

Dr. LEHMANN BENJAMIN

Curriculum Vitae

High Mountain Geomorphologist - Quaternary Scientist

Nationality: French

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Birthdate: January 28th, 1988

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EDUCATION

PhD in Earth Sciences

Dec. 2014 - May 2019

Institute of Earth Surface Dynamics (IDYST) - University of Lausanne (UNIL, Switzerland)

Title: Ice-extent variations and post-glacial erosion in the Mont Blanc massif.

Supervisor: Prof. Frédéric Herman

Funding: Swiss National Science Foundation (SNSF)

Defended on May 1st 2019

MSc in Earth and Environmental Sciences

Sept. 2009 - June 2011

Joseph Fourier University, Grenoble (France) - Specialty: Solid Earth

BSc in Earth and Environmental Sciences

Sept. 2006 – June 2009

Joseph Fourier University, Grenoble (France)

High school diploma in Sciences

June 2006

Champollion High School, Grenoble (France) - Specialty: Earth and life sciences

EMPLOYMENT

Early.Postdoc Mobility

Oct. 2020 – May. 2022

Laboratory of Environment Dynamics and Territories of the Mountain (EDYTEM, USMB, Chambéry, France)

Institute of Arctic and Alpine Research (INSTAAR, CU Boulder, Colorado, USA)

Funding: Early.Postdoc Mobility fellowship from the Swiss National Science Foundation (SNSF)

Title “Rock glaciers in alpine environments: Reconstruction of surface velocities and surface erosion rates”

Hosts: Dr. Xavier Bodin (EDYTEM, USMB, Chambéry, France), Prof. Robert S. Anderson (INSTAAR, CU Boulder, USA)

Postdoc position

Feb. 2020 – Apr. 2020

Centre for Advanced Studies in Arid Zones (CEAZA, La Serena, Chile)

Project title “Evaluation of the hydrological role of rock glaciers and their spatial distribution in the high Andean basins in the Coquimbo Region.”

Supervisor: Dr. Shelley MacDonell (CEAZA, La Serena, Chile)

Field glaciology engineer

Sept. 2011 - Dec. 2013

Institute of research for development (IRD, La Paz, Bolivia) - Andes glacier observatory Glacioclim

Position title “Management of the glaciological, meteorological and hydrological monitoring”

Supervisor: Dr. Antoine Rabatel (Institute of Environmental Geosciences, University Grenoble Alpes, France)

Dr. LEHMANN BENJAMIN

Curriculum Vitae

ACTIVITIES IN COMMISSIONS

Organizing committee of the doctoral retreat of IDYST (UNIL) for 2015-2016-2017

Organizing committee of the winter institute retreat (IDYST, UNIL) for 2017

APPROVED RESEARCH PROJECT

Early.Postdoc Mobility of the Swiss National Science Foundation (SNSF) - Number: P2LAP2_191400

Period: Oct. 2020 – May. 2022

Title: “Rock glaciers in alpine environments: Reconstruction of surface velocities and surface erosion rates”

Host institutions: Laboratory of Environment Dynamics and Territories of the Mountain (EDYTEM, USMB, Chambéry, France) and Institute of Arctic and Alpine Research (INSTAAR, CU Boulder, Colorado, USA)

Host researchers: Dr. Xavier Bodin (EDYTEM, USMB, Chambéry, France), Prof. Robert S. Anderson (INSTAAR, CU Boulder, USA)

SUPERVISION OF JUNIOR RESEARCHERS

- ◆ **BSc thesis of Guillaume Poncelet:** “Study of the movements of rock glaciers in the Combeynot massif (Southern Alps, France)” – 2021 (Edytem, USMB, France)
- ◆ **MSc thesis of Dilan Rech:** “OSL based climate change impact assessment on hillslope erosion: A Nunatak case study at Aiguille du Midi” – 2021 (IDYST, UNIL, Switzerland)
- ◆ **BSc thesis of Alexandre Moreau:** “Modélisation du glacier de l'Arve dans le massif du Mont-Blanc durant le stade de Magland” – 2018 (IDYST, UNIL, Switzerland)
- ◆ **Field campaign of Arnaud Duverger:** “Glacial erosion during a glacial cycle: insights from the Franz Josef Glacier/Ka Roimata o Hine Hukatere” 2016 (IDYST, UNIL, Switzerland)
- ◆ **BSc thesis of Mélanie Delasoie:** “Dating glacier retreats from Optically Stimulated Luminescence (OSL)” – 2015 (IDYST, UNIL, Switzerland)

