SGIMS 2009
Sino - German Initiative on Marine Sciences: Higher Education

5th Summer School
The Coastal Zone and its Management

July 18 - 31, 2009, Qingdao, China
Welcome to the

5th Sino-German Summer School
“The Coastal Zone and its Management”

from July 18 to 31, 2009

at Ocean University of China,
Qingdao, China

The Summer School follows the model of the Sino-German Initiative on Marine Sciences. It is supported by the German Federal Ministry of Education and Research (BMBF) and the Ministry of Education of the People’s Republic of China (MoE).

The Summer School is jointly implemented by the University of Kiel, the University of Bremen, the Leibniz Institute of Marine Sciences (IFM-GEOMAR), the Leibniz Center for Tropical Marine Ecology (ZMT) and the Ocean University of China (OUC).
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### Program

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<tr>
<td>Arrival Day</td>
<td><strong>Registration</strong></td>
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<td><strong>18:30</strong></td>
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<td><strong>Dinner (Qihai Hotel)</strong></td>
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<tr>
<th>Sunday, July 19</th>
<th>9:00</th>
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<tr>
<td></td>
<td><strong>Campus and City tour (Seaside, Olympic Sailing Center etc)</strong></td>
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<td><strong>18:00</strong></td>
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<td><strong>Welcome Dinner (Qihai Hotel)</strong></td>
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<th>Monday, July 20</th>
<th>09:00 - 09:15</th>
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<tr>
<td></td>
<td><strong>Opening</strong></td>
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<td><strong>09:15 - 10:30</strong></td>
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<td></td>
<td><strong>Contamination and ecological risks of persistent organic pollutants in coastal areas of China</strong></td>
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<td><strong>Ass. Prof. Li Zhengyan</strong></td>
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<td><strong>10:30 - 10:45</strong></td>
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<td><strong>Coffee Break</strong></td>
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<td><strong>10:45 - 11:30</strong></td>
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<tr>
<td></td>
<td><strong>Continuation of lecture followed by discussion</strong></td>
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<td><strong>11:30 - 12:30</strong></td>
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<td></td>
<td><strong>Lunch Break</strong></td>
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<td><strong>12:30 - 14:30</strong></td>
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<td></td>
<td><strong>Fouling, algal tides and beyond: Management of unwanted marine organisms</strong></td>
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<td><strong>Dr. Florian Weinberger</strong></td>
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<td><strong>14:30 - 17:30</strong></td>
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<td></td>
<td><strong>Visit Marine Biological Cultural Collection Centre &amp; the marine biological science museum, Chinese Academy of Sciences</strong></td>
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<td><strong>18:30</strong></td>
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<td></td>
<td><strong>Dinner</strong></td>
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## Program

**Tuesday, July 21**

<table>
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<tr>
<th>Time</th>
<th>Event</th>
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| 09:00 – 10:30 | **Metal biogeochemistry in the coastal environments**  
  *Ass. Prof. PAN Jinfen* |
| 10:30 – 10:45 | Coffee Break                                                                         |
| 10:45 – 12:00 | **Marine biogeochemical cycles of trace elements – case study of marginal seas of China**  
  *Ass. Prof. REN Jingling* |
| 12:00 – 13:30 | Lunch Break                                                                           |
| 13:30 – 15:00 | **Students’ Presentations (1)**                                                       |
| 15:00       | **Visit to Aoshanwei Aquaculture Experimentation Station**                              |
| 18:00       | Dinner                                                                                |

**Wednesday, July 22**

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<thead>
<tr>
<th>Time</th>
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| 09:00 – 10:30 | **Looking back at ICZM of China and its future implications**  
  *Prof. XUE Guifang* |
| 10:30 – 10:45 | Coffee Break                                                                         |
| 10:45 – 12:00 | Continuation of lecture followed by discussion                                            |
| 12:00 – 13:30 | Lunch Break                                                                           |
| 13:30 – 14:00 | **An introduction to geophysical techniques used to explore the oceans**  
  *Dr. Andrew M. Goodliffe* |
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<tr>
<th>Time</th>
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| 14:00 - 15:00| **A Geophysical Characterization of the Orogenic Rifting to Seafloor Spreading Transition in Western Woodlark Basin, Papua New Guinea**  
*Dr. Andrew M. Goodliffe* |
| 15:00 - 15:15| Coffee Break                                                                                     |
| 15:15 - 16:30| **Reconciling extension from brittle faulting, subsidence, and kinematic reconstructions: Lessons from the Woodlark Basin**  
*Dr. Andrew M. Goodliffe* |
| 16:30 - 17:30| **Evidence for subduction of the Solomon Sea Plate at the Trobriand Trough, Papua New Guinea**  
*Mr. Milo Cameron* |
| 18:30        | Dinner                                                                                            |

### Thursday, July 23

(Yushan Campus)

<table>
<thead>
<tr>
<th>Time</th>
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| 8:30 - 10:00 | **Marine functional zoning in China**  
*Ass. Prof. ZHANG Runqiu* |
| 10:00 - 10:15| Coffee break                                                                                     |
| 10:15 - 10:45| **Brief introduction for excursion**  
*Prof. Dr. Karsten Reise* |
| 10:45 - 12:00| **Excursion to coastal beach**                                                                    |
| 12:00 - 13:30| Lunch break                                                                                      |
| 13:30 - 15:00| **Seashore ecology: Ecological seashore zoning**  
*Prof. Dr. Karsten Reise* |
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<tr>
<th>Time</th>
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<tr>
<td>15:00 - 15:15</td>
<td>Coffee Break</td>
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<tr>
<td>15:15 - 17:00</td>
<td>Continuation of lecture followed by discussion and lab work</td>
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<tr>
<td>18:00</td>
<td>Dinner</td>
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<tr>
<td><strong>Friday, July 24</strong></td>
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| 09:00 - 09:45| **Investigation of the biology and the ecology of marine mammals - evaluation of human impacts**<br>
                  *Ms Marion Rademaker* |
| 09:45 - 10:30| **Coastal observatories for long term observations in coastal waters**<br>
                  *Prof. Dr. Franciscus Colijn* |
| 10:30 - 10:45| Coffee Break                                                         |
| 10:45 - 12:00| Continuation of lecture followed by discussion                       |
| 12:00 - 13:30| Lunch Break                                                          |
| 13:30 - 15:00| **Numerical modelling of coastal and shelf waters**<br>
                  *Ass. Prof. CHEN Xueen* |
| 15:00 - 15:15| Coffee Break                                                         |
| 15:15 - 16:00| Continuation of lecture followed by discussion                       |
| 16:00 - 17:30| **Students’ presentations (2)**                                      |
| 18:00        | Dinner                                                               |
## Program

<table>
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<tr>
<th>Date</th>
<th>Activities</th>
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<tr>
<td><strong>Saturday, July 25</strong></td>
<td>8:30 Visit to Laoshan Mountain</td>
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<tr>
<td><strong>Sunday, July 26</strong></td>
<td>Free Day (No Activities Scheduled)</td>
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| **Monday, July 27** | 09:00 - 10:30 The marine carbonate system  
                  Prof. Dr. Dieter Wolf-Gladrow                                                |
|                   | 10:30 - 10:45 Coffee Break                                                  |
|                   | 10:45 - 12:00 Continuation of lecture followed by Practical Exercises       |
|                   | 12:00 - 13:30 Lunch Break                                                  |
|                   | 13:30 - 15:00 Mathematical models of biological systems  
                  Prof. Dr. Dieter Wolf-Gladrow                                                |
|                   | 15:00 - 15:15 Coffee Break                                                  |
|                   | 15:15 - 16:00 Continuation of lecture followed by Practical Exercises       |
|                   | 16:00 - 17:30 Students’ presentations (3)                                   |
|                   | 18:30 Dinner                                                              |
| **Tuesday, July 28** | 09:00 - 10:30 Methane biogeochemistry in coastal ocean sediments  
                 Dr. Marcus Elvert                                                        |
|                   | 10:30 - 10:45 Coffee Break                                                  |
|                   | 10:45 - 12:00 Continuation of lecture followed by discussion                |
# Program

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<tr>
<td>12:00 – 13:30</td>
<td>Lunch Break</td>
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| 13:30 - 15:00 | **Biogeochemical processes of methane along coastal areas and their effects on global climate change**  
**Dr. DING Haibing** |
| 15:00 - 15:15 | Coffee Break                                                              |
| 15:15 - 17:00 | Continuation of lecture followed by discussion                            |
| 18:00         | Dinner                                                                    |

