The Geophysical Fluid Dynamics group at Jacobs University Bremen, Germany, within the Department of Mathematics & Logistics, Focus Area Mobility, invites applications for

Four Doctoral Positions in Applied Mathematics/Fluid Dynamics (f/m/d)

Job ID 20-14
(75% time / limited time contracts)

within the Collaborative Research Center TRR 181 "Energy Transfers in Atmosphere and Ocean" for a duration of up to four years parallel to approved German Research Foundation funding periods. TRR 181 is a collaborative project between Universität Hamburg, Universität Bremen, Jacobs University, the Alfred-Wegener-Institut Bremerhaven, the Max-Planck-Institut für Meteorologie Hamburg, Helmholtz-Zentrum Geesthacht, Leibniz-Institut für Ostseeforschung Warnemünde, and Leibniz-Institut für Atmosphärenphysik, Kühlungsborn.

Physical oceanographers, meteorologists, and applied mathematicians are working together in the project

I. to understand the energy transfers between the different dynamical regimes – small-scale turbulence, internal gravity waves, and geostrophically balanced motion – in both atmosphere and ocean,
II. to develop, to test, and to implement new and consistent parameterisations in models, and
III. to develop mathematical and numerical methods featuring consistent energetics.

The goal are energetically more consistent climate models for advanced climate predictions.

The positions are associated with the following sub-projects of the research center.

1. One position in Project M3 "Toward consistent sub-grid momentum closures in ocean models" to develop, implement, and analyze new numerical schemes to reduce unphysical kinetic energy loss in ocean models and to improve the simulation of oceanic eddies in the context of climate modelling (first advisor Dr. Stephan Juricke, Jacobs University).
2. One position in Project M5 "Reducing spurious mixing and energetic inconsistencies in realistic ocean-modelling applications" to work on advanced numerical techniques aimed at improved preservation of the layer structure of water density in an unstructured-mesh ocean model in climate-relevant simulations (first advisor Prof. Sergey Danilov, Alfred Wegener Institute and Jacobs University).
3. One position in Project L2 on "Quantifying dynamical regimes in the ocean and the atmosphere" specifically to refine mathematical concepts for detecting and quantifying emission of internal gravity waves (first advisor Prof. Marcel Oliver, Jacobs University).
4. One position in Project L4 on "Energy-consistent ocean-atmosphere coupling" to develop, implement, and analyze new deterministic and stochastic numerical coupling strategies to provide improved and more energetically consistent atmosphere-ocean-interactions in climate models and to better understand the impact of ocean variability at the atmosphere-ocean-interface (first advisor Dr. Stephan Juricke, Jacobs University).

Successful applicants will have the option to become members of the Bremen International Graduate School for Marine Sciences (GLOMAR) and complete a PhD degree at Jacobs University.

Applicants are expected to have a Master degree in Mathematics, Physics or a related field with a good background and outstanding research promise in theoretical fluid dynamics, geophysical fluid dynamics, partial differential equations, and/or numerical analysis.

Candidates will collaborate with partner institutions within the TRR 181, in particular the Alfred Wegener Institute Bremerhaven, and participate actively in the general network activities of the Collaborative Research Center.

Two positions are funded from July 1, 2020, with two further positions from January 1, 2021, subject to pending approval of funding. An earlier or later starting date may be possible upon request and at the discretion of the network coordination. Applicants for all positions are encouraged to apply early. Employment is 75% time at the level of Research Associate at a salary equivalent to public payscale.

Applications should arrive by **June 24, 2020**. Applications received later will be reviewed until the positions are filled. Applicants should submit a cover letter, curriculum vitae, list of publications, a statement of research interests, and the names and addresses of at least three potential referees as a single PDF attachment to trrjobs@jacobs-university.de.

The Collaborative Research Center TRR 181 aims to increase the number of women in research and teaching in this field and explicitly encourages women to apply.

For further information about TRR 181, please see http://www.trr-energytransfers.de/

Jacobs University is an equal opportunity employer.

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