

## Master's Project

The place of employment is Geesthacht, Germany.



Centre for Materials and Coastal Research

The Helmholtz-Zentrum Geesthacht (HZG), Centre for Materials and Coastal Research, is located near Hamburg. You can find more

information at <http://www.hzg.de>. The Institute of Coastal Research investigates the physical and biogeochemical dynamics of the coastal ocean and the impact of anthropogenic influences on the natural state.

### Introduction

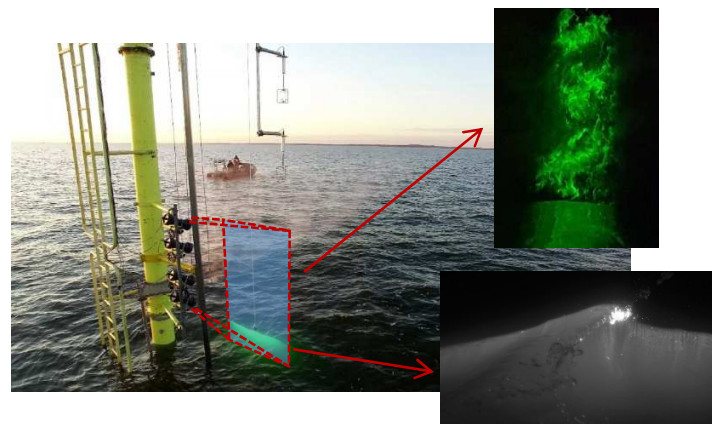
Understanding and quantifying energy and scalar fluxes across the air-sea interface are crucial for a number of environmental challenges, including weather, climate and sea state forecasting. The Air-Sea Interaction group at the Institute of Coastal Research conducts laboratory and field based research, **using novel imaging techniques** to investigate small-scale turbulent dynamics within the coupled atmospheric and oceanic boundary layers. Particular focus is given to ocean surface waves, and how they influence ocean-atmosphere interactions.

### Research objective

Understanding and parametrizing the dynamics of the wavy water surface as a function of wind stress, using stereo imaging techniques.

### Approach

- Literature review of **stereo particle tracking velocimetry and ocean surface reconstruction from stereo imaging**.
- Field work: Assisting in the designing, planning and performing field (coastal waters) experiments from a small platform, using state-of-the-art imaging techniques
- Analysis of stereo images of wavy water surface and of particles at the surface, and reconstruction of water surface elevation and estimate of Lagrangian surface particle motions.
- **Estimate the partitioning of measured surface motions between Stokes drift, wind drift, orbital motions...**
- Parametrize observed dynamics as a function of wind stress and relevant parameters.



### Essential qualifications:

- a Bachelor's degree in oceanography, geosciences, physics, mechanics or related disciplines
- programming skills in one or more languages (Matlab, Python, R, C, Fortran)
- excellent knowledge of English (written and spoken)
- high degree of motivation, creativity, and flexibility
- ability and willingness to participate in sea-going research

### Starting period:

Field measurements will be carried out between July and October 2019, so the preferred starting date is **any time before Aug. 2019**.

For further questions please contact **Dr. Marc Buckley** ([marc.buckley@hzg.de](mailto:marc.buckley@hzg.de)) or **Dr. Marion Tisser** ([M.F.S.Tissier@tudelft.nl](mailto:M.F.S.Tissier@tudelft.nl))

The Helmholtz-Zentrum Geesthacht is an equal opportunity employer and particularly strives to increase the percentage of women in the science sector. Severely disabled persons with equal qualifications will be considered preferentially.

Geesthacht is located 35 km southeast of Hamburg in Northern Germany. Its location combines proximity to Germany's second largest city and its cultural offerings with easy access to numerous outdoor activities in a beautiful setting. We are a family-friendly employer and operate our own kindergarten on campus.