuniversität Leoben goes back to as early as the 19th century. Many joint education and research projects are the basis for a lively cooperation.

Please find further information at: <https://tu-freiberg.de/>

LUT - LAPPEENRANTA-LAHTI UNIVERSITY OF TECHNOLOGY



LUT University is the Finnish flagship centre within the network of the Centre for Mining Education UNESCO. LUT brings in their expertise, for instance, in separation technology, waste management and circular economy involving mineral resources. We are happy to have further deepened the cooperation between LUT and MUL, through LUT's participation in our online lecture series.

Please find further information at: <https://xplorer.fi/en/> and <https://lut.fi/tu>

UNESCO AALBORG PBL CENTRE



Like the UNESCO Competence Centre for Mining-Engineering Education, the Aalborg Centre for Problem Based Learning in Engineering Science and Sustainability is a category 2 centre under the auspices of UNESCO. It contributes to a reform strategy to higher education by combining

Problem and Project Based Learning (PBL), Engineering Education Research (EER) and Education for Sustainable Development (ESD).

We are happy that the Aalborg Centre followed our invitation to participate and share their expertise in our online lecture series.

From this starting point, the Austrian branch has paved the ground for possible further joint projects at Montanuniversität in Leoben.

Please find further information at: <https://www.ucpbl.net/>

As part of our efforts to pave the ground for future collaboration, the Austrian branch of the UNESCO Mining Engineering Education Competence Centre plays a key role in building a bridge and establishing relations to the European Raw Materials Sector and the European Commission.

In this context, Vice-Rector and Director of the Austrian branch, Peter Moser, addressed the Commission at the virtual launch event for the European Raw Materials Alliance (ERMA) on 3 September 2020.

Founded by the European Commission, ERMA was announced as part of an Action Plan on Critical Raw Materials, and the publication of the “2020 List of Critical Raw Materials”.

The Alliance aims to make Europe economically more resilient by diversifying its supply chains, creating jobs, attracting investments to the raw materials value chain, fostering innovation, training young talents and contributing to the best enabling framework for raw materials and the Circular Economy worldwide.

It addresses the challenge of securing access to sustainable raw materials, advanced materials, and industrial processing know-how.



Vice-Rector Peter Moser

As an academic expert and active participant in the commission’s raw materials activities, Professor Moser was invited to give an independent view of the research’s perspective, and sharing his thoughts on the potential of the alliance.

In the beginning, Professor Moser stated that societies are currently undergoing a massive transformation, a transformation that needs to be successful for future generations to be able to meet their needs and to live in favourable ecological conditions.

In order to make this change successful and to tackle future challenges in a flexible and systemic manner, he went on to describe the research and development prerequisites in the field of raw materials along with the necessary underlying transformation of our conventional systems. In essence, he emphasised the necessity of an interdisciplinary research approach in the raw materials sector, coupled with unbureaucratic excellence-oriented framework conditions.

In Professor Moser’s opinion, the key to developing new technologies for a sustainable and affordable supply of (critical) raw materials for mankind lies in the enthusiasm and vision of young people to work on sustainable solutions.



Vice-Rector Peter Moser

In his concluding remark he stated: “Society has to undergo a massive transformation to be successful for future generations to meet their needs and live in favourable ecological conditions.

Therefore, we have to concentrate our future R&D efforts on the development of innovative responsible production and consumption systems with low impacts that fit into the boundaries of our planet.”

OVERVIEW KEY ACTIVITIES

(IN CHRONOLOGICAL ORDER)

ESTABLISHMENT OF THE PREMISES

EXPERT FORUM ON DIGITALISATION IN THE RAW MATERIALS SECTOR

PRE -JUMPSTARTER WORKSHOP

ONLINE RESEARCH AND EDUCATION SERIES

“SUSTAINABLE DEVELOPMENT APPROACHES IN ENGINEERING RESEARCH AND EDUCATION“

Peter Moser: Introduction to sustainable raw materials supply

Riina Salmimies: Recovery of phosphorous from municipal sludge

Anette Kolmos: Basic principles of PBL in engineering education

Saeed Rahimpour Golroudbary: Global supply chains of critical raw materials

Robert Obenaus-Emler: Sustainable hydrogen & carbon supply & energy mining

Outlook to January 2021: Harald Harmuth (MUL), Antti Häkkinen (LUT), Helmut Flachberger (MUL)

RECTOR EICHLSEDER AT “ADVANCED ENGINEERING COMPETENCIES – FUTURE OF THE RAW MATERIALS INDUSTRY”

STUDENT ACHIEVEMENTS: AUSTRIAN WINNERS OF THE YOUNG RESEARCHERS FORUM (SPMU)

SOCIAL MEDIA: INSTAGRAM, LINKEDIN, RESEARCH GATE

MOBILITY AND MEASURES TO INCREASE MOBILITY: JOINT STUDY PROGRAMME, SURVEYS, EQUIVALENCE CATALOGUES

DEVELOPMENT OF A RESEARCH STRATEGY AGENDA UND JOINT RESEARCH TOPICS AND ACTIVITIES

Presentation of the UNESCO Centre at the Chair of Mining Engineering and Mineral Economics

Meeting with the Vice-Rector of Science and Innovation of SPMU

Coordination of the „Scientific Research Project“ for the students of the Geoecology programme

PARTICIPATION AND ATTENDANCE IN ONLINE CONFERENCES/SEMINARS/EVENTS OF OUR PARTNERS

Moscow Green Economy Forum: joint presentation with J. Zhukovsky (SPMU)

Seminar on didactics (MUL)

MINEX Russia Forum 2020

Innovative directions in mining process: effective mineral exploration (SPMU)

Intercultural sensibilisation of university personnel (MUL)

Online Flipped IRSPBL Aalborg (UNESCO Aalborg PBL)

12th ESEE Dialogue Conference „Brain Drain“

Skills and competencies of the XXIst century workforce (LUT)

Circular Economy for materials processing (LUT)

Hydrogen Conference of the German-Russian Raw Materials Forum

EXPERT FORUM ON DIGITALISATION IN THE RAW MATERIAL SECTOR

Exploration, mining and mineral processing- as the digitalisation of the 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, analyse and manage data and to visualise content in real time in variable contexts.



Welcoming the Russian delegation at the Expert Forum, Leoben. From left to right: Aleksey Boikov, Yuriy Zhukovskiy, Sergey Chernyadiev, Peter Moser, Alexandra Byldysko, Mikhail Shabalov, Anna Voica, Anastasia Kucheryavaya

These technologies are therefore the topics of the first Expert Forum of the EIT Raw Materials Sustainable Discovery and Supply Lighthouse. The International Competence Centre for Mining-Engineering Education under the auspices of UNESCO as the Austrian branch at Montanuniversität Leoben, co-organised this event.

As the mission of the Austrian branch is to support UNESCO's global priorities of sustainable development by creating conditions for excellence and the continuous education of qualified specialists for the mining sector, it has given priority to the topics of sustainability, global supply of raw materials and raw materials policy.

In this context, in cooperation with partner universities and organisations, the Competence Centre seeks to work towards a more sustainable raw materials sector.

As digitalisation in the sector progresses, such joint events enable key stakeholders to come together, discuss trends, identify industry needs and innovative solutions and establish networks for project and strategic alliances.

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

We were pleased to welcome the delegation from SPMU and to invite Dr. Yuriy Zhukovskiy, Director of the Scientific Centre for Digital Technologies of Mining University St. Petersburg, as one of our expert speakers.



Speaker Yuriy Zhukovskiy from SPMU

ONLINE RESEARCH AND EDUCATION SERIES

SUSTAINABLE DEVELOPMENT APPROACHES IN ENGINEERING RESEARCH AND EDUCATION

“We are very glad that more than 200 people from over 20 different countries have signed up for one or all lectures. Each lecture is attended by around 70-120 persons. This is a remarkable success” - Peter Moser, Vice-Rector and Director of the Centre.

The current situation of uncertainty is an important opportunity to learn from this exceptional situation to adapt to changes and enable continuity.

Higher education institutions all over the globe have now the chance to accelerate the implementation of modern learning methods and create new opportunities with partner institutions, such as virtual mobility, shared resources, networking and joint online activities.

Within the network of the Competence Centre, the Austrian branch proposed the implementation of a series of Online Research and Education Lectures, starting in November 2020, ushering into the new academic year with its new online programmes and learning activities.

We are content and blissed, that this proposal resulted in a fruitful collaboration where we are showcasing international experts from

- the Finnish branch at Lappeenranta Technical University (LUT), Finland;
- the Headquarter at Saint Petersburg Mining University (SPMU), Russian Federation;
- the UNESCO Aalborg Centre for Problem-Based Learning (PBL) at Aalborg University (AAU), Denmark; and
- the Austrian branch at Montanuniversität Leoben (MUL), Austria.

The lectures are held under the umbrella title “Sustainable Development Approaches in Engineering Research and Education”.

GOAL

The aim of the establishment of a series of online research and education lectures is to build up and promote networking among researchers, which would lead to the facilitation of future joint research activities.

We further want to connect lecturers/researchers with students (Master/PhD level) through knowledge sharing and interaction. Our goal is to encourage debate and exchange of experience.

The poster features a blue background with a mountain landscape at the bottom. In the top left corner, a diagonal banner reads '2 ECTS'. The main title is 'LV 200.132 ONLINE RESEARCH & EDUCATION LECTURES' in large, bold, teal letters. Below this, the subtitle 'SUSTAINABLE DEVELOPMENT APPROACHES IN ENGINEERING RESEARCH & EDUCATION' is centered. A pickaxe icon is positioned below the subtitle. The text 'SELECTED EXAMPLES BROUGHT TO YOU BY RENOWNED INTERNATIONAL EXPERTS IN THE FIELDS OF RAW MATERIALS, MINING, MATERIAL SCIENCES, RECYCLING & ENGINEERING EDUCATION' is centered in white. Below that, it says 'SIGN UP IN MUONLINE'. The text 'ORGANISED BY THE AUSTRIAN BRANCH' is followed by the email 'unesco@unileoben.ac.at'. Logos for UNESCO, the International Competence Centre for Mining-Engineering Education, Montanuniversität Leoben, LUT University, and Aalborg University are displayed at the bottom.

