



## Course programme within the ESSReS Curriculum

### **ESSReS-L7: Paleoclimate: from proxies to climate data**

*Block course: 10 - 12 May 2010, three days, 8:45h – 17:00h*

*Location: Alfred-Wegener-Institut Bremerhaven*

*Responsible: **F. Lamy, R. Tiedemann, B. Diekmann**, O. Esper, J. Hefter, G. Kuhn, G. Knorr*

*Email: [info@earth-system-science.org](mailto:info@earth-system-science.org)*

This course will focus on the introduction to the fundamental understanding of Earth's history and its evolution on long time scales. Lectures and interactive modules will show how climate history can be reconstructed in order to understand the mechanisms and impacts of past global environmental variability related to natural driving forces of climate change. This can be achieved by interpreting chemical signatures of biologic, oceanographic and climatic processes that are preserved in the marine sediment record.

Special modules on basic and expert level will be provided (*please register for the expert course due to limited places, own laptop necessary*).

#### **Unit 1:**

**Date:** Monday, 10 May 2010  
**Location:** AWI, Columbusstraße  
**Building:** D, Geo-Lab (afternoon)  
**Room:** 2930

8:45h – 10:15h: Introduction to paleoclimatology (forcings and processes on different time-scales)  
(Frank Lamy)

10:30h – 12:30h: Paleoclimate archives (Bernhard Diekmann)

12:30h – 13:30h: lunch break

13:30h – 16:30h: Case studies with visual inspection of sediment cores in the Geo-lab:  
(Ralf Tiedemann, Frank Lamy, Bernhard Diekmann)

1. Marine case study: Changes in sediment lithology in the Mediterranean Sea: paleoclimatic and stratigraphic implications

2. Terrestrial case study: The third Pole - Lake-System Response to late Quaternary Climatic and Environmental Change on the Tibetan Plateau

Theory: Compilation of field data (sediment cores, seismic survey, geomorphology) and their interpretation. Paleoclimatic implications.

## Unit 2:

**Date:** Tuesday, 11 May 2010  
**Location:** AWI, Columbusstraße  
**Building:** D  
**Room:** 2930

8:45h – 10:45h: Heat transport and paleocirculation over the past ca. 50 Ma  
(Ralf Tiedemann)

11:00h – 13:00h: Paleoclimates during the pre-Cenozoic (Bernhard Diekmann)

13:00h – 14:00h: lunch break

14:00h – 15:30h: Geo-Seminar presentation by Gregor Knorr "Extreme Amplification of the Atlantic Overturning Circulation during Ice Ages: Insights by Models and Data"

15:30h – 16:30h: Sea-level changes during the Quaternary (Frank Lamy)

## Unit 3:

**Date:** Wednesday, 12 May 2010  
**Location:** AWI, Columbusstraße  
**Building:** D, F, Geo-Lab  
**Room:** D-2130, D: Geo-Labs, F-Glaskasten

8:45h – 12:45h: **Expert course:** Orbital tuning (8-10 persons) (Ralf Tiedemann, Frank Lamy)  
(with own laptops), **Room D2130**  
**Precondition:** Basic knowledge in proxy data and Earth orbital changes  
(Milankovic theory) is desirable  
[Please, send an email for registration to info@earth-system-science.org](mailto:info@earth-system-science.org)

In parallel:

10:00h – 12:30h: Guided tour through the Geo-labs (Oliver Esper, Jens Hefter, Gerd Kuhn)  
**Geo-Lab**  
**Group 1: 10:00h – 11:00h**  
**Group 2: 11:30h – 12:30h (reserved for people not hosted at the AWI)**

12:45h – 13:30h: lunch break

13:30h – 15:30h: Practical on radiocarbon dating (Ralf Tiedemann, Frank Lamy)  
(with own laptops), **Room: F-Glaskasten**