Jobbnorge ID: 196938
Deadline: 12/11/2020
Website: http://www.ntnu.no
Scope: Fulltime
Duration: Fixed Term

The Department of Energy and Process Engineeringhas a vacancy for a

Postdoctoral Research Fellow in Combustion Dynamics

This is NTNU

At NTNU, creating knowledge for a better world is the vision that unites our 7 400 employees and 42 000 students.

We are looking for dedicated employees to join us.

You will find more information about working at NTNU and the application process here.

Video: https://www.youtube.com/watch?v=clgKd1SwGLI

About the position

We have a vacancy for a postdoctoral research fellow in the Thermo-fluids Group at the Department of Energy and Process Engineering, Faculty of Engineering, Norwegian University of Science and Technology.

The position is associated with the project "Tailoring flame dynamics in carbon-free combustors'' in collaboration with the King Abdullah University of Science and Technology.

To reduce the carbon footprint associated with power generation, replacing traditional fuels by carbon-free alternatives such as blends of hydrogen carriers is highly desirable. But this is challenging as fuel properties significantly differ and thus strongly affect stability, efficiency and pollutant emissions. An aspect of utmost importance in gas turbine combustors is dynamic flame stability. The susceptibility of flames to upstream perturbations and their coupling with resonant combustor modes has been one of the biggest challenges in the development of modern high-efficiency, low-emission gas turbine combustors during the last decades. Considering hydrogen-ammonia mixtures as gas turbine fuel provides the unique opportunity for tailoring the fuel composition such that dynamic flame stability is vastly improved.

Until now, this aspect has not been investigated, but it promises a step change in the development of dynamically stable carbon-free gas turbines. The main objective of the project is to provide methods for the stable design of future combustor technology operating on carbon-free fuels. Specifically, (i) the effect of the spatial mixture profiles of hydrogen and ammonia on the dynamic response of canonical and gas-turbine-relevant flames will be revealed; and (ii) superior combustor stability will be demonstrated utilizing adaptive control of hydrogen and ammonia mixture profiles based on physical insight and machine learning. The postdoctoral researcher will be tasked with experimentally assessing the effect of the hydrogen-ammonia mixture profiles on the flame response to acoustic perturbations.

The position has a duration of 2 years. The starting daas soon as possible.

The position's supervision and day-to day management is by Associate Professor Jonas Moeck.

Duties of the position

- Development of an acoustic technique for measurements of heat release rate fluctuations in multi-fuel flames.
- Assessment of the effect of the fuel mixture profile on the flame response to perturbations.
- Assisting project partners in implementation and application of the developed techniques in a turbulent swirl flame experiment at elevated pressure.
- Dissemination of the project results in scholarly journals and at international conferences.

Required selection criteria

A postdoctoral research fellowships is a qualification position in which the main objective is qualification for work in academic positions. You must have completed a Norwegian doctoral degree in engineering or physics, or corresponding foreign doctoral degree recognized as equivalent to a Norwegian doctoral degree.

If, for any reason, you have taken a career break or have had an atypical career and wish to disclose this in your application, the selection committee will take this into account, recognizing that the quantity of your research may be reduced as a result.

The appointment is to be made in accordance with the regulations in force concerning State Employees and Civil Servants and national guidelines for appointment as PhD, post doctor and research assistant.

Other required selection criteria:

- Strong expertise in fluids dynamics, acoustics, and combustion.
- Experience in experimental work in a thermo-fluids context, preferably with combustion.
- Excellent command of the English language; skilled in academic writing.
- Proficient user of Matlab, Python or similar for data processing.

Preferred selection criteria

- In-depth knowledge of combustion dynamics/thermoacoustic oscillations.
- High-quality journal publications.
- good written and oral English language skills

Personal characteristics

We offer

- exciting and stimulating tasks in a strong international academic environment
- an open and inclusive work environment with dedicated colleagues
- favourable terms in the Norwegian Public Service Pension Fund
- employee benefits

Salary and conditions

The employment period is 2 years.

Postdoctoral candidates are placed in code 1352, and are normally remunerated at gross NOK 545 300 per annum, depending on qualifications and seniority. From the salary, 2% is deducted as a contribution to the Norwegian Public Service Pension Fund.

The engagement is to be made in accordance with the regulations in force concerning State Employees and Civil Servants, and the acts relating to Control of the Export of Strategic Goods, Services and Technology. Candidates who by assessment of the application and attachment are seen to conflict with the criteria in the latter law will be prohibited from recruitment to NTNU. After the appointment you must assume that there may be changes in the area of work.

The position is subject to external funding.

It is a prerequisite you can be present at and accessible to the institution daily.

About the application

The application and supporting documentation to be used as the basis for the assessment must be in English.

Publications and other scientific work must follow the application. Please note that applications are only evaluated based on the information available on the application deadline. You should ensure that your application shows clearly how your skills and experience meet the criteria which are set out above.

The application must include:

- CV, certificates and diplomas
- Academic works - published or unpublished - that you would like to be considered in the assessment (up to 5 works)
- Name and address of three referees
- “Qualification” document, in which you detail how you meet the required qualifications listed above (max one page). An application missing this document may be considered incomplete by the selection committee.

Joint works will be considered. If it is difficult to identify your contribution to joint works, you must attach a brief description of your participation.

In the evaluation of which candidate is best qualified, emphasis will be placed on education, experience and personal suitability.

NTNU is committed to following evaluation criteria for research quality according to The San Francisco Declaration on Research Assessment - DORA.

General information

Working at NTNU

A good work environment is characterized by diversity. We encourage qualified candidates to apply, regardless of their gender, functional capacity or cultural background.

The city of Trondheim is a modern European city with a rich cultural scene. Trondheim is the innovation capital of Norway with a population of 200,000. The Norwegian welfare state, including healthcare, schools, kindergartens and overall equality, is probably the best of its kind in the world. Professional subsidized day-care for children is easily available. Furthermore, Trondheim offers great opportunities for education (including international schools) and possibilities to enjoy nature, culture and family life and has low crime rates and clean air quality.

As an employee at NTNU, you must at all times adhere to the changes that the development in the subject entails and the organizational changes that are adopted.

Information Act (Offentleglova), your name, age, position and municipality may be made public even if you have requested not to have your name entered on the list of applicants.

If you have any questions about the position, please contact Jonas Moeck, email jonas.moeck@ntnu.no. If you have any questions about the recruitment process, please contact Guro Hoel Sjøberg, e-mail: guro.h.sjoberg@ntnu.no.

Please submit your application electronically via jobbnorge.no with your CV, diplomas and certificates. Applications submitted elsewhere will not be considered. Diploma Supplement is required to attach for European Master Diplomas outside Norway. Chinese applicants are required to provide confirmation of Master Diploma from China Credentials Verification (CHSI).

If you are invited for interview you must include certified copies of transcripts and reference letters. Please refer to the application number IV-240/20 when applying.

Application deadline: 11.12.2020.

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Additional information

Place of service:

Trondheim, Norway 7491 Trondheim (Trondheim Municipality)