**Jobbnorge ID:** 184643
**Deadline:** 4/1/2020
**Website:** http://www.ntnu.no
**Scope:** Fulltime
**Duration:** Temporary

The Department of Energy and Process Engineering has a vacancy for a

# PhD position in experimental fluid mechanics, unsteady aerodynamics (inspired by sports).

## 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.

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

## About the position

A PhD position is available in experimental fluid mechanics at the Department of Energy and Process Engineering, in the Thermo-Fluids research group. The appointment has a duration of 3 years at the end of which the candidate is expected to defend a PhD thesis. The position is financed directly by the Faculty of Engineering.

The project will focus on unsteady aerodynamics which are important to a wide variety of applications from sports to bio-propulsion. Compared with steady flows, it is not well understood how unsteady flows affect the forces experienced by bodies such as lift and drag. The project will focus on the unsteady aerodynamics produced by a bluff body placed on a forced vibration rig and subjected to various incoming turbulent flows generated with an active grid. The unsteady motions used in the experiments will be inspired by the motion of athletes in various sports and other propulsive biological flows. Measurements of the force, pressure and wake will be performed in order to gain an understanding of both the flow field and the forces on the body. Tools such as particle image velocimetry (PIV), hot-wire anemometry, and force balances will be used. The ultimate objective will be to identify a model for the drag that incorporates the motion of the body and the incoming flows.

The position will be supervised by Associate Professor Jason Hearst (jason.hearst@ntnu.no), whom you can contact for further information. The project is co-supervised by Professor James Dawson.

Please read this entire posting before applying for this position.  Incomplete applications may not be considered.

## Duties of the position

- Design experimental models.
- Perform experiments measuring the force, pressure, and flow fields.
- Participate in meetings with supervisors and colleagues.
- Write journal papers.
- Present scientific work at conferences.

## Required selection criteria

The PhD-position's main objective is to qualify for work in research positions. The qualification requirement is that you have completed a master's degree or second degree (equivalent to 120 credits) with a strong academic background in fluid mechanics or equivalent education with a grade of B or better in terms of NTNU's grading scale. If you do not have letter grades from previous studies, you must have an equally good academic foundation. If you are unable to meet these criteria you may be considered only if you can document that you are particularly suitable for education leading to a PhD degree.

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.

**Required qualifications:**

- A Masters degree and strong background in fundamental or applied fluid mechanics.
- Programming skills in MATLAB, Python, or similar packages.

- Experience conducting fluids experiments (e.g., hot-wire anemometry, particle image velocimetry, laser-Doppler anemometry, high-speed imaging).
- Scientific reports and papers are written in English, and thus strong command of the English language is required (demonstrated by works written in English, application correspondence and language, and/or certified English tests).

**Desired additional qualifications:**

- Experience with CAD software packages (e.g., SolidWorks, Fusion360, NX).
- Experience as part of a design team or project.
- Previous experience writing and contributing to peer-reviewed journal articles.

Please note, a purely computational background without experimental or other hands-on experience is not sufficient exposure to fluid mechanics, particularly if only commercial software packages were used.

## Personal characteristics

- Enthusiastic.
- Highly motivated.
- Works effectively in teams and individually.
- Able to operate in a goal-oriented manner.

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

## We offer

- world-class experimental laboratories
- state-of-the-art experimental measurement equipment
- a strong group of researchers focused on fluid mechanics
- 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

PhD candidates are remunerated in code 1017, and are normally remunerated at gross from NOK 479 600 per annum before tax, depending on qualifications and seniority. From the salary, 2% is deducted as a contribution to the Norwegian Public Service Pension Fund.

The period of employment is 3 years.

Appointment to a PhD position requires that you are admitted to the PhD programme in Engineering, https://www.ntnu.edu/studies/phiv within three months of employment, and that you participate in an organized PhD programme during the employment period.

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.

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

## About the application

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

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.

Please include the following with your application:

- A “research statement” briefly describing your Masters research or other previous research experience. This document should not exceed 1 page.
- A “qualifications” document explicitly listing each of the above qualifications and briefly describing how you meet each of the “required” qualifications and some or all of the “desierd" qualifications. This document should not exceed 2 pages.

An application missing these two documents may be considered incomplete by the selection committee.

Transcripts of grades are required for all candidates. If you are applying from outside Norway, please include a document detailing the grading/credit equivalencies to the Norwegian or ECTS systems. If this is not available, then please include a document describing the grading system at your university and the requirements for degree completion. This can be a print-out from your university’s webpage or in some cases is included on your actual transcript. If your transcript does not include an average grade for the last two years of your education, please calculate it and include it in your application. Applications without this supporting material may not be considered.

## General information

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

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**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.

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

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 Prof. Jason Hearst, email jason.hearst@ntnu.no., If you have any questions about the recruitment process, please contact Ingrid Wiggen, e-mail: ingrid.wiggen@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-93/20 when applying.

Expected start date is September 2020.

**Application deadline: 01.04.20**

## NTNU - knowledge for a better world

**NTNU - knowledge for a better wo**rld

The Norwegian University of Science and Technology (NTNU) creates knowledge for a better world and solutions that can change everyday life.

**Department of Energy and Process Engineering**

We conduct research and teaching covering the entire energy chain, from resources to the end-user. We look at how energy is produced and used by humans and machines in a sustainable way with regard to health, climate change and the resource base. The Department of Energy and Process Engineering is one of eight departments in the Faculty of Engineering.

## Additional information

### Place of service:

Department of Energy and Process Engineering 7491 Trondheim (Trondheim Municipality)