Jobbnorge ID: 275217
Deadline: 4/1/2025
Website: http://www.ntnu.no
Scope: Fulltime
Duration: Fixed Term

The Department of Materials Science and Engineering has a vacancy for a

PhD Candidate position on through-process modelling of aluminium alloys

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.

A PhD Candidate position within the frame of the SFI PhysMet (Centre for Sustainable and Competitive Metallurgical and Manufacturing Industry; https://www.ntnu.edu/physmet) is offered at the Department of Materials Science and Engineering (DMSE). The funding is 3 years.

Your immediate Line Manager will be the Head of Department.

About the project

Industrial thermo-mechanical processing is to a too large extent based on trial-and-error experimental approaches, which is both costly and time consuming. With application of more recycling-based metals in the production cycles it is important to increase the ability to design and adjust processes based on simulation tools. An important objective of SFI PhysMet is to allow for more use of recycled metal in the metal-based manufacturing industry. An important objective is to further develop existing (and possibly new) models, which can handle more complex chemistries and processing conditions.

The physical metallurgy group at DMSE, NTNU has a long tradition for and expertise in the development and application of physical-based models for analysing thermomechanical processing of aluminium alloys. This includes models for precipitation, work hardening, crystal plasticity and texture, recovery, recrystallization and grain growth. Existing models for microstructure evolution during thermomechanical processing cannot properly deal with transient conditions experienced during complex thermomechanical processing, e.g. during rolling, extrusion, hot forging and forming lines. Therefore, an objective is to further develop and generalize existing microstructure-evolution models for heat treatment, recrystallization and work hardening/crystal plasticity, to account also for transient conditions. The improved models should then be used as sub-models in finite-element simulation software to simulate the thermomechanical processes and predict the properties of products.

The work will include experimental trials using a Gleeble machine for hot deformation tests. Characterization of microstructures and evaluation of properties will provide experimental input to the models and for validation.

If appropriate and needed, machine-learning-based approaches may also be a part of the research activities, allowing for a combination of the through-process modelling tools with artificial-intelligence approaches will be applied to improve the digitalization and automatization level of user partners in their production.

Duties of the position

- Complete the doctoral education until obtaining a doctorate
- Carry out research of good quality within the framework described above
- Academic publications and popular science dissemination
- Participate in international activities such as conferences and/or research stays at foreign educational institutions

Be prepared for changes to your work duties after employment.

Required selection criteria

- Strong background with experience with numerical/mathematical modelling and simulations of microstructure phenomena in materials science and engineering.
- You must have a Master's degree in Materials Science and Engineering, Physics, Materials Chemistry, Mechanical Engineering 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 and no later than July 2025.
- 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 (https://www.ntnu.edu/nv/phd)
- Experience with model implementation/programming in Fortran, C/C++, Python or similar computer languages.
- Competence in Scanning electron microscopy, including electron back scattering diffraction and texture measurement and representation.
- Good written and oral English language and communication skills. Knowledge of a Scandinavian language is considered as a plus.

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

- An educational background which also includes hands-on experience with methods for characterization of materials microstructure and texture and mechanical testing
- Some knowledge of Machine Learning methodologies is an advantage.

Personal characteristics

- Creativity, with a strong ability to work goal-oriented and independently.
- Good skills to deliver oral and written presentations of research results.
- He/she should also enjoy interdisciplinary research and take keen interest in working in project teams.

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.

Salary and conditions

In the position of PhD Candidate, code 1017, your gross salary will normally be NOK 536,200 per annum. 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 Materials Science and Engineering (https://www.ntnu.edu/studies/phmt) 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 bein conflict with the criteria in the latter act, will not be able to be employed.

Please note that the person hired will work with critical infrastructure and areas affected by controls on the export of strategic goods, services and technology. Candidates who do not meet the requirements for the necessary security clearance, access clearance and authorization as described in the National Security Act, the Export Control Act and the Act on the Implementation of International Sanctions (Sanctions Act) cannot be considered.

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 and certificates
- 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.
- A cover letter describing your motivation for the position, a summary of scientific experience and how the applicant sees their background as suitable (1-2 pages max).
- Applicants from non-English-speaking countries outside Europe must document English skills by an approved test. Approved tests are TOEFL, IELTS and Cambridge Certificate in Advanced English (CAE) or Cambridge Certificate of Proficiency in English (CPE)
- 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.
- Name and contact information 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. 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 Bjørn Holmedal +47 90084946, email bjorn.holmedal@ntnu.no, or Assoc. Professor Tomas Manik, e-mail tomas.manik@ntnu.no.

If you have any questions about the recruitment process, please contact HR consultant Marie Kristiansen, email: mare.kristiansen@ntnu.no.

Application deadline: 01.04.2025

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 Materials Science and Engineering

We are Norway's leading educational and research environment in materials engineering, materials chemistry and materials science. In collaboration with business and industry, we are a driving force for the development of innovative materials as well as new applications and manufacturing processes. Activities in our disciplines are vital for the green shift. The Department of Materials Science and Engineering is one of eight departments in the Faculty of Natural Sciences.

Additional information

Contact persons:

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Place of service:

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