



Reconstruction of the Glacial Deep Ocean Circulation

4-7 November 2008

**MARUM-Center for Marine
Environmental Sciences**

**University of Bremen
Bremen, Germany**

Program

Welcome to Bremen !!!



Dear workshop participant,

We would like to welcome you to Bremen, and especially to this workshop that brings together many colleagues in the field of paleoceanography, from North America and Europe. The main goal of the workshop is to compile a global data base of proxies that are related to deep-water circulation and have the potential to be simulated in climate models. These proxies include $\delta^{18}\text{O}$, $\delta^{13}\text{C}$, Cd/Ca, Mg/Ca and $\Delta^{14}\text{C}$ of benthic foraminifera as well as $^{231}\text{Pa}/^{230}\text{Th}$, and ϵ_{Nd} .

Important questions to be addressed include:

- What is the state of the art on the distribution of deep-water properties during the Last Glacial Maximum (LGM) based on established ($\delta^{13}\text{C}$, $\delta^{18}\text{O}$, Cd/Ca) and new (ϵ_{Nd}) water mass proxies?
- Do kinematic proxies (Pa/Th, $\Delta^{14}\text{C}$, grain size) support the general view of a shallower and somewhat weaker overturning circulation during the LGM?
- Which models show the best representation of the ice-age circulation state?

In this program booklet you will find some additional tips to find your way around in the city of Bremen, on the campus of the University of Bremen, and in the MARUM - Center for Marine Environmental Sciences.

Yours sincerely,

The organizers,

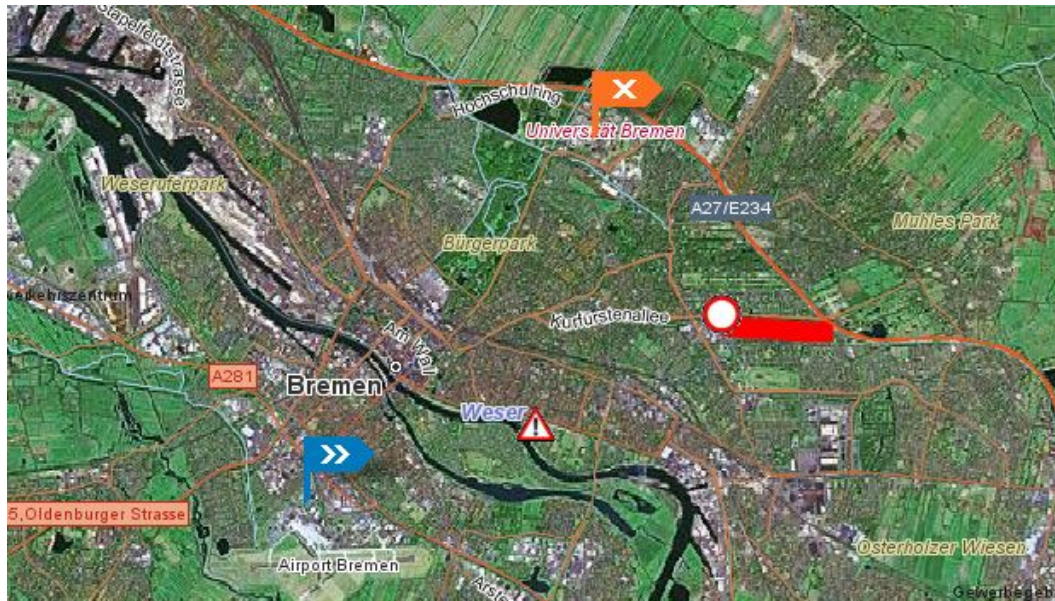
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Stefan Mulitza (smulitza@uni-bremen.de)



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Map of Bremen:



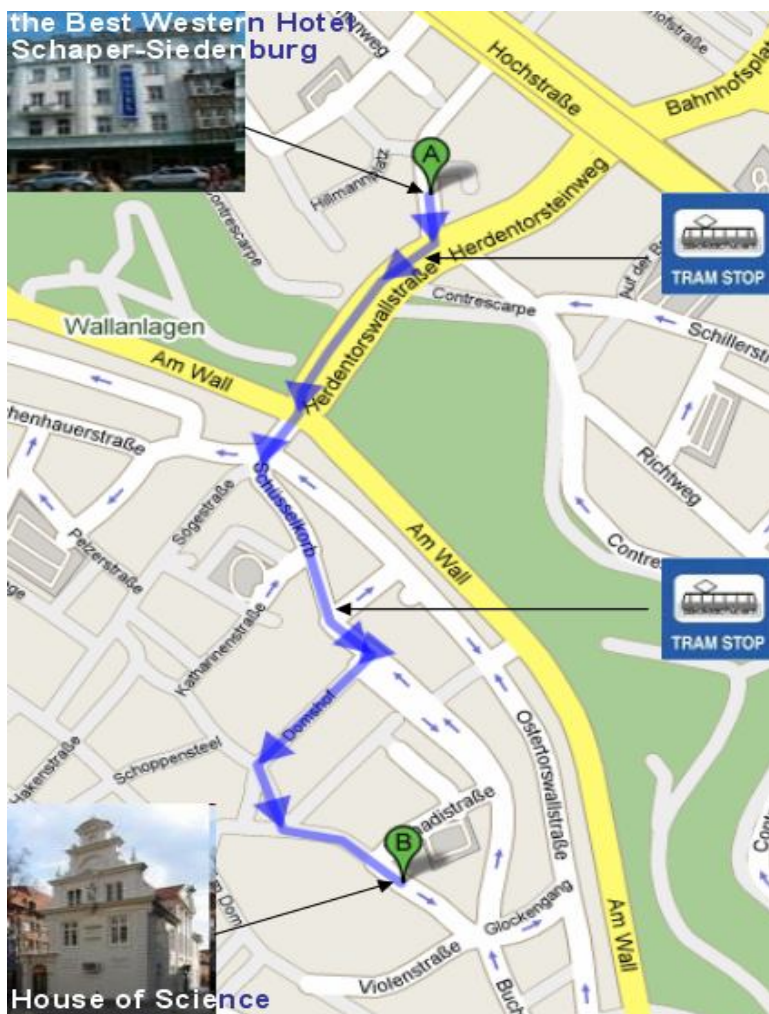
The workshop will take place on the second floor of the MARUM building, which is located on the campus of the University of Bremen, in Leobener Straße (see map on page 6). Here we will also have our (coffee) breaks, as well as dinner on Wednesday. We made a room reservation in the Mensa (our university canteen) for lunch on Thursday and Friday.

The Campus of the University of Bremen is exactly on the other side of the city from the airport. But the good news is: there is a direct tram connection between campus and airport through line 6 (see time schedule on page 5). The tram stop is directly opposite to the airport's exit. See map of the campus on page 7 for a closer look at where to find the MARUM building. Easiest would be to get off at the second-last stop on the campus called "Zentralbereich".

This ride takes you through the center of the city, passes also the central station, and takes about half an hour. Buy your tickets from the tram driver - on some trams there's a ticket machine instead (the fare is around €2.15).

Any taxi will of course also take you to the campus (the price is around €25 Euro).

Icebreaker reception at the Haus der Wissenschaft (House of Science):



In order to get to the Haus der Wissenschaft (House of Science):

From the tram stop *Herdentor* (to the left from your hotel) take the tram no. 4, 5, 6 or 8 to the tram stop *Schüsselkorb* (see the right map on this page). The whole trip takes about 5 minutes.

If you like to enjoy the city center, we would rather recommend walking, which takes 10-15 minutes (see the left map on this page). We will pick you up in the lobby of the Hotel Schaper-Siedenburg at 7 pm to walk with you to the House der Wissenschaft where the icebreaker reception will be held.

Useful phone numbers:

Best Western Hotel
Schaper-Siedenburg
+49 (0) 421-30870

Time schedule of tram line 6 from the airport to the campus:

6

Bahn

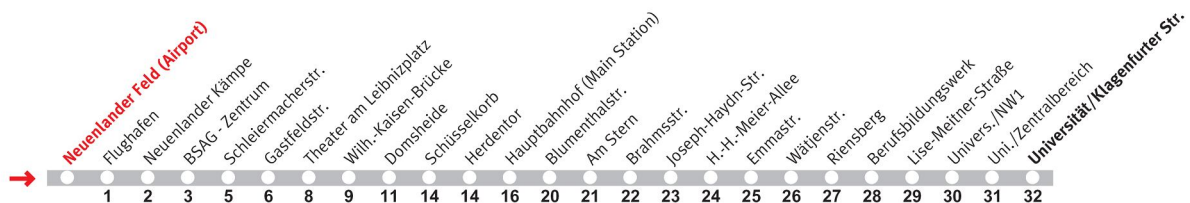
Abfahrt ab Neuenlander Feld (Airport)
 über Theater am Leibnizplatz
 Domsheide
 Hauptbahnhof (Main Station)
 Riensberg
Richtung Universität/Klagenfurter Str.

