



Symposia Program 15th Swiss Geoscience Meeting

Davos, 17–18 November 2017

Moving Boundaries



sc | nat 

Swiss Academy of Sciences
Akademie der Naturwissenschaften
Accademia di scienze naturali
Académie des sciences naturelles



Free public WiFi access: davoscongress

The Magic Line

The large picture shows the Glarus thrust fault and the Martinsloch at the Tschingelhörner (at the boundary between the Cantons of Glarus and Graubünden). This Geological-tectonic structure of scientific and historical significance can be clearly observed as a more or less straight horizontal line through the steep cliffs of the Tschingelhörner. The Martinsloch is a rock hole of cultural, historical and astronomical significance.

At the Tschingelhörner, the line formed by the Glarus thrust fault marks the boundary between dark-colored Permian Verrucano rocks (250 Ma) overthrust over light-colored Late-Jurassic limestones («Quinten-Kalk» 150 Ma) with slivers of flysch («Sardona flysch» 50 Ma). In other regions along the Glarus thrust fault, the Verrucano rocks are even resting directly over the much younger Sardona flysch.

This superposition of older rocks over much younger rocks is the result of the moving boundaries between the European and African tectonic plates some 20-25 mio years ago. Because of the collision between these two plates, the Verrucano rocks were «pushed» northwards along the Glarus thrust fault over a distance of more than 35 kilometers to rest in their actual final position.

The legendary Martinsloch («Martin's hole») is the result of preferential erosion along two zones of geological weakness. Twice a year, for two days in spring and in autumn, the sun shines through the Martinsloch and illuminates the Church tower of Elm in the Valley below.

Photo credit: Pierre Dèzes

The small cover picture shows Ice formation in a mountain stream.

Photo credit: Marcia Phillips

Page setup: Jacqueline Annen, WSL

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Welcome to Davos and to the 15th Swiss Geoscience Meeting 2017

Dear Participants

Welcome to Davos – the little science town in the Alps. Thank you for joining us and for moving the boundary of the Swiss Geoscience Meeting beyond the Swiss university cities. For the first time, the Swiss Geoscience Meeting is not being hosted by a university. In fact, the Canton of Grisons, and in particular Davos, is not a tourism-only zone, but is also home to a number of leading research laboratories.

When we discussed possible themes for this year's SGM, boundaries, or rather borders, were a major issue all over the world. Research is always about moving boundaries. We all want to go a step further and look round the corner, advance our understanding and move the boundary of knowledge a little bit further and then advance yet another step. Being the curious people we are, we always like to cross borders. So we think «Moving boundaries» is a truly fitting theme for the SGM, leaving the door wide open for an interesting afternoon.

In geoscience, boundaries are among the most prominent topics – and by understanding how these boundaries move, we learn about the shaping of our planet, but also about how the future might look like as the climate changes. Moreover, the boundaries in science are moving and the way we work and publish is changing. The boundaries may not fully disappear as data and research open up, but future challenges call for cooperation among research communities, which implicitly requires open exchange. Open science looks like the bright future, but as individual researchers we also face obstacles and overcoming those is not always straightforward.

Our keynote speakers will focus on this year's theme «Moving boundaries» and take us on a journey covering a wide range of geoscientific topics and scales.

First, **Florian Amann** (RWTH Aachen) and his colleagues will show us what led to the extraordinary bergsturz at Pizzo Cengalo less than three months ago. Of course, we did not plan for this presentation, but we felt it is more than appropriate to include it into the plenary session so you can all get first-hand information on this devastating cascading event.

Maurine Montagnat (University of Grenoble) will introduce us to a fitting subject for Davos: the microstructure of ice. As crystals grow and deform – a classical moving boundary problem – they capture information about their environment. A deep ice core extracted from a polar ice sheet contains information about small scale deformation and microstructure evolution processes, an in parallel informs us about large scale flow processes.

With **Susanne Buiter** (Geological Survey of Norway) we will change temporal and spatial scales, as she will focus on the geodynamic evolution of continental plate boundaries through the plate tectonic cycle. By following plate boundaries through phases of oceanic subduction, continental collision and continental break-up, she analyses how structural and thermal inheritance from one phase can control deformation in subsequent ones.

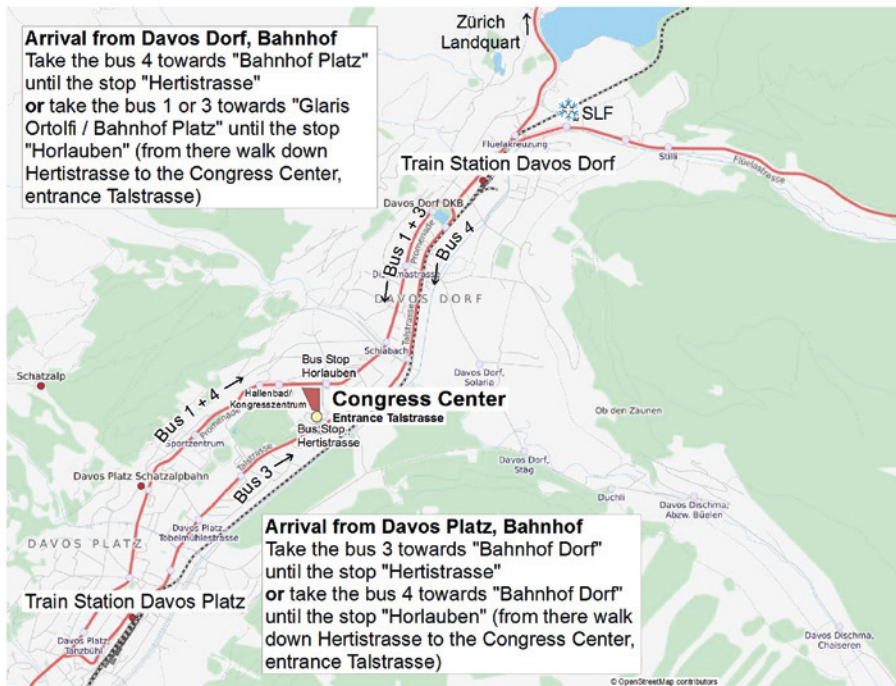
In the mountains surrounding Davos climate change is already occurring and will further change boundaries. **Annette Menzel** (Technical University of Munich) will focus on ecosystem boundaries and how they move as the climate changes. As the snow and tree lines move uphill, many other changes happen to the flora and fauna, in particular in the mountains – the third pole – where expected changes are as prominent as in the polar regions.

The symposium will conclude with a presentation by **Helen Glaves** (British Geological Survey) on open (data) science – a development we all welcome but often see as a burden rather than a benefit. She will discuss current drivers and approaches, and with several examples will illustrate ‘the good, the bad and the ugly’ of open data in Geoscience.

We hope you will enjoy our programme as well as being in Davos and that you'll even get a chance to get a taste of our great outdoors!

Jürg Schweizer
President SGM 2017

Location



Patronage

Platform Geosciences of the Swiss Academy of Sciences, SCNAT

Participating societies and organisations

Geothermie-Schweiz (Geothermie.ch)
International Union of Geodesy and Geophysics, Swiss Committee (IUGG)
International Union of Geological Sciences, Swiss Committee (IUGS)
Kommission der Schweizerischen Paläontologischen Abhandlungen (KSPA)
Swiss Association of Energy Geoscientists (SASEG)
Swiss Association of Geographers (ASG)
Swiss Commission for Remote Sensing (SCRS)
Swiss Commission on Atmospheric Chemistry and Physics (ACP)
Swiss Committee for Stratigraphy (Platform Geosciences/SCNAT)
Swiss Geodetic Commission (SGC)
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Swiss Geomorphological Society (SGGm/SSGm)
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Swiss Society for Hydrology and Limnology (SGHL/SSHL)
Swiss Society for Quaternary Research (CH-QUAT)
Swiss Society of Mineralogy and Petrology (SMPG/SSMP, Swiss Geological Society)
Swiss Tectonics Studies Group (Swiss Geological Society)

Abstracts can be downloaded at:

<http://geoscience-meeting.ch/sgm2017/downloads/>

Local committee

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Charles Fierz
Marion Hofmänner
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Marcia Phillips
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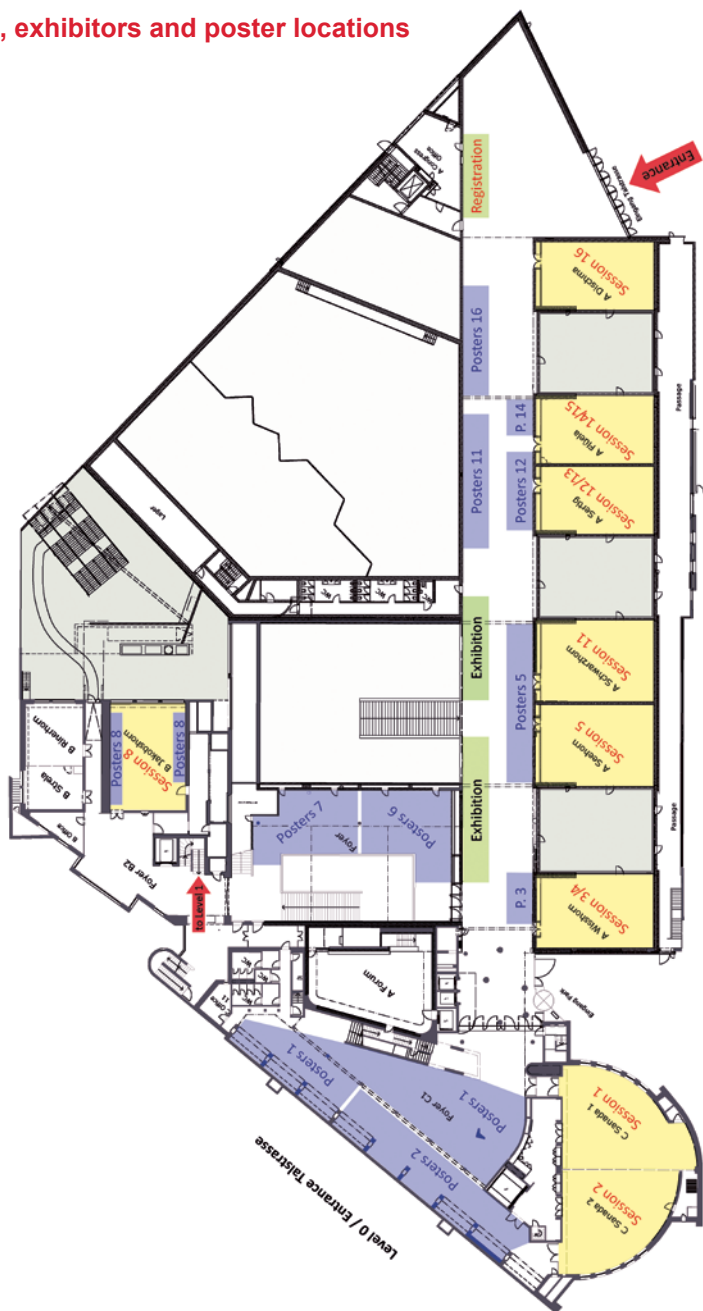
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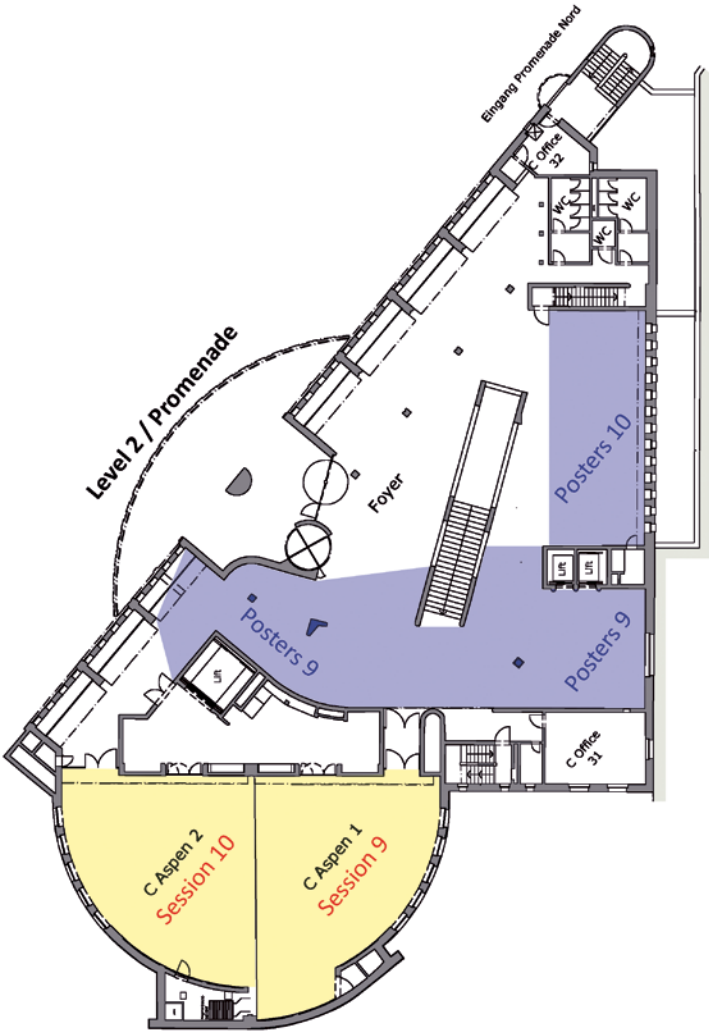
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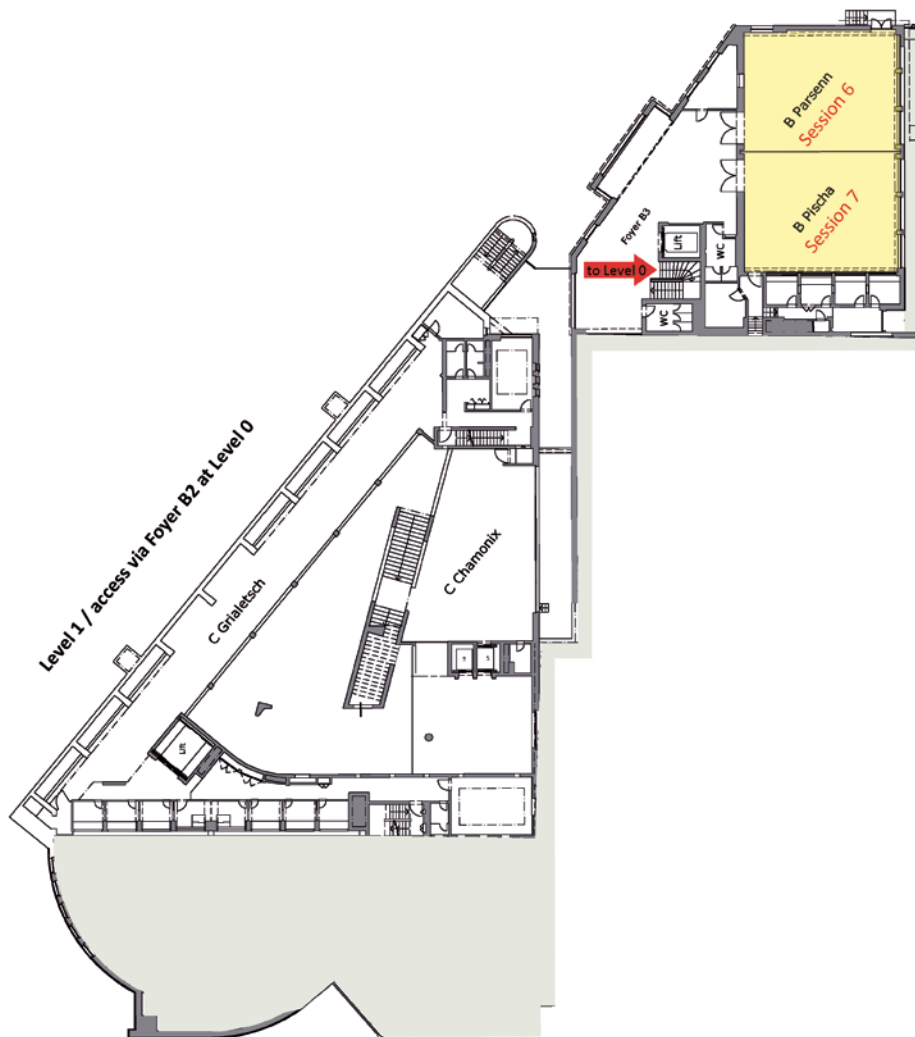
Lecture rooms, exhibitors and poster locations



