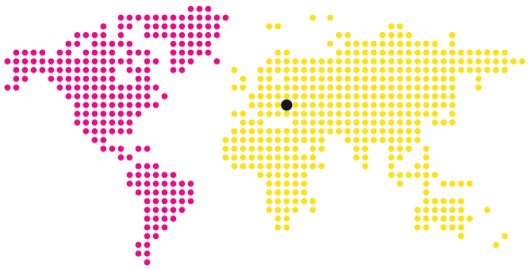
21.-25.Sept.2026



PANGEO AUSTRIA Graz

2nd Circular (3/2026)

„PANGEO AUSTRIA 2026“

„New Horizons in Geosciences and Geotechnics“

Dear colleagues,

Welcome to PANGEO AUSTRIA 2026.

We are delighted to welcome you to this year's PANGEO conference in Graz. Graz is hosting PANGEO for the third time; the two previous meetings took place in 2004 and 2014. This year, the meeting is being organized by NAWI Graz Geocenter. The conference will once again bring together scientists, students, and colleagues from the field to share their experiences and research findings on a range of aspects of the geosciences.

Since 2015, the NAWI Graz Geocenter has been pooling the scientific expertise of the Department of Earth Sciences at the University of Graz and the Institutes of Applied Geosciences, Rock Mechanics and Tunneling, as well as Soil Mechanics, Foundation Engineering and Numerical Geotechnics at Graz University of Technology in an inter-university cooperation network for scientific research and university teaching. The NAWI Graz Geozentrum thus combines basic and applied research, as well as earth science and geotechnical disciplines.

Such cooperation models, as well as the visibility and international standing of earth and geosciences in Austria, will also be a focus of PANGEO 2026. The integration of these areas allows synergies to be exploited, innovations to be driven forward, the pressing challenges of our time to be tackled, and new horizons in the geosciences to be opened up. The guiding motto of PANGEO 2026 is therefore

„New Horizons in Geosciences and Geotechnics.”

A broad range of topics has always been a fundamental principle of PANGEO AUSTRIA, which is also reflected in the lectures and poster presentations. The importance of regional and application-oriented aspects is further emphasized by excursions. In order to promote the teaching of geoscientific content in schools, we are keen to actively involve teachers and students in the conference and its organization.

Conference content:

- Sessions on current general and applied geoscientific and geotechnical research topics with poster and oral presentations
- Sessions as part of the federal seminar “Geology in Schools”
- Awards for poster and oral presentations by students
- Field trips
- Short courses

Organizer:

NAWI Graz Geocenter: Department of Earth Sciences (University of Graz), Department of Applied Geosciences, Department of Rock Mechanics and Tunneling, Department of Soil Mechanics, Foundation Engineering, and Numerical Geotechnics (Graz University of Technology)

Venue:

University of Graz, Graz University of Technology

Event dates:

September 21 to 25, 2026

Scientific committee:

Martin Dietzel, Frank Melcher, Markus Kaspar, Klaus Voit, Paul Unterlass, Helmut Wannenmacher, Franz Tschuchnigg, Barbara Schneider-Muntau , Steffen Birk, Christine Stumpp, Christoph Hauzenberger, Jürgen Konzett, Walter Kurz, Christoph Iglseder, Gerald Auer, Theresa Nohl, Bernhard Hubmann, Martin Gross

Contact address for inquiries:

pangeo2026@uni-graz.at

Event promoters:

Österreichische Geologische Gesellschaft (ÖGG)

Österreichische Geophysikalische Gesellschaft (AGS)

Österreichische Mineralogische Gesellschaft (ÖMG)

Österreichische Paläontologische Gesellschaft (ÖPG)

Österreichische Vereinigung für Hydrogeologie (ÖVH)

Registration and deadlines:

Conference fees

	Payment by 03.06.2026	Payment after 03.06.2026
	130 €	180 €
Students (Confirmation of enrolment)	80€	100 €

ÖGG student members can have the conference fee of €80 reimbursed by the ÖGG: https://geologie.or.at/pangeo/pangeo-unterstuetzung

Conference Dinner	60 €	60 €

The conference fee includes conference documents, icebreaker party, lecture and workshop program, public evening lecture, and coffee breaks.