FORMAT

Alternately every week, a speaker from MUL/LUT/SPMU/AAU gives a keynote speech within their area of expertise and/or presents ongoing research projects, followed by a lively discussion in the Q&A session.

With the goal to open the lecture series to the wider public, registration is free of charges and available at Eventbrite, an event management and ticketing website, via https://unesco_mining_aut.eventbrite.com.

TIME TABLE 2020/2021

10.11.20 Peter Moser

Sustainable raw material supply (MUL)

20.11.20 Riina Salmimies

Recovery of phosphorous from municipal sludge (LUT)

26.11.20 Anette Kolmos

Variations of PBL in engineering education (UCPBL)

09.12.20 Saeed Rahimpour Golroudbary

Global supply chains of critical raw materials (LUT)

17.12.21 Robert Obenaus-Emler

Sustainable hydrogen & carbon supply & energy mining (MUL)

12.01.21 Harald Harmuth

Future topics of research and education in refractory sciences (MUL)

22.01.21 Antti Häkkinen

Innovative technologies for tailings management (LUT)

tba Helmut Flachberger

Dry processing (MUL)





VICE-RECTOR PROFESSOR PETER MOSER

INTRODUCTION TO SUSTAINABLE RAW MATERIAL SUPPLY

MONTANUNIVERSITÄT LEOBEN, AUSTRIA

On 10 November the online lecture series started with Professor Peter Moser's lecture dealing with the topic "Introduction to sustainable raw material supply".

Professor Peter Moser is Head of Chair of Mining Engineering and Mineral Economics at Montanuniversität Leoben. In his function as Vice-Rector of the university he is president and member of relevant national and international committees and steering groups in the field of mineral resources and sustainability, such as the Austrian University Conference, the European Innovation Partnership on Raw Materials and the Austrian coordinator of the successful application for the Raw Materials Initiative, the largest consortium in the raw materials sector worldwide. He is the driving force for the establishment and further development of the Austrian branch of the International Competence Centre for Mining-Engineering Education under the auspices of UNESCO in cooperation with the Saint Petersburg Mining University.

Professor Moser's lecture addressed the challenges of sustainability both in production and consumption of raw materials. He discussed in detailed the sustainable raw material supply approach and its measurements.

In his remarks he covered society's needs of mineral raw materials and how those are influenced by industrial, technological and societal development. The exploding increase of raw materials consumption in the last decade is one of the major problems of a sustainable raw material supply.

He drew attention to the fact, that the need of critical raw materials will further increase as third world countries seek to improve the living conditions of their citizens.

Another aspect that was discussed, is the issue of the so-called throw-away society. Mankind has shown to

consume without thinking about consequences of their behaviour.

Establishing awareness with respect to the industry, fueling the world-wide consumption, is only a first step.

As a result of increased awareness of the developing resource scarcity, a desire and need to reuse materials has brought the research of resource recycling to the forefront in the area of raw materials. Even if the percentage of recycled materials is increasing from year to year, the amount of needed raw materials to hold our life standard is increasing faster.

In the context of living standards, he addressed the issue of consumer behaviour, and stimulated the listeners to reflect on their own behaviour.

Professor Moser further stressed the connections between the visions of circular economy, green deal and sustainable development goals and how those concepts are going to be synergised.

He showed the impact on raw material consumption due to the development of renewable energy sources. Due to this process the demand of raw materials like gallium, lithium and cobalt had expanded enormously. The importance of maximising the material flow inside the circular economy cycle, especially for such materials was emphasised.

In the following Q&A many students asked questions about the effectivity and the implementation of the circular economy. They were also very interested in how to deal with the challenge of the increasing raw material consumption.

"The aim is to meet the needs of the present without compromising the ability of future generations to meet theirs."

Brundtland report

DEAN, D.Sc. (TECH), M.Sc. (BUS) RIINA SALMIMIES

RECOVER OF PHOSPHOROUS FROM MUNICIPAL SLUDGE

LUT UNIVERSITY, FINLAND



On 20 November 2020, the second unit of the Austrian branch’s online lecture series, with the title “Recovery of Phosphorous from Municipal Sludge”, took place.

The lecture was held by dean of School of Engineering Science at LUT (Finland) Riina Salmimies D.Sc. (Tech), M.Sc. (Business). The lecturer brought her expertise for industrialising a technology of recovering phosphorous from municipal sludges for fertilisers application. Holding a position of CTO of a Finnish start-up she dealt with the implementation of this technology from pilot to full commercial scale. “Phosphorous is a depleting natural resource necessary for modern agriculture. The phosphates for commercial fertilizers are typically produced using apatite rock but in the face of scarcity we must also turn to urban sources, such as municipal sludge produced as a by-product of municipal waste water treatment. Multiple technologies exist to valorise sludge and recover phosphorous from it, but most have their advantages and disadvantages. This lecture highlights incineration as a way to treat sludge and recover phosphorous. A practical perspective with advantages and disadvantages is taken.” – Riina Salmimies.

Being supporter of the circular economy, she addressed different available technological procedures like digestion, thermal treatment or pyrolysis for usage of municipal sludge.

The lecture was followed by a discussion of how the implementation of a scientific idea to a profitable business can be done. Several crucial milestones during the process of bringing the innovation to production were named.

First of all, working with partners with expertise like universities ensures the technological solutions, which could not be offered by non-specialist compe-

titors.

Secondly, on the academic level the following key competences of project participants would be advantageous: the adaptability as well as the knowledge and skills gained during pilot-scale activities. These competences are earned by students and project participants by challenges of problem solving. In return this experience of being part of a start-up helps in training the entrepreneurial mindset of engineers and opens a broad carrier prospective.

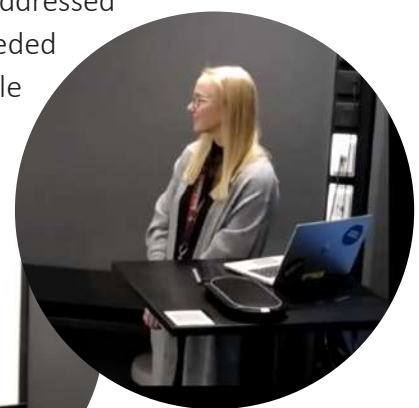
And lastly, Riina Salmimies recommended patenting as it helps protecting the business, especially considering the necessity of financial investment.

Polling questions during the presentation helped participants to check their understanding of entrepreneurship challenges and provided interaction during the online format of the lecture. Integration of engineering ideas into commercial model was discussed in the Q&A session.

The lecturer underlined the significance of collaboration with different institutions in order to build up any business. A connection between primary and recycle phosphorus productions for fertilisers as well as legislations were addressed as important and needed variables in this multiple solution.



Moderator and Educational Lead at the Finnish branch Matti Lampinen



Speaker Riina Salmimies



PROFESSOR ANETTE KOLMOS

VARIATION OF PBL IN ENGINEERING EDUCATION

UNESCO AALBORG PBL CENTRE, DENMARK

On 26 November 2020, the third unit of the Austrian branch’s online lecture series, with the title “Variations of problem-based and project-based learning in engineering education” was held by Professor Anette Kolmos.

At the centre of the lecture was the question: How do engineering institutions respond to major sustainability challenges? As they will require new types of engineering competences as well as an embrace of interdisciplinary, complex problem solving and humane interaction.

One of the responses is student-centred learning and in particular problem- and project-based learning (PBL), which has been seen as one of the pedagogical models to bridge the knowledge gap between education and professional work.

The Aalborg Centre for Problem Based Learning in Engineering Science and Sustainability under the auspices of UNESCO is a widely renowned institution in this field. It is based at Aalborg University in Denmark.

The director of the Centre and Chair holder for UNESCO in Problem Based Learning in Engineering Education, Professor Kolmos, has researched the following areas, primarily within the field of Engineering Education: gender and technology, project based and problem-based curricula, change from traditional to project organised and problem-based curricula, development of transferable skills in PBL and project work, and methods for staff development.

From that starting point onwards, Professor Kolmos presented in her keynote variations of PBL ranging from discipline problems to complex problems at varying scales. In this context she showed the differences in team dimensions, collaboration and level of complexity. Particularly, megaprojects in engineering education were exemplified.

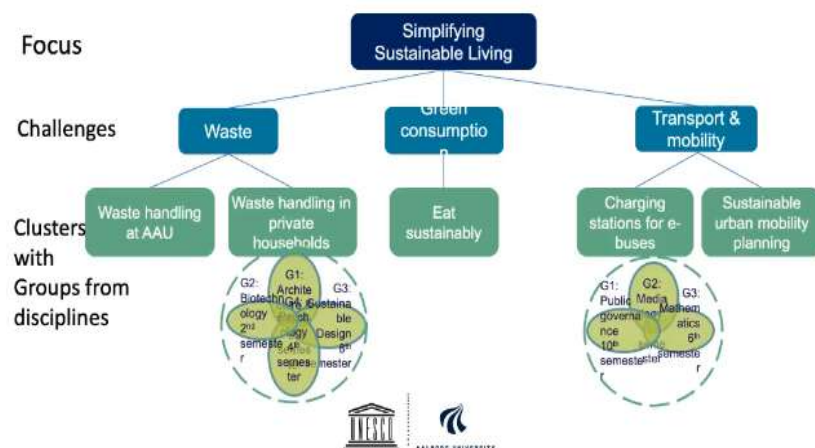
“What is needed from companies are flexible systems, where students get the ability to work on different projects in parallel and work on different types of small projects in a much more agile way.”

Anette Kolmos

At a later point, including insights of the latest research, she underlined that more coherent curriculum models are emerging with clear progression of student-centered activities, including new competences of being able to develop personal learning trajectories.

In the final discussion she shared her perspective on the plentiful opportunities to include PBL principles into traditional learning settings.