Lecture rooms and poster locations



Lecture rooms and poster locations



Plenary session «Moving boundaries»

Davos Congress Center, Davos, Switzerland

Friday, 17 November 2017

Chairperson: Jürg Schweizer

13:30-13:45	Welcome address by the Government Council of the Canton of Grisons	Mario Cavigelli
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13:45-14:15	History of the Pizzo Cengalo rock avalanche and the subsequent debris flows	Florian Amann RWTH Aachen
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Chairperson: Marcia Phillips

14:15-15:00	Joint SNC-IUGG & SNC-IUGS Union Lecture: Inside a deep ice core – From small scale processes to large scale flow	Maurine Montagnat University of Grenoble
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15:00-15:30 Coffee Break

Chairperson: Marcia Phillips

15:30-16:15	The geodynamic evolution of moving continental plate boundaries	Susanne Buiter Geological Survey of Norway
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16:15-17:00	Moving ecosystem boundaries in the Alpine	Annette Menzel Technical University of Munich
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17:00-17:15 Break

Chairperson: Marcia Phillips

17:15-18:00	Open Science ... the good, the bad and the ugly	Helen M. Glaves British Geological Survey
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Chairperson: Pierre Dèzes

18:00-18:45	<ul style="list-style-type: none">– Platform Geosciences & SCNAT– Presentation SGM 2018 in Bern– Paul Niggli Medal– CHGEOL Award– Acknowledgements	<ul style="list-style-type: none">– Werner Eugster– Guido Schreurs– C. Heinrich– Michael Schnellmann– Jürg Schweizer
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18:45-22:30 Swiss Geoscience Party for registered participants

Abstracts

History of the Pizzo Cengalo rock avalanche and the subsequent debris flows

Florian Amann¹⁾, Marcia Phillips²⁾, Andrew Kos³⁾

¹⁾ Chair of Engineering Geology, RWTH Aachen, Germany

²⁾ WSL Institute for Snow and Avalanche Research SLF, Davos, Switzerland

³⁾ Terrasense Switzerland Ltd, Switzerland

Rockfall activity on the north face of Pizzo Cengalo has long been recognized by Alpine climbers. Despite this, the rock wall has remained an attractive destination since its first ascent in 1897. On 27 December 2011 a rock volume of approximately 1.5 million m³ failed catastrophically from the northeast face causing a rock avalanche that travelled about 1.5 km down the Bondasca valley. Following that event, blue ice was observed on the vertical release scarp. In addressing the role of permafrost on the rock slope instability, a collaborative ArgeAlp research project was initiated in 2012, with a focus on geological and kinematic analysis, quantification of slope displacements using terrestrial radar interferometry and laser scanning, and analysis of ongoing rockfall activity.

Geological analysis showed that northeast directed toppling was the dominant failure mechanism. Periodic measurements between 2012 and 2015 showed displacements of a few cm/year. From 2015 to 2016 an increase in displacement rate was recognized with a further increase between 2016 and 2017. The latter triggered the immediate action of the authorities in early August 2017. In addition to the increase in displacement rate, increasing rockfall activity was observed. The first major rockfall event occurred on 21 August 2017 followed two days later by a catastrophic collapse with a volume of 3.15 million m³ (09:30 on 23 August 2017). The impact of the failed rock mass on the glacier lying at the toe of Pizzo Cengalo was massive, causing approximately 600 000 m³ of glacier ice to become incorporated in the rock avalanche. Within a few minutes of failure, a debris flow was initiated, followed by a series of further debris flow events, which impacted the village of Bondo, leading to its evacuation.

This presentation summarizes the event history, geological investigations, displacement monitoring and provides some insight into the potential factors leading to progressive failure and collapse of the Pizzo Cengalo instability, and the debris flow events that followed immediately after failure.

Inside a deep ice core – From small scale processes to large scale flow

Maurine Montagnat

Institute of Geosciences of Environment, CNRS – University of Grenoble Alpes, France

A deep ice core extracted from a polar ice sheet contains information about small scale deformation and microstructure evolution processes, and, in the meantime, informs us about large scale flow processes surrounding it.

Polar ice caps initiate from snow falling on the surface, snow then compact to become ice that deforms while flowing to the edges. All along these multi-physics processes, ice grains (or crystals) are moving their boundaries, changing shape, orientation, leading to the evolution of the ice flow properties. Climate signal is being impregnated into this ice, and flowing history leaves its mark too.

How do we build the link between scales? What do we learn from Earth and Material Sciences to understand ice and what can ice tell us about fundamental mechanisms?

During this presentation, I will show the main characteristics of polar ice and snow physical properties as extracted from a deep ice core, and I will illustrate the laboratory observations performed to better understand the processes that come into play.

The geodynamic evolution of moving continental plate boundaries

Susanne Buiter

Geological Survey of Norway, Trondheim, Norway and the Centre for Earth Evolution and Dynamics, University of Oslo, Norway.

The motions of continental plates over geological times reshape Earth's surface, forming mountains where plates converge and rifts where they move apart. The destruction and creation of continental plate boundaries tends to occur in similar locations. A classic example is the Wilson Cycle in the North Atlantic region: Here Tuzo Wilson proposed that an earlier ocean must have preceded the present-day Atlantic Ocean (WILSON 1966). Closure of this Iapetus Ocean led to continent-continent collision in the Silurian and the formation of the Caledonian mountain belt. The present-day North Atlantic Ocean opened nearby the Caledonian suture in the early Cenozoic, after a long period with several rifting phases. In fact, most, if not all, of the present-day rifted continental margins of the Atlantic and Indian Oceans formed on former collision zones. In this lecture, I will review geodynamic experiments that investigate the Wilson Cycle of subduction, collision and rifting and use these results to discuss the effects of collisional inheritance on the architecture of continental rifted margins.

Continental rifted margins differ in width, onshore topography, and fault patterns. For example, the mid-Norwegian and Iberian margins are considered hyper-extended margins, displaying highly thinned continental crust over a wide region. Other continental margins, such as in the northern Norway and Flemish Cap regions, are much narrower. Existing numerical experiments of continental break-up show that variations in width of rifted margins may be explained by variations in crustal rheology and rate of extension. However, such studies usually aim at systematic mapping of the sensitivities of continental rifting to parameter variations and are, therefore, composed of laterally homogeneous lithospheric layers, ignoring inheritance.

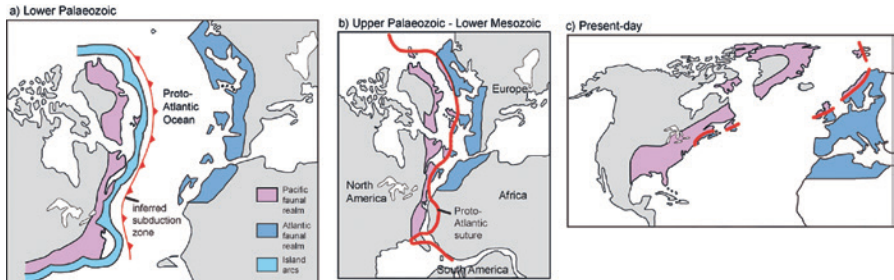


Fig. 1: The Wilson Cycle in the North Atlantic region, modified after WILSON (1966). a) The Proto-Atlantic Ocean (later recognised to have consisted of the Iapetus and Rheic Oceans (HARLAND and GAYER 1972; MCKERROW and ZIEGLER 1972)) closed in the Mid-Late Palaeozoic after subduction initiation at its rifted margins. b) This closure formed the supercontinent Pangea. The present-day Atlantic Ocean opened near the suture. c) At present, subduction is almost completely absent in the Atlantic domain, indicating that a new closure phase has not begun.

I will show that taking into account collisional inheritance substantially impacts rifted margins. Continental collision zones contain structural, compositional, and thermal inheritances that each may favour localisation of rifting. Thrust faults are large-scale heterogeneities that rifts can initiate on, inherited sedimentary and magmatic sequences can act as deformation localisers, and mountain belts are thermally weak, because of the greater amount of heat producing elements in their vertical column due to their thicker crustal root. My Wilson Cycle experiments illustrate that continental rifts utilise collisional thrust faults and the weak former subduction interface to exhume deep crustal rocks to the surface. In tandem, elevated temperatures in the collisional orogen can weaken its crustal rheology sufficiently to localise rifting away from the former subduction interface. A fascinating result of the experiments is that inheritance also lies in the sub-lithospheric mantle, where mantle flow currents, produced during oceanic subduction, influence rift development from below.

Rifted continental margins in turn may constitute preferred locations for subduction initiation. Inherited extensional faults and areas of exhumed serpentinised mantle may weaken a margin enough to localise shortening and thus induce the next phase in the Wilson Cycle of moving plate boundaries.

Moving ecosystems boundaries in the Alpine

Annette Menzel

Technical University of Munich, Germany

Recent climate change is also observed in mountainous areas such as the Alps, even at much higher warming rates compared to the global average of 0.85 °C in the last 100 years (IPCC 2013) since the rate of warming is amplified with elevation (see examples in MRI 2015, *Nature Climate Change* or MATIU *et al.* 2016, *Int J Climatol*). In the cryosphere the observed impacts of climate change comprise e.g. melting of glaciers, increase of permafrost temperatures, and decreasing snow cover in mid elevations. In the biosphere, the most prominent change refers to phenology, the timing of annually recurring events in plant and animal life. Especially spring events such as leaf unfolding, flowering, migration are concurrently earlier observed. Changes in species distributions in combination with invasive species or species extinctions alter the species composition in space and time. Among the moving ecosystem boundaries in the alpine are e.g. primary succession on glacier forelands or changes of vascular plant species diversity in alpine environments at the GLORIA summit sites (PAULI *et al.* 2012, *Science*). All examples have in common that species have moved upward on average, especially seen for other ecosystem boundaries such as the forest line and treeline. Forest line / timberline and treeline are mainly triggered by climate, mostly minimum temperatures during the vegetation period seem to be limiting (above 5 to 7 °C). Secondary drivers may include snow movements, late spring frost event, wind, drought as well as diseases and competition. However, land use changes such as former deforestation and recent extensification of agricultural use may have led to anthropogenically shaped boundaries complicating the thorough assessment of warming induced changes (see GEHRIG-FASEL *et al.* 2007, *Journal of Vegetation Science*). In addition lagged effects due to systems' inertia have been observed making the quantification of the link between warming and upward movement of ecosystem boundary difficult. Nevertheless, fossil logs of wood emerging like Ötzi with glacier melt witness the dynamic movement of such ecosystem boundaries in the alpine. For the recent past, global average upward movements are reported as 11 m/decade (CHEN *et al.* 2011, *Science*), being two to three times faster as previously assessed (IPCC 2014). Equally for forest plant species in west Europe a significant (29 m/decade) upward shift in optimum elevation has been observed (LENOIR *et al.* 2008, *Science*). Even such velocities won't be sufficient to keep pace with moving temperature isolines.

