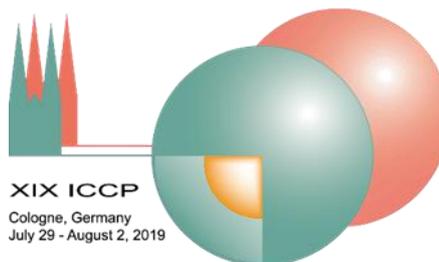




19TH INTERNATIONAL CONGRESS ON THE CARBONIFEROUS AND PERMIAN (XIX ICCP 2019)

SECOND CIRCULAR



With great pleasure we invite you to attend the 19th International Congress on the Carboniferous and Permian, to be held at the University of Cologne, Cologne, Germany, July, 29th–August, 2nd, 2019. It is our special privilege, to host the ICCP again in Central Europe, following the successful meetings in Cracow 1995 and Utrecht 2003, and forty-eight years after the meeting in Krefeld 1971, hitherto the only “Congres International du Stratigraphie et Géologie du Carbonifère” held in Germany.

The widened spectrum of the congress and major advances made in almost 50 years are a unique opportunity to demonstrate the scientific progress in Germany and adjacent countries of Central Europe, to put these into a global frame enabled by the presentations of established researchers and young scientists and students from all over the world, and to evaluate the results on various fieldtrips in classical and new localities. The Carboniferous and Permian of Central Europe display a multitude of facies, which might suit everybody’s interest. In the Mississippian, facies range from carbonate platform environments in Belgium and westernmost Germany to the classical basinal Kulm successions

in the Rhenish Mountains and beyond, also seen during the proposed field trip to the Moravo-Silesian Zone (Czech Republic). Pennsylvanian successions contain in part coal-bearing paralic and intramontane succession. The latter continue throughout most of the Permian (“Rotliegend”), and finally are topped by the carbonate and salt deposits of the uppermost Permian “Zechstein” sea, both constituting the classical Northwest-Central European Permian. Finally, an excellent glimpse of the Northwestern margin of the Palaeotethys will be provided by a field trip to the Carnic Alps and Karavanke in the border triangle of Austria, Italy and Slovenia. New data concern stage and substage boundaries, among those on the Devonian-Carboniferous, Viséan-Serpukhovian, and Permian-Triassic boundaries, sequence stratigraphic interpretations, refined biostratigraphic data and non-marine-marine correlations, refined facies interpretations, and spectacular Pennsylvanian-Permian fossils sites. Last but not least, the future economic potential of Carboniferous deposits after ending of coal mining in Germany and adjacent countries is of major interest and new models for the tectonic assemblage of the Variscides “in the heart of Pangaea” emerged in recent years.

We would appreciate to welcome all of you in Cologne. Do not miss this unique forum on the Carboniferous and Permian, meet old and new friends to discuss latest results, and contribute to cutting-edge research of our favourite time slice. We will do our best to organize a splendid meeting!

General sponsors



DSK

DSK – German Stratigraphic Commission and Subcommissions on Carboniferous Stratigraphy, and Permian and Triassic Stratigraphy



Sponsoring

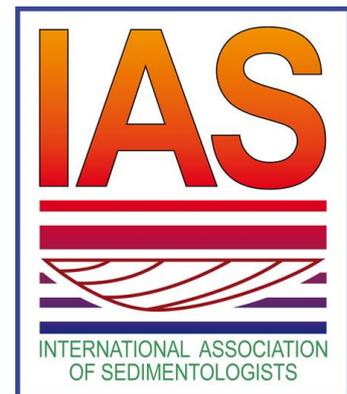


Sponsoring was requested from further science supporting institutions and commercial companies and we are confident to raise additional funds. Updates will be announced on the website

Travel grants

We gratefully acknowledge the International Association of Sedimentologist IAS for the commitment of travel grants for students that are members of IAS, resp. will become members. Application can be done on <http://www.sedimentologists.org/>. Deadline for application is **31-05-2019**.

Travel grants will be a contribution to the expenses, but not a full reimbursement. Please note that money will be transferred to your account after the conference.



The organisation committee will apply for travel grants for scientists at the German Academic Exchange Service DAAD. Affiliation with an university and Ph.D. is required.

Applicants should send their CV and a confirmation of their affiliation directly to ICCP-2019@uni-koeln.de. Deadline for application is **31-03-2019**.

Travel grants will be a contribution to the expenses, but not a full reimbursement. Please note that money will be transferred after the conference . As only a limited number of grants is available, the organisation committee seeks to support especially young scientists from developing countries.

19TH INTERNATIONAL CONGRESS ON THE CARBONIFEROUS AND PERMIAN



Our team

MEMBERS OF THE SCIENTIFIC COMMITTEE AND AREAS OF SPECIALIZATION

Michael Amler (Köln), Carboniferous marine invertebrates. Co-leader of the proposed field trip to the Rhenish Mountains

Markus Aretz (Toulouse), Carboniferous and Permian carbonate environments and reefs.

Ondřej Bábek (Olomouc), Co-leader of proposed field trip to the Mississippian of Moravia; multiproxy stratigraphy, sequence stratigraphy and climate-eustacy interactions in the Carboniferous

Julien Denayer (Liège), Leader of proposed field trip to the Mississippian of Belgium; Carboniferous stratigraphy and marine macrobiota.

Holger Forke (Berlin), Leader of proposed field trip to the Pennsylvanian and Permian of the Carnic Alps and Karavanke Mts.; Pennsylvanian and Permian fusulines, stratigraphy and regional geology.

Annette Götz (Portsmouth), Permo-Carboniferous of Gondwana and its conventional and unconventional energy resources.

Hans-Georg Herbig (Köln), Carboniferous stratigraphy and facies; Congress Chair. Leader of the proposed field trip to the Rhenish Mountains.

Jiří Kalvoda (Brno), Co-leader of proposed field trip to the Mississippian of Moravia; Carboniferous stratigraphy and marine microbiota.

Hartmut Jäger (Leimen/Germany), Palynology, Geochemistry, Organic Maturation, basin and hydrocarbon system development. Co-eader of the proposed field trip to the Rhenish Mountains

Hans Kerp (Münster), Permo-Carboniferous palaeobotany.

Dieter Korn (Berlin), Carboniferous and Permian marine invertebrates, stratigraphy, co-eader of the proposed field trip to the Rhenish Mountains

Tomas Kumpan (Brno), Leader of proposed field trip to the Mississippian of Moravia; multiproxy stratigraphy of Devonian and Carboniferous carbonate successions

Spencer G. Lucas (Albuquerque), Permo-Carboniferous vertebrate palaeontology and marine – non-marine correlations.

Svetlana Nikolaeva (Moscow-London), Vice-chair of the International Subcommittee on Carboniferous Stratigraphy; Carboniferous stratigraphy and marine macrobiota.

Matevž Novak (Ljubljana), Leader of proposed field trip to the Pennsylvanian and Permian of the Carnic Alps/Karavanke Mts.; Pennsylvanian and Permian palaeontology, stratigraphy and regional geology.

Edouard Poty (Liège), Co-leader of proposed field trip to the Mississippian of Belgium; Carboniferous marine invertebrates, biostratigraphy and sequence stratigraphy.

Ausonio Ronchi (Pavia), Non-marine Permian basins in Europe, their stratigraphy and biota.

Martin Salamon (Krefeld), Conventional and unconventional Permo-Carboniferous energy resources in Europe.

Jörg Schneider (Freiberg), Vice-chair of the International Subcommittee on Permian Stratigraphy; Co-leader of the proposed field trip to the classical Northwest-European Permian in central Germany; Permian marine – non-marine correlations.

Hans Peter Schönlaub (Vienna and Kötschach-Mauthen), Leader of proposed field trip to the Pennsylvanian and Permian of the Carnic Alps and Karavanke Mts.; stratigraphy, regional and structural geology, palaeogeography/plate tectonics.

Shuzong Shen (Nanjing), Chair of the International Subcommittee on Permian Stratigraphy; Permian stratigraphy.

Vladimir Silantiev (Kazan), Chair of the 18th International Congress on the Carboniferous and Permian; non-marine Permian stratigraphy and biota.

Sebastian Voigt (Thallichtenberg), Leader of the proposed field trip to the Pennsylvanian-Permian non-marine Saar-Nahe Basin, SW Germany; Carboniferous–Triassic non marine biota, palaeoichnology and palaeoenvironments

Xiangdong Wang (Nanjing), Chair of the International Subcommittee on Carboniferous Stratigraphy; Carboniferous stratigraphy.

Volker Wrede (Krefeld): Leader of the proposed field trip to the Pennsylvanian paralic foreland basin of the Ruhr area; regional and structural geology, coals.

Silvio Zeibig (Kassel), Co-leader of the proposed field trip to the classical Northwest-European Permian in central Germany; Zechstein deposits of central Europe and salt mining.

MEMBERS OF THE ORGANIZATION COMMITTEE

Hans-Georg Herbig

Michael Amler

Markus Aretz

Sarah Esteban-Lopez

Sven Hartenfels

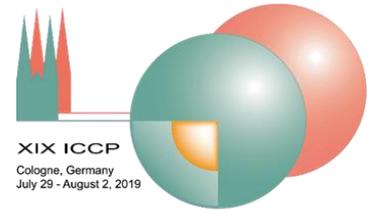
Hanna Cieszynski

Eliza Stehr

Johanna Noelle

(all University of Cologne), Markus Aretz (Université de Toulouse).

19TH INTERNATIONAL CONGRESS ON THE CARBONIFEROUS AND PERMIAN



Venue



Cologne, the fourth biggest German city, is a vibrant metropolis with somewhat more than one million inhabitants in the western part of Germany. Based on an older local settlement, it was founded by the Romans and is thought to be the oldest city of Germany. During centuries people from many countries met in its open-minded atmosphere. Its flair is due to the unique location at River Rhine, the mixture of modern and historical buildings – the famous cathedral is included in the UNESCO world heritage



list, and the many students visiting several universities. The University of Cologne, which will host the 19th ICCP has almost 50,000 students in six faculties covering the complete spectrum of natural and cultural sciences.

Cologne is an ideal base to visit classical Carboniferous localities

in the near-by Belgian Ardennes, the German Rhenish Mountains and the Ruhr area. Permian outcrops are somewhat more distant, but easily reached via a dense net of highways. Do not forget additional touristic highlights, including four UNESCO world heritages: scenic “Upper Middle Rhine Valley”, “Germanic-Rhaetic Limes”, the originally 550 km long boundary fortification of the Romans, as well as the rococo castles “Augustusburg” and “Falkenlust”, both only some kilometres south of Cologne.