SIMPLIFYING SUSTAINABLE LIVING



D.Sc. SAEED RAHIMPOUR GOLROUDBARY

GLOBAL SUPPLY CHAINS OF CRITICAL RAW MATERIALS

LUT UNIVERSITY, FINLAND



On 9 December 2020, the third unit of Austrian branch's online lecture series, with the title "Global Supply Chains of Critical Raw Material Supply", took place.

The lecture was held by Saeed Rahimpour Golroudbary, researcher and lecturer at LUT University, Finland.

He holds a M.Sc. in Industrial Engineering from University Technology Malaysia (UTM). In 2020 he received his Ph.D. with distinction from LUT University in Industrial Engineering and Management.

His research interests include the development of methods and analysis for a sustainable supply chain of materials and their circularity, using several methods such as dynamic, numerical and mathematical modelling.

Dr. Goulroudbary has published several articles in high impact journals such as Energy Conversion and Management, Science of the Total Environment, Environmental Science & Policy and Journal of Cleaner Production.

The lecture offered a systematic view to address the challenges on global supply chains of critical raw materials, focusing on different stages including mining, processing, production, and recycling. Besides the necessity of looking at the technology of different processes, the presentation has highlighted the needed for interaction between different stages of supply chains as a system to analyse their dynamic behaviour.

In the beginning of his presentation he discussed what critical raw materials are and which different definitions are applied for those.

Due to this exposition Dr. Golroudbary clarified why some raw materials are critical and what the chal-

lenges are in their supply chains. He also stressed how waste management and recycling can help and create new and exciting opportunities in the next decades to decrease the scarcity of certain critical raw materials.

Furthermore, the lecturer elaborated on how industry partners may strive to be more resource efficient thus reducing the need for scarce raw materials.

Additionally, proposals on how governments and regulators can support supply chain management in addressing the challenges on critical raw materials were also explained. Further, he stressed the importance of gaining a little resilience to be not completely dependent on the global players.

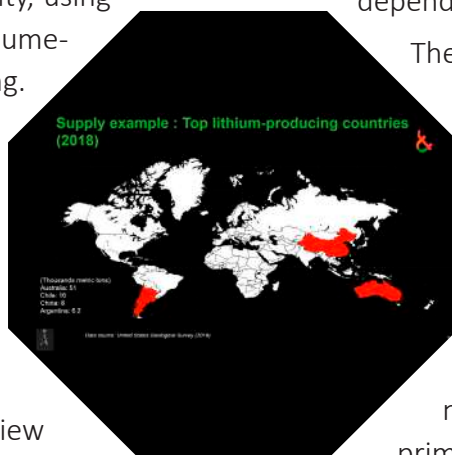
The lecture provided concrete examples of the supply chain modelling to analyse the challenges on critical raw materials from a sustainability perspective.

In this context Dr. Golroudbary pointed out, that recycling of some critical raw materials has a greater negative environmental impact than primary production, one example being Lithium.

Different case studies in the field of raw material recycling were discussed to show the complexity within responsible supply chain management.

The technique of simulation modelling (system dynamics methodology) from a systematic perspective was introduced to elaborate on the qualitative and quantitative analysis.

In Q&A following the lecture especially the reduction of critical raw material consumption and the dependency of the EU from the global players were of special interest to the students.





DIPL.ING. ROBERT OBENAUŠ-EMLER

SUSTAINABLE HYDROGEN AND CARBON SUPPLY AND ENERGY MINING

MONTANUNIVERSITÄT LEOBEN, AUSTRIA

On 17 December the sixth instalment of the lecture, under the title “Sustainable hydrogen and carbon supply and energy mining” took place.

The lecturer, Robert Obenaus-Emler studied Ceramics at Montanuniversität Leoben from 1998 to 2005 with participation in exchange programs at the Colorado School of Mines (Golden, USA) and the McGill University and École Polytechnique (Montréal, Canada) for one semester each. He continued to work at the Montanuniversität Leoben as a scientific researcher with focus on thermodynamic and kinetic modelling of large-scale industrial processes.

In the recent years his research focus shifted to the valorisation of industrial by-products at large scale, mainly in the field of alternative mineral binder systems. Additionally, he is involved in the education at the Montanuniversität in the field of mineral binders.

Since June 2020 he is Head of Innovation and R&D portfolio management at the Resources Innovation Center, a service hub at the Montanuniversität Leoben where he is in charge for the management and coordination of large-scale research projects in cooperation with national and international industrial and research partners.

As the title above already reveals his lecture was all about how Hydrogen produced with a zero-material footprint will play a major role in future energy systems relying solely on renewable energy.

Hydrogen enables the coupling of the sectors electricity, gas, and heat and further enables the storage of renewable electrical energy at a massive scale. It therefore contributes to a climate-neutral mobility and industrial production.

Robert Obenaus-Emler showed that presently hydrogen is produced by steam methane reforming with a remarkable CO₂-footprint.

Considering a strongly increasing demand of hydrogen in the near future, alternative production technologies for hydrogen are needed.

In this context, he elaborated on two of them:

One being the electrolysis of water. However, this technology requires high specific energy input and is only CO₂-neutral, if all the required energy is available from renewable resources.

Another more energy saving production route would be the pyrolysis of methane. This procedure, as Robert pointed out, requires by far a lower specific energy input compared to electrolysis. Hence, it is a possible alternative bridging technology for hydrogen production.

An additionally huge advantage of this technology is the fact that carbon is produced as a by-product which has numerous applications in agriculture, construction, and high-tech products.

In the following Q&A many questions were asked. The students especially showed huge interest in how the technological implementation for pyrolysis will be managed in the following years, and how hydrogen will be transported from producers to users.



Lecturer
Robert Obenaus-Emler

OUTLOOK TO JANUARY 2021

PROFESSOR HARALD HARMUTH – MONTANUNIVERSITÄT LEOBEN, AUSTRIA



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Prof. Dr. mont.
HARALD HARMUTH




FUTURE TOPICS
OF RESEARCH AND
EDUCATION IN
REFRACTORY
SCIENCES


12.01.2021
9:15 AM UTC+1

PROFESSOR ANTTI HÄKKINEN - LUT UNIVERSITY, FINLAND



LUT
University

Prof. D.Sc.
ANTTI HÄKKINEN




INNOVATIVE
TECHNOLOGIES
FOR
TAILINGS MANAGEMENT


22.01.2021
10 AM UTC+1

PROFESSOR HELMUT FLACHBERGER – MONTANUNIVERSITÄT LEOBEN AUSTRIA



M

Prof. Dr. mont.
HELMUT FLACHBERGER




DRY
PROCESSING


JANUARY
TBA

RECTOR WILFRIED EICHLSEDER AT “ADVANCED ENGINEERING COMPETENCIES – THE FUTURE OF THE RAW MATERIALS INDUSTRY”

Engineers with relevant competence will be instrumental in responding to key issues of the mineral resource industry protecting the environment, improving industry safety, and reducing investment risk.

One way that could help the profession drive positive change would be a new, common competence framework for Raw materials Engineers that builds on existing national systems and focusses on developing higher competencies relevant to these above-mentioned challenges.

The organisers, the headquarter of UNESCO MinEngEdu Competence Centre at SPMU and IOM3 (Institute of Materials, Minerals and Mining), invited to share and discuss views and perspectives about such a competence-framework for Mining Engineers, which could shape the future of mining.

Rector of Montanuniversität Leoben, Wilfried Eichlseder was invited to share his perspective within the second panel discussion «**National and international competence systems – opportunities for integration**».

Rector Eichlseder started by depicting the education system for mining engineers followed by the elaboration on the ability to exercise the profession, in Austria as well as Germany.

He named the institutions, procedures and regulations that ensure a high quality of the national educational and professional systems, as well as already existing certifications for mining professionals.

Regarding further certifications, the rector stated: “In principle, a quality assurance for the education programmes in mining is welcomed.” At the same time, he stressed that it is highly relevant to ask following questions, when discussing about new international certification:

Who should certify?



Rector Wilfried Eichlseder

What should be certified?

How to certify?

In this context it was mentioned that new regulations must not question the competence of existing quality-assured universities and must not subject them to additional, extensive bureaucracy.

In the second part of his statement Rector Eichlseder elaborated on the necessity to integrate and deepen the cooperation and common approach between disciplines to tackle the issues of climate, energy and raw materials supply.

In his closing remarks he underlined the UNESCO MinEngEdu Competence Centre’s strength to collaboratively develop education from different perspectives and in the same way beneficial to research.

“This diversity through cooperation within UNESCO offers the opportunity to make an important contribution to solving the challenges of our time through innovation.” - Wilfried Eichlseder

STUDENT ACHIEVEMENTS

WINNERS OF THE YOUNG RESEARCHERS FORUM

In June the International Forum-Contest **“Topical Issues of Rational Use of Natural Resources”** took place. The event was organised by the headquarter of the International Competence Centre for Mining Engineering Education under the auspices of UNESCO, St. Petersburg Mining University.

Traditionally taking place in St. Petersburg, this event is attended by students, postgraduates and young scientists from Russian and foreign universities, employees of mining, geological, oil and gas, energy, engineering, and metallurgical companies.

This year, more than a thousand participants, from all over the world, have registered for and participated in the forum. Due to the current Covid-19 situation, the Forum-Contest was held online. Young scientist’s presented their research in their area of expertise.

The topics included enhancing the technology of the complex processing of mineral raw materials to produce new generation materials; geological mapping, prospecting and mineral exploration; improving the energy efficiency of the mineral resource complex’s production, waste recycling, water treatment, restoration of disturbed lands and other relevant scientific areas.

The Austrian branch of the International Competence Centre for Mining Engineering Education, under the auspices of UNESCO selected eight students from Montanuniversität Leoben to participate in this event. Four of our students were among the winners of the event. They were nominated **“Best Speaker”** in their research area by the respective international jury.

For their engagement and excellent performance on the international stage the students were rewarded by the Austrian branch to value their dedication.



Kurt Friedrich

What I liked the most about this event was the interaction with the jury after the presentation. Here it turned out who really was familiar with his presentation and if all critical questions could be answered and if you could “defend” your work.” –

Kurt Friedrich

It was exciting to listen to other lecturing students from various universities and to experience their shared interest in raw materials and mining.

