

23rd to 27th September 2024, Salzburg Austria



Pangeo-DEUQUA 2024

Third Circular

pangeo-deuqua2024.at



Dear colleagues,

we are delighted to welcome this year's joint Pangeo-DEUQUA conference to one of Austria's most historic and attractive cities, Salzburg. This is the third time that Salzburg will host Pangeo; the two previous meetings having been held in 2002 and 2012. We hope that it will again bring together leading academic scientists, researchers, research scholars and practitioners to exchange and share their experiences and research results on a range of aspects of earth science.

The upcoming joint Pangeo-DEUQUA conference will take place on **23rd to 27th September 2024**. It will be held **at the Faculty of Natural and Life Sciences of the Paris Lodron University Salzburg (PLUS), Hellbrunner Str. 34, 5020 Salzburg**. Under the heading "**Converging Spheres**", this conference provides an open platform for presentation of research carried out at universities, other organizations, and companies.

This year the Pangeo meeting is being held jointly with the biennial German Quaternary Association (DEUQUA) meeting. The DEUQUA is the main Quaternary research society for Germany, Austria and Switzerland, and its meetings are alternatively held in these three countries. Its focus is on the Quaternary period, but DEUQUA meetings offer a broad forum on related topics including earth surface processes and climate change. As such, combining the two meetings will bring together people with some common interests and enable an exchange of ideas and allow for interdisciplinary discussions of topical issues. The conference will also provide an excellent opportunity to initiate or further the collaboration of geoscientists from Austria and its neighbours. The conference motto "**Converging Spheres**", therefore, refers not only to the multi-sphere technical and scientific content, but also to the bringing together of a wide range of people with a common interest in earth sciences.

We have put together a comprehensive program, which includes a range of excursions in and around Salzburg. On Monday 23rd September, there will be two full-day workshops specifically aimed at students and earth science teachers respectively. The conference itself will consist of two parallel programs: the DEUQUA meeting on Tuesday 24th to Thursday 26th September, will keep the classical session format where consecutive oral contributions will cover a range of topics (see below). The 'Landesgeologen' of Austria and 'Landesämter' of Germany will be organized in a joint session within this part of the program. In addition to the classical format of these DEUQUA sessions, there will be a new conference format, where individual sessions will be initiated by invited speakers who will provide a stimulus for discussion. These plenary sessions will be on Tuesday, 24th September. On Wednesday, 25th September, 4 parallel, themed workshops will focus on poster and short oral presentations from the scientific community. The aim of these workshops is to encourage fruitful discussion. Workshop leaders will compile the main outputs of each workshop for presentation on Thursday 26th September to a wider audience.

Pre-conference workshops (Monday 23rd September)

Students' Workshop

Thermochron Workshop, 9 am – 6 pm, HS 435

Led by: **Bjarne Friedrichs, Bianca Heberer, Nicolas Villamizar, Christoph von Hagke**

Having established a new Thermochronometry Core Facility at the Paris Lodron University Salzburg (PLUS), we invite you to gain insights into this evolving field through our one-day workshop on Low-Temperature Thermochronology for students and scientists eager to learn about Low-Temperature Thermochronology and possibly apply it in their own research.

Contents:

- Theoretical Introduction (Basics and Applications of Low-Temperature Thermochronology)
- Sample Preparation (Crystal Selection and Documentation for (U-Th)/He Dating)
- Lab Tour (Demonstration and Explanation of (U-Th)/He Analytical Routines)
- Thermal History Modeling (Fundamentals and Exercises using Synthetic and Natural Data)

Language: English, free of charge, coffee breaks included

Teachers' Workshop, 10 am – 5 pm, C 3.006

Why geology is needed in the classroom (in German)

Led by: **Bernhard Hubmann**

The workshop is aimed equally at biology and geography teachers from all school types and at colleagues from geological subjects who are interested in teaching earth science topics. The program consists of lectures, the opportunity to try out teaching materials yourself and, above all, sufficient time and space for discussion.

Hilberg, Sylke	Geologie begreifen – digitale Lernspiele und analoge Modelle für den Geologie - Unterricht
Unger, Clara-Louisa	Erdwissenschaften und Schulbücher
Nievoll, Gabriel	"Die unsichtbaren Schätze im Klassenzimmer: Kritische Rohstoffe für eine nachhaltige und digitale Welt"
Riedl & Gulas-Wöhri	Young European GeoExplorer
Moser, Bernd	„Es sind die G'schichten, Herr Professor...“ – Erfahrungen und Erkenntnisse aus 22 Jahren Edelsteinkunde-Unterricht im Fachbereich „Schmuck Metall Design“ an der HTL Ortweinschule Graz.
Hubmann & Krenn	Die Grazer Perspektive auf das Lehramtsstudium Biologie und Umweltkunde: wie sieht die Ausbildung aus und wie „ticken“ die Studierenden?

Conclusion: Discussion on the forthcoming reduction in teacher training programs.

Participation in the teacher workshop is free of charge. Please select the appropriate option when registering at www.pangeo-deuqua2024.at, language: German, coffee breaks included

Ice Breaker (Monday, 23rd September, 7 pm, Mensa)

We look forward to welcoming you to our Ice Breaker at 7 pm on Monday evening at the conference venue. The cost is included in the conference registration fee, and no extra registration is required.

