

Program
of the
ForWind
Wind Physics Symposium
Oldenburg, June 14th, 2024



WELCOME TO THE FORWIND WIND PHYSICS SYMPOSIUM!

Over the next couple of years, wind turbines will increase in size and power output further. Simultaneously, wind farms and wind farm clusters will grow in size and number. The interactions of the turbines with the atmospheric boundary layer and the influences of turbines, farms, and clusters on each other will have far-reaching consequences. Energy yield, loads, and grid integration will be dependent on improved planning, operation, monitoring, and control.

For years, ForWind has been at the forefront of wind energy research, providing application-oriented research and scientific support for industrially oriented projects. The Wind Physics Symposium aims at transferring the knowledge of our teams and researchers to the interested public. On June 14, 2024 ForWind organizes the fourth edition of this research conference as part of the OLEC Energy Week 2024. Speakers will also come from our cooperation partners Fraunhofer Institute for Wind Energy Systems (IWES) and DLR as well as our international partners. In addition to the presentations there will also be a poster session about ForWind's current research topics.

The presented research topics include among others: global blockage effects, cluster wakes, boundary layer flow, novel rotor concepts, wake models, and minute-scale forecasting. The research methods include computational fluid dynamics on all relevant scales, validation by wind tunnel tests, field measurements and operating data as well as development of analytical and empirical models.

The research will be presented in the following three sessions:



Session 1: Wind resources for future wind farm clusters



Session 2: Turbulent wind fields and their interaction with wind turbines



Session 3: Control and monitoring of wind turbines and wind farms



09:30
10:00

Registration and Coffee
Welcome - Prof. Dr. Martin Kühn, University of Oldenburg

10:05 SESSION I - Dr. Stephan Barth, ForWind

WIND RESOURCES FOR FUTURE WIND FARM CLUSTERS

On parameter sensitivities and uncertainty propagation for wind resource assessment
Dr. Zahra Lakdawala, Fraunhofer IWES

Effect of cluster wakes on wind turbine loads
Arjun Anantharaman, ForWind - University of Oldenburg

A new parametrization of the Global Blockage Effect
Gabriele Centurelli, ForWind - University of Oldenburg

The AIRE Project: A Detailed Look at Rain Effects Across Different Scales in Wind Energy Production
Dr. Hassan Kassem, Leo Höning, Fraunhofer IWES

Power production and large-scale wake effects of novel rotor concepts
Johannes Paulsen, ForWind - University of Oldenburg

12:00

Lunch (optional wind tunnel tour)

13:00 SESSION II - Prof. Dr. Kerstin Avila, University of Oldenburg

TURBULENT WIND FIELDS AND THEIR INTERACTION WITH WIND TURBINES

Fluid mechanics of floating offshore wind farms
Prof. Dr. Raúl Bayoán Cal, Portland State University

Leading effect for wind turbine wake models
Dr. Ingrid Neunaber, NTNU (Norwegian University of Science and Technology)

Wind tunnel study of the wake dynamics of a floating offshore wind turbine subjected to low inflow turbulences
Thomas Messmer, ForWind - University of Oldenburg

Periods of constant wind speed: How long do they last in the turbulent atmospheric boundary layer?
Dr. Matthias Wächter, ForWind - University of Oldenburg

Analysis of higher-order moments and intermittency in turbulent wind field models by large-eddy simulations
Marcel Bock, ForWind - University of Oldenburg

14:45

Coffee break

15:15 SESSION III - Prof. Dr. Martin Kühn, University of Oldenburg

CONTROL AND MONITORING OF WIND TURBINES AND WIND FARMS

LES-based validation of a dynamic wind farm flow model under unsteady inflow and yaw misalignment
Jan Bohrer, ForWind - University of Oldenburg

Rotor concept for demand-driven power feed-in of offshore wind turbines
Prof. Dr. Martin Kühn, ForWind - University of Oldenburg

Model wind turbine performance in turbulent-non-turbulent boundary layer flow
Dr. Lars Neuhaus, ForWind - University of Oldenburg

Minute-scale prediction of wind ramp events
Janna Seifert, ForWind - University of Oldenburg

Stochastic dispatch optimization using lidar-based power forecast
Hauke Bents, DLR Institute of Networked Energy

17:00

Closing - Dr. Stephan Barth, ForWind

Registration and travel directions for the **FORWIND WIND PHYSICS SYMPOSIUM**

Registration for the Wind Physics Symposium is possible until June 7th, 2024 by E-Mail to: manuel.siebert@forwind.de

The participation is offered **free-of-charge** for professionals from the wind energy community. As the number of participants is limited, please register as soon as possible. Catering will be provided, so we ask for a binding registration. The event will be held in person at the ForWind WindLab. Online participation is not possible.

How to get here:

ForWind – Center for Wind Energy Research of the Universities of Oldenburg, Hannover and Bremen
Oldenburg University, Wechloy Campus, Building W33 – WindLab
Küpkersweg 70
26129 Oldenburg

By bus

Line 306 „Universität“ bus stop „Uni / Campus Wechloy“ (~5 min. walk via Wechloy Campus)
Line 310 „Wehnen/Famila-Center“ or lines 350/S35 „Westerstede“ bus stop „Pophankenweg“ (10 min. walk via Küpkersweg)
All busses stop at Oldenburg Hauptbahnhof (Central Station). On the North side of the station is the ZOB (Central Bus Terminal), where both lines depart.

By train

Train station Oldenburg-Wechloy (~12 min. walk via Carl-von-Ossietzky-Straße)
Train station Oldenburg Hauptbahnhof (Take bus 306 or 310 from ZOB station next to Hauptbahnhof)

Contact:

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Partners:

The Wind Physics Symposium 2024 is part of the OLEC Energy Week 2024. You can find out more about the events here: https://www.energiecluster.de/de/veranstaltungen/energy_week