Open Science: the good, the bad and the ugly!

Helen Graves

British Geological Survey, Keyworth, Nottingham, U.K.

So what exactly is Open Science? Some confusion exists over the term but it is actually a concept that encompasses a number of aspects including open data, open access to journals, and open source software, to name but a few.

The OECD defined Open Science as being “to make the primary outputs of publicly funded research results – publications and the research data – publicly accessible in digital format with no or minimal restriction” (OECD, 2015:7). However, in practice this definition does not cover the entire scope of Open Science which is increasingly considered to be applicable to the whole research cycle, and not just the final outputs.

Open Science has many potential benefits that include more transparent and efficient research, improved opportunities for researchers to gain career credit beyond the traditional scholarly publications process, and improved public trust in science. But this is only one side of the story. There are also recognised concerns which provide the counter arguments for Open Science. These relate to the additional resources required to support open science practices, for example, the extra time and effort to make data accessible and re-useable and the need for cost recovery for publicly funded data acquisition. Scientists also have major reservations about Open Science related to the potential for inappropriate re-use of their research, and the competition they already face for funding, employment and recognition.

Several use cases will provide the case for and against open science illustrating both sides of the argument before coming to the conclusion that, on balance, the benefits of open science far outweigh the arguments against it....at least for the scientist.

Symposium Sessions

Davos Congress Center, Davos, Switzerland

Saturday, 18 November 2017

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Session 1: Structural Geology, Tectonics and Geodynamics

Room Sanada I

Convenors: Guido Schreurs, Neil Mancktelow, Paul Tackley, Daniel Egli

Chairperson: Paul Tackley

09:00-09:15	Moulas E., Schmalholz S., Brandon M.	Analytical two-wedge corner flow model for tectonic nappe evolution in collisional orogens
09:15-09:30	Vaughan-Hammon J.D., Luisier C., Schmalholz S.M., Baumgartner L.P.	Impact of flow law and viscosity ratio on finite strain evolution during buoyancy-driven exhumation with application to the Monte Rosa nappe
09:30-09:45	Hässig M., Erukidze O., Galoyan G., Popkhadze N., Moritz R.	Jurassic and Cretaceous geodynamic environments of ore formation along the Tethyan belt: New insights from the structural context along the Somkheto- Karabagh mountain belt, Armenia and Georgia
09:45-10:00	Mozafari Amiri N., Tikhomirov D., Sümer Ö., Özkaymak Ç., Uzel B., Yesilyurt S., Ivy-Ochs S., Vockenhuber C., Sözbilir H.H., Akçar N.	Destructive earthquakes history of western Anatolia during the last 15 ka

10:00-11:30 Morning Poster Session with coffee

Chairpersons: Guido Schreurs, Neil Mancktelow

11:30-11:45	Andrić, N, Vogt K., Matenco L., Cvetković V., Cloetingh S., Gerya T.	Magmatic pulses during Mediterranean-style continental collisions: A numerical modelling approach
11:45-12:00	Cionoiu S., Tajcmanova L., Moulas E., Stünitz H.	Stress distribution in samples from solid confining medium deformation experiments: An experimental and numerical study
12:00-12:15	Beaussier S., Gerya T., Burg J.-P.	3D thermomechanical modeling of the Wilson Cycle: Structural inheritance of alternating subduction polarity
12:15-12:30	Zwaan F., Schreurs G., Adam J.	Effects of sedimentation on rift basin and transfer zone evolution: insights from 4D analogue models

12:30-14:00 Lunch

Chairperson: Daniel Egli

14:00-14:15	Herwegh M., Berger A., Baumberger R., Wehrens P., Kissling E.	The Rise of the Aar Massif by Subvertical Large-Scale Block Extrusion
14:15-14:30	Nibourel L., Berger A., Egli D., Luensdorf K., Herwegh M.	Tectonic exhumation of isothermal planes: RSCM thermometry data record intense retrograde deformation in the Aar massif
14:30-14:45	Zurbruggen R.	Early Paleozoic orthogneisses in the Alps: products of a peri-Gondwanan peraluminous arc system
14:45-15:00	Mosar J., Nguyen V.-T., Scheidt N., Gruber M.	The Pontarlier Fault System: Tectonics Revisited
15:00-17:00	Afternoon Poster Session with coffee	

Posters Session 1:

P 1.1	Sanan P.	StagBL: A Scalable, Portable, High-Performance Discretization and Solver Layer for Geodynamic Simulation
P 1.2	Tackley P.J., Lourenco D., Fomin I.	Mantle Compositional Heterogeneity Arising From Magma Ocean Crystallisation Followed by Long-Term Differentiation: Modelling From a Molten Earth to the Present Day
P 1.3	Gülcher A., Beaussier S., Gerya T.	Influence of detachment faults for intra-oceanic subduction initiation: 3D thermomechanical modeling
P 1.4	Bessat A., Pilet S., Duretz T., Schmalholz M.S.	Numerical modelling of lithospheric flexure at subduction zones: what controls the generation of petit-spot volcanoes?
P 1.5	Candioti L.G., Duretz T., Picazo S., Schmalholz S.M.	Orogenic wedge formation starting from hyper-extended passive margins: a self-consistent modelling study with application to the Western Alps
P 1.6	Petri B., Duretz T., Mohn G., Schmalholz S.M.	Thinning of heterogeneous lithosphere: insights from field observations and numerical modelling
P 1.7	Kiss D., Duretz T., Podladchikov Y., Schmalholz S.M.	Scaling laws and numerical simulations for shear zones caused by thermal softening for 1D, 2D and 3D simple and pure shear
P 1.8	Spitz R., Schmalholz S.M., Kaus B.J.P.	3D numerical modelling and finite strain analysis of the transition between viscous overthrusting and folding
P 1.9	Nabavi S.T., Alavi S.A., Frehner M.	3D FE-modelling of inclined, brittle-ductile transpression

P 1.10	Nabavi S.T., Alavi S.A., Frehner M., Mohammadi S., Ghassemi M.R.	Mechanical evolution of transpression zones affected by fault interactions: insights from 3D elasto-plastic finite element models
P 1.11	Zwaan F., Schreurs G.	Evolution of rifts and rift linkage zones in orthogonal and scissor extension settings: insights from analogue models analysed with 4D X-ray computed tomography
P 1.12	Waldvogel M., Zurbruggen R., Berger A., Herwegh M.	Structural Geology in Applied Material Science: Strain Localisation and Crack Initiation in Waterproofing Membranes during Tensile Tests
P 1.13	Simon V., Kraft T., Tormann T., Diehl T., Herrmann M.	The Swiss-army-knife approach to nearly automatic micro- earthquake analysis for natural and induced sequences
P 1.14	Diehl T., Kissling E., Lee T., Schmid S.	How deep is shallow? Improving hypocenter locations of upper crustal seismicity in Switzerland
P 1.15	Lee T., Diehl T., Kissling E., Wiemer S.	High-Quality Earthquake Catalogue for a Changing Network Configuration: Application to Southwestern Switzerland
P 1.16	Hetényi G., Molinari I., Clinton I., Kissling E., Alparray Seismic Network Team, Alparray OBS Cruise Crew, Alparray Working Group	The completed AlpArray Seismic Network
P 1.17	Scarponi M., Hetényi G., Plomerová J., Solarino S., Berthet T.	High resolution imaging of the Ivrea Geophysical Body: A receiver function and gravity approach
P 1.18	Calignano E., Zappone A., Madonna C. & The Epos-Ip Wp16 Team	The Swiss participation to a coherent and collaborative network of Solid Earth Multi-scale laboratories: EPOS-TCS MSL
P 1.19	Rauch A., Sartori M., Castelltort S., Volken S., Dall'agnolo S.	A tool to assist bedrock geology interpretation
P 1.20	Mair D., Lechmann A., Herwegh M.M., Schlunegger F.	Insights on the Aar Massif exhumation from new field data from the Jungfrau-Eiger mountain chain
P 1.21	Berger A., Egli D., Herwegh M.	Hydrothermal cockade-like breccias in the Grimsel Breccia Fault: fluidization, flow rates and growth dynamics during seismic events
P 1.22	Dutler N., Nejati M., Amann F., Valley B.	The Measurement of Fracture Toughness Anisotropy in Grimsel Granodiorite using Semi-Circular Samples
P 1.23	Kakurina M., Guglielmi Y., Nussbaum C., Valley B.	A multiparametric evaluation of the Wallace-Bott hypothesis in the presence of a fluid source

P 1.24	Akker V., Kaufmann J., Desbois G., Klaver J., Urai J., Berger A., Herwegh M.	Porosity of slates – from 3D bulk rock measurements to direct imaging
P 1.25	Pantet A., Epard J.-L., Masson H.	Mimicking Alpine thrusts by orogenic passive deformation of synsedimentary normal faults: a record of Jurassic extension of the European margin (Mont Fort nappe, Middle Penninic, Western Alps).
P 1.26	Schori M., Mosar J.	Basement-cover interaction in the Jura Mountains: Where, how and to what degree?
P 1.27	Radaideh O.M. A., Mosar J	Analysis of geomorphic indices in the westernmost area of Switzerland: Implications for neotectonics
P 1.28	Schmitt N., Verbeken B., Gruber M., Miller S., Valley B., Mosar J.	Three-dimensional measurement of limestone fracture network from the La Sarraz Fault Zone using high resolution X-ray μ -computed tomography
P 1.29	Rime V., Mosar J.	Tectonic structure and dynamic of the Neuchâtel Jura Mountains: new insight from detailed mapping and forward modelling techniques
P 1.30	Schenker L.F., Ambrosi C., Scapozza C., Czerski D., Maino M., Castelletti C. Gouffon Y.	Distribution of HP rocks in the nappes of the Lepontine Dome
P 1.31	Buchs N., Epard J.-L.	Ophiolites in the North Himalayan nappes and Indus Suture Zone in Eastern Ladakh (NW Himalaya, India)
P 1.32	Mladenović A., Cvetković V., Trivić B., Cvetkov V.	Late Eocene to recent tectonic evolution of the northern Internal Dinarides (western Serbia)
P 1.33	Alania V., Erukidze O., Tevzadze N.	Blind thrusts under Tbilisi, Georgia
P 1.34	Laziz O., Bouaja F., Benabbas C.	Travertine occurrences along major neotectonic normal fault zones in the Hammam Debar- Roknia Guelma region, North-East Algeria
P 1.35	Bastias J., Spikings R., Ulianov A., Schaltegger U., Grunow A., Hervé F., Riley T., Burton-Johnson A.	The tectono-magmatic evolution of the Antarctic Peninsula Batholith, Graham Land: insights from U-Pb zircon ages and geochemical data
P 1.36	Gilgannon J., Herwegh M., Poluet T., Regenauer-Lieb K., Veveakis M.	Revisiting diffusion creep of calcite
P 1.37	Biermanns P., Schmitz B., Ustaszewski K., Sokol K., Reicherter K.	The External Dinarides of Southern Montenegro and Northern Albania: Contraction vs. extension – Instrumentally recorded seismicity vs. field observations
P 1.38	Youcef Brahim E.H., Chadi M., Djeflal R.	Diagenesis and Stadial Analysis of Jurassic Dolomite, Case Study: South-setifian Shelf (NE Algerian)

Session 2: Mineralogy, Petrology, Geochemistry

Room Sanada II

Convenors: Sébastien Pilet, Bernard Grobéty, Eric Reusser

Chairperson: Eric Reusser

09:15-09:30	Wolf M., Romer R.L., Franz L.	Metal enrichment in granitic melts: the role of protolith chemistry and partial melting conditions
09:30-09:45	Hörlér J., Burkhard R.	The Karavansalija Mineralized Center in southwestern Serbia: Time relationship of intrusive events, gold skarn mineralization and overlying volcanics and characterization of the ore mineral assemblage.
09:45-10:00	Maltese A., Mezger K.	A Model for the Pb-isotope Evolution of the Bulk Silicate Earth
10:00-10:15	O'Sullivan E., Kamber B., Nägler T.	Molybdenum isotopic composition of the 1.85 Ga Sudbury impact basin fill, Ontario: insights into volatile element loss and post-impact biological activity
10:15-11:00	Tollan P.M.E., O'Neill H.St.C.	The role of trace and major element chemistry in controlling the solubility of water in upper mantle olivine