TEACHING

- ⇒ **Introduction to the alpine geology** - BSc 1st year (UNIL, Switzerland)
- ⇒ **Numerical modelling** - BSc 2nd year (UNIL, Switzerland)
- ⇒ **Tectonic erosion climate** - BSc 3rd year (UNIL, Switzerland)

AFFILIATIONS

Member of the European Geosciences Union

Member of the American Geophysical Union

Member of the International Permafrost Association

Reviewing activities for Journal of Quaternary Science Review, Quaternary Geochronology, Geochronology

ORGANIZATION OF CONFERENCES

Member of the organization panel of the Steepest Descent meeting - 2019-2020-2021 (Vienna, AUT)

Member of the organization panel of the luminescence conference - DLED 2018 (Beatenberg, CH)

Member of the organization panel of the IDYST seminars - fall and spring 2015

Dr. LEHMANN BENJAMIN

Curriculum Vitae

AWARDS

◇ **Ann Wintle Prize for Best oral for Applications**

International Luminescence and Electron Spin Resonance Dating conference 2017 - Capetown (South Africa)

◇ **Outstanding Student Poster and PICO (OSPP) Awards**

European Geoscience Union meeting 2016 - Vienna (Austria)

◇ **Student Poster Awards**

United Kingdom Luminescence Meeting 2015 - Glasgow (United Kingdom)

LANGUAGE PROFICIENCY

French: Native speaker

English: Advanced (C2)

Spanish: Advanced (C2)

ANALYTICAL SKILLS

- ✓ **Geochronology:** Surface exposure dating with optically stimulated luminescence (OSL), and terrestrial cosmogenic nuclide dating (^{10}Be)
- ✓ **Remote sensing:** GPS differential mapping, Image acquisition using unmanned aerial vehicles, realization of digital terrain model using LiDAR and terrestrial photogrammetry, realization of digital surface model and orthomosaic using aerial and satellite photogrammetry, image correlation with feature tracking algorithms
- ✓ **Glaciology:** Mass balance measurements and calculations, Installation of automatic camera
- ✓ **Geophysics:** bedrock mapping using ground penetrating radars, realization campaign electrical resistivity and refraction seismic tomography
- ✓ **Hydrology:** Hydrological monitoring of glacial water intakes, gauging and bathymetry, measurements and calculations of hydrological balance
- ✓ **Meteorology:** Establishment and maintenance of automatic weather stations at high altitude sites (Campbell Scientific, Hobos), radiation balance measurements and calculations

FIELD WORK SKILLS

- Experience on logistic, organisation and team management for field excursions in remote area and isolated high mountains (6000 m a.s.l.)
- Organization, management and achievement of numerous glacier mountaineering and snowboard expeditions over 6000 m a.s.l. and several weeks expeditions in autonomy (Amazonian jungle, Chilean Andes, NZ Alps...)
- Implementation and realization of rope sampling work with machinery (circular saw, drill)
- International driving license, 4WP off road driving experience
- Certified First Aids medicine from NOLS Wilderness Medicine WFA sponsored by Mountain Rescue (USA) and Aids medicine in isolated area FormaMed (Switzerland)
- Trained of crevasse, climbing rescues with rope
- Black belt judo (1st Dan) - 20 years of practice
- Drone and picture footages for scientific communication

Dr. LEHMANN BENJAMIN

Curriculum Vitae

Majors scientific achievements

1. Publications In Peer-Reviewed Scientific Journals

Elkadi, J., King, G.E., **Lehmann, B.**, Herman, F.: Reducing variability in OSL rock surface dating profiles, *Quaternary Geochronology*, Volume 64, 101169, ISSN 1871-1014, <https://doi.org/10.1016/j.quageo.2021.101169>, 2021.

