Jobbnorge ID: 299101
Deadline: 4/25/2026
Website: http://www.ntnu.no
Scope: Fulltime
Duration: Temporary

The Department of Structural Engineering has a vacancy for a

Postdoctoral Fellow in Microstructure-Informed Modelling of Fracture in Cast 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 can find more information about working at NTNU and the application process here.

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

About the position

High-pressure die-cast (HPDC) aluminium alloys are widely used in structural applications due to their low weight, good strength, high recyclability, and ability to enable cost-efficient manufacturing of complex-shaped components. However, due to the interplay between casting defects and a heterogeneous microstructure, their fracture behaviour often exhibits significant scatter. Improving the understanding of the mechanisms governing this variability is essential for developing reliable predictive models and ensuring safe and robust component design.

This position is part of the CastAI project, which aims to identify the mechanisms governing stochastic fracture in HPDC aluminium alloys and to develop a virtual modelling framework capable of describing this behaviour. The research combines advanced microstructural characterization, including SEM and X-ray-based computed tomography, with numerical simulations informed by microstructural data.

The successful candidate will work at the interface between experiments, modelling, and data-driven methods. Particular emphasis will be placed on characterizing defect populations and incorporating this information into finite element models, either through direct reconstruction of microstructures or statistically generated synthetic representations. The project will also explore machine-learning approaches and efficient imaging strategies, including reconstruction of three-dimensional pore structures from radiography. By linking defect characteristics to fracture strain obtained from mechanical testing, the work aims to clarify the role of defects and microstructural heterogeneity in the stochastic fracture behaviour of HPDC aluminium alloys.

Are you ready to take your research career to the next level? We offer an exciting 3-year postdoctoral position that gives you the opportunity to develop a strong profile as researcher. You will also gain valuable experience that might be relevant for your further career.

The purpose of a postdoctoral position is to build up a researcher profile that qualifies for a position as associate professor. The position may also offer additional skills that are relevant to the postdoctoral fellow's future career.

Apply for this position to become part of our research environment and take the next step in your career with us.

Your supervisor will be associate professor Lars Edvard Blystad Dæhli.

About the project

The position is part of the CastAI project at the Department of Structural Engineering, NTNU. CastAI is a collaborative research project with Hydro Aluminium and Honda, focusing on stochastic fracture in high-pressure die-cast (HPDC) aluminium alloys. The project aims to advance the understanding of how casting-induced defects and microstructural heterogeneities influence fracture behavior, and to develop improved modelling approaches for predicting failure in these materials.

Duties of the position

- Conduct high-quality research within the scope of the project
- Publish research results in leading scientific journals and contribute to dissemination
- Actively participate in the SIMLab research group (SIMLab) and its activities

- Apply for research funding and write applications and report on progress to funding sources
- Engage in international activities such as conferences and/or research stays at foreign educational institutions
- Contribute to teaching activities in courses at the Department of Structural Engineering
- Mentoring students, helping them with their research projects, and advising on methodology and academic writing
- Other career-promoting work

Required selection criteria

- A doctoral degree (PhD) in solid mechanics, computational mechanics, or a closely related field, with a strong academic record
- If you are in the final phase of your doctorate and can document that the thesis has been submitted or that the defense date has been confirmed, your application can be considered even if you have not defended. NOTE: Documentation of the obtained doctorate must be presented before you can take up the position
- Good oral and written communication skills in English

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

If you do not already have educational competence that meets the requirements for a position as associate professor in Norway, NTNU will arrange for you to acquire such competence during the employment period. In such cases, you will also be assigned relevant teaching as part of the career-promoting work.

The appointment is to be made in accordance with NTNUs guidelines for recruitment positions and Regulations concerning the degrees of philosophiae doctor (ph.d.) in artistic development work at the Norwegian University of Science and Technology (NTNU)for general criteria for the position.

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

- Strong background in non-linear finite element methods
- Solid knowledge of materials mechanics
- Knowledge of fracture mechanics
- Experience with machine learning and/or data-driven methods
- Oral and written communication skills in Norwegian/Scandinavian
- Experience from research collaboration with industrial partners or industry-oriented projects

Personal characteristics

Working as a Postdoctoral fellow requires that you

- Work independently
- Work structured, set goals and make plans to achieve them
- Present and discuss your research with other professionals
- Engage and contribute constructively with feedback
- Analyze data, assess different perspectives and draw well-founded conclusions

Emphasis will be placed on personal qualities.

We offer

- An exciting job with an important social mission
- Developing tasks in a strong and international professional environment
- Career guidance throughout the postdoctoral program and together with you we will prepare a career plan, which containsthe skills and knowledge you will acquire
- Open and inclusive working environment with committed colleagues
- Mentor programme as a new employee at NTNU
- Favorable terms in the Norwegian Public Service Pension Fund
- Free Norwegian language training at a basic level (A2)

As a Postdoctoral Fellow at NTNU, you will have access to employee benefits.

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

As a Postdoctoral Fellow (code 1352) you are normally paid from gross NOK 604 900,- 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.

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

For the necessary professional 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 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 and diplomas upon request.

The application must include:

- Transcripts and diplomas for Bachelor's-,Master's- and PhD degrees. If you have not yet completed your PhD, you must provide confirmation on your estimated date for the doctoral dissertation, or confirmation that your PhD thesis has been submitted. Documentation of a completed doctoral degree must be presented before taking up the position.
- CV
- A copy of the doctoral thesis. If you are close to submitting,you can attach a draft of the thesis.
- Academic works - published or unpublished(up to 3 items)
- Possible recommendation letters
- Name and contact information of three referees

If all or parts of your education hasbeen taken abroad, we also ask you to attach documentation of the scope and quality of your entire education. Description of the documentation requiredcan 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 works, you must attach a brief description of your participation.

If you have had leave or another break in your career, it is important that this is stated in your application so that the selection committee can take this into account and that the amount of your research may be reduced as a result.

In the evaluation of which candidate is best qualified, emphasis will be placed on education, experience and personal qualities. Motivation, ambitions and potential for research will also be emphasized in the assessment of the candidates.

NTNU recognizes a wide range of academic contributions and is committed to follow evaluation criteria for research quality according to The San Francisco Declaration on Research Assessment DORA and the obligations in 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 list of applicants, 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 have any questions about the position, please contact associate professor Lars Edvard Blystad Dæhli, phone: +47 47373883, email: lars.e.dahli@ntnu.no.

If you have any questions about the recruitment process, please contact HR consultant June Hovde, email: june.b.hovde@ntnu.no.

If you find this position interesting, and in accordance with your qualifications, please submit your application electronically via jobbnorge.no with your CV, diplomas and certificates attached. Applications submitted elsewhere will not be considered. Upon request, you must be able to obtain certified copies of your documentation.

Application deadline: 25.04.2026

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

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 Structural Engineering

We teach mechanical engineering, engineering and ICT, and civil and environmental engineering. The Department conducts internationally leading research and participates in several large national research projects. The Department of Structural Engineering is one of eight departments in the Faculty of Engineering.

Additional information

Place of service:

Høgskoleringen 1 7491 Trondheim (Trondheim Municipality)