**Wednesday, July 29**

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<thead>
<tr>
<th>Time</th>
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| 09:00 - 10:30 | **Application of GIS for marine and coastal habitat mapping**  
**Dr. Angela Schaefer** |
| 10:30 - 10:45 | Coffee Break                                                              |
| 10:45 - 12:00 | Continuation of lecture followed by Practical Exercises                  |
| 12:00 - 13:30 | Lunch Break                                                               |
| 13:30 - 15:00 | **Distributed Data Management with WebGIS for marine and coastal areas: A tool connecting scientists and policymakers**  
**Dr. Angela Schaefer** |
<p>| 15:00 - 15:15 | Coffee Break                                                              |
| 15:15 - 16:00 | Continuation of lecture followed by Practical Exercises                  |</p>
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<th>Time</th>
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<tr>
<td>16:00 - 17:30</td>
<td>Students’ presentations (4)</td>
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<tr>
<td>18:30</td>
<td>Dinner</td>
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<tr>
<td><strong>Thursday, July 30</strong></td>
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| 09:00 - 10:30 | Finite element ocean modeling in coastal and shelf regions  
Dr. WANG Qiang |
| 10:30 - 10:45 | Coffee Break                                                              |
| 10:45 - 12:00 | Continuation of lecture followed by discussion                           |
| 12:00 - 13:30 | Lunch Break                                                               |
| 13:30 - 15:00 | Numerical study of circulation, retention, and dispersion in the Bras d’Or Lakes of Nova Scotia using a nested-grid numerical circulation model  
Dr. YANG Bo |
| 15:00 - 15:15 | Coffee Break                                                              |
| 15:15 - 17:00 | Continuation of lecture followed by discussion                           |
| 18:00     | Dinner                                                                    |
| **Friday, July 31** |                                     |
| 18:00     | Closing Ceremony, Awarding of Certificates, Farewell Party (Qihai Hotel) |
Contamination and ecological risks of persistent organic pollutants in coastal areas of China

Ass. Prof. LI Zhengyan (OUC)

Persistent Organic Pollutants (POPs) are chemical substances that persist in the environment, bioaccumulate through the food web, and pose a risk of causing adverse effects to the health of various wild lives as well as of our human being. With the evidence of long-range transport of these substances to regions where they have never been used or produced and the consequent threats they pose to the environment of the whole globe, the international community has called for urgent global actions to reduce and eliminate releases of these chemicals. POPs in the ocean have also caused vast problems to marine lives, including environmental deterioration, resource shrinkage, food crises and so on. In this lecture, main chemicals in the ocean with significant risks to marine environment are introduced. The biological effects and ecological risks of these chemicals are described. The current status of POPs pollution in coastal areas of China is discussed. One group of chemicals have received special concerns since they can interfere the hormone balance and consequently impair the reproductive capacity of various species including human being, and they are known as environmental hormones. Totally about 70 chemicals have been defined as endocrine disruptors, among which, nonylphenol and tributyltin, are selected as examples and described in details in this lecture. The former is widely used throughout the world as surfactants, detergents, wetting agents in industrial as well as domestic products. When discharged into the environment, it will cause male fish individuals to change sex into females. The latter is used as an active ingredient in antifouling paints in shipping industry. It has posed serious ecological disasters in coastal areas of the world. One of the outcomes is the disappearance of several species of marine gastropods in some coastal shores in Europe. Several basic concepts in environmental toxicology and ecological risk assessment will also be introduced.
Abstracts of Lectures

Fouling, algal tides and invasions: Management of unwanted marine organisms

Dr. Florian Claus Weinberger (IFM-GEOMAR)

Problems with unwanted marine organisms are reported with increasing frequency. Technical surfaces in the sea become overgrown by sessile marine organisms, which are adapted to an intense competition for suitable substrate. Also, mass developments of algae in coastal waters happen more and more often, polluting beaches, hampering fishing, causing oxygen depletion and sometimes producing toxins. As worldwide trade increases more and more species manage to cross geographic barriers. In their new habitats these exotic organisms are often released from natural enemies and they sometimes find ecologically more suitable conditions than in their native habitats. Introduced species may then become dominant, cause ecological and/or economic damage. In this module we will explore these problems more in detail, as well as the possible measures for control of unwanted marine organisms.
Metal biogeochemistry in the coastal environments

Ass. Prof. PAN Jinfen (OUC)

The importance of metal ions to the vital functions of living organisms, hence their health and well-being, has become increasingly apparent. The lecture centers on the speciation, transportation, and biological reactivity of metals in the coastal environments, where the economic growth and fast urban developments have exerted an unprecedented pressure. The metabolism and transport of metal ions and their complexes are being studied, especially for those potentially toxic metals (PTMs), which are persistent contaminants in the environments. Relevant paradigms in environmental monitoring, risk assessment and remediation feasibility are the PTMs’ mobility and bioavailability to marine microorganisms, plants, animals and humans.

Metal availability to organisms is in most cases proportional to the free ion concentrations of the metal, organic complexation decreases the immediate availability of nutrient metals. If retained in surface waters, these organic complexes serve to buffer metal ion activities at levels far below the total dissolved metal concentrations. A major fraction of organic carbon on the earth’s surface exists as dissolved substances in seawater, especially in coastal waters. These dissolved substances can bind trace elements. Assessing the effect of dissolved carbon substances on the chemical speciation and transport of metals from surface waters is a key issue for understanding the coupling between and metal biogeochemistry and the global carbon cycle. The section finishes with a brief discussion of the biological effects and biological monitoring of the PTMs, especially Cd and Hg.

Marine biogeochemical cycles of trace elements – case study of marginal seas of China

Ass. Prof. REN Jingling (OUC)

The Yellow Sea and East China Sea receive large amounts of terrigenous inputs from adjacent rivers (e.g. Changjiang (Yangtze River) and Huanghe etc.)
and are characterized by the seasonal variability of monsoons and the incursion of Kuroshio. The coastal areas are under strong stress of anthropogenic perturbation (e.g. over-fishing and pollution) and are resulted in coastal eutrophication and frequently occurring harmful algae bloom. The lecture mainly introduces the results of dissolved aluminum and arsenic in the marginal seas of China. The oceanic distribution of Al is primary controlled by external sources and rapid scavenging from water column, and is often applied as a sensitive tracer of water masses in the coastal and offshore seawater. The distributions of dissolved aluminum in the Yellow Sea and East China Sea showed the effect of land-source input from adjacent rivers (e.g. Changjiang) and the dissolution of spring dust storm, with obvious seasonal variations. The concentrations of dissolved aluminum in the seawater were sharply decreased during the bloom, which indicate the effect of biological scavenging. Based on the results of Al and Ti in the core sediments collected by multi-corer and gravity corer from typical stations in the Yellow Sea and East China Sea, excess aluminum signal can also be quantified. The distribution of total dissolved inorganic arsenic (TDIAs) in the marginal seas of China was mediated by the freshwater discharge and the incursion of the Kuroshio waters. TDIAs were moderately depleted in the surface water and enriched in the deep water. The distributions and seasonal variations of arsenite (AsO$_3^{2-}$, As(III)), arsenate (AsO$_4^{3-}$, As(V)) and their influencing factors were also discussed. Compared with other areas in the world, the concentration of dissolved inorganic arsenic in the Yellow Sea and East China Sea remained at natural levels.
Looking back at ICZM of China and its future implications

Prof. XUE Guifang (OUC)

The management of coastal zone resources is of great economic and social importance as half of the world population lives within the coastal zone. In China, coastal zones have been developed for economic growth and urbanisation. Industries involving resource exploitation and tourism have led to the evolution of thriving coastal economies. However, the over-development of coastal zones and ineffective management have resulted in negative impact on coastal environment and resources. Over the years, coastal issues have emerged in many areas, such as continuing intensification of coastal development, reclamation of wetlands and estuaries, declining coastal water qualities, declining nearshore fisheries, eutrophication, accelerated erosion, and loss of habitats, declining public access to coast, and also growing concern from the public to environmental degradation. The Chinese government has tried to implement various programs to cover the coastal waters and coastal land based on ecosystem-based management. Integrated Coastal Zone Management (ICZM) has also been designed to deter the negative environmental issues. Although ICZM is designed to catch the complexity of coastal socio-ecological system, it has not been so effective in because of strong barriers between the existing coastal land plans and national coastal management programs. ICZM has not fully demonstrated its potential. This presentation reviews briefly the process of coastal zone management in China, discusses advantages and disadvantages of mainstream approaches, and lastly, emphasises the importance of involvement of all social actors for the ICZM. It is emphasized that the ICZM should be employed as the most appropriate process for dealing with current and long term coastal problems. The ICZM is expected to be effective in removing the barriers and improve the coastal zone management.
Abstracts of Lectures

A Geophysical Characterization of the Orogenic Rifting to Seafloor Spreading Transition in Western Woodlark Basin, Papua New Guinea

Dr. Andrew M. Goodliffe (UA)

The Woodlark Basin, forming as the mountains of Papua New Guinea collapse, provides a unique opportunity to capture the complete orogenic cycle as continental collision gives way to orogenic collapse, rifting and finally, seafloor spreading. Within the basin itself is the only place on Earth where the instant of spreading center initiation has been fully imaged geophysically. Ring dikes and high acoustic backscatter on the seafloor are coincident with a high amplitude positive magnetization anomaly. Multichannel seismic lines image intrusions that represent a nascent spreading center, offsetting the two sides of the shallow angle normal fault (~30°) bounding the north side of Moresby Seamount.

