KARTHAUS-2016 / 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 13

Afternoon	Arrival / check-in
19:30	DINNER

Wednesday 14

08:30 - 08:50	Welcome / practical announcements *(Oerlemans)*
08:50 - 09:30	Continuum mechanics-I *(Kyrke-Smith)*
09:40 - 10:30	Continuum mechanics-II *(Kyrke-Smith)*
10:40 - 11:00	coffee break
11:00 - 11:50	Rheology of ice *(Hewitt)*
12:00 - 12:50	Thermodynamics of ice *(Hewitt)*
13:00	LUNCH
14:00 - 16:00	Exercises for all groups *(Kyrke-Smith)*
16:00 - 16:30	coffee break
16:30 - 17:30	5-min presentations by students
19:30	DINNER

Thursday 15

08:30 - 09:20	Commonly used approximations in ice flow modelling *(Kyrke-Smith)*
09:30 - 10:20	Analytical models of ice sheets *(Oerlemans)*
10:20 - 10:40	coffee break
10:40 - 11:30	Climates of ice sheets and glaciers *(Reijmer)*
11:40 - 12:30	Modelling glacier surface and near-surface processes *(Reijmer)*
13:00	LUNCH
14:30 - 15:30	5-min presentations by students
16:00 - 16:30	coffee break
16:30 - 17:30	5-min presentations by students
19:30	DINNER

Friday 16

08:30 - 09:20	Numerical modeling of ice sheets and ice shelves I *(Pattyn)*
09:30 - 10:20	Numerical modeling of ice sheets and ice shelves II *(Pattyn)*
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 17

08:30 - 09:20	Numerical modeling of ice sheets and ice shelves III *(Pattyn)*
09:30 - 10:20	Ocean processes and land ice I *(Straneo)*
	FREE TIME
12:45	LUNCH
	FREE TIME
16:30 - 17:20	Ground-penetrating radar (GPR) methods in glaciology *(Navarro)*
17:30 - 18:20	Internal structure and physical properties of glaciers from GPR *(Navarro)*
19:30	DINNER

Sunday 18

08:30 - 09:20	Ocean processes and land ice II *(Straneo)*
09:30 - 10:20	Introduction to glacial geomorphoplogy *(Stroeven)*
10:20 - 10:40	coffee break
10:40 - 11:30	Basal processes and geomorphology *(Hewitt)*
11:40 - 12:30	Geomorphology and mapping of paleo-ice sheets *(Stroeven)*
14:00 - 15:30	Group I: exercises *(Pattyn)* / Group II: computer projects
15:30 - 16:00	coffee break
16:00 - 17:30	Group II: exercises *(Pattyn)* / Group I: computer projects
19:30	DINNER

Monday 19

08:30 - 09:20	Geomorphology and mapping of paleo-ice sheets *(Stroeven)*
09:30 - 10:20	Combining GPR and remote-sensing with glacier dynamics modelling *(Navarro)*
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: FREE TIME / Group I: computer projects
15:30 - 16:00	coffee break
16:00 - 17:30	Group I: FREE TIME / Group II: computer projects
19:30	DINNER

Tuesday 20

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

Wednesday 21

08:30 – 09:20	Ice cores I *(Blunier)*
09:30 – 10:20	Ice cores II *(Blunier)*
10:20 – 10:40	coffee break
10:40 – 11:30	The response of glaciers to climate change *(Oerlemans)*
11:40 – 12:30	Minimal glacier 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 22

08:30 - 09:20	Ice cores III *(Blunier)*
09:30 - 10:20	Introduction to geodynamics *(Spada)*
10:20 - 10:40	coffee break
10:40 - 11:30	Geodynamics, glacial isostacy and sea level I *(Spada)*
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 *(Spada)* / Group I: computer projects
15:30 - 16:00	coffee break
16:00 - 17:30	Group I: exercises *(Spada)* / Group II: computer projects
19:30	DINNER

Friday 23

08:30 - 09:20	Geodynamics, glacial isostacy and sea level II *(Spada)*
09:30 - 10:20	Ice sheets and the climatic history of the Earth *(Oerlemans)*
10:20 - 10:40	coffee break
10:40 - 12:30	*working on project presentations*
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 24

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:   Glacial geomorphology I *(Stroeven)*

Project 2:   Glacial geomorphology II *(Stroeven)*

Project 3:   Ice stream / ice shelf model *(Kyrke-Smith)*

Project 4:   Fjord / ice model *(Straneo)*

Project 5:   Energy balance of glacier surface *(Reijmer)*

Project 6:   SIA glacier model *(Reijmer)*

GROUP II:

Project 7:   Sliding *(Hewit)*

Project 8:   Interpretation of GPR observations *(Navarro)*

Project 9:   Tidewater glacier *(Nick)*

Project 10:   Calving *(Nick)*

Project 11:   Ice-sheet model: Antarctica *(Pattyn)*

Project 12:   What is the age-depth relationship of the GRIP ice core? *(Blunier)*