Pangeo-DEUQUA Opening

(Tuesday, 24th September, 8:30 am – 8:45 am, Audimax)

Words of welcome

Pangeo Award Ceremony of the ÖGG

(Tuesday, 24th September, 8:50 am – 10 am, Audimax)

10 am – 10:30 am COFFEE BREAK

Pangeo Plenary Session (10:30 am – 6 pm, Audimax)

Impulse talks by invited speakers. Talks are related to the different workshop topics on Wednesday.

Arne Ramisch, Universität Innsbruck: Tracing Elements to Landscapes: Core Scanning and the Dynamics of Earth's Surface

Andreas Wölfler, University of Hannover: The Austroalpine units to the east of the Tauern Window. A key-area for understanding the Cretaceous and Cenozoic Orogenies. New data, models and open questions

12:30 – 2 pm LUNCH BREAK

Jochen Kolb, Karlsruher Institut für Technologie: Lithium resources in geothermal brines of the Upper Rhine Graben and possible extraction technologies

Alissa Kotovsky (Utrecht University), Caroline E. Seyler, James D. Kirkpatrick: How 'refrigeration weakening' drives catastrophic subduction initiation

4 pm – 4:30 pm COFFEE BREAK

Jan Piotrowski, Aarhus University: Water at the ice-bed interface and below: processes, sediments and landforms

Gaudenz Deplazes, Nagra: Tracing glacial erosion in Quaternary sediments of Northern Switzerland

DEUQUA Sessions

(Tuesday, 24. September, 8:50 am - 5:30 pm, Blue lecture hall)

Terrestrial records of paleoenvironments and -climates

(8:50 am – 12:30 pm, Blue lecture hall)

Chaired by Tobias Sprafke, Philipp Schulte & Stephanie Neuhuber

8:50 am – 10:00 am Terrestrial records of paleoenvironments and -climates I

Terhorst et al.	The relevance of periglacial cover beds and interbedded loess-like slope deposits
Böse et al.	The challenge to decipher Late Pleistocene to Holocene geomorphological processes in the Taiwanese mountains
Novak, Andrej	From seasons to centuries: activity of sedimentary processes on alpine alluvial fans (Planica Valley, NW Slovenia)
Sauer, Daniela	When and why did floodplain sediments in Mongolia start to accumulate?

10:00 am – 10:30 am COFFEE BREAK

10:30 am – 11:30 am Terrestrial records of paleoenvironments and -climates II

Stojakowits et al.	Environments during the Late Middle Pleistocene in the Heidelberg Basin, Upper Rhine Graben (Germany)
Labahn et al.	Cyclicity patterns within Quaternary vega formation on the eastern Canary Islands
Mayr et al.	A composite geochemical record based on X-ray fluorescence scanning and radiocarbon dating for the Upper Palaeolithic site Kammern-Grubgraben (Austria)
Vinnepand et al.	Lake Bosumtwi – A million year record of hydro-climate oscillations in West Africa

11:30 am – 12:30 pm Terrestrial records of paleoenvironments and -climates III

Prochnow et al.	A 7500 year long, 30-yr-resolution $\delta^2\text{H}$ record from Moossee, Switzerland, indicates strong influence of solar activity on paleohydrology
Oehler et al.	Central European LGM temperatures revealed using an innovative luminescence approach
Rettig et al.	Glacier evolution in the Valsugana (south-eastern European Alps) during the Last Glacial Maximum and the Late Glacial
Asch et al.	The International Quaternary Map of Europe and Adjacent Areas: Based on a plethora of detailed regional mapping results

12.30 - 2 pm LUNCH

2 pm – 4 pm POSTER SESSION (Entrance hall)

Terrestrial records of paleoenvironments and -climates (thematically listed)

Otto et al.	Reconstructing past glacier extents in the Chilean Altiplano (18.5°-19° S) - Regional patterns and paleoclimatic implications
Griesmeier, Le Heron	What happened after the Last Glacial Maximum in the Sölk Valleys (Styria, Austria)?
Winsemann et al.	Entangled external and internal controls on periglacial alluvial fan evolution: the Late Pleistocene Senne and Heller fans in the Münsterland Embayment and Elbe Valley (Germany)
Eder et al.	The sedimentological anatomy of a landslide in Embach, Salzburg.
Marburg et al.	Introducing DFG-research project RO 7078/2-1: Late Pleistocene dune archives spanning from the Canary to the Tyrrhenian Basin – Paleoenvironmental reconstruction via dust imprint from source areas in northern Africa

Zeeden et al.	Reconstructing past climate from Loess-Palaeosol Sequences: Challenges of calibration functions
Kögler et al.	Pleistocene river terrace development in the Baza Basin, Spain: Processes and chronology
Meng et al.	Holocene mollusc faunas in a northern German lowland river system of the Baltic Sea region (Peene River, Mecklenburg-Western Pomerania)
Wulf et al.	Preliminary geochemical results from a gravity core from Stechlinsee in northeastern Germany
Wrozyña et al.	Middle to late Holocene climatic changes in the Dominican Republic, Caribbean Region, deduced from ostracode and coral stable oxygen and carbon isotope values.
Biermanns	Adiabatic winds, put into mathematical formulas

Regional Quaternary und applied geology (in alphabetical order)

Asch, Kristine	IQUAME 2500 - The International Quaternary Map of Europe and Adjacent Areas, scale 1:2,5 million: Hands-on Harmonisation and Review of the Austrian and German part
Rother et al.	Die Forschungsbohrungen Concordia-See und Königsau (ehemaliger Ascherslebener See, Sachsen-Anhalt): Neue Multiproxy-Analysen zur detaillierten Gliederung der Weichsel-Kaltzeit
Weidenfeller et al.	Integrated geological map of the East Eifel Volcanic Field (EEVF)

