

Dr. Markus ECKERSTORFER

snow avalanches, slope processes, forecasting, SAR remote sensing, geophysical data collection, arctic field work, student supervision, course design & implementation, science outreach

PERSONAL INFORMATION

Family name, First name: Eckerstorfer, Markus

Date of birth: 08.01.1982

Sex: Male

Nationality: Austria

Marital status: Married, one son

Researcher unique identifier: orcid.org/0000-0002-4997-9593

Professional web site: https://www.researchgate.net/profile/Markus_Eckerstorfer

Social media: @eck_markus

EDUCATION

- 2013 **PhD in Physical Geography:** Date and year of approved disputation: 16.01.2013
Faculty of Mathematics and Natural Sciences, University of Oslo, Norway / Arctic Geology Department, UNIS, Svalbard, Norway
Thesis: *Snow avalanches in central Svalbard: A field study of meteorological and topographical triggering factors and geomorphological significance (cited by 6)*
- 2007 **MSc in Cartography & Geoinformation** (high distinction):
Faculty of Earth Sciences, Geography and Astronomy, Department of Geography and Regional Research, University of Vienna, Austria
Thesis: *Cartographic analysis of avalanche hazard maps (cited by 2)*
- 2005 **BSc in Geography & Regional Research:**
Faculty of Earth Sciences, Geography and Astronomy, Department of Geography and Regional Research, University of Vienna, Austria

CURRENT AND PREVIOUS POSITIONS

- 2013 - now Current Position: **Research Scientist (100 %)**
Earth Observation, Norut (Northern Research Institute) Tromsø, Norway
- 2017 - 2018 **Adjunct Associate Professor (10%),** Arctic Safety Centre, UNIS, Norway
- 2016 3 months parental leave
- 2015 - 2016 **Adjunct Associate Professor (20 %),** Arctic Geology Department, UNIS, Norway
- 2009 - 2013 **PhD candidate:** UiO, UNIS
- 2008 - 2009 **Scientific Technician:** Cryoslope Research project 'Monitoring, dating and modelling climate change effects on high arctic mountain slope processes and their impact on traffic', UNIS
- 2007 - 2008 **Intern:** Tyrolean Avalanche Warning Service, Tyrol, Austria

PROFESSIONAL MEMBERSHIPS

- 2017 - now Professional Member of the Norwegian Avalanche Association, Norway
- 2012 - now Professional Member of the American Avalanche Association, USA

MOBILITY

- 2012 3 months at the Department of Earth Sciences, Montana State University, Montana, USA:
Leif Erikson Personal overseas research grant – IS-BILAT 216892, (5000 EUR)

RESEARCH & PRACTICAL EXPERIENCE

- 2017 - now Snow avalanche activity monitoring for the Norwegian Avalanche Centre, Norway
- 2008 - now Field-based research experience from Svalbard (over 450 field days), Northern Norway, New Hampshire, Montana & Alaska, USA, Yukon T. Canada
- 2010 Snow avalanche hazard consulting, mining entrance Lunckefjell for Store Norske
- 2010 Snow avalanche forecasting for K-SAT, Svalbard

SUPERVISION OF GRADUATE STUDENTS

- 2017 - 2021 Co-supervision of 2 PhD-students: Earth Observation, Norut & UNIS, Norway (Line Rouyet, Holt Hancock)
- 2017-2018 Supervision of BSc-students: Norut & Department of Engineering and Safety, UiT (Frida Berg, Solrun Skeibu)
- 2016 – 2018 Supervision of 2 MSc-students: Earth Observation, Norut, Norway (Paul Velsand, Marius Jenssen)
- 2013 – 2015 Co-supervision of 2 MSc-students: Earth Observation, Norut, Norway (Erlend Vognhild, Dieuwertje Wesselink)
- 2009 – 2013 Co-supervision of 4 MSc-students: Arctic Geology Department, UNIS, Svalbard, Norway (Matilda Hallerstig, Stephan Vogel, Matthias Siewert, Wesley Farnsworth)

TEACHING ACTIVITIES

- 2017 – 2018 Course responsible (development of curriculum) for AG-301 Risk assessment of Arctic Natural Hazards, UNIS (Arctic Safety Centre), Svalbard, Norway (10 ECTS)
- 2015 Course responsible (development of curriculum, teaching, field work, grading) for AG-346 Snow and avalanche dynamics, UNIS, Svalbard, Norway (10 ECTS)
- 2009 - 2017 Lectures and field work in snow physics and –mechanics, avalanche dynamics for AG-330, AG-346, and AG-204, UNIS, Svalbard, Norway
- 2009 - 2012 Lectures and field demonstration in avalanche safety and awareness for A-101, UNIS, Svalbard, Norway
- 2009 - 2010 Lectures and field work in avalanche sedimentation for IPY/APECS Polar Field School, Svalbard, Norway

ORGANISATION OF SCIENTIFIC MEETINGS

- 2013 Main organizer of the ‘Snow avalanches in central Svalbard’ workshop, held at UNIS, Svalbard, funded by NSF Svalbard Science Forum Workshop Grant (30,000 EUR).