How to reach the congress venue

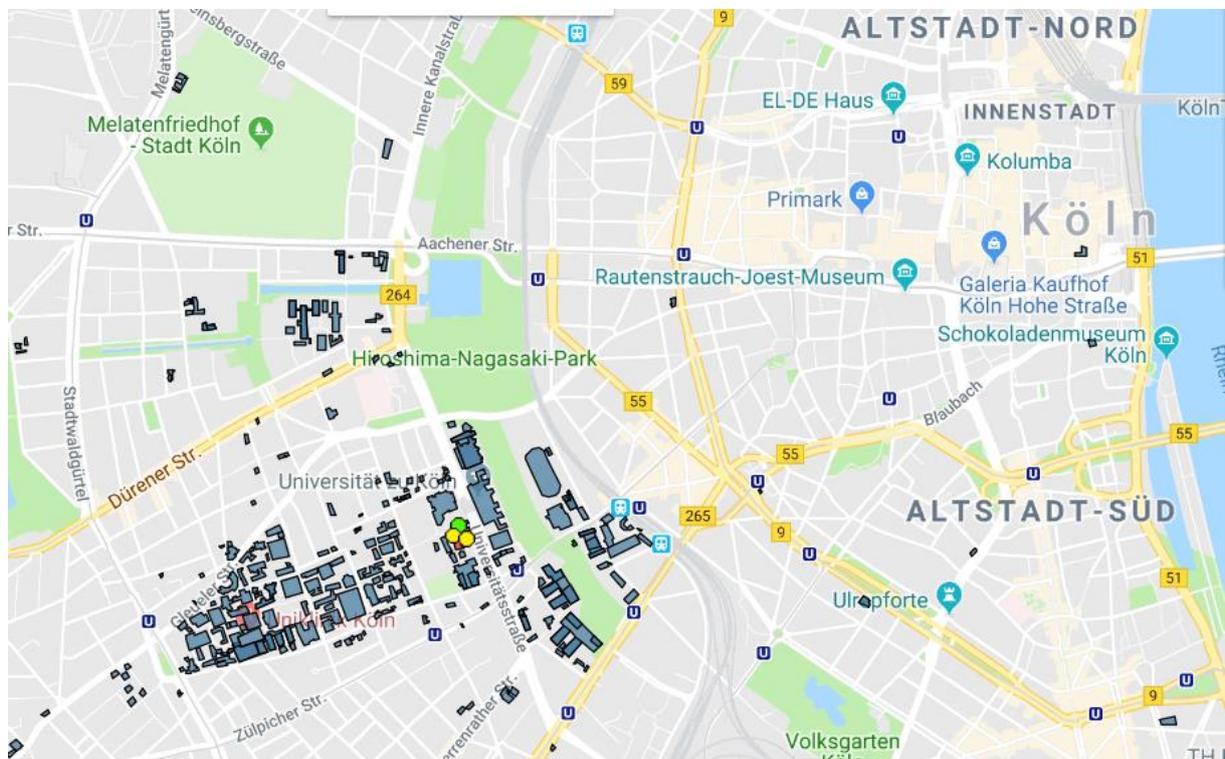


Entrance of the main building of the university

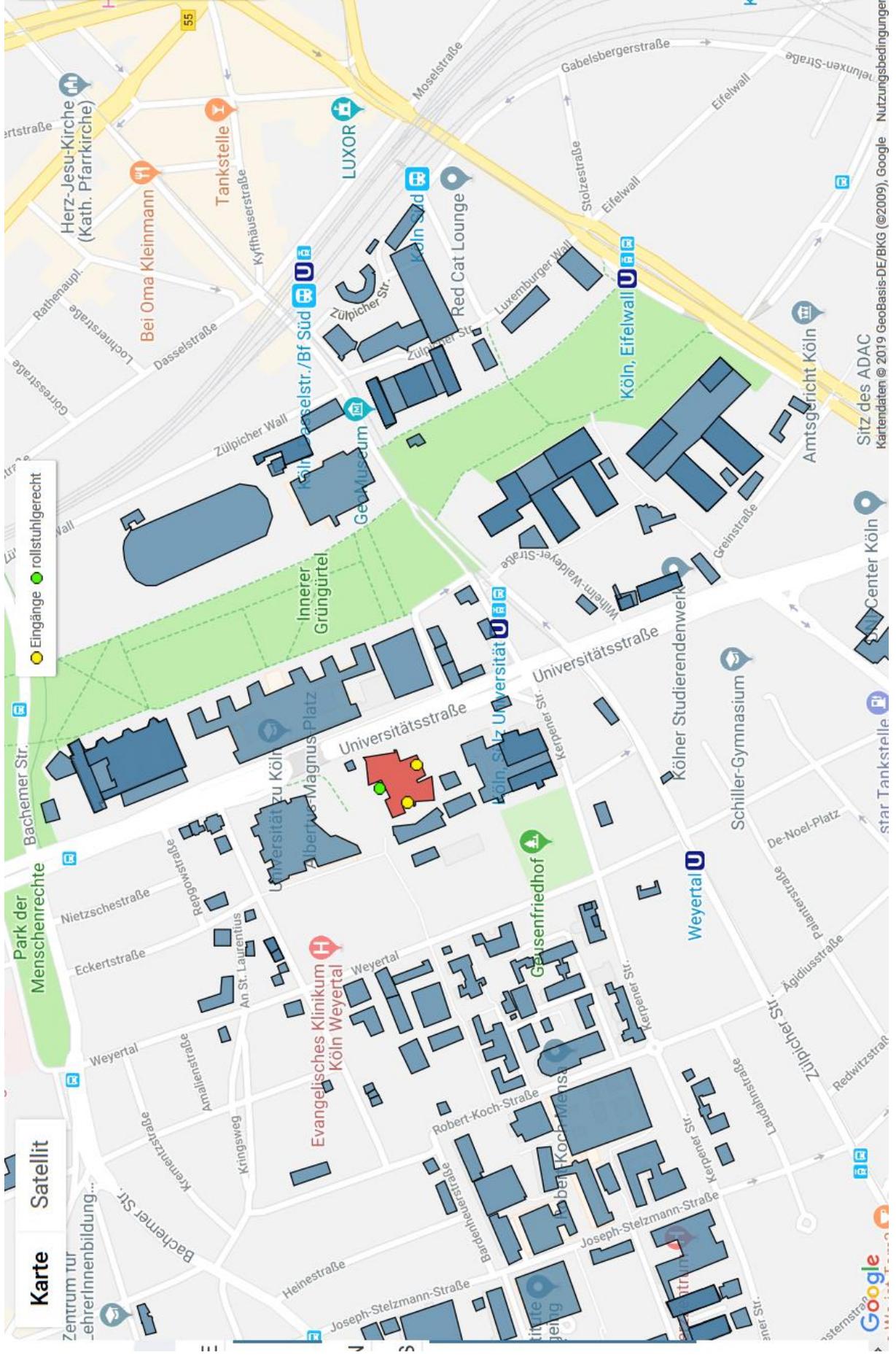


Central lecture hall

The congress will take place in the **Central lecture hall of the University of Cologne, Building No. 105, Universitätsstrasse 35, D- 50923 Köln**. See <https://lageplan.uni-koeln.de/#!105> The building is opposite of the main building of the University at Albertus-Magnus-Platz and can be approached across the pedestrian square in front of the latter. For access with public transport use the tramway line No. 9 from the city center (stations Heumarkt or Neumarkt) in direction **Sülz** and get of at the **station Universität**. By foot, it will take about 30-45 minutes from the center.



Yellow dots indicate the entrances to the central lecture hall. Green dot indicates entrance for handicapped persons.



Karte Satellit

Eingänge rollstuhlgerecht

How to reach Cologne - where to sleep where to have lunch

TRAVEL



Cologne is reached by a dense network of highways and high-speed trains. By air, it is reached via the airport Cologne-Bonn CGN (12,000,000 passengers/year, 130 destinations, also by low-cost carriers).

Participants from overseas may find good travel deals to the airports of Düsseldorf DUS, Frankfurt/Main FRA, or even to Brussels BRU (Belgium) and Amsterdam AMS (The Netherlands). All airports are directly connected by high-speed trains with Cologne:

- Düsseldorf (40 km, 25 min)
- Frankfurt (180 km, 1 h)
- Brussels (230 km, 2 h)
- Amsterdam (280 km, 3h)

ACCOMODATION

A large variety of hotels is available in Cologne. Prices during summertime are reasonable, as no trade fairs or other big events will take place. You might find hotels directly at the riverside and downtown run either by hotel chains or private owners. Student dormitories are not available, but low cost hostels and youth hostels might be booked. Participants are responsible for making their own accommodation arrangements. See Cologne Tourist Information <https://www.cologne-tourism.com/book-buy/hotels-accommodation/> or any commercial booking system.

PUBLIC TRANSPORT

We will try to arrange a ticket for the public transport system, valid from Monday, July, 29, through Friday, August, 2.

LUNCH

Participants might order lunch tickets for the students restaurant, situated in walking distance (about 15 minutes) from the congress venue. Ticket price is 26 € for four lunches including one soft drink (Monday, Tuesday, Thursday, Friday; Wednesday excepted because of mid-congress field trips). Additional reasonable restaurants and cafes are also in walking distance.

19TH INTERNATIONAL CONGRESS ON THE CARBONIFEROUS AND PERMIAN



The scientific program

Add your contribution to a wealth of topics and sessions

Major topics of the congress were proposed in the First Circular, now slightly varied and including a variety of – in part interdisciplinary - session proposals. Contributions might be placed either in a definite session or below a topic heading.

A. THE WORLD OF STRATIGRAPHY

A1. Carboniferous stage boundaries, stratotype sections, and GSSPs

A1.1. The redefinition of the base of the Carboniferous Period

Markus Aretz¹, Carlo Corradini²

¹Université de Toulouse (France), markus.aretz@get.omp.eu

²Università di Cagliari (Italy), corradin@unica.it

The session deals with all aspects of defining and dividing the late Famennian to early Tournaisian time scale in general, and the Devonian-Carboniferous Boundary (DCB) in special. Contributions can range from detailed local stratigraphic studies to studies on global correlation, from biostratigraphy to physical stratigraphy, from descriptive to quantitative tools and approaches.

The definition of the base of the Carboniferous came back on the agendas of the subcommissions on Devonian and Carboniferous stratigraphy after the marker fossil for the base of the Carboniferous, the conodont *Siphonodella sulcata*, was found below the boundary just above a facies change in the GSSP in La Serre (France). Also, taxonomical problems with *Si. sulcata* are well known since long time. A joined SDS/SCCS Task group was established in 2009 to redefine the base of the Carboniferous and thus to regain stratigraphical stability in this critical interval of Earth history.

Members of the DCB Task group members have been active in various aspects related to the boundary definition and a wealth of new data have become available. These new data are often based on multi-disciplinary approaches, which combine palaeontological, sedimentological, geochemical and petrophysical methods and data. In late 2016 the task group has agreed to test a proposal combining several criteria for the redefinition of the Devonian-Carboniferous boundary. This phase should come to an end with the Cologne Meeting marked by a vote by the working group on the suitability of the Montpellier criteria.

A1.2. The quest for a global Viséan–Serpukhovian boundary

Svetlana Nikolaeva, Hans-Georg Herbig²

¹Natural History Museum London (United Kingdom), Borissiak Paleontological Institute Moscow, Kazan State University (Russia) s.nikolaeva@nhm.ac.uk

²University of Cologne (Germany), herbig.paleont@uni-koeln.de

Due to an erosional unconformity at the present stratotype in the Moscow basin and the provincialism of ammonoids at the hitherto recognized boundary level, a task group of ISCS is searching for new boundary criteria and a suitable GSSP. The proposed FAD of the conodont *Lochriea ziegleri* in the phylogenetic lineage *L. nodosa* – *L. ziegleri* has been increasingly criticised in the last years due to problems in taxonomy, phylogeny, probable diachronous first occurrences and the almost complete absence of the taxa in North America, and, last but not least, an FAD considerably older than the hitherto defined Viséan-Serpukhovian boundary. Smaller calcareous foraminifers in particular, might have important potential for overcoming the problems, but other fossil groups should be not excluded as additional markers.

This session, therefore, addresses all aspects of the Viséan–Serpukhovian transition. Contributions can range from detailed local stratigraphic studies to studies on global correlation, from biostratigraphy to physical stratigraphy, from descriptive to quantitative tools and approaches. An ad-hoc workshop might be arranged for further discussion on various types of boundary markers and their prospects for future use.

- open for proposal of further presentations outside the proposed sessions –

A2. Permian stage boundaries, stratotype sections, and GSSPs

- open for proposal of presentations -

A3. Carboniferous and Permian multistratigraphy and correlations (including isotope stratigraphy, magnetostratigraphy, sequence stratigraphy, and cyclostratigraphy)

A3.1. Late Carboniferous to Early Triassic continental successions of Central-Western Europe: updated stratigraphic, sedimentologic, paleontological and geochemical constraints

Ausonio Ronchi¹, José López Gómez² & Sylvie Bourquin³

¹Università di Pavia (ITALY), ausonio.ronchi@unipv.it;

²Universidad Complutense Madrid (Spain), jlopez@geo.ucm.es;

³Université de Rennes, CNRS (France), sylvie.bourquin@univ-rennes1.fr

Late Carboniferous, Permian to Early-Middle Triassic continental successions are wonderfully exposed in different Countries of current south-western and Central Europe such as Spain, France, Italy and Germany up to northwestern Africa. Many of these successions were investigated since the beginning of last century; nonetheless modern methodologies permitted in recent years to acquire new data on sedimentology, geochemistry, petrography, geochronology and paleontology, to further deepen their knowledge under various perspectives. This session aims at showing these advances in various field, using traditional and innovative methods, concerning terrestrial key-sections of different Countries, which have led to more detailed stratigraphic correlation and paleogeographic to paleogeodynamic reconstructions.

- open for proposal of further presentations outside the proposed session –

A4. Late Carboniferous to earliest Triassic non-marine – marine correlation

- open for proposal of presentations -

B. THE WORLD OF PALAEOLOGY

B1. Carboniferous and Permian marine biota: taxonomy, palaeoecology, palaeogeography

B1.1. Marine frontier groups

Michael Amler¹, Andrej Ernst², Hans-Georg Herbig¹

¹University of Cologne (Germany), michael.amler@uni-koeln.de, herbig.paleont@uni-koeln.de;

²University of Hamburg (Germany), Andrej.Ernst@uni-hamburg.de

We define marine frontier groups as minor or less well studied fossil groups that are often underrepresented or even neglected in palaeontological research. Reasons are manifold: they might be rare, difficult to classify due to scarce morphological differentiation or, vice versa, because of very complex skeletons. Often, they are just considered to be “useless” compared with major groups, such as the ammonoids, rugose corals, brachiopods or foraminifers. However, inadequate consideration will result not only in a biased picture on biodiversity – also in palaeontological databases – but also fails to explore the stratigraphic, palaeobiogeographic and palaeoecological importance and further interpretations relying on these fossils. In a self-enhancing process minor consideration will result in further decrease of studies and of interested researchers, and increase of biased knowledge. Therefore, we invite colleagues to present and discuss all kind of available palaeontological data and interpretations on taxonomic frontier groups like bivalves, bryozoans, tabulate corals, chaetetids, radiolaria, agglutinating foraminifers, and others not mentioned herein. We also welcome studies on new methodologies that will contribute to a better understanding and usage of these groups.

B1.2. Applied concepts in microfacies analysis and micropaleontology

¹Holger Forke, ²Geraint Wyn Hughes

¹Millennia Stratigraphic Consultants (United Kingdom) holger.forke@gmx.de

²Applied Microfacies Limited (Wales/United Kingdom), King Fahd University of Petroleum and Minerals (Saudi Arabia) and Natural History Museum London (United Kingdom)

This session aims to highlight the range of applied techniques in microfacies analysis and/or micropaleontology. It will include presentations from academic and industrial/petroleum system researchers who have used applied microfacies/micropaleontology to provide innovative solutions to geological/geotechnical problems.

These techniques have been preferably applied to interpret biostratigraphy, sequence stratigraphy, stratigraphic correlation, (paleo)ecology, (paleo)environments, (paleo)climates and (paleo)oceanographic systems.

It invites scientists working in both industry and academia who use microfacies concepts and microfossil groups as practical tools. We would particularly like to see presentations highlighting examples where an applied technique has been used to solve a specific problem.