Anthropogenic impact on the development of landscapes

Boettcher et al.	The search for environmental changes in the tropical Lago Enriquillo (Dominican Republic) using multi-isotope (H, C, N, O, S) partitioning
Koukal et al.	FT-IR microplastics identification in natural sediments of Austria and the Republic of Korea – introduction and first results
Pauly et al.	OSL dating of Holocene fluvial sediments of the Wiesent River in the Northern Franconian Alb (Bavaria, Germany)
Schneider et al.	Anthropogene Kleinreliefformen als Relikte früherer Landnutzung – Großflächige Kartierung aus digitalen Geländemodellen
Wulf et al.	Preliminary geochemical results from a gravity core from Stechlinsee in northeastern Germany

4 pm – 4:30 pm COFFEE BREAK

4:30 pm – 5:30 pm Keynotes Workshop: Glacial erosion and deposition
(DEUQUA & Pangeo, Audimax)

Jan Piotrowski: Water at the ice-bed interface and below: processes, sediments and landforms
Gaudenz Deplazes: Tracing glacial erosion in Quaternary sediments of Northern Switzerland.

5:30 pm – 7 pm DEUQUA General Assembly (Blue lecture hall)

Conference Dinner (Tuesday, 24th September, 7 pm, Mensa)

The conference dinner will take place at 7 pm at the conference venue on Tuesday evening. The cost (including drinks) is €45,00. Please register with the conference registration.

Full-day Workshops

(Wednesday, 25th September 8.30 am – 6 pm, various lecture rooms)

Special issues of the [Austrian Journal of Earth Sciences – Home \(ajes.at\)](http://www.ajes.at) are planned and will include workshop results and contributions are very welcome!

Workshop Earth Surface Dynamics (8:30 am – 6 pm, HS 434)

Responsible organizers: Michael Strasser, Jörg Robl, Sylke Hilberg

The morning of the workshop will be dedicated to the presentation of the submitted studies and the discussion of the research results. In the afternoon, under the motto "Bringing together early career scientists and established researchers", we will work in break-out groups on research questions in the field of Earth surface dynamics. We will vote on several possible research questions in the coming weeks, but we also welcome suggestions from workshop participants via e-mail (joerg.robl@plus.ac.at). In addition to the joint scientific work, we would like to emphasize the mentoring and networking of early career scientists. The break-out groups will be composed of established researchers and early career scientists, so that the combined expertise can be used to solve specific scientific questions and problems.

The 25 contributions to the workshop are thematically divided into the three thematic blocks "*Mass movements*", "*Water, weathering and fluxes*" and "*Landscape evolution*" and will be presented in the form of posters. Each of these blocks will be opened with a 12 (+3) minute keynote lecture. In the following short impulse presentations (3 minutes), the poster contributions will be briefly presented with selected highlights. We will allocate 1.5 hours in the morning for the subsequent poster session. We encourage the participants of the afternoon workshop to include the poster contributions and to ensure a lively exchange between the groups.

BLOCK 1 | Mass movements (Keynote talk: Patrick Oswald)

Oswald et al.	New perspectives on volume and emplacement dynamics of the Köfels rockslide deposits by combined geophysical–geological studies
Westreicher et al.	Multiple Datierung eines Holozänen Bergsturzes am Stöttlbach in der Mieminger Kette (Nördliche Kalkalpen, Tirol)
Ortler et al.	Signals of two earthquakes at Lake Altaussee (Salzkammergut, Austria)
Uhlir	Exceptional gravitational mass movements within the Austrian UNESCO Geoparks
Fink et al.	Recent sediment dynamics in the landslide-debris flow complex of the Sattelkar, Obersulzbachtal, Hohe Tauern
Haunsperger et al.	3D modeling of topographic stress in alpine landscapes: the competition between relief formation and destruction
Hergarten	A modified Voellmy rheology for modeling rapid mass movements

BLOCK 2 | Water, weathering, and fluxes (Keynote talk: Benedikt Pleyer)

Pleyer et al.	Chemical erosion and dissolved load of a calcareous torrential catchment in the northern Alps
Schultz & Bufer	Weathering fluxes under moderate erosion rates – the case of the Black Forest, Germany
Hilberg & Hauser	Grubenwässer der Altbergbaue im Geopark Erz der Alpen
Winkler et al.	Das Abflussverhalten von Blockgletschern und übergeordneter alpiner Einzugsgebiete – ein Blick in die Zukunft
Vremec et al.	Trend analysis of Alpine Spring discharge in Austria: Interplay between climate and catchment characteristics

Höfer-Öllinger	25 Jahre Quartär- und Hydrogeologie des Nordöstlichen Flachgaus
Tenczer et al.	Alpine soils from the Rieding valley: geochemical, mineralogical and granulometric analysis
Kahre & Otto	Sediment core analysis of glacial lakes Löbbensee and Salzbodensee, Hohe Tauern, Austria

BLOCK 3 | Long term landscape evolution (Keynote talk: Maud Meijers)

