Currently the International Max Planck Research School on Earth System Modelling (IMPRS-ESM) is calling for application for

1 Doctoral Position

which will be allocated at one of the involved UHH research groups. Please visit http://www.earthsystemschool.mpg.de/Call-2010.200.0.html to review the scientific questions pursued in the UHH research groups involved in IMPRS-ESM.

Proposed doctoral research topics are:

Proposed PhD topics

ID:	**2011-UHH-01**
PhD Topic:	**Climate Change and Agricultural Production in India** **- A High-Resolution Spatial Scale Analysis**
Supervisors:	Prof. H. **Held** (Sustainability & Global Change (SGC)); Prof. M. **Funke** (Department of Economics); Dr. U. **Schneider** (SGC)
Abstract:	Possible research questions include but are not limited to: • How do projected changes in climate and weather variability affect risk averse agricultural decision makers? • What are the agricultural cost of climate change? • What is the competitive economic potential of adaptation and mitigation strategies to climate change? • How does climate change affect agricultural externalities (water and food pollution, land degradation, greenhouse gas emissions, biodiversity decline)? • What are the benefits of early warning systems (reg. extreme events) for Indian farmers and consumers of agricultural products? • What are the benefits of high spatial resolution assessments and for the regulation of land externalities? • How does climate change impact optimal agricultural research spending? The successful candidate is expected to have a reasonably good knowledge of Indian agriculture. He/she should employ both biophysical and economic modeling tools to address relevant research questions within the indicated topic.

Proposed PhD topics

ID:	**2011-UHH-02**
PhD Topic:	**The role of meso-scale turbulent mixing for the ocean circulation**
Supervisor:	Prof. C. **Eden** (Institute of Oceanography)
Abstract:	This research topic is concerned with the role of geostrophically balanced turbulence for the large-scale ocean dynamics and in particular its role for mixing of density, momentum and water mass characteristics. Meso-scale mixing processes are not resolved by earth system models, but are known to play an important role for e.g. the large-scale dynamics and lateral transports of e.g. the carbon content of the ocean. The anticipated work will involve theoretical aspects, numerical modelling and the use of available observations to understand and to parameterize the meso-scale mixing processes in earth system models.
ID:	**2011-UHH-03**
PhD Topic:	**Atmospheric wave breaking in very high resolution model**
Supervisor:	Prof. K. **Fraedrich** (Meteorological Institute)
Abstract:	Breaking of synoptic waves is a fundamental nonlinear process in geophysical fluid dynamics and responsible for the interaction of wave and the mean flow. The wave breaking process is usually studied in general circulation models and data with moderate resolution only. The aim of this thesis is to study wave breaking in the troposphere and the stratospheric, the seasonality and the impacts. A major interest lies in the sensitivity with respect to model resolution and external forcings like orography. The high resolution model environment and the diagnostic tools are available [Kunz et al., 2009, Quart. J. Roy. Meteorol. Soc.].
ID:	**2011-UHH-04**
PhD Topic:	**Climate impact of lakes**
Supervisor:	Prof. K. **Fraedrich** (Meteorological Institute)
Abstract:	Lakes are found in arid, temperate and polar climatic regions with

Proposed PhD topics

	sizes and properties varying on wide ranges and time scales. For example, large lakes have been found at the final stages of the ice age, and will be jeopardized by water withdrawal and warmer climate conditions. The aim of this project is to study the climatic impacts of lakes in different climatic zones and for different global climate conditions. Based on model simulations the understanding of the interaction processes should be fostered with applications for parameterization in numerical models.
ID:	**2011-UHH-05**
PhD Topic:	**Monitoring and Predicting the Large-Scale Ocean Circulation**
Supervisor:	Prof. J. **Baehr** (Institute of Oceanography)
Abstract:	My group's overall goal is to contribute to the understanding of the large- scale ocean circulation and its role in the climate system. As a tool, we employ numerical models to study timescales of variability of oceanic quantities. Most of our research combines numerical models with observations through data assimilation. Our studies focus on the predictability of the ocean circulation on seasonal to decadal timescales, and the observing system required to facilitate the detection and prediction of changes in the ocean circulation. Within this general framework, a potential PhD student in my group could work on a project tailored to the interests of the student. General topics - to be further specified - could for example be: • observing system design (either conceptual or testing a specific concept prior to deployment for a real campaign), or • testing advanced data assimilation methods in one or more components of the climate system (e.g., ocean, atmosphere, cryosphere, ...) to ultimately improve predictions.