



Earth Systems Sciences – High-Altitude Geo-Biology

Microbial Geo-Ecology in „new“ Landscapes and Habitats in High Altitude Environments of the Biogeoscience Arena Silvretta, Eastern Swiss Alps

For University Students and Interested Guests World-wide

Courses are taught in English or German

September 2 – 7 (Monday – Saturday), 2019

Kurt Hanselmann^{1,4}, Tim Eglinton¹, Adrian Gilli¹, Jakob Zopfi², Andreas Kappler³

¹ETHZ Dept. for Earth Sciences, Biogeosciences, ²University of Basel Environmental Sciences, Aquatic & Stable Isotope Biogeochemistry, ³Eberhard-Karls-University Tübingen and ⁴swiss i-research & training

Locations	Biogeoscience Arena Silvretta. Lower Engadin Window: Scuol-Tarasp - Fuschna - Nairs – Clozza – (Sinestra) - Rablönch Davos – Klosters – Alvaneu: Weissfluhjoch – Totalp – Gotschna - Silvretta. Wägerhus – Jöri glacial Lake Catchment.
Topics	Geo-Ecology: New landscapes in glacial retreat areas, evolution of mountain lakes, initial colonization, stability. Interactions between geology and hydrochemistry: Carbon sinks, soil formation and vegetation development. Sequestration of organic and inorganic nutrients and element cycling in high altitude ecosystems, role of glacial abrasion particles and colloids, coupled Fe-Mn-P-N-cycling. Biogeochemistry: Erosion, weathering, basin deposition, buildup and fate of organics in soils and sediments in glacial flood plains and river deltas. Carbonate ice formation in CO ₂ outgassing zones. Organics and fluid inclusions in perinnic shale deposits. Geobiology: Low temperature geobiochemistry in sulfur and iron dominated mineral springs. Nutrient cycling by microbial ice and snow communities. Geology: Lower Engadin Window with shale, travertine / tufa deposits, Silvretta nappe (gneis), Ela nappe (dolomite, gypsum), Totalp intrusion (serpentine), Gotschna (radiolarite). Applied and economic aspects of Geo-Ecology: Alpine water resources, geomedicine, modern mineral water wellness, geomicrobiological and geobotanical toxins. For more details see https://lms.uzh.ch/url/RepositoryEntry/16318464010?quest=true&lang=en
Deliverables	Preparation , Monday, September 2, at ETH in Zürich for students from Swiss Universities. Presentation of results on September 7 in Davos. Course ends late afternoon.
Accommodation	Youthpalace, Davos Dorf, 5 nights.
Meeting Points	Monday, September 2, noon (international students, Youth Palace Davos. End of course: Saturday, September 7, early afternoon. Departure from Davos Dorf 17.06
Costs	CHF 415. Includes 5 nights, breakfast, dinner, all local bus / mountain train trips with ½ Tax or GA. Not included: 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.
Fitness	Walking on rough mountainous terrain and working in the field for 7-9 hrs / day
Clothing	Good mountain walking boots, layers of clothes for warm as well as for rainy, cold weather.
Insurance	Is the responsibility of each participant, also Alpine Air Rescue (REGA)
Prerequisites	Interest and the ability to delve into a field trip topic.
Preparation	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.
Credits	ECTS 2 credits (ETHZ, UZH) others according to institutional practice, includes preparation (15 hours), field work and reporting (50 hrs).
Enrolment	Until June 2 via www.microeco.ethz.ch/geobio/GeoBiology_field_courses_Kurt_Hanselmann_ETHZ.html#contact
& Information	After June 2 inquire for open places via e-mail to kurt.hanselmann@erdw.ethz.ch
Participants	25 max (waiting list)