Through an analysis of the bathymetry, magnetic, gravity, and reflection seismic data the shape of the shallow angle fault as it interacts with the nascent spreading center has been fully characterized and the volume of material accreted estimated. A number of questions are addressed:

1. what is the stress state at the transition zone;
2. how does the transfer from strain accommodation by faulting to strain accommodation by accretion takes place;
3. what is the stratigraphic response to the transition; and
4. how do the intrusives interact with the syn-rift sediments.

A model is presented that describes in detail the process by which a nascent seafloor spreading center nucleates in a rift basin as orogenic rifting draws to a close and a new ocean basin is born.

Reconciling extension from brittle faulting, subsidence, and kinematic reconstructions: Lessons from the Woodlark Basin

Dr. Andrew M. Goodliffe (UA)
In contrast to ancient rift margins where many of the mechanisms vital to the formation of the margin have long since been hidden, the Woodlark Basin of Papua New Guinea offers the opportunity to study active rift processes. Near the rifting-to-seafloor spreading transition the asymmetric rift system comprises large tilted fault blocks on the southern margin and a principally unfaunlted northern margin that has subsided more than 3 km. As is often the case, estimates of extension derived by examining brittle faulting fall short of those calculated through subsidence. However, by including multiple phases of faulting and sub-resolution faulting, this gap can be closed – resulting in a total of 111 +/- 23 km of extension. Assuming Airy isostasy, the extension calculated from subsidence along the same profile is 115 +/- 45 km. Though these estimates are in close agreement, it remains that locally a mechanism such as lower-crustal flow must be important. Extension can also be estimated by fitting Euler poles to fracture zones and magnetic chrons in the oceanic lithosphere. This gives an estimate of more than 200 km of extension since 6 Ma. Given that the basin has been opening since at least 8.4 Ma, this estimate far exceeds those predicted by brittle extension and subsidence. Can these extension estimates be reconciled? Estimates of brittle extension have so far ignored the potential role of metamorphic core complexes (MCC). At an MCC the upper crust has been removed - a 30 km wide MCC represents 30 km of extension. MCCs have not yet been identified along the study profile, but an MCC that has been dissected by normal faults may not be visible. The extension discrepancy may also be explained by a detachment between the mantle lithosphere and the upper crust. In this case estimates of extension from Euler pole kinematics should not agree with other estimates.

Evidence for subduction of the Solomon Sea Plate at the Trobriand Trough, Papua New Guinea

Mr Milo Cameron (UA)

The Solomon Sea plate is bounded to the north and south by subduction zones and to the east by a major strike slip fault. On the northern side of the Solomon Sea plate, the New Britain Trench is associated with a well-defined north-dipping Benioff zone. In contrast, on the southern side
Sea plate, the south dipping subduction zone at the Trobriand Trough is poorly defined seismologically, and its existence has been debated. There is much evidence to suggest that the Trobriand Trough represents a subduction zone that is either active or was active in geologically recent times. This includes:

1. newly collected multibeam bathymetry data that clearly defines the deformation front that has formed as a result of southward subduction of the Solomon Sea plate;
2. a clear gravity signature that is similar to, but not as strong as that seen at the New Britain Trench;
3. modern subduction zone volcanism (e.g. Mt. Lamington, Mt Victory and smaller volcanoes to the east);
4. calcalkaline volcaniclastic material recovered during ODP Leg 180 that records nearby volcanic eruptions between 1.5 Ma and 3.8 Ma;
5. plate motion reconstructions that require southward subduction of the Solomon Sea plate at the Trobriand Trough; and
6. low heat flow (~30 mW m⁻²) in the forearc directly overlying the southward subducting Solomon Sea plate.

Thursday, July 23

Marine functional zoning in China

Ass. Prof. ZHANG Runqiu (OUC)

Marine functional zoning refers to dividing a sea area into dominantly functional sub-areas with independent geographic units in natural conditions in accordance with the natural environmental condition and geographic location, considering marine development and use status and the needs for social and economic development.

Marine function zonings are worked out on the following principles:

1. scientifically defining the functions of the sea areas in light of such natural attributes as their geographical location, natural resources and natural environment;
2. making overall arrangements for the use of sea areas among various related sectors according to the needs of economic and social development;
3. protecting and improving the ecological environment, ensuring the
sustainable utilization of the sea areas and promoting the development of the marine economy;
4. ensuring the maritime traffic safety; and
5. safeguarding the security of national defense and guaranteeing the needs in the military use of the sea areas.

It gives guidelines on what is suitable and what is unsuitable for a specific sea area, as well as the orientation for sea area use. So the managerial department can appropriately approve applications for specific use based on the functional zoning. For this reason, marine functional zoning serves as one of the important systems for sea area use and management. There are ten Functional Zones in China Port and shipping zone, Fishery resource utilization and conservation zone, Mineral resource utilization zone, Tourism zone, Seawater resources utilization zone, Ocean energy utilization zone, Construction project sea area use zone, MPA, Zone for special use, Reserved zone.

**Seashore ecology: Ecological seashore zoning**

*Prof. Dr. Karsten Reise (AWI)*

Ecotones are transitional zones between ecosystems, and seashores exemplify ecotones. There are fluxes of materials and organisms in both directions. The biota stem from adjacent ecosystems plus genuine ecotone species. The diversity of seashores may be described by five environmental gradients: elevation from dry land to deep water, hydrodynamics from sheltered bays and estuaries to exposed headlands, substrate from rock to boulders, pebbles, sand and mud, salinity from marine to freshwater, and latitudes and longitudes with increasing seasonality and decreasing mean temperature from equator to poles. The interactions between gradients produce a high diversity of living conditions at the seashore from small to large scales. Point diversity may be low but at the scale of gradients a high diversity of biota is encountered.

Across the transition from land to sea, organisms occur in a banded pattern, corresponding to physiological and behavioural adaptations, interactions with the environment and an interplay between each other. The focus of the course will be on sediment shores. These belong to the most dynamic habitats, change position with sea level rise, are reshaped by waves, wind and organisms, while coastal engineering often attempts to
restrict such dynamics. The course should comprise a field excursion to the seashore at low tide, sampling and analyses of samples in the laboratory. The aim is to demonstrate how a rapid assessment of the biota can be accomplished and how environmental problems can be identified. Measures of mitigation and restoration will be discussed.

Friday, July 24

Investigation of the biology and the ecology of marine mammals - evaluation of human impacts

Ms Marion Rademaker (FTZ)

Cetaceans, pinnipeds, sirenians, mustelids and polar bears belong to the group of marine mammals. They have adapted to the marine environment by specific physiological and anatomical characteristics. Marine mammals developed different feeding strategies for their different habitats. While hunting was the largest threats to marine mammals in the past they are nowadays exposed to a large variety of anthropogenic activities like e.g. fisheries as well as habitat degradation through noise and chemical pollution. In German waters harbour porpoises, harbour seals and grey seals are the most common marine mammals. Research has been conducted and monitoring programs were developed to investigate the biology, health status and effects of anthropogenic activities. These projects included abundance estimates, pathological investigations and studies on hearing abilities as well as movement and habitat use. This understanding is essential in order to develop management strategies for the conservation of marine mammals.

Coastal observatories for long term observations in coastal waters

Prof. Dr. Franciscus Colijn (FTZ)

Coastal observatories in the Northern and Arctic Seas (COSYNA), is a project financed by the HGF (Helmholtz Association) and combines field
observations and modelling studies to obtain an overall picture of the status of specific marine areas like the North Sea. Several methods are available for on-line observations such as piles in the Wadden Sea with sensors for currents, physical and chemical parameters. In the North Sea Ferries are used to obtain high frequent observations along the transect covered by the ship of opportunity. The spatial scale is obtained through comparison with remote sensing taken from the MERIS Spectrometer aboard the European environmental satellite ENVISAT. Other potential methods to obtain good data from the sea are: gliders, radar hydrography, 3-D scanfish observations and buoys on fixed positions. The use of these data will be discussed as well as future sensors installed on ships of opportunity. The possibilities and relevance of the different types of data will be explored. The link towards using these field data for modelling will be discussed as well. As a scientific example on the use of these data the eutrophication case will be discussed.