We kindly ask you to book your participation at the conference dinner (Tuesday, 22 September 2026, € 60,-), as well as the excursions separately when registering.

The **registration platform** can be found on the conference website: pangeo2026.uni-graz.at
Registration will be possible electronically via the conference website once the second circular has been published.

Abstract submission

Please submit your contributions (max. 500 words) by June 3, 2026, at the latest via the registration platform on our website pangeo2026.uni-graz.at

Conference languages: English and German

Hotels and accommodations:

Please note that other conferences and congresses will be taking place in Graz at the same time as PANGEO 2026. We therefore recommend booking accommodations as early as possible. You can find a list of hotels near the venue on our conference website: pangeo2026.uni-graz.at

Preliminary Conference Program:

21.9.2026	07:30-08:15	Registration	
	08:15-18:30	Excursions/Workshops	Teachers‘ session
	16:00-19:00	Registration	
	19:30	Icebreaker Party	
22.9.2026	07:30-19:00	Registration	
	09:00-10:30	Plenary Session: Welcome and opening, Awards, Plenary Talks	
	11:00-13:00	Oral Presentations	
	14:30-16:00	Oral Presentations	
	16:00-17:00	Posters; break	
	17:00-18:30	Oral Presentations	
	19:00	Social event (Conference dinner)	
23.9.2026	08:30-10:00	Oral Presentations	
	10:30-12:00	Oral Presentations	
	12:00-14:00	Austrian geoscience lab lunch	
	14:00-15:30	Oral Presentations	
	15:30-16:30	Posters; break	
	16:30-18:00	Oral Presentations	
	19:00	Public evening lecture	
24.9.2026	08:30-10:30	Oral Presentations	
	11:00-13:00	Oral Presentations	
	14:30-16:00	Posters	
	16:00-17:00	Prize ceremony, closing event	
25.9.2026	08:15-18:30	Exkcursions/Workshops	

A detailed program will be announced in the third circular in June 2026.

Topics for scientific sessions

<u>Session 1:</u> Regional geology of Austria and Geology of the Eastern Alps – insights, perspectives and trends

Regional geology continues to form the basis of geological research in many areas. Regional geological studies have always been an essential pillar for reconstructing the development of the Earth's crust in a wide variety of tectonic contexts. The original basis of field observations has been significantly expanded in recent decades by a variety of methods, such as geo- and thermochronology, deep seismic data, (bio)stratigraphy, GIS, etc.

This year's conference venue, Graz, is located on the edge of the Eastern Alps, at the transition zone between the Eastern Alpine nappe system and the Styrian Basin. This location is therefore an ideal place to discuss the results of various regional geological studies on the Alpine-Carpathian-Dinaric system and on parts that were not affected or only marginally affected by Alpine orogenesis, such as the Bohemian Massif.

Within this broad thematic area, we welcome contributions on the latest research and operational developments in regional geology. During the conference, the topics will be presented in interactive presentations and on posters. Our focus is on intensive exchange and feedback. We particularly encourage BSc, MSc, or PhD students, as well as early-stage postdocs, to present their studies.

<u>Session 2:</u> Stratigraphy and lithodemy in Austria

Austria hosts an exceptionally diverse and well-studied geological record that spans key intervals of Earth history, from the Paleozoic to the Cenozoic. The complex tectonic and metamorphic evolution of the Eastern Alps, combined with well-exposed sedimentary successions and crystalline nappes, makes Austria a natural laboratory for advancing stratigraphic frameworks and lithodemic classification in complex orogenic settings. Bridging stratigraphic and lithodemic perspectives fosters consistency in regional classification and its integration into international stratigraphic and lithodemic concepts. Combining these concepts and approaches advances our understanding of regional to global correlations and builds consistent stratigraphic and lithodemic principles. Through this, they support applied fields such as geohazard and resource management, and strengthen the link between classical field geology and modern analytical approaches.