Meijers et al.	Quantifying surface elevations in deep time through stable isotope paleoaltimetry
Stuewe et al.	Surface uplift of the Eastern Alps - much faster than we thought?
Robl et al.	Old orogen - young topography: lithology governs landscape evolution in the uplifting Bohemian Massif
Ranftl et al.	Miocene and Quaternary sediments in the Wachau region, revisited
Brisson et al.	Using low temperature thermochronometers for model selection: an approach for choose the best geometry for the Eastern Alps
Rau et al.	Investigating the Influence of Uplift on the Central European Drainage Pattern using a Landscape Evolution Model
Dremel et al.	Old Orogens - Young Topography: Exploring the Effects of Continental Rifting on Erosional Dynamics and Topographic Development
HAMPL et al.	Uranium-, vanadium- and chromium-bearing reduction spheroids in karst bauxite of the Unterlaussa mining district (Upper Austria)
Eichkitz et al.	Geoelektrik und Sub-Bottom Profiling an der Grenzmur im Bereich Bad Radkersburg
Nuss et al.	Holocene Coastal Dynamics in the Eastern Gulf of Thailand

Combined Workshop Earth's Spheres (Crust, Mantle & Core) and Regional Geology (8:30 am – 18 pm, HS C 3.006)

Leaders: **Bernhard Grasmann, Christoph von Hagke, Walter Kurz, Bianca Heberer**

Understanding the spatial and temporal evolution of the system Earth requires studying geologic processes based on knowledge of composition, rheology, and thermal structure of crust and mantle, as well as feedback processes between the different spheres of the Earth. To do this, regional geological studies are essential.

This workshop aims to bring together multidisciplinary research contributions that explore the structure and dynamics of lithospheric and asthenospheric upper mantle across a range of tectonic settings (e.g., subduction zones, transform faults, rifts, orogens) and length scales using techniques and datasets from various fields, including but not limited to tectonics, seismology, physical and numerical modelling, geochronology, petrology, and mineralogy. During the workshop we will discuss these topics at posters, in interactive longer as well as short presentations (PICOs) and breakout sessions.

BLOCK 1 (8:30 am-10:00 am) Petrology & Geochronology (Chairs: W. Kurz & C. von Hagke)

Talk 1 & 2 (12+3 minutes)

Hollinetz et al.	Not sexy, but still dateable: Unravelling the P-T-t-d evolution of low-grade Permian metasediments using xenotime geochronology (Austroalpine Unit, Eastern Alps)
Költringer et al.	The Sankt Leonhard nappe: HP-UHT metamorphic rocks within the Gföhl Nappe System, where and how to draw the nappe boundary

Picos à 2 minutes, followed by posters:

Sawasdee et al.	Geochronology, Geochemistry and Petrology of Metabasites and Metadacites from the Nan Suture Zone, Northern Thailand
Santitharangkun et al.	Petrology and Geochronology of Igneous and Metamorphic Rocks from the Inthanon Zone: Implications for the Tectonic Evolution of Northwestern Thailand
Fehleisen et al.	Petrology and geochemistry of the Belhelvie and Arnage-Haddo House gabbro intrusions and their contact aureoles - Aberdeenshire, Scotland
Raso et al.	Diabases are petrologists' best friends: quantitative P-T constraints on the Eoalpine metamorphic gradient in the Ötztal nappe using diabase dikes
Karner-Rühl et al.	Pre-Alpine Metamorphism in Alpine low-grade metamorphic units in the Eastern Alps
Arnold et al.	Petrographie exotischer Gerölle aus dem Helvetikum im Gschliefgraben (OÖ)
Haas et al.	Provenance of the Permo-Mesozoic cover sediments of the Seckau-Schladming nappe system revealed by detrital zircons
Haas et al.	Unravelling the pre-Alpine evolution of Alpine basement units by U-Pb zircon geochronology – a case study of the Austroalpine Schladming nappe system
Heberer et al.	Deciphering the 4-D evolution along and across the Insubric Line using a multi-method geo- and thermochronological approach

**BLOCK 2 (10:30 am - 12:30 pm), Tectonics and Structural Geology 1
(Chairs: B. Grasemann & B. Heberer)**

Talk 1 – 4 (12+3 minutes)

DeFelipe et al.	Characterizing gravimetric and magnetic anomalies in the South of Salamanca (Spain): implications on the tectonic structure and Sn-W mineralizations
Villamizar-Escalante et al.	Slab length and slab tearing control asymmetric exhumation of the Calabrian Arc
Sieberer et al.	Control of lateral strength variations on deformation of the Adriatic plate: insights from lithospheric-scale analogue models
Hinsch et al.	Geometrical kinematical forward modelling of stages in easternmost Alps development

Picos à 2 minutes, followed by posters:

Ortner et al.	Thrusts and unconformities in tectonic maps: The Trattberg thrust and the Trattberg fault system
Iglseder et al.	Initial exhumation of the Upper Austroalpine Unit along the Walchen Shear Zone (Styria, Austria)
Neubauer et al.	Controls of the collisional architecture in an evaporite-bearing fold-thrust wedge: the central Northern Calcareous Alps
Louis et al.	Low-temperature thermochronology and vitrinite reflectance data reveal long-wavelength exhumation of the Molasse basin
Pengg et al.	Petrophysical and sedimentological characterization of fault rocks from the Vienna Basin: Implications for induced seismicity and fault reactivation
DeFelipe et al.	Alpine deformation mechanisms along central and north Iberia Peninsula: a wide-angle seismic cross-section
von Hagke et al.	Triangle Zones as Mechanical Gages for Fold-Thrust-Belts
Barjaktarović et al.	Inner Dinarides revisited: Opening and closure of a Neotethys branch in Western Serbia
Guo et al.	Cenozoic tectonic evolution of the West Qinling and its effects on the Cenozoic climate evolution, NE Tibetan Plateau

