Jobbnorge ID: 296314
Deadline: 3/16/2026
Website: http://www.ntnu.no
Scope: Fulltime
Duration: Temporary

The Department of Structural Engineering has two vacancies for

SFI FAST: PhD positions in Modelling Strength and Failure in Recycled 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

The Department of Structural Engineering has two vacancies for PhD candidates within **Modelling Strength and Failure in Recycled Aluminium Alloys** funded through the Centre for Research-based Innovation SFI FAST - Future Aluminium Structures. The positions are linked to the research group SIMLab (Structural Impact Laboratory).

For a position as a PhD candidate, the goal is a doctoral education leading to a doctoral degree.

About SFI FAST - Future Aluminium Structures

SFI FAST (Future Aluminium Structures) is a national Centre for Research-based Innovation (SFI) funded by the Research Council of Norway and the aluminium industry. The centre is led by NTNU in close collaboration with SINTEF and a broad consortium of 16 leading industrial partners across the aluminium value chain. FAST runs from 2026 to 2033 and represents one of Norway's most ambitious long-term research initiatives within aluminium materials, manufacturing technologies, and circular economy.

The primary objective of FAST is to establish the scientific and technological knowledge base required to enable the large-scale use of post-consumer scrap (PCS) aluminium in high-value, structural, and safety-critical products. FAST adopts a through-scale and through-process research methodology, integrating materials science, manufacturing processes, product and structural design, and lifecycle performance.

A key outcome of FAST is the development of the FAST Virtual Lab, a digital framework combining experimental data, physics-based models, and data-driven methods to support design, manufacturing, and decision-making across aluminium value chains.

Education and competence building are central pillars of FAST. The centre will educate more than 18 PhD candidates and postdoctoral researchers and over 100 MSc students, strengthening Norway's international position in aluminium research and innovation. The two positions posted here will be among the first ones to start in the centre.

Please see the centre's website: Future Aluminium Structures (FAST) - NTNU

PhD Position 1: Modelling Plastic Flow and Fracture in Recycled Aluminium Alloys

We are seeking a highly motivated PhD candidate to join a project focused on understanding how the microstructural heterogeneity of recycled aluminium alloys affects their ductility and fracture behaviour. The work will explore how this heterogeneity influences deformation and damage, combining **advanced experimental characterization** with **multi-scale modelling**.

As a PhD candidate, you will:

- Characterize recycled aluminium microstructures using SEM/EBSD, microCT, and in situ mechanical tests.
- Develop microstructure informed models of plasticity and fracture across length scales.
- Investigate how particle clustering and morphology affect strain localization and damage evolution.
- Integrate experiments and modelling to create predictive tools for recycled alloy performance.

Your immediate leader is David Morin at the Department of Structural Engineering at NTNU.

Proposed starting date: August 1, 2026.

PhD Position 2: Modelling fillet Welds in Aluminium Structures

We are seeking a highly motivated PhD candidate to work on advanced modelling of fillet welds in aluminium structures. The project focuses on understanding how weld geometry, alloy composition, thermal history, and manufacturing variability influence stiffness and failure behaviour, particularly when recycled alloys are used. The work will combine experimental characterization with numerical modelling to improve the predictive capability of engineering simulations.

As a PhD candidate, you will:

- Develop improved stiffness representations for fillet welds in shell and mixed shell-solid FE models.
- Investigate failure mechanisms in fillet welds, including initiation at weld start-stop regions.
- Characterize weld properties across different alloys, welding processes, and recycled material compositions.
- Integrate mechanical testing, microstructural data, and thermal-mechanical modelling.
- Propose robust and efficient modelling strategies suitable for industrial design workflows.

Your immediate leader is Miguel Costas at the Department of Structural Engineering at NTNU.

Proposed starting date: August 1, 2026.

Duties of these positions

- Collaborate with other researchers and industry partners in SFI FAST to validate models and apply findings to real-world industrial problems.
- Conduct and publish high-level research in peer-reviewed journals and at international conferences.
- Participate and contribute to activities in SFI FAST and the research group SIMLab, including mentoring and supervising MScs.
- Disseminate relevant parts of the research