**Numerical modelling of coastal and shelf waters**

*Ass. Prof. CHEN Xueen (OUC)*

A global ocean current and tide model (GOCTM) with varying unstructured grids will be discussed. The model was developed based on the philosophy of unstructured grids to conserve the water transportation through model cells. The model takes advantage of the geometric flexibility of unstructured triangular mesh system using a realistic global topography which includes also Arctic. Thus, there is no open boundary condition to be considered. The first six partial tides were included as ephemerides forcing. Furthermore, the model is fully baroclinic and 3-dimensional.

As a general application, the model is first applied to the East-Chinese Shelf, which includes Bohai Sea, Yellow Sea and the East China Sea, and has many marginal seas, channels and islands. In this application the model grids are globally refined over coastal areas, marginal seas and channels, especially those of the East-Chinese Shelf. GOCTM is initialized by Levitus 98 climatological ocean temperature and salinity data, driven by surface heat flux and surface wind stress.

Analysis of the model results indicates that GOCTM well reproduced
the realistic global tidal harmonic constants and the fundamental global general circulation fields. The results over the East-Chinese Shelf were almost exactly reproduced. The transport of Kuroshio and its subbranches are in agreement with the observations. The seasonal variation of the Kuroshio Extension and the main currents over the East-Chinese Shelf seem reasonable. GOCTM provides a robust model to survey the interaction of global ocean and the coastal waters, by which we may easily study the dynamic system and the Ecosystem of the western Pacific under the climate changes induced by the global warming.

**Monday, July 27**

**The marine carbonate system**

*Prof. Dr. Dieter Wolf-Gladrow (AWI)*

The course will provide various aspects of the marine carbonate system: oceanic response to atmospheric CO$_2$ increase, change in system properties due to production of organic carbon by algae or precipitation of calcium carbonate.

The following topics will be included: equilibrium (chemical species of dissolved inorganic carbon, total alkalinity, Revelle factor etc.), kinetics (diffusive boundary layers), isotopes (equilibrium and kinetic fractionation).

**Mathematical models of biological systems**

*Prof. Dr. Dieter Wolf-Gladrow (AWI)*

The course will focus on modelling of biological/ecological systems. Even if students might never become ‘modellers’ themselves, it would be good to get a clue what modellers do or are able to do (and what not). The examples discussed were chosen according to mathematical simplicity.

A short introduction to the programming languages OCTAVE and MATLAB
Abstracts of Lectures

will be given. The course will include exercises where you will use OCTAVE or MATLAB to code, run and analyse mathematical models.

The following topics will be included: discrete models of population dynamics (Fibonacci, logistic equation: steady states, stability, oscillations, chaos), predator-prey equations (e.g. Lotka-Volterra), pelagic ecosystems, mechanistic understanding of paleoproxies (isotopic composition of foraminifera calcite).

Tuesday, July 28

Methane biogeochemistry in coastal ocean sediments

Dr. Marcus Elvert (MARUM)

• Background

Microorganisms play a crucial role in carbon turnover in ocean margin sediments. Because these coastal zones are relevant to human society the ecological significance of this world-spanning environment calls for systematic investigations. This ecosystem is dominated by bacteria and archaea which are also important players in the reduction of the efflux of major greenhouse gases such as methane and carbon dioxide. Thus, microorganisms considerably affect the global warming potential on Earth.

The methane biogeochemistry in coastal ocean sediments is dominated by an interplay between methane production (methanogenesis) and methane oxidation (methanotrophy). Because the latter process successfully consumes most parts of the methane diffusing upwards in the sediment column, either via aerobic or more importantly via anaerobic microbial activity, the oceans contribute with only 2% to the atmospheric methane budget. However, point sources of methane efflux exist where methane is advectively transported, namely cold seeps and mud volcanoes, and which have not been fully considered in recent oceanographic and atmospheric models.
Abstracts of Lectures

- Course description

This course is intended to provide the students with experience in the study of methane biogeochemistry dominantly by using organic geochemical tools. In a first part, I will give an introduction to the factors influencing sedimentary organic matter biogeochemistry and the impact of this ecosystem on a global scale. I will specifically introduce the concept and analysis of molecular markers (biomarkers) in these systems and how to interpret them. Moreover, the relation to methane gas geochemistry and microbial ecology will be pointed out. The students will get information about the dominating microbial communities and the determination of their carbon sources. I will also move the students to complementary biogeochemical data on carbon turnover from concentration profiles of important metabolites in organic matter degradation such as carbon dioxide, acetate, hydrogen etc. All lines of evidence will ultimately provide estimates of the capability to reduce greenhouse gas emissions to the ocean water.

In a second part, I will be provide the students with data sets from unknown coastal locations in order to move their theoretical knowledge in a seminar-like discussion into hands-on experience of interpreting the biogeochemical behavior of methane in different sedimentary environments.

Biogeochemical processes of methane along coastal areas and their effects on global climate change

Dr. DING Haibing (OUC)

Methane is the third most abundant greenhouse gas in the Earth’s atmosphere. It is also the most abundant organic greenhouse gas. Its concentration in the atmosphere kept increasing dramatically in last several decades. As a greenhouse gas, methane warms the earth 23 times more than CO₂ per unit mass. Recently, more and more studies focused on the global cycle of methane. Coastal areas are very important for methane cycle. This session will discuss the new results of studies on distribution, flux, source, sink and biogeochemical processes of
methane along coastal areas. Two different types of microorganism, methanogenesis and methanotrophy which present the methane producer and consumer, respectively, will be a topic in the discussion. The discussion will also deal with subjects such as how the methane processes along coastal area affect global carbon cycle and global climate change.

Wednesday, July 29

Application of GIS for marine and coastal habitat mapping

Dr. Angela Schaefer (MARUM)

Marine GIS are designed to help coastal officials make and prioritize decisions about habitat restoration and conservation. Using widely available data, officials can generate pertinent reports, maps, and data tables, as well as evaluate and compare different land use scenarios. This lecture will give a short introduction to some of the most useful applications of GIS in marine and coastal geosciences: Examples of spatial analysis, modeling, visualization and data management will be given by means of the European North Sea – an area under constant pressure from human-induced as well as natural phenomena. Hence practical case studies of how spatial data for biological communities and environmental parameters can be organized and analyzed in GIS will be shown with the example of the digital atlas initiative of the North Sea and integration of EEZ data and Maritime Boundaries:
Abstracts of Lectures

- Integration of heterogeneous marine data types in GIS
- Bathymetric data modeling, coastline integration, terrain modeling
- Nutrient atlas of the North Sea and interpolation techniques
- Integration of satellite derived primary production at sea surface
- Spatial analysis of benthic habitat data and substrate characteristics

In a second part, I will be provide the students with data sets from unknown coastal locations in order to move their theoretical knowledge in a seminar-like discussion into hands-on experience of interpreting the biogeochemical behavior of methane in different sedimentary environments.

Distributed Data Management with WebGIS for marine and coastal areas: A tool connecting scientists and policymakers

Dr. Angela Schaefer (MARUM)

This presentation will be an introduction to the concept and practical implementation of the WebGIS done for HERMES (‘Hotspot Ecosystem Research on the Margins of European Seas’ - a major EU-project with 54 international partner institutions) with its dynamic linkage to the World Data Centers for marine data. Examples out of the experience of a GIS-coordinator for the northern European margins will be given as well as show cases for most useful WebGIS and internet data-mining with practical hands-on training. Additionally sites and techniques will be pointed out how to integrate world wide available Web Map Services into local GIS applications e.g. from the United Nation Environment Program, conservation data, marine biodiversity atlas, marine protected areas, etc.
Finite element ocean modelling in coastal and shelf regions

Dr. WANG Qiang (AWI)

Numerical models are important tools in studying coastal dynamics and processes. It is necessary to represent topography and coastlines faithfully in ocean modelling in order to accurately simulate shelf processes. The finite element (FE) method allows flexible unstructured discretization of the computational domain. A faithful representation of coastlines and bottom topography is natural in finite element ocean models. FE formulation facilitates the use of hybrid vertical grids within one model. The flexibility in local mesh refinement without traditional nesting makes finite element ocean models ideally suited for coastal as well as global applications. Great efforts have been made in investigating the FE method for ocean modelling in many institutions throughout the world during the last decade. Currently there are many on-going projects involving development and applications of finite element ocean models in the ocean modelling community.

