Jobbnorge ID: 276776
Deadline: 3/28/2025
Website: http://www.ntnu.no
Scope: Fulltime
Duration: Fixed Term

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

PhD Candidate in Fire safety and computational modelling (CFD)

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 43,000 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

Become a PhD within fire safety and CFD modelling of fire development.

Fires cause deaths and injuries, economic and heritage losses and environmental harm. The risk of building fires and their consequences can be avoided or mitigated by the design of the building, operation of ventilation, equipment for suppression/extinction, etc. This requires knowledge of the behaviour of fires, their physics and chemistry, also known as fire dynamics. More knowledge is needed about the growth and spread of fires in buildings and how to analyze and simulate them. Computational fluid mechanics (CFD) is a modern tool for analysis of potential or experienced fires in buildings. The fire development will depend on natural and mechanical (forced) ventilation of the rooms and spaces in the building.

Another aspect of fires is the increasing use of timber as a structural and decorative material in both small and large buildings. On one side, thanks to the low carbon footprint, buildings with timber structures can contribute to fulfilling some of the sustainable development goals set up by the United Nations. On the other hand, wood is combustible and can contribute to fuel fires. More knowledge is needed to better understand the development of a fire, its interaction with ventilation conditions and wood surfaces, and the possibilities of fire suppression.

The results of the PhD-project shall lead to more firesafe buildings and a better ability to analyse fires. The project will build on experiences from previous work in this field, including previous projects in the Fire Research and Innovation Centre (FRIC).

Are you motivated to take a step towards a doctorate and open up exciting career opportunities? As a PhD Candidate with us, you will work to achieve your doctorate, and at the same time gain valuable experience that qualifies you for a further career in higher education and research, in and outside academia.

Your immediate leader will be the Head of Department.

About the project

The project work will have an emphasis on computational work, i.e., investigations using CFD and development and use of submodels. A focus will be on the interactions between fire development and ventilation of the compartment. It will include collaboration and participation in experimental work. Close collaboration and communication with relevant actors in the FRIC network will help to optimize the impact of the work in the relevant areas. The exact problem specification will be developed by the candidate in cooperation with the supervisors.

The PhD candidate will work within the research activity Fire development and suppression in FRIC - Fire Research and Innovation Centre, in Trondheim (www.fric.no/en). FRIC was established 2019 in Trondheim by RISE Fire Research (www.risefr.com), SINTEF (www.sintef.no/en), NTNU, and a number of industry and public partners. The centre is funded by the Gjensidige foundation (https://www.gjensidigestiftelsen.no/english-information/en/) and partners of the centre, and administered through the Research Council of Norway. The main goal of the centre is to improve evidence-based decision-making and solutions for fire safety and fire protection in the built environment.

Your supervisor will be Professor Ivar S. Ertesvåg (https://www.ntnu.edu/employees/ivar.s.ertesvag).

Duties of the position

- Engage in theoretical research, computational and practical experimental work.
- Perform mandatory coursework as part of the PhD-education.
- Plan and execute comprehensive, independent research under supervision.
- Interact and collaborate with researchers and FRICpartners.
- Communicate results effectively through research journal publications, conference presentations and other forms of communication to a diverse range of audiences.
- Submit and defend a doctoral thesis.

Be prepared for changes to your work duties after employment.

Required selection criteria

- You must have an academically relevant background mechanical or civil engineering, fire safety engineering or related equivalent education.
- You must have experience in computational fluid dynamics (CFD).
- You must have a Master's degree or equivalent. Your course of study must correspond to a five-year Norwegian course, where 120 credits have been obtained at master's level. Master's students can apply, but the master's degree must be obtained and documented before starting the position.
- You must have a strong academic background from your previous studies and have an average grade from your Master's degree study, or equivalent education, which is equal to B or better compared to NTNU's grading scale. If you do not have letter grades from previous studies, you must have an equally good academic foundation. If you have a weaker grade background, you may be considered 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 Programme.
- Good oral and written English language skills.

PLEASE NOTE: For detailed information about what the application must contain, see paragraph “About the application”.

If you cannot document skills in Norwegian, Swedish or Danish at level A2 upon employment, you must complete Norwegian courses corresponding to at least 15 credits before the end of the employment period. NTNU will facilitate this.

The appointment is to be made in accordance with Regulations for the Universities and Colleges Act (university and colleges regulations) and Regulations for the degrees philosophiae doctor (ph.d.) and philosophiae doctor (ph.d.) in artistic development work at the Norwegian University of Science and Technology (NTNU) for general criteria for the position.

Preferred selection criteria

- Experience from fire safety engineering work.
- Experience from work on combustion and other topics directly relevant to the PhD project.
- Experience in implementing/modifying sub-models in CFD code.
- Some experience with laboratory-or experimental activities.
- Good written and oral Norwegian/Scandinavian language skills.

Personal characteristics

To complete a doctoral degree (PhD), it is important that you are able to:

- Work independently, as well as in a team
- Work in a structured way, set goals and make plans to achieve them
- Present and discuss your research with other professionals
- Work constructively under pressure or in the face of adversity
- Show curiosity and a strong motivation for the subject

Emphasis will be placed on personal qualities.

