



20-24/09/2020

PANGEO

AUSTRIA 2020

MONTANUNIVERSITÄT LEOBEN

PANGEO AUSTRIA 2020

SESSION PROGRAM



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(final program may be subject to changes)

Advanced Structural and Geochemical Characterization of Geomaterials

(Anna Rogowitz, David Misch)

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.

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.

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, CO₂ sequestration) may also serve as a testing bed of new methodologies regarding seismic events analysis.

Earth Surface Dynamics

(Jan-Christoph Otto, Ronald Pöppel, 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.

Economic Geology

(Thomas Angerer, Frank Melcher)

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.

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.

Enhanced Oil Recovery Challenges in Complex Reservoirs

(Riyaz Kharrat)

With growing global energy demand and depleting reserves, enhanced oil recovery (EOR) from green to brown fields has become more and more important, especially for complex reservoirs such as carbonate. The key challenge of carbonate reservoirs is the high heterogeneity of this formation from the pore scale to the flow unit scale, which results in an average recovery often below 20% of total petroleum.

The latest advances in low salinity water flooding, chemical, gas injection, emerging and innovative methods, drilling and completion challenges for EOR applications, and more will be covered for conventional and fractured carbonate reservoirs.

The EOR session covers topics such as: low salinity water flooding, chemical additives, gas injection, emerging and innovative methods, as well as drilling and completion challenges for EOR applications.

Geo-energy (Oil, Gas, Coal, Secondary Storage, Geothermal Energy)

(Johann Goldbrunner, Reinhard F. 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, H₂, CO₂, heat). Our session welcomes contributions related to any of the above topics.

Geophysics

(Florian Bleibinhaus, Robert Scholger)

General contributions from theoretical or applied geophysical research.

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.

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.

Igneous and Metamorphic Petrology

(Fritz Finger, Benjamin Huet)

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.

Mining, Mechanical Excavation and Alternative Fragmentation Methods

(Philipp Hartlieb, Elisabeth Clausen)

Low impact and highly productive excavation methods are the key to boosting sustainability of mining operations. We welcome contributions to mechanical excavation, alternative rock fragmentation methods but also improvement of drill and blast operations. These can be both from an experimental and numerical perspective.

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.

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.

Reservoir Engineering: Multiphase Flow on the Pore Scale and Upscaling

(Holger Ott, Pit Arnold)

Many reservoir engineering problems are related to multiphase flow physics. Multiphase flow determines to a large extent fluid-displacement efficiencies and sweep effects in reservoirs. 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 to understand the underlying mechanisms and to 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 and the upscaling to the continuum scale. Studies of complex displacements as typical for enhanced oil recovery, CO₂ 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.

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.

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.

Young Sediments

(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 palaeoenvironments 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.

Young Scientists' Session

(Markus Palzer-Khomenko, Moritz Bauer)

Young scientists get only few chances to test and train their ability of presenting their work and results. In most cases, these opportunities lack comprehensive feedback. Most of the feedback given is scientific and concerns rather the scientific work itself and only rarely the quality of the presentation. Nevertheless, a good, professional and convincing presentation plays an important role in the world of science and for a successful professional career.

Therefore, we offer a special session for students to present their scientific work with focus on their appearance and performance. We take the time to discuss your strengths and weaknesses in a positive, constructive atmosphere. Seize the opportunity of getting feedback from a jury of young and experienced scientists and from the audience itself and benefit from feedback given to other participants.

Landesgeologie im Dienste der Bevölkerung

(Vorsitz: Konrad, Schröttner)

Dr. Mair (Südtirol)

„Wissen um zu schützen – die Bedeutung einer detaillierten geologischen Karte für Gefahrenzonenplanung und Risikomanagement im alpinen Raum“

Gefahrenzonenplanung und Risikomanagement sind Begriffe, welche immer häufiger gebraucht werden und schon fest im alltäglichen Sprachgebrauch eingebaut sind. Insbesondere dann, wenn zudem das überstrapazierte Wort „nachhaltig“ im selben Satz auftaucht.