- Alexandros Evangelatos

I think such events are relevant in an educational context to see how and on which topics other scientists and students are working. You get to know the views of students from all over the world.

- Carina Doedlinger



Alexandros Evangelatos

SOCIAL MEDIA & PUBLIC OUTREACH

In order to establish and grow its (online) presence and outreach, the Austrian branch created an account on various social media platforms, including Instagram, LinkedIn and Research Gate. At the same time, by sharing content of your partner institutions, we support the increase of the Centre's visibility.

Instagram - unesco_mining_aut

Instagram is a photo and video sharing social networking service. It's two biggest user groups are aged 18-24 and 25-34. Being used worldwide, it allows to engage with the audience and build up a connection to the followers. This is the main reason the Austrian branch started its presence on Instagram.

The targeted audience on this platform are students of all partners of the Competence Centre's. The content shared are firstly, hard facts such as information about activities of our partners and ourselves, study programmes and conferences; secondly, information to building cultural awareness and thirdly, insights behind the scenes of the Austrian branch's work.



Get to know the team and event invitation – the first posts on Instagram



Our Advent calendar posted on Instagram showed cultural aspects in Austria, Russia and Finland of celebrating Christmas and new year were shown (typical food, traditions, proverbs, songs).



Research Gate is a scientific social media platform entirely devoted to research. The main focus audience is scientists, current and future academic partners. It allows not only to be updated about accepted and published papers, but also to get in direct contact with the authors.

It is, a rapidly growing network that provides an overview of scientific fields of interest. It is a valuable and convenient tool supporting scientific collaboration. The Austrian branch is represented in Research Gate and invites to follow scientific news.

www.researchgate.net/project/Austrian-Branch-UNESCO-Competence-Centre-for-Mining-Engineering-Education-MUL

Project

Austrian Branch | UNESCO Competence Centre for Mining-Engineering Education @ MUL

 Anastasia Kucheryavaya

Goal: As part of the International Competence Centre for Mining-Engineering Education under the auspices of UNESCO the mission of the Austrian branch is the promotion and support of UNESCO's overarching objective of sustainable development at the national and international level with regard to the mineral-resources and mining sector.

The mission focus of the Austrian Branch is on following Sustainable Development Goals:

SDG 4 Quality Education

SDG 9 Industry, Innovation, and Infrastructure

SDG 12 Responsible Consumption and Production

SDG 13 Climate Action

Job Profile „RAW MATERIALS ENGINEER“ on Watchado

Whatchado is an innovative Austrian enterprise headquartered in Vienna which is gaining more and more popularity among young people of German speaking countries. The secret of its success is that Whatchado is not a conventional job searching platform. Their vision is to support young people to find inspiration in a profession. For this purpose, they promote not only open positions but also the profession itself. A great number of interviews with people working in different sectors talking about their job environment, motivation, tasks, responsibilities, challenges, and insider know-how can be found here for free. Pupils and young people can use this website to watch this video-interviews, do a career orientation test and get a better understanding of their respective future professional aspirations.

The Austrian branch sponsored the job profile of an Raw Materials Engineer on Whatchado, since there was no related information available. By doing so the attention of young people is attracted towards the mining sector, encouraging them to study in a related study programme and hence raising the prestige of mining engineering.

The job profile “Raw Materials Engineer” answers questions such as how to become a raw materials engineer, which competencies do engineers need to have, which kind of hard and soft skills are required, which subjects to focus on at school and what income to expect after graduation.

Find more information here: (only available in German)

www.whatchado.com/de/jobinfo/wie-werde-ich-rohstoffingenieur

WEEKLY
STARTING ON
10. NOVEMBER
8 AM UTC+1

AN ONLINE LECTURE SERIES
SUSTAINABLE DEVELOPMENT
APPROACHES IN
ENGINEERING RESEARCH
& EDUCATION

A COOPERATION BETWEEN:

International Competence Centre for Mining-...
Bergbau & Metallverarbeitung · Leoben, Steiermark · 161 Follower

AUSTRIAN BRANCH @MUL | Education | Sustainable global supply of raw materials | SDGs 4, 7, 9, 12 and 13

Zur Website

Susanne Feiel und 1 weiterer Kontakt arbeiten hier

Alle 2 Beschäftigten auf LinkedIn ansehen

LinkedIn is a social network specifically designed for career and business professionals to connect. The focus audience are partners and possible future partners of the centre. Further, LinkedIn expert groups in the field of mining are used to increase the visibility of the organisation.

The information and activities shared on the Centre’s and the staff member’s profile have between 300-3000 impressions per article. “Organic impressions” on LinkedIn refers to the number of times unpaid content is shown to members.



International Competence Centre for Minin
201 Follower:innen
4 Monate

The UNESCO MinEngEdu Centre | Austrian Branch successfully commenced its new activity:

- "Online Research and Education Series", which focuses on sustainable development in the field of resource engineering, mining, materials science, recycling and education.
- Vice-Rector **Peter Moser** officially opened the online series of lectures. His presentation focused on "Sustainable Raw Material Supply", which is also one of the core topics of the UNESCO Centre.
- A total of 119 researchers, professors and students from 20 different countries globally attended the first lecture and engaged in lively discussions.
- Registration for the lecture series is open via Eventbrite:

<https://lnkd.in/evG5eC7>

The participation is

- for free and takes place via
- the video conference systems Webex and Zoom.

Montanuniversität Leoben
University of Leoben
Stadt Leoben
Montanuniversität Leoben - RIC Leoben
#sdg4 #engineersfortomorrow

MOBILITY AND MEASURES TO INCREASE MOBILITY



Aiming to promoting and creating favourable conditions for the mobility of students, increasing the number of mobilities as well as encouraging cultural curiosity and awareness, the Austrian branch has focused in the second half year on the following three activities:

STUDY PROGRAMME „ENGINEERING GEOECOLOGY“

MUL, SPMU and TUBAF established the International Joint Study Programme “Engineering Geoecology”. In October 2020, selected students started their first semester of studies in Leoben.

Due to the current Covid- 19 situation the students were not able to come to Austria physically.

However, thanks to the technical infrastructure and good preparations, the courses and exams were transformed and adapted to distance learning mode.

The semester at Montanuniversität Leoben started with a Virtual Welcome Day, where the team of the Austrian branch warmly welcomed everyone. After a virtual campus and city tour of Leoben all open questions regarding the student’s time and studies at our university where answered.

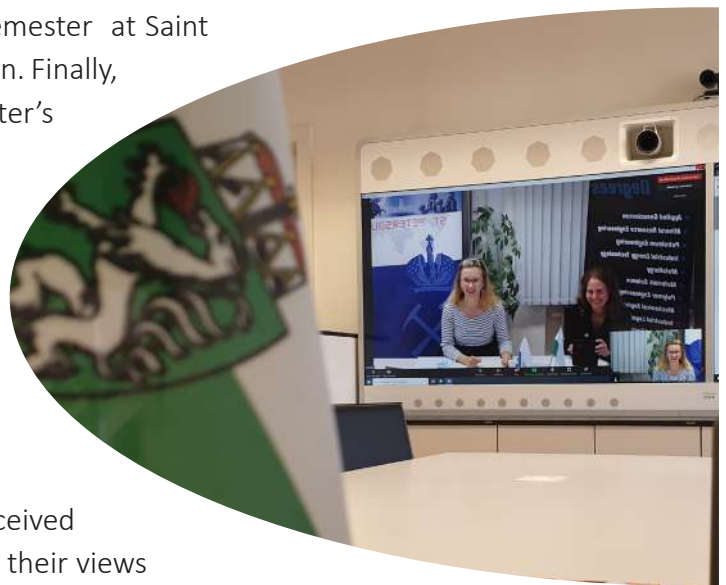
The international students will continue their second semester at TU Bergakademie Freiberg in Germany, followed by the third semester at Saint Petersburg Mining University in the Russian Federation. Finally, the fourth semester is all about finalising the master’s thesis at the respective home university.

STUDENT SURVEY ON BARRIERS TO MOBILITY

Seeking to increase the number of international student mobility and encourage students to gain experience in an international environment, the Austrian branch collected information, conducted surveys and interviewed local students.

The goal was to learn more about the students perceived obstacles and motivation of going abroad along with their views and perspectives on outgoing mobility in general.

The most commonly mentioned outgoing barriers were 1) Intransparency regarding the creditability of courses, 2) language difficulties, 3) cultural differences.



COMMENCING WORK ON THE CREATION OF EQUIVALENCE CATALOGUES



To overcome one of the barriers mentioned in the conducted survey (see above), the Austrian branch started to exchange information with SPMU on courses taught in English at both universities. The next step then will be the creation of an equivalence catalogue for courses between MUL and SPMU.

Such equivalence catalogues ensure transparency in the recognition process at the home university of ECTS earned at the receiving university. This makes planning the time abroad for students easier.

ESTABLISHMENT OF THE PREMISES

The premises of the Austrian branch at Montanuniversität Leoben are perfectly surrounded by other key institutions of the University: The Austrian branch is situated in Peter-Tunner-Strasse 15, 8700 Leoben together with MIRO, Montanuniversität International Relations Office; RIC, Resources Innovation Centre; ZSBK, the University's Centre for foreign languages, education and culture; as well as USI, the University's sports institute.

It comprises of one seminar room, the "Litvinenko seminar room" on the 3rd floor, a UNESCO entrance hall and welcome lounge, the office of the coordinators as well as a second seminar room on the 2nd floor.

The seminar room on the 2nd floor with advanced conference technology will allow geographically independent, real time online research and education lectures.



Seminar room
Litvinenko



Welcome area

FILM STUDIO FOR TEACHING VIDEOS



Markus Orthaber
preparing the installation
of the studio

It can be seen from various discussions in higher education institutions nationally and internationally that the concepts of Blended Learning, Inverse Classroom and Flipped Classroom will most probably become established in the very near future. In this context, there are strong efforts at many universities to update the technical infrastructure.