Brill, D., May, S. M., Mhammdi, N., King, G., **Lehmann, B.**, Burow, C., Wolf, D., Zander, A., and Brückner, H.: Evaluating optically stimulated luminescence rock surface exposure dating as a novel approach for reconstructing coastal boulder movement on decadal to centennial timescales, *Earth Surf. Dynam.*, 9, 205–234, <https://doi.org/10.5194/esurf-9-205-2021>, 2021.

Biswas, R. H., Herman, F., King, G. E., **Lehmann, B.**, and Singhvi, A. K.: Surface paleothermometry using low-temperature thermoluminescence of feldspar, *Clim. Past*, 16, 2075–2093, <https://doi.org/10.5194/cp-16-2075-2020>, 2020.

Lehmann, B., Herman, F., Valla, P.G., King, G.E., Biswas, R.H., Ivy-Ochs, S., Steinemann, O., Christl, K.: Postglacial erosion of bedrock surfaces and deglaciation timing: New insights from the Mont Blanc massif (western Alps). *Geology*; 48 (2): 139–144. doi: <https://doi.org/10.1130/G46585.1>, 2019.

Lehmann, B., Herman, F., Valla, P. G., King, G. E., and Biswas, R. H.: Evaluating post-glacial bedrock erosion and surface exposure duration by coupling in situ optically stimulated luminescence and ¹⁰Be dating, *Earth Surf. Dynam.*, 7, 633–662, <https://doi.org/10.5194/esurf-7-633-2019>, 2019.

Benoit, L., Gourdon, A., Vallat, R., Irrazaval, I., Gravey, M., **Lehmann, B.**, Prasicek, G., Gräff, D., Herman, F., and Mariethoz, G.: A high-resolution image time series of the Gorner Glacier – Swiss Alps – derived from repeated unmanned aerial vehicle surveys, *Earth Syst. Sci. Data*, 11, 579–588, <https://doi.org/10.5194/essd-11-579-2019>, 2019.

Lehmann B., Valla, P.G., King, G.E., Herman, F.: Investigation of OSL surface exposure dating to reconstruct post-LIA glacier fluctuations in the French Alps (Mer de Glace, Mont Blanc massif), *Quaternary Geochronology* 44, 63–74, <https://doi.org/10.1016/j.quageo.2017.12.002>, 2018

2. Peer-Reviewed Books/Monograph

Lehmann, B.: Ice-Extent Variations And Post-Glacial Erosion In The Mont Blanc Massif, Université de Lausanne, Faculté des géosciences et de l'environnement, Herman Frédéric (dir.). Thèse. https://serval.unil.ch/resource/serval:BIB_2077596C0B8A.P001/REF. 2019

King, G.E., Valla, P.G. and **Lehmann, B.**: Rock Surface and Rock Surface-Exposure Dating. Invited contribution to “Handbook of Luminescence Dating”, Eds: M. Bateman and I. Bailiff, 2019. Whittles Publishing, Dunbeath, Caithness KW6 6EG, Scotland, UK. Hardback, 416 pages, ISBN 978-184995-395-5.

Dr. LEHMANN BENJAMIN

Curriculum Vitae

3. Submitted but not yet accepted/published publications

Biswas, R., Višnjević, V., Magnin F., **Lehmann, B.**, King, G.E., Herman, F.: Last Glacial Maximum temperature in the Alps quantified using luminescence paleothermometry. (in review)

Yáñez, E., Schaffer, N., **Lehmann, B.**, MacDonell, S.: Factors influencing active rock glacier distribution in the semiarid Andes of Chile. Permafrost and Periglacial Processes. (in review)

Joanne Elkadi J., **Lehmann B.**, King G., Steinemann O., Ivy-Ochs S., Christl M. and Herman F., Quantification of post-glacier erosion in the European Alps using ^{10}Be and OSL exposure dating. (in review).

Lehmann, B., Anderson, R. S., Bodin, X., Cusicanqui, D., Valla, P. G., & Carcaillet, J. (2022). Alpine rock glacier activity over Holocene to modern timescales (western French Alps). *Earth Surface Dynamics Discussions*, 1-40.