- open for proposal of further presentations outside the proposed sessions –

B2. Carboniferous and Permian non-marine biota and plants: taxonomy, palaeoecology, palaeogeography

- open for proposal of presentations -

C. THE WORLD OF FACIES, ENVIRONMENTS AND BASIN ANALYSIS

C1. Carboniferous and Permian carbonate environments – from platforms and basins to mounds and reefs

- open for proposal of presentations -

C2. Carboniferous and Permian siliciclastics and shales

C2.1.1. Marine Black shales – depositional systems, palaeoenvironmental conditions and resource potential

Hartmut Jaeger

GeoResources STC, Leimen (Germany), jaeger@georesources.de

Marine organic-rich 'black' shales are well known from many places worldwide in the Carboniferous and Permian. Although Upper Permian shales (Kupferschiefer) were partially of economic interest, for a long time most shale units were poorly studied regarding the depositional processes and basin development. During the last 10 years this has changed completely due to the rise of unconventional hydrocarbon shale resources. Significant scientific and petroleum exploration activities have been focused on shale systems across the globe, particularly on Carboniferous 'black' shales. This has led to a significant increase in the understanding of shale systems, from depositional patterns, palaeoenvironmental conditions and basin development to diagenetic processes and the maturation of shales. Increased recognition and understanding of the high complexity of shale sedimentary systems and the interaction of different shale features have significantly contributed to the better understanding of the generation of shale resources, like the unconventional hydrocarbon potential within shale systems, but also other resources (e.g. ore mineralization). This session aims to further improve the understanding of marine shale systems and its interaction with the development of shale resources. Therefore contributions are invited from sedimentology (particularly high-resolution analysis), palynology and palynofacies, organic petrology, organic and inorganic geochemistry, palaeontology and mineralogy.

- open for proposal of further presentations outside the proposed session –

C3. Non-marine basins and environments of the Variscides and beyond

C3.1. The Permian basins of Central Europe – the state of the art

Tadeusz M. Peryt¹ & Jörg W. Schneider²

¹Polish Geological Institute - National Research Institute, Warsaw (Poland), tadeusz.peryt@pgi.gov.pl;

²TU Bergakademie Freiberg (Germany), Joerg.Schneider@geo.tu-freiberg.de

The session on the Permian basins of Central Europe is aiming to present the achievements reached during the last decade and to offer a synthesis of current geologic knowledge on a vast range of problems such as stratigraphy, palaeogeography, palaeoclimatology and basin history, in a time interval representing the maximum stage of Pangean continental assembly. The rocks of Permian age in Central Europe host large hydrocarbon concentrations, very extensive evaporite deposits including a variety of potash salts, and economically important deposits of copper and silver, and hence the Permian basins of Central Europe are of key importance to numerous areas of scientific and economic investigations.

C3.2. Environments of late Palaeozoic wetlands and wet spots: lessons from palaeontology, organic petrology and geochemistry

Christoph **Hartkopf-Fröder**¹, Ralf **Littke**² & Stanislav **Opluštil**³

¹Geological Survey of North Rhine-Westphalia, Krefeld (Germany), hartkopf-froeder@gd.nrw.de;

²RWTH Aachen University, Aachen (Germany), ralf.littke@emr.rwth-aachen.de;

³Charles University Prague (Czechia), oplustil@natur.cuni.cz

Late Palaeozoic wetlands were the habitat of a rich and varied flora and fauna. As wetlands were mostly located in non-erosional areas with high preservation potential much is known about their depositional environments and ecosystems. The vast Euramerican tropical to subtropical peatlands of Pennsylvanian age were dominated by lycopsids, tree ferns and calamites. Starting in the late Pennsylvanian the climate changed from ever-wet through seasonally-dry to very dry conditions so that the ever-wet vegetation was restricted to narrow riparian corridors and wet spots. By contrast, on southern Gondwana the Permian high-latitude mires with seed ferns and gymnosperms developed under cool temperature. Besides palaeontology, studies using sedimentology, organic petrology and geochemistry have considerably improved our understanding of the evolution of wetlands during the late Palaeozoic, e.g. the temporal succession from topogenous to ombrogenous mires, the importance of wildfires in mires or microbial reworking of the terrestrial organic material. This session is devoted to all environmental and ecological aspects of late Palaeozoic wetlands and wet spots. Studies that use various proxies are especially welcome.

In case that we are notified about a sufficient number of relevant contributions, we are planning to publish the proceedings of the session as a special volume in a high-impact international journal. Deadline for manuscript submission will probably be end of 2019.

- open for proposal of further presentations outside the proposed session -

C4. Permo-Carboniferous basins and environments from Gondwana

- open for proposal of presentations -

C5. The Permo-Carboniferous glaciations, end-Permian extinction and early Triassic recovery

C5.1. Ecosystem response to environmental change in the Permian

David **Bond**¹ & Yadong **Sun**²

¹University of Hull (United Kingdom), D.Bond@hull.ac.uk; ²Universität Erlangen-Nürnberg (Germany) yadong.sun@fau.de

The Permian was one of the most dynamic intervals in Earth history as the transition from icehouse to greenhouse was accompanied by evolutionary innovation as well as two major mass extinctions, in the Capitanian and at the end of the Permian. This session explores the complex links between

environmental change, evolution and extinction. Recent advances in the stratigraphic record and dating of the Permian crises, and newly developed proxies for anoxia, ocean acidification, and global warming, have stimulated intense mass extinction research in the past decade. There is growing evidence that large igneous province eruptions (e.g. of the Emeishan and Siberian Traps during the Middle and Late Permian) might be the driver of proximal kill mechanisms, but the link between those phenomena is still not well understood. We welcome contributions on Permian change from the fields of geochronology, geochemistry, mineralogy, palaeontology, sedimentology, stratigraphy, palaeomagnetism, volcanology and geophysics.

C5.2. Great Permian-Triassic Transition: biotic, environmental and climatic changes in ocean and on land

Zhong-Qiang **Chen**¹, Satoshi **Takahashi**² & David **Bond**³

¹China University of Sciences Wuhan (China), zhong.qiang.chen@cug.edu.cn; ²University of Tokyo (Japan), stakahashi@eps.s.u-tokyo.ac.jp; ³University of Hull (United Kingdom), D.Bond@hull.ac.uk

The 20-million-year interval from the Late Permian to Middle Triassic was a critical period for the evolution of life on Earth. It witnessed the most protracted Phanerozoic crisis consisting of two major episodes, at the ends of the Guadalupian (Middle Permian) and the Lopingian (Late Permian), respectively. The latter extinction itself is also episodic, and similar biotic crisis and environmental perturbations have also repeated numerous times during the Early Triassic. A more sustained recovery of ecosystems did not occur until the early Middle Triassic. The extended Permian–Triassic transition therefore has attracted increasing attentions from worldwide paleontologists and geologists. IGCP 630 is organizing a thematic session addressing environmental and organismal changeovers during the great Permian-Triassic transition. This session gathers timely research results of biostratigraphic, paleoecologic, sedimentologic, and geochemical studies focused on environmental, climatic and biotic variations from marine to terrestrial ecosystems during the Late Permian to Middle Triassic interval. These contributions enhance our understanding of organism-environment interactions during this critical period of Earth history.

- open for proposal of further presentations outside the proposed sessions -

D. THE WORLD OF OCEANS AND MOUNTAINS

D1. Carboniferous and Permian palaeoceanography

D2.1. Climate, Oceanic Circulation, and Global Change in the Carboniferous and Permian–Geochemical Evidence

Ethan **Grossman**¹, Yadong **Sun**² & Michael **Joachimski**³

¹Texas A&M University College Station (USA), e-grossman@geos.tamu.edu; ²Universität Erlangen-Nürnberg (Germany), yadong.sun@fau.de; ³Universität Erlangen-Nürnberg (Germany), michael.joachimski@fau.de

Evolution and environment are inescapably linked, as revealed by studies of major extinction events in the past and at present. With the development of new geochemical methods, new clues are emerging about, for example, past ocean anoxia, acidification, and chemical composition with new paleothermometers (e.g., clumped isotopes) improving our understanding of the interdependence of climate, global change, and biodiversity. The robust sedimentary record of the Permian and

Carboniferous presents an excellent opportunity to understand (1) the Earth system prior to and during Earth's most dramatic extinction event, and (2) Earth's last transition from an Icehouse to Greenhouse climate mode, revealing clues to the future of the planet. Our session strives to connect researchers who apply geochemical methods, whether new and novel (e.g., metal and clumped isotopes) or time-tested (e.g., C, O, N, S, and Sr isotopes), with sedimentologists and paleobiologists to better understand the interconnection between Permo-Carboniferous life and environment.

D2. Carboniferous and Permian plate tectonics and the evolution of relief (building and deconstruction of mountains)

- open for proposal of presentations -

E. THE WORLD OF ECONOMIC GEOLOGY

E1. Carboniferous and Permian coals and evaporites

- open for proposal of presentations -

E2. Carboniferous and Permian conventional and unconventional hydrocarbon systems

- open for proposal of presentations -

E3. Carboniferous and Permian geothermal resources

E3.1. Mississippian carbonate rocks in North-West Europe –Reservoir for deep geothermal energy Martin Salamon & Anna Thiel

Geological Survey of North-Rhine Westphalia, Krefeld (Germany), Martin.Salamon@gd.nrw.de,
anna.thiel@gd.nrw.de

Dinantian Carbonates are coming into focus as an important reservoir for deep hydrothermal energy in North-West Europe. They are abundant in the subsurface of France, Belgium, Germany Ireland and the UK. These Carbonates are the “proven” reservoir for deep geothermal energy, as deep geothermal plants in Belgium and the Netherlands show. National (UGD, SCAN) and transnational (DGE-ROLLOUT, INTERREG) research and application projects focussing on Dinantian Carbonates as reservoir for deep hydrothermal energy are ongoing at the moment. The session will focus on their facies, subsurface and surface distribution, stratigraphic range and sequence stratigraphic interpretation, multitemporal karstification, reservoir properties and the applied used of these rocks as hydrothermal reservoir. The session will also be part of the project meeting of DGE-ROLLOUT.

- open for proposal of further presentations outside the proposed session -

19TH INTERNATIONAL CONGRESS ON THE CARBONIFEROUS AND PERMIAN



Listen to splendid keynotes

We will start each scientific session in the morning and in the afternoon with a plenary keynote highlighting one of the major topics of the congress. Duration should be 40 minutes.

A. THE WORLD OF STRATIGRAPHY

Dr Svetlana **Nikolaeva**, The Natural History Museum London

Boundaries in sections, not in research: New and old Carboniferous stratotypes of Russia

Dr Shuzhong **Shen**, Nanjing University

The Permian timescale: Progresses, problems and perspectives

B. THE WORLD OF PALAEOONTOLOGY

Prof. Dr George R **McGhee**, Rutgers University, Piscataway/New Jersey

Carboniferous giants and mass extinction: The legacy of the Late Palaeozoic Ice Age

C. THE WORLD OF FACIES, ENVIRONMENTS AND BASIN ANALYSIS

Prof. Dr. Isabel P. **Montañez**, University of California, Davis

Understanding feedbacks between climate, pCO₂, and ecosystems in the late Palaeozoic earth system

Prof. Dr. Tadeusz **Peryt**, Polish Geological Institute - National Research Institute, Warsaw

The origin and evolution of the North-European Zechstein Basin: a Polish perspective

D. THE WORLD OF OCEANS AND MOUNTAINS

Prof. Dr. Ulf **Linnemann**, Senckenberg Natural History Collections Dresden

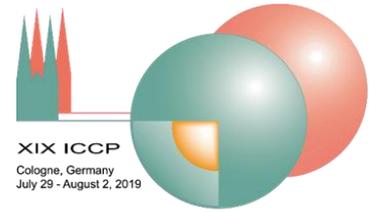
Germany – the heart of Pangaea

E. THE WORLD OF ECONOMIC GEOLOGY

Prof. Dr. Annette E. **Götz**, University of Portsmouth

Late Palaeozoic energy resources of Gondwana - Archives of climate change that power the world

19TH INTERNATIONAL CONGRESS ON THE CARBONIFEROUS AND PERMIAN



Prepare your contributions

ABSTRACTS

Abstracts are due **April, 30, 2019**. The fully citable abstracts will be published in *Kölner Forum für Geologie und Paläontologie*. The volume will be distributed to the registered delegates

Abstracts are limited to **two pages**, format DIN A4. Graphics and/or photographs (black and white, resp. grey shading) as well as key references might be included. Abstracts must be directed to ICCP-2019@uni-koeln.de

Indicate in the first line (1) allocation of your contribution to a session or, if not applicable, to one of the the major topics of the congress. And (2) indicate oral presentation or poster presentation.

Set page margins to 3.1 cm above, 1.9 cm below and 2.1 cm on both sides. Use the font **Book Antiqua** throughout. Indicate below the heading (14 pt, bold, centered) name of authors including not shortened first names (12pt, centered), and below full addresses including emails. Separate heading, names of authors, addresses, and text body by a blank line. Maximum length of the text body (10 pt) including references (9pt) are 90 lines containing 9000 characters (including blanks). Please note that you have to reduce the number of lines correspondingly, if you include figures!

We welcome fully formatted abstracts using the provided word template.

TALKS

Time for oral presentation is limited to 12 minutes + 3 minutes for discussion. Presentations should be prepared in MS Power Point (.ppt, .pptx) and handed in to the organization half-day before the presentation (at evening for the morning sessions, at the morning for the afternoon sessions). Each speakers is allowed to **one presentation**, but individuals may participate as non-presenting co-author in additional talks.