This trend has been accelerated due to the current Covid-19 situation. The adaption of teaching settings in higher education institutions followed and new formats of knowledge transfer and networking emerged.

One example are the online lecture series of the Austrian branch (see in detail page 16), where between 70-120 participants from over 20 countries come together each week to receive relevant information from international experts about the latest research in the area of sustainable engineering. Simultaneously, the seminar room at the premises of the Competence Centre is being converted into a video studio for general use by lecturers at our university, the student's union and of course (inter-)national guest researchers.

Equipped with appropriate camera, lighting and sound technology, lecturers will be able to produce high quality videos for teaching, by spring 2021.

The advantage of lecture videos is that they can be recorded very effectively. The students can view the content asynchronously (i.e. at any time up to a defined date) and also for several times, if they wish. The actual lecture units are then used more efficiently by discussing unclear points, doing exercises, supervising group work, etc. The valuable time in the classroom is thus effectively used and students have an incentive to come to classes, even if their presence is not mandatory. Beside a „self-service“ scenario where the equipment is pre-set in a default mode, the set-up also allows for a very complex setting including a green screen.

PRE - JUMPSTARTER WORKSHOP



Frans Nauta, speaker and trainer

Fostering innovation is one of the goals of the Austria branch. Therefore, in cooperation with EIT RawMaterials, a one-day workshop was organised in order to prepare students and young researchers for the application procedure of the Jumpstarter Programme: 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 in the Raw Materials Value Chain.

The aim of the Pre-Jumpstarter workshop was to facilitate an international environment to hold a fruitful workshop, where knowledge is shared, questions are asked, entrepreneurial mindset is built, and where ideas are grown and validated. 18 participants with 12 different nationalities took the chance to network and explore new opportunities.

The agenda included working sessions on the question “What is an entrepreneur?”, brainstorming and presenting start-up ideas, networking and getting to know the application procedure of the Jumpstarter Programme.

Robert Obenaus-Emler, Senior Researcher at the Chair of Ceramics:

“The Pre-Jumpstarter workshop is a perfect location for students to apply and sharpen their tools to tackle problems that they are facing either in their everyday life or when working on projects or a thesis.”

We were pleased to invite Mr. Frans Nauta, speaker and trainer: “Raw Materials clearly have a big challenge in Europe both as an industry to produce enough for what Europe needs and also from a sustainability challenge. Any industry that is challenged has huge economic opportunities.

I would argue for instance that climate change is not only a problem but is actually the biggest economic opportunity in the 21st century, because we need to fix all these problems. And eventually – I am an optimist – humanity will. That means the better, cleaner, greener, more efficient solutions will win. All in all, this is a huge opportunity. And where can you do this better than at Montanuniversität Leoben and the Competence Centre for Mining-Engineering Education?”



Participants of the workshop

Frans Nauta’s work is in innovation & entrepreneurship, with a focus on cleantech and more recently Data Science and AI. He is training start-ups, giving lectures and helping clients develop innovation ecosystems. He is the founder of ClimateLaunchpad, the green business ideas competition. The adventure started in 2014, and accidentally grew into the world’s largest green business ideas competition.

EVENT „METAL DAYS“

The “MetalDays” are an annual programme organised by the Department of Metallurgy (Montanuniversität Leoben) to give selected young people between 17-18 years of age an insight into the exciting field of metallurgy. Under the motto „Experience and understand metals“, pupils from all over Austria can discover the many opportunities offered by studying metallurgy. Due to the Covid-19 situation the event was rescheduled and reorganised, splitting the group into smaller ones. In 2020 the “MetalDays” took place from 01.07.-03.07. (group 1, 12 pupils) and 26.08.-28.08. (group 2, 13 pupils).

The programme included visiting the Chairs of Non-ferrous Metallurgy, Metal Forming, Iron and Steel Metallurgy, Casting Research, and Simulation, among networking opportunities with Master- and PhD students of Metallurgy as well as graduates and professionals in this field.

The Austrian branch is financially supporting this event, thus raising the prestige of mining engineering, contributing to activities in education which raise the status of and interest in universities in the raw materials sector, promoting sustainable development and lifelong learning opportunities. In the event’s information brochure the Austrian branch introduced itself and its activities thus carrying out marketing activities on the territory of Austria promoting the ideas of the Centre.



Metallurgy engineers at work

INTERNATIONAL SUMMER SCHOOL „CIRCOOL“

CirCOOL is MUL’s innovative & interdisciplinary international summer school programme that successfully premiered in July 2018 and went into its second round in 2019 – again with outstanding feedback. In 2020 CirCOOL took place for the third time in a revised form. This year’s CirCOOL focused on one specific field within the circular economy: the production, processing and recycling of polymers.

The CirCOOL programme intends to enable students to see the bigger scope of their specific educational field and what it can contribute to the whole material circle. CirCOOL is arranged in a modular structure, which mirrors the various major steps of the value life cycle. This approach strongly contributes to the de-isolation of the various fields of expertise needed to implement the material loop.

Due to the current Covid-19 situation the event has been rescheduled (originally planned in July 2020) and reorganised as an online format in September 2020.



Two future engineers & Coordinator Anja Zarfl with the participants of the online format

RESEARCH STRATEGY DEVELOPMENT AND JOINT RESEARCH TOPICS AND ACTIVITIES

One of the activity areas of the Competence Centre for Mining-Engineering and Education and its network is “Science and Innovation”. The Austrian branch actively participates in this area by developing a research strategy agenda and realise specific actions:

PRESENTATION AT THE CHAIR OF MINING ENGINEERING AND MINERAL ECONOMICS



On 10 December the Austrian branch held an informational presentation at the Chair of Mining Engineering and Mineral Economics. This meeting was aiming to facilitate future cooperation in research and education between SPMU and MUL.

During this online event professors and scientific staff received an update about current and future activities of the Centre. Among others, the ongoing joint Master’s and planned double PhD programme, staff mobility offers and prospective intern-

ships in mining enterprises were presented. Further, opportunities for scientific cooperation between SPMU and MUL were discussed.

After giving an overview, the presentation focused in more detail on the planned double PhD programme. PhD students from Russia are known for their thorough knowledge and remarkable scientific results. The implementation of such a joint PhD programme opens further possibilities for mutual scientific projects and results. In this context, short-, mid- and long-term PhD internships became an important part of the discussion.

Another focus was the funding of common scientific projects. The Austrian branch is researching for information available to offer a portfolio of different funding opportunities, which would be beneficial for both parties. An example would be the special call for joint Russian-Austrian scientific projects. Announced in December 2020 both by FWF and Russian Fonds, the possible application for this funding is in discussion and elaboration between the scientific coordinator of the Austrian branch, Anastasia Kucheryavaya, and SPMU.

The last point on the agenda was the announcement, that the Austrian branch will organise a visit of scientific staff members of MUL to SPMU, once the Covid-19 situation is over. It will create the opportunity to get familiar with scientific and educational facilities, connect with other researches, gain international and cultural experience.

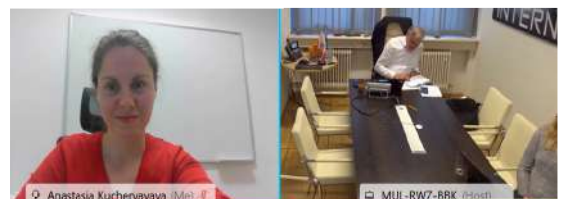
COORDINATION OF „SCIENTIFIC RESEARCH PROJECT“ FOR THE GEOECOLOGY STUDENTS

The students of the master’s programme “Engineering Geoecology” will write the final version of their master thesis during the fourth semester at the home university. Nevertheless, preparatory work and experiments start with the first semester.

During the first online semester of studies, the Austrian branch supported the students in advancing their scientific work .

On the one hand, the young researchers presented their topics in the course “Scientific Research Project” and discussed it with MUL’s programme coordinator, Professor Peter Moser.

On the other hand, in the writing process the students will receive supervision from the Austrian branch and Professors of MUL for their specific topics. During the whole process, they are commonly mentored by all three partner universities.



GeoEco Scientific work presentation

MEETING WITH THE VICE-RECTOR OF SCIENCE AND INNOVATION OF SPMU



As part of the preparation to facilitating educational and scientific collaboration, on 17 December a meeting between Vice-Rector of Science and Innovation at SPMU Professor Maria Pashkevich, scientific staff members of SPMU and the scientific coordinator of Austrian branch Anastasia Kucheryavaya took place. During the meeting several topics were covered.

Firstly, the Joint Master's Programme „Engineering Geocology“ was discussed.

The students enrolled in this programme have to complete the course “Scientific Research Project” during their first semester at Montanuniversität in Leoben. The work, done for this course will be a part of their master theses. The protocol of the joint scientific supervision by SPMU, TUBAF and MUL of the master theses were drafted.

The scientific supervisors from SPMU, Vice-Rector Maria Pashkevich and Olga Cheremisina were present at the meeting.

After consultations between the supervisors, the experiments will be defined. Finally, the common working schedule should be agreed by all sides.

Consequently, students could optimise the work through the whole period of the master programme. This detailed schedule will allow to use resources of involved universities to an optimised and efficient way.

As a result, the collaboration of the triple master's programme ensures that scientific supervisors and students get familiar with experimental facilities and working procedures throughout all involved universities. It also will help enabling future academic activities and facilitate the growth of professional networks.



Meeting with Vice-Rector Maria Pashkevich
representants of SPMU

Secondly, the planned double PhD programme, between MUL and SPMU, was discussed. As previously agreed by both universities, PhD internships were installed to give PhD students the opportunity to already work at the partner university, before the final implementation of the double PhD programme is achieved.

Due to the Covid-19 situation, the start of the internships planned for March 2020 was postponed. In this context, both sides confirmed their high interest of realisation of this PhD Internships after the Covid-19 situation will permit.

Adding another aspect, Vice-Rector Maria Pashkevich mentioned the academic potential of the above-mentioned master theses to be continued in the new double PhD programme.

Lastly, possibilities of scientific funding were envisaged.

