

Doctoral Researcher position in Experimental studies on
Hydrogen and Methane combustion in Argon
Aalto University

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Posted Jun. 26, 2025, set to expire Dec. 31, 2025

Job Title	Doctoral Researcher position in Experimental studies on Hydrogen and Methane combustion in Argon
Department	T212 Department of Energy and Mechanical Engineering
Institution	Aalto University , , Finland
Date Posted	Jun. 26, 2025
Application Deadline	Open until filled
Position Start Date	Available immediately
Job Categories	Graduate Student
Academic Field(s)	Chemical/Petroleum Energy Technology
Job Website	https://aalto.wd3.myworkdayjobs.com/aalto/job/Otaniemi-Espoo-Finland/Doctoral-Researcher-position-in-Experimental-studies-on-Hydrogen-and-Methane-combustion-in-Argon_R43659-3

Apply By Email

Job Description

Aalto University is where science and art meet technology and business. We shape a sustainable future by sparking the game changers of tomorrow and by creating novel solutions to major global challenges. Our community is made up of 13,000 students, 400 professors and close to 4 500 other staff members working on our vibrant campus in Espoo, Greater Helsinki, Finland. 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 Department of Energy and Mechanical Engineering is a leading multidisciplinary research unit with

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strong ties to industry and whose work has an impact on business and society. We focus on topics related to mechanics and energy engineering, where we conduct cutting-edge research and offer high-quality degree education.

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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 internal combustion engine relevant studies, including optical diagnostics in the constant volume chamber, full-metal and optical research engines.

Topic: Optical diagnostics for the hydrogen and methane combustion in argon: This project investigates the combustion characteristics and jet dynamics of ultra-high-pressure (>300 bar) hydrogen and methane injections in argon environments, under engine-relevant conditions. Advanced optical diagnostics, including high-speed Schlieren imaging, Particle Image Velocimetry (PIV), and Planar Laser-Induced Fluorescence (PLIF) will be employed within a custom optical spray and combustion chamber to capture detailed flow and combustion phenomena.

The primary objectives are to visualize and quantify jet dynamics, mixing behavior, ignition delay, flame structure, and overall combustion characteristics in argon environment. The experimental data obtained from Mckenna burner, optical spray and combustion chamber, and optical engine will provide valuable benchmarks for validating Computational Fluid Dynamics (CFD) models of high-pressure, inert-atmosphere combustion. The project is particularly relevant to future low-emission or nitrogen-free power cycles. Prior experience with optical diagnostics or combustion systems is highly desirable.

Requirements

The applicant should have a good experimental track-record with additional background knowledge in some of the following topics: *

Knowledge in internal combustion engine, fluid dynamics, and combustion *

CAD modelling capability to design and modify the facilities, such as nozzles, optical spray and combustion chamber, optical engine, etc. *

Matlab, Python, and other programming languages *

Machine learning or deep learning in image post-processing *

Experience using optical tools, e.g., high-speed cameras, intensifiers, spectrometers, lasers, etc.

The applicant for the position of a doctoral Candidate 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->

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Employment

The expected duration of doctoral studies is four years, but a contract is at first made for two years, and the extension depends on candidate's advancement in her/his studies and research.

The salary for the position is determined according to the salary system for universities used at Aalto University. The starting gross salary for a doctoral candidate is currently €2960 per month, increasing as studies progress and set goals are achieved. (The highest salary level for a doctoral candidate is currently €3662 per month.) The annual workload for research and teaching staff at Aalto University is 1612 hours. The employment relationship at Aalto University is full-time and fixed-term (two years), and it can be extended based on achievements and the availability of funding.

How to apply

Please, submit the applications online through the Apply now link provided below no later than August 29th 2025 (UTC +2) including *

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).

?Please note: Aalto University's employees should apply for the position via our internal HR system Workday (Internal Jobs) by using their existing Workday user account (not via the external webpage for open positions).

Further information

For additional information on funding and contents of work, please contact Associate professor D.Sc.(Tech.) Vuorinen Ville or Staff Scientist Qiang Cheng. Emails

[url=mailto:firstname.lastname@aalto.fi]firstname.lastname@aalto.fi In questions regarding the recruitment process, contact [url=mailto:hr-eng@aalto.fi]hr-eng@aalto.fi

Contact Information

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Contact

Finland