CERTIFICATIONS

- 2017 RO2 + RO3 Remotely Piloted Aircraft System license
- 2012 Avalanche processes & leadership course, Level II, American Avalanche Association
- 2009 Pedagogical basic competence, University of Tromsø, Norway

MAJOR COLLABORATORS

Professor Dr. Hanne H. Christiansen, periglacial slope processes, Arctic Geology Department, UNIS, Svalbard, Norway
 Associate Professor Dr. Jordy Hendrikx, snow avalanche science, Department of Earth Sciences, Montana State University, USA
 Dr. Rune Engeset, snow avalanche forecasting, NVE, Norway

INVITED PRESENTATIONS

- 2017 Presentation at the CARE seminar series in Tromsø, Norway: ‘Avalanche accident in Longyearbyen, Svalbard, 19.12.15. *(In Norwegian)*
- 2017 Presentation for TEKNA UNG in Tromsø, Norway: ‘Avalanche detection from space’ *(In Norwegian)*
- 2015 Presentation at the ‘Saturday University’ series by the University of Tromsø, Norway: ‘Are avalanches visible from space?’ *(In Norwegian)*
- 2014 Solicited presentation at AGU Fall Meeting 2014: ‘Avalanche debris detection using satellite- and drone based radar and optical remote sensing’
- 2011 Lecture at Bates College, USA: ‘The geomorphological work of snow avalanches’
- 2010 Field excursion leader at EUCOP III in Svalbard: ‘Snow avalanches in Svalbard’

AWARDED GRANTS

- 2018 ESA Open call project, ESA, 150k EUR (PI)
- 2017 PRODEX project, ESA & Norwegian Space Centre, 300K EUR (PI)
- 2017 SatSkred 2.0 project, Norwegian Space Centre, 150K EUR (PI)
- 2017 SatSkred 1.0 project, Norwegian Space Centre, 150K EUR (PI)
- 2016 Følgemidler prosjekt, Norwegian Space Centre, 40K EUR (PI)
- 2015 ESA SEOM Living Planet Fellowship, European Space Agency, 35K EUR (PI)
- 2012 Regionalforskningsfond, Norwegian Science Foundation, 300K EUR (PI)

TRACK RECORD

Google Scholar: 276 citations (incl. self-citations), h-index: 10

ResearchGate: 238 citations (excl. self-citations), 7.8K unique reads of 67 publications

Relevant publications in peer-reviewed journals

Jenssen, R.O., **Eckerstorfer, M.**, Jakobsen, S.: Drone-mounted UWB radar for airborne snowpack measurements. *IEEE Aerospace and Electronic Systems*. to be submitted.

Abermann, J., Eckerstorfer, M., Malnes, E., Hansen, B.U.: The largest snow avalanche event recorded in history – magnitude, triggers and impact. *Scientific reports*, submitted.

Eckerstorfer, M., Eriksen, H.Ø., Rouyet, L., Christiansen, H.H., Lauknes, T.R., Blikra, L.H.: Comparison of geomorphological field- and 2D InSAR mapping of the periglacial landscape at Nordnesfjellet, Northern Norway. *Earth Surface Processes and Landforms*. doi: 10.1002/esp.4380. 2018.

Eckerstorfer, M., Malnes, E., Müller, K.: A complete snow avalanche activity record from a Norwegian forecasting region using Sentinel-1 satellite-radar data. *Cold. Reg. Sci. Technol.* 144, 39-51, 2017. **Cited by 1.**

Eckerstorfer, M., Malnes, E., Christiansen, H.H.: Freeze/thaw conditions at periglacial landforms in Kapp Linne, Svalbard, investigated using field observations, in situ, and radar satellite monitoring. *Geomorphology*. 2017. 433-447. **Cited by 2.**

Wesselink, D., Malnes, E., **Eckerstorfer, M.**, Lindenbergh, R.C.: Automatic detection of snow avalanche debris in central Svalbard using C-band SAR data. *Polar Research*, 36. 1333236. 2017.

Vickers, H., **Eckerstorfer, M.**, Malnes, E., Larsen, Y., Hindberg, H.: A method for automated snow avalanche debris detection through use of synthetic aperture radar (SAR) imaging. *Earth and Space Science*. 3, doi:10.1002/2016EA000168. 2016. **Cited by 1.**

Eckerstorfer, M., Bühler, Y., Frauenfelder, R., Malnes, E.: Remote sensing of snow avalanches: recent advances, potential, and limitations. *Cold. Reg. Sci. Technol.* 121, 126-140, 2016. **Cited by 14.**

Eckerstorfer, M. and Malnes, E.: Manual detection of snow avalanche debris using high-resolution Radarsat-2 SAR images, *Cold. Reg. Sci. Technol.*, 120, 205-218, 2015. **Cited by 2.**

Eckerstorfer, M., Malnes, E., Solbø, S.A.: Using “structure-from-motion” photogrammetry in mapping snow avalanche debris. In: K. Kriz (Editor), *Wiener Schriften zur Geographie und Kartographie*. University of Vienna, Vienna, pp. 171-187, 2015.