The Austrian branch is compiling funding opportunities, in both Russia and Austria, available for common projects. Subsequently, this knowledge will be made available to our partners through the network of the Competence Centre, where more ideas of researchers from both universities could be put into practice.

Such meetings of the Austrian branch with Vice-Rector of Science and Innovation, including other colleagues from SPMU, became an important step to explore potential common specific topics for future joint research activities between MUL and SPMU.

PARTICIPATION IN CONFERENCES/SEMINARS/EVENTS

MOSCOW GREEN ECONOMY FORUM: COMMON PRESENTATION WITH DR. JURIY ZHUKOVSKIY

29-30 OCTOBER 2020



Dr. Yuriy Zhukovskiy giving his presentation

“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. The main target was the promotion of the principles of sustainable development and green economy.

Supported by the Ministry of Science and Higher Education of the Russian Federation, it brought together over 300 participants. International educational and scientific institutions, representatives of governmental authorities and non-profit organisations took part in the event.

The broad spectrum of topics enabled the participants to engage in lively discussions. Among others, the agenda included green economy principles in industrialised countries and achievements in the implementation of the SDGs in Russian businesses and in education.

During the Forum, special attention was paid to the synergies of digital technologies and education. The Austrian branch of the Competence Centre and the Educational Research Center for Digital Technologies at SPMU were given the opportunity to jointly give a presentation on “Digital competences as a basis for sustainable development of energy sector”.

This presentation was a result of the cooperation between the headquarter of the UNESCO MinEngEdu Competence Centre at SPMU, the Austrian branch and Resources Innovation Center (RIC) at MUL. RIC provided information on the European Union’s policies in education as well as on current projects at MUL in the field of in mining education.

The first speaker was Dr. Yuriy Zhukovskiy, Director of the Educational Research Center for Digital Technologies at SPMU. The second speaker was Anastasia Kucheryavaya, Scientific Coordinator of at the Austrian branch. Both addressed opportunities and challenges of digital competences for future engineers.

In his part Dr. Zhukovskiy named the key conditions for development, adaptation and implementation of digital technologies in the energy sector.

His presentation was based on the experiences made at SPMU in creating and implementing educational programmes, which included digital technologies.

At SPMU digital competences are taught, as they are seen as part of necessary skills for future engineers. In addition, the target of their education is not only to give the future generation knowledge on how to solve engineering tasks in the mining or raw materials sector, but also to ensure the sustainability of the solutions offered, including their benefits for society in general.





Anastasia Kucheryavaya giving her presentation

The second speaker, Anastasia Kucheryavaya, gave an overview on policies of the European Union in the educational field: the mile stones include the implementation of digital tools, creation of modern methodological materials, teachers' trainings and development of new study programmes. In particular, the European Skills Agenda for Sustainable Competitiveness, Social Fairness and Resilience 2020 was presented to the forum's audience.

In this context, Montanuniversität Leoben was given as an example of a higher education institution developing programmes and activities deriving from this EU agenda.

For instance, the implementation of the "Engineering Geoecology" study programme was mentioned, which is an international triple degree master's programme between MUL, TUBAF and SPMU. Another example are the mixed reality handbooks for higher mining education "MiReBooks", which are planned to be made available in Russian language.

КЛЮЧЕВЫЕ РИСКИ УГЛЕВОДОРОДНОЙ ЭНЕРГЕТИКИ И РОЛЬ ЦИФРОВЫХ ТЕХНОЛОГИЙ В УСТОЙЧИВОМ РАЗВИТИИ

САНКТ-ПЕТЕРБУРГСКИЙ ГОРНЫЙ УНИВЕРСИТЕТ

МИНИСТЕРСТВО ЭНЕРГЕТИКИ РОССИЙСКОЙ ФЕДЕРАЦИИ

УЧЕБНО-НАУЧНЫЙ ЦЕНТР ЦИФРОВЫХ ТЕХНОЛОГИЙ
САНКТ-ПЕТЕРБУРГСКОГО ГОРНОГО УНИВЕРСИТЕТА

EDUCATIONAL RESEARCH CENTER FOR DIGITAL TECHNOLOGIES
SAINT-PETERSBURG MINING UNIVERSITY

СОЗДАНИЕ КЛЮЧЕВЫХ УСЛОВИЙ ДЛЯ РАЗРАБОТКИ, АДАПТАЦИИ И ВНЕДРЕНИЯ В ПРОИЗВОДСТВО ЦИФРОВЫХ ТЕХНОЛОГИЙ

Educational research center for digital technologies

Директор УНЦ ЦТ **Жуковский Юрий Леонидович**

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«ЗАСЕДАНИЕ РАБОЧЕЙ ГРУППЫ ПО ВОПРОСАМ ЦИФРОВОЙ ТРАНСФОРМАЦИИ УГОЛЬНОЙ ПРОМЫШЛЕННОСТИ ПРИ СОВЕТЕ ПО ЦИФРОВОЙ ТРАНСФОРМАЦИИ ТОПЛИВНО-ЭНЕРГЕТИЧЕСКОГО КОМПЛЕКСА»

ATTENDANCE IN CONFERENCES/SEMINARS/EVENTS

DIDACTIC SEMINARS

SEPTEMBER 2020

As part of the Competence Centre the Austrian branch organises a variety of educational activities. Aiming to deliver the best quality, knowledge about structuring courses using different medias and motivation methods for learning are necessary.

For the purpose of gaining this knowledge, the Austrian branch is team participated in two didactic courses, offered at Montanuniversität Leoben.

The first course, Didactic II, a 2-day workshop took place on 17-18 September.

The second course, Active learning I, took place on 28-30 September and aimed at future lecturers at the Montanuniversität Leoben.

Taken from these workshops, the practical advices were successfully implemented in the Online Lecture Series and other educational events organised by Austrian branch.

The knowledge gained from these courses will enable the team from the Education Competence Centre at the Austrian branch to provide the students and staff at the headquarter and other branches with qualified educational lectures and seminars.



Anna Voica, Professor Enrique Grabl, Anastasia Kucheryavaya at the didactics seminar

THE 16TH MINING AND EXPLORATION FORUM MINEX RUSSIA

6-8 OCTOBER 2020



Screenshot made during the conference

The central theme of the forum in 2020 was «Russian Mining Industry – Unprecedented Challenges and Solution” and was attended by around 440 participants. The conference hosted 120 speakers, 57 exhibitors and 15 session and workshops.

In particular, the following topics were discussed:

- forecasts and trends in demand for ores and metals,
- business activities in the mining and geological industry in Russia,
- the role of the state in the regulation and development of the mining industry in the context of a global pandemic,
- resources recovery: the balance between discretion and risk.

The global Covid-19 consequences influenced the agenda of the Minex. Specifically, the management of mining production during lockdown was a focus topic.

Within the forum the second edition of the conference “Mining Goes Digital” took place. It presented successes of companies in decreasing costs and becoming more efficient by implementing digital technologies, such as artificial intelligence in their mining operations.

INNOVATIVE TRENDS IN MINING: EFFECTIVE MINERAL EXPLORATION

14-16 OCTOBER 2020

The Xth research and practical conference „Innovative trends in mining engineering design: effective mineral exploration” was held at SPMU. This prestigious event, brought together more than 300 specialists of the mining sector.

Delegates from scientific and research institutions, universities, and mining companies took part in this online conference. Further, members of governmental offices, such as the Federal Environmental, Industrial and Nuclear Supervision Service of Russia as well as the Federal autonomous institution “Main Department of State Expertise” were represented.

The main themes of the conference in Russian were:

- efficiency improvement of mineral exploration,
- exchange of practical experiences, and
- professional networking.

Among other, topics were geological and economic assessment of mineral deposits, mineral processing, geomechanics, underground and surface mining, digital technologies, mining safety, and blasting.

ESEE DIALOGUE CONFERENCE

03-04 NOVEMBER 2020



The EIT RawMaterials Regional Center Leoben at Montanuniversität Leoben organised the 12th ESEE Dialogue Conference.

During the online conference, the topic Brain Drain and its effects on the ESEE (East and South-East European) region was discussed in the field of education, industry and politics.

This phenomenon refers to the permanent loss of skilled workers or students in a region and is more important today than ever before.

Through various initiatives, attempts are being made to counteract the brain drain as the raw materials industry and other sectors in the Eastern and South Eastern Europe are strongly affected.

The aim of the 12th ESEE Dialogue Conference was to address the brain drain through discussions and a lively exchange of views and to jointly find new approaches in order to use brain drain positively.

WORKSHOP “SKILLS AND COMPETENCIES OF THE XXIST CENTURY WORKFORCE”

The Finish branch at LUT organised an international online workshop about future mining-engineering education. It explored the different opinions, currents, and trends existing in the business sector. Leading companies, research centers, and stakeholders met with selected speakers and renowned professional figures in industry to analyse and discuss which the professional needs would be in a close future.

Funded by EIT RawMaterials, it was hosted in the context of the work within the MEITIM Project “MSc Program in Entrepreneurship, Innovation and Technology Integration in Mining” (2020-2023)- Shaping the next generation skilled workforce”.

WEBINAR “CIRCULAR ECONOMY FOR MATERIALS PROCESSING”

11 DECEMBER 2020

The Finish branch of the Competence Centre at LUT organised a webinar, where a new course “Circular Economy for Materials Processing” was introduced.

Piloted in 2019, it got very positive feedback from the over 120 participants.

The aim of the course is to provide knowledge and skills for interdisciplinary problem solving, the entrepreneurial mindset and gender equality.

The Austrian branch in cooperation with the LUT, will promote the dissemination of these skills among engineering students on an international stage.

HYDROGEN CONFERENCE OF THE GERMAN-RUSSIAN RAW MATERIALS FORUM

1 DECEMBER 2020

Montanuniversität Leoben participated in the conference „Global Energy Economy: Hydrogen as a Future Driver?“ organised by the the German-Russian Raw Materials Conference. It was dedicated to the topic of Hydrogen as an important part of the future energy sector.

The agenda listed three points to be discussed.