Interessanterweise kommen dann aber sehr schwammige Modelle zur Anwendung, wenn es zur Umsetzung der Gefahrenzonenplanung und zum Einsatz eines Risikomanagements kommen soll. Dann werden vielfach statistische Modelle herangezogen, Simulationen mit digitalen Höhenmodellen bemüht und vor allem - um ganz modern herauszukommen - Satellitendaten ausgewertet und angepriesen, deren Auflösung zumeist unzureichend sind; deren Vor- und Nachteile und vor allem deren Anwendungsbereiche und Grenzen nur den wenigen wirklichen Experten bekannt sind. Zudem werden geologische und geothematische Karten aus dem letzten Jahrhundert als Grundlage verwendet, welche keinesfalls dem Stand der Technik und der Wissenschaft entsprechen. Das heißt nun überhaupt nicht, dass die Karten falsch sind – sondern lediglich, dass die Karteninhalte nicht oder nur sehr begrenzt jene Informationen enthalten, die für eine moderne Gefahrenzonenplanung notwendig wären. Diese Fragestellung war zur Zeit ihrer Erstellung nie im Focus der Ersteller. Was es wirklich als Datengrundlage braucht, um eine Wissens- und Fakten basierte Analyse und Darstellung der hydrogeologischen Gefahren braucht, sind detaillierte geologische und thematische Karten in einem Maßstab, der für die Raumplanung notwendig ist: 1:25.000, wenn geht 1:10.000. Nur

so lassen sich die notwendigen Inhalte und Informationen darstellen, die letztlich als Eingangsparameter für die Simulationen, Szenarienbildungen und Berechnungen dienen. Nur so können Kartenderivate entstehen, die für die Raumordnung und den Zivilschutz nutzbar sind.

Mag. Einberger (Oberösterreich)

„Steinschlaggefährdung eines touristisch stark frequentierten Wanderweges und die damit verbundenen Schwierigkeiten“

Steinschläge entlang von Wanderwegen stellen vermehrt die Wegerhalter und auch die Tourismusgemeinden in schwierige Situationen. Wie sollen wir damit umgehen und was können wir Landesgeologen dazu beitragen diese Konflikte zu minimieren, ist hier die Frage.

Mag. Konrad (Steiermark)

„Der Felssturz von Pürgg – vom Ereignis bis zur Sicherung“

Die Felsstürze im November 2018 und Jänner 2019 zeigten, dass eine stabil geglaubte Felswand keine Gefährdung für den oberen Ortsteil von Pürgg darstellt. Die stummen Zeugen berichten jedoch anderes. Wie kann nun die verbliebene Felswand beobachtet werden und wie sieht eine Sicherung des Ortsteils aus.

Dr. Schlamberger (Kärnten)

„Data Mining – Rohstoffe der Zukunft!“

Im geologischen Landesdienst fallen viele Daten aus unterschiedlichen geologischen Fachbereichen an. Diese Daten werden bei uns archiviert und in Datenbanken georeferenziert gesammelt. Verschiedene Beispiele für die Anwendung und Auswertung dieser Daten in der Praxis werden vorgestellt.

Dr. Fritz (Universalmuseum Steiermark)

„Portale zu Geologie-Daten der Steiermark“

Hier werden die verschiedenen Plattformen vorgestellt, auf den geologischen Daten zu finden sind, die nicht nur für Experten, sondern auch für interessierte Studenten und Bürger zur Verfügung stehen.

Mag. Schröttner (Steiermark)

„Vom Altbergbau zur Altlast“

Im Zuge von ergänzenden Untersuchungen gem. §13 Abs 2 wurde in der Steiermark ein ehemaliger Bergbau – Hüttenstandort untersucht. Anhand dieses Fallbeispiels, welches ein Ortszentrum betrifft, wird die Vorgehensweise von Beginn der Untersuchungen, über Kartierung, geochemische Probenahme, Beprobung von Nutzpflanzen und Grundwasser bis hin zum Informationsmanagement gegenüber der betroffenen Bevölkerung sowie die Sanierung dargelegt.

Mag. Eder (Steiermark)

„Erdwärmennutzung am Beispiel von Erdwärmesonden in der Steiermark“

Die Nutzung von im Untergrund gespeicherter thermischer Energie („Erdwärme“) in Form von Erdwärmesonden erfreut sich in der Steiermark wachsender Popularität. In diesem Vortrag soll daher auf folgende Themenbereiche eingegangen werden:

- Arten und Funktionsweise von Erdwärmesonden
- Problemstellungen/Risiken bei Planung, Errichtung und Betrieb
 - Exkurs: Vorhandensein von gespannten oder artesisch gespannten Grundwasserkörpern in der Steiermark (wasserrechtliches Bewilligungsverfahren)

- *Strategiepapier: „Die Gewinnung von Erdwärme in Form von Vertikalkollektoren (Tiefsonden)“ des Amtes der Steiermärkischen Landesregierung*
- *Erfahrungen aus wasserrechtlichen Bewilligungsverfahren*

* Please follow program updates on pangeo2020.unileoben.ac.at.