10:15-11:00 Morning Poster Session with coffee

Chairperson: Eric Reusser

11:00-11:15	Gugushvili V., Beridze T., Chkhotua T., Khutsishvili S., Migineishvili R.	Interrelation of Regional Metamorphism, Volcanism, Hydrothermal Activity and Metallogeny During the Tethys Ocean Subduction and at Post-collision Stage of Eurasian Continental Margin Development
11:15-11:30	Weber S., Diamond L.W., Alt-Epping P.	Epidosite alteration of the oceanic crust: cumulative water-rock ratios derived from reactive-transport modelling
11:30-11:45	Kempf E., Hermann J.	Water incorporation into metamorphic olivine at high pressures in the Zermatt-Saas serpentinites
11:45-12:00	Kaufmann A., Pettke T., Baumgartner L.	Fluid-involved processes at the magmatic-hydrothermal transition in Torres del Paine, Chile, studied through inclusions in miarolitic quartz
12:00-12:15	Myint M.P., Franz L., de Capitani C., Balmer W., Krzemincki M.	Petrology and PT-conditions of quartz- and nepheline-bearing gneisses from Mogok Stone Tract, Myanmar
12:15-13:45	Lunch	

Chairperson: Lucie Tajcmanová

13:45-14:00	Paul A., Spikings R., Chew D., Daly J.S.	Apatite in-situ U-Pb thermochronology: the effect of parent uranium isotope zonation
14:00-14:15	Popov D., Spikings R.	Effect of apatite crystal geometry, parent isotope zonation and petrological environment on its closure temperature (U-Th-Pb system)
14:15-14:30	Schmidt K., Vrijmoed J., Tajcmanova L., Moulas E.	Mechanically controlled chemical zoning in UHP garnets from the Western Gneiss Region, Norway
14:30-14:45	Vho A., Rubatto D., Lanari P., Giuntoli F., Regis D.	Garnet chemical and oxygen isotope zoning and accessory mineral investigation to constrain the evolution of subducted continental crust (Sesia Zone, Italy)

14:45-15:30 Afternoon Poster Session with coffee

Chairperson: Luca Caricchi

15:30-15:45	Prelević D.	The origin of Alpine-Himalayan K-rich orogenic lavas: an integrated experimental and geochemical approach
15:45-16:00	Hartung E., Caricchi L., Floess D., Wallis S., Harayama S.	The volcanic-plutonic connection unveiled
16:00-16:15	Tollan P., Dale C., Hermann J., Davidson J., Arculus R.	Melting and modification of the mantle wedge beneath the West Bismarck island arc, evidenced by the chemical and isotopic composition of peridotite xenoliths
16:15-16:30	Belgrano T.M., Diamond L.W.	Supra-subduction zone spreading in the Oman ophiolite

Posters Session 2:

P 2.1	Brunner M., Müller L.	High-precision zircon dating of miocene magmatism in the Apuseni Mountains (Romania) with TIMS
P 2.2	Naumenko-Dèzes M., Rolland Y., Gallet S., Villa I.	Heterogeneities in natural $^{40}\text{Ar}/^{39}\text{Ar}$ flux monitors and pristine magmatic micas
P 2.3	Bulle F., Rubatto D., Ruggieri G.	Oxygen isotopes in white mica from the Larderello geothermal field – a potential tool to trace fluid flow in complex magmatic – hydrothermal systems
P 2.4	Glauser A., Eggenberger U., Weibel G., Mäder U.K.	Quality criteria for municipal solid waste incineration bottom ash with regard to recycling and deposition without aftercare
P 2.5	Richter L., Diamond L.W.	Hydrothermal Epidosite Formation in the Oceanic Crust
P 2.6	Rouwendaal S.E., Eglinton T.I., Al-Kuwari A., H., Haghipour N., Bontognali T.R.R.	The fossilization potential of gypsum and its relevance to the search for life on Mars
P 2.7	Curry A., Caricchi L., Sheldrake T., Simpson G., Lipman P.	Determining the physical and chemical processes behind four caldera-forming eruptions in rapid succession in the San Juan caldera cluster, Colorado, USA
P 2.8	Edwards M., Pioli L., Andronico D., Cristaldi A., Scollo S.	Mafic magma fragmentation and eruption dynamics of the May 2016 Etna eruption
P 2.9	Devoir A., Müntener O.	Monitoring local-scale igneous underplating crystallization and interactions with country-rocks by garnet Y+REE chemistry
P 2.10	El Korh A., Deloule E., Boiron M.C., Luais B.	Lithium partitioning and isotope fractionation in the Limousin ophiolite (Massif Central, France)
P 2.11	El Korh A., Luais B., Boiron M.C., Deloule E., Cividini D.	Iron isotope fractionation in the Limousin ophiolite (Massif Central, France)
P 2.12	Gabarashvili K., Lobzhanidze K., Beridze T., Vashakidze G., Kavsadze M., Togonidze M.	Morphological Features of Chkheri (the Great Caucasus) and Khertvisi (Southern Georgia) Lava Flows
P 2.13	Grosjean M., Moritz R., Melkonyan R., Hovakimyan S., Ulianov A.	Cenozoic subduction to post-collision magmatic evolution of the Lesser Caucasus: new constraints from the Tejsar and Amulsar areas, Armenia
P 2.14	Sheldrake T., Caricchi L., Gander M., Wallace G., Simpson G.	Cross correlation of magmatic crystals: interpreting correlations and identifying families

P 2.15	Weber G., Caricchi L., Sheldrake T., Arce J.L.	Magma dynamics and long-term evolution of Nevado de Toluca volcano, Mexico
P 2.16	Jensen M., Caricchi L., Blundy J., Melekhova L., Cooper G.	The Temporal Evolution of an Arc Volcano through Thermobarometry and Petrography of Intrusive and Volcanic Products
P 2.17	Marxer F., Ulmer P.	Differentiation of intermediate calc-alkaline magmas at 2 kbar
P 2.18	Hantsche A.L., Kouzmanov K., Dini A., Vassileva R., Guillong M., Quadf V.A.	U-Pb age constraints on skarn formation in the Madan Pb-Zn district, Bulgaria: zircon evidence from Tertiary magmatism
P 2.19	Hetényi G., Pistone M., Nabelek P., Baumgartner L.	Lhasa Block partial melt zones: matching geophysical characteristics and petrological origin
P 2.20	Ravindran A., Mezger K., Balakrishnan S., Raith M.M.	Archaeon Barite: Strontium Isotopes as a tracer of early crust-mantle evolution
P 2.21	Roggero D., Müntener O., Pilet S.	Neogene retro-arc basaltic magmatism in southern Patagonia: magmatic arc connection and alternatives to subslab models
P 2.22	Demers-Roberge A., Tolan P., Müntener O.	Water content of Nominally Anhydrous Mineral in mantle xenoliths from Southern Patagonia: Spatial variability and implications
P 2.23	Reynes J., Hermann J., Jollands M.	Water incorporation and site-specific hydrogen diffusion in garnets
P 2.24	Manzotti P., Rubatto D., Korh E.A., Ballèvre M., Cenki-Tok B., Zucali M., Engi M.	Permian magmatism and metamorphism in the Dent Blanche nappe: constraints from field observations and geochronology
P 2.25	Ricchi E., Gnos E., Bergemann C., Whitehouse M.	Th-U-Pb cleft monazite crystallization ages linked to exhumation history and shear zone activity in the Tauern Window
P 2.26	Klimentyeva D., Heinrich C., Quadf V.A.	Veining and mineralization history of Bor (Serbia)
P 2.27	Zucha W., Eggenberger U., Weibel G.	Recovery Potential of Heavy Metals from Swiss Fly Ash
P 2.28	Schlatter D.M., Schlöglöva K., Fettweis R., Bark G., Hughes J.W.	Lithogeochemical classification of hydrothermally altered Paleoproterozoic plutonic rocks associated with gold mineralisation: examples from South Greenland and Northern Sweden

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| P 2.29 | Stefanova E., Marchev P., Georgiev S., Peytcheva I., Raicheva R. | Trace element geochemistry of pyrites from porphyry systems in Elatsite ore field, Bulgaria: a reliable tool for exploration of porphyry (Cu-Au-Mo) and epithermal base metal-Au deposits |
| P 2.30 | Kavsadze M., Dudaury O., Togonidze M., Vasahkidze G., Gabarashvili K., Beridze T. | Shirimi – Georgian Travertine |
| P 2.31 | Lukovic A., Zavasnik J., Vulic P., Banjesevic M., Saric K., Cvetkovic V., Pacevski A. | Hemoilmenite from andesite of the Late Cretaceous Timok Magmatic Complex, Serbia |
| P 2.32 | Sadradze N., Beridze T.T., Sadradze G. | Upper Cretaceous Kachagiani (Sakdrisi) Ore deposit host rocks analysis, Bolnisi ore field, Georgia |
| P 2.33 | Georgiev S., Peytcheva I., von Quadt A., Grozdev V., Marchev P., Serafimovski T. | Cenozoic magmatic/metagenic activity of distinct areas of SW Bulgaria, FYR of Macedonia and Northern Greece |
| P 2.34 | Peretti A., Mullis J., Franz L., Günther D. | Spinel formation by sulphur-rich saline brines from Mansin (Mogok area, Myanmar) |

Session 3: Palaeontology
Session 4: Stratigraphy

Room Weisshorn

Convenors session 3: Christian Klug, Torsten Scheyer, Lionel Cavin
Convenors session 4: Alain Morard, Reto Burkhalter, Oliver Kempf & Ursula Menkveld-Gfeller

Stratigraphy Chairperson: Alain Morard

09.15-09.30	Garefalakis P., Schlunegger F.	Late Oligocene megafan progradation and shifts in depositional style driven by higher concentrations of supplied sediment – the Rigi conglomerates
09.30-09.45	Wohlwend S., Bernasconi S., Deplazes G.	A new high-resolution C-isotope chemostratigraphic correlation through the Aalenian Opalinus Clay – from Mont Terri to Northeastern Switzerland
09.45-10.00	Schneebeli-Hermann Elke, Looser N., Hochuli P.A., Furrer H., Reisdorf A.G., Wetzel A., Bernasconi S.M.	Palynology of Triassic–Jurassic boundary sections in Northern Switzerland
10.00-10.15	Adams Arthur, Diamond L.W.	Meteoric diagenesis of a carbonate ramp: a reinterpretation of the Upper Muschelkalk, Switzerland
10.15-10.30	Bagherpour B., Bucher H., Vennemann T., Chiaradia M., Schneebeli-Hermann E., Schaltegger U., Yuan Dx., Leu M., Zhang C., Shen Sz.	C and Sr isotope chemostratigraphy and the extension of Emeishan volcanism to early Wuchiapingian time: new insights from the Middle–Late Permian transition in South China

10:30-11:00 Morning Poster Session with coffee

Palaeontology Chairperson: Christian Klug

11.00-11.15	Pates Stephen, Daley A.C.	Diversity of USA Radiodonta
11.15-11.30	Drage Harriet, Vandenbroucke T.R.A., Roy V.P., Daley A.C.	Freshly-moulded nileid trilobites from the Fezouata lagerstätte of Morocco
11.30-11.45	Fau Marine, Villier L.	Comparative anatomy and phylogeny of the Forcipulatacean starfish (Asteroidea, Echinodermata)
11.45-12.00	Lebanidze Zurab, Beridze T., Koiaa K., Khutsishvili S., Chagelishvili R., Khundadze N.	Trace Fossils from Deep Sea Sediments of the Palaeocene-Lower Eocene Borjomi Suite Exposed in the Eastern Part of the Achara-Trialeti Fold-Thrust Belt, Georgia

12.00-12.15	Friesenbichler Evelyn, Hautmann M., Nützel A., Ulrichs M., Bucher H.	Palaeoecology of Late Ladinian (Middle Triassic) benthic faunas from the Schlern and Seiser Alm (South Tyrol, Italy)
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12:15-13:45 Lunch

Palaeontology Chairperson: Torsten Scheyer

13.45-14.00	Klug Christian, Fuchs D., Landman N.H., Mapes R.H.	On the origin of the Coleoidea
14.00-14.15	Pohle Alexander, Klug C.	Body size of orthoconic cephalopods from the late Silurian and Devonian of the Anti-Atlas (Morocco)
14.15-14.30	Jattiot R., Brayard A., Bucher H., Vennin E., Caravaca G., Jenks J.F., Bylund K.G., Escarguel G.	Distribution and abundance of Smithian (Early Triassic) ammonoid faunas within the western USA basin and their controlling parameters
14.30-14.45	Ferrante Christophe, Furrer H., Martini R., Cavin L.	Coelacanths from the Middle Triassic of Switzerland: Stratigraphic distribution and diversity
14.45-15.00	Argyriou Thodoris	Paleobiology and interrelationships of Saurichthys (Actinopterygii, Saurichthyidae), and the importance of the Swiss fossil record

15:00-15:45 Afternoon Poster Session with coffee

Palaeontology Chairperson: Walter Joyce

15.45-16.00	Scheyer Torsten M., Jaquier V.P., Fraser N.C., Furrer H.	A new specimen of <i>Macrocnemus</i> (Archosauromorpha: <i>Tanystropheidae</i>) from the Middle Triassic of Monte San Giorgio, Switzerland: implications for species recognition and palaeogeography of the group
16.00-16.15	Garbin Rafaella C., Böhme M., Joyce W.G.	New geoemydid material (Cryptodira: Testudinoidea) from the Eocene of Vietnam and its implication for geoemydid systematics
16.15-16.30	Veitschegger Kristof	Reconstructing life history from the fossil record – the case of Pleistocene cave bears
16.30-16.45	Gaillard, Charlene, Vasylian D., Maridet O., Lu X.-Y., Prieto J.	Fossil fauna of Glovelier karstic pocket