- During the first section, the current situation in the global hydrogen energy future was discussed. Special attention was paid to leading countries in this area of research, such as Japan, Norway, Saudi Arabia, and the European Union.
- The second section was entirely devoted to the opportunities of Russian-German cooperation.
- The third section provided a comprehensive outlook to current scientific progresses in hydrogen energy.

Montanuniversität Leoben has a strong competence in the field of hydrogen production from natural gas, especially based on pyrolysis processes. Experimental infrastructure was recently set up for the pyrolysis of methane in liquid metal-based installation.

The development of common research activities in the field of the pyrolysis of natural gas is one of the potential research topics for a cooperation between SPMU and MUL.



Rector Vladimir S. Litvinenko giving his presentation

The team of the Austrian branch has attended, among others, additionally following events:

„Intercultural Sensibilisation of University Personnel“ (MUL) on 28 October 2020

„Online Flipped IRSPBL Aalborg“ (UNESCO Aalborg PBL Centre) on 28 October 2020

We would like to thank our partners for the organisations of such important events and we are looking forward 2021.



ANNEX

MEDIA RELEASES

Article on the website of Montanuniversität Leoben regarding the kick-off of the online lecture series (<https://www.unileoben.ac.at>)

MONTAN UNIVERSITÄT Universität Studium Forschung Neuigkeiten PURE ONLINE

Willkommen

an der Montanuniversität Leoben

Erfolgreicher Kick-Off zur neuen Vorlesungsreihe

11.11.2020

Das UNESCO Kompetenzzentrum (International Competence Centre for Mining Engineering Education under the auspices of UNESCO) eröffnete äußerst erfolgreich die neue Vorlesungsreihe „Online Research and Education Series“, deren Schwerpunkt auf der nachhaltigen Entwicklung der Fachbereiche Rohstoffingenieurwesen, Materialwissenschaften, Recycling und der Ausbildung Studierender liegt.

Unter dem Titel „Sustainable Development Approaches In Engineering Research and Education“ kommen wöchentlich abwechselnd acht internationale Experten zu Wort.

Internationales Publikum

Vizekanzler Peter Moser eröffnete gestern unter reger Interesse die Online-Lehrveranstaltungsreihe mit seinem Vortrag „Sustainable Raw Material Supply“, welches auch eines der Kernthemen des UNESCO Zentrums ist. Insgesamt nahmen an der ersten Vorlesung 119 Forscher*innen, Professor*innen sowie Studierende aus 20 verschiedenen Ländern teil und diskutierten eifrig mit.

Organisiert und koordiniert durch die österreichische Niederlassung des UNESCO Zentrums mit Sitz an der Montanuniversität Leoben, konnte man für die Vorlesungsreihe Vortragende folgender Universitäten gewinnen, die ihre Expertise für eine nachhaltige Gestaltung der Zukunft mit allen Interessierten teilen:

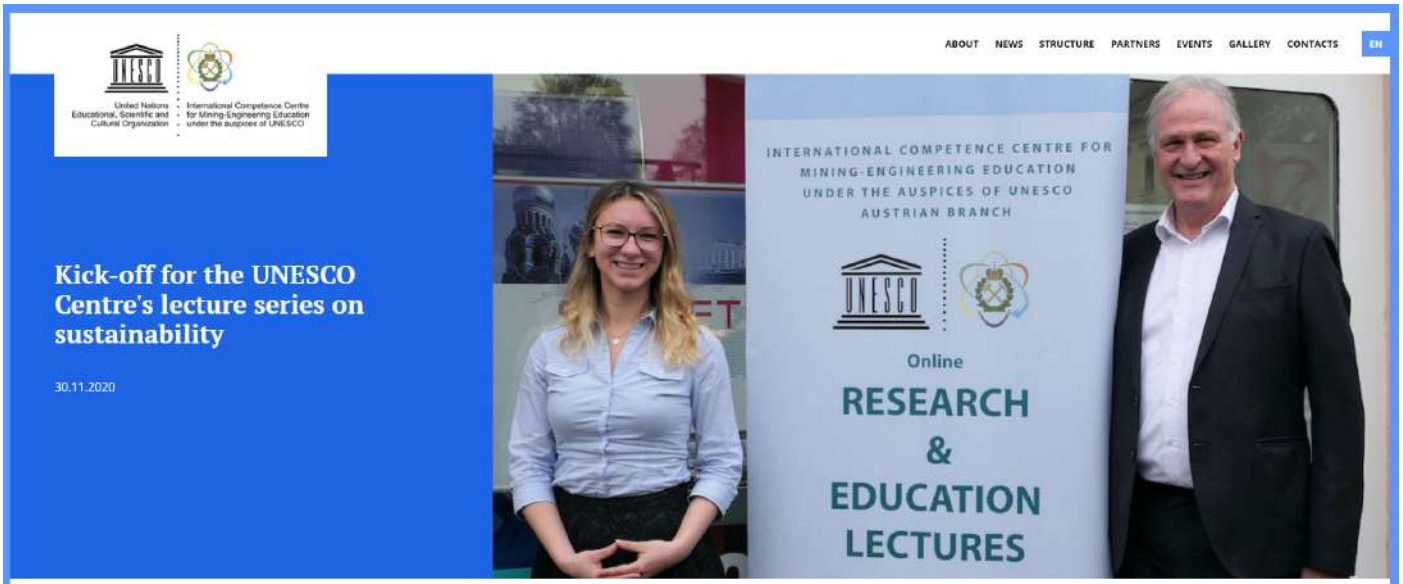
- Finnland: LUT - Lappeenranta Lahti University of Technology
- Dänemark: UNESCO PEL – Aalborg Centre for Problem Based Learning in Engineering Science and Sustainability under the auspices of UNESCO
- Russland: SPMU – Saint Petersburg Mining University
- Österreich: MUL - Montanuniversität Leoben & RIC – Resources Innovation Centre Leoben

Event-Koordinatorin und Moderatorin Anna Voica: „Mit dieser Online-Lehrveranstaltungsreihe möchten wir auch in der aktuellen Situation internationalen Austausch ermöglichen und fördern sowie Einblicke in aktuell relevante Themen und Forschungsbereiche geben.“

Der nächste der wöchentlich stattfindenden Termine ist am Freitag, den 20.11.2020. Frau Rina Sahmimies D.Sc. (Dekanin der School of Engineering Science) wird das Thema „Recovery of phosphorus from municipal sludge – a practical perspective“ behandeln. Alle weiteren Termine befinden sich im Veranstaltungskalender der Universitätshomepage.

Die Anmeldung zur Vorlesungsreihe ist laufend über Eventfritte möglich: <https://www.unileoben.ac.at/lehre/veranstaltungen/online-research-and-education-series>
Die Teilnahme ist kostenlos und findet über die Videokonferenz-Systeme Webex und Zoom statt.

Weitere Informationen:
Mag. Inr. Anna Voica
Communications & Partnership Management
anna.voica@unileoben.ac.at
unesco@unileoben.ac.at



The Austrian Branch of the UNESCO Competence Centre has very successfully started the new lecture series "Online Research and Education Series", which focuses on sustainable development in the fields of mining, resource engineering, materials science, recycling and education.

Under the title "Sustainable Development Approaches in Engineering Research and Education", eight international experts share their expertise, alternating every week.

Vice-Rector Peter Moser opened the online series of lectures on 10 November with lively interest of the audience. His lecture was entitled "Sustainable Raw Material Supply", which is also one of the core topics of the Austrian Branch.


A total of 119 researchers, professors and students from 20 different countries attended the first lecture and engaged in lively discussions.

Organised and coordinated by the Austrian Branch of the UNESCO Centre based at Montanuniversität Leoben, the lecture series is showcasing international experts from the following universities:

- Finland: LUT - Lappeenranta Lahti University of Technology
- Denmark: UNESCO PBL - Aalborg Centre for Problem Based Learning in Engineering Science and Sustainability under the auspices of UNESCO
- Russia: SPMU - Saint Petersburg Mining University
- Austria: MUL - University of Leoben & RIC - Resources Innovation Centre Leoben

With this online course series, we would like to enable and promote international exchange, even in the current situation, and provide insights into currently relevant topics and research areas

Communications & Partnership Manager and moderator Anna Voica



Registration for the lecture series is continuously available via Eventbrite: <https://www.eventbrite.com/o/aust-branch-unesco-mining-engineering-education-31518724389>

Participation is free and takes place online via the video conference systems Webex and Zoom. All dates can be found in the event calendar.



MONTANUNI



NACHHALTIGKEIT ALS LANGFRISTIGES

Mit ihrer spezifischen Ausrichtung in Lehre und Forschung sieht sich die Montanuniversität als der Circular Economy (Kreislaufwirtschaft). Sie ist in ihrer Profilierung mit ihren Fachgebieten gut Wissensbasis, welche eine der Grundvoraussetzungen für die globalen Herausforderungen im Si

Die Montanuniversität beteiligt sich an mehreren nationalen und internationalen Initiativen, deren Ziel es ist, Nachhaltigkeit in allen administrativen Abläufen, aber auch in Forschung und Lehre zu etablieren.

Allianz Nachhaltige Universitäten in Österreich

Die Montanuniversität ist auch Mitglied in der Allianz Nachhaltige Universitäten in Österreich. Diese Vereinigung verpflichtet sich, Nachhaltigkeitskonzepte zu erstellen und entsprechende Maßnahmen umzusetzen. Dabei geht es sowohl um die Erstellung von CO₂-Bilanzen im allgemeinen universitären Ablauf als auch um Maßnahmen, die Forschung und Lehre betreffen.

