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PANGEO AUSTRIA 2022

MONTANUNIVERSITÄT LEOBEN

PANGEO AUSTRIA 2022

SESSION PROGRAM

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* (final program may be subject to changes)

Geo-energy

(Johann Goldbrunner, Reinhard Sachsenhofer, Gabor Tari)

The growing global energy demand requires reliable, sustainable and competitive energy systems. According to all current forecasts, apart from renewable energy sources (incl. geothermal energy), fossil fuels will continue to play a major role in the energy supply mix for the foreseeable future. In addition to be the dominant overall source for energy, the subsurface also provides critically important storage space for various media (e.g., methane, H_2, CO_2, heat). Our session welcomes contributions related to any of the above topics.

Economic Geology

(Frank Melcher, Holger Paulick)

Mineral deposits are the backbone of our society; both fundamental and applied research help to secure the supply of raw materials for the generations to come. We invite contributions that cover the wide field of raw materials and ore deposits including metal ores, industrial minerals and gemstones. Papers covering the spectrum from exploration, characterization and genetic aspects to mineral processing and process mineralogy are welcome.

Reservoir engineering trends and challenges

(Holger Ott, Riyaz Kharrat)

Multiphase flow determines to a large extend fluid-displacement efficiencies and sweep effects in reservoirs, especially in the EOR stage. However, our flow models are based on a phenomenological theory, including capillary pressure and relative permeability, which are in general, complex functions of fluid saturation. Emerging technologies like pore-scale physics and digital rock physics help us understand the underlying mechanisms and derive macroscopic flow properties from pore-scale images and pore-scale simulations.

This session aims to provide a state-of-the-art picture of pore-scale physics from upscaling to continuum scale and the related trends & challenges of EOR methods. Studies of complex displacements as typical for enhanced oil recovery, CO_2 storage, or deep geothermal energy systems are welcome. The session may cover topics such as: core flood experiments with pore-scale imaging, digital rock physics, microfluidic studies or pore-to-field approaches, emerging and innovative EOR processes, and related modelling.

Advanced Structural and Geochemical Characterization of Geomaterials

(David Misch, Phillip Gopon, Bernhard Rupprecht)

The striving after methodological advancement unites all geoscience-related disciplines. Be it structural characterization down to the atomic scale, analysis of deformation processes by electron diffraction crystallography, the advancement of isotope geochemistry as a sensitive environmental correlation tool, or improved multi-element geochemistry for fingerprinting applications: this session invites contributions that highlight the importance of cutting-edge analytical approaches to address major earth science questions.

Engineering Geology and Geohazards

(Marlène Villeneuve, Scott Kieffer)

This session will address key topics of engineering geology, including site investigation, field and laboratory characterisation of rock and soil, and development of engineering geology ground models. These topics can be applied to a variety of areas, such as engineering works, urban environments, construction materials and cultural heritage protection. A key focus will also be on analysis and mitigation of geohazards, including innovations in remote sensing and geomatics, as well as their impacts on society.

Hydrogeology and Hydrochemistry

(Steffen Birk, Sylke Hilberg)

This session addresses all aspects of hydrogeology and hydrochemistry from local case studies to the development of theoretical concepts and methodological approaches, from field investigations to modelling studies and laboratory methods, from water quantity to water quality. Contributions that bridge gaps between hydrogeology/hydrochemistry and other disciplines within and beyond the geosciences are particularly welcomed. These may include (but are not limited to) innovative methodologies adapted from other disciplines such as geophysics, geochemistry and isotope hydrology, remote sensing, groundwater biology, etc. as well as topics that require collaboration among scientist and practitioners from various disciplines such as the assessment of climate change impacts on water resources, environmental impact assessments, or the investigation and remediation of contaminated sites.

Aspects of Seismology

(Wolfgang Lenhardt, Götz Bokelmann)

The session shall attract presentations from the various themes of seismology such as earthquake research, hazards, mechanism studies, waveform modelling, signal analysis, tomography, crustal modelling, induced seismicity, and also ”non-instrumental” aspects such as macroseismology and historical earthquake research.

Theoretical considerations and practical results are of equal importance to demonstrate the wide field of applications. Seismic activities triggered by the vast number of industrial activities (e.g. mining, geothermal power plants, CO_2 sequestration) may also serve as a testing bed of new methodologies regarding seismic events analysis.

Geophysics

(Florian Bleibinhaus, Robert Scholger)

General contributions from theoretical or applied geophysical research.

Structural Geology in Academics and Industries

(Bernhard Grasemann, Volker Schuller)

In this session we solicit contributions that are of general interest to the tectonics and structural geology community ranging from academic research to industrial applications. The range of topics includes investigations of rock deformation in the brittle and ductile field at all scales based on natural observations, including mapping, remote sensing, seismics and experimental methods. We encourage submission with a focus on applications of structural geology to civil engineering, mining and oil/gas/geothermal exploration, production and development.

Earth Surface Dynamics

(Jan-Christoph Otto, Ronald Pöppl, Kirsten von Elverfeldt)

The earth surface is shaped by highly dynamic geomorphic processes, affected by both the natural and human realm. They are closely tied to human activities manifested by modified erosion rates or the occurrence of natural hazards. Earth surface dynamics thus are of great importance to society. This session invites scientists and practitioners to present the latest challenges, solutions and adaptation strategies for past and ongoing changes and effects of earth surface dynamics. The scope covers geomorphological process research, new analysis techniques, and applied topics of environmental and natural hazard management.

