KARTHAUS-2017 / GLACIERS AND ICE SHEETS IN THE CLIMATE SYSTEM
Programme

Exercises, computer projects, workshop

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. On monday afternoon there will be a workshop about Quantarctica (see page 4 of this programme).

Tuesday 12

Afternoon	Arrival / check-in
19:30	DINNER

Wednesday 13

08:30 - 08:50	Welcome / practical announcements *(Oerlemans)*
08:50 - 09:30	Continuum mechanics-I *(Hewitt)*
09:40 - 10:30	Continuum mechanics-II *(Hewitt)*
10:30 - 10:50	coffee break
10:50 - 11:40	Rheology of ice *(Karlsson)*
11:50 - 12:40	Thermodynamics of ice *(Karlsson)*
13:00	LUNCH
14:00 - 15:30	4-min presentations by students
16:00 - 16:30	coffee break
16:30 - 18:00	4-min presentations by students
19:30	DINNER

Thursday 14

08:30 - 09:20	Commonly used approximations in ice flow modelling *(Pattyn)*
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)*
12:45	LUNCH
14:00 - 15:30	Group I: exercises *(Hewitt)* / Group II: computer projects
15:30 - 16:00	coffee break
16:00 - 17:30	Group II: exercises *(Hewitt)* / Group I: computer projects
19:30	DINNER

Friday 15

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 *(Pattyn)* / Group I: computer projects
15:30 - 16:00	coffee break
16:00 - 17:30	Group I: exercises *(Pattyn)* / Group II: computer projects
19:30	DINNER

Saturday 16

08:30 - 09:20	Interaction of ice shelves with the ocean-I *(Jenkins)*
09:30 - 10:20	Numerical modeling of ice sheets and ice shelves III *(Pattyn)*
	FREE TIME
12:45	LUNCH
	FREE TIME
16:30 - 17:20	Geophysical and remote-sensing methods in glaciology I *(Eisen)*
17:30 - 18:20	Geophysical and remote-sensing methods in glaciology II *(Eisen)*
19:30	DINNER

Sunday 17

08:30 - 09:20	Interaction of ice shelves with the ocean-II *(Jenkins)*
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)*
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

Monday 18

08:30 - 09:20	Geomorphology and mapping of paleo-ice sheets *(Stroeven)*
09:30 - 10:20	Geophysical and remote-sensing methods in glaciology III *(Eisen)*
10:20 - 10:40	coffee break
10:40 - 11:30	The use of radar data in glaciology *(Karlsson)*
11:40 - 12:30	Minimal glacier models *(Oerlemans)*
12:45	LUNCH
14:00 - 15:30	Quantarctica workshop *(Roth)*
15:30 - 16:00	coffee break
16:00 - 17:30	Quantarctica workshop *(Roth)*
19:30	DINNER

Tuesday 19   **Excursion to the glaciers of the Oetztal Alps** *(Grüner)*

19:30	DINNER

Wednesday 20

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	Calving glaciers *(Oerlemans)*
11:40 – 12:30	The response of glaciers to climate change *(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 21

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 22

08:30 - 09:20	Geodynamics, glacial isostacy and sea level II *(Spada)*
09:30 - 10:20	Glacier engineering *(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 23   **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 *(Stroeven)*

Project 2:   Geodynamics and ice sheets *(Spada)*

Project 3:   Ice shelf – ocean interaction *(Jenkins)*

Project 4:   What is the age-depth relationship of the GRIP ice core? *(Blunier)*

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

Project 6:   SIA glacier model *(Reijmer)*

GROUP II: A special project group on BE-OI (Beyond Epica – Oldest Ice) *(Eisen, Karlsson, Pattyn)*

Project 7:   Ice sheet properties from radar data I

Project 8:   Ice sheet properties from radar data II

Project 9:   Age distribution by combining radar stratigraphy and modelling I

Project 10:   Age distribution by combining radar stratigraphy and modelling II

Project 11:   Basal properties from 1D and 3D modelling
Project 12:   Basal properties from 1D and 3D modelling