KARTHAUS-2014 / 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 9

Afternoon	**Arrival / check-in**
19:30	DINNER

Wednesday 10

08:30 - 08:50	Welcome / practical announcements *(Reijmer)*
08:50 - 09:30	Continuum mechanics-I *(Gudmundsson)*
09:40 - 10:30	Continuum mechanics-II *(Gudmundsson)*
10:40 - 11:00	coffee break
11:00 - 11:50	Polar meteorology *(Reijmer)*
12:00 - 12:50	Thermodynamics of ice sheets *(Karlsson)*
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 11

08:30 - 09:20	Commonly used approximations in ice flow modelling *(Gudmundsson)*
09:30 - 10:20	Rheology of ice *(Dahl-Jensen)*
10:20 - 10:40	coffee break
10:40 - 11:30	Dating of ice *(Dahl-Jensen)*
11:40 - 12:30	Interaction of ice shelves with the ocean-I *(Jenkins)*
13:00	LUNCH
14:00 16:00	Exercises for all groups *(Dahl-Jensen)*
16:00 - 16:30	coffee break
16:30 17:30	5-min presentations by students
19:30	DINNER
21:15 - 22:15	5-min presentations by students

Friday 12

08:30 - 09:20	Numerical modeling of ice sheets and ice shelves I *(Bueler)*
09:30 - 10:20	Numerical modeling of ice sheets and ice shelves II *(Bueler)*
10:20 - 10:40	coffee break
10:40 - 11:30	Sliding *(Hewitt)*
11:40 - 12:30	Glacier hydrology *(Hewitt)*
12:45	LUNCH
14:00 - 15:30	Group II: exercises *(Hewitt)* / Group I: computer projects
15:30 - 16:00	coffee break
16:00 - 17:30	Group I: exercises *(Hewitt)* / Group II: computer projects
19:30	DINNER

Saturday 13

08:30 - 09:20	Numerical modeling of ice sheets and ice shelves III *(Bueler)*
09:30 - 10:20	Ground-penetrating radar (GPR) methods in glaciology *(Navarro)*
10:20 - 10:40	coffee break
10:40 - 11:30	Investigating the hydrothermal structure of glaciers with GPR *(Navarro)*
11:40 - 12:30	Glacier surface and near-surface processes *(Van Pelt)*
12:45	LUNCH
14:00 - 15:30	Group I: exercises *(Bueler)* / Group II: computer projects
15:30 - 16:00	coffee break
16:00 - 17:30	Group II: exercises *(Bueler)* / Group I: computer projects
19:30	DINNER

Sunday 14

08:30 - 09:20	Remote sensing of the cryosphere I *(Howat)*
09:30 - 10:20	Remote sensing of the cryosphere II *(Howat)*
10:20 - 10:40	coffee break
10:40 - 11:30	Introduction to glacial geomorphoplogy *(Stroeven)*
11:40 - 12:30	Basal processes and geomorphology *(Hewitt)*
12:45	LUNCH
	free afternoon
19:30	DINNER
21:15	***Evening lecture:* Evolution of the Greenland ice sheet** *(Dahl-Jensen)*

Monday 15

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

Tuesday 16

	Excursion to the glaciers of the Oetztal Alps *(Grüner)*
19:30	DINNER

Wednesday 17

08:30 – 09:20	Interaction of ice shelves with the ocean-III *(Jenkins)*
09:30 – 10:20	Ice cores I *(Blunier)*
10:20 – 10:40	coffee break
10:40 – 11:30	Ice cores II *(Blunier)*
11:40 – 12:30	Analytical ice-sheet models *(Oerlemans)*
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

Thursday 18

08:30 - 09:20	Interaction between ice sheets and the solid earth *(Whitehouse)*
09:30 - 10:20	What can we learn from glacier rebound ? *(Whitehouse)*
10:20 - 10:40	coffee break
10:40 - 11:30	The response of glaciers to climate change *(Oerlemans)*
11:40 - 12:30	The mass budget of the Greenland and Antarctic ice sheets *(Reijmer)*
12:45	LUNCH
14:00 - 15:30	Group II: exercises *(Whitehouse)* / Group II: computer projects
15:30 - 16:00	coffee break
16:00 - 17:30	Group I: exercises *(Whitehouse)* / Group I: computer projects
19:30	DINNER

Friday 19

08:30 - 09:20	Inverse modelling *(Gudmundsson)*
09:30 - 10:20	Extra-terrestrial ice *(Karlsson)*
10:20 - 10:40	coffee break
10:40 - 11:30	Ice sheet modelling through the Cenozoic *(Van de Wal)*
11:40 - 12:30	Cryospheric inferences on paleoclimate sensitivity and feedbacks *(Van de Wal)*
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 20

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:	Firn modelling	*(Van Pelt)*
Project 2:	Mass balance modelling	*(Van Pelt)*
Project 3:	Remote Sensing of tidewater glacier changes	*(Howat)*
Project 4:	Inverse modelling	*(Gudmundsson)*
Project 5:	Ice on Mars	*(Karlsson)*
Project 6:	Glacial geomorphology	*(Stroeven)*

GROUP II:

Project 7:	SIA glacier model	*(Reijmer)*
Project 8:	Analysis of glacier structure from GPR records	*(Navarro)*
Project 9:	Ice shelf – ocean interaction	*(Jenkins)*
Project 10:	Ice-sheet model	*(Bueler)*
Project 11:	Sea level and geodynamics	*(Whitehouse)*
Project 12:	Dating of ice using RES layers	*(Dahl-Jensen)*