In this lecture the concept and basic method of finite element ocean modelling will be explained. The state-of-the-art techniques and current status of finite element ocean modelling will be presented. Examples will be given using FEOM (the Finite Element Ocean circulation Model), which has been developed in AWI.

Numerical study of circulation, retention, and dispersion in the Bras d’Or Lakes of Nova Scotia using a nested-grid numerical circulation model

Dr. YANG Bo (OUC)

The Bras d’Or Lakes are a semi-enclosed salty water lake system in central Cape Breton Island of Nova Scotia, Canada, and connected to the North Atlantic Ocean via several narrow channels. In October 2000, an oyster parasite known as *Haplosporidium nelsoni* (MSX) was discovered at several localized sites within the Lakes. A three-dimensional (3D) hydrodynamic model
Abstracts of Lectures

is used in the study of the circulation, hydrography, and retention/dispersion of MSX disease in the Lakes. The 3D circulation sites within the Lakes. A three-dimensional (3D) hydrodynamic model is used in the study of the circulation, hydrography, and retention/dispersion of MSX disease in the Lakes. The 3D circulation model is first used in the process study of the lake circulation in response to tides, wind forcing and buoyancy forcing associated with freshwater runoff. The model is also used in simulating the 3D circulation, temperature/salinity distributions in summer 1974, during which currents and hydrographic measurements were made at several locations in the Lakes. The simulated 3D velocity fields are used to track the trajectory of passive particles carried by the model currents. A transition matrix calculated from the 3D particle trajectories is used to examine the exchanges of passive particles between different sub-areas in the Lakes. The model results demonstrate that the particle exchanges between several small bays over the western areas and main basins of the Lakes are much weaker than those between the two main basins (i.e., North Basin and Bras d’Or Lake), due to the restriction of narrow passages between the bays and the main basins. This study indicates that the 3D lake hydrodynamic model and the Lagrangian tracking module is very useful tools for ecologists and biologists in estimating disease dispersal in the Lakes.
German Lecturers

Prof. Dr. Franciscus Colijn

Born in July 1945

Education

Gymnasium Winschoten and Nijmegen, The Netherlands: final examination 1964
University of Groningen, NL: Biology with Microbiology, Limnology and Marine Botany, final examination 1971.
1983 PhD, University of Groningen, NL: Primary production of Phytoplankton and Microphytobenthos in the Ems-Dollard estuary

Work Experience

Since 1975: senior scientist at University of Groningen, NL: teaching botany, and marine biology.
Since 1.11.1994: professor in coastal ecology at the Research and Technology Centre of the University of Kiel, Germany: research on impacts of wind parks in the North Sea on higher trophic levels, eutrophication of coastal waters.
Since 1.10.2001: institute director at the HGF Research Centre Geesthacht, Institute for Coastal Research, Germany: Department Development of operational systems.
Several EU projects in the North Sea, e.g. FerryBox; ENCORAs, NOWESP; EUROCAT; Cooperation with Yantai Institute (China).

Research Areas / Memberships

Coastal zone management, role of higher trophic levels in marine systems, species diversity of phytoplankton, primary production of phytoplankton, flow-cytometry; Fe fertilisation experiment in the southern Atlantic (2003) with AWI (Smetacek); coastal observatories.
**Information on Lecturers**

Active in ICES since 20 years; Chair of WGs, Chair of OCC, EUROGOOS, SGGOOS, ESF/Marine Board; member of the DFG Senate Commission for Oceanography; speaker for the coastal part of the HGF Coastal programme (Marcopoli, PACES); Board of the newly formed Dutch Wadden Academy in Leeuwarden Wadden Sea Research, participation in ESF-Marine Board activities for EMODNET.

Main current issue: COSYNA (Coastal Observatory System for Northern and Arctic Waters (Large HGF investment >10 Mill.)

**Contact Information**

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**Dr. Marcus Elvert**

Born in 1968

*Education and Work Experience*

1988 - 1994: Studies of Chemistry, University of Kiel
1994 - 1995: Diploma work (equivalent to M.Sc.) at the Institute of Marine Sciences, Kiel, Dept. of Marine Chemistry
1996 - 1999: Research Assistant (PhD-student) at GEOMAR, Kiel, Dept. of Marine Environmental Geology
1999 - 2000: Research Associate (Post-Doc) at GEOMAR, Kiel, Dept. of Marine Environmental Geology
2000 - 2003: Research Associate (Post-Doc) at the Max-Planck-Institute for Marine Microbiology, Bremen, Dept. of Biogeochemistry
since 2003: Senior Research Associate, MARUM - Center for Marine Environmental Sciences, University of Bremen, Organic Geochemistry Group
Main Research

Organic Geochemistry and biomarker studies of marine environments; Biogeochemistry of methane formation and consumption; Development of new analytical methods in Organic Geochemistry.

Participation in Research Projects

1996 - 1999: NSERC Collaborative Special Project “Ultra-high resolution of climatic, oceanographic, biological and geochemical records in Saanich Inlet, British Columbia - Ocean Drilling Program Leg 169”; Research Assistant, Centre for Earth and Ocean Research, University of Victoria, Canada

2001 - 2007: Project MUMM “Methane in the Geo/Bio-System - Turnover, Metabolism, and Microbes”; BMBF/DFG-Initiative Geotechnolgies, Sub-project leader; Max-Planck-Institute for Marine Microbiology and Dept. of Geosciences, University Bremen, Bremen


Teaching

2003 - 2004: Biogeochemistry of Seawater and Sediments (Lecture)
2003 - 2005: Current Research in Organic Geochemistry and Biogeochemistry (Seminar series)
2003 - 2005: Analytical Procedures in Organic Geochemistry (Lecture)
2004: ECOLMAS (European Graduate College in Marine Sciences) course “Proxies in Paleoceanography: Basics and new developments - Molecular biomarkers”, University Bremen
2006: NEBROC (Netherlands - Bremen Oceanography ) and ECOLMAS(European Graduate College in Marine Sciences)
**Information on Lecturers**

Since 2003: Lab exercises in Organic Geochemistry (Practical course)
Since 2005: Molecular Geochemistry (Lecture)
Since 2006: Methods in Marine Biogeochemistry and Molecular Geochemistry (Lecture)
Since 2006: Molecular Paleontology (Lecture)
Since 2007: Organic Chemistry for Geoscientists (Lecture)

**Contact Information**

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**Mrs Marion Rademaker**

Born Born in 1951 in Groningen, the Netherlands

**Education**

1955 - 1968: Primary and secondary school, Groningen (the Netherlands)
1968 - 1972: Laboratory education for technician in Groningen
1972 - 1978: Preliminary scientific education in Groningen

**Work Experience**

1972 - 1978: The Ems-Dollard Project at the University of Groningen
1978 - 1988: Projects on fresh and marine phytoplankton in the Netherlands
Since 2004: Data management at the Working Group Marine Mammals and Birds of the Research and Technology Centre in Büsum (Germany)

Research Areas

Marine phytoplankton; toxic marine algae analysis; marine mammals

Contact Information

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Prof. Dr. Karsten Reise

Born in 1946

Education and Work Experience

Studies in Biology and Ecology at the Universities of Kiel, Würzburg, Göttingen (Germany), and California and Washington (US).

1976: Doctorate (Ph.D.) in Marine Zoology
1982 - 1990: Professor in Zoology, Göttingen
2001 - present: Professor in Coastal Ecology at Kiel University
1991 - 2000: Professor in Biological Oceanography, Hamburg
since 1998: Head of the Wadden Sea Station Sylt; this is an island facility of the Alfred Wegener Institute for Polar and Marine Research (AWI), which is member of the Helmholtz Association of German Research Centres (HGF).
since 2001: Professor in Coastal Ecology at Kiel University
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**Information on Lecturers**

**Research Areas**

Shore ecology: Field experiments on species interactions in intertidal sediments.

Benthic long-term change caused by exploitation of marine living resources.

Ecosystem research on coastal exchange processes in the North Sea.

Ecological history: Interdisciplinary reconstruction of the past millennium at the coast.

Effects of climate change on coastal biota of the North Sea.

Biological globalisation under water: Consequences of species introduction.

Arctic coastal ecology.