BLOCK 3 (14:00 pm - 16:00 pm), Tectonics and Structural Geology 2

(Chairs: B. Grasmann and Christoph von Hagke)

Talk 1 – 4 (12 +3 minutes)

Neubauer	Tectonic models for the Austroalpine structure in Eastern Alps: nomenclature matters
Hinterwirth et al.	Re-interpretation of the TRANSALP seismic section in the light of a new tectonic subdivision of the western Northern Calcareous Alps
Pomella et al.	The Subpenninic units in the southwestern Tauern Window
Brandner	Permotrias-Paläogeographie der westlichen Nördlichen Kalkalpen und deren Zwangspunkte bei Deckenüberschiebungen und Seitenverschiebungen.

Poster session and plenum discussion

BLOCK 4 (16:30 pm - 18:00 pm), Paleontology & Stratigraphy & Mapping

(Chairs: W. Kurz and B. Heberer)

Talk 1 – 5 (12+3 minutes)

Kettler et al.	Drive by vestiges of the past: A non-salient Vertebrate track site from the Upper Triassic near Lake Achensee/Tyrol
Harzhauser et al.	The Neogene of the Vienna Basin between geodynamics and global climate
Mrdak et al.	Enigmatic traces of volcanism in the Rhaetian of a far-travelled Late Triassic Hallstatt nappe in northern Montenegro
Kranner et al.	Continuative foraminiferal research using the Enhanced Benthic Foraminifera Oxygen Index
Haider	Tethys Research Data Repository – an approach to provide sustainable and readable valuable geoscientific data for further research

Picos à 2 minutes, followed by posters:

Neubauer	Facies analysis in a poorly exposed siliciclastic area: the Upper Cretaceous basal Gosau Conglomerate at Gaisberg, Austria
Hofmayer et al.	Revision of the „Robulus-Schlier“ in Austria – A stratigraphic enigma in the North Alpine Foreland Basin
Diersche	Blassangerl-Hundstodscharte Fm - a new Lower to Middle Miocene lignite formation from the Steinernes Meer, NCA/Tirol, Germany and Austria
Diersche et al.	The Ledererkar Formation: a new Late Jurassic Formation with type-locality in the Steinernes Meer (Northern Calcareous Alps)
Hofmayer et al.	A new vertebrate fossil in Upper Austria – Preparation, 3D Modelling and Regional Geology
Andreea et al.	Jurassic to Early Cretaceous history of the obducted Mirdita ophiolites in Albania: new insights based on a Late Jurassic – Early Cretaceous sedimentary succession above the from Mali I Shejtit
Hintersberger et al.	EAGLe = Erstellung der Allgemeinen Geologischen Legende für Österreich im Maßstab 1:50.000

Mineral Raw Materials, and Energy Transition (8:30 am – 18:00 pm, HS 435)

Leaders: **David Misch, Frank Melcher**

The workshop Mineral Resources and Energy Transition will address aspects of the sustainable use of geoenery (e.g. geothermal energy production, natural hydrogen), energy storage (e.g. hydrogen, green methane, thermal energy), carbon capture and storage (CCS) and the production of mineral resources in connection with the technologies needed for the energy transition (photovoltaics, wind energy, battery systems). There will be a combination of keynote speeches (morning), a classical poster session (afternoon) and open discussions (morning/afternoon). The results of the workshop will be summarized by the co-chairs in a final presentation on the last day of the conference. A short summary of the workshop will be distributed among the workshop participants.

BLOCK 1 (08:30 am - 10:00 am) Mineral Resources & Geoenery,

Impulse talks 1

08:30 am – 08:40 am Opening

Talk 1 – 4 (15+5 minutes)

Melcher	The Critical Raw Materials Act: what does it mean for domestic production?
Bertrandsson Erlandsson et al.	The Eastern Alpine metallogenic province: a resource of critical and strategic elements?
Hölzel	Geoenery – Ziele, Potentiale und Forschung in Österreich
Kulich & Ott	CO2 storage options in Austria & current developments

COFFEE BREAK (10:00 am -10:30 am)

BLOCK 2 (10:30 am - 12:30 am) Mineral Resources & Geoenery,

Impulse talks 2

10:30 am - 10:40 am, Block 1 recap

Talk 5 – 7 (15+5 minutes)

Angerer et al.	Geological Surveys as multiplier for domestic exploration incentives – Austria’s response to the Critical Raw Materials Act
Nachtmann	Fossil Energy Sources in Light of the Energy Transition
Conradi et al.	Aquifer Thermal Energy Storage (ATES) – Review of Principles, Significance and Feasibility of ATES Applications in Neogene Strata from the Vienna Basin

11:40 am - 12:30 am Open discussion and wrap-up of morning session (Blocks 1+2)

LUNCH BREAK (12:30 am -13:30 pm)

BLOCK 3 (13:30 am – 14:45 am) Mineral Resources & Geoenergy,

Poster session (5 min slots per poster, listed in alphabetical order)