Resources Innovation Center (RIC) Leoben

Eine Aktivitätslinie des RIC Leoben ist es, die Montanuniversität am Weg zu einem nachhaltigen Universitätsbetrieb zu unterstützen und zu begleiten. Hierzu hat das RIC verschiedene Initiativen und Projekte gestartet und mitgestaltet:

2020 hat das RIC mit der Datenerhebung für eine CO₂-Bilanz der Universität begonnen. Dabei wird der Status Quo erhoben, der eine Zielsetzung zur Reduktion der Emissionen erst möglich macht. In der Folge ist geplant, die Entwicklungen über die Jahre zu beobachten. Der Nutzen dieser Aktivität ist es, ein klares Bild der Emissionen der eigenen Einrichtung zu bekommen und dieses kommunizieren zu können. Durchgeführt wird die Erhebung und Berechnung

der CO₂-Bilanz mit einem Bilanzierungstool, das im Zuge einer Arbeitsgruppe der Allianz Nachhaltige Universitäten Österreichs entstanden ist.

Die Montanuniversität hat 2019 ein institutionsinternes Sustainable Development Panel gegründet, das sich mit der Implementierung der nachhaltigen Entwicklung in den Bereichen der Forschung, der Lehre und der Organisation als solches beschäftigt. Das Panel ist ein Konsortium von engagierten und an Nachhaltigkeit interessierten Professorinnen und Professoren und arbeitet in Kooperation mit dem RIC Leoben daran, Entwicklungen und Aktivitäten zur Nachhaltigkeit zentral zu organisieren sowie neue Initiativen anzuregen und anzubahnen.

An der Montanuniversität gibt es 243 Projekte, welche als Beitrag zu den Sustainable Development Goals (SDGs) wirken. Jedes Projekt kann Einfluss auf mehrere SDGs haben. Die Sustainable Development Goals (SDGs) sind 17 gesellschaftliche Ziele unserer Zeit, die 2016 von der UNO verabschiedet wurden. Die Ziele sind vielschichtig und müssen gemeinsam verfolgt werden, um die ökonomische, soziale und ökologische Dimensionen nachhaltiger Entwicklung auszubalancieren. Gemeinsam mit 192 weiteren Staaten hat sich Österreich zu den SDGs verpflichtet. Da Rohstoffe und deren Verarbeitung einen beachtlichen Teil zur Entwicklung, Ökonomie und modernen Gesellschaft beitragen, beschäftigt sich das RIC Leoben im Zuge der SDGs mit dem nachhaltigen Umgang von Rohstoffen. Die Expertise der Montanuniversität im Rohstofflebenszyklus spiegelt sich auch im verantwortungsbewussten Umgang mit Ressourcen wider.

Auf Initiative des RIC findet derzeit erstmals eine öffentliche Ringvorlesung statt. Die Triple N Talks beschäftigen sich mit nachhaltig ökologischen, ökonomischen und sozialen Themen.

European University EURECA-PRO

Sieben europäische Hochschulen, darunter die Montanuniversität Leoben als Projektkoordinatorin, haben eine Allianz gebildet, um gemeinsam im Bereich des 12. Entwicklungsziels der Vereinten Nationen, „Nachhaltige Konsum- und Produktionsmuster sicherstellen“, zu lehren und zu forschen. Im Rahmen der European-University-Initiative der EU bilden sie „EURECA-PRO – The European University Alliance on Responsible Consumption and Production“.

Im Zuge des Projektstarts fand Mitte November das



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ZIEL ETABLIEREN

führendes Mitglied der nationalen und internationalen Scientific Community im Bereich ist in den zukünftigen Themen positioniert und verfügt über eine beinahe geschlossene Gruppe der von den Vereinten Nationen formulierten Sustainable Development Goals ist.

Kick-off-Meeting online statt. Über zwei Tage wurden mit insgesamt 25 Vertreterinnen und Vertretern sowie Rektoren der Technischen Universität Bergakademie Freiberg (Deutschland), der Universität León (Spanien), der Technischen Universität Kreta (Griechenland), der Universität Petrosani (Rumänien), der Schlesischen Technischen Universität (Polen) und der Hochschule Mittweida (Deutschland) die nächsten Schritte, Aufgaben und Fristen besprochen.

Die Allianz verknüpft Lehre, Forschung und Innovation mit Universitäts-campus-übergreifenden flexiblen Studienangeboten, wobei der Fokus auf Nachhaltigkeit, exzellenter Ausbildung und Stärkung der europäischen Werte liegt. Das Projekt wird im EU-Programm Erasmus mit fünf Millionen Euro gefördert. Nach Ablauf der dreijährigen Förderungsdauer besteht die Möglichkeit, das Vorhaben erneut einzureichen. Zukünftig sollen auch Synergien zu anderen EU-Programmen, wie zum Beispiel Horizon Europe, geschaffen werden.

UNESCO Kompetenzzentrum

Ende letzten Jahres wurde in Leoben ein UNESCO Kompetenz- und Ausbildungszentrum mit den Kernthemen „Nachhaltigkeit, Globale Rohstoffversorgung und Rohstoffpolitik“ etabliert. Kürzlich wurde die neue Vorlesungsreihe „Online Research and Education Series“, deren Schwerpunkt auf der nachhaltigen Entwicklung der Fachbereiche Rohstoffingenieurwesen, Materialwissenschaften, Recycling und der Ausbildung Studierender liegt, ins Leben gerufen. Unter dem Titel „Sustainable Development Approaches in Engineering Research and Education“ kommen wöchentlich abwechselnd acht internationale Experten zu Wort.

Vizekanzler Peter Moser eröffnete unter regem Interesse die Online-Lehrveranstaltungsserie mit seinem Vortrag „Sustainable Raw Material Supply“, welches auch eines der Kernthemen des UNESCO-Zentrums ist. Insgesamt nahmen an der ersten Vorlesung 119 Forscherinnen und Forscher, Professorinnen und Professoren sowie Studierende aus 20 verschiedenen Ländern teil und diskutierten eifrig mit. Weitere teilnehmende Universitäten sind: LUT - Lappeenranta Lahti University of Technology (Finnland), Aalborg Centre for Problem Based Learning in Engineering Science and Sustainability under the auspices of UNESCO (Dänemark), Universität St. Petersburg (Russland).

Die Teilnahme ist kostenlos und findet über die Videokonferenz-Systeme Webex und Zoom statt.

Europäische Nachhaltigkeitswoche

Die Montanuniversität nahm auch erfolgreich an der Europäischen Nachhaltigkeitswoche teil. In der Woche von 21. bis 25. September hielten Wissenschaftlerinnen und Wissenschaftler Online-Vorträge rund um Nachhaltigkeit. Inhaltlich spannten sich die Themen von „grüner“ Stahlproduktion, über nachhaltige Eisenherstellung und Speicherung von Energie in Erdgaslagerstätten bis hin zu einer schonenden Kreislaufwirtschaft der Kunststoffe. Die Vorlesungen fanden über Webex statt und stießen auf reges Interesse, daher wird die Montanuniversität auch im kommenden Jahr wieder an dieser europäischen Initiative teilnehmen.

WEITERE INFORMATIONEN

Allianz Nachhaltige Universitäten in Österreich: www.nachhaltigeuniversitaeten.at

Resources Innovation Center Leoben: <https://ric-leoben.at>

Triple N Talks: <https://triplen.unileoben.ac.at>

European University: lisa.pichler@unileoben.ac.at

UNESCO Kompetenzzentrum: unesco@unileoben.ac.at

www.unileoben.ac.at



Rektor Wilfried Eichseder

LIEBE LESERINNEN UND LESER!

Das vorliegende Triple N stellt die Nachhaltigkeit in den Mittelpunkt. Um unseren Wohlstand und unsere Lebensqualität abzusichern, ist nachhaltiges Handeln unabdingbar und muss das Ziel unserer Gesellschaft sein.

Die Montanuniversität Leoben fühlt sich seit jeher ihrer nachhaltigen Entwicklung verpflichtet und hat sich in den letzten Jahrzehnten in ihrem Forschungs- und Studienprogramm derart entwickelt, dass sie den Material- und Energiefluss von der Gewinnung bis zum Recycling abbilden kann. Mit diesem geschlossenen Wertschöpfungskreislauf steht die Montanuniversität einzigartig da und erfüllt damit eine wichtige Forderung der Nachhaltigkeit, nämlich Ressourcen effizient und umweltfreundlich zu nutzen.

Diese Forderung ist umso wichtiger, da die Weltbevölkerung wächst, Energie- und Materialverbrauch damit steigen, wobei die natürlichen Ressourcen aber begrenzt sind. Wir sind alle aufgerufen, als Person oder Institution, unseren Beitrag zur Erhaltung unserer Lebensbasis zu leisten.

Dazu möchte ich die WCED, die World Commission on Environment and Development, zitieren:

„Eine nachhaltige Entwicklung ist eine Entwicklung, die die Bedürfnisse der Gegenwart befriedigt, ohne zu riskieren, dass künftige Generationen ihre eigenen Bedürfnisse nicht befriedigen können.“

In diesem Sinne

Glück Auf!

LIST OF ABBREVIATIONS

BIPs	Blended Intensive Programmes
BOKU	University of Natural Resources and Life Sciences, Vienna
EIT RawMaterials	European Institute for Technology on Raw Materials
ESF	Engineers for a Sustainable Future
EU	European Union
EURECA-PRO	The European University on Responsible Consumption and Production
KIC	Knowledge and Innovation Community (of the EU)
LCA	Life Cycle Assessment
LUT	Lappeenranta-Lahti University of Technology, Finland
MiReBooks	Mixed Reality Handbooks for Mining Education
MINT (German) = STEM	Mathematik, Informatik, Natur- und Ingenieurwissenschaft und Technik
MIRO	Montanuniversität International Relations Office
MUL	Montanuniversität Leoben, Austria
Q&A	Questions and Answers
R&D	Research & Development
RIC	Resources Innovation Center Leoben
SDGs	Sustainable Development Goals
SPMU	Saint Petersburg Mining University, Russian Federation
STEM	Science, Technology, Engineering and Math
TUBAF	Technische Universität Bergakademie Freiberg, Germany
UNESCO Aalborg Centre	Aalborg Centre for Problem Based Learning in Engineering Science and Sustainability under the auspices of UNESCO
UNESCO Competence Centre	International Competence Centre for Mining-Engineering Education Centre under the auspices of UNESCO



United Nations
Educational, Scientific and
Cultural Organization



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