**Contact Information**

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Alfred Wegener Institute for Polar and Marine Research  
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Fax: +49-4651-956200  
Email: karsten.reise@awi.de

**Dr. Angela Schaefer**

Born in 1967

**Academic Career and Employments**

1988 - 1995: Studies of Applied Geology, University of Erlangen


1994: Diploma (M.Sc.) in Geology, University of Erlangen, Germany

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Information on Lecturers

1995 - 1996: Environmental Consultancy, Dr. Eisenbarth & Partner, Königsee, Germany
1996 - 1999: Doctoral fellowship of the German Research Foundation at GEOMAR, Kiel, Dept. of Marine Environmental Geology, Germany
2000: Dissertation in marine Geosciences at University of Kiel, Germany
1999 - 2000: Scientific assistant at GEOMAR Research Center for Marine Geosciences in Kiel, Germany
2000 - 2004: Research Associate (Post-Doc) at the Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany
2004 - 2005: Research Associate and GIS Lab Manager at International University of Bremen
2005 - 2009: Instructor of Geographic Information Sciences and Senior Research Associate at Jacobs University Bremen, Germany

Main Research

Marine GIS: modeling, analysis and visualization & marine habitat mapping; WebGIS and distributed data management; Web based geodata infrastructure and international standardization; Sensor Web Enablement and SensorML.

Research Projects

- “Long-term, real-time, sensor web enabled environmental seabed monitoring for ESONET & StatoilHydro”, originator
- HERMES "Hotspot Ecosystems Research on the Margins of European Seas", WebGIS
- CORAMM “Coral Risk Assessment, Monitoring and Modeling”, GIS
- IRCCM “International Research Consortium on Continental Margins”, data management
- MarGIS "A marine GIS to visualize and regionalize marine geodata", WebGIS
- METROL "Methane flux control in ocean margin sediments", WebGIS
- Sub-Gate "Submarine groundwater-fluxes and transport-processes from methane rich coastal sedimentary environments"
Information on Lecturers

- Dissertation "Regional modeling and calculation of marine organic Carbon flux with GIS"

Teaching

2001: Lecture for relational database management, Univ. Bremen
2002: Introductory lecture in Desktop GIS, Univ. Bremen
2003: Module: Database and GIS at POMOR Master Program for Applied Polar and Marine Sciences, St. Petersburg, Russia
2003: Lecture in "Practical application of GIS in marine sciences", Univ. Bremen
2004 - 2009: Jacobs University Bremen: Geo Information Systems, Spatial Data Infrastructure, modeling and visualization, data management

since 2006: GIS Lecturer at "Informatica Feminale" – summer studies at University Bremen
since 2008: Faculty member of ESSReS “Earth System Science Research School”, PhD

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Dr. WANG Qiang

Born in 1977 in Shandong, China

Education

1996 - 2000: Bachelor, Illuminating Engineering and Light Sources, Fudan University, China
2000 - 2003: Master, Physical Electronics, Fudan University, China
2003 - 2004: Certificate, Environmental Physics, University of Bremen, Germany
2004 - 2007: PhD (Dr. rer. nat.), University of Bremen and Alfred Wegener Institute, Germany

Experience

2000 - 2003: Coordinator for a class of bachelor students, Fudan University, Shanghai, China
since 2007: Postdoc, Alfred Wegener Institute, Bremerhaven, Germany

Current Research Focus

- Development of FEOM (Finite Element Ocean circulation Model)
- Overflow dynamics and bottom water formation in the Weddell Sea and Ross Sea
- Model intercomparison of ocean-ice simulations in Arctic and global setups

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Information on Lecturers

Dr. Florian Claus Weinberger

Born in 1961

Education

1968 - 1981: Primary and secondary school, Hamburg
1981 - 1983: Civil Service
1984 - 1991: University of Hamburg
1991: Diploma Biology
1996 - 1999: Graduate student in Biology at Kiel, Germany
1999: Ph.D. in Microbiology

Work Experience

1991 - 1993: Researcher, Hamburg University
1993 - 1995: Scientist, Silva Jardim, Brazil
1995: Scientist, Haifa, Israel
1999 - 2005: Postdoctoral Researcher, Roscoff, France
since 2005: Scientist at Marine Ecology Research Division, Leibniz Institute of Marine Sciences (IFM-GEOMAR)

Awards

1991 - 1993: Fellowship sponsored by Biologische Anstalt Helgoland
1996 - 1999: Fellowship sponsored by MINERVA foundation

Research Areas

- Marine chemical interactions;
- Defence mechanisms;
- Molecular signalling, recognition and communication;
- Seaweed-microbe and seaweed-grazer interactions;
- Fouling and epiphytism; algal innate immunity; invasion ecology
Contact Information

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Prof. Dr. Dieter Wolf-Gladrow

Born in April 1953

Education

1980: Diploma in Physics, University of Braunschweig, Germany
1985: Ph.D in Physics, University of Köln, Germany
1996: Habilitation in Environmental Physics at University of Bremen

Professional Experience

1985 - 1987: Post-Doc at University of Köln
1987 - 1990: Post-Doc at Alfred Wegener Institute for Polar and Marine Research (AWI)
since 1990: Senior Scientist at AWI
since 1999: Professor for Theoretical Marine Ecology at the University of Bremen
since 2004: Head of AWI-Section 'Marine Biogeosciences' (currently 25 persons)

Research Areas

Marine biogeochemistry, mechanistic understanding of paleo-proxies, Lattice Boltzmann Models
Information on Lecturers

Committee Memberships

1998 - 2006: Scientific Board of the Institute for Baltic Research, Warnemünde
since 2008: Member of the Academic Council of the Helmholtz Research School on Earth System Science (ESSReS; earth-system-science.org)
since 2006: Member of the Executive Board of the Bremen International Graduate School for Marine Sciences ‘Global Change in the Marine Realm’ (GLOMAR) www.glomar.uni-bremen.de
since 2005: Scientific Steering Committee of CARBOOCEAN (European Integrated Programme)
since 2004: SCOR/IMAGES Working Group 124 on Analyzing Links Between Present Oceanic Processes and Paleo-Records (LINKS); SCOR = Scientific Committee on Oceanic Research; IMAGES = International Marine Past Global Changes

Teaching

since 1999: Courses in the Biology Division at the University of Bremen
since 2003: Courses in the framework of the International Max Planck Research School for Marine Microbiology (MARMIC); http://marmic.mpg.de/marmic_cms/overview.php
since 2007: GLOMAR
since 2008: ESSReS
since 2009: Helmholtz Graduate School for Polar and Marine Research (POLMAR); http://polmar.awi.de/

Referee

Information on Lecturers

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Chinese Lecturers

Ass. Prof. Dr. CHEN Xueen

Work Experience

1994 - 1997: Institute of Physical Oceanography, Ocean University of China, Research Associate
1999 - 2006: Institute of Physical Oceanography, Ocean University of China, Lecturer
2002 - 2004: Institute of Oceanography, Centre for Marine and Atmosphere Science, University of Hamburg; Research Associate
2005 - 2006: Centre for Marine and Atmosphere Science, University of Hamburg; Research scientist
2006 - 2007: AWI, Bremenhaven, Germany; Research scientist
since 2007: Ocean University of China, Qingdao, China; Associate Professor; research scientist

Research Areas

• Operational Oceanography: Dynamics of shelf, marginal and coastal seas, Tidal currents and heights over Chinese Shelf, Tidal-power generation, Storm surges, Ocean observing systems, Oceanographic database, Data assimilation.
• Climate Changes: Coupled climate modelling, Sea level and climate changes, Atmosphere-sea-ice-land-ocean interactions, Impact of polar processes on global ocean, Global carbon cycling.
Information on Lecturers

Contact Information

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Dr. DING Haibing

Education

1993: BS in Chemistry, Ocean University of Qingdao (Now China Ocean University), China
1997: MS in Chemistry, Ocean University of Qingdao (Now China Ocean University), China
1999: MA in Molecular, Cellular and Developmental Biology, University of California, Santa Barbara
2004: Ph.D, Oceanography, University of Georgia
2005 - 2009: Post-doctorate Researcher and Senior Research Associate, University of California, Santa Barbara

Working and Teaching experience

1993 - 1994: Participate in the design and assemble of several new generations of refrigerator in Qingdao Aucma Electric Appliance Company
2003: TA assistant in marine biology, University of Georgia
2006: Mentor of California Nanosystem Institute

Awards and Fellowships

• Several excellent student awards in undergraduate and graduate studies
Information on Lecturers

from Ocean University of Qingdao

• Second prize award for metal anti-corrosion research, 1993. ShanDong Province Science and Technology Competition for Undergraduate Students.
• Graduate Fellowship from University of California at Santa Barbara, 1999
• Graduate School travel grant from University of Georgia, 2004
• Chinese-American Oceanic and Atmospheric Association travel grant, 2007

