

Doctoral Researcher position in Computational Fluid Dynamics (CFD) related to Large eddy simulation (LES) of compressible two-phase flows  
Aalto University

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Posted May 23, 2024, set to expire Dec. 30, 2024

**Job Title** Doctoral Researcher position in Computational Fluid Dynamics (CFD) related to Large eddy simulation (LES) of compressible two-phase flows

**Department** T212 Mechanical Engineering

**Institution** Aalto University  
, , Finland

**Date Posted** May 23, 2024

**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-position-in-Computational-Fluid-Dynamics--CFD--related-to-Large-eddy-simulation--LES--of-compressible-two-phase-flows\\_R39783-3](https://aalto.wd3.myworkdayjobs.com/aalto/job/Otaniemi-Espoo-Finland/Doctoral-Researcher-position-in-Computational-Fluid-Dynamics--CFD--related-to-Large-eddy-simulation--LES--of-compressible-two-phase-flows_R39783-3)

**Apply By Email**

**Job Description**

Aalto University is a community of bold thinkers where science and art meet technology and business. We are committed to identifying and solving grand societal challenges and building an innovative future. Aalto University has been ranked the 9th best young university in the world (Top 50 under 50, QS 2018) and one of the world's top technology challenger universities (THE 2017), for its outside-the-box thinking on research collaboration, funding and innovation. Aalto has six schools with nearly 11 000 students and 4000 employees of whom close to 400 are professors. Our main campus is located in Espoo, capital area of Finland.

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PhD student position in Computational Fluid Dynamics (CFD) related to Large eddy simulation (LES) of compressible two-phase flows

The work will be completed at the Department of Mechanical Engineering in the Energy Conversion and Systems research group. The research work will be completed as part of a multidisciplinary team focusing on Large-Eddy Simulation (LES) of turbulent flows with applications in heat transfer, combustion, multiphase flow, and energy storage.

The following topic area is available for a PhD student:

Topic: Large-eddy simulation of an alkaline electrolyzer for H<sub>2</sub> production: H<sub>2</sub> formation and the bubbly two-phase flow characteristics using OpenFOAM

In order to produce green hydrogen, electrolyzers running with green electricity will be of significant importance. The materials used for e.g. anode and cathode within electrolyzers have been studied extensively while the fluid dynamical aspects of electrolyzers have not received much focus. Here, within the present proposal, we will use LES to characterize the flow field and H<sub>2</sub> formation, related to bubble growth and transport, connected to the efficiency of the electrolyzer.

The project involves studies using LES in compressible, two-phase flows related to H<sub>2</sub> production in an alkaline electrolyzer. The simulations will be mostly performed using the OpenFOAM open source software utilizing a radically fast finite rate chemistry accelerator developed at the host institution. Some previous experience in physics/mathematics related numerical simulations and high-performance computing will be considered particularly useful.

#### Requirements

The applicant should have a good CFD track-record with additional background knowledge in some of the following topics: \* Numerical methods in physics and mathematics \* Matlab, Python, and other programming languages \* Experience using OpenFOAM

The applicant for the position of a Doctoral Researcher must have a Master's degree and must fulfill the requirements for doctoral students at the Aalto University School of Engineering:

[url=https://www.aalto.fi/en/study-options/aalto-doctoral-programme-in-engineering?check\_logged\_in=&#61;1]Aalto Doctoral Programme in Engineering | Aalto University .

#### What we offer

Aalto University follows the salary system of Finnish universities. The salary of a starting Doctoral researcher is currently 2720 € / month (gross), increasing as milestones for the PhD are achieved (highest PhD researcher level is currently 3403 €/month). The annual workload of research and teaching staff at Aalto University is 1612 hours. The employment contract includes occupational health care, and Finland has a comprehensive social security system. The employment relationship is full-

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time, fixed-term (period of two years) employment at Aalto University, which can further be extended, based on performance and availability of funding.

#### How to apply

To apply for the position, please submit your application electronically through our online recruitment system and provide the following documents: \* Motivation letter \* CV \* Certified copies of the completed degrees certificates and official transcripts of records, and their translations, if the originals are not in Finnish, Swedish or English \* Proof of proficiency in Finnish, Swedish or English if the applicant is not a native speaker of them \* Copy of Master thesis and 2 most important publications (Max file size 10 Mb).

The deadline for applications is the 16th of June, 2024, 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 on funding and contents of work, please contact Associate professor D.Sc.(Tech.) Ossi Kaario or post-doc Parsa Tamadonfar. In questions regarding the recruitment process, contact the HR Advisor Paula Thomsson-Levä. E-mails: [firstname.lastname@aalto.fi](mailto:firstname.lastname@aalto.fi).

More about Aalto University:

[url=https://www.aalto.fi/en/open-positions/doctoral-researcher-phd-student-in-mechanical-engineering]Aalto.fi

[url=http://twitter.com/aaltouniversity]twitter.com/aaltouniversity

[url=http://facebook.com/aaltouniversity]facebook.com/aaltouniversity

[url=http://instagram.com/aaltouniversity]instagram.com/aaltouniversity

Interested?

Check out our new virtual campus experience: <https://virtualltour.aalto.fi/>

#### 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: <https://worldhappiness.report/news/its-a-three-peat-finland-keeps-top-spot-as-happiest-country-in-world/>

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keeps-top-spot-as-happiest-country-in-world/. For more information about living in Finland:  
[url=<https://www.aalto.fi/en/careers-at-aalto/living-in-finland>]<https://www.aalto.fi/en/careers-at-aalto/living-in-finland> & <https://www.aalto.fi/en/services/welcome-to-aalto-university-and-finland-info-package> .

### Contact Information

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

### Contact

Finland