Gültig vom 04.10.2008 bis 27.03.2009

BSAG Infotelefon
 VBN 01805 - 826 826

Uhr	Montag bis Freitag	Samstag	Sonn- und Feiertag	Uhr
4	54	47 _b		4
5	09 24 39 54	07 _b 27 _b 47 _b	07	5
6	08 18 28 38 43 48 58	07 _b 27 _b 47 _b	11 _b 41 _b	6
7	08 13 18 23 28 33 38 43 48 53 58	07 27 47	11 _b 23 41	7
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■ = bis BSAG - Zentrum
 ■ = bis Hauptbahnhof / weiter wie Linie 1 bis Geschäftsstelle Neue Vahr
 ■ = bis Riensberg
 c = nur freitags
 d = nur montag bis donnerstag
■ = bis Domsheide
 a = bis Herdentor
 b = bis Riensberg



Time schedule of tram line 6 from the campus to the airport:

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Bahn

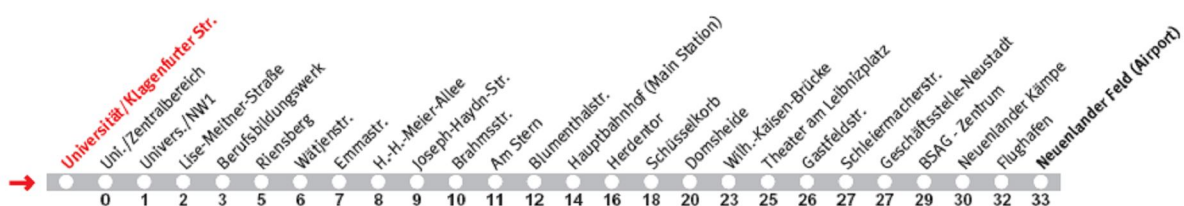
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6	08 18 38 43 48 53 58			6
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14	08 18 28 38 48 51 55 58	08 18 28 38 48 58	18 38 58	14
15	03 08 13 18 23 28 33 38 43 48 53 58	08 18 28 38 48 58	18 38 58	15
16	03 08 13 18 23 28 33 38 43 48 51 55 58	08 18 28 38 48 58	18 38 58	16
17	03 08 13 18 23 23 _a 28 33 33 _a 38 43 43 _a 48 53 58	08 18 28 38 48 58	18 38 58	17
18	03 08 13 18 23 28 33 38 43 48 53 58	08 18 38 58	18 38 58	18
19	03 08 18 28 38 48 58	18 38 58	18 38 58	19
20	08 18 23 38 43 58	18 38 58	18 38 58	20
21	18 38 58	18 38 58	18 38 58	21
22	18 38 49	18 38 49	18 38 49	22
23	08 37	08 37	08 37	23
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K = Kein Niederflurfahrzeug ■ = bis Domsheide ■ = bis Geschäftsstelle-Neustadt ■ = bis Hauptbahnhof (Main Station) a = nur freitags ■ = nur montag bis donnerstag



Workshop program:

Tuesday 4 November 2008

All day	Arrival of participants
19.30-22.00	Icebreaker at the House of Science (downtown Bremen)