Akhverdiev et al.	Methodical seismic inversion techniques for quantitative interpretation in the Libyan Murzug basin
Altenberger et al.	Innovative stream sediment analysis for tungsten exploration: A case study in the Rauris Valley (Salzburg, Austria)
Arató et al.	Fingerprinting natural graphite deposits
Bakker et al.	The origin of sparry magnesite deposits of Brumado (Bahia, Brazil) - evidence from fluid inclusions
Bokelmann et al.	Passive seismic imaging for geothermal reservoirs: the Schwechat depression under Eastern Vienna
Efendiyev et al.	Geomechanical modeling of well sections based on the results of complex geophysical and geological-technological studies during the drilling process
Geringer et al.	Polyphase deformation of the Graz Paleozoic recorded in the Pb-, Zn-, Ba- and Ag-bearing Arzberg deposit
Gopon et al.	Precious and critical metal potential of historic Cu-Au-As mine waste in the Eastern Alps
Jud et al.	Seismische Exploration für tiefe Geothermie in Braunau– Akquisition und Processing einer kabellosen 2D-Vibro-Seismik mit STRYDE Nodes.
Sachsenhofer et al.	From peat facies to oil quality: Investigations in the Barito Basin (Indonesia)
Safaei et al.	CO ₂ Storage Potential of Low-rank and Medium-rank coal deposits from Austria and Kazakhstan
Shi et al.	Unraveling the micromechanical response to mudstone compaction: A combined approach of nanoindentation mapping and machine learning data analysis
Skerbisch et al.	Comprehensive characterization of rock salt from the Haselgebirge Formation: Insights for cavern storage of hydrogen
Weitz et al.	Geochemical characterization of the Göstling formation in the Scheiblingbachgraben: Implications for climate change and hydrocarbon potential

BLOCK 4 (14:45 am – 16:30 am) Mineral Resources & Geoenergy,

Open discussion and wrap-up of the workshop

Glacial erosion and deposition (8:30 am – 12:30 am, Audimax)

Leaders: Lukas Gegg, Jörg Lang

This workshop will focus on aspects of erosion and deposition by (paleo)glaciers, their interactions with the landscape, and their traces in the geological record. The workshop starts with a brief introduction by Gaudenz Deplazes & Jan Piotrowski. It will be divided into 3 thematic blocks, each comprising 5 short presentations of 3 minutes each (max. 2 slides) and around 60 minutes discussion time at the posters in front of the lecture hall. The workshop ends with a final discussion in the plenum (~30 min).

BLOCK 1: Regional scale

Cohen-Corticchiato et al.	Erosion and sediment transport by subglacial water in the Rhine glacier during the LGM
Kamleitner et al.	Alpce - ongoing compilation of geochronological & geo(morpho)logical constraints on Alpine paleoglacier evolution
Firla et al.	The timing of the infilling of glacially overdeepened structures from the northern Alpine foreland in the context of tunnel valleys from the Fennoscandian ice shield
Jungdal-Olesen et al.	Modelling tunnel valley erosion in northern Germany during the first icesheet advance (Elsterian, MIS 12) – a conceptual model and preliminary

Lang et al.	Structural control on tunnel-valley incision: Fact or fiction?
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BLOCK 2: Landform scale

Fiebig et al.	End moraine system of Lake Altaussee.
Schmalfluss et al.	The paleolake deposits of Bad Aussee (Austria): New insights into pre-LGM inner-alpine landscape dynamics of the Eastern Alps
Kettler et al.	Unravelling the maximum extent of Middle Pleistocene Glaciation in the Ybbstal Alps, Austria
Pomper et al.	Overdeepening-fill profiles in southwestern Germany
Breuer et al.	Sedimentary Architecture of a Pleistocene Tunnel-Valley Fill from 3D Seismic Data in the German North Sea
Hofmann & Kox	Extent and dynamics of the last glaciation in Kellwassertal, Harz Mountains, central Europe

BLOCK 3: Grain scale

Reitner & Menzies	Subglacial deformation, till formation and deformable bed conditions: The Late Pleistocene sequence of Einödgraben (Aurach, Kitzbühel Alps, Austria)
Heninger, Marianne	Bringing Order to Chaos: Micromorphological Analysis of Late Palaeozoic Glacial Diamictites
Piotrowski et al.	Response of till to subglacial shear stress simulated in ring-shear experiments derived from X-ray computed microtomography
Schuster et al.	Quantitative CT scan analysis: an innovative tool for interpreting ice-contact sediments from overdeepened basins of the northern Alpine foreland
Gegg et al.	A geotechnical view on glacial sediment profiles

Pangeo- Session (Wednesday, 25th September, 2 pm – 6 pm, HS 431)

Analytical Advances

Chairpersons: **Christoph Hauzenberger, Bjarne Friedrichs**

Earth Sciences rely on data generated by a wide range of analytical methods, with a continuous development of new instruments and applications. This session comprises five oral presentations (12 + 3 minutes) with an analytical focus with plenty of room for additional discussions and laboratory tours according to participants' interests afterwards.

Degenhart et al.	Micro-computer-tomographic mineralogical and textural evaluations of Egyptian Blue Spheres
Auer et al.	New multiproxy approaches in paleoenvironmental reconstruction – An example from a Late Miocene upwelling cell in the northwestern Indian Ocean
Santitharangkun et al.	EPMA and LA-ICP-MS monazite dating in the Western Gneiss Belt, Northern Thailand: An Over 200-Ma Spread of Dates
Altenberger et al.	Simplifying LA-ICP-MS data processing and interference correction using the non-commercial G.O.Joe software tool
Friedrichs et al.	Development of an analytical protocol for solution ICP-MS analysis in (U-Th)/He thermochronometry

Pangeo-DEUQUA Session (Wednesday, 25th September, 2 pm – 5:30 pm, Audimax)

Regionale Quartär- und angewandte Geologie (in German)

Chaired by Christian Hoselmann, Michael Hermann Konrad & Henrik Rother

Session of the German state offices (Landesämter) and Austrian state geological services (Landesgeologie).