Palaeoprize Chairperson: Christian Klug

16.45-17.00 Palaeoprize

Posters Session 3+4:

P 3.1	Bailey Lydia, Picotti V., Schenker F., Fellin G.	Cretaceous Stratigraphic and Tectonic Evolution of the Eastern Margin of the Pelagonian Zone, Northern Greece
P 3.2	Djeffal Rami, Chadi M., El Hadj B.Y.	Tectono-Stratigraphy of The Cretaceous Shelf (Constantinois Platform- NE Algeria)
P 3.3	Koiavqa K., Kvaliashvili L., Maissuradze L., Mauvilly J., Mosar J.	Species of the genus Porosononion from Sarmatian deposits of Georgia and their stratigraphic significance
P 3.4	Lefort Apolline, Yilmaz T.	Reconstruction of a Late Jurassic marine environment
P 3.5	Lesniak Barbara, Blattmann T.M., Wessels M., Eglinton T.I., Gehring A.U.	Bio-magnetic feedback to eutrophication

Session 5: Shale-Gas, CO₂ Storage and Deep Geothermal Energy

Room Seehorn

Convenors: Lyesse Laloui, Larryn Diamond, Paul Bossart

Chairperson: Larryn Diamond

09:15-09:20	Introductory remarks	
09:20-09:45	Lavanchy J.M. (Keynote speaker)	AGEPP – First Swiss hydrothermal well for electricity and heat production
09:45-10:00	Egli D., Baumann R., Küng S., Berger A., Baron L., Herwegh M.	Fault structure and porosity distribution in an active hydrothermal system
10:00-10:15	Wanner C., Diamond L.W., Alt-Epping P.	Quantification of the 3D thermal anomaly in the orogenic geothermal system at Grimsel Pass, Switzerland
10:15-11:00	Morning Poster Session with coffee	
	Posters P 5.1–P 5.6 (poster titles: see below) First authors of posters, participants	These posters will be shortly presented (3 minutes per poster) by the first authors. Discussion during rest of time.

Chairperson: Christophe Nussbaum

11:00-11:15	Doetsch J., Amann F., Gischig V., Jalali R., Krietsch H., Villiger L., Evans K., Valley B., Dutler N., Brixel B., Klepikova M., Kittilä A., Wiemer S., Saar M.O., Loew S., Driesner T., Maurer H., Giardini D.	Overview of the hydraulic stimulation experiments at the Grimsel Test Site
11:15-11:30	Dutler N., Valley B., Villiger L., Krietsch H., Jalali R., Gischig V., Doetsch J., Amann F.	Injection Protocol and First Results of Hydraulic Fracturing Experiments at the Grimsel Test Site
11:30-11:45	Gischig V., Jalali M., Doetsch J., Krietsch H., Villiger L., Amann F.	Pressure propagation during decameter-scale hydraulic stimulation experiments in crystalline rock at the Grimsel Test Site
11:45-12:00	Krietsch H., Gischig V., Doetsch J., Valley B., Amann F.	Mechanical response of a decameter-scale reservoir during an in-situ hydraulic stimulation experiment

12:00-12:15 Discussion of morning sessions

12:15-14:00 Lunch

Chairperson: Paul Bossart

14:00-14:15 Afshari Moein M.J.,
Tormann T., Valley B.,
Wiemer S., Evans K.F. Constraining the stochastic fracture network using
induced microseismicity in the Basel geothermal
reservoir

14:15-14:30 Moradian Z. Acoustic Emission Monitoring of Fractures in
Opalinus Clay Shale

14:30-14:45 Fryer, B., Laloui, L. The stochastic modelling of large basement
seismicity during fluid injection in sedimentary
horizons

14:45-15:00 Kong X.-Z., Ma J.,
Saar M.O. Alteration of hydrogeochemical properties during
reactive flow-through experiments on sandstone
specimen using CO₂-charged brine

15:00-15:15 Nussbaum C., Guglielmi Y.,
Jeanne P., Birkholzer J. In-situ observations of fault leakage during a semi-
controlled fault activation (FS) experiment, Mont Terri
rock laboratory, Switzerland

15:15-16:00 Afternoon Poster Session with coffee

Posters P 5.7–P 5.11
(poster titles: see below)
first authors of posters,
participants

These posters will be shortly presented (3 minutes per
poster) by the first authors. Discussion during rest of
time.

Chairperson: Christoph Wanner

16:00-16:15 Gawenda P. A decade of unconventional exploration in Europe –
where are we now

16:15-16:30 Minardi A., Ferrari A.,
Ewy R., Laloui L. Experimental study on the swelling behaviour of a
gas shale

16:30-16:45 Van Den Heuvel D.B.,
Gunnlaugsson E.,
Gunnarsson I., Stawski
T.M., Diamond L.W.,
Benning L.G. Two pathways of silica scaling inside a high-enthalpy
geothermal power plant

16:45-17:00 Discussion of afternoon sessions

Posters Session 5:

P 5.1	Alt-Epping P., Diamond L.W., Wanner C.	Regional-scale reactive transport models of the orogenic hydrothermal system at Grimsel Pass, Switzerland
P 5.2	Aschwanden L., Adams A., Diamond L.W.	Effect of progressive burial on matrix porosity and permeability in Muschelkalk dolostones, Swiss Molasse Basin
P 5.3	Carvalho I., Meylan F., Piguet F., Erkman S.	An overview of CO ₂ storage and utilization
P 5.4	Blasco M., Auqué L.F., Gimeno M.J., Acero P., Asta M.P.	Geothermometrical calculations and the influence of the mobile elements in a low temperature thermal system hosted in carbonate-evaporitic rocks
P 5.5	Jansen G., Valley B., Miller S.A.	A MATLAB package for thermo-hydraulic modeling and fracture stability analysis in fractured reservoirs
P 5.6	Liu D., Lecampion B., Benedetti L.	Modelling the propagation of hydraulic fracture using cohesive zone models
P 5.7	Makhloufi Y., Samankassou E., Rusillon E., Brentini M., Meyer M.	Dolomitization of the Upper Jurassic Carbonate Rocks in the Geneva Basin, Switzerland and France
P 5.8	Räss L., Duretz T., Podladchikov Y.	Fluid flow in porous rocks: drastic localisation due to time-dependent deformation of the matrix
P 5.9	Sohrabi R., Omlin S., Miller S.A.	BATMAN – 3D Numerical simulator for mass and heat transport with porosity change using GPUs technology
P 5.10	Wenning Q.C., Madonna C., Joss L., Pini R.	Measuring pressure dependent aperture heterogeneity in rough-walled fractures using X-ray computed tomography
P 5.11	Zhang W., Wang Q., Zappone A., Madonna C., Burg J.	Comparison between permeability and seismic velocity anisotropy of shales

Session 6: Progress in Assessment of Hazards and Risks in Mountain Regions

Room Parsenn

Convenors: Michael Bründl, Linda Zaugg, Markus Stoffel

Chairperson: Michael Bründl

09:15-09:20	Welcome	
09:20-09:40	Fäh D., Cauzzi C.	Towards rapid likelihood estimation of earthquake-triggered mass-movements in Switzerland based on the calibration to historical observations
09:40-10:00	Franz M., Rudaz B., Jaboyedoff M., Podladchikov Y.	Coupling SLBL with shallow water model to assess landslide-generated tsunami hazard at Oeschinensee
10:00-10:20	Poster Authors P 6.1–6.6	Overhead Poster Presentation in the conference room
10:20-11:00	Morning Poster Session with coffee	

Chairperson: Michael Bründl

11:00-11:20	Jaboyedoff M., Artigue V., Aye Z.C., Derron M.-H., Gerber C., Lévy S.	From the average velocities of deep seated landslides to intensity-frequency scenarios
11:20-11:40	Leonarduzzi E., Molnar P., Mcardell B.W.	How much rain does it take to cause a landslide?
11:40-12:00	Brunner M.I., Vivioli D., Sikorska A.E., Seibert J., Favre A.-C.	Synthetic design hydrographs for gauged and ungauged catchments in Switzerland
12:00-14:00	Lunch	

Chairperson: Linda Zaugg

14:00-14:20	Evers F.M., Frank P., Hager W.H., Boes R.M.	Outburst floods triggered by impulse wave overtopping
14:20-14:40	Derron M.-H., Rouyet L., Guerin A., Lefevre C., Jaboyedoff M.	Imaging of non-gravitationnal movements in rock faces

14:40-15:00	Noël F., Wyser E., Jaboyedoff M., Derron M.	Real-size rockfall experiment: How different rockfall simulation impact models perform when confronted with reality?
15:00-15:20	Poster Authors P 6.7–6.13	Overhead Poster Presentation in the conference room
15:20-16:00	Afternoon Poster Session with coffee	
<i>Chairperson: Linda Zaugg</i>		
16:00-16:20	Nurtaev B., Inatov N., Nurtaev D., Kurbanova D., Bühler Y.	Numerical simulations of mudflow movements using RAMMS:HILLSLOPE Software: a case study from Uzbekistan
16:20-16:40	Semakova E., Popov A., Bühler Y.	Experience of snow avalanche numerical simulation in Uzbekistan
16:40-17:00	Zar Chi Aye, Artigue V., Jaboyedoff M., Derron M., Gerber C., Lévy S.	An open-source webGIS platform for risk management of natural hazards in Canton Vaud

Posters Session 6:

P 6.1	Tonini M., Cama M.	Detection and analysis of space-time landslides pattern in Switzerland
P 6.2	Glueer F., Manconi A., Loew S.	Kinematic Analysis of the September 2016 Moosfluh Landslide Acceleration
P 6.3	Meier C., Derron M., Jaboyedoff M., Gerber C., Artigue V.	Inventory of shallow landslides in regards to their frequency in the Canton of Vaud (Switzerland).
P 6.4	Vouillamoz N., Rothmund S., Joswig M.	Characterizing active clayey landslides dynamics by microseismic monitoring
P 6.5	D'almeida C., Guerin A., Jaboyedoff M., Hantz D.	Model and cartography of the Saint-Eynard cliff erosion by rockfalls
P 6.6	Wyser E., Jaboyedoff M.	Dramatic granular impact(s): a plastic- or friction-dominated transition phase
P 6.7	Noël F., Wyser E., Jaboyedoff M., Derron M.	Real-size rockfall experiment: A relatively simple method to acquire 3D impact characteristics from video footage

P 6.8	Nduwayezu E., Jaboyedoff M., Derron M.-H., Nsengiyumva J.-B., Twarabamenye E.	Pression démographique et outils analyse d'aléas et risques gravitaires au Rwanda.
P 6.9	Ben Hammouda M., Jaboyedoff M., Derron M.H., Bouaziz B.	Rockfall hazard evaluation in a touristic area of northern Tunisia using SFM photogrammetry in a zero data site
P 6.10	Matti B., Beffa F., Salvadè A., Pellegrini D., Gardenghi R., Monleone R, Marti U.	A revolutionary Array Synthetic Aperture Radar (ASAR) and methodology for landslide, unstable slope and manmade structure measurement
P 6.11	Nigg V., Girardclos S., Kremer K., Anselmetti F.	Tsunami deposits in coastal areas surrounding perialpine lakes in Switzerland
P 6.12	Schimmel A., Hübl J.	Automatic detection of debris flows based on infrasound and seismic data
P 6.13	Voumard J., Derron M.-H., Jaboyedoff M.	Characterization of natural hazard events affecting the Swiss transportation networks from 2012 to 2016

Session 7: Geomorphology

Room Pischa

Convenors: Nikolaus Kuhn, Christoph Graf, Isabell Kull, Geraldine Regolini, Isabelle Gärtner-Roer, Sébastien Castelltort, Margreth Keiler, Christophe Lambiel, Christian Scapoza, Reynald Delaloye, Christine Levy

Chairperson: Cristian Scapoza

09:15-9:30	Bakker M., Costa A., Silva T.A., Stutenbecker L., Girardclos S., Loizeau J.-L., Molnar P., Schlunegger F., Lane S.N.	Combined climate and flow abstraction impacts on an aggrading Alpine river
09:30-9:45	Costa A., Molnar P., Schmitt R.J. P.	River network bedload model: a tool to investigate the impacts of flow regulation on bed load and grain size in a large Alpine basin
09:45-10:00	Morgenthaler J., Frehner M.	Bulldozer-like soil erosion at the front of a rockglacier indicates change in advance dynamics: Case study from the Furggental, Valais, Switzerland
10:00-10:15	King G.E., Tsukamoto S., Sueoka S., Herman F., Ahadi F., Gautheron C., Delpech G., Tagami T.	Low-temperature thermochronometry of the Japanese Alps
10:15-10:30	Lehmann B., Valla P.G., King G.E., Ivy-Ochs S., Kronig O., Herman F.	Constraining paleo-glacier extent and local erosion using OSL and ¹⁰ Be surface exposure dating
10:30-11:00	Morning Poster Session with coffee	

Chairperson: Christophe Lambiel

11:00-11:15	Martin M., Ramirez J.A., Zimmermann M., Peleg N., Skinner C., Keiler M.	Simulating the effect of check dams on landscape evolution at centennial time scales
11:15-11:30	Mettra F., Antoniazza G., Lane S.	Sediment transport in a small alpine river: hysteresis and seasonal behaviour
11:30-11:45	Schide K., Gallen S., Lupker M., Märki L., Willett S., Cook K., Gajurel A.	Evaluating the role of coseismic landsliding on cosmogenic nuclides, erosion rates, and topographic evolution in mountainous landscapes. A case study of the Mw 7.8 Gorkha Earthquake.