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Ass. Prof. Dr. LI Zhengyan

Background Information

Dr. LI received his bachelor’s degree from Department of Ecology and Environmental Biology of Nanjing University in 1992 and Ph.D. degree from Swire Institute of Marine Science of the University of Hong Kong in 2000. He went to Korea Ocean Research and Development Institute for one year’s postdoctoral fellowship in 2002. Since 2003, he has been working at College of Environmental Science and Engineering, Ocean University of China. Dr. Li’s research interests include environmental distribution of organic pollutants, biological effects of chemical pollutants, ecotoxicology of endocrine disruptors, and marine ecological risk assessment. Now he is the Associate Professor of Environmental Science at Ocean University of China.
Information on Lecturers

Research Areas

- Biological effects and biomarkers of persistent organic pollutants
- Environmental distribution and ecotoxicology of endocrine disruptors
- Marine environmental quality assessment and monitoring
- Environmental monitoring through bioassay and biomarker techniques

Current research projects

- Environmental distribution and ecological risks of alkylphenolic endocrine disruptors in coastal areas of China
- Chlorophyll distribution and primary productivity in Yellow Sea of China.
- Ecological quality assessment and zoning in estuarine area

Contact Information

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Ass. Prof. Dr. PAN Jinfen

Born in 1974

Education and Work Experience

2004: Doctorate (Ph.D.) in marine biology, Hong Kong University of Science and Technology
Information on Lecturers

since 2005: Lecturer/associated professor in environmental chemistry and ecotoxicology, Ocean University of China

Research Areas

- Environmental chemistry: Field studies on metal speciation, transportation, bioavailability and other environmental process in wetland, coastal waters and sediments
- Effects of coastal eutrophication on metal bioavailability (e.g., influences of seagrass, green algae degradation) in the coastal environments
- Ecotoxicology of metals on marine organisms and their biomonitoring

Contact Information

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Ass. Prof. Dr. REN Jingling

Education

1991 - 1995: Department of Chemistry, Beijing Normal University, B.S. of chemistry
1995 -1998: College of Chemistry and Chemical Engineering, The Ocean University of Qingdao, M.S. of marine chemistry
2003: College of Chemistry and Chemical Engineering, The Ocean University of China, Ph.D. of marine chemistry
Information on Lecturers

Teaching

- Experiment of Analytic Chemistry for sophomore students
- Analytical Chemistry for junior students
- Experiment of Instrument Analysis for senior students
- Trace Analysis for postgraduate students

Work Experience

1998 - 2000: Assistant Lecturer, College of Chemistry and Chemical Engineering, Ocean University of Qingdao
2001 - 2005: Lecturer, College of Chemistry and Chemical Engineering, Ocean University of China
since 2005: Associate Professor, College of Chemistry and Chemical Engineering, Ocean University of China
1999: Research fellow, Korean Ocean Research and Development Institute
2006: Research fellow, Bremen University and Center for Tropical Marine Ecology, Germany

Research Areas

- Improvement of the fluorimetric determination method of aluminum in natural waters
- The distribution of aluminum, arsenic and selenium in river, estuary and ocean system
- Initial work on the analysis of marine colloidal metal
- Scavenging mechanism of aluminum by biogenic particles and their records in the sediments
- The trace metal pollution of estuarine and coastal sediments

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Prof. Dr. XUE Guifang

Brief Introduction

Prof. Dr. XUE Guifang (Julia) is the Director and Professor of the Law of the Sea Institute, Chair of International Law of the Faculty for Law and Politics, Ocean University of China (OUC). She got her PhD at the Centre for Maritime Policy, University of Wollongong, Australia. Her thesis entitled China’s Response to International Fisheries Law and Policy: National Action and Regional Cooperation was published by Martinus Nijhoff Publishers under the series of Publications on Ocean Development.

She has extensive research interests and practical experiences in the areas of the United Nations Convention on the Law of the Sea (LOSC), the state practice on the LOSC, ocean-related legislation and management, marine environmental protection, coastal zone management, and international fisheries law and policy. She involves actively in academic activities home and abroad and has published widely on these issues.

Besides the day-to-day function of the Law of the Sea Institute, she takes responsibilities for funding application and project operation. She chairs governmental funded projects for drafting up national marine laws and regulations, provides consultancy on policy-making to ocean-related ministries and governmental agencies, and conducts training courses for their administratvie personnels and enforcement teams.

She hosts English course for international students, bilingual courses to master students and PhD candidates on Marine Laws, LOSC & International Fisheries Agreements, and International Law of the Sea and Marine Affairs. She supervises postgraduates in International Law, Ocean Governance and Resource Management.
Information on Lecturers

Projects Completed/Conducting

- Experiment of Analytic Chemistry for sophomore students
- Analytical Chemistry for junior students
- Experiment of Instrument Analysis for senior students
- Trace Analysis for postgraduate students

Work Experience

- 3. Amendment of Management Regulations of Prevention of Marine Environment Pollution by Construction of Costal Projects, sponsored by the State Environmental Protection Administration (SEPA);
- National Reports on Legal Aspects of Northwest Pacific Ocean and Costal Area Protection, sponsored by SEPA, 2005;
- Amendment of Regulations of the People’s Republic of China on Control of Waste-dumping in Oceans and relevant legislative reports, sponsored by SOA, 2005;
- Management Regulations on Marine Environment Monitor and Prediction and relevant legislative reports, sponsored by SOA, 2005;
- Management Measures on Special Marine Environmental Zones and relevant legislative reports, sponsored by SOA, 2005;
- Regulations on Eco-environmental Protection of Fishery Waters and relevant legislative reports, sponsored by the Ministry of Agriculture, 2005;
- Regional Overview on Legal Instruments, Institutional Arrangements and Programmes related to the NOWPAP Marine Litter, sponsored by UNEP, 2006;
- Regional Overview of Legal Aspects of the Protection and Management of the Marine and Coastal Environment of the NOWPAP Region, sponsored by UNEP, 2006;
Information on Lecturers

- Legislative Studies for the Environmental Protection of Fisheries Water, Sponsored by the Ministry of Agricultures; 2006.

Contact Information

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Dr. YANG Bo

Born in 1974

Education

1997: B.S. Ocean University of China
2004: Ph.D. Institute of Oceanology, Chinese Academy of Sciences, China
2005 - 2007: PostDoc at Dalhousie University, Canada

Work Experience

2004 - 2005: Assistant Researcher, the First Institute of Oceanography, State Oceanic Administration, China
since 2005: Teacher at Ocean University of China
Information on Lecturers

2007 - 2008: Research Associate at Dalhousie University, Canada
2000: Visiting Scientist, Hong Kong University of Science and technology, Hong Kong
2001 - 2002: Visiting Scientist, Hong Kong University of Science and technology, Hong Kong

Research Areas

- Physical processes over coastal waters and shelf seas
- Numerical predictions of coastal and shelf circulations
- Retention and connectivity of chemical and biological materials in the ocean

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Ass. Prof. Dr. ZHANG Runqiu

Born in 1976

Education

1996: B.Sc. in Chemistry and B.Sc.in computer science at Shanghai Jiaotong Universities, Shanghai, China
2002: M.S in Physical Oceanography at Ocean University of China, (OUC) Qingdao, China
2007: Ph.D. in Environment Planning and Administration, OUC
since 2008: Ass. Professor in Marine Management, OUC
Research Areas

• Integrated Coastal Area Management (ICAM): ICAM is a process that unites government and the community, science and management, sectoral and public interests in preparing and implementing an integrated plan for the protection and development of coastal ecosystems and resources.

• Marine resources sustainable exploitation & utilization: Nowadays, research on marine sustainable development has become the frontier and hot domain of multi-interdisciplines. And marine resources sustainable exploitation & utilization indicators and assessment models are the core contents of the research, and are also the theoretical basis of comprehensive valuation and integrated management practice. Therefore, to study on its indicators and establish assessment models are very important in theory and extremely indispensable in practice.