2 pm – 4 pm Regionale Quartär- und angewandte Geologie I

Börner et al.	Aktueller Stand und Methoden der Bohrungsaufnahme im Quartär Mecklenburg-Vorpommerns
Meinsen et al.	Heterogener und tiefer als zuvor bekannt – aktueller Stand der Neumodellierung der Quartärbasis in Niedersachsen (Norddeutschland)
Endtmann et al.	Die Forschungsbohrung Klosterrohrbach in der Helme-Niederung (Sachsen-Anhalt) – Interdisziplinäre Untersuchungen an Sedimenten aus dem obersten Mittelpleistozän.
Posch-Trözmüller et al.	Fremddatenmanagement an der GeoSphere Austria
Melzner et al.	Ein GIS basiertes Dokumentations- und Kommunikationstool für Gemeinden im Katastrophenfall
Linner et al.	Hierarchische Liste der Gesteinsbegriffe der GeoSphere Austria – Standard für geologische Aufnahmen, Lithologie und Generallegende

4 pm – 4:30 pm COFFEE BREAK

4:30 pm – 5:30 pm Regionale Quartär- und angewandte Geologie II

Jawecki et al.	Landesgeologie Wien im U-Bahn-Bau: Geologie in Prognose und Ausführung
Vigl, Eva	Rutschung Hochreute in Hörbranz/Vorarlberg
Konrad, H. M.	Muren, Rutschungen, Felsstürze – der Landesgeologe im Katastropheneinsatz

Public Evening lecture (Wednesday, 25th September, 7 pm, Audimax)

The large cave systems of the Eastern Alps – Archives of landscape evolution (in German)

By **Lukas Plan (Naturhistorisches Museum Wien)**

The karst plateaus of the Eastern Alps contain about 15,000 caves, some of which are over 100 km long and/or 1 km deep. The talk will give an overview of these caves and what they tell us about the post Miocene landscape evolution.

Pangeo Discussion Session (Thursday, 26th September, Audimax)

8:30 am - 11:15 am Presentation of workshop results

DEUQUA Session (Thursday, 26th September, 8:30 am – 12 am, Blue lecture hall)

8:30 am - 10:00 am Anthropogenic impact on the development of landscapes

Chaired by Eileen Eckmeier & Anna Schneider

Wagreich, M.	Anthropocene Geology.
Grimm et al.	Late Holocene sedimentary floodplain architecture & human interaction of the Wiesent River (Northern Franconian Alb, Bavaria, Germany)
Hatzenbühler et al.	Anthropogenic stratigraphic signals downstream a metropolis: Extracting Vienna's signature from Danube River plain archives
Weißl et al.	Die Donau-Auen stromab von Wien als Sedimentarchiv

10 am – 10:30 am COFFEE BREAK

10:30 -11:30 DEUQUA Awards

Pangeo-DEUQUA Closing Ceremony (Thursday, 26th September, 11:30 am – 12 am, Audimax)

Conference closing ceremony including the poster awards and the passing of the baton.

Excursion program

Field trip 1, Monday 23rd September 2024 (Full day)

Engineering Geology - Großglockner Hochalpenstraße

Guide: Gert Furtmüller

The Grossglockner Hochalpenstraße leads over approx. 45 kilometers into the high alpine landscape up to an altitude of almost 2.400 meters and has been an Austrian landmark for around 90 years. The listed road leads through the Hohe Tauern National Park. On this field trip, for which a whole day is planned, a profile is traversed from Salzburg through the Northern Limestone Alps, the graywacke zone and ultimately various units of the Tauern Window. The construction of the Tauern Window and the challenge of maintaining and protecting the road in this high alpine region are also part of the excursion. The protection against gravitational natural hazards in a time of rapidly changing climatic conditions (heat days, permafrost & heavy precipitation) and on the other hand the preservation of the road in this sensitive landscape will be visited and discussed on site using several examples.

Planned stops include e.g. the i) Franz Josefs Höhe with a view of the Grossglockner and Pasterze, ii) Hochtörl and iii) Fuscher Törl.

Field trip 2, Monday 23rd September 2024 (Full day)

Sedimentological and structural evolution of the Salzburg-Reichenhall Gosau basin.

Guide: Franz Neubauer

Based on recent research, including MSc and BSc student's work, we will visit 7-8 key outcrops that illustrate the main stages of the sedimentary facies and structural evolution of the Gosau basin and its boundaries.

Field trip 3, Monday 27th September 2024 (Full day)

The tectono-sedimentary record in the central NCA: from passive margin to the onset of orogeny

Guides: Oscar Fernandez, Hugo Ortner, Diethard Sanders

The central NCA thrust sheets are detached above a Permo-Triassic evaporitic-clastic sequence (Haselgebirge - Werfen) that was deposited during the latest stages of rifting. The preserved Triassic to Lower Jurassic stratigraphic succession above records the progressive deepening of the ensuing Tethyan passive margin with ongoing salt tectonics. The overlying Middle Jurassic to Cretaceous sedimentary rocks record the initial inversion of the passive margin and are locally, strongly controlled by the interaction of pre-existing salt structures. The field trip visits outcrop and panorama (weather-dependent) stops in the Salzach and Lammer valleys (between Hallein and Abtenau).