POSTERS

Poster format is restricted to portrait layout DIN A 0 (width 841 mm, height 1189 mm). Do not prepare in landscape format or other sizes due to the size of the display boards! The number of poster presentations per person is not limited. Posters should be on display during all days of the congress, but in case of a very elevated number of contributions, it might be necessary to restrict the presentation to two days (Monday-Tuesday, Thursday-Friday).

WORKSHOPS

Rooms for workshops will be available for any colleagues or working groups on demand. Please contact us not later than May, 31, 2019 with workshop title, duration and expected number of participants. Rooms will be available for the business meetings of the Subcommissions on Carboniferous and Permian stratigraphy and for ad-hoc workshops of smaller groups.

PROCEEDINGS

Congress proceedings will be published, but at the time being no final decision on the format has been made. However, we prefer a publication in the “Compte Rendue” style of earlier congresses, as in our opinion dispersion in several journals minimizes the importance and impact of the congress.

19TH INTERNATIONAL CONGRESS ON THE CARBONIFEROUS AND PERMIAN



Social Events

WELCOME RECEPTION

Everybody is invited you to take part in the icebreaker party which is free of charge. Come and gather with friends, listen to experiences from the pre-Congress field trips, register and get your posters ready. And – of course – enjoy local “Kölsch beer”, beverages and snacks. The event will start at 6:00 p.m. at the central lecture hall, and end at 9:30 p.m

CONGRESS DINNER



The congress dinner might be a special highlight of your stay at the 19th ICCP in Cologne. A river cruise with the ship MS Loreley will bring you through the sunset and return at night in front of the impressive waterfront of the city.

Boarding will be at 7 p.m., return at 11 p.m, but you can stay with all friends and colleagues until one o'clock. Costs including all drinks are 65 €.

19TH INTERNATIONAL CONGRESS ON THE CARBONIFEROUS AND PERMIAN



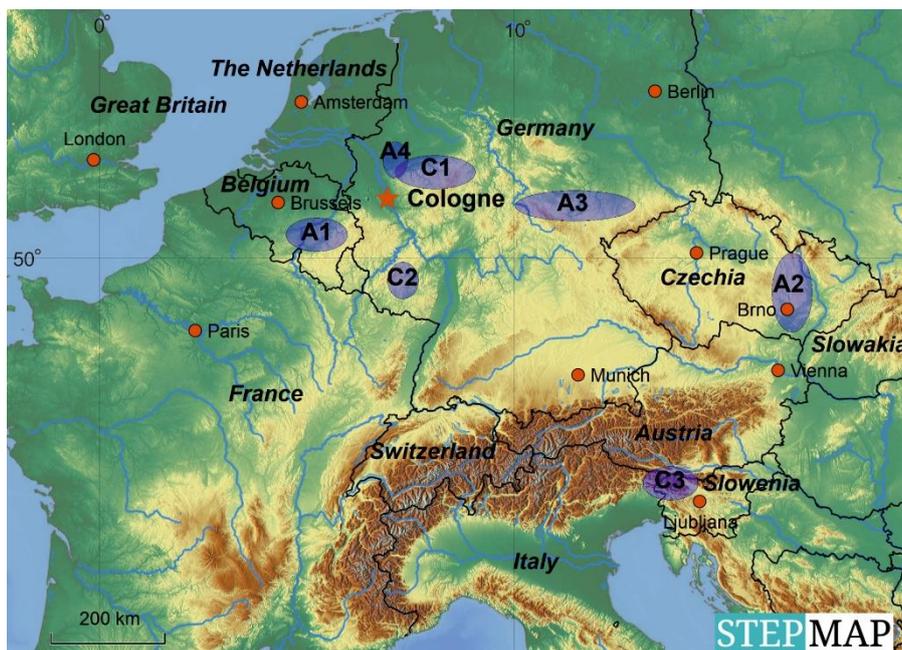
Back to the field

Choose your appropriate scientific pre-Congress and post-Congress field trips and explore regional geology and culture during the mid-Congress field trips

In all pre-Congress and post-Congress field trips cases a certain number of single bed rooms will be available. This might increase your fees. Additional costs have to be paid on the field trip. Requests for single bed rooms and all further questions should be directed to the responsible field trip leaders. All field trips will require some walking along roads, on forest paths, meadows, in active and inactive quarries in hilly landscapes except for field trip C3 that will be in high mountainous areas of the Alps. It will include some more extended walking.

Field boots are obligatory on all trips. If possible, bring your hammer and own safety goggles. For the German and Belgian field trips we will additionally provide helmets and safety jackets.

For mid-congress field trips direct questions to ICCP-2019@uni-koeln.de. We will serve potential participants strictly on a “first come first served” mode. In case that the field trip of your choice might be overbooked, please inform the organization committee to be included on a waitlist.



A. Pre-Congress field trips

A1 – The Mississippian carbonate platform of the Ardennes, Belgium – fauna, facies, and stratigraphy.

Julien Denayer (University of Liège), Edouard Poty (University of Liège), Bernard Mottequin (Royal Belgian Institute for Natural Sciences, Brussels), Cyrille Prestianni (Royal Belgian Institute for Natural Sciences, Brussels)

26.-28.07.2019

Contact: julien.denayer@uliege.be, University of Liège, Allée du Six-Aout B18, 4000 Liège, Belgium

The Lower Carboniferous (Dinantian) strata of the Namur-Dinant Basin in Belgium is probably the best known worldwide and many recent works have abundantly documented the stratigraphy, facies development and depositional settings, sequence stratigraphy and palaeontology. Belgium is the type area of the Tournaisian and Viséan stage and exposes on a rather small surface a very variegated set of characteristic formations in good-quality sections, easily accessible and of great geological value.



Hastarian (lower Tournaisian) crinoidal limestone and shaly interbedded recording precession cycles. Chansin quarry



Ivorian (upper Tournaisian) Waulsortian mound in Moniat, near Waulsort.



Underground quarry in Lives, stratotypic section of the Livian (middle Viséan) substage.



Moliniacian (lower Viséan) massive limestone forming the cliff capped by the citadelle in Dinant.

This field trip aims to present this succession with a peculiar view on the facies and biotic components. The excursion will visit the classical Tournaisian and Viséan formations both in renowned and off-the-beaten-tracks sections. The first days will be dedicated to the upper Famennian to upper Tournaisian Viséan shelf deposits of the Condroz area, including the Devonian-Carboniferous Boundary in the classical sections of Dolhain, Chanxhe and Royseux. The second day will focus on the deeper part of the basin, in the Dinant area where the well-developed and well-exposed Waulsortian mudmounds were first described in the early XXth century. The Tournaisian-Viséan succession north of Dinant will also be presented, including the lower Viséan Black Marble Lagerstätte. The last day will be dedicated to the proximal upper Tournaisian to upper Viséan strata in the proximal areas of Namur and its comparison with the succession of the Dinant area.

Transport: Coach

Departure: Friday, 26.07.2019, 08:30 a.m., Cologne University

Return: Sunday, 28.07.2019, approx. 5:00 p.m., Cologne University

Number of participants: minimum 10, maximum 20

Costs (including hotel and all meals): 420 Euros

Clothing and type of outcrops: no special clothing required except for field boots. Bring along your private safety goggles, if possible. However, goggles, helmets, and safety jackets will be provided.

Outcrops are active and abandoned quarries, natural and artificial outcrops along forest roads, slopes and river banks, easily reached by minor walking.

Suggestions: The field trip might be supplemented by post-congress field trip C1 to the Kulm Basin of the Rhenish Mountains that demonstrates time-equivalent successions of the deeper water foreland basin adjoining towards the east of the Ardenne carbonate platform. On post-congress field trip C3 the marine mixed carbonate-siliciclastic platform of the Pennsylvanian to Permian in the Southern Alps can be studied. Besides the Cantabrian Mountains (NW Spain) this is the only possibility to visit such a marine succession in central and western Europe!

A2. – Depositional history and stratigraphical evolution of the Mississippian of the Moravian-Silesian Basin

Tomas **Kumpan** (University of Brno), Ondřej **Bábek** (University of Olomouc), Jiří **Kalvoda** (University of Brno), Daniel **Šimíček** (University of Olomouc).

24.-28.07.2019

Contact: Tomáš Kumpan Kumpan.tom@gmail.com, Masaryk University Brno, Department of Geological Sciences, Kotlářská 267/2, 61137 Brno, Czech Republic

The field-trip will provide complete overview on the development of the Variscan Moravo-Silesian Basin from pre-orogenic to post-orogenic deposition shown on a three-day traverse from Brno to Ostrava. The examined sequences are parts of the Rhenohercynian Zone and represent counterpart of the German Rhenish Mountains. The main motive of the field-trip are gravitational redeposited facies starting from upper Devonian calciturbidites to Viséan synorogenic siliciclastic turbidites.

During the first day, limestone sequence of the Moravian Karst in the vicinity of Brno will be inspected, with special focus on the Devonian-Carboniferous and Tournaisian-Viséan boundary intervals, which are well documented by means of foraminifers and conodonts. Two different facies successions will be observed: slope calciturbiditic facies composed of platform and mixed platform-slope derived components, and upper slope hemipelagic facies. Second day will be dedicated to stratigraphic, sedimentological and paleontological aspects of synorogenic “Kulm” facies of the Drahaný Upland and Nížký Jeseník Mountains. Various types of turbidites and debrites of the remnant and peripheral foreland basin will be studied in several quarries and road-cuts. The history of the extensive slate mining in the ‘Slate Country’ of the Nížký Jeseník region since the Middle Ages will be revealed in the

Slate museum of Budišov nad Budišovkou, which, formerly a baroque mill, now is an important architectural monument. The field trip will end with a visit of the coal-bearing paralic succession in the region of Ostrava that was deposited after the Variscan orogeny in the external molasses of the Upper Silesian Basin.



Lesní lom quarry near Brno. Upper Frasnian, Famennian and Lower Tournaisian limestones succession of the Moravian Karst exposing the well dated Devonian-Carboniferous boundary

Proetid trilobite from Upper Tournaisian, siltstones of the Březina Fm.



Rhythmic alternation of shales, siltstones and sandstones produced by low-density turbidity currents. Lower to Middle Viséan, Protivanov Fm, Šošůvka quarry

Rhythmic alternation of turbiditic graywackes, siltstones and shales affected by fold-and-thrust tectonics in the old quarry at Stará Ves near Bílovec.

Transport: Coach

Departure: Thursday, 25.07.2019, 08:00 a.m., Brno city centre (meeting point will be specified later)

Return: Saturday, 27.07.2019, late afternoon, Brno

Number of participants: minimum 10, maximum 20

Costs (including hotels and all meals): 300 Euros

Clothing and type of outcrops: no special clothing required except for field boots. Bring along your private safety goggles, if possible. However, goggles, helmets, and safety jackets will be provided. Outcrops are active and abandoned quarries, natural and artificial outcrops along forest roads, slopes and river banks, easily reached by minor walking.

Note well: participants have to make their own travel reservations towards Brno. Transfer Brno-Cologne not included in field trip fees.

For the transfer from Brno to Cologne there are two options:

(A) Arranged by the organizers: coach Brno-Cologne (airport). Departure 27.07. 06:30 p.m., arrival 28.07. 9:30 about 40 Euro.

(B) Not arranged by the organizers: Train Brno-Vienna (2 hours, no reservation required, 15 Euro) and flight Vienna-Cologne (1.5 hours, from about 100 Euro)

Suggestions: The field trip might be supplemented by post-congress field trip C1 to the Kulm Basin of the Rhenish Mountains that demonstrates time-equivalent successions of the deeper water foreland basin on the northern side of the bilaterally symmetric European Variscan Orogen. On post-congress field trip C3 the marine mixed carbonate-siliciclastic platform of the Pennsylvanian to Permian in the Southern Alps can be studied. Besides the Cantabrian Mountains (NW Spain) this is the only possibility to visit such a marine succession in central and western Europe!

A3 – The classical Central European Permian: continental ‘Rotliegend’, marine ‘Zechstein’, and the Permian-Triassic transition in Germany.

Joerg W. **Schneider** (Technische Universität Bergakademie Freiberg), Thomas **Wotte** (Technische Universität Bergakademie Freiberg), Silvio **Zeibig** (K+S Kali GmbH, Kassel), Birgit **Gaitzsch** (Technische Universität Bergakademie Freiberg),

26.07. – 28.07.2019

Contact: joerg.schneider@geo.tu-freiberg.de, Technische Universität Bergakademie Freiberg, Bernhard-von-Cotta-Straße 2, 09596 Freiberg, Germany

Thuringia belongs to the classical European regions from where the traditional miners terms ‘Rotliegend’ and ‘Zechstein’ (for the continental and marine Permian, respectively), but also terms like ‘Saxonian’ and ‘Thuringian’ originate. This field trip aims to present typical outcrops of the Latest Carboniferous to the earliest Triassic in this classical Central European region. We will visit earliest to middle Permian well exposed outcrops in the Thuringian Forest characteristic for the intramontane basins of the European Variscan Orogen. Facies pattern and fossil content indicate the primarily climatically driven transition from fluvial and palustrine ‘grey facies’ to wet reds beds with lacustrine black shales, and finally to increasingly dryer playa red beds. The detailed studied fossil content of the visited Carboniferous and Permian sections will be used to discuss the current progress to correlate non-marine deposits of this period with the marine Standard Global Chronostratigraphic Scale. At the border of the Thuringian Forest the exceptional rapid marine Zechstein transgression including its basal Kupferschiefer (Copper Shale) on the nearshore palaeorelief is discussed in two representative outcrops. The unique barrier reef complex at the southern coast of the former Zechstein sea will be exemplified at the mediaeval castle Burg Ranis, build on one of these well exposed reefs. A Zechstein-reef diorama and the reconstruction of a Pleistocene archaeological site of the transition from the Neandertal man to the sapiens populations in a karst cave in the reef is seen in the castle museums exhibition.

