

# Earth Systems Sciences - Mountain Geo-Microbiology

## Microbial geo-ecology in „new“ landscapes and habitats in High Altitude Environments of the Biogeoscience Arena Silvretta, Eastern Swiss Alps

for Participants of the ETH Earth Sciences Bachelor and Master Programs together with the Universities of Zürich and Basel and Guests

*Course is taught in German, unless there are students who are not familiar with the language*

**September 2 – 7 (Monday – Saturday), 2019**

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<b>Locations</b>	<b>Biogeoscience Arena Silvretta.</b> Lower Engadin Window: Scuol-Tarasp - Fuschna - Nairs – Clozza – (Sinestra) - Rablönch Davos – Klosters – Alvaneu: Weissfluhjoch – Totalp – Gotschna - Silvretta. Wägerhus – Jöri glacial Lake Catchment.
<b>Topics</b>	<b>Geo-Ecology:</b> New landscapes in glacial retreat areas, evolution of mountain lakes, initial colonization, stability. Interactions between geology and hydrochemistry: Soil formation and vegetation development. Sequestration of organic and inorganic nutrients and element cycling in high altitude ecosystems, role of clay erosion particles and colloids, coupled Fe-Mn-P-N-cycling. <b>Geology:</b> Lower Engadin Window with shale, travertine / tufa deposits, Silvretta nappe (gneis), Ela nappe (dolomite, gypsum), Totalp intrusion (serpentine), Gotschna (radiolarite). <b>Biogeochemistry:</b> Erosion, weathering, basin deposition, soil formation. Buildup and fate of organics in soils and sediments in alpine flood plains and river deltas. Carbonate ice formation in CO <sub>2</sub> outgassing zones. Organics and fluid inclusions in periglacial shale deposits. <b>Geobiology:</b> Low temperature geobiochemistry in sulfur and iron dominated mineral springs. Nutrient cycling by microbial ice and snow communities. <b>Applied and economic aspects</b> of Geo-Ecology: Alpine water resources, geomedicine, modern mineral water wellness, geomicrobiological and geobotanical toxins. For details see <a href="https://lms.uzh.ch/url/RepositoryEntry/16318464010?quest=true&amp;lang=en">https://lms.uzh.ch/url/RepositoryEntry/16318464010?quest=true&amp;lang=en</a>
<b>Deliverables</b>	<b>Preparation</b> , Monday, September 2, at ETH in Zürich. <b>Presentation of results</b> on September 7 in Davos. Course ends late afternoon on September 7.
<b>Accommodation</b>	Youthpalace, Davos Dorf, 5 nights.
<b>Meeting Points</b>	Monday, September 2: 08.30 ETH Zürich: Preparation of sampling equipment, then travel to Davos. Saturday, September 7: Return from Davos Dorf 17.06 → Zürich, arr. ca. 19.30.
<b>Costs</b>	CHF 415 (CHF 200 reduction for ETH students). Includes 5 nights, breakfast, dinner, all local bus / mountain train trips with ½ Tax or GA. <b>Not included:</b> back pack lunches, travel to Davos and back, to Wägerhus by Postal Bus and from Davos to Val Sinestra and back by train and Bus. Cancellation fees apply after June 30.
<b>Fitness</b>	Walking on rough mountainous terrain and working in the field for 7-9 hrs / day
<b>Clothing</b>	Good mountain walking boots, layers of clothes for warm as well as for rainy, cold weather.
<b>Insurance</b>	Is the responsibility of each participant, also Alpine Air Rescue (REGA)
<b>Prerequisites</b>	Interest and the ability to delve into a field trip topic.
<b>Preparation</b>	Pre-excursion preparation with field guides online on OLAT. Researching a course topic for presentation at the end of the course, organization of materials for sampling.
<b>Credits</b>	ECTS 2 credits (ETHZ, UZH) others according to institutional practice, includes preparation (15 hours), field work and reporting (50 hrs).
<b>Enrolment</b>	Until June 2 at Secretariat Environmental Geosciences and Biogeochemistry, Bernoullianum Room 201a, K. Liesenfeld, starting Monday, April 9, 2019
<b>&amp; Information</b>	After June 2 and if there are places available, apply by mail to <a href="mailto:jakob.zopfi@unibas.ch">jakob.zopfi@unibas.ch</a> or <a href="mailto:kurt.hanselmann@erdw.ethz.ch">kurt.hanselmann@erdw.ethz.ch</a>
<b>Participants</b>	20 max (waiting list)