We welcome contributions on all aspects of Austrian lithodemy and stratigraphy, ranging from conceptual models and global analogues to regional, field-based research. In addition, interdisciplinary studies are encouraged that link concepts and results from other disciplines— including, but not limited to, (isotope) geochemistry, biostratigraphy, sedimentology, structural geology, petrology, and geochronology— with the concepts of lithodemy and stratigraphy.

<u>Session 3:</u> The Role of Paleontology in Earth System Research – Methods, Innovations, and Integrated Research Approaches

Paleontological studies form a core component of modern research into the origin, evolution, and adaptation of the biosphere. Fossil records provide unique insights into the development of the Earth system and changing environmental conditions. In light of ongoing climate change, it is becoming increasingly important to understand how ecosystems respond to changing environmental parameters. This integrated response of the Earth system can only be investigated through studies of fossil analogues.

Contributions with a regional to global focus are invited on the following topics: classical paleontology and morphotaxonomy of vertebrates, invertebrates, microfossils, and paleobotany; studies of taphonomy and diagenesis; classical facies analysis and (carbonate) sedimentology; actualistic (neo-)paleontological comparisons and model organisms; qualitative and quantitative reconstructions of paleoclimate and paleoenvironmental conditions based on paleontological datasets and observations.

We especially encourage and welcome contributions from early-career researchers and students (BSc; MSc; PhD). We also welcome contributions that integrate classical paleontology into interdisciplinary research approaches, for example, with (isotope) geochemistry, climate and ecosystem modeling, biostratigraphy, as well as the modeling of chemical and microbiological processes across different scales.

<u>Session 4:</u> Dynamics of Earth's Spheres (petrology, geochronology, tectonic, analytical techniques, …)

Geodynamic processes in the Earth's sphere system drive the movements of the lithospheric plates relative to the underlying mantle and are associated with geological phenomena such as earthquakes, volcanism, mountain formation, rifting, and basin formation.

The lithosphere plays a central role and interacts with the asthenosphere and the deeper mantle as well as with surface processes. In order to understand the spatial and temporal evolution of the Earth system, geological processes must be studied based on knowledge of the composition, rheology, and thermal structure of the crust and mantle, as well as the feedback processes between the different spheres of the Earth.

The aim is to bring together multidisciplinary research contributions that address the structure and dynamics of the upper lithospheric and asthenospheric mantle in different tectonic environments (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 modeling, geochronology, petrology, and mineralogy.

Session 5: Igneous and Metamorphic Petrology

This session presents recent advances in metamorphic and igneous petrology, offering a cohesive picture of the geological processes that build, modify, and recycle Earth's crust. Contributions may highlight experimental, analytical, and modelling approaches, ranging from in situ analytical methods to (isotope) geochemistry, trace element systematics, phase equilibrium modelling, as well as integrative field-based investigations. A key emphasis is the role of petrology in decoding tectonic evolution, how mineral reactions record P–T–t paths, and shallow-to-deep cycling of volatiles and trace elements through subduction, magmatism, metamorphism, and exhumation. Researchers, students, and professionals with interests in the broader fields of mineralogy, petrology, geochemistry, geochgronology and geology are warmly invited to attend and contribute.

Session 6: Earth Surface Dynamics and Quaternary Geology

The Earth's surface is considered the boundary layer between the different spheres of the Earth and is characterized by complex interactions and feedback loops between tectonics, climate, biota, and human civilization. "Earth Surface Dynamics" describes Earth surface processes from the nanometer scale to mountain systems – over time scales ranging from seconds to millions of years. This session invites contributions that present field-based, laboratory analytical, and numerical studies, as well as developments in innovative methods and interdisciplinary approaches that improve our ability to quantitatively characterize and understand the interconnected dynamics of the Earth's surface.

