

Title: Makalu Climate Climb 2018: exploring earth from Land and Space

Location: Giardino Agora

Date and time: Wednesday 15 May 1700-1900

Session Convenor(s) Paul Fisher & Pascal Lecomte

Invited Speakers

Carina Ahlqvist, explorer and expedition lead

Carina is one of the most experienced female 8000 m mountain climbers in Sweden. She climbed her first mountain, Mount Kenya Point Lenana 5985 meters, at just 20 years of age. She has been to five 8000 meters mountain expeditions in the Himalayas and recently made a summit attempt on Mount Makalu during the Spring of 2018.

Carina collaborates with the Space Agencies, including the European Space Agency (ESA) and universities across Europe and the US, integrating on-the-ground research in climate change as part of her expedition.

Website: <http://www.adventurebycarina.com>

Deliang Chen (U. Gothenburg)

Deliang is Professor at the Department of Earth Sciences of the University of Gothenburg and an elected member of the Royal Swedish Academy of Sciences (RSAS). He is an internationally renowned climate researcher and a lead author and coordinating lead author in Working Group I of the IPCC's fifth and sixth assessment reports.

At the University of Gothenburg he founded and directs the Regional Climate Group. The group studies regional climate variability including recent (around 1000 years back) and future (present-100 years) climate changes in Scandinavia and Asia using instrumental and proxy data, as well as advanced statistical techniques and numerical climate models. He has been instrumental in the international research program – The Third Pole Environment – which focuses on climate and environment changes, and their impact on water resources, ecosystems, and disaster/risk over the Tibetan Plateau and its surroundings.

Website: <http://rcg.gvc.gu.se/dc>

Laura Büchler (U.Zurich), Glaciologist

Laura Büchler is an undergraduate Master student in physical Geography at University of Zurich, Switzerland. Her scientific interests are mainly focusing on Geomorphology, Glaciology, Geochronology and Soil Science. Laura's current project determines the age of the outer lateral moraines of the Barun Glacier in Nepal with cosmogenic radionuclide surface exposure dating (10Be-method). Additionally, she reconstructs past glacial extents of Barun Glacier in order to gain more knowledge about the timing and extent of past glaciations. Laura is a passionate climber and likes to be outdoors in places where nature is still undisturbed.

Romy Schlögel, ESA research fellow focused on Earth Observations to monitor climate change effect on mountainous hazards

Abstract: Investigating climate and meteorological hazards in Barun valley, Nepal

Numerous researches focus on the monitoring of mountainous hazards by applying remote sensing techniques. However, the potential of Earth Observations (EO) has been barely exploited to investigate the influence of climate perturbation on potentially dangerous natural phenomena.

The objectives of this research are to collect long time series of EO data related to climate perturbation and natural hazards occurring in the Barun valley (Southern Makalu region, Nepal) to explore potential relations between meteorological conditions and hazard occurrence. In this data-poor context region, in-situ and satellite-based climate data will be exploited to enable a distinction between meteorological anomalies and “normal” seasonal variations in the Himalaya. Thus, this research will take full advantage of satellite missions that enable a monitoring of climatic variables and associated indexes (e.g. standard precipitation index) over time. Spatiotemporal behaviour of mountainous hazards inducing Earth surface deformation will be detected using Sentinel-1 images that are available since the launch of the Copernicus missions. In particular, Synthetic Aperture Radar techniques as provides by the ESA Geohazards Exploitation Platform (GEP) will enable a recognition and monitoring of recent natural hazard hotspots. Landsat imagery will be also use to detect changes related to natural hazards that occurred in the past. The establishment of statistical relations between potential triggering factors, such as rainfall, and the detected natural hazards will contribute to the understanding of mountainous hazard activity in changing climate context for an improved hazard assessment.

Website: www.researchgate.net/profile/Romy_Schloegel

Pierre Lecomte, expedition photographer

Pierre Lecomte is a keen landscape photographer. He enjoys the outdoors and loves capturing the beauty of unspoiled nature. He was the official photographer chronicling the Makalu Climate Climb 2018.

Website: pierrelecomtephotography.com

Agenda Points

- A review of the 2018 Mount Makalu Climb | **Carina Ahlqvist**
- Climate change impacts in the Third Pole | **Deliang Chen** (U. Gothenburg)
- A field study of the Barun glacier | **Laura Büchler**
- Investigating climate and meteorological hazards in the Barun valley | **Romy Schlögel**
- Vertical Landscapes of the Makalu Climate Climb – a Photo exposition | **Pierre Lecomte**

Session scope/description

The session focusses reviews research undertaken during the Makalu Climate Climb 2018, a ground-based expedition to the Himalayas, and supported by the ESA Climate Office.

Swedish expedition lead, Carina Ahlqvist will introduce the expedition, and her attempt to reach the 8,481m Makalu summit. This will be followed by keynote review of climate

impacts on the Third Pole by IPCC author, Prof. Deliang Chen (U. Gothenburg) and presentations on-the-ground research in support of the ESA Climate Change Initiative (cci.esa.int) to:

- validate Sentinel-1 satellite data used to investigate natural hazards in mountainous areas (Romy Schlögel, ESA)
- survey the historical extent of the Barun glacier, nearby to Mount Makalu. (Larua Büchler, U. Zurich)

To conclude, Pierre Lecomte will provide a visual retrospective based on his role as the expedition's photographer.