Wednesday 5 November 2008

9.00-9.15	Welcome and introduction to the workshop	
9.15-9.35	Wolfgang Berger	On the end of the LGM
9.35-9.55	Trond Dokken	Circulation during LGM, very different from stadials and Heinrich event, and also different from Holocene
9.55-10.15	Olivier Marchal	On the abyssal circulation in the Atlantic ocean during the LGM
10.15-10.45	Coffee break	
10.45-11.05	Jean Lynch-Stieglitz	Challenges and rewards for benthic $\delta^{18}\text{O}$ intercalibration
11.05-11.25	Babette Hoogakker	Quaternary QUEST and synthesis of marine benthic isotope records
11.25-11.45	Kevin Oliver	Analysis of $\delta^{13}\text{C}$ in the QUEST marine data synthesis
11.45-12.05	Thomas Marchitto	Distribution of LGM deep water masses based on benthic foraminiferal Cd/Ca
12.05-13.30	Lunch break (12.30-13.00 reservation in Mensa)	
13.30-13.50	Martin Butzin	Glacial $\delta^{13}\text{C}$ in the Atlantic ocean: A data-model comparison
13.50-14.10	Thomas Arsouze	Comparative modeling study of ϵ_{Nd} and $\delta^{13}\text{C}$ at LGM
14.10-14.30	Alex Piotrowski	Nd isotopes from the glacial north Atlantic
14.30-14.50	Marcus Gutjahr	Changes in North Atlantic Deep Water strength and bottom water masses during MIS 3, the LGM and termination 1 traced using authigenic Nd and Pb isotopes
14.50-15.10	Mea Cook	Incorporating uncertainty in radiocarbon measurements, reservoir correction, and calibration in estimates of $\Delta^{14}\text{C}$ of the past ocean
15.10-15.30	Luke Skinner	to be announced
15.30-16.00	Coffee break	
16.00-16.20	Michael Sarnthein	The record of ^{14}C reservoir ages on global surface and deep water circulation during LGM and H1
16.20-16.40	Ben Hickey	Pa/Th data collected so far from the south Atlantic
16.40-17.00	Jörg Lippold	Atlantic North-South Transect of Pa/Th profiles for the last 30.000 years
17.00-17.20	Jeanne Gherardi Scao	Glacial-Interglacial circulation changes inferred from Pa/Th sedimentary records in the North Atlantic region
17.20-17.40	Matthias Prange	Shoaling of glacial Antarctic Intermediate water in the south Pacific as inferred from stable isotopes and climate modelling
17.40-18.00	Joel Hirschi	Monitoring the modern Atlantic MOC: Moving beyond 26°N
18.00-19.00	Plenary discussion	
19.00-	Dinner at MARUM	

Thursday 6 November 2008

9.00-10.15	Discussion in working groups/ Data compilation	
10.15-10.45	Coffee break	
10.45-12.00	Discussion in working groups/ Data compilation	
12.00-14.00	Lunch break (12.30-13.00 reservation in Mensa)	
14.00-15.30	Discussion in working groups/ Data compilation	
15.30-16.00	Coffee break	
16.00-18.00	Discussion in working groups/ Data compilation	
19.00-20.00	Tour City Center	

Friday 7 November 2008

9.00-10.15	Presentations of working groups' results	
10.15-10.45	Coffee break	
11.00-12.30	Discussion	
12.30-14.00	Lunch break	

List of presentations:

Name:	Title:
Thomas Arsouze	Comparative modeling study of ϵ_{Nd} and $\delta^{13}C$ at LGM
Wolfgang Berger	On the End of the LGM
Martin Butzin	Glacial $\delta^{13}C$ in the Atlantic Ocean: A data - model comparison
Mea Cook	Incorporating uncertainty in radiocarbon measurements, reservoir correction, and calibration in estimates of $\Delta^{14}C$ of the past ocean
Trond Dokken	Circulation during LGM, very different from stadials and Heinrich events, and also different from the Holocene
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Ben Hickey	Pa/Th data collected so far from the south Atlantic
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Babette Hoogakker	Quaternary QUEST and Synthesis of marine benthic isotope records
Jörg Lippold	Atlantic North-South Transect of Pa/Th profiles for the last 30.000 years
Jean Lynch-Stieglitz	Challenges and rewards for benthic $\delta^{18}O$ intercalibration
Thomas Marchitto	Distribution of LGM deep water masses based on benthic foraminiferal Cd/Ca
Oliver Marshal	On the abyssal circulation in the Atlantic Ocean during the Last Glacial Maximum
Kevin Oliver	Analysis of $\delta^{13}C$ in the QUEST marine data synthesis
Alex Piotrowski	Nd isotopes from the glacial North Atlantic
Matthias Prange	Shoaling of glacial Antarctic Intermediate Water in the South Pacific as inferred from stable isotopes and climate modelling
Michael Sarnthein	The record of ^{14}C reservoir ages on global surface and deep water circulation during LGM and H1.
Luke Skinner	To be announced

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25	Mahyar	Mohtadi	GEO Bremen	Germany	mohtadi@uni-bremen.de	www-user.uni-bremen.de/~micropal/mohtadi_en.html
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