Session 7: Applied Geosciences and Mineral Raw Materials

Climate change, the scarcity of critical raw materials, and industrial changes constantly present new challenges and research questions for the disciplines of applied geosciences, such as raw material mineralogy, materials science, building material mineralogy, and geotechnical engineering. The topic area of energy transition will cover all aspects of the sustainable use of geoenergy (e.g., geothermal energy production, natural hydrogen), carbon capture and storage (CCS), and technologies required for the energy transition (e.g., energy storage, renewable energies). The topic area of mineral raw materials will deal with industrial minerals, sustainable building materials, the exploration and use of mineral raw materials, and issues relating to the circular economy of mineral resources.

Session 8: Water as a resource and a risk: Geoscientific, geotechnical, and practical perspectives

Water is an indispensable resource, but also a potential natural hazard whose availability and dynamics are increasingly influenced by climate change. The associated challenges—from the sustainable use of water resources to managing risks such as drought, flooding, erosion, and landslides—require interdisciplinary approaches from geosciences, geotechnical engineering,

and practice. The focus is therefore on both scientific findings and practice-oriented solutions that bring together authorities, engineering firms, and research institutions. The aim is to promote exchange between theory and practice and to develop innovative approaches for sustainable water and risk management.

Session 9: Hydrogeochemistry and water quality: Natural processes, anthropogenic influences, and practical solutions

The quality of groundwater and surface water is influenced by both natural processes and anthropogenic factors. On the one hand, it determines the usability of water resources and, on the other hand, supports the characterization of water and material flows. In addition to investigations of groundwater contamination, contributions on the use of water constituents and isotopes as tracers are sought. Possible topics include hydrogeochemical characterization and modeling of water quality, age determination of waters, groundwater protection and pollutant management in catchment areas, practice-oriented contaminated site investigations, and much more.

Session 10: Engineering Geology and Natural Hazards

The session "Engineering Geology and Natural Hazards" is dedicated to issues at the interface between geology and civil engineering that play an important role in planning, construction, operation, and maintenance in areas affected by natural hazards (especially gravitational mass movements) and climate change. The presentation topics cover the following general engineering geological topics, among others:

- Transport infrastructure construction, tunnel or storage structures
- Stability of rock slopes, building foundations, and tunnel structures
- Engineering geological exploration, in-situ monitoring, and remote sensing
- Numerical simulations, including those relating to subsurface structure, groundwater, and stability
- Proposed solutions for stabilization and remediation

The aim is to promote interdisciplinary exchange on engineering geological issues and to apply the available engineering geological toolbox to develop practical and implementable solutions – from problem identification and process understanding to modeling and on-site implementation.

Session 11: Quantifying geological information for engineering practice

This session invites contributions on approaches for capturing, quantifying, and communicating geological information for rock engineering and geotechnical practice. We welcome submissions that explore how geological observations—at sample, outcrop, tunnel face, and project scale—can be translated into engineering-relevant information for design, construction, and reporting.

Topics of interest include (but are not limited to) fault zone and ground characterisation, veined and anisotropic rock masses, hydraulic fracturing and injection works, monitoring- and image-based methods (e.g. TBM camera systems), information extraction from big geotechnical datasets (including data-driven and machine-learning approaches), and numerical modelling for geomechanical assessment and design. Case studies from tunnels, caverns, and underground infrastructure are encouraged.
Overall, the session aims to provide a broad forum for researchers and practitioners working at the interface of engineering geology and rock mechanics, with contributions ranging from methodological developments to lessons learned from real projects.

Session 12: Model-Based Engineering Geology and Geohazards

This session focuses on model-driven approaches in engineering geology for the analysis and assessment of geological hazards. Contributions may address conceptual and numerical models, scenario development, uncertainty handling, and model validation. Submissions may also include the use of geospatial and Earth observation data as supporting inputs. Practical applications include slope stability, ground conditions, and infrastructure risk assessment.

Session 13: Monitoring and Remote Sensing in Applied Geology

This session focuses on monitoring and observation strategies in applied geology using in-situ measurements and remote sensing data. Topics include satellite and UAV monitoring, InSAR, LiDAR, sensor networks, time-series analysis, and multi-source observation datasets for terrain dynamics and hazard detection.