11:45-12:00	Walter F., Marchetti E., Clinton J.	Monitoring alpine mass movement with seimology and infraosund
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12:00-14:00 Lunch

Posters Session 7:

P 7.1	Abbassi M., Ouezdou B.H., Fraj B.T., Reynard E., Moussa M.	Geohistorical analysis of the evolution of the hydraulic system of Jessour in Southeast Tunisia
P 7.2	Ambrosi C., Castelletti C., Czerski D., Scapozza C, Schenker F.L.	The new landslide and rock glacier inventory map of Canton Ticino
P 7.3	De Palézieux L., Leith K., Loew S.	Incorporation of hillslope morphology into an analysis of river profile development in NW Bhutan
P 7.4	Goldman N., Mayer M., Fister W., Kuhn N.J.	A methodological approach to improve erosion experiments on biochar by using a high precision rainfall simulator and photogrammetry
P 7.5	Greenwood P., Kuhn N.J.	Impatiens glandulifera (Himalayan Balsam) and increased soil loss: causation or association? Case studies from Switzerland and the UK
P 7.6	Huber M.L., Gallen S.F., Lupker M., Haghipour N., Christl M., Gajurel A.P.	Assessing the origins, timing and transport distances of large exotic boulders in trans-Himalayan rivers
P 7.7	Larsen A., Larsen J., Lane S.N.	Dam busy: beavers and their influence on the structure and function of river systems
P 7.8	Salehipour Milani A., Mohammadi A., Kaveh A.	Active Tectonic Faults and Their Effects on Quaternary Shorelines of the Malekan Regions (Northwestern Iran)
P 7.9	Schläfli S., Ruiz-Villanueva V., Schlunegger F., Stoffel M.	Regulated flows influence on river morphodynamics: the Spöl River (Swiss National Park)
P 7.10	Winterberg S., Willett S, Picotti V.	Paleo drainage networks of the Alpine region
P 7.11	Zaki A.S., Castellort S.	Saharan networks and the Martian networks: a key analogue to extract response of surface to past, present and future climatic changes
P 7.12	Kuhn N., Kuhn B., Maendli D., Schaub D.	UAV based soil erosion monitoring for soil protection

Session 8: Quaternary Environments: Landscapes, Climate, Ecosystems, Human Activity during the past 2.6 million years

Room Jakobshorn

Convenors: Naki Akçar, Christine Pümpin, Stéphanie Girardclos, Gaudenz Deplazes, Stephanie Wirth, Jean Nicolas Haas, René Löpf, Loren Eggenschwiler

Chairpersons: Naki Akçar, Loren Eggenschwiler

09:15 Welcome – Naki Akçar

09:20-09:40 Deák J., Magny M.M., Wüthrich S.S. Late Neolithic to Middle Bronze Age (ca 4900–3100 cal. BP) lake-level and palaeoclimatic fluctuations revealed by the sediment sequence of the Colombier/Les Plantées de Rive site (Neuchâtel, Switzerland).

09:40-10:10 Poster authors P 8.1–P 8.9 Overhead Poster Presentation in the conference room

10:10-11:10 Morning Poster Session with coffee

Chairpersons: Loren Eggenschwiler, Stephanie Wirth

11:10-11:30 Glaus N.C., Vogel H., Anselmetti F.S. Flood-event reconstruction and land-use history in Alpine Lake Grosssee (Flumserberg, Switzerland)

11:30-12:00 Poster authors P 8.10–P 8.18 Overhead Poster Presentation in the conference room

12:00-14:00 Lunch

14:00-14:20 Guillemot T., Stockhecke M., Bechtel A., Schubert C. Paleo-humidity reconstruction around Lake Van (Turkey) between MIS 5 to 7 based on alkenones assemblages and δD measurements

14:20-14:40 Ordóñez L., Ariztegui D., Chiaradia M., Vogel H., Melles M., Russell J.M., Bijaksana S., The Tdp Scientific Team Investigating Fe-phases as potential recorders of past environmental changes

14:40-15:00 Zwahlen P. Klimageschichte der späten Würm-Eiszeit im hinteren Prättigau

15:00-15:10 10th anniversary of CH-QUAT – Naki Akçar

15:10-17:00 Afternoon Poster Session with Apéro

Posters Session 8:

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| P 8.1 | Abbott P., Jaccard S.,
Barker S., Gottschalk J. | Constraining the timing of deep-water ventilation changes and the marine reservoir effect in the Southern Ocean between 40–10 kyr BP: A tephrochronological and radiocarbon approach |
| P 8.2 | Amsler H.E., McCave I.N.,
Ikehara M., Jaccard S.L. | Variations in near-bottom flow of ACC during the past glacial cycle in SW Indian Ocean |
| P 8.3 | Blattmann F.R., Eglinton T.I.,
Haghipour N., Bernasconi S.M.,
Dittrich M., Al-Kuwari A.H.A.,
Bontognali T.R.R. | Assessing the Biogenicity and Fossilization Potential of Polygonal Sedimentary Structures |
| P 8.4 | Boxleitner M., Maisch M.,
Brandova D., Egli M.,
Ivy-Ochs S., Christl M. | Going beyond the YD – The difficulty of dating early Lateglacial stadials in central Switzerland |
| P 8.5 | Camperio G., Lloren R.,
Ladd N.S., Prebble M., Dubois N. | Tracing human arrival and ecosystem modification in the Pacific archipelago of Vanuatu |
| P 8.6 | Czerski D., Adatte T., Humane S. | Sedimentary record of the Naleshwar Lake (Maharashtra, India): a witness of climate change and influence of human activity during the last 100 years |
| P 8.7 | Grischott R., Kober F., Ivy-Ochs S.,
Hippe K., Lupker M., Christl M.,
Vockenhuber C., Maden C. | Determination the age of Swiss Deckenschotter with cosmogenic isochron burial dating |
| P 8.8 | Haas M., Belkina N.,
Subetto D., Dubois N. | How politics shape agricultural landscapes: The plant wax record of Lake Lavijärvi, Russia Karelia |
| P 8.9 | Kaveh Firouz A., Burg J.-P.,
Haghipour N., Mandal S.K.,
Elyaszadeh R., Christl M. | Spatial variability of ¹⁰ Be-derived erosion rates in Ghezel-Ozan Basin, NW Iran |
| P 8.10 | Lloren R., Augustinus P.,
Dubois N. | Multiproxy approach in assessing the downcore variations of Lake Pupuke, North Island, New Zealand during the last 1700 cal yr BP |
| P 8.11 | Makri S., Grosjean M.,
Rey F., Gobet E. | Long-term productivity and meromixis dynamics on the Swiss Plateau (Lake Moossee, Switzerland) inferred from Hyperspectral Imaging |
| P 8.12 | Mettler K., Fredin O.,
Romundset A., Christl M.,
Vockenhuber C., Akçar N. | Reconstruction of deglaciation chronology and relative sea level change in northern Norway using cosmogenic nuclides |

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| P 8.13 | Morlock M.A., Vogel H., Hadi J., Foubert A., Ariztegui D., Melles M., Russell J.M., Bijaksana S., The Tdp Science Team | A novel 4D-view on sediments: insights to sedimentation processes and post-sedimentary mineral formation |
| P 8.14 | Normand R., Simpson G., Biswas R.H., Herman F., Bahroudi A. | Optically stimulated luminescence dating of the Western Makran marine terraces (Iran) |
| P 8.15 | Pregler A., Werthmüller S. | Uranium accumulation and leaching in Swiss plateau wetlands |
| P 8.16 | Salehipour Milani A. | Mangrove Forest Sedimentary Environments along Iranian Coasts of The Persian Gulf (Bushehr to Naybad Bay) |
| P 8.17 | Silva T. A., Costa A., Girardclos S., Stutenbecker L., Bakker M., Schlunegger F., Lane S. N., Molnar P., Loizeau J.-L. | Sediment input fluctuations to Lake Geneva – climate and human impact |
| P 8.18 | Zwahlen P. | Würmeiszeit und die Rückzugsstadien im Alpenrheintal |

Session 9: Cryospheric Sciences

Room Aspen I

Convenors: Margit Schwikowski, Martin Heggli, Matthias Huss, Jeannette Nötzli, Daniel Tobler, Andreas Vieli

Chairperson: Martin Heggli

09:15-09:30	Capelli A., Reiweiger I., Schweizer J.	A fiber bundle model with healing mechanisms for snow failure modelling
09:30-09:45	Heck M., Hobiger M., van Herwijnen A., Fäh D.	Localization of avalanches using seismic monitoring
09:45-10:00	Sommer C.G., Fierz C., Lehning M.	Wind tunnel experiments: influence of erosion and deposition on wind-packing of fresh snow
10:00-10:15	Gugerli R., Huss M., Salzmann N.	Using a cosmic ray sensor and weather radar composites to estimate the snow water equivalent on a Swiss glacier

10:15-11:15 Morning Poster Session with coffee

Chairperson: Margit Schwikowski

11:15-11:30	Rohrer M., Steinegger U., Nötzli C., Lorenzi D., Schwarb M. (solicited)	75 years snow water equivalent measurements in the Wägital catchment
11:30-11:45	Barbieux K., Charitsi A., Merminod B.	Observation of the Ice Coverage of Great Lakes with Landsat 8 Multispectral Imagery
11:45-12:00	Bernhard P., Zwieback S., Leinss S., Hajnsek I.	Large-scale monitoring of rapid permafrost thaw with satellite radar interferometry
12:00-12:15	Kenner R., Phillips M., Hauck C., Hilbich C., Mulsow C., Bühler Y., Stoffel A., Buchroithner M.	Genesis and conservation of permafrost excess ice in the Flüelapass talus slope

12:15-13:45 Lunch

Chairperson: Matthias Huss

13:45-14:00	Steiner J.F., Kraaijenbrink P.D.A., Jiduc S.G., Immerzeel W.W.	A rapid glacier surge in the Karakoram – employing new high-resolution satellite products for coupled research and hazard assessment
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14:00-14:15	Cohen D., Jouvét G., Gillet-Chaulet F., Haeberli W., Machguth H., Seguinot J., Imhof M., Fischer U.H.	Numerical Reconstructions of the Flow and Basal Conditions of the Rhine Glacier at the Last Glacial Maximum
14:15-14:30	Prohaska Y.M., Werder M.A., Farinotti D.	The roughness of englacial R-channels determined by physical experiments
14:30-14:45	Leysinger Vieli G.	Basal-ice accretion – pushing boundaries within ice sheets
14:45-15:00	Mercenier R., Luethi M.P., Vieli A.	Using Continuum Damage Mechanics to Simulate Iceberg Calving from Tidewater Outlet Glaciers
15:00-16:00	Afternoon Poster Session with coffee	

Chairpersons: Jeannette Nötzli, Daniel Vonder Mühl

16:00-16:10	Haeberli W. (solicited)	30 Years Murtèl Deep Permafrost Boreholes – Background and 1987 Drilling
16:10-16:20	Movie: Core drilling through rock glacier permafrost in 1987	
16:20-16:35	Hoelzle M. (solicited)	Rockglacier Murtèl-Corvatsch: a short historical research overview.
16:35-16:50	Vieli A., Cicoira A. (solicited)	The 'new' 2015 borehole at Murtèl rock glacier: strategy, drilling and new results
16:50-17:00	SEP Young Scientist Award Ceremony	

Posters Session 9:

P 9.1	Barandun M., Huss M., Usabaliev R., Azisov E., Berthier E., Käab A., Bolch T., Hoelzle M.	Long-term mass changes on three Kyrgyz glaciers
P 9.2	Bobillier G., Capelli A., Schweizer J.	Effect of load-sharing rules in modeling snow failure with a fiber bundle model
P 9.3	Buri P., Steiner J.F., Miles E.S., Ragettli S., Pellicciotti F.	How much do supraglacial ice cliffs contribute to the mass-balance of glaciers? A modelling approach for the Langtang catchment, Nepalese Himalaya
P 9.4	Crivelli P., Paterna E., Lehning M.	Mass-flux dynamics in a drifting snow wind-tunnel