One of the highlights will be the visit of the huge, abandoned Caaschwitz quarry where the lithostratigraphic boundary between Zechstein and Buntsandstein is exposed. Based on multistratigraphic approaches the equivalent to the marine Permian-Triassic boundary of the GSSP Meishan (South China) could be fixed here for the first time in European continental deposits.

The last day of the field trip is devoted to the salt mine Merkers, famous for its meter-sized halite crystals, to demonstrate the Zechstein evaporites. On the way back to Cologne, we will show the intra-Zechstein fissure fill at Korbach (northern Hesse), probably the second oldest fossil-bearing karst fill globally known. Among the diverse reptile fauna, therapsids like Procynosuchus proved for the first time palaeobiogeographic affinities of Central Europe and Gondwana during the Late Permian.



Tabarz quarry in the Thuringian Forest. Vulcanites as well as lacustrine black shales and fluvial red beds of latest Gzhelian and middle Asselian age, are intruded by Sakmarian basalts. The fossil content of plants, diverse arthropods, tetrapods and their tracks is very typical for the Central European Permian Rotliegend and important for the correlation with the marine Standard Global Chronostratigraphic Scale.



Gera-Märzenberg, a classical outcrop. Middle to earliest late Permian continental red beds covered by the Zechstein transgression conglomerate, and followed by the Kupferschiefer (Copper shale) and carbonates of the Zechstein 1 cycle



Abandoned Caaschwitz quarry near Gera. Lithostratigraphic boundary between Zechstein and Buntsandstein. Based on multistratigraphy, the equivalent to the marine Permian-Triassic boundary of the GSSP Meishan (South China) could be fixed here for the first time in European continental deposits.



Former potash mine 'Merkers', South Thuringia. 20 m to 150 m thick evaporites of the Zechstein 1 cycle (Werra Formation) were exploited by galleries 4.600 km long. The mine is known as the hiding-place of large amounts of Nazi gold during World War II, discovered by the US Army in 1945.

Transport: Coach

Departure: Friday, 26.07.2019, 08:00 a.m., Cologne University

Return: Sunday, 28.07.2019, approx. 5:30 p.m., Cologne University

Number of participants: minimum 12, maximum 25

Costs (including hotels, all meals and visit of salt mine): 430 Euros

Clothing and type of outcrops: no special clothing required except for field boots. Bring along your private safety goggles, if possible. However, goggles, helmets, and safety jackets will be provided. Outcrops are active and abandoned quarries, natural and artificial outcrops, easily reached by minor walking; one outcrop will need a moderate walk. A visit of the subsurface potash mine Merkers is included.

Suggestions: The field trip might be supplemented by post-congress field trip C2 demonstrating the development of an intramontane basin south of the Zechstein sea, i.e. a completely continental

Pennsylvanian-Permian succession. On post-congress field trip C3, the marine mixed carbonate-siliciclastic platform of the Pennsylvanian to Permian in the Southern Alps can be studied. Opposed to the continental Rotliegend and enclosed central European Zechstein sea, it demonstrates open marine platform development at the NW margin of the Tethys. Besides the Cantabrian Mountains (NW Spain) this is the only possibility to visit such a marine succession in central and western Europe!

A4 – The Pennsylvanian of the Ruhr basin, western Germany – facies, stratigraphy, and tectonics of a paralic foreland basin of the Variscides including coal formation

Volker **Wrede** (GeoPark Ruhrgebiet, Essen), Günter **Drozdzewski** (formerly Geologischer Dienst Nordrhein-Westfalen, Krefeld)

27.07.– 28.07.2019

Contact: wredevolker@yahoo.de, GeoPark Ruhrgebiet e. V., Kronprinzenstraße 35, 45128 Essen, Germany

The field trip will focus on the paralic development of the Subvariscan Foreland Basin during the Marsdenian (Namurian B), Yeadonian (Namurian C), and Langsettian (Westfalian A) in the Ruhr Basin and also include the Bolsovian (Westphalian C) and Asturian (Westphalian D) strata of the Ibbenbüren / Osnabrück area. Sedimentary evolution starts with marine deposits in the Marsdenian, and is ending with alluvial flood plains in the Westphalian C/D.

The basin development is determined by cyclic sedimentation of different scales. It will be highlighted by “classic” sections in the surroundings of the towns of Hagen, Witten, Bochum on day one. The second day of the field trip will lead to Ibbenbüren and Osnabrück.

Famous locations as e.g. the “Vorhalle Quarry” in Hagen, well known for the findings of early insects, as well as “Geological Gardens” in Bochum with one of the best exposures of the Variscan unconformity, and the huge Piesberg Quarry near Osnabrück, will be visited. Aspects of sedimentology, sequence stratigraphy, palaeontology, and coal formation are discussed. Tectonic features, typical for the area will be demonstrated.

After closure of the last active coal mines in Germany in late 2018, a visit of the historic Nightingale Mine in Witten is one of the only remaining opportunities to investigate mineable coal seams in situ underground.



Hagen, Vorhalle Quarry. Intensively folded marine strata of Marsdenian age (Namurian B).

Transport: Coach

Departure: Saturday, 27.07.2019, 08:30 a.m., Cologne University

Return: Sunday, 28.07.2019, approx. 5:00 p.m., Cologne University

Number of participants: minimum 12, maximum 25

Costs (including hotel and all meals): 230 Euros

Clothing and type of outcrops: no special clothing required except for field boots. Bring along your private safety goggles, if possible. However, goggles, helmets, and safety jackets will be provided. Outcrops are active and abandoned quarries, natural and artificial outcrops, easily reached by minor walking.



Namurotypus sippeli BRAUCKMANN & ZESSIN) from the Vorhalle Quarry (Ziegelschiefer Formation). (Photo: L. Koch)



Bochum, Geological Gardens. Variscan unconformity – horizontally bedded strata of the Cenomanian overlay tilted upper Langsetian strata (Bochum-Formation).



Osnabrück, Piesberg Quarry. Sediments of the Asturian (Westphalian D) with coal seams and alluvial sandstones

Suggestions: The field trip might be supplemented by post-congress field trip C1 to the Kulm Basin of the Rhenish Mountains. It exemplified the development of the deeper water foreland basin that was the southeastern precursor basin during Mississippian times. Opposed to the paralic realm, the intramontane Saar-Nahe Basin can be studied during post-congress field trip C2. Post-congress field trip C3 demonstrates the marine mixed carbonate-siliciclastic platform of the Pennsylvanian to Permian in the Southern Alps. It developed after the Variscan paroxysm and, besides the Cantabrian Mountains (NW Spain), is the only possibility to visit a marine succession of that time slice in central and western Europe!

B. Mid-Congress field trips

B1 Laacher See volcanism and medieval to industrial cultural history of the East Eifel region Carsten Münker (University of Cologne)

Full day excursion. This field trip will provide a geo-cultural blend covering 12.900 year old Laacher See volcanism and the cultural history of the region from medieval to early industrial times. The morning is dedicated to deposits of the 12.900 old Laacher See phonolite eruption which is the second youngest in Germany and one of the most massive Plinian eruptions in Europe. We will visit Wingertsbergwand, a world class outcrop illustrating a textbook style combination of different volcanic eruption styles.

This will be followed by a visit of the ca. 900 year old abbey of Maria Laach with an impressive 13th century basilica. The local brewing culture can be studied over lunch at “Vulkanbrauhaus Mendig”,

where a worldwide unique selection of volcano-beers can be tasted. The early industrial history of the region will be explored by a one hour underground tour through the so called “lava cellars”, a large underground mine in a buried tephritic lava flow that has been active since Roman time until the 1960s.



Volcanic sediments at Wingertsbergwand



Abbey Maria Laach

© Schiblon

Transport: Coach

Departure: 09:00 a.m.

Return: approx. 5:00 p.m.

Numbers: minimum 25, maximum 60 participants (with separately guided tours for maximum 30 participants).

Special requirements: none

Costs (including lunch and guided tour): 60 €

B2 – Rhenish brown coals and Chateau Paffendorf *Hans-Georg Herbig (University of Cologne)*

Full day excursion. Main topic of the excursion is the largest contiguous brown coal mining area in Europe west of Cologne that covers an area of about 250 km². The Rhenish brown coals are generally blackish lignites that originated from extensive Miocene coastal forests and bogs in the Lower Rhine Embayment, a southeastern trending rift of the North Sea, between 23 and 5 million years ago. Since the middle of the 18th century, the coal was mined in larger amounts. Operated by the energy provider RWE, open pit mining commenced in 1955. Currently, three continuously prograding open pit mines – Hambach, Inden, and Garzweiler – have a size of 94 km². Bucket wheel excavators are digging down to 350 m below surface –



this means considerably lower than present day sea-level. The largest excavator (see figure above), a steel giant weighing over 13.500 tons overtrumps the NASA Crawler Transporter, hitherto the world largest land vehicle. With its dimensions – nearly 220 meters long and 96 meters high – it can convey up to 204.000 cubic meters of coal and other sediments each day. In total, about 96.2 million tons of lignite are produced annually in the area. The overburden is transported via conveyor belts to exhausted mine areas for refill. This is the first step for recultivation that will create a new landscape composed of farmland, forests and lakes. The other side of the coin is the necessary relocation of several smaller towns and villages with over 40.000 habitants.

During a guided bus tour, about three hours long, you will get the opportunity to get into the open pit mine Garzweiler to see the geology and the excavation techniques. The tour also includes a visit of recultivated areas and a village that will be relocated. Afterwards, if you are free from giddiness, you can walk over the edge of the open pit mine on a breathtaking glass skywalk.



After a short transfer, Chateau Paffendorf will be reached for lunch. Built in the Renaissance style, mostly between 1531 and 1546, it is completely surrounded by a moat. After lunch, served in the inner courtyard or in one of the wings of the site, the large park of the chateau is inviting you to take a walk and to admire the architecture of the building.

Transport: Coach

Departure Group 1: 08.00 a.m.

Departure Group 2: 09:30 a.m. (optional, only if more than 50 persons will participate)

Return Group 1: approx.: 04.30 p.m.

Return Group 2: approx.: 06.00 p.m.

Numbers: minimum 25, maximum 90 participants

Special requirements: Take field boots for visit of the open pit mine and additional shoes to change. If available, bring your own safety goggles: Helmets and safety jackets will be provided.

Costs (including lunch and guided tour): 60 €

B3 – Neanderthal Museum and medieval town of Zons *Sven Hartenfels (University of Cologne)*



Full day excursion. The morning is dedicated to the Neanderthals and a time travel through the history of mankind. It includes a visit to the iconic type locality of the first Neanderthal man, discovered in 1856 in cave sediments of Middle Devonian reef limestone. Albeit later completely removed by quarry works, additional bones and artifacts were recovered in the ancient quarry pile in the late Nineties of the last century. Nearby, a guided tour in one of the most modern museums of Europe will enable to hear about the history of mankind from its beginnings more than four million years ago and to admire besides many other objects breath-taking dermoplastic reconstructions of hominids.

After short transfer (about 45 min) the medieval town of Zons will be reached, a unique piece of history, founded in 1373 on the banks of the river Rhine. Still completely engirded by the town wall, it served as customs fortification for the river boats. After lunch served in one of the oldest houses of Zons, you can explore the town on your own, with a guided tour, or simply enjoy the time in one of the beautiful cafes.



Transport: Coach

Departure: 08:45 a.m.

Return approx. 5:15 p.m.

Numbers: minimum 25, maximum 90 participants (with separately guided tours for maximum 30 participants)

Special requirements: none

Costs (including lunch and guided tours): 60 Euros

B4 – Guided city tour – the history of Cologne

External guide

Excursion (about 2 ½ hours). Cologne was founded in the 1st century AD by the Romans on the banks of the river Rhine. It functioned as the headquarter of the Roman military in the region and capital of a Roman province until occupied by Frankish tribes in 462. During medieval times, the city flourished due to its place at the intersection of the major trade routes from Northern Italy to The Netherlands, and from Western to Eastern Europe. Counting about 50,000–55,000 inhabitants around the year 1300, it grew to one of the largest cities North of the Alps. During Napoleon times it became part of the French Empire – actually the fancy soldier costumes of the world-known Rhenish Carnival result from these days. After World War I, the city was occupied by the British for several years. Heavily bombed and almost completely destroyed during World War II, the city nowadays has a very unique cityscape, from well preserved Roman relicts to contemporary architecture. The intermingling of cultures since Roman days also created a unique population, further shaped in our days by students, businessmen, visitors, and immigrants from all over the world. Cologne is the fourth biggest German city with somewhat more than one million inhabitants.



The best way to discover Cologne is the way the Romans did – on foot. During the guided tour you will discover the historical center of the city adjacent to the Cathedral, which is included in the UNESCO world heritage list. You will see Roman relicts, Romanesque churches, medieval houses and city gates, the impressive town hall and other places of interest. The stroll through narrow, cobbled streets and across vibrant squares will give you a feeling of the life in the city, as it was in the past – and as it is today.

