At the research group Wind Energy Systems, ForWind – Center for Wind Energy Research, Institute of Physics of the Carl von Ossietzky University of Oldenburg, there is a vacant PhD position starting as soon as possible for a

Research Assistant (f/m/d)

(Salary according to TV-L E13, 75%)

The research focus will be on

Lidar-based reconstruction of inflow wind fields of wind turbines

With a laser beam, we are scanning the entire wind field in front of a wind turbine with high spatial and temporal resolution. Our vision is to establish a high-quality database to derive more precise models of atmospheric wind fields. Future large wind turbines require more reliable and cost-efficient design concerning fatigue as well as extreme operating conditions. We want to realize this by a joint research project with several academic and industrial partners.

At least two long-term measurement campaigns are foreseen with the continuous-wave short-range SpinnerLidar. This Doppler lidar can operate in the rotating spinner of a wind turbine. It remotely measures the incoming wind field between distances of 10 m and 150 m, with a 1 Hz resolution and up to 500 measurement points on a spherical measurement trajectory. Although this lidar is a very suitable sensor for the generation of wind fields, the measurement data needs additional effort to be useful for the aforementioned purposes. With the help of e.g. meteorological sensors and fluid dynamics models, inflow wind fields have to be reconstructed from the raw SpinnerLidar measurement data.

Job Description

The main objective of the PhD project is the further development of wind field reconstruction methodologies for the SpinnerLidar in particular, and for short-range Doppler lidar in general, and the extensive analysis of a large measurement data set of wind fields, containing a variety of atmospheric conditions including extreme operating conditions.

Among others, the job will comprise:

- conducting two lidar measurements campaigns with the SpinnerLidar, both on a platform in a met mast and in the spinner of a wind turbine
- processing large amounts of wind field data by combining lidar measurements with meteorological information and possibly flow models
- wind field reconstruction and modelling based on the lidar measurements of atmospheric wind flow for a variety of atmospheric conditions
- uncertainty analysis of the reconstructed wind fields and the generated models

The research has to be performed in close cooperation with two other research groups of ForWind – Center for Wind Energy Research and further academic and industrial project partners.

Furthermore, the candidate will be given opportunities and a firm encouragement to actively improve personal, scientific, and teaching skills.

Candidate Profile

Prerequisite is a qualifying university degree (diploma or master) in Meteorology, Physical Sciences, Mathematics, Engineering, Wind Energy, Remote Sensing, or a similar field. The successful candidate is required to have:

- profound knowledge of at least two of the following three fields: experimental/numerical fluid dynamics, statistical analysis of large data amounts, measurement techniques
- extensive experience in programming with at least MATLAB or Python
- high motivation and ability to work on a complex research topic
- fluency in communicating and reporting in English

The employment is initially limited until January 31st, 2024, with an intention for further prolongation up to a total of four years to facilitate a PhD.

The University of Oldenburg is dedicated to increase the percentage of female employees in the field of science. Therefore, female candidates are strongly encouraged to apply. In accordance with § 21 Section 3 NHG, female candidates with equal qualifications will be preferentially considered. Handicapped applicants will be given preference in case of equal qualification. Full-time positions can be also turned into part-time ones.

Research environment at ForWind – University of Oldenburg

Wind energy research at the Carl von Ossietzky University of Oldenburg has gained international recognition by its integration into ForWind – Center for Wind Energy Research of the Universities of Oldenburg, Hannover and Bremen and into the national Wind Energy Research Alliance of the German Aerospace Center (DLR), Fraunhofer Institute for Wind Energy Systems (IWES) and ForWind. In Oldenburg, researchers from the fields of physics, meteorology and engineering are collaborating at the »Research Laboratory for Turbulence and Wind Energy Systems« centred on wind physics. Laboratory experiments, free-field measurements and HPC-based numerical simulations are utilised. Main topics include the description and modelling of wind turbulence, the analysis of interactions of turbulent atmospheric wind flow and wind energy systems as well as control of wind turbines and wind farms. State-of-the-art facilities comprise three turbulent wind tunnels, different sensing equipment for free-field measurements at on- and offshore wind farms and an own high-performance computing cluster. Two multi-lidar systems each equipped with three scanning lidars are of particular importance for many of our research projects.

Contact

Preferably electronic applications should be referenced **#FW64** and must be submitted preferred as **one PDF file** containing all materials in English or German to be given consideration no later than **January 22nd, 2021** to

> Carl von Ossietzky University of Oldenburg
> Institute of Physics, ForWind - Center for Wind Energy Research
> Research Group Wind Energy Systems, Prof. Dr. Martin Kühn
> Küpkersweg 70, 26129 Oldenburg, Germany
> Phone +49 441 798 5061, Email wesys.bewerbungen@uol.de

The PDF file must include:
- A letter motivating the application (cover letter)
- Curriculum vitae
- Grade transcripts and BSc/MSc certificates
- References
- Research statement, up to one page. The applicants are requested to write a research statement of their interest that is by preference related to the advertised PhD position.

A **second PDF file** containing the final thesis of the studies or relevant research papers (if available) is an optional attachment.