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Omfang: Heltid
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The Department of Mechanical and Industrial Engineering has a vacancy for a

PhD Candidate in welding of high-strength steel for renewable energy applications

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

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

We are looking for a 3-year PhD candidate within the cutting-edge field of “welding of high-strength steels for renewable energy applications”. Norway has been significantly investing in sustainable energy production and transportation to minimize CO2 emissions. This project aims to investigate high-productivity welding solutions primarily for the application of high-strength steels in hydrogen production and transportation. The project will require welding of steels using different techniques such as GMAW and laser-arc hybrid. The study shall be supported by numerical modelling and thermodynamic calculations. In the next step, the welds shall be characterized using advanced microscopy techniques and mechanically tested in air and hydrogen environments. The outcomes of the study, such as welding procedure, modelling approach, microstructure, and performance will be used to develop sustainable solutions for welding of high-strength steels.

During the PhD study, the candidate is expected to collaborate with the research institution SINTEF as well as the industrial partner Equinor, present his/her research results in national and international forums, and write high-quality research papers. Possible placement of the PhD candidate may be expected for passing relevant courses or/and performing research in universities and research centres other than NTNU.

Duties of the position

- Contribute to the development of welding procedures for welding of high strength steel based on the guidelines and standards using conventional as well as innovative welding techniques
- Develop a weld monitoring system to correlate the results with numerical calculations
- Develop basic numerical and thermodynamic modelling to evaluate the process-microstructure-performance relationship in the welded components
- Perform mechanical and microstructural testing, characterization, and analysis to assess the properties and performance of welded components
- Investigate the process and material behaviours, mechanisms, and models to target welding production characteristics and performance considering Design for X concept
- Conduct high-level research and publish it in peer-reviewed journals and international conferences to qualify for a PhD career
- Take part in the mandatory PhD research education programme

Be prepared for changes to your work duties after employment.

Required selection criteria

- You must have an academically relevant background within Welding Engineering, Manufacturing Engineering, Mechanical Engineering, Materials Processing, or Metallurgical Engineering
- 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
- Documented strong background in processing and manufacturing of metallic materials, for example via welding, additive manufacturing, or metal forming.
- Excellent written and oral English.

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

As a result of the new Act relating to universities and university colleges with associated regulations of 01.08.2024, NTNU has, during a transitional period (for decisions on employment in recruitment positions before 1 August 2025), chosen to use the terms of employment in the old regulations of 31 January 2006 no. 102 on terms of employment for positions such as postdoctoral fellow, research fellow, scientific assistant and specialist candidate

Preferred selection criteria

- Experience in designing and developing material processing, welding, or additive manufacturing processes
- Knowledge and testing skills in physical metallurgy and mechanical testing of metallic materials
- Experience in modelling material, process, or product behaviour (such as using analytical, finite element (FE) analysis, thermodynamic, and data-driven modelling approaches)
- Experience in working with industrial partners via academic projects or direct employment
- Having demonstrated presenting academic research in referred journals and international conferences

Personal characteristics

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

- Highly motivated, independent, and enthusiastic
- Strong ability to systematically carry out goal-oriented work
- Enjoy interdisciplinary research
- Keen interest in learning and working in teams
- Good skills in delivering oral and written presentations of research project progress and results
- Strong interest in conducting experimental and numerical research
- Possessing a research-oriented mindset with a strong interest in understanding the underlying mechanisms of phenomena by developing systematic testing methodology

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
- Working capital that can be used to implement the project
- Mentor programme as a new employee at NTNU
- 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.

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.

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.

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 bein 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 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 must be presented before taking up the position.
- Preliminary research plan (max. 2 pages)
- Documentation relevant to the required criteria
- Possibly publications etc. other relevant research work
- Possibly certificates
- 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 Vahid Hosseini, e-mail: vahid.hosseini@ntnu.no.

If you have any questions about the recruitment process, please contact HR Consultant Hedda Winnberg, e-mail: hedda.winnberg@ntnu.no

Application deadline: 08.06.2025

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

NTNU - knowledge for a better world

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

Department of Mechanical and Industrial Engineering

We educate graduates who can create new products, operate and maintain products, and manage projects. The Department has a variety of bachelor’s and master’s degree programmes. We conduct wide-ranging research in fields such as technology, energy, product quality and development, and productivity. The Department of Mechanical and Industrial Engineering is one of eight departments in the Faculty of Engineering.

Tilleggsinformasjon

Arbeidssted:

Richard Birkelands vei 2B 7034 Trondheim (Trondheim Kommune)