Jobbnorge ID: 219457
Deadline: 2/17/2022
Website: http://www.ntnu.no
Scope: Fulltime
Duration: Temporary

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

PhD position in fluid mechanics: wave-turbulence-shear interactions or free-surface turbulence

This is NTNU

NTNU is a broad-based university with a technical-scientific profile and a focus in professional education. The university is located in three cities with headquarters in Trondheim.

At NTNU, 9,000 employees and 42,000 students work to create knowledge for a better world.

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

Video: https://youtu.be/Xt-yHCN5QS0

About the position

The Department of Energy and Process Engineering has a vacancy for a PhD candidate.

For a position as a PhD Candidate, the goal is a completed doctoral education up to an obtained doctoral degree.

We are looking for excellent applicants for a PhD position at the Thermo-Fluids research group, Department of Energy and Process Engineering, NTNU Trondheim.

For a position as a PhD Candidate, the goal is a completed doctoral education up to an obtained doctoral degree.

The position has a duration of 3-4 years depending on funding. The supervisor will be Professor Simen Å. Ellingsen (simen.a.ellingsen@ntnu.no) whom you may contact for further information.

The topic is in the fundamental mechanics/physics of fluid flow, best suited for a candidate with a background in fundamental topics in (rather than industrial/applied) physics or mechanical engineering. More specifically the detailed topic can be either the triple interaction between waves, shear currents and turbulence (WCT), or methods for remote sensing of sub-surface flow from above, either near-surface turbulence or mean currents. Which specific sub-field will depend on the candidate's qualifications and interests, and be decided together with the supervisor.

The methodology for the WCT-focus project will be a mix of theoretical work and laboratory experiments, and will be conducted in the new water channel at NTNU where currents with tailored profiles of mean velocity and turbulence intensity can be created (see Jooss et al, J. Fluid Mech. 911 A4 (2020)) beneath waves. Experimental techniques currently in use for these purposes in our facility are particle image velocimetry (PIV), free surface measurement by synthetic schlieren and Fourier transform profilometry methods, acoustic and laser Doppler velocimetry, and more. He/she will independently perform and set up experiments under the guidance of the project supervisors. A candidate aiming for this project should document experience with independent laboratory work. The successful candidate will be part of a broader research team focussing on their overall topic.

The remote sensing project focusses on using various methods (including computer vision algorithms) to estimate properties of sub-surface flow from observations of the surface only. This task will include much data analysis, programming and mathematical theory.

NB: The application should include a short discussion (about half a page) telling which of the topics is most relevant to them, and why (for example motivation, experience and what qualifies them more specifically).

The Thermo-Fluids group is internationally excellent with a cutting-edge team of researchers from many branches of fluid mechanics. The candidate will be part of a vibrant scientific environment.

You will report to Professor Simen Å. Ellingsen.

Duties of the position

- The candidate will plan and execute a comprehensive, independent research project under supervision. Depending on the project decided this will involve laboratory experiments, theoretical work and/or numerical programming.

- The candidate will learn to master academic writing and be lead author of several journal publications.
- The candidate is expected to present her/his work at international conferences and workshops.
- Depending on funding, the position may be extended to 4 years, in which case the candidate will do 25% teaching.
- The candidate is expected to contribute to the supervision of MSc students and other student projects.

Required selection criteria

- You must have a strong background in fundamental physics, mechanics and mathematics.
- For a laboratory project the candidate must document relevant laboratory experience at research level (for example during Masters' thesis work) relevant to the project.
- For a theoretical/numerical project, especially good physics and mathematics knowledge and documented experience developing advanced computer programmes is required.
- For the laboratory project, relevant experience with independent laboratory work is necessary.
- Previous experience with surface waves and/or turbulent flow is a clear advantage, but experience from other branches of physics could also qualify.
- For either specific project, a strong theory background in mathematics and physics, preferably (but not necessarily) advanced fluid mechanics and turbulence, will also be required. Likewise, programming proficiency in MATLAB, Python, C++ or similar is necessary.
- Good written and oral English language skills
- Your education must correspond to a five-year Norwegian degree programme, where 120 credits are obtained at master's level
- You must have a strong academic background from your previous studies and an average grade from the master's degree program, or equivalent education, which is equal to B or better compared with NTNU's grading scale. If you do not have letter grades from previous studies, you must have an equally good academic basis. If you have a weaker grade background, you may be assessed if you can document that you are particularly suitable for a PhD education.
- You must meet the requirements for admission to the faculty's doctoral program in Engineering.

Please note that experience with CFD software (e.g., ANSYS Fluent, Star CCM, openFOAM), while potentially useful, is not particularly relevant and does not qualify for the position.

The appointment is to be made in accordance with the regulations in force concerning State Employees and Civil Servants and Regulations concerning the degrees of Philosophiae Doctor (PhD) and Philosodophiae Doctor (PhD) in artistic research national guidelines for appointment as PhD, post doctor and research assistant

Preferred selection criteria

- The research is of a fundamental kind; applicants with an applied or industrial background in engineering will typically not be competitive.
- Specialisation in Fluid Mechanics or physics.
- Women and persons of minority background are especially encouraged to apply.

Personal characteristics

- Enthusiastic and highly motivated
- Able to work effectively on their own and in a team
- Diligent, thorough, and hard-working
- Able to work structured and goal oriented with a drive to get projects finished
- Creative, good at finding solutions
- Open-minded and tolerant, able to work in a highly multicultural environment and collaborate equally well regardless of colleagues' cultural background, religion, gender, sexual orientation, or nationality.

The applicant is expected to contribute to the social and environment and activities, of the Ellingsen group and the larger Thermo-Fluids group above and beyond the position itself.

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

PhD candidates are remunerated in code 1017, and are normally remunerated at gross from NOK 491 200 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 - 4 years (4 years with duty work).

Appointment to a PhD position requires that you are admitted to the PhD programme in [subject area] (Link to website, if applicable) 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 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
- transcripts and diplomas for bachelor's and master's degrees. If you have not completed the master's degree, you must submit a confirmation that the master's thesis has been submitted.
- A copy of the master's thesis. If you recently have submitted your master's thesis, you can attach a draft of the thesis. Documentation of a completed master's degree must be presented before taking up the position.
- Project proposal
- Research plan
- Name and address of three referees
- If you have publications or other relevant research work

If all, or parts, of your education has been taken abroad, we also ask you to attach documentation of the scope and quality of your entire education, both bachelor's and master's education, in addition to other higher education. Description of the documentation required can be found here. If you already have a statement from NOKUT, please attach this as well.

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 and interpersonal qualities. Motivation, ambitions, and potential will also count in the assessment of the candidates.

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.

In accordance with The Public 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 Professor Simon Ådnøy Ellingsen, email simen.a.ellingsen@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-24/22 when applying.

Application deadline: 17.02.22.

NTNU - knowledge for a better world

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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)