

Monday 25th June

Morning: Welcome and Introductory session

Afternoon: Presentations by PhD students and Laboratory Visits
(¹⁴C AMS and stable isotopes)

Institute for Geosciences, Ludewig Meynstr. 14 room 7 (Micropaleontology Practical Room)

9:00 Welcome and Introduction

10:00 Introductory Session

Wolfgang Kuhnt and Ann Holbourn

Introduction to Deep Water Micropaleontology and Paleoceanography of the Indonesian Throughflow Area

- Methods of ITF and Indonesian Paleoclimate Research in Kiel (XRF Core scanning, stable isotope analysis of planktonic and benthic foraminifera, Mg/Ca seawater temperature estimates and paleosalinity reconstructions)
- Preliminary synthesis of R/V Sonne Cruise 185 (Timor Strait, 2005), R/V Marion Dufresne Cruise MD-06 (Mindanao, 2006) and R/V Sonne 217 Cruise (Makassar Strait, 2011)

12:00-13:00 Lunch Break

13:00-15:00 Presentations by Early Stage Researchers

15:30-17:00 Laboratory Visits: Leibniz Laboratory Radiometric Dating and Stable Isotope Research (¹⁴C AMS Accelerator, stable isotope mass spectrometers)

Tuesday 26th June

Morning: Laboratory visits (Micropaleontology Lab, XRF-Scanner, ICP-MS and ICP-OES)

Afternoon: "Law of the Sea" Lecture

9:00-12:00 Lab Visits and introduction to micropaleontological and geochemical sampling and analyses

12:00-13:00 Lunch Break

13:00-14:00 Preparation for Littorina Cruise (assemblage of multicorer, sampling equipment, cruise track)

14:00-15:30 room R.03.19 Westring 400

Between Science and Society: Legal Regulation of Marine Resources

Prof. Nele Matz-Lück, CAU, Walther-Schuecking-Institute for International Law

How law links to science research, exploitation and conservation are issues strongly anchored in the natural sciences, but implementation in a societal context is dependent on national and international legal frameworks. An understanding of these issues is important to fields such as marine conservation, resource exploitation, and other aspects of research. In this course, key aspects of the Law of the Sea will be presented and discussed. No prior legal knowledge is required!

Contents:

- (Legal) Terminology, Historical Overview
 - Marine Scientific Research vs. Resource Exploration
 - Resources: Non-living Resources, Living Resources (e.g. Fisheries) and Genetic Resources
 - Protected Areas in the Oceans
 - Possible Effects of Global Warming (e.g. accessibility of resources in the Arctic)
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Wednesday 27th June

Baltic Sea Cruise on RV "Littorina"

The Research Cutter "LITTORINA" was built by Julius Dietrich Shipyard in Oldersum, Germany, and was commissioned on June 27th 1975. The total costs of construction were 3,4 Mio. DM and were covered by the German Research Council (DFG) for the forum Special Research Project (SFB) 95 "Sea and Sea Floor Interactions" in order to avoid high charter costs for other vessels.

After the termination of SFB 95 the vessel was taken over by Christian-Albrechts-University at Kiel. Since then the "Littorina" is operated jointly by Kiel University and IFM-GEOMAR on a cost sharing agreement and is integrated in the IFM-GEOMAR Research Vessel Fleet.

The "LITTORINA" has been used for all marine disciplines up to a water depth of 500 m. The vessel is specially equipped for training of research divers and has a compressor and equipment for 12 divers (Kiel University Research Diving Division). A special inflatable is used on diving missions.

The name of the vessel reflects the close cooperation of marine biologists and geologists, as *Littorina littorina* was one of the most abundant mollusca in the earlier stage of development of the Baltic Sea 8500-2500 before present ("Littorina Sea").

The vessel is equipped with the latest navigational and communication gear, as GPS, Computers, Echo sounding systems, software for seafloor surveying, etc.

"Littorina" has a capacity for 12 scientists for daily cruises. The range corresponds to the area of the licence for "small fisheries" (Baltic Sea, North Sea, English Channel and Norwegian Coast). The vessel is equipped with a special waste water disposal system to avoid pollution.

Communications include mobile telephone and fax services and email

(littorina@ifm-geomar.de).

Laboratory facilities: dry lab of 12 qm and wet lab container on board; Sediment sounding system (30 and 200 KHZ), Log, cruise documentation, electronic chart monitor, onboard communications, warm and cold water, seawater supply, refrigerators (up to -20°C).

We will take seafloor samples using a 12-tube multicorer system. Tubes will be extracted onboard ship and samples will be conserved in alcohol using Rose Bengal stain to identify living foraminifera. We will process, extract and analyse the microfauna of the Kiel Bight during the practical session on thursday and friday.

Thursday 28th June

Morning: Practical session

Afternoon: Presentation of progress reports by Early Stage Researchers

Laboratory Session: Environmental Micropaleontology of the Kiel Fjord - Introduction and sample processing of marine sediment surface samples
Microscope Session: Identification and morphologic analysis of recent marine benthic foraminifers collected during the Littorina cruise

Friday 29th June

Morning: Oceanography and modelling session

Afternoon: Board Meeting and continuation of practical session (students)

Prof. Martin Visbeck (GEOMAR, Chairman of the Research Unit Physical Oceanography and the Excellence Cluster "Future Ocean"):
Oceanography of the Indonesian Throughflow.

Prof. Birgit Schneider (Institute of Geosciences, Chairman of the Research Group Biogeochemical Modelling):
Introduction to Biogeochemical Modelling