

Application

The Winter School invites international and national PhD students interested in challenges of modelling methods to answer current questions of high mountain research. Experience in R is required at beginner to intermediate level. More experienced PhD students are also warmly welcomed.

We are looking forward to lively exchanges of knowledge about the challenges of exploring high mountain areas, as well as international networking of junior scientists with a climatological and ecological background.

Modelling Challenges for Mountain Ecosystems

MCME²⁰₁₉

International Winter School

March 25. – 29. 2019

Icebreaker am 24.03.

6 credit points

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Registration fees*		Registration deadline	
Early bird	40€	Early bird	31.12.2018
Regular	60€	Regular	31.01.2019

* Fees includes the icebreaker and beverages during workshop.

Not included in the workshop: travel cost, accomodation and any other personal expenses.

Registration

Please register here:

<https://goo.gl/forms/h4mGNaVHXGqOpv7G3>

Applicants should upload a short motivation letter (max. 200 words) in the registration process.



IGU commission on
Biogeography and Biodiversity





Modelling challenges

Based on heterogeneous and often topographically complex terrain, high altitude ecosystems are characterised by distinct vertical climatic gradients and respective altitudinal vegetation zonation. Compared to other high mountains of the world, such as the Alps or the Rocky Mountains, the Himalayas are often underrepresented in scientific modelling literature.

Modelling studies in remote mountainous regions such as the Himalayas face numerous challenges:

- limited data availability due to difficult accessibility of the terrain
- poor data basis with unknown magnitude of uncertainties
- limited number of reference studies for comparison

Programme

With short, introductory lectures and current research-orientated hands-on sections, the Winter School will cover the essential methods for modelling climate and ecological data.

We will create all models with freely available remote sensing data (MODIS) and climate data (Chelsa), using the open-source software R.

We will address potential model pitfalls, discuss solutions and provide example data from the Himalayas.

Besides the provided example data, all participants are encouraged to prepare and work with their own data.

During the Winter School, data and problems brought in by participants will be discussed and analysed.

Pt. 1: Modelling climate data

Based on the generated time series, spatiotemporal statistical climate modelling will be presented. The aim is to analyse and predict surface parameters such as land surface temperature and snow cover in the Himalayas. Special focus is on automatization of data preparation and processing as well as machine learning algorithms.

Pt. 2: Ecological niche models

The modelled results of Pt. 1 will be used as predictor variables to model the ecological niche of a treeline species: the Himalayan birch (*Betula utilis*). Additionally we will use different climate predictor variable sets (Chelsa and Worldclim) to model the distribution under current climatic conditions. Special focus is on model comparison, evaluation and prediction.