Regional Geology and Geodynamics

(Gerd Rantitsch, Ralf Schuster)

The session focus on the structure and geodynamic processes of the Alpine orogenic belt and its forelands. Contributions presenting new tectonic, metamorphic, sedimentary and geophysical data as well as results from geological mapping, which give rise to a better understanding of the regional geology are highly welcome. The session will also address aspects of Geodata-management and studies from other orogens.

Applied Mineralogy

(Johann Raith, Martin Dietzel)

Contributions are invited to various tasks of Applied Mineralogy with special emphasis on the application of mineralogy, geology and geochemistry in exploration, mining, beneficiation, metallurgy, cements, ceramics, refractory, material sciences, mineral formation and alteration, waste and secondary raw materials, biomineralogy, environmental and geochemical forensic sciences, scaling, archaeometry etc. Contributions covering the full spectrum from theoretical, experimental to field-based studies are welcome.

Igneous and Metamorphic Petrology

(Benjamin Huet, Peter Tropper)

This session aims at gathering presentations of research on igneous and metamorphic rocks as records of the processes acting below the surface of the Earth. The session welcomes studies dealing with regional, experimental or theoretical aspects, covering a broad range of topics from low grade metamorphism to melt generation or phase transformation in the deep mantle. Presentation of interdisciplinary studies involving for example geochemistry, tectonics and/or geochronology are encouraged.

Integrated Stratigraphy

(Werner Piller, Christoph Iglseder)

The stratigraphic trinity “Lithostratigraphy, Biostratigraphy and Chronostratigraphy”, which is the core of stratigraphic research, has considerably be expanded during last decades by already well-established methods such as magnetostratigraphy, seismostratigraphy and sequence stratigraphy, and more recently by cyclostratigraphy. Modern stratigraphic research attempts to integrate as many stratigraphic methods and tools as possible to increase stratigraphic resolution.

In this context we would highly appreciate to receive contributions integrating various stratigraphic methods, however, the session is open to all stratigraphic topics. A specific topic are crystalline rocks, for which lithodemic units have been established and are in use. Not least, in a digitized world, the significance of lithostratigraphic units is used in Web 4.0 as an instrument standardizing, harmonizing and linking geologic contents.

Sedimentology/Stratigraphy

(Daniel Le Heron, Christoph Kettler)

What does it take in a subject to get a paradigm shift? There are a number of big changes at work in sedimentology and stratigraphy. These include the changing role of soft rock geology in the Energy Transition, and how this balances against the continuing importance of this subject and its cultural significance in petroleum exploration. It includes rapid technological development, where digital outcrop observation is the norm, and where digital data are being gathered at a rate perhaps exceeding the rate at which they can be interpreted. A further change includes an increasing anthropogenic activity (e.g. microplastics), and thus the future record of human activity in deep sea strata. This session will showcase current research on

the topics above and more throughout the Alpine area and beyond. We welcome submissions on all aspects of sedimentology (clastic and carbonates, evaporites) and stratigraphy, and are particularly excited to receive abstracts on new approaches to old rocks (e.g. photogrammetry, drone work to map outcrops, new geochemical directions to unveil depositional environments, etc). The emphasis will be on how these contributions can change (as well as enhance) the subject.

IGCP 710: Western Tethys meets Eastern Tethys

(Michal Krobicki, Hans-Jürgen Gawlick)

The Paleozoic, Mesozoic and Cenozoic evolution of this ocean has long been investigated both in Asia and Europe. The IGCP-710 project targets both areas and this session will be focused on a comparison between European (western) and Asian (eastern) geotectonic events, with special focus on the history of the Western Tethys realm. Contributions based on research of different branches of geology are highly welcome: stratigraphy, palaeontology, sedimentology, tectonics, structural geology, paleogeography, petrology, geochemistry, paleomagnetism, and geophysics.

Young Sediments

(Stephanie Neuhuber, Michael Wagreich, Bernhard Salcher)

The session on geologically young sediments broadly covers topics on the sedimentology and stratigraphy of Quaternary sediments, including Holocene and the much-debated Anthropocene. We welcome studies from fluvial, glacial, periglacial and aeolian settings and motivate the submission of contributions applying various techniques to reconstruct palaeo-enviroments and climate by using methods related to e.g. age dating, palaeontology, geophysics, numerical modelling or the processing of multi-proxy data. This session will also give a platform for studies dealing with the Anthropocene such as investigating human-induced environmental changes and related signatures in the sedimentary record.

Geoscience and Archeology

(Walter Prochaska, Erich Draganits)

In the last years, there has been growing interest in integrating geoscientific and archaeological studies, both in research and in teaching. We invite contributions dealing with methods from all fields of geoscience applied in archaeological research questions, including for example geoarchaeology, archaeozoology, archaeobotany, archaeometallurgy, archaeological prospection, experimental archaeology, palaeo-environmental reconstruction, palaeohydrology, geomorphology, material and provenance analysis and geochronology.

Paleontology

(Mathias Harzhauser, Martin Gross)

Geodynamics is a major driver for changes in climate and paleoenvironments. Thus, geological processes are important extrinsic factors influencing evolution, which may be reflected in the paleontological record.

Therefore, we would especially appreciate contributions discussing the biotic response to global or regional events. Our session will also welcome contributions with focus on systematics, biostratigraphy and paleobiogeography.

Landesgeologie im Dienste der Bevölkerung

(Michael Konrad)

Details will follow soon.

Poster Session

(Phillip Gopon, Xiangyun Shi)

Poster contributions from all geoscience fields are welcome.

* Please follow program updates on *Pangeo.unileoben.ac.at*.