KARTHAUS-2013 / GLACIERS AND ICE SHEETS IN THE CLIMATE SYSTEM
Programme

Exercises and computer projects

The 36 participants are divided into 12 teams. In the first part of the afternoon, 6 teams do exercises, supervised by the teacher indicated in the programme. Meanwhile, the other 6 teams work on computer projects. In the second half of the afternoon the teams switch. A particular team of 3 students works on the same project during the entire course, guided by a teacher. At the end of the course there will be 15-minute presentations on the outcome of the projects.

Tuesday 10

Afternoon	Arrival / check-in
19:30	DINNER

Wednesday 11

09:00 – 09:30	Welcome / practical announcements *(Oerlemans)*
09:30 – 10:20	Continuum mechanics-I *(Gudmundsson)*
10:20 – 10:40	coffee break
10:40 – 11:30	Continuum mechanics-II *(Gudmundsson)*
11:40 – 12:40	5-min presentations by students
13:00	LUNCH
14:00 – 16:00	Exercises for all groups *(Gudmundsson)*
16:00 – 16:30	coffee break
16:30 – 17:30	5-min presentations by students
19:30	DINNER

Thursday 12

08:30 - 09:20	Commonly used approximations in ice flow modelling *(Gudmundsson)*
09:30 - 10:20	Ice as a material, rheology *(Karlsson)*
10:20 - 10:40	coffee break
10:40 - 11:30	Thermodynamics of ice sheets *(Ng)*
11:40 - 12:30	Polar meteorology *(Van de Berg)*
13:00	LUNCH
14:00 – 16:00	Exercises for all groups *(Karlsson)*
16:00 - 16:30	coffee break
16:30 – 17:30	5-min presentations by students
19:30	DINNER

Friday 13

08:30 - 09:20	Introduction to glacial geomorphology *(Stroeven)*
09:30 - 10:20	Numerical modeling of ice sheets and ice shelves I *(Pattyn)*
10:20 - 10:40	coffee break
10:40 - 11:30	Sliding *(Ng)*
11:40 - 12:30	Geodynamics - basics *(Lambeck)*
12:45	LUNCH
14:00 - 15:30	Group II: exercises *(Ng)* / Group I: computer projects
15:30 - 16:00	coffee break
16:00 - 17:30	Group I: exercises *(Ng)* / Group II: computer projects
19:30	DINNER

Saturday 14

08:30 - 09:20	Numerical modeling of ice sheets and ice shelves II *(Pattyn)*
09:30 - 10:20	Numerical modeling of ice sheets and ice shelves III *(Pattyn)*
12:45	LUNCH
16:00 – 16:50	Interaction between ice sheets and the solid earth *(Lambeck)*
17:00 – 17:50	What can we learn from glacier rebound ? *(Lambeck)*
18:00 – 18:40	History of glaciological research at Hintereisferner; Information about the excursion I *(Kuhn)*
	Information about the exursion II *(De Boer)*
19:30	DINNER

Sunday 15

Excursion to the glaciers of the Oetztal Alps *(Grüner, Kuhn)*

Monday 16

08:30 - 09:20	Interaction of ice shelves with the ocean-I *(Jenkins)*
09:30 - 10:20	Interaction of ice shelves with the ocean-II *(Jenkins)*
10:20 - 10:40	coffee break
10:40 - 11:30	Glacier hydrology *(Ng)*
11:40 - 12:30	Geomorphology and mapping of paleo-ice sheets *(Stroeven)*
12:45	LUNCH
14:00 - 15:30	Group I: exercises *(Jenkins)* / Group II: computer projects
15:30 - 16:00	coffee break
16:00 - 17:30	Group II: exercises *(Jenkins)* / Group I: computer projects
19:30	DINNER

Tuesday 17

08:30 - 09:20	Interaction of ice shelves with the ocean-III *(Jenkins)*
09:30 - 10:20	Remote sensing of the cryosphere I *(Kääb)*
10:20 - 10:40	coffee break
10:40 - 11:30	Remote sensing of the cryosphere II *(Kääb)*
11:40 - 12:30	Geophysical methods in glaciology I *(Eisen)*
12:45	LUNCH
14:00 - 15:30	Group II: exercises *(Eisen)* / Group I: computer projects
15:30 - 16:00	coffee break
16:00 - 17:30	Group I: exercises *(Eisen)* / Group II: computer projects
19:30	DINNER
21:30	*Evening lecture:* **Extra-terrestrial ice** *(Karlsson)*

Wednesday 18

08:30 – 09:20	Basal processes and geomorphology *(Ng)*
09:30 – 10:20	Tidewater glaciers I *(Nick)*
10:20 – 10:40	coffee break
10:40 – 11:30	Tidewater glaciers II *(Nick)*
11:40 – 12:30	Analytical ice-sheet models *(Oerlemans)*
12:45	LUNCH
14:00 – 14:50	Ice cores I *(Blunier))*
15:00 – 15:50	Ice cores II *(Blunier)*
19:30	DINNER

Thursday 19

08:30 - 09:20	The microclimate of glaciers *(Oerlemans)*
09:30 - 10:20	The response of glaciers to climate change *(Oerlemans)*
10:20 - 10:40	coffee break
10:40 - 11:30	Ice cores III *(Blunier)*
11:40 - 12:30	Geophysical methods in glaciology II *(Eisen)*
12:45	LUNCH
14:00 - 15:30	Group I: exercises *(Blunier)* / Group II: computer projects
15:30 - 16:00	coffee break
16:00 - 17:30	Group II: exercises *(Blunier)* / Group I: computer projects
19:30	DINNER

Friday 20

08:30 - 09:20	Inverse modelling *(Gudmundsson)*
09:30 - 10:20	The mass budget of the Greenland and Antarctic ice sheets *(Van de Berg)*
10:20 - 10:40	coffee break
10:40 - 11:30	Ice sheet modelling through the Cenozoic *(De Boer)*
11:40 - 12:30	Cryospheric inferences on paleoclimate sensitivity and feedbacks *(De Boer)*
12:45	LUNCH
14:00 - 15:30	Presentation of computer projects (6x)
15:30 - 16:00	coffee break
16:00 - 17:30	Presentation of computer projects (6x)
17:30 - 18:00	Discussion
19:30	DINNER

Saturday 21 — **Departure**

Computer projects

The organizing committee will make a proposal about the distribution of students over the projects. The list will be posted on the first day of the course. Some (limited) changes can then be made before the projects start on friday.
A number of Mac's will be available in a local network. Participants may also bring their own laptops. We will have a wireless net to have ties with the outside world. Practice has shown that these ties are not very fast.

GROUP I:

Project 1:   Ice shelf – ocean interaction I *(Jenkins)*

Project 2:   Glacial geomorphology *(Stroeven)*

Project 3:   Modelling a tidewater glacier *(Nick)*

Project 4:   Inverse modelling *(Gudmundsson)*

Project 5:   Ice-core dating *(Karlsson)*

Project 6:   Glaciers on Mars *(Karlsson)*

GROUP II:

Project 7:   Ice-sheet modelling I *(Pattyn)*

Project 8:   Ice-sheet modelling II *(Pattyn)*

Project 9:   Discriminating wet versus dry beds from geophysics *(Eisen)*

Project 10:   Polar meteorology I *(Van de Berg)*

Project 11:   Polar meteorology II *(Van de Berg)*

Project 12:   Paleo ice sheets *(De Boer)*