Session 14: Field and Laboratory Methods with Geodata Integration

This session highlights field and laboratory investigation methods linked with digital geodata workflows. Contributions may cover in-situ testing, laboratory characterization of soils and rocks, sensor-supported field campaigns, digital logging, georeferenced datasets, and the transfer of test results into GIS-based site models and applied interpretations.

Session 15: Teacher training seminar “Geology4School”

Geology is not a school subject in Austria, but it provides important basic knowledge for biology and geography lessons. Due to the shortening of university teacher training by one year and new curricula in schools, the teaching of geoscience topics is in danger of being marginalized. The seminar is aimed at teachers of all school types as well as colleagues from geological subjects who are interested in teaching geoscience topics. The program consists of lectures and the opportunity to test teaching materials. There will also be plenty of time for general discussions. Participation can be credited as continuing education for teachers.

The program is complemented by a cultural geology excursion through Graz and a visit to the geoscience exhibition rooms of the Universalmuseum Joanneum.

<u>Session 16:</u> Austrian geoscience lab lunch: Presenting geoscience research infrastructure in Austria

Adequate research infrastructure and the necessary methodological and technological expertise are an important basis for internationally competitive geoscientific research in Austria. Due to technical developments, increasing performance and growing specialisation, the establishment, updating to the state of the art, operation and staffing of such infrastructure are becoming increasingly cost-intensive. In order to maintain the portfolio of methods and infrastructure at an internationally competitive level in the future, improved coordination at the national level appears to be advisable.

Particular attention should be paid to communicating the availability of methods, the prerequisites and conditions for using the research infrastructure, and the costs of analyses, syntheses, and experiments. Potential users should also benefit as much as possible from the methodological expertise available at the various locations, especially when integrating methods into research projects. To this end, existing strengths should be identified and further developed in a targeted manner. The primary goal of this workshop is to present the analytical possibilities and framework conditions in order to promote collaboration within Austria.

The respective institutes and laboratories will present their work in a three-minute presentation and one slide each, followed by a poster session with one poster per laboratory, providing an opportunity for discussion and networking.

Workshops

<u>Workshop 1:</u> Computational tools for Petrology, Mineralogy, and Geochemistry (Jesse B. Walters, Sebastian Stumpf, Nils B. Gies)

New analytical developments and increased access to instrumentation is leading to larger and more complex datasets in petrology and geochemistry. As the user base and their needs expands, there is a need for free open-source software solutions to analytical problems. Our workshop will focus on new, free, open-source computational tools for electron probe microanalysis (EPMA), laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS), and spectroscopy techniques, such as Fourier Transform Infrared (FTIR) and Raman spectroscopy. The first part of the workshop will focus on MinPlotX, a new open-source software package for mineral formula recalculation and the plotting of mineral compositional data (Walters, 2022; Walters & Gies, 2025). In the second part of the workshop, we will showcase and provide training for ICP-Base, a new software for LA-ICP-MS data reduction (Stumpf et al., 2025). Finally, in the third part, we will cover SpecXY (Gies et al., 2024), a software for processing, visualizing, fitting, and comparing 1- and 2-D FTIR and Raman spectroscopic data. In all three sections we will provide hands on training with natural data, preparing you to implement these software tools into your research workflow.

Date: Monday, September 21st 2026

<u>Workshop 2:</u> Light Stable Isotopes: Techniques, Applications, Advances, and Analytical Pitfalls (Gerald Auer, Franziska Stamm)

This workshop will showcase recent advances in analytical capabilities for light stable isotopes, leveraging the capabilities of the NAWI Graz Core Facility: Stable Isotopes. The workshop will cover analytical capabilities, theoretical and practical laboratory procedures, and will allow participants to plan and implement analytical stable isotope work for scientific projects. The workshop will furthermore serve as a networking platform for interested researchers and industry specialists working with stable isotopes in the broad field of geosciences. Participation in the workshop includes a self-introduction as well as a statement of interest in light stable isotopes (in the form of a short presentation), along with theoretical and practical workflows for stable isotope analyses, with a focus on laboratory procedures and best-practice guidelines.