P 9.5	Dal Farra A., Kaspari S., Beach J.J., Bucheli T.D., Schaepman M., Schwikowski M.	Spectral signatures of submicron scale light absorbing impurities in snow and ice using hyperspectral microscopy
P 9.6	Delaney I., Werder M.A., Farinotti D.	A model for subglacial sediment discharge and comparison with available measurements
P 9.7	Förster S., Huss M., Gudmundsson H.	Applying the ice flow model Úa to the Alpine region: first simulations of Rhonegletscher
P 9.8	Gerber F., Besic N., Sharma V., Mott R., Gabella M., Germann U., Bühler Y., Marty M., Berne A., Lehning M.	From the clouds to the ground – snow precipitation vs. snow accumulation patterns
P 9.9	Gerling B., Löwe H., van Herwijnen A.	Measuring the elastic modulus of snow
P 9.10	Gräff D., Walter F.	Analysis of Borehole Measurements and Determination of the Basal Sliding Velocity of Rhonegletscher
P 9.11	Groos A.R., Mayer C., Smiraglia C., Diolaiuti G., Lambrecht A.	A first attempt to model region-wide glacier surface mass balances in the Karakoram: findings and future challenges
P 9.12	Haberkorn A., Fierz C., Marty C., Macelloni G., Morin S., Schöner W.	The European Snow Booklet
P 9.13	Heil K., Kaitna R., Fischer J.T., Reiweger I.	Properties of flowing snow – measurements in a rotating drum
P 9.14	Imhof M., Jouvét G., Seguinot J., Cohen D., Funk M.	Modelled and reconstructed ice thickness of the Rhine Glacier during the Last Glacial Maximum
P 9.15	Irrazaval I., Mariethoz G., Herman F.	Stochastic subglacial hydrology model for water pressure and mass transport data assimilation.
P 9.16	Jouvét G., Stastny T., Oettershagen P., Hugentobler M., Mantel T., Melzer A., Weidmann Y., Funk M., Siegwart R.	Sun2Ice: Monitoring calving glaciers from solar-powered UAVs
P 9.17	Kronenberg M., Machguth H., Stainbank W., Hoelzle M.	Investigating firm changes of Abramov glacier, Pamir Alay
P 9.18	Landmann J., Huss M., Farinotti D.	Cryospheric Monitoring and Prediction Online ("CRAMPON") – a first version
P 9.19	Le Bris R., Paul F.	Glaciers of Patagonia in 2016: A new inventory from Landsat 8 and the TanDEM-X DEM

P 9.20	Lindner F., Laske G., Walter F.	Seismic azimuthal anisotropy in crevasse fields
P 9.21	Lüthi M.P., Mercenier R., Vieli A.	A new parametrization and minimal model for glacier calving
P 9.22	Magrani F., Ayres-Neto A., Vieira R., Rosa K., Ferreira F.	Glaciomarine Sedimentation and Submarine Landforms in Admiralty Bay, South Shetland Islands
P 9.23	Nötzli J., Phillips M.	Borehole measurements in Alpine permafrost – acquired experience and best practices for long-term monitoring
P 9.24	Preiswerk L.E., Michel C., Walter F., Fäh D.	Analysis of surface waves from ambient vibrations on Alpine glaciers in Switzerland
P 9.25	Pruessner L., Phillips M., Lehning M., Hoelzle M., Farinotti D.	Near-surface energy balance on an Alpine rock glacier
P 9.26	Rastner P., Notarnicola C., Nicholson L., Prinz R., Sailer R., Paul F.	Processing of multi-temporal Landsat images to detect fractional snow cover and the snow line altitude for large glacier samples
P 9.27	Roth F., Schneebeli M.	Sensitivity of snow specific surface area measurements to different μ CT settings
P 9.28	Richter B., Schweizer J., Rotach M.W., van Herwijnen A.	Using snow cover models driven with meteorological data to predict snow instability for avalanche forecasting
P 9.29	Scherler M., Hoelzle M., Huss M., Hauck C.	Present and future runoff regimes at Murtèl-Corvatsch rockglacier
P 9.30	Schlögl S., Mott R., Lehning M.	How do patchy snow covers affect turbulent sensible heat fluxes?
P 9.31	Seguinot J., Ivy-Ochs S.	Modelled transfluences and crosswise divides in the Last Glacial Maximum Alpine ice flow
P 9.32	Steiner L., Geiger A.	GPS for the Point-wise Quantification of Snow Water Equivalent in alpine Terrain
P 9.33	Trachsel J., Avak S., Edebeli J., Schneebeli M., Eichler A., Bartels-Rausch T.	Microscale Distribution of Impurities in Snow
P 9.34	Walter A., Lüthi M.P., Vieli A., Funk M.	Using terrestrial radar interferometry for understanding calving processes
P 9.35	Weber S., Faillettaz J., Meyer M., Beutel J., Vieli A.	Characteristics of acoustic and micro-seismic signals in steep bedrock permafrost on Matterhorn (CH)
P 9.36	Wicky J., Hauck, Ch.	Influence of slope angle on the convective heat transfer in porous permafrost substrate

Session 10: Hydrology, Limnology and Hydrogeology

Room Aspen II

Convenors: Pascal Blanc, Michael Doering, Tobias Jonas, Michael Sinreich, Massimiliano Zappa

Chairperson: Michael Sinreich

09:15-09:35	Hunkeler D., Cochand M., Christe P., Ornstein P.	Keynote: Seasonal groundwater storage in alpine catchments and its influence on stream discharge
09:35-09:50	Scheidler S., Anders B., Eichenberger U., Calonder G.-P., Aebli H., Huggenberger P.	Integrating geological structures into hydraulic-geothermal models to evaluate the productivity of alpine geological systems; the case study Davos
09:50-10:05	Kiewiet L., Meerveld V.I., Seibert J.	Spatio-temporal variability in shallow groundwater chemistry in a small pre-alpine catchment

10:05-11:00 Morning Poster Session with coffee

Chairperson: Michael Döring

11:00-11:20	Addor N.	Keynote: Two ways to overcome boundaries in hydrology
11:20-11:35	Gaudard A., Schmid M., Wüest A.	Using lakes and rivers for the extraction and disposal of heat
11:35-11:50	Mastrotheodoros T., Pappas C., Molnar P., Burlando P., Hadjidoukas P., Fatichi S.	Alpine ecohydrology across scales: propagating fine-scale heterogeneity to the catchment and beyond
11:50-12:05	Tischer J., Zopfi J., Giglio E., Su G., Cojean A., Lepori F., Lehmann M.F.	Dynamics and isotope effects of denitrification in Lake Lugano

12:05-13:00 Lunch

Chairpersons: Massimiliano Zappa

13:00-14:00	For SGHL Members or candidate members	General Assembly of the Swiss Society for Hydrology and Limnology SGHL
14:00-14:45	Presented by Reinhard Bachofen	Hydrobiology-Limnology Award

14:45-15:05	Peleg N., Fatichi S., Paschalis A., Molnar P., Burlando P.	Keynote: AWE-GEN-2d: A new gridded stochastic weather generator
15:05-15:20	Pool S., Viviroli D., Seibert J.	Prediction of hydrographs and flow-duration curves in almost ungauged catchments: which runoff measurements are most informative for model calibration?

15:20-16:00 Afternoon Poster Session with coffee

Chairperson: Massimiliano Zappa

16:00-16:15	Round V., Huss M., Farinotti D.	The hydropower potential of future ice-free basins worldwide
16:15-16:30	Roques C., Jachens E., Rupp D., Selker J., Grant G., Lewis S., Walter C., Nolin A.	On the origin of low flows in alpine systems: Insights from a year without snow in the Cascade Mountains of Oregon, USA

Posters Session 10:

P 10.1	Alcolea A., Becker J.K.	Automatic interpretation of geophysical well logs
P 10.2	Bergami G., Drummond A., Molnar P., Burlando P.	Flow regulation effects on riparian vegetation: the Maggia River case
P 10.3	Bolay S., Regli C., Eichenberger U., Calonder G.P., Aebli H., Siddiqi G.	Case study: Site investigation and geothermal exploitation of an alpine, fractured, artesian aquifer in Davos, Switzerland
P 10.4	Botter M., Burlando P., Fatichi S.	Water quality in Swiss rivers: analysis of magnitude, trends and concentration-discharge relations
P 10.5	Ceperley N., Michelon A., Beria H., Larsen J., Schaeffli B.	Isotopes in water shed light on changing alpine water resources
P 10.6	Cotte G., Vennemann T.	Tracing of the Rhône River within Lake Geneva using the stable isotope composition of water
P 10.7	De Palézieux L., Loew S., Zwahlen P.	Recharge and Transient Pore Pressure Propagation in steep Alpine Mountain Slopes near Poschiavo, Switzerland
P 10.8	Dembélé M., Mariéthoz G., Schaeffli B.	Gap filling of streamflow time series using Direct Sampling in data scarce regions

P 10.9	Ehrenfels B., Kalvelage T., Wehrli B.	How biogeochemistry shapes the ecosystem of Lake Tanganyika
P 10.10	Fluixá-Sanmartín J., García-Hernández J., Fluixá-Sanmartín P., Paredes-Arquiola J.	Impacts of climate change on the water resources of an Alpine catchment in the Upper Rhone Basin, Valais, Switzerland
P 10.11	Guerhazi E., Milano M., Reynard E., Zairi M.	Impact of climate change and anthropogenic pressure on groundwater resources in Regueb basin, Central Tunisia
P 10.12	Hyman J., Jimenez-Martinez J.	Dispersion and mixing in fractured media: interplay between structural and hydraulic heterogeneity
P 10.13	Kouame A.A., Jaboyedoff M., Goola Bi Tie A., Derron M., Kouamé Kan J.	Assessment of potential pollution of an unconfined aquifer in Abidjan by hydrocarbons
P 10.14	Michelon A., Ceperley N., Beria H., Larsen J., Schaeffli B.	Role of snowcover on water balance and melt dynamics in the Vallon de Nant, Switzerland
P 10.15	Pavia D., Lebrezn H., Bárdossy A.	Parameter estimation: drivers of extreme discharge in the Northwestern Switzerland
P 10.16	Remondi F., Fatichi S., Kirchner J.W., Burlando P.	Water transit time variability in time and space by fully distributed hydrology-transport modelling
P 10.17	Schmocker-Fackel P., Hüsler F., Zahner S., Hohmann R., Overney O.	Hydro-CH2018: Climate change and its consequences on hydrology in Switzerland
P 10.18	Sy B., Frischknecht C., Dao H., Consuegra D., Giuliani G.	What role for citizen science in flood hazard mapping?
P 10.19	Vogt M.-L., Zwahlen F., Ibrahim H., Brunner P., Hunkeler D.	Modern recharge and flowfield organization of the Nubian Sandstone Aquifer System in Northern Chad
P 10.20	Voytek E.B., Jougnot D., Singha K.	Evaluating groundwater flow at multiple temporal scales using passive electrical measurements
P 10.21	Wienhues G., Makri S., Grosjean M., Rey F.	Iron speciation in lake sediments of Moossee (Swiss Plateau) as anoxia proxy by applying a new sequential extraction technique
P 10.22	Yao F.Z., Ouattara I., Reynard E., Savané I.	Analysis of trends of hydroclimatic variables in the White Bandama Basin, Northern Côte d'Ivoire

Session 11: Environmental Biogeochemistry of Trace Elements

Room Schwarzhorn

Convenors: Andreas Voegelin, Moritz Bigalke, Montserrat Filella, Adrien Mestrot, Lenny Winkel

Chairpersons: Andreas Voegelin, Moritz Bigalke

09:15-09:30	Filella M.	Beauty, bottlenecks and progress in the study of the environmental behaviour of less-studied technology-critical elements
09:30-10:00	Kretzschmar R., Christl I., Kotsev T. (Keynote)	Arsenic pollution of Ogosta River floodplain by legacy mining: Assessing pollution and environmental impacts at different scales

10:00-11:00 Morning Poster Session with coffee

Chairpersons: Montserrat Filella, Adrien Mestrot

11:00-11:15	Wick S., Fischer M., Pfenninger N., Voegelin A.	Solubility of thallium in soils: role of TI uptake by illite
11:15-11:30	Imseng M., Wigganhauser M., Frossard E., Müller M., Keller A., Wilcke W., Bigalke M.	Copper and zinc stable isotopes as analytical tool to trace sources and processes in agricultural systems
11:30-11:45	Wigganhauser M., Bracher C., Imseng M., Keller A., Rehkämper M., Eikenberg J., Wilcke W., Frossard E., Bigalke M.	The fate of P fertilizer derived Cd in soil-wheat systems
11:45-12:00	Peter Hug D., Castella E., Slaveykova V.I.	Metal availability to invertebrate community: integrating field experimentation and modelling

12:00-14:00 Lunch

Chairpersons: Lenny Winkel, Andreas Voegelin

14:00-14:15	Gfeller L., Mestrot A.	Spatial distribution of mercury and methylmercury in an industrially polluted floodplain soil.
14:15-14:30	Feinberg A., Stenke A., Suess E., Peter T., Winkel L.H. E.	Tracing the atmospheric transport and fate of selenium using a chemistry-climate model
14:30-14:45	Mueller E., von Gunten U., Bouchet S., Winkel L.H.E.	New insights into the oxidation of marine organic sulfur compounds by reactive bromine species
14:45-15:00	Su G., Niemann H., Zopfi J., Lehmann M.F.	Limitation of anaerobic oxidation of methane in sulfate-rich lake sediments

15:00-16:00 Afternoon Poster Session with coffee

16:00-16:15	Cojean A., Zopfi J., Robertson E., Thamdrup B., Lehmann M.F.	Fe ²⁺ , H ₂ S and Mn ²⁺ Availability modulate the Balance between N-Removal and N-Recycling in Lake Lugano Sediments
16:15-16:30	Müller B.	Trace elemental analysis of arsenic-contaminated groundwater in the lowlands of Nepal suggest the initial source of arsenic in the High Himalayas
16:30-16:45	Bhattacharya S.	Arsenic contamination in the groundwater and soil and subsequent bioaccumulation in the edible crops in Bengal Delta

Posters Session 11:

P 11.1	Blattmann T.M., Liu Z., Wen K., Lin S., Li J., Zhao Y., Zhang Y., Wacker L., Haghipour N., Plötze M., Eglinton T.I.	Geochemical tracing of sedimentary organic matter and associated clay minerals in the South China Sea
P 11.2	Caplette J., Mestrot A.	Trapping of volatile antimony (Sb): current work and future developments
P 11.3	Chonova T., Slaveykova V.I.	Inorganic mercury adsorption and internalization kinetics and the role of dissolved organic matter
P 11.4	Deonarine A., Gfeller L., Neuhaus P., Mestrot A.	Mercury and methylmercury quantification in floodplain soils, canal sediments, and plants in the Upper Valais
P 11.5	Groß-Schmölders M., Woodard J., Krüger J., Leifeld J., Alewell C.	Depth profile of $\delta^{15}\text{N}$ indicates drainage effects on peat
P 11.6	Guilmot S., Slaveykova V.I.	Toxicity and uptake of mercury compounds to the cyanobacterium <i>Synechocystis</i> PCC603
P 11.7	Hoffmann K., Christl I., Kaegi R., Kretzschmar R.	Effects of metal-to-sulfide ratio, NOM, and Mn ²⁺ on metal sulfide nanoparticle characteristics
P 11.8	Marafatto F.F., Ferreira-Sanchez D., Dähn R., Grolmund D., Voegelin A.	Synchrotron X-ray beam-induced chemical transformations: The case study of Ti redox changes as a function of photon flux and temperature
P 11.9	Rodríguez-Murillo J.C., Filella M.	Exploring the application of time series analysis methods to concentration data from Swiss rivers and lakes
P 11.10	Van Groeningen N., Christl I., Kretzschmar R.	Mn(II) and Cd(II) sorption to synthetic montmorillonite

Session 12: Atmospheric Processes and Interactions with the Biosphere

Session 13: Aerosols and Clouds in a changing World

Room Sertig

Convenors session 12: Christof Ammann, Stefan Brönnimann, Susanne Burri, Martin Steinbacher

Convenors session 13: Christopher Hoyle, Ulrich Krieger

Chairpersons: Christof Ammann, Martin Steinbacher, Stefan Brönnimann, Ulrich Krieger, Christopher Hoyle

09:15-09:30	Malle J., Mazzotti G., Jonas T.	Influence of sub-canopy energy fluxes on snowpack dynamics in forest
09:30-09:45	Etzold S., Burri S., Haeni M., Zweifel R.	Tree growth patterns and water relations of beech, spruce, pine, fir and oak trees across Switzerland
09:45-10:00	Gharun M., Vervoort W., Turnbull T., Adams M.	Testing the influence of vegetation coupling to the atmosphere on catchment-scale hydrological processes in Australia
10:00-10:15	Buchmann N., Brinkmann N., Kahmen A., Eugster W.	Changes in water uptake of temperate tree species in response to low soil moisture

10:15-11:00 Morning Poster Session with coffee

Chairpersons: Christof Ammann, Martin Steinbacher, Stefan Brönnimann, Ulrich Krieger, Christopher Hoyle

11:00-11:15	Voglmeier K., Ammann C., Jocher M., Menzi H.	Nitrous oxide emissions of a Swiss rotational grazing system: how important are small scale emissions
11:15-11:30	Carozzi M., Loubet B.	Estimating NH ₃ volatilisation from multi-plot agronomic trials measured with low-cost samplers
11:30-11:45	Müller M., Berchet A., Graf P., Meyer J., Brunner D., Hüglin C., Emmenegger L.	Low-cost sensors for CO ₂ monitoring: sensor calibration and first data from the Carbosense network
11:45-12:00	Berhanu T.A., Szidat S., Brunner D., Satar E., Schanda R., Nyfeler P., Battaglia M., Steinbacher M., Hammer S., Leuenberger M.	Estimation of the fossil-fuel component in atmospheric CO ₂ based on radiocarbon measurements at the Beromünster tall tower, Switzerland
12:00-12:15	Jeannet P.	Comparison of tropospheric temperature trends based on radiosondes and satellite instruments

12:15-14:15 Lunch

Chairpersons: Christof Ammann, Martin Steinbacher, Stefan Brönnimann, Ulrich Krieger, Christopher Hoyle

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| 14:15-14:30 | Gilgen A., Huang K., Ickes L., Neubauer D., Lohmann U. | Future changes in Arctic aerosol emissions and their impact on clouds and radiation |
| 14:30-14:45 | Krieger U.K., Luo B.P., Corral-Arroyo P., Alpert P., Ammann M., Peter T. | Feedbacks between microphysics and photochemical aging in viscous aerosols |

14:45-15:00 Short break

Chairpersons: Christof Ammann, Martin Steinbacher, Stefan Brönnimann, Ulrich Krieger, Christopher Hoyle

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| 15:00-15:15 | Bartels-Rausch T. | Fundamentals of multiphase chemistry at the surface of environmental snow with relevance to the Atmosphere |
| 15:15-15:30 | Emmel C., Winkler A., Hörtnagl L., Revill A., Buchmann N., Eugster W. | Long-term C budget of a cropland site on the Swiss plateau |
| 15:30-15:45 | Volk M., Bassin S., Enderle J., Fuhrer J. | Atmospheric N deposition causes carbon balance gains in a seven year field experiment in subalpine grassland |

Posters Session 12+13:

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| P 12.1 | Winther M., Blunier T., Balslev-Harder D., Christensen S., Priemé A., Elberling B. | Continuous measurements of nitrous oxide isotopomers during incubation experiments |
| P 12.2 | Imhof S., Steinbacher M., Conen F. | Large-scale CO ₂ flux estimated from CO ₂ and ²²² Rn measurements on Jungfraujoch |
| P 12.3 | Hörtnagl L., Baur T., Burri S., Eugster W., Etzold S., Haesler R., Käslin F., Meier P., Merbold L., Pluess P., Zielis S., Buchmann N. | Two decades of ecosystem CO ₂ and H ₂ O gas exchange above a sub-alpine coniferous forest in Switzerland |
| P 12.4 | Meier P., Burri S., Merbold L., Eugster W., Hörtnagl L., Buchmann N. | Beyond CO ₂ – Tackling the full greenhouse gas budget of a sub-alpine forest ecosystem |
| P 12.5 | Satar E., Berhanu T., Brunner D., Henne S., Herrmann L., Leuenberger M. | Four years of continuous CO ₂ /CH ₄ /CO measurements (2012–2016) at the Beromünster tall tower station in Switzerland |
| P 12.6 | Steinbacher M., Wyss S.A., Emmenegger L. | Harmonization of atmospheric greenhouse gas observations in Europe |

Session 14: Remote Sensing of the Spheres

Session 15: High Alpine Remote Sensing

Room Flüela

Convenors session 14: Stefan Wunderle, Mathias Kneubühler, Dominik Brunner, Alain Geiger

Convenors session 15: Yves Bühler, Christian Ginzler

Chairpersons: Stefan Wunderle, Mathias Kneubühler, Dominik Brunner, Alain Geiger

09:15-09:30	Schmidt S., Alewell C., Borrelli P., Meusburger K.	Seasonal dynamics and spatial patterns of the cover management factor for Swiss grassland
09:30-09:45	Xie J., Kneubühler M., Garonna I., de Jong R., Schaepman M.E.	Influence of meteorological factors on the autumn land surface phenology in alpine grasslands
09:45-10:00	Li C., Wulf H., Schaepman M.	The impacts of human activities and environmental variables on grassland canopy traits on the Qinghai-Ti- betan Plateau

10:00-11:00 Morning Poster Session with coffee

Chairpersons: Yves Bühler, Christian Ginzler

11:00-11:15	Paul F., Rastner P.	Recent glacier changes in western Greenland and glacier mapping challenges in mountain topography
11:15-11:30	Dizerens C., Huesler F., Wunderle S.	Webcam-based snow cover monitoring in the Swiss Alps: methods and evaluation
11:30-11:45	Mazzotti G., Bühler Y., Webster C., Schirmer M., Stoffel A., Jonas T.	Mapping snow depth distribution in forested terrain using Unmanned Aerial Vehicles and Structure-from- Motion
11:45-12:00	Caduff R., Strozzi T., Wies- mann A., Wegmüller U.	Monitoring glacial, periglacial and landslide surface motion with Sentinel-1 over the Swiss Alps every 6 days.

12:00-14:00 Lunch

Chairpersons: Stefan Wunderle, Mathias Kneubühler, Dominik Brunner, Alain Geiger

13:00-13:15	Wilgan K., Geiger A.	High-resolution troposphere models based on numeri- cal weather prediction and Global Navigation Satellite Systems data
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13:15-13:30	Kuhlmann G., Clément V., Fuhrer O., Marshall J., Meijer Y., Löscher A., Brunner D.	Atmospheric CO ₂ simulations to study the capability of future imaging CO ₂ satellites to observe emissions from cities and power plants
13:30-13:45	Meyer U., Arnold D., Ben-tel K., Jean Y., Jäggi A.	GRACE satellite gravimetry to assess global hydrology and ice melt
13:45-14:00	Payne D., Adler C., Krauer J., Sayre R.	The GEO-GNOME Mountain Explorer – visualizing and comparing commonly applied mountain definitions

Chairpersons: Yves Bühler, Christian Ginzler

14:00-14:15	Meier L., Jäger D., Steinacher R., Funk M.	Remote Monitoring of Glaciers and Landslides Using Interferometric Radar and High-Resolution Cameras
14:15-14:30	Strozzi T., Caduff R., Barboux C., Delaloye R., Käb A., Lambiel C.	Inventory and state of activity of rockglaciers and periglacial slope instabilities from satellite SAR interferometry (InSAR)
14:30-14:45	Manconi A., Galletti M., Loew S.	Remote sensing of rock fall events in high alpine environments
14:45-15:00	Vivero S., Meyrat R., Delaloye R., Lambiel C.	UAV-photogrammetry for rock glacier monitoring: Examples from the Swiss Alps
15:00-16:00	Afternoon Poster Session with coffee	

Posters Session 14+15:

P 14.1	Vallat R., Mariéthoz G.	UAV-based thermal remote sensing to highlight groundwater inputs in rivers
P 14.2	Bühler Y., Schneebeli M., Schwank M., Fierz C., Jonas T., Lehning M., Löwe H., Caduff R., Ginzler C.	High alpine remote sensing test site Davos: validating remote sensing technology in complex terrain

Session 16: Geoscience and Geoinformation – From Data Acquisition to Modelling and Visualisation

Room Dischma

Convenors: Nils Oesterling, Adrian Wiget, Massimiliano Cannata, Michael Sinreich

Chairperson: Adrian Wiget

09:15-09:35	Cledat E., Cucci D., Skaloud J.	Planning of UAV mission for precise terrain reconstruction in steep terrain without ground control points
09:35-09:55	Jaeggi D., Herfort M., Tabani P.	Long-term performance of fiber optical sensors subjected to HLW repository conditions

10:00-11:00 Morning Poster Session with coffee

Chairperson: Nils Oesterling

11:00-11:20	Dawes N., Suter C.	FeldApp – Fieldwork to final report in the most efficient fashion
11:20-11:40	Cannata M., Strigaro D., Cardoso M., Hoffman M., Antonovic M.	4 times open weather station: first results of non-conventional cost-effective monitoring system
11:40-12:00	Galvan B.	Efficient implementation of complex elasto-plastic models in high performance computing systems

12:00-14:00 Lunch

Chairperson: Massimiliano Cannata

14:00-14:20	Boulicault L., Manzini M., Faubert M., Minnig C., Glaus L., Oesterling N., Baumberger R.	GeoTherm: Public Data Infrastructure for Deep Geothermal Energy in Switzerland
14:20-14:40	Brodhag S.H., Oesterling N., Baumberger R.	Geological Data Management – An Example for Borehole Data
14:40-15:00	Plattner G.-K., Espona Pernas L., Iosifescu Enescu I., Lehning M., Steffen K.	Moving research boundaries by enhancing access to Swiss environmental data

15:00-16:00 Afternoon Poster Session with coffee

Chairperson: Michael Sinreich

16:00-16:20	Nurtaev B.	Application of solar numeral system in geosciences
16:20-16:40	Produit T., Ingensand J.	Visualisation and analysis of landscape change using crowdsourced historical photographs
16:40-17:00	Wiget A., Wicht A.	Moving national boundaries – reasons, documentation and backtracking

Posters Session 16:

P 16.1	Dahrabou A., Valley B., Ladner F., Guinot F., Meier P.	Optimisation of borehole trajectory in order to minimize borehole failure
P 16.2	Guignard F., Leuenberger M., Kanevski M.	Uncertainty quantification in environmental data driven modelling using machine learning
P 16.3	Hunziker J., Laloy E., Linde N.	Towards probabilistic full-waveform inversion
P 16.4	Laib M., Telesca L., Kanevski M.	Multifractal Detrended Fluctuation Analysis of Wind Speed Connectivity Density Time Series
P 16.5	Leith K., Perras M., Loew S.	Integration of open-source hardware in a low-power, low-cost system to monitor thermally-driven rock fracturing
P 16.6	Long X., Ballmer D.	Intraplate volcanism in northeast China due to upwellings rising from the stagnant slab
P 16.7	Tonini M., Amato F., Kanevski M., Murgante B.	A prospective scenario for Rural Urban Interface based on spatio-temporal LULCC
P 16.8	Wehrens P., Volken S., Preisig G., Gaehwiler M., Möri A.	GeoQuat project: Benefits of standardization and automation for analyzing and modelling data from Quaternary deposits

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