PhD Student Position at IST-MARETEC - Ocean CO₂ Modelling

MARETEC and GEOMAR are looking for an excellent, highly motivated PhD student with a keen interest in ocean carbon processes in order to model anthropogenic CO₂ uptake by the ocean, leading to ocean acidification, in relation to ocean heat uptake. The MOHID model (http://mohid.com/) will be utilised for this task. The PhD student will be working in a multidisciplinary research project related to the European Marine Strategy Framework Directive (MSFD, 2008/56/EC).

THE RESEARCH GROUP

MARETEC (http://maretec.org/) is a Research Centre of the Instituto Superior Técnico (http://tecnico.ulisboa.pt/) for Marine, Environment and Technology based in Lisbon, Portugal. Currently, MARETEC is involved in several multi-disciplinary projects related to climate change impacts and adaptation, sustainable environment and human perturbations, sea level rise impacts to water quality, storm surge and flooding vulnerability, and extraction of renewable energy from the oceans.

The GEOMAR Helmholtz Centre for Ocean Research Kiel is among the largest non-university research institutions in the field of marine sciences in Germany (1000 staff, incl. 400 experienced scientists). It is a member of the Helmholtz Association, Germany's largest non-university scientific organisation. The centre's mandate is inter- and multidisciplinary investigation of all relevant aspects of modern marine sciences, from sea floor geology through physical, chemical and biological oceanography to marine meteorology. Research is conducted worldwide in all oceans. The main research topics are grouped in four divisions: Ocean Circulation and Climate Dynamics, Marine Biogeochemistry, Marine Ecology, and Dynamics of the Ocean Floor. Its publication record and research grant funding is leading in these fields. GEOMAR cooperates closely with national and international research institutions and with a number of SMEs active in marine technology and science. The PhD degrees of projects conducted at GEOMAR are issued by the University of Kiel.

The selected candidate will have the opportunity to participate in the modelling activities at MARETEC and marine sciences at GEOMAR, which include modelling and observations of physical, chemical, and biological processes within fresh- and salt-water systems coupled to landscapes, atmospheric processes, and human systems.

THE PROJECT

The activities developed by the successful candidate will be developed within the European project iFADO (innovation in the framework of the Atlantic Framework Directive; http://www.ifado.eu/). The iFADO project is a European project funded with ERDF funds from the INTERREG Atlantic Area Programme (http://atlanticarea.eu/) that will develop its activities during the period November 2018-2021. The project will demonstrate the application of innovative products by providing answers to the MSFD. The project will combine traditional monitoring with cost-effective, state-of-the-art technologies: remote sensing, numerical modelling and emerging observation platforms such as gliders and new sensors.

THE BACKGROUND

The oceans play an important role in the global carbon cycle, and absorb 25-30% of anthropogenic carbon. The oceans are also warming, and the regions with largest heat uptake are possibly also important CO₂ sinks. The CO₂ uptake results in ocean acidification. Ocean acidification has been identified as one of the main threats to marine life and though is relatively a newcomer on the policy side, it will become one of to the top of marine conservation issues in the next future. For this reason, initiatives such as the Global Ocean Acidification Observing Network (http://goa-on.org/) were generated at the international level. And though ocean acidification is not a listed pressure in Annex III of the Directive, the iFADO project will evaluate data and will model indicators allowing delivering information to the competent authorities involved in the project.

Position responsibilities include improving and extending the existing MOHID Water Modelling System to incorporate new features related to carbon chemistry and biogeochemical processes in order to enhance the processes related to ocean acidification. These new features will then be implemented and tested in real ecosystem conditions i.e. the European Atlantic region (EAR). Model experiments will be run to explore the hypothesis of simultaneous uptake of anthropogenic CO₂ and heat.
The successful candidate must demonstrate prior experience in conducting oceanographic modelling based research using one or more of the leading state of the art 3-D ocean models and interest in the simulation of the carbon cycle.

**THE CANDIDATE**

MARETEC and GEOMAR invite applications from recent coastal, environmental, civil, oceanography or engineering graduates specializing in coastal hydrodynamic and biogeochemical modelling and analysis. The candidate should preferably have:

- Background in biogeochemistry in the context of modelling and analysis;
- Some knowledge on hydrological/biogeochemical modelling;
- Demonstrated proficiency in scientific programming languages such as Fortran and C/C++;
- Some knowledge in shell scripting and/or data languages used to analyse and interpret large spatial data sets (Matlab, R, Python).

**PERSONAL ABILITIES**

The candidate needs to be flexible, innovative and cooperative, and wish to work in a broad interdisciplinary scientific research group. The candidate should be able to work in a team, but also independently and able to communicate easily in English, both verbally and in writing.

**CONDITIONS**

The selected candidates will join a well-established group of coastal and ocean modellers at IST in Lisbon, and marine biogeochemists at GEOMAR. We offer you a fulltime position for 4 years. The student will receive a PhD grant from IST or IST-ID or IMAR with a salary according to the highest degree achieved related to the FCT values [https://www.fct.pt/apoios/bolsas/valores.phtml.en](https://www.fct.pt/apoios/bolsas/valores.phtml.en) plus the amount to cover the Portuguese voluntary social security system. The PhD degree will be jointly between the University of Lisbon (Portugal) and the University of Kiel (Germany).

**APPLICATION**

Please send your complete application (CV, letter of motivation, contact information of three references) to Dr. Francisco Campuzano (campuzanofj.maretec@tecnico.ulisboa.pt), Professor Ramiro Neves (ramiro.neves@tecnico.ulisboa.pt) and Professor Eric Achterberg (eachterberg@geomar.de).

A first evaluation of applications will be performed on the 31st of January 2019. If a suitable candidate is found, the position will be closed. Please add the reference “Ocean CO2 PhD position” in the subject of your email.