

KARTHAUS-2018 / GLACIERS AND ICE SHEETS IN THE CLIMATE SYSTEM

Programme

Tuesday 11

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

Wednesday 12

08:30 **BUS to Katharinaberg**
09:00 - 09:10 Welcome / practical announcements (*Oerlemans*)
09:10 - 10:00 Continuum mechanics-I (*Hewitt*)
10:10 - 11:00 Continuum mechanics-II (*Hewitt*)
11:00 - 11:20 coffee break
11:20 - 12:10 Rheology of ice (*Karlsson*)
12:20 - 13:10 Thermodynamics of ice (*Karlsson*)
13:15 LUNCH
14:15 - 15:45 4-min presentations by students
15:45 - 16:15 coffee break
16:15 - 17:45 4-min presentations by students
18:15 **BUS to Karthaus**
19:30 DINNER

Thursday 13

08:30 **BUS to Katharinaberg**
09:00 - 09:50 Commonly used approximations in ice flow modelling (*Pattyn*)
10:00 - 10:50 Analytical models of ice sheets (*Oerlemans*)
10:50 - 11:10 coffee break
11:10 - 12:00 Climates of ice sheets and glaciers (*Van de Berg*)
12:10 - 13:00 Modelling glacier near-surface processes (*Van de Berg*)
13:00 LUNCH
14:00 - 15:25 Group I: exercises (*Hewitt*) / Group II: computer projects
15:25 - 15:35 get coffee break / tea / cakes
15:35 - 17:00 Group II: exercises (*Hewitt*) / Group I: computer projects
17:15 **BUS to Karthaus**
19:30 DINNER

Friday 14

08:30 **BUS to Katharinaberg**
09:00 - 09:50 Numerical modeling of ice sheets and ice shelves I (*Pattyn*)
10:00 - 10:50 Numerical modeling of ice sheets and ice shelves II (*Pattyn*)
10:50 - 11:10 coffee break
11:10 - 12:00 Sliding (*Hewitt*)
12:10 - 13:00 Glacier hydrology (*Hewitt*)
13:00 LUNCH
14:00 - 15:25 Group II: exercises (*Oerlemans*) / Group I: computer projects
15:25 - 15:35 get coffee break / tea / cakes
15:35 - 17:00 Group I: exercises (*Oerlemans*) / Group II: computer projects
17:15 **BUS to Karthaus**
19:30 DINNER

Saturday 15

08:30 **BUS to Katharinaberg**
09:00 - 09:50 Numerical modeling of ice sheets and ice shelves III (*Pattyn*)
10:00 - 10:50 Ground-penetrating radar (GPR) methods in glaciology (*Navarro*)
10:50 - 11:10 coffee break
11:10 - 12:00 Internal structure and physical properties of glaciers from GPR (*Navarro*)
12:10 - 13:00 Ice on Mars (*Karlsson*)
13:00 LUNCH
14:00 - 15:25 Group I: exercises (*Pattyn*) / Group II: computer projects
15:25 - 15:35 get coffee break / tea / cakes
15:35 - 17:00 Group II: exercises (*Pattyn*) / Group I: computer projects
17:15 **BUS to Karthaus**
19:30 DINNER

Sunday 16

morning	FREE TIME
12:15	LUNCH
13:30	BUS to Katharinaberg
14:00 - 14:50	Introduction to glacial geomorphology (<i>Stroeven</i>)
15:00 - 15:50	Basal processes and geomorphology (<i>Hewitt</i>)
15:50 - 16:10	coffee break
16:10 - 17:00	Geomorphology and mapping of paleo-ice sheets (<i>Stroeven</i>)
17:10 - 18:00	Introduction to geodynamics (<i>Spada</i>)
18:15	BUS to Karthaus
19:00 (!)	DINNER
21:00	Ice Stupa's - special evening lecture by Felix Keller in the Goldene Rose Music by TangoGlaciar