We offer

- An exciting job with an important mission in society
- Developing tasks in a strong and international professional environment
- Career guidance and follow-up during the PhD period
- Open and inclusive working environment with committed colleagues
- As a public employee, you have favourable benefits as a member of the Norwegian Public Service Pension Fund (SPK)

You will be employed as a PhD Candidate at NTNU and will have access to employee benefits and discounts.

Diversity

Diversity is a strength, and at NTNU we aim to be an employer that reflects the diversity in society and that makes use of the potential of the population's collective skills. Our vision is Knowledge for a better world and our values are creative, critical, constructive and respectful. We believe that an organization that is equal, diverse and gender-balanced is essential for us to achieve our goals.

We strive to attract employees with different skills, life experiences and perspectives to contribute to even better problem solving of our societal mission in research and education.

If you think this position is relevant and interesting, we encourage you to apply, regardless of gender, functional ability and cultural background, or whether you have been out of work for a period of time.

At NTNU we want to increase the proportion of women in scientific positions. We have a number of measures to promote equality.

The Department of Energy and Process Engineering (EPT) has established EPT Women in Science. The group is focused on supporting female Research Assistants, PhD Candidates, Postdoctoral Fellows and permanent academic employees within the Department. This support aims to help develop the academic careers of female employees, and is also made visible to our student body, to encourage them to consider an academic path. As part of the EPT Women in Science initiative we continue to build on our international network, inviting prominent female academics within and beyond the field of Engineering to speak at our events.

Salary and conditions

In the position of PhD Candidate, code 1017, your gross salary will normally be NOK 536 200,- per annum depending on qualifications and seniority. A 2% statutory contribution to the State Pension Fund is deducted from the salary.

The employment period is 3 years. If learning Norwegian (level A2 corresponding to at least 15 credits) is to be completed before the end of the employment period, the employment period can be extended by 10 weeks after completed and documented the Norwegian course.

For employment as a PhD Candidate, it is a prerequisite that you gain admission to the PhD programme in Engineering within three months of your employment contract start date, and that you participate in an organized doctoral programme throughout the period of employment.

The position is conditional on external funding.

As an employee at NTNU, it is important that you keep yourself up to date with academic and organizational changes and adapt to them.

For the necessary academic and social interaction, it is a prerequisite that you are physically present and available to the institution on a daily basis.

The appointment is carried out in accordance with the principles of the State Employees Act, and Export control (legislation that regulates the export of knowledge, technology and services). Candidates who, after assessment of the application and attachments, are considered to be in conflict with the criteria in the latter act, will not be able to be employed.

About the application

The attachments (including a description of your scientific work) must accompany the application as these documents form the basis of the application assessment. The documents must be in Norwegian/a Scandinavian language or English.

Please note: the application will only be assessed on the basis of the information we have received by the application deadline. Therefore, make sure that your application clearly shows how your skills and experience meet the criteria described above. The application and all attachments must be sent electronically via Jobbnorge.no. If you are invited to an interview, you must bring certified copies of certificates.

The application must include:

- Transcripts and diplomas for Bachelor's and Master's degrees
- CV
- Copy of Master's thesis. If you have recently submitted your Master's thesis, you can attach a draft of the thesis. Documentation of a completed Master's degree (with final grading) must be presented before taking up the position. If you have not yet submitted the master's thesis, a confirmed outline of the work, time plan and deadline must be included.
- A description (1-2 pages) of 'Ideas for research approach' including preferred focus areas and suggested methods.
- A description (1 - 2 pages) of your experience with CFD, including examples of cases and type/name of code.
- Publications etc. or other relevant research work that you may have developed
- Possibly certificates or relevance
- Names and contact information of three relevant referees

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. If your institution uses "diploma supplement" (normal for most European institutions), you must attach this. A description of the documentation required can also be found here. If you already have a statement from Norwegian Directorate for Higher Education and Skills (HK-dir), please attach this as well.

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

When assessing the best qualified, we emphasize necessary qualifications such as education, experience and personal suitability. Motivation for the position, ambitions and potential for research will also count when assessing the candidates.

NTNU recognizes a wide range of academic contributions and has committed itself to The San Francisco Declaration on Research Assessment and CoARA (responsible assessment of research and recognition of a greater breadth of academic contributions in accordance with NTNU's social mission).

General information

A public list of applicants with name, age, job title and municipality of residence is prepared after the application deadline. If you wish to be exempt from entry on the public applicant list, this must be justified. Assessment will be made in accordance with current legislation. You will be notified if the exemption is not granted.

If you think this position looks interesting and in line with your qualifications, you are welcome to apply.

If you have any questions about the position, please contact Professor Ivar S. Ertesvåg, e-mail: Ivar.S.Ertesvag@ntnu.no.

If you have any questions about the recruitment process, please contact HR consultant Ingrid Wiggen, e-mail: ingrid.wiggen@ntnu.no.

Application deadline: 28.03.2025

For practical information about working at NTNU, please visit this webpage.

The city of Trondheim is a modern European city with a rich cultural scene. Trondheim is the tech 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.

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

Contact person:

Ivar S. Ertesvåg, Professor
Phone: | E-mail: Ivar.S.Ertesvag@ntnu.no

Place of service:

Høgskoleringen 1 7491 Trondheim (Trondheim Municipality)