Field trip 4, Monday 23rd September 2024 (Full day)

Rockfall, glacier recession and permafrost degradation: Long-term monitoring of climate change impacts at the Open-Air-Lab Kitzsteinhorn, Hohe Tauern

Guides: Ingo Hartmeyer, Jan-Christoph Otto

This full-day excursion will visit the Hohe Tauern Range (about 90 minutes from the city of Salzburg) where you will visit the summit region of the Kitzsteinhorn (3202 m a.s.l.). Here, the GEORESEARCH Forschungsgesellschaft has established long-term geoscientific monitoring to investigate the impacts of climate change which are particularly pronounced in high-alpine environments. The monitoring is based on a combination of surface (e.g. laser scanning, UAV surveys, crack meters etc.), subsurface measurements (temperature/inclination measurements in boreholes etc.) and investigates how rock stability is affected by rapid atmospheric warming. The excursion includes three consecutive cable car runs (~ 45 minutes) to the top station (3030 m a.s.l.) and short hikes around the study site to

inspect the monitoring sites (if the weather permits). Please bring appropriate protection against the cold (subzero temperatures possible) and the sun (strong UV radiation).

Field trip 5, Monday 23rd September 2024 (Full day)

Glaciers and mass movements in the Hohe Tauern range: from the LGM until now

Guides: Jürgen Reitner, Mathias Steinbichler

The trip will focus on the Rauris Valley and the lower part of the Fusch Valley, where well preserved successions of glacial and gravitational deposits can be studied. During the trip we will show how sedimentary successions of glacial, periglacial and gravitational deposits in combination with dating techniques lead to a model of landscape evolution driven by glaciers and mass movements for this inner alpine part of the Eastern Alps during the Late Pleistocene and the Holocene. At the head of Rauris Valley, we will visit crucial landforms and deposits for understanding the dynamic Late glacial to Holocene history of glacial stands and re-advances.

Field trip 6, Thursday 26th September 2024 (Half Day)

Sediment dynamics of a major glacier lobe: the Salzach Glacier in the North Alpine Foreland

Guides: Bernhard Salcher, Reinhard Starnberger

This field excursion visits some key landforms and sediments of the Salzach foreland glacier lobe that record glacial, glaciofluvial and associated postglacial processes during and after four foreland glaciations. Stops will follow the temporal succession of processes, from ice build-up to the period of maximum ice expansion, to ice wastage at the end of glacial cycles. The excursion will also visit sites of postglacial landscape evolution related to the dynamics triggered by warm periods following the glacial maxima.

Field trip 7, Friday 27th September 2024 (Full day)

Brunhes to burials – the Loess region Krems, Lower Austria

Guides: Tobias Sprafke, Robert Peticzka

This excursion is dedicated to loess, paleosols, and to Quaternary research history in the region around Krems a.d. Donau. The landscape at the eastern exit of the picturesque Wachau valley, carved by the Danube into crystalline basement rocks, is covered by thick loess and has a more than 100-year-long research history. World-famous are Late Paleolithic findings (e.g., the Venus of Willendorf and Stratzing, Wachtberg infant burials). We will pass Krems-Wachtberg, with a last glacial high-resolution loess record, which we have studied in detail before the closure of the excavation site. We visit still accessible, but almost forgotten tremendous loess outcrops known from literature. The loess-paleosol sequences Paudorf, Göttweig, and Krems have been type localities of the Quaternary until the 1970s. Our recent studies have identified the complex nature of these profiles, with marked discontinuities and polygenetic units. Transport will be by train.

Field trip 8, 27th September 2024 (Half Day)

The Salzburg City Mountains – A Cultural Geological Excursion **Guide: Christian Uhlir**

During a 3-hour hike over the Nonnberg, Festungsberg, and Mönchsberg, the formation of the Salzburg city mountains is presented, along with their position in the Salzburger Basin. Emphasis is placed on their significance for the historical development of the city of Salzburg, not only as a raw material resource but also as a natural hazard and a space where infrastructural- and medieval to early modern military installations have been incorporated.

Conference fee

Registration: €180, reduced fee for students: €120.

Price includes scientific program, ice breaker party and coffee breaks.

Participation at conference Dinner on Tuesday 24th (45 €) and field trips need to be booked during registration.

Lunch is available at the venue (around 7-9 €) or at nearby shops and restaurants.

Conference language: English and German.

*We look forward to welcoming you in Salzburg!
The Scientific and Organizing Committee of PANGEO / DEUQUA*

Preliminary conference schedule

Day	PANGEO	Joint program	DEUQUA	Evening
Mon, 23 rd	Pre-Excursions, Teachers' session, Student workshop	Pre-Conference Student workshop	Pre-Excursions	Ice Breaker
Tue, 24 th	Impulse presentations (Key notes)	Opening ceremony	Sessions	Conference Dinner
Wed, 25 th	Workshops, technical session	Landesgeologie (AT) Landesämter (Ger)	Sessions, Workshops	Public Evening Lecture
Thu, 26 th	Workshops: results & conclusions	Awards & Closing ceremony, Excursion	Sessions, Post-Excursions	
Fri, 27 th		Post-Excursions		

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