Monday 17

08:30	BUS to Katharinaberg
09:00 - 09:50	Geodynamics, glacial isostasy and sea level I (<i>Spada</i>)
10:00 - 10:50	Geodynamics, glacial isostasy and sea level II (<i>Spada</i>)
10:50 - 11:10	coffee break
11:10 - 12:00	Minimal glacier models (<i>Oerlemans</i>)
12:10 - 13:00	Calving glaciers (<i>Oerlemans</i>)
13:00	LUNCH
14:00 - 15:25	Group II: exercises (<i>Spada</i>) / Group I: computer projects
15:25 - 15:35	get coffee break / tea / cakes
15:35 - 17:00	Group I: exercises (<i>Spada</i>) / Group II: computer projects
17:15	BUS to Karthaus
19:30	DINNER (with music by the Karthaus Trio)

Tuesday 18

08:30	Excursion to the glaciers of the Oetztal Alps (<i>Grüner</i>) BUS leaves for Kurzras BUS back to Karthaus 16:07, 17:07, 18:07 (this is the last one !)
19:30	DINNER

Wednesday 19

08:30	BUS to Katharinaberg
09:00 - 09:50	Ice cores I (<i>Blunier</i>)
10:00 - 10:50	Ice cores II (<i>Blunier</i>)
10:50 - 11:10	coffee break
11:10 - 12:00	Interaction of ice shelves with the ocean-I (<i>Jenkins</i>)
12:10 - 13:00	Interaction of ice shelves with the ocean-II (<i>Jenkins</i>)
13:00	LUNCH
14:00 - 15:25	Group I: exercises (<i>Jenkins</i>) / Group II: computer projects
15:25 - 15:35	Get coffee break / tea / cakes
15:35 - 17:00	Group II: exercises (<i>Jenkins</i>) / Group I: computer projects
17:15	BUS to Karthaus
19:30	DINNER

Thursday 20

08:30	BUS to Katharinaberg
09:00 - 09:50	Ice cores III (<i>Blunier</i>)
10:00 - 10:50	Interaction of ice shelves with the ocean-III (<i>Jenkins</i>)
10:50 - 11:10	coffee break
11:10 - 12:00	The mass budget of the Greenland and Antarctic ice sheets (<i>Van de Berg</i>)
12:10 - 13:00	Paleo ice-sheet and climate modelling I (<i>De Boer</i>)
13:00	LUNCH
14:00 - 15:25	Group II: exercises (<i>Blunier</i>) / Group I: computer projects
15:25 - 15:35	get coffee break / tea / cakes
15:35 - 17:00	Group I: exercises (<i>Blunier</i>) / Group II: computer projects
17:15	BUS to Karthaus
19:30	DINNER

Friday 21

08:30	BUS to Katharinaberg
09:00 – 09:50	Paleo ice-sheet and climate modelling II (<i>De Boer</i>)
10:00 – 10:50	The response of valley glaciers to climate change (<i>Oerlemans</i>)
10:50 – 11:10	coffee break
11:10 - 12:00	<i>finalizing the project presentations</i>
12:00 (!)	LUNCH
13:15 - 14:45	Presentation of computer projects (6x)
14:45 - 15:15	coffee break
15:15 - 16:45	Presentation of computer projects (6x)
16:45	<u>Closure of the course</u>
17:15	BUS to Karthaus
19:30	DINNER

Saturday 22

Departure

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.

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: Geodynamics and ice sheets (*Spada*)
- Project 4: What is the age-depth relationship of the GRIP ice core? (*Blunier*)
- Project 5: Energy balance of glacier surface (*Van de Berg*)
- Project 6: SIA glacier model (*Van de Berg*)

GROUP II:

- Project 7: Interpretation of GPR observations (*Navarro*)
- Project 8: Using radar data to retrieve accumulation rates (*Karlsson*)
- Project 9: Palaeo-ice sheets (*De Boer*)
- Project 10: Ice shelf – ocean interaction (*De Boer, Jenkins*)
- Project 11: Sensitivity of the grounding line to sub-shelf melting (*Pattyn*)
- Project 12: ABUMIP revised: sensitivity of ice shelf buttressing on the Antarctic ice sheet (*Pattyn*)