

# Job posting (PHY 04/2025)

The Leibniz Institute for Baltic Sea Research Warnemünde (IOW) has a temporary vacancy starting **01.08.2025** for a

## Postdoctoral position in coastal ocean modeling

in the Department of Physical Oceanography for the next 3.5 years (until 31.03.2029) and a percentage of 100% (40h/week), subject to the funding of the project.

Remuneration is paid in accordance with the Tarifvertrag für den öffentlichen Dienst der Länder (TV-L, Public Sector Collective Agreement on Länder) salary scale at level 13. The position can also be filled on a flexible part-time basis with at least 30h/week.

## About AIR-MoPSy

This position is embedded in the **AIR-MoPSy** project (Atmospheric Impact on the **R-Mo**de **P**ositioning **Sy**stem), which supports the development of a terrestrial backup to satellite-based navigation systems. GNSS (Global Navigation Satellite Systems) are crucial for positioning and timing but are vulnerable to natural and man-made interference—as recently observed in the Baltic Sea region. R-Mode (Ranging Mode), developed by the DLR Institute of Communications and Navigation, offers a promising alternative by using medium-wave signals from existing maritime radio stations.

The AIR-MoPSy project aims to improve the accuracy and reliability of R-Mode, particularly under varying environmental conditions. Key objectives include understanding the physical processes that affect R-Mode signal propagation, quantifying the variability of relevant parameters, and providing realistic error estimates for positioning. A concept for a user warning system will also be developed.

The IOW (Leibniz Institute for Baltic Sea Research) contributes to this interdisciplinary project by investigating the oceanic component—specifically how marine environmental variability influences R-Mode signal propagation and positioning accuracy.

AIR-MoPSy is a joint effort of the IOW, the University of Greifswald, the Leibniz Institute of Atmospheric Physics (IAP), and the German Aerospace Center (DLR)

## Who are we?

The IOW is an independent research institute of the Leibniz Association for which equal opportunities, family friendliness and work-life balance are very important. Our research focus is on the coastal and marginal seas, especially the Baltic Sea. The staff of

the five sections Physical Oceanography and Instrumentation, Marine Chemistry, Biological Oceanography, Marine Geosciences, and Marine Observations works interdisciplinary within a joint research program.

## What will be your tasks?

The successful candidate will work closely with scientists, postdoctoral researchers, and doctoral students within the department, as well as external researchers, focusing on improving the oceanic component.

The primary objective of this position is to develop, maintain and improve a near-realtime forecast system, to estimate the surface salinity and temperature of the entire Baltic Sea and its coasts. Moreover, the successful candidate will also need to develop a system to estimate the uncertainty of the predictions. Potential solutions could include ensemble generation, a combination of EOF-reconstructions and observations, low-order data assimilation, or deep neural networks. A quantification of the impact of mesoscale and submesocale features is also expected.

At a later stage, the successful candidate is also expected to join research cruises to test the implementation of the entire positioning system over the Baltic Sea.

Your primary responsibilities will include:

- Develop, maintain and improve a near-real-time forecast system for the Baltic Sea
- Generate high-resolution daily surface salinity maps for the Baltic Sea and validate them with available observational datasets
- Develop algorithms and methods to estimate the uncertainty in the daily predictions

#### What do we expect from you?

We seek a scientifically curious researcher who is passionate about understanding the environment. You should hold a master's degree (or equivalent diploma) and a PhD in meteorology, oceanography, or a related natural or geoscientific discipline with significant physical and mathematical components. It is essential that you have the ability to conduct independent scientific research within a collaborative team environment and demonstrate enthusiasm for contributing to the innovative IOW research program (2024–2033). Your primary involvement will focus on Research Area 3.

#### **Required qualifications:**

- Documented experience in developing and applying ocean models
- Experience using high-performance computing systems
- Proficiency in running numerical coastal ocean models

- Familiarity with operating systems such as Linux/Unix and proficiency in shell scripting
- Strong programming skills, preferably in Fortran, C/C++, or Python
- Competency in visualizing and analyzing large-scale datasets using software tools like Matlab, IDL, Ferret, Python, or R

## Merit criteria:

- Proven track record of publishing high-quality articles in peer-reviewed journals
- Excellent command of written and spoken English
- Proficiency with structured coastal ocean models (e.g., ROMS, GETM, CROCO)
- Familiarity with the hydrodynamics specific to the Baltic Sea region (also including the North Sea)
- Understanding of the salt exchange processes in estuarine-like coastal environments
- Ability to configure and apply deep neural networks
- Understanding of the impact of the submesoscale on salt and tracer transport
- Ability and willingness to actively engage in interdisciplinary collaborations
- Seagoing fitness

## What does the IOW offer?

The IOW offers you a varied workplace in the immediate vicinity of the Baltic Sea with flexible working arrangements, e.g. the possibility of working from home or remotely, and qualification opportunities for the English/German language. A very good infrastructure with modern laboratory and office equipment, including our own research vessel, form the framework for the best working conditions.

## How do we promote equal opportunities?

Our job offers are aimed at all people regardless of their gender. Research benefits from a diverse working environment, which is why we have signed the Diversity Charter. IOW aims to specifically promote women in areas where they are underrepresented. For this purpose, the institute has given itself a plan to promote equality (plan for the equal opportunities committee at the IOW) and has repeatedly been awarded the Total E-Quality award for its commitment (website TOTAL E-QUALITY e. V.) Female applicants are given preference in the case of equal qualifications and suitability, as the position belongs to a working group in which women are underrepresented. You can find an overview of our measures for equal opportunities and for improving the compatibility of work and family on our <u>website</u>. We give preference to applications from disabled persons with equal professional and personal suitability. Please mention the disability or equality in your letter of application and enclose a copy of the relevant certificate.

#### How to apply?

Please submit your complete application, including a cover letter describing your motivation and qualifications and a current CV highlighting relevant experience and publications. Combine all application documents into a single PDF file and send them to us until 07. June 2025, quoting the keyword: PHY 04/2025

to: bewerbung.physik@io-warnemuende.de

or:

Leibniz Institute for Baltic Sea Research Warnemünde Human Resources Department Seestraße 15 18119 Rostock Germany

The interviews are expected to take place online (via Zoom) on the 02. Juli 2025

Unfortunately, we cannot cover your application and travel costs. Online participation in the job interview is possible.

For further information please contact:

Dr. Ulf Gräwe, ulf.graewe@io-warnemuende.de

or visit our website: www.io-warnemuende.de.