Doctoral researcher to study multi-scale modeling of sea ice dynamics around wind farms
Aalto University

Job Title	Doctoral researcher to study multi-scale modeling of sea ice dynamics around wind farms
Department	T212 Department of Energy and Mechanical Engineering
Institution	Aalto University , , Finland
Date Posted	Feb. 6, 2025
Application Deadline	Open until filled
Position Start Date	Available immediately
Job Categories	Graduate Student
Academic Field(s)	Mechanical Engineering
Job Website	https://aalto.wd3.myworkdayjobs.com/aalto/job/Otaniemi-Espoo-Finland/Doctoral-researcher-to-study-multi-scale-modeling-of-sea-ice-dynamics-around-wind-farms_R42223-4
Apply By Email	

Job Description

Aalto University is where science and art meet technology and business. We create novel solutions to major global challenges by making research breakthroughs in and across our disciplines. Our community is made up of 13 000 students, 400 professors and close to 4 500 other faculty and staff working on our dynamic campus in Espoo, Greater Helsinki, Finland. Diversity is part of who we are, and we actively work to ensure our community’s diversity and inclusiveness. This is why we warmly encourage qualified candidates from all backgrounds to join our community.

The Marine and Arctic Technology group at the Department of Energy and Mechanical Engineering studies how sea ice deforms and fractures in different scales, and how sea ice interacts with ships and

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offshore windfarms. We are now looking for a

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Offshore wind farms are planned for annually freezing regions of the Baltic Sea. The farms are expected to influence sea ice motion; the wind turbines act as pinning points for sea ice drift, affecting the sea ice drift rate and causing sea ice fragmentation. The work will also relate to broader research questions, as the dynamics of sea ice in environments such as skerry archipelagos remain poorly understood. The effects may lead to challenges for winter navigation, but their strength and extent remain unknown and can be estimated only by using advanced numerical simulations.

Your role and goals
Your research will have its focus on wind farm scale high-resolution sea ice simulations by using state-of-the-art discrete element modeling (DEM) tools (Åström et al., 2024; Åström and Polojärvi, 2024; Polojärvi, 2022). The simulation tools you are using and potentially further developing are optimized to be running on LUMI supercomputer, 8th fastest supercomputer in the world. This allows for very high-resolution modeling of sea ice motion and failure in sea ice domains that can fit an offshore wind farm inside them. Together with the research team, your will then use the results from these wind farm scale simulations (scale up to tens of kilometers) to further develop local-scale sea ice model (scales up to hundreds of kilometers).

Your network and team
You will work in a multi-disciplinary project in a consortium consisting of major Finnish sea ice-related research bodies Aalto University, Finnish Meteorological Institute (FMI) and VTT Technical Research Centre of Finland. The project team also includes CSC—IT Center for Science. While other partners support your work on wind farms scale simulations, FMI focuses on combining the results as part of large-scale sea ice dynamics simulations. Your close research network will also include the project funder, Finnish Transport Infrastructure Agency, and the steering group consisting of several industrial partners and other stakeholders related to offshore wind and maritime sector.

Your experience
The research performed focuses on computational modeling of sea ice. Successful candidate will have a good understanding of computational mechanics or oceanography. They should also have some programming experience and preparedness to learn more programming. Suitable background may come from applied and computational mechanics, fluid dynamics, computer sciences, mechanical engineering, engineering physics, oceanography or geophysics. Experience on discrete element method, differential methods, and parallel computing are considered beneficial. We can consider hiring a candidate, who has a strong background and would start as a master thesis students, but by the time

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of starting in the actual doctoral student position, the applicant must fulfill the requirements for doctoral studies at Aalto University ([url=https://into.aalto.fi/display/endoctoraleng/How+to+apply]https://into.aalto.fi/display/endoctoralen

What we offer

Aalto University follows the salary system of Finnish universities. The starting salary of a doctoral researcher is about 2800€/month (gross), with a possible increase based on achievements. The annual workload of research and teaching staff at Aalto University is currently 1612 hours. The employment contract includes occupational health care, and Finland has a comprehensive social security system. The employment relationship is full-time employment at Aalto University. The first contract will be made for two years.

Doctoral studies at Aalto University take four years and, in addition to a work contract, you need to apply for a doctoral student position at the Aalto Doctoral Programme in Engineering. Please check the admission criteria at [url=https://www.aalto.fi/en/programmes/aalto-doctoral-programme-in-engineering]https://www.aalto.fi/en/programmes/aalto-doctoral-programme-in-engineering. In particular, please pay attention to the required proficiency in English language.

Join us!
To apply for the position, please submit your application electronically through our online recruitment system and provide the following documents in English: * Letter of motivation, maximum one page * CV * Degree certificates and academic transcripts * Letters of recommendation from at least two referees, or a list of references that we may contact
The deadline for applications is the 28th of February, 2025, at 23:59 Finnish time (UTC +2) and the position will be filled as soon as possible.

Aalto University reserves the right for justified reasons to leave the position open, to extend the application period, and reopen the application process.
Please note: Aalto University’s employees and visitors should apply for the position via the internal HR system Workday (Internal Jobs -> Find Jobs) by using their existing Workday user account.

Further information
For additional information, please contact Assistant Professor Arttu Polojärvi (email: [url=mailto:firstname.lastname@aalto.fi]firstname.lastname@aalto.fi). In questions related to the recruitment system, please contact [url=mailto:hr-eng@aalto.fi]hr-eng@aalto.fi

More about Aalto University:

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About Finland
Finland is a great place for living with or without family - it is a safe, politically stable and well-organized Nordic society. Finland is consistently ranked high in quality of life and was just listed again as the happiest country in the world: [url=https://worldhappiness.report/news/its-a-three-peat-finland-keeps-top-spot-as-happiest-country-in-world/]https://worldhappiness.report/news/its-a-three-peat-finland-keeps-top-spot-as-happiest-country-in-world/.

Contact Information

Please reference Academickeys in your cover letter when applying for or inquiring about this job announcement.

Contact

Finland