

KARTHAUS-2010 / GLACIERS AND ICE SHEETS IN THE CLIMATE SYSTEM

Provisional programme, May 2010

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.

Lecturers: M. van den Broeke, E. Bueler, C. Buizert, D. Dahl-Jensen, B. DeConto, H. Fischer, H. Gudmundsson, M. Helsen, I. Howat, A. Jenkins, K. Lambeck, T. Moelg, F. Ng, J. Oerlemans, C. Tijm-Reijmer

Excursion: J. Abermann, M. Kuhn

Tuesday 14

Afternoon	Arrival / check-in
19:30	DINNER

Wednesday 15

09:00 – 09:30	Welcome / practical announcements (<i>Oerlemans</i>)
09:30 – 10:20	Continuum mechanics-I (<i>Gudmundsson</i>)
10:20 – 10:40	coffee break
10:40 – 11:30	Continuum mechanics-II (<i>Gudmundsson</i>)
11:40 – 12:30	5-min presentations by students
12:45	LUNCH
14:00 – 16:00	Exercises for all groups (<i>Gudmundsson</i>)
16:00 – 16:30	coffee break
16:30 – 17:30	5-min presentations by students
19:30	DINNER

Thursday 16

08:30 - 09:20	Commonly used approximations in ice flow modelling (<i>Gudmundsson</i>)
09:30 - 10:20	Ice as a material, rheology (<i>Dahl-Jensen</i>)
10:20 - 10:40	coffee break
10:40 - 11:30	Analytical ice-sheet models (<i>Oerlemans</i>)
11:40 - 12:40	Thermodynamics of ice sheets (<i>Dahl-Jensen</i>)
13:00	LUNCH
14:00 - 15:30	Group I: exercises (<i>Oerlemans</i>) / Group II: computer projects
15:30 - 16:00	coffee break
16:00 - 17:30	Group II: exercises (<i>Oerlemans</i>) / Group I: computer projects
19:30	DINNER
21:00 - 22:00	5-min presentations by students

Friday 17

08:30 - 09:20	Transport processes in firn (<i>Buizert</i>)
09:30 - 10:20	Ice core records - I (<i>Fischer</i>)
10:20 - 10:40	coffee break
10:40 - 11:30	Introduction to geodynamics (<i>Lambeck</i>)
11:40 - 12:30	Interaction between ice sheets and the solid earth (<i>Lambeck</i>)
12:45	LUNCH
14:00 - 15:30	Group II: exercises (<i>Dahl-Jensen</i>) / Group I: computer projects
15:30 - 16:00	coffee break
16:00 - 17:30	Group I: exercises (<i>Dahl-Jensen</i>) / Group II: computer projects
19:30	DINNER
21:30	Special evening lecture: Extra-terrestrial ice (<i>Dahl-Jensen</i>)

Saturday 18

08:30 - 09:20	What can we learn from glacial rebound? (<i>Lambeck</i>)
09:30 - 10:20	Numerical modelling of ice sheets and ice shelves I (<i>Bueler</i>)
10:20 - 10:40	coffee break
10:40 - 11:30	Ice core records - II (<i>Fischer</i>)
11:40 - 12:30	Ice core records – III (<i>Fischer</i>)
12:45	LUNCH
14:00 - 14:45	History of glaciological research at Hintereisferner (<i>Kuhn</i>)
14:45 - 15:15	Introduction to the excursion (<i>Abermann</i>)
19:30	DINNER

Sunday 19**Excursion to the glaciers of the Oetztal Alps** (*Abermann, Kuhn*)**Monday 20**

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

Tuesday 21

08:30 - 09:20	Basal processes and geomorphology (<i>Ng</i>)
09:30 - 10:20	Remote sensing of glaciers and ice sheets (<i>Howat</i>)
10:20 - 10:40	coffee break
10:40 - 11:30	Interaction of ice shelves with the ocean-I (<i>Jenkins</i>)
11:40 - 12:30	Interaction of ice shelves with the ocean-II (<i>Jenkins</i>)
12:45	LUNCH
14:00 - 15:30	Group II: exercises (<i>Jenkins</i>) / Group I: computer projects
15:30 - 16:00	coffee break
16:00 - 17:30	Group I: exercises (<i>Jenkins</i>) / Group II: computer projects
19:30	DINNER

Wednesday 22

08:30 - 09:20	Interaction of ice shelves with the ocean-III (<i>Jenkins</i>)
09:30 - 10:20	Inverse modelling (<i>Gudmundsson</i>)
10:20 - 10:40	coffee break
10:40 - 11:30	Coupling of ice sheet models and climate models (<i>DeConto</i>)
11:40 - 12:30	Compaction of firn (<i>Helsen</i>)
12:45	LUNCH
	Afternoon free
19:30	DINNER

Thursday 23

08:30 - 09:20	Polar meteorology (<i>Van den Broeke</i>)
09:30 - 10:20	The microclimate of glaciers (<i>Oerlemans</i>)
10:20 - 10:40	coffee break
10:40 - 11:30	Tropical glaciers and climate dynamics (<i>Moelg</i>)
11:40 - 12:30	Tidewater glaciers (<i>Howat</i>)
12:45	LUNCH
14:00 - 15:30	Group I: exercises (<i>Van den Broeke</i>) / Group II: computer projects
15:30 - 16:00	coffee break
16:00 - 17:30	Group II: exercises (<i>Van den Broeke</i>) / Group I: computer projects
19:30	DINNER

Friday 24

08:30 - 09:20	The Cenozoic history of the Antarctic ice sheet (<i>DeConto</i>)
09:30 - 10:20	The glacial cycles of the Pleistocene (<i>DeConto</i>)
10:20 - 10:40	coffee break
10:40 - 11:30	The response of glaciers to climate change (<i>Oerlemans</i>)
11:40 - 12:30	Ice sheets, greenhouse warming and sea level (<i>Van den Broeke</i>)
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 25**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 thursday. 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.

GROUP I:

- Project 1: Remote sensing (*Howat*)
- Project 2: Glacier hydrology (*Ng*)
- Project 3: Ice-sheet model (*Bueler*)
- Project 4: Ice sheets and palaeoclimate (*DeConto*)
- Project 5: Inverse modelling (*Gudmundsson*)
- Project 6: Ice shelf – ocean interaction (*Jenkins*)

GROUP II:

- Project 7: Ice/firn cores I (*Buizert*)
- Project 8: Ice/firn cores II (*Buizert*)
- Project 9: Mass balance modelling (*Moelg*)
- Project 10: Compaction of firn (*Helsen*)
- Project 11: Polar meteorology I (*Tijm-Reijmer*)
- Project 12: Polar meteorology II (*Tijm-Reijmer*)