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Cellphone: +86-139-6395 6191
Email: Runqiu_zhang@sina.com

Specially Invited Lecturers from University of Alabama, USA

Dr. Andrew M. Goodliffe

Born in 1967

Education

1989: B.Sc. (hons.) Applied Geology with Physics (first class), Polytechnic South West
1993: M.S. Geophysics, University of Alaska Fairbanks
Information on Lecturers

1998: Ph.D. Geology and Geophysics, University of Hawai‘i at Manoa

Academic Experience

1989 - 1992: Research Assistant: University of Alaska Fairbanks
1995 - 1997: 
1998 - 2000: Postdoctoral Researcher: Department of Geology and Geophysics, University of Hawai‘i at Manoa

2000 - 2003: Assistant Researcher: Hawai‘i Institute of Geophysics and Planetology, University of Hawai‘i at Manoa

since 2005: Graduate Program Director: Department of Geological Sciences, University of Alabama

since 2004: Assistant Professor: Department of Geological Sciences, University of Alabama

since 2009: Associate Professor: Department of Geological Sciences, University of Alabama

Teaching

- Undergraduate level
- Introduction to Physical Geology
- Sustainable Earth
- Introduction to Geophysics
- Graduate level
- Scientific Computing
- Multi-Channel Seismic Processing and Interpretation
- Tectonics Seminar
- Introductory Geology for Graduate Students
- Marine Geophysics
- Academic committee chair for three past UA graduate students (M.S.), two present UA students (one Ph.D., one M.S.), member for nine others
- Undergraduate research project supervisor for three UA undergraduate students and two IRIS REU students
Scholarships and Awards Received

- Honorable mention in the Outstanding Student Paper evaluation, AGU Fall 1996 meeting

Professional Memberships

- American Geophysical Union
- Society of Exploration Geophysicists.
- American Association of Petroleum Geologists
- National Association of Geoscience Teachers

Special Interests

- The use of active and collaborative learning techniques in a large classroom setting
- The use of computational and visualization techniques to demonstrate and solve problems in the classroom
- The design and implementation of teaching modules using data from current research projects
- The use of geophysical techniques to solve tectonic problems
- Rifting and the transition to seafloor spreading in continental and back-arc environments
- Spreading center reorientation
- Evolution of young ocean basins
- Reconstructions of ocean basin evolution

Contact Information

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Fax: +1-205-348-0818
E-mail: amg@ua.edu
http://www.geo.ua.edu/AMG
Information on Lecturers

Mr Milo Cameron

Education

1992: The University of Alabama at Huntsville Alabama, B.S. Mathematics; Minor: Chemistry
1995 - 1997: University of Tennessee at Knoxville, M.S. in Geology
since 2006: The University of Alabama at Tuscaloosa, Pursuing a Ph.D

Work Experience

1995 - 1997: The University of Tennessee, Geology Teaching Assistant; Duties included: instructing the Introductory Geology, and the Mineralogy labs
2007: Research Assistant: Helped to describe, and catalogue information from the cores, seismic lines, and well logs, for the Little Cedar Creek Field, Alabama and the North Louisiana Salt Basin
since 2006: Graduate Teaching Assistant: The University of Alabama

Contact Information

Mr Milo Cameron
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### Information on Students

#### German Students

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<thead>
<tr>
<th>Name</th>
<th>Major Subject</th>
<th>Educational Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ms Sophie Bodenstein</td>
<td>Biological Oceanography</td>
<td>Diplom-Student; IFM-GEOMAR</td>
</tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>Mr Stefan Bötel</td>
<td>Environmental and</td>
<td>MSc-Student; PEP- Programme, Univ. Bremen</td>
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<td></td>
</tr>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>Ms Regine Hermann</td>
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<td>PhD-Student; Univ. Kiel</td>
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<tr>
<td>Mr Harald Schunck</td>
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<td>of tropical photosynthetic</td>
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<td>diazotrophic cyanobacteria</td>
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<tr>
<td>Mr Scarlett Sett</td>
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<td>MSc-Student; IFM-GEOMAR</td>
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<tr>
<td>Ms Sabine Schrüneder</td>
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</tbody>
</table>
Information on Students

<table>
<thead>
<tr>
<th>Name</th>
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</thead>
<tbody>
<tr>
<td>Mr Esteban Acevedo Trejos</td>
<td>Marine Ecology</td>
<td>MSc-Student; ISATEC-Programme, Univ. Bremen</td>
</tr>
<tr>
<td>Mr Benjamin Weigel</td>
<td>Biological Oceanography</td>
<td>Diplom-Student; IFM-GEOMAR</td>
</tr>
<tr>
<td>Ms GAO Kun</td>
<td>Analyzing CTD and LADCP dataset, numerical modeling on internal tides</td>
<td>MSc-Student; College of Physical and Environmental Oceanography</td>
</tr>
<tr>
<td>Ms HAN Bing</td>
<td>Mesoscale Eddies and ocean mixing by numerical modeling</td>
<td>MSc-Student; College of Physical and Environmental Oceanography</td>
</tr>
<tr>
<td>Ms LI Peipei</td>
<td>Biogeochemistry of biogenic gases</td>
<td>MSc-Student; College of Chemistry and Chemical Engineering</td>
</tr>
</tbody>
</table>

OUC Students

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<tbody>
<tr>
<td>Mr CAO Lu</td>
<td>Biogeochemistry of biogenic silica</td>
<td>PhD-Student; College of Chemistry and Chemical Engineering</td>
</tr>
<tr>
<td>Mr GAO Kun</td>
<td>Analyzing CTD and LADCP dataset, numerical modeling on internal tides</td>
<td>MSc-Student; College of Physical and Environmental Oceanography</td>
</tr>
<tr>
<td>Ms GAO Kun</td>
<td>International law specializing in ocean management</td>
<td>MSc-Student; School of Law and Political Science</td>
</tr>
<tr>
<td>Mr GUO Chuncheng</td>
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<td>MSc-Student; College of Physical and Environmental Oceanography</td>
</tr>
<tr>
<td>Ms HAN Bing</td>
<td>Mesoscale Eddies and ocean mixing by numerical modeling</td>
<td>MSc-Student; College of Physical and Environmental Oceanography</td>
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<td>MSc-Student; College of Chemistry and Chemical Engineering</td>
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<tr>
<td>Name</td>
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</tbody>
</table>
### Information on Students

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<tr>
<th>Name</th>
<th>Discipline</th>
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<tbody>
<tr>
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</table>
Registration

Registration will be on Saturday, July 18 from 17:00 to 18:30 at the Qihai Hotel in Qingdao.

Accommodation

Qihai Hotel
126 Xianggang Zhong Lu (Middle Hongkong Road)
Tel: 0532-8587 9500

Transportation

Ocean University of China will be responsible for transportation between the airport and the campus and other venues for group activities in Qingdao.

If you want to take local city buses, you are advised to have exact change (in most cases 1.00 yuan RMB) since most buses operate with an automatic cash-ticketing system.

Taxis are all air-conditioned and can be easily flagged down along the street. The initial fare for most taxis is 7.00 yuan RMB, which covers the first 3 km. The fare is then 1.20 yuan RMB per km. For some taxis, the fare may reach 1.70 yuan RMB per km. A 50% surcharge will be added automatically for all taxis between 22:00 and 06:00.

Meals

Breakfast, lunch and dinner are available for all registered participants. Breakfast is served in Hotel and all participants have lunch at the university cafeteria. Dinner is offered at various places depending on the day’s program.
General Information

Banks and Currency

Money exchange services can be provided at the front desks of hotels with three-, four-, or five-stars and the Bank of China. Major credit cards, such as Visa and American Express are acceptable in many big stores and hotels. However, German guests are kindly recommended to prepare some RMB in cash for other occasions where credit cards cannot be used.

Post, Fax and Internet

Postal services and facsimile communication are available in the Secretariat Office. Internet connection is available in your hotel room if you bring your lap-top with you. Please go to the Reception Desk of the hotel to open the Internet connection service.

Shopping

The major shopping centers are located near the hotel (20 minutes walk or closer): CARREFOUR Supermarket, JUSCO Supermarket and MYKAL shopping mall.

Phone Numbers in Common Use in Qingdao

Report to the Police 110
First Aid 120
Fire Alarm 119
Airport 96567
Air Ticket Booking 8577 5555
Railway Station 9510 5175
Train Ticket Booking 9510 5105
Contact

Secretariat

The Fifth Sino-German Summer School Secretariat is at Room 3206 on the second floor of the Guanhai Building in the hotel. The Secretariat will be at your service from 07:00 to 22:00 from July 18 to 31, 2009.

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Coordinators

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Notice

Notice

• Please read the agenda carefully for timely presence at the programs.

• Please turn off your mobile phone or leave it mute during the workshop.

• Please take care of your mini-bar expenses when you leave the Hotel. Application has to be made at the front desk before IDD can be opened at your hotel room. The telephone bill is on your own expenses.

• Please inform the secretariat if you leave the hotel ahead of the schedule.

• Please leave the postal services and facsimile communication to hotel front desk.

• Internet connection is available in your hotel room if you bring your lap-top with you.
Sino-German Initiative on Marine Sciences:
Funded by the German Federal Ministry of Education and Research (BMBF) and the Ministry of Education of the People’s Republic of China (MoE)

Host: Ocean University of China
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Editor & Layout: LIU Yue