GEOMAR Helmholtz Centre for Ocean Research Kiel is a foundation under public law jointly financed by the Federal Republic of Germany (90%) and the State of Schleswig-Holstein (10%). It is one of the internationally leading institutions in the field of marine research.

Through our research and our commitment to the transfer of knowledge and technology, we contribute significantly to the preservation of the function and protection of the ocean for future generations.

The research unit Physical Oceanography of the research division Ocean Circulation and Climate Dynamics is offering a position as

Doctoral researcher (m/f/d)
in Computer Science and Marine Data Science in the project "Oceanic Synergy: Fusion of Physics, Biology, and Computing"

starting at the earliest possible date.

The position offers the possibility to attain a doctoral degree in computer sciences as member of the graduate school "Helmholtz School for Marine Data Science" (MarDATA). MarDATA aims to define and educate a new type of "marine data scientists" by introducing and embedding researchers from computer sciences and mathematics into ocean sciences, covering a broad range from supercomputing and modelling, (bio)informatics, robotics, to statistics and big data methodologies. Education of doctoral researchers in joint block courses, international summer schools and colloquia goes beyond a single discipline towards genuine scientific insight into and a more systematic treatment of marine data. (https://www.mardata.de/)

Project Description
Ocean biodiversity is under threat. Hence there is an urgent need to understand how physical forcings structure marine communities to enable sustainable preservation and utilization of the oceanic ecosystem. Due to the close interaction between physics, biogeochemistry and biology on multiple scales, a comprehensive understanding of ocean ecosystems requires an integrated approach. With this position we aim to combine small-scale turbulent physical motions and plankton dynamics with novel data science methods.

Completely new possibilities are also open up by the new high-resolution data obtained from the recent satellite altimetry mission Surface Water and Ocean Topography (SWOT). Combining this data with existing high-resolution temperature and chlorophyll satellite data, we now have the unprecedented capability to capture the dynamics of small-scale processes such as fronts and small eddies at the ocean's surface. It opens up the possibility of systematically sampling these phenomena with ships or autonomous vehicles and investigating their properties and effects in depth. The main task of the position is to analyze the various satellite data, control/accompany measurement campaigns and combine the satellite data with the biological and physical point measurements in the ocean to gain new insights.

This is a joint research project of GEOMAR and the Department of Computer Science at Kiel University. The PhD student work at the interface between Computer Science, Data Science and Physical Oceanography, but have a research focus on the Computer Science aspects. The overarching research question of the PhD project is to investigate the potential of machine

learning and pattern mining (or combinations of both) and to what extent the fusion of different data sets (satellite, physical, biological etc) can lead to new insights into small-scale physical processes and their impact on biology. The project will focus on novel approaches from data mining and shallow and deep machine learning to (1) the analysis of complex spatio-temporal systems, as well as (2) spatio-temporal pattern mining.

Qualification

Required:
- Master's degree (or equivalent) in Computer Sciences or a related field by the beginning of the project, preferably with a focus on neural networks or machine learning and pattern mining in general
- Proven ability to communicate fluently in spoken and written English
- have experience in software development, preferably in data processing applications, in Python or related programming languages

Desired:
- knowledge in Marine Sciences in particular Oceanography and Biology
- experience with large heterogeneous data sets
- experience with machine learning (neural networks & data mining)
- willingness to work in teams of the two research units and the MarDATA school
- enjoy interdisciplinary work

At a workplace, directly on the Kiel Fjord with many leisure and recreational opportunities, we offer you:
- Good conditions for work-life balance: We offer, among other things, the possibility of mobile working and individual working time arrangements, vacation courses for the children of our employees, and good support in finding a place in a daycare center at the Kiel site
- Support services for professional and personal life situations
- An exciting work environment with the opportunity to provide important impetus for the development of sustainable solutions
- Exciting topics in an international environment
- Work in the field of marine and climate research, a forward-looking area with social significance
- 30 vacation days + additional time off at Christmas Eve and New Year's Eve
- Company pension plan and capital-forming benefits

The position is available for a funding period until of 36 months. The salary depends on qualification and could be up to the class E13 TVöD-Bund of the German tariff for public employees. This is a full-time position. The position can not be split. The fixed-term contract shall comply with Section 2 Paragraph 1 of The Act of Academic Fixed-Term Contract (German WissZeitVG).

GEOMAR Helmholtz Centre for Ocean Research Kiel seeks to increase the proportion of female scientists and explicitly encourages qualified female academics to apply. GEOMAR is an equal opportunity employer and encourages scientists with disabilities to apply. Qualified disabled applicants will receive preference in the application process.

Please send your application for this post **not later than 02. October 2024** under the following link:

Online application

As soon as the selection procedure has finished, all your application data will be removed according to data protection regulation.

For further information regarding the position and research unit please contact Prof. Dr. Florian Schütte (fschuette@geomar.de).

We will answer all your questions if you send us an e-mail to bewerbung@geomar.de. In doing so, please refer to the keyword "MarDATA Ocean Fuse".

For further information on GEOMAR Helmholtz Centre for Ocean Research Kiel or the Helmholtz Association, please visit www.geomar.de or www.helmholtz.de.

GEOMAR is committed to an objective and non-discriminatory personnel selection. Our job advertisements address all people. We expressly renounce the submission of application photos.

The TOTAL E-QUALITY award is presented to GEOMAR for efforts in terms of human resource management aimed at providing equal opportunity.