Date: Friday, September 25th 2026

Excursions

<u>Excursion 1:</u> Geological evolution of the Seckauer Tauern (Kevin Karner-Rühl, Walter Kurz)

Based on new geological mapping, structural geological analysis, petrological and geochronological investigations, the magmatic, metamorphic and tectonic evolution of the Eastern Alpine units of the Seckauer Kristallin will be presented.

Combined new results of geological mapping, structural analysis, petrological and geochronological data, the magmatic, metamorphic, and tectonic evolution of the Austroalpine Seckau Crystalline will be discussed.

Date: Monday, September 21st 2026

Services: Bus trip, guided excursion

Cost: € 75

Minimum number of participants: 12

Maximum number of participants: 16

<u>Excursion 2:</u> Surface Uplift oft he Eastern Alps. Neotectonic evidence in the Grazer Bergland (Kurt Stüwe)

The eastern margin of the Alps is the only part of the entire mountain range that was never glaciated in the Pleistocene, but still features mountains up to 2000 m and above. Because of the absence of morphological overprinting by glacial carving, the region is unique in preserving landforms that can be used to infer the uplift history of the Alps. In this context, the Grazer Bergland is the ”type locality” for the modern understanding that much of the surface uplift of the eastern Alps occurred in the last 5-6 million years. This field trip visits about 10 localities within 30 km of Graz that can be interpreted in terms of this young uplift. These localities are located in the region of Schöckl, Semriach, Kesselfall, Peggau, Badlhöhle, Lurgrotte and Mixnitz. The localities involve palaeosurfaces, view points, caves and knickpoints in rivers. The field trip involves only short walks but it is possible to plan finishing the trip with a 1 hour (500 hm) hike up to the Drachenhöhle near Mixnitz.

Date: Monday, September 21 st 2026

Services: Bus trip, guided excursion

Cost: € 75

Minimum number of participants: 12

Maximum number of participants: 16

<u>Excursion 3:</u> The Neogene of the Styrian Basin: Insights into Its Sedimentary Evolution, Stratigraphy, and Resource Utilization (Gerald Auer, Martin Gross, Nikolaus Petschacher, Arthur Borzi, Gerfried Winkler, Werner Piller)

The Styrian Basin, as a subbasin of the Pannonian Basin System, is one of the key areas for deep groundwater and geothermal resource utilization in Styria. Exploiting these resources and their future-proof management requires a sound understanding of the Neogene stratigraphy and depositional history of the basin interior. This field trip showcases key outcrops of Badenian, Samartian, and Pannonian strata and historic drill core material. It will also showcase examples of economic use cases for industrial geothermal resource utilization and energy storage.

Date: Monday, September 21 st 2026

Services: Bus trip, guided excursion

Cost: € 75

Minimum number of participants: 12

Maximum number of participants: 16

<u>Excursion 4:</u> The Graz Paleozoic: A new interpretation of a nappe complex (Kurt Krenn, Harald Fritz, Bernhard Hubmann)

Current structural geological investigations in the Graz Paleozoic allow for a new interpretation of the tectonic structure, taking stratigraphy and metamorphism into account. Selected key outcrops will be presented during this excursion.

Date: Friday, September 25 th 2026

Services: Bus trip, guided excursion

Cost: € 75

Minimum number of participants: 12

Maximum number of participants: 16

Green Meeting

Sustainable and environmentally responsible methods and measures are now of central importance in modern geosciences, both in theory and in practice.
PANGEO AUSTRIA 2026 is to be held as a “green meeting” in the spirit of responsible management of ecosystems and raw material reserves, both through the content focus of the conference and through a wide range of organizational measures.

We look forward to welcome you in Graz in 2026!
The Scientific and Organizing Committee of PANGEO AUSTRIA 2026