Meeting point: finial – a detached copy of the tip of the cathedrals’s spire – opposite the main entrance of the Cologne Cathedral

Group 1: 10:00 a.m.

Group 2: 02:00 p.m. (optional, only if more than 30 persons will participate)

Duration: about 2 ½ hours
Numbers: minimum 25, maximum 60 participants
Special requirements: none
Costs: 10 €

C. Post-Congress field trips

C1 – The Mississippian Kulm Basin of the Rhenish Mountains, western Germany – fauna, facies, and stratigraphy of a mixed carbonate-siliciclastic foreland basin.

Hans-Georg Herbig (Universität zu Köln), Hartmut Jäger (GeoResources STC Leimen), (Dieter Korn (Museum für Naturkunde Berlin), Michael Amler (Universität zu Köln)

03.-05.08.2019

Contact: herbig.paleont@uni-koeln.de, michael.amler@uni-koeln.de, University of Cologne, Institute of Geology and Mineralogie, Zùlpicher Strasse 49A, D-50674 Köln, Germany

The Mississippian Kulm Basin of the Rhenish Mountains serves as a typical example of the central European and northwestern African Variscan deeper water foreland basins. However, subdivided into internal basins and swells it is internally differentiated, containing a surprising variety of sediments. They include ammonoid-bearing nodular limestone on swells, calciturbidites shed from not any more existing shallow-water sources, black shales, siliceous shales and bedded cherts in the starved basin, as well as shales, siltstones and greywackes shed from the advancing orogenic front. Based on decades of research, very detailed biostratigraphic subdivisions based on ammonoids, conodonts, and radiolarians were developed, notably for the lower Tournaisian and upper Viséan, which are generally applied in all the Variscan Kulm basins. Recently, the first application of sequence stratigraphy in such a complex deeper water basin showed that the lithostratigraphic succession is not random nor controlled by tectonics, but instead by sea level changes that only were overridden by the general succession from starved basin to orogenic sediments. Sequence stratigraphy now also enables a better correlation with the successions of the NW European shallow-water platform.

The field trip aims to present this succession based on many results, which in part still might have escaped the attention of the community. We particularly focus on litho- and biofacies, facies control, and stratigraphy, crossing the basin from its external margin in the west to proximal flysch facies in the east, which in part already is exposed within difficult to spot allochthonous nappes. Among others, the excursion will be visiting two outstanding sections exposing the Devonian-Carboniferous transition (Borkewehr, Drewer), the very well constrained Tournaisian-Viséan boundary in the Zippenhaus section, and the proposed Viséan-Serpukhovian boundary at the Wenne-Ufer section with its well documented and ammonoid-correlated conodont fauna. We also will visit the most important Mississippian black shale units in the Kulm Basin, i.e. the classical “Lower Alum Shale” that represents a world-wide event, an upper Viséan succession (Bromberg Fm) and the uppermost Viséan-lower Serpukhovian “Upper Alum Shale”, which also is widely distributed throughout the Kulm Basin and beyond. In several places worldwide these units are targets for unconventional hydrocarbon shale plays. We will look at typical sedimentological pattern of each unit, combined with results from optical kerogen analysis and geochemistry, for a better understanding of the depositional systems, diagenesis and thermal history and the influence on the development of the resource potential of these shales.

Transport: Coach

Departure: Saturday, 03.08.2019, 08:30 a.m., Cologne University

Return: Monday, approx. 6:30 p.m., Cologne University

Number of participants: minimum 12, maximum 25

Costs (including hotels and all meals): 420 Euros

Clothing and type of outcrops: no special clothing required except for field boots. Bring along your private safety goggles, if possible. However, goggles, helmets, and safety jackets will be provided. Outcrops are active and abandoned quarries, natural and artificial outcrops along forest roads, slopes and river banks, easily reached by minor walking.



Drewer quarry. Condensed middle Famennian to lower Viséan succession on a submarine swell. Late Famennian mudmound at the very right. Detailed biostratigraphic control on the DC boundary by ammonoids and conodonts in nodular limestone facies. Blackish Lower Viséan blackish siliceous shale on top of section.



Abandoned quarry at Bromberg. Black alum shales, siliceous shales and few intercalated calciturbidites of the Asbian Bromberg Fm. Overlain above a sequence boundary by lower Brigantian mudstones and siltstones (Leibach Fm.) bearing pseudoplantic bivalves. Cephalopod limestone horizon close to the top of the Bromberg Fm. Indicates maximum flooding interval section



Abandoned quarry Becke-Oese. Upper Viséan calciturbidites (Herdringen Fm.) overlain by lower Namurian black shales (Seltersberg Fm, the classical "Upper Alum Shales")



Dainrode quarry. Upper Viséan siliciclastic flysch sediment (greywackes, siltstones, mudstones) in the easternmost Rhenish Mountains were shed from the prograding orogenic front. They are time-equivalent to the sediments at Bromberg pictured above.

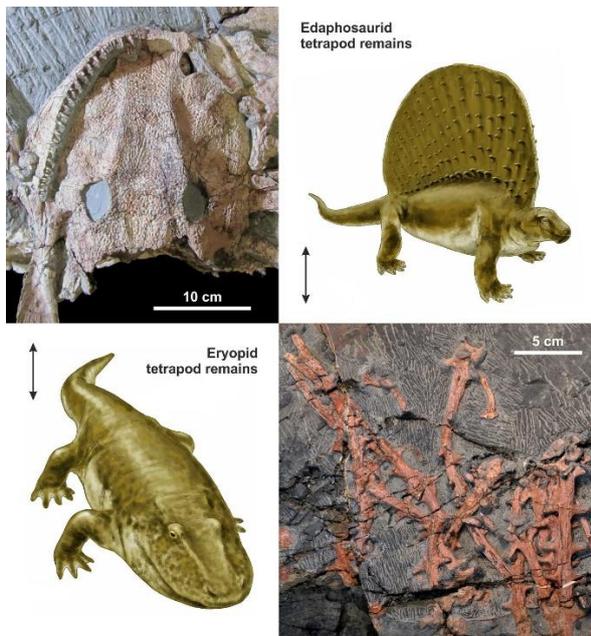
Suggestions: The field trip might be supplemented by pre-congress field trip A1 to the Ardennes that demonstrates time-equivalent successions of the carbonate platform adjoining towards the west of the Rhenish Kulm Basin. Pre-Congress field trip A2 allows comparison with a foreland basin on the southern side of the bilaterally symmetric European Variscan Orogen. On pre-congress field trip A4 the following Pennsylvanian development can be studied: basin progradation towards the northwest created the Subvariscan Basin, which after vanishing of the flysch facies was filled by paralic coal-bearing molasse sediments.

C2 – The Pennsylvanian–Permian of the Saar–Nahe Basin, southwestern Germany –an intramontane continental molasse basin of the Variscides.

Sebastian Voigt (Urweltmuseum Geoskop, Thallichtenberg), Thomas Schindler (Generaldirektion Kulturelles Erbe Rheinland Pfalz, Koblenz)

03.-05.08.2019

Contact: s.voigt@pfalzmuseum.bv-pfalz.de, Urweltmuseum GEOSKOP, Burg Lichtenberg (Pfalz), Burgstraße 19, D-66871 Thallichtenberg, Germany



This trip focuses on fossil biota, facies and stratigraphy of one of the largest and best studied central Variscan basins of Europe. Its continental volcano-sedimentary succession measures about 8,000 m in cumulative thickness and covers early Pennsylvanian (ca. 320 Ma) to late Early Permian (ca. 280 Ma) rocks. Description of macrofossil content goes back to the mid-18th century and is world-famous especially regarding plants, freshwater sharks and tetrapods. The sedimentary fill of the Saar-Nahe Basin records in most detail the well-known Pennsylvanian-Permian paleoequatorial climatic shift from year-round hot and wet to monsoonal climate with extended dry seasons. First day of field trip will be dedicated to Pennsylvanian rocks of the formerly important hard coal mining Saar region. Limnic coal formation, coal tonsteins, plant macrofossils, horizons of the clamp shrimp *Leaia* and coarse-grained clastic intercalations as evidence of tectonic impulses are of main scientific interest in this part of the basin. Second day will be focused

Eryopid and pelycosaurian tetrapod remains from the about 300 Ma old fluvio-lacustrine sediments of the Remigiusberg Fm. of the Remigiusberg quarry near Haschbach (Palatinate).

on fluvio-lacustrine sediments of the Lower Rot-Rotliegend (Glan Subgroup) of northwestern Palatinate area including the Odernheim black shales with its famous amphibian fauna. Of global importance is the recently discovered Remigiusberg fossil tetrapod hot spot with excellently preserved temnospondyl (Eryopidae, Dvinosauridae), reptiliomorph amphibian (Diadectomorpha) and pelycosaurian (Edaphosauridae, Sphenacodontidae) skeletons from around the Pennsylvanian-Permian boundary. Third day will be dedicated to the volcano-sedimentary rocks of the Upper Rotliegend (Nahe Subgroup) in the central and northeastern part of the Palatinate area. The focus will be on various products of an intense late Sakmarian intra-basinal magmatism (lava flows, lahars, laccoliths, maar-diatremes etc.), eolian-influenced playa red-beds as well as fossil biota which had to adapt to extreme environments. The field trip includes the visit of two museums (Urweltmuseum GEOSKOP and Paläontologisches Museum Nierstein) that offer remarkable insight into the fossils of the Saar-Nahe Basin.

Transport: Coach

Departure: Saturday, 03.08.2019, 08:00 a.m., Cologne University

Return: Monday, approx. 08:00 p.m., Cologne University

Number of participants: minimum 12, maximum 26

Costs (including overnight stay in a hostel, which is situated within the medieval castle Burg Lichtenberg / Pfalz; single and double rooms with private bath; Including all meals except at first evening): 310 Euros

Clothing and type of outcrops: no special clothing required except for field boots. Bring along your private safety goggles, if possible. However, goggles, helmets, and safety jackets will be provided.

Outcrops are active and abandoned quarries, natural and artificial outcrops along forest roads, slopes and river banks, easily reached by minor walking.



Haschbach (Palatinate), Remigiusberg Fm., Glan Subgroup, Lower Rotliegend, Pennsylvanian-Permian boundary. Remigiusberg quarry with fluvio-lacustrine sediments on top of an early Permian andesitic sill ('Kuselite').



Hinzweiler (Palatinate), Altenglan Fm., Glan Subgroup, Lower Rotliegend, early Permian. Surface and subsurface mining of lacustrine limestone.



Münster-Sarmsheim (Nahe region), Wadern Fm., Nahe Subgroup, Upper Rotliegend, early Permian. Trollfelsen locality, slightly silicified conglomerates exposed by weathering.



Bretzenheim (Nahe region), Kreuznach Fm., Nahe Subgroup, Upper Rotliegend, early Permian. Ancient monastery carved out of late early Permian red sandstone of disputable eolian or fluvial origin.

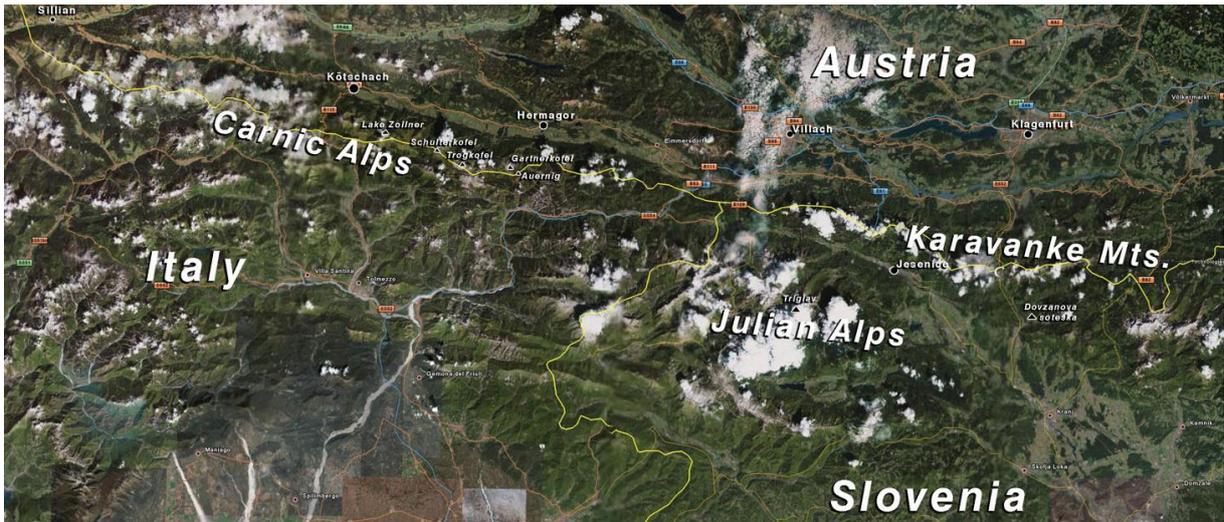
Suggestions: The field trip might be combined with pre-Congress field trip A3, which demonstrates the classical continental succession of the Rotliegend in central Germany. However, the latter differs by the uppermost Permian ingression of the Zechstein Sea. Pre-Congress field trip A4 shows the time-equivalent development in the paralic environment of the Ruhr area.

C3 – The Pennsylvanian–Permian of the Southern Alps (Carnic Alps/Karavanke Mts.), Austria/Italy/Slovenia – fauna, facies and stratigraphy of a mixed carbonate-siliciclastic shallow marine platform along the northwestern Palaeotethys margin.