Eckerstorfer, M., Farnsworth, W. R., and Birkeland, K. W.: Potential dry slab avalanche trigger zones on wind-affected slopes in central Svalbard *Cold. Reg. Sci. Technol.*, 99, 66-77, 2014. **Cited by 3.**

Eckerstorfer, M., Christiansen, H. H., Vogel, S., and Rubensdotter, L.: Snow cornice dynamics as a control on plateau edge erosion in central Svalbard *Earth Surf. Process. Landf.*, 38, 466-476, 2013. **Cited by 10.**

Christiansen, H. H., Humlum, O., and **Eckerstorfer, M.**: Central Svalbard 2000-2011 meteorological dynamics and periglacial landscape response, *Arctic Antarctic and Alpine Research*, 45, 6-18, 2013. **Cited by 18.**

Eckerstorfer, M., Christiansen, H. H., Rubensdotter, L., and Vogel, S.: The geomorphological effect of cornice fall avalanches in the Longyeardalen valley, Svalbard, *The Cryosphere*, 7, 1361-1374, 2013. **Cited by 4.**

Vogel, S., **Eckerstorfer, M.**, and Christiansen, H. H.: Cornice dynamics and meteorological control at Gruvefjellet, Central Svalbard, *The Cryosphere*, 6, 157-171, 2012. **Cited by 9.**

Siewert, M.B., Krautblatter, M., Christiansen, H.H., **Eckerstorfer, M.**: Arctic rockwall retreat rates estimated using laboratory-calibrated ERT measurements of talus cones in Longyeardalen, Svalbard. *Earth Surface Processes and Landforms*. 37/14, 1542-1555. 2012. **Cited by 22.**

Eckerstorfer, M. and Christiansen, H. H.: Meteorology, topography and snowpack conditions causing two extreme mid-winter slush and wet slab avalanche periods in High Arctic Maritime Svalbard, *Permafrost and Periglacial Processes*, 23, 15-25, 2012. **Cited by 11.**

Eckerstorfer, M. and Christiansen, H. H.: *The "High Arctic Maritime Snow Climate" in Central Svalbard, Arc., Antarc. Alp. Res., 43, 11-21, 2011. Cited by 9.*

Eckerstorfer, M. and Christiansen, H. H.: *Relating meteorological variables to the natural slab avalanche regime in High Arctic Svalbard. Cold. Reg. Sci. Technol., 69, 184-193, 2011. Cited by 8.*

Eckerstorfer, M. and Christiansen, H. H.: *Topographical and meteorological control on snow avalanching in the Longyearbyen area, central Svalbard 2006-2009, Geomorphology, 134, 186-196, 2011. Cited by 20.*

+ 22 conference proceedings papers & presentations (selection):

Hancock, H., Prokop, A., Eckerstorfer, M., Hendrikx, J.: *Synoptic atmospheric circulation patterns controlling avalanche activity in central Svalbard. EGU General Assembly Conference Abstracts. 19, 8757. 2017.*

Jenssen, R.O.R., Eckerstorfer, M., Vickers, H., Høgda, K-A., Malnes, E., Jacobsen, S.K.: *Drone-based UWB radar to measure snow layering in avalanche starting zones. Proceedings of the International Snow Science Workshop, 573-577, 2016. Cited by 1.*

Eckerstorfer, M., Vikhamar-Schuler, D., Malnes, E., and Antonsen, Y.: *Evaluating the local avalanche danger in Tromsø, Northern Norway using field monitoring, field investigations and the Surfex/Isba-Crocus snowpack model, Proceedings of the International Snow Science Workshop, 425-431, 2014.*

Eckerstorfer, M., Christiansen, H. H., Lauknes, T. R., Eriksen, H. Ø., Rouyet, L., and Blikra, L. H.: *Periglacial landscape scale InSAR analysis of individual landform deformation patterns in Svalbard and Northern Norway, 4th European Conference on Permafrost, 2014.*

Eckerstorfer, M., Christiansen, H. H., Smith, F., Eriksen, H. Ø., and Lauknes, T. R.: *New field instrumentation for real-time monitoring of solifluction in Northern Norway, 4th European Conference on Permafrost, 2014.*

Eckerstorfer, M., Eriksen, H. Ø., Lauknes, I., Corner, G. D., and Larsen, Y.: *Rock glacier displacement patterns measured using ascending and descending TerraSAR-X InSAR data, ESA DUE Permafrost Workshop, Frascati, Italy, 2014.*

Lauknes, T.R., Christiansen, H., Eckerstorfer, M., Larsen, Y.: *InSAR detection of permafrost landform dynamics at Kapp Linne, central Svalbard. EGU General Assembly Conference Abstracts, 15. 2013.*

Malnes, E., Eckerstorfer, M., Larsen, Y., Frauenfelder, R., Jonsson, A.: *Remote sensing of avalanches in northern Norway using Synthetic Aperture Radar. Proceedings of the International Snow Science Workshop, 955-959. 2013: Cited by 3.*

Eckerstorfer, M., Neumann, U., Christiansen, H.H.: *High arctic avalanche monitoring in maritime Svalbard. Proceedings of the International Snow Science Workshop, 784-790. 2008. Cited by 5.*