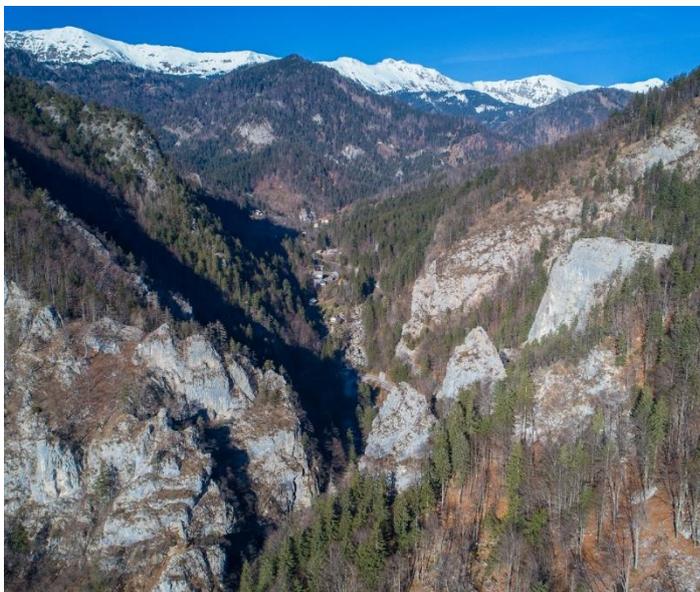
Matevž **Novak** (Geological Survey of Slovenia, Ljubljana), Holger **Forke** (Millenia Stratigraphic Consultants), Hans-Peter **Schönlaub** (Vienna and Kötschach-Mauthen, Austria)

03.-06.08.2019

Contact: matevz.novak@geo-zs.si Dimičeva ulica 14, 1000 Ljubljana, Slovenia; holger.forke@gmx.de



Excursion Day 1 Dovžanova Soteska (Lower Permian)

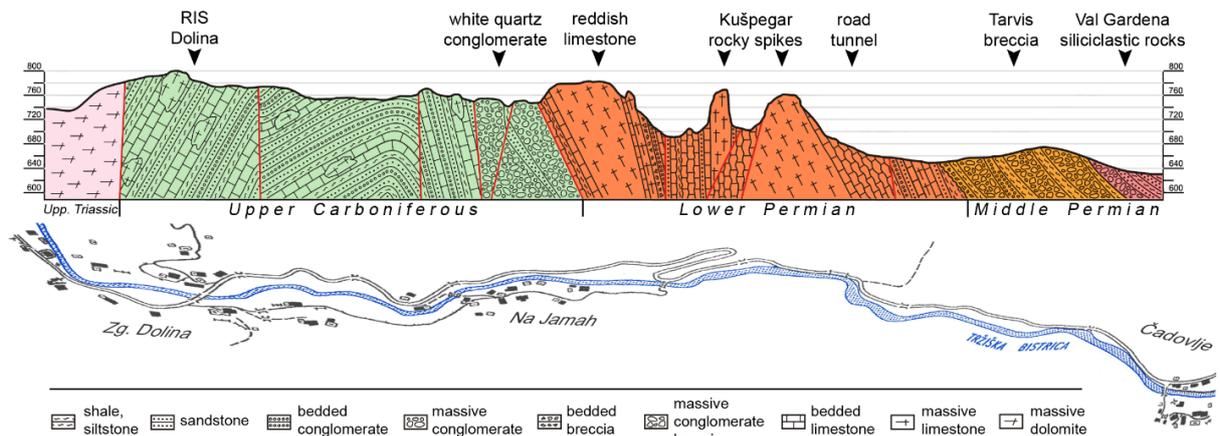


- Aim of the excursion is to visit classical localities of Late Paleozoic sediments of Tethyan origin in Central Europe. Carboniferous/Permian rocks in the Southern Alps are among the earliest scientifically described and were discovered in the first half of the 19th century. The Dovžanova soteska (Dovžan's Gorge) exposes the most complete section of shallow-marine fossil-rich Late Paleozoic beds in the Karavanke Mts.

Ever since the early studies of fusulinids and brachiopods by SCHELLWIEN (1898, 1900), corals and brachiopods by HERITSCH (1933, 1938) and fusulinids by KAHLER & KAHLER (1937), the Dovžanova

soteska has attracted attention of paleontologists as a type locality of large number of fossil taxa.

- The section, although it is cut by several faults, displays an almost continuous development of cyclic, siliciclastic-carbonate deposition from a gently steeping ramp during Gzhelian into a reef-rimmed platform through Asselian and Sakmarian. Since the Gzhelian succession of fluvial to fan-deltaic conglomerates, nearshore storm regime dominated sandstones, bioturbated siltstones, and offshore

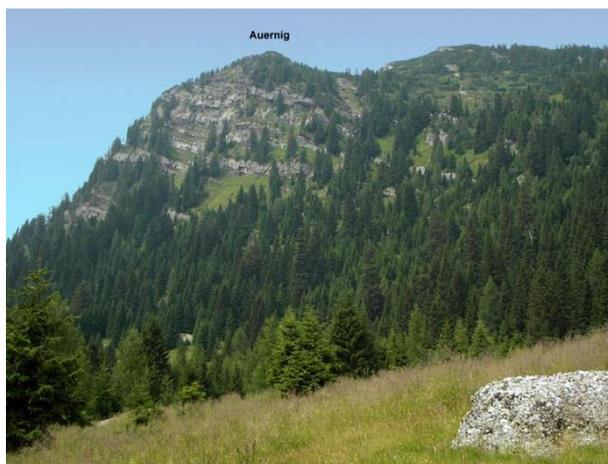


algal buildups (Auernig and Schulterkofel Formations) is almost identical to the one in the better exposed sections in Carnic Alps (see Excursion days 2 and 3), our observations will focus on the predominantly carbonate, reef and lagoonal, Asselian-Sakmarian succession of Dovžanova Soteska Formation, Born Fm. and Rigelj Beds (FORKE, 2002; NOVAK, 2007). On the walkway through the gorge, we will cross five regional fusulinid assemblage zones and stop at the most important fossil sites.

Excursion Day 2 Gartnerkofel - Gugga – Auernig (Upper Carboniferous)

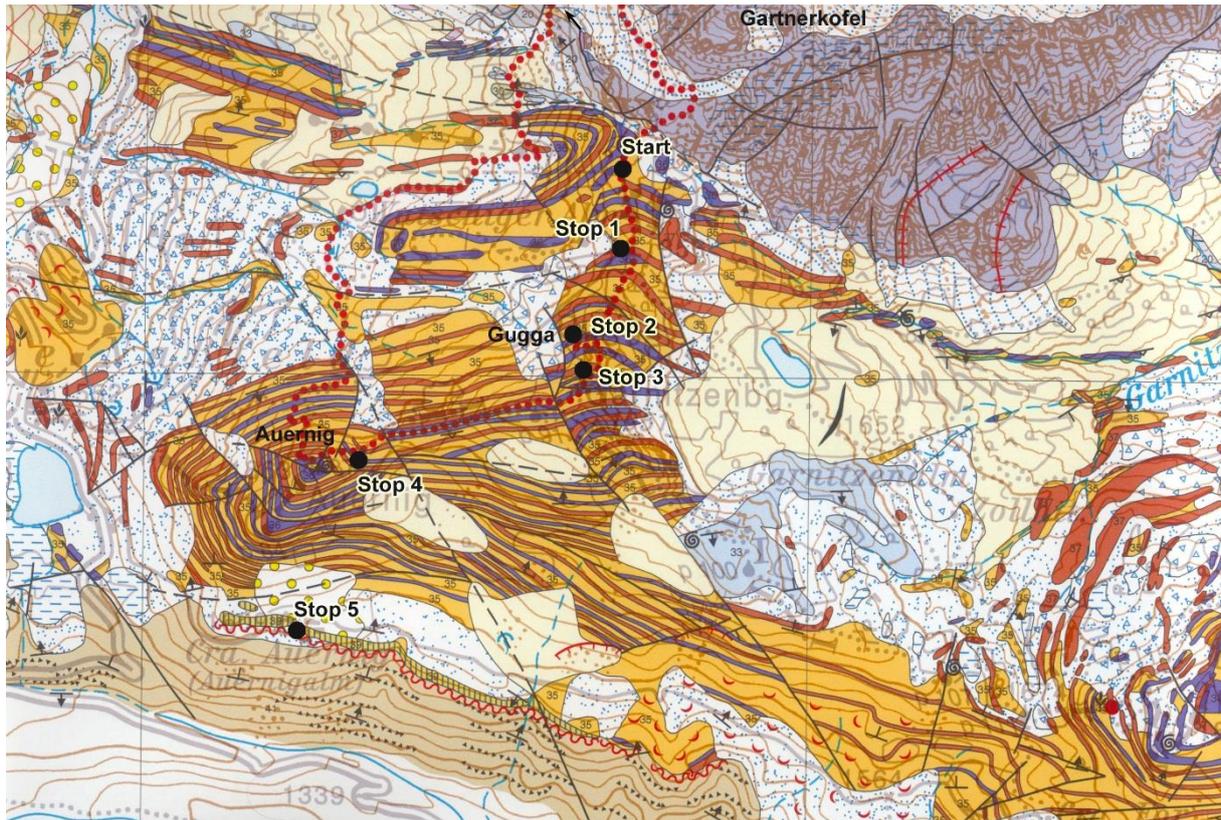


- Excursion day 2 starts with an overview of the geology of the surrounding area with emphasis on the Late Paleozoic sequence. On the Kammleiten (1998 m) a scientific core was drilled in 1986 to analyze the P/T boundary (Gartnerkofel Drilling Project). The summit of the Gartnerkofel (2195 m) consists of Schlern Dolomite with a thickness of more than 500 m.



- Typical Auernig cyclothem.

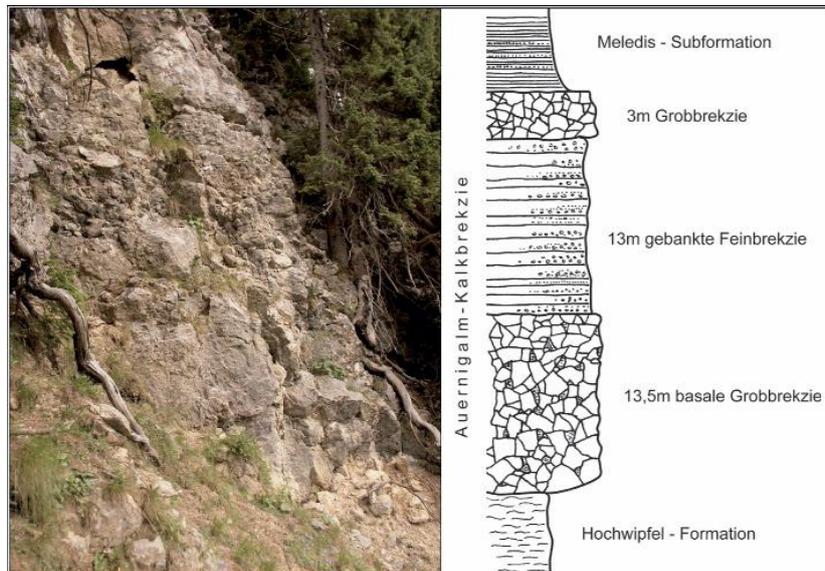
This locality represents one of the scientifically most interesting settings in the Carnic Alps. The Carboniferous succession at the western and southern flank of Auernig mountain with the repetitive alternations of conglomerates, sandstones, shales, and limestones has attracted geologists since the end of the 19th century. SCHELLWIEN (1892), FRECH (1894) and GEYER (1896) investigated this area and introduced letters, respectively numbers for the individual beds. SCHELLWIEN (1898) first studied the fusulinids from the Auernig section with several new species. The term „Auernigschichten“ was introduced by FRECH (1894). HERITSCH et al. (1934) lithologically defined and subdivided the Auernig Formation according to the predominance of limestone horizons into five members (“untere kalkarme, untere kalkreiche, mittlere kalkarme, obere kalkreiche, obere kalkarme Schichtgruppe”). SELLI (1963) introduced the terms Meledis, Pizzul, Corona, Auernig, and Carnizza as subdivision of the Auernig Formation, which are regarded as equivalents of those of HERITSCH. Abundant plant debris (with Stefanian flora) has been studied by FRITZ & BOERSMA (1990). Sedimentology and cyclostratigraphy have been discussed by KRAINER (1990) and SAMANKASSOU (2002).



- The basal deposits at the contact between Pre-Variscan Basement and Post-Variscan sedimentary cover.

The Auernigalm Limestone Breccia consists of coarse and fine-grained clasts. The thickness of the breccia varies from 12 m on the lateral sides to more than 30 m in the central part (SE of the Auernigalm). Of particular interest are the uppermost parts of the limestone breccia, which yielded conodonts and sparse fusulinoideans in the interstices. The presence

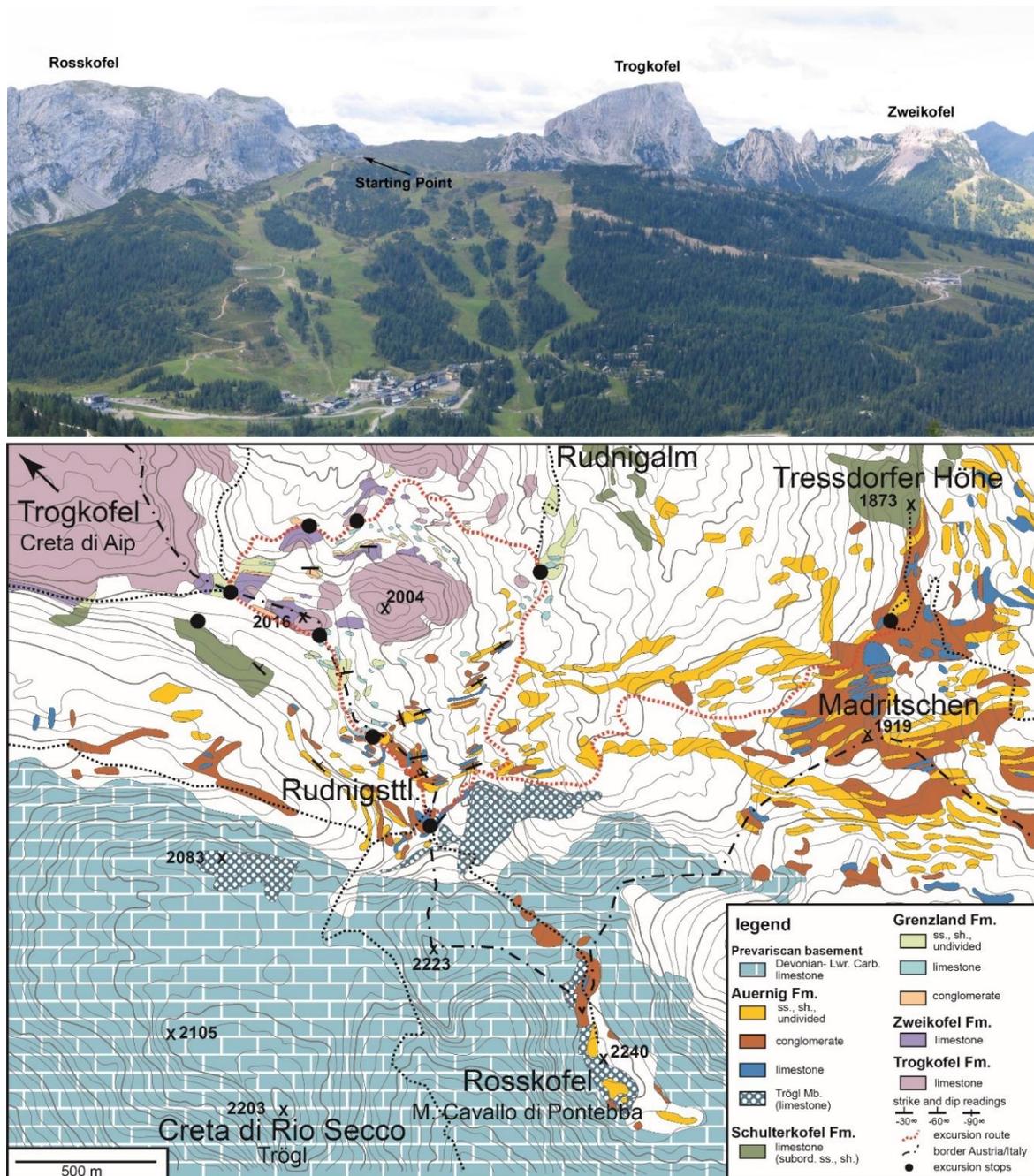
of *Idiognathodus cf. expansus*, *Swadelina ? cf. makhlinae*, and *Fusulina (Quasifusulinoidea) sp.* indicates at least a lower Kasimovian (Krevyakinian) age. The lense-like geometry of the Auernigalm Limestone Breccia between the underlying Hochwipfel Formation and the overlying Auernig Formation suggests an extensive fan deposit along the foothill of the escarpment of the Roßkofel-Malurch massif.



Excursion Day 3 Madritschen – Rudnig Saddle – Trogkofel (Lower Permian)

- The third day starts at Madritschen with an overview of Lower Permian stratigraphy. We will discuss the sedimentology, cyclicity, the various types of build-ups and changes in biota of the individual formations. Highlights are the distinct *Anthracoporella* mounds in the Schulterkofel

Formation, the oncoïd limestones with abundant larger benthic forams (e.g. *Zellia*) in the Grenzland and Zweikofel Formation and *Archaeolithoporella* reef limestone in the Trogkofel Formation. Our walkway will lead us along the Rudnig saddle to the base of Trogkofel massif. On the way back through the Trogkar, we will pass the red limestones of Altitude 2004 m.

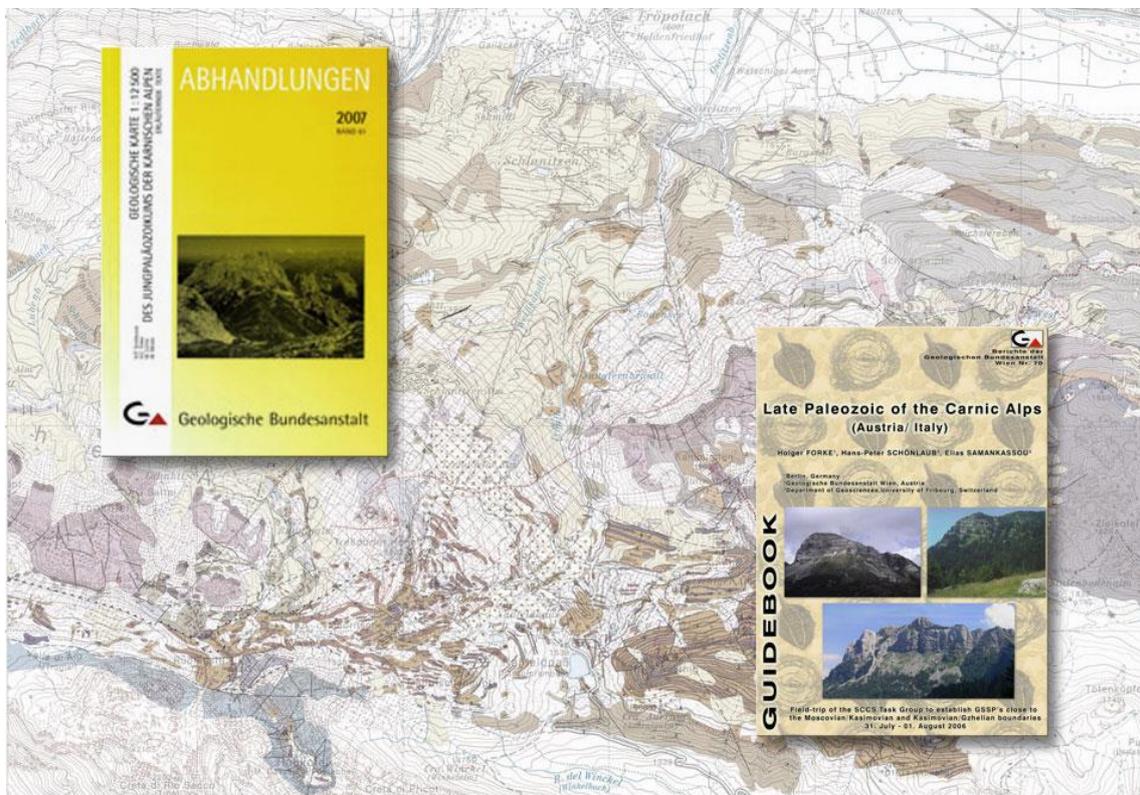


Suggested further reading:

- FORKE, H. C., SCHÖNLAUB, H. P., SAMANKASSOU, E. (2006): Late Paleozoic of the Carnic Alps (Austria/Italy): Guidebook, Field Trip of the SCCS Task Group to establish GSSP's close to the Moscovian/Kasimovian and Kasimovian/ Gzhelian boundaries, 31. July – 01. August 2006, Ber. Geol. B.-A., 70, 57 p., Wien.
- SCHÖNLAUB, H. P., FORKE, H. C. (2007): Die post-variszische Schichtfolge der Karnischen Alpen – Erläuterungen zur Geologischen Karte des Jungpaläozoikums der Karnischen Alpen 1:12.500, Abh. Geol B.-A., 61, 3-157, Wien.



View from SE to NW across Rudnig Saddle with predominant siliciclastics (Auernig and Grenzland formations) to the carbonate Trogkofel-Zweikofel massifs.

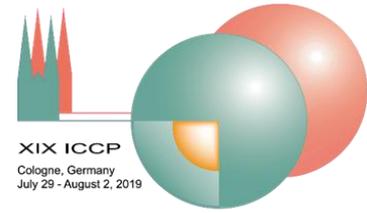


General information: The excursion will start on the **3rd August** and end on the **6th August** at Klagenfurt/Austria (optional Ljubljana/Slovenia). Travel from Cologne to Klagenfurt and back is not included, but might be jointly organised, when the registration of participants is completed. The transport to Slovenia (Dovžanova soteska) and the Nassfeld area will be conducted with Minibuses. Accommodation will be arranged in a hotel near the Tröpolach/Nassfeld area. Hiking boots, rain jackets and warm clothing are required during the field trip. Hiking will be about 3-4 hrs per day at altitudes up to 1500-2000m. Passport (with valid Schengen visa) has to be carried at all times as the hiking path is close to the Italian/Austrian/Slovenian borders.

Number of participants: minimum 8, maximum 21

Costs (including transport with minibus, chairlift and accommodation (3 nights) with breakfast, dinner and field lunch, without transfer from Cologne): 580 Euros.

**19TH INTERNATIONAL CONGRESS ON
THE CARBONIFEROUS AND PERMIAN**



Registration – fees – dates

Electronic registration and all payments have to be arranged via **Converia**. The link is indicated on the Congress website <http://iccp2019.uni-koeln.de/>.

REGISTRATION FEES:

	Before April, 15, 2019 (Early Bird)	April, 16 – May 30, 2019 (Late registration)
Regular participant	280 €; includes congress fee, printed abstract volume, printed volume of all field trips, additional USB stick with electronic versions of both volumes. Welcome reception and refreshments during the sessions	330 €; includes congress fee, printed abstract volume, printed volume of all field trips, additional USB stick with electronic versions of both volumes. Welcome reception and refreshments during the sessions
Student	190 €; as above, applies only with valid student ID card	240 €; as above, applies only with valid student ID card
Single day admittance	80 €, as above without welcome reception and field trip guides	100 €, as above without welcome reception and field trip guides
Accompanying person	80 €; welcome reception, congress bag without scientific contents, refreshments during the sessions	100 €; welcome reception, congress bag without scientific contents, refreshments during the sessions

FIELD TRIPS (to be paid before April, 15, 2019)

A1 – Ardennes	420 €	B3 – Neanderthal Museum	60 €
A2 – Moravia	300 €	B4 – City tour Cologne	10 €
A3 – Central Germany	430 €		
A4 – Ruhr Area	230 €	C1 – Rhenish Mountains	420 €
		C2 – Saar-Nahe Basin	320 €
B1 – Laacher See volcanism	60 €	C3 – Southern Alps	580 €
B2 – Rhenish Brown Coal	60 €		

LUNCH AND CONGRESS DINNER (to be paid before April, 15, 2019)

Lunch at Students restaurant (4 days)	26 €	Congress Dinner (drinks inclusive)	65 €
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CANCELLATION AND REFUNDING

Registration fees will not be refunded except if a notice of cancellation is received by the organization committee before 31.05.2019. Fees of 30 % are payable, if the cancellation notice is received between 01.06 and 30. 06 2019. Fees will increase to 60 %, if the cancellation notice is received between 01.07 and 14.07 2019. After 14.07.2019 no refund will be possible. Please note well that field trips will be not refunded due to our obligations with third parties.

IMPORTANT DATES

March, 30, 2019	Deadline for application of travel grants to Ph.D. scientists (strongly preferred are young scientists from developing countries)
April, 15, 2019	Deadline for Early Bird payment of congress and field trip fees abstract submission;
April, 30, 2019	Deadline for abstract submission
May, 31, 2019	End of late registration interval; announcement of workshops Deadline for application of travel grants to students by IAS
June, 15, 2019	Third circular/programme

CONGRESS SCHEDULE

Pre-Congress field trips	
Sunday, July 28	Return of pre-congress field trips/arrival in Cologne, Registration and welcome reception
Monday, July 29	Talks, poster-sessions, workshops
Tuesday, July 30	Talks, poster-sessions, workshops
Wednesday, July 31	Mid-Congress Field trip
Thursday, August 1	Talks, poster-sessions, workshops, Congress Dinner
Friday, August 2	Talks, poster-sessions, workshops
Thursday, August 1	Congress Dinner
Saturday, August 3	Departure/start of post-Congress field trip
Post-congress field trips	

19TH INTERNATIONAL CONGRESS ON THE CARBONIFEROUS AND PERMIAN



What else? – Some general informations

GUEST PROGRAMME

No formal guest programme is planned at this time. All places of interest can be reached by foot or public transport. For information see the official website <https://www.cologne-tourism.com/>. Feel free to request further information from the organizers.

WEATHER CONDITIONS

Due to its position relatively close to the Atlantic and the North Sea, Cologne has a mild, maritime influenced climate. Average maximum temperatures in July and August are 24°C during the day, minimum temperatures 12–13°C at night. Rain cannot be excluded and even some hot days with temperatures up to 30°C.

TYPE OF CLOTHING

A light rain coat and a sweater should be obligatory. For field trips also bring field boots and, if possible, your hammer and safety goggles. See further information under “Back to the field”.

INSURANCE

The organization committee cannot accept liability for personal accidents or loss of, or damage to private property of participants, either during or indirectly arising from the congress or on the field trips. Participants are advised to take out their own personal health and travel insurance for their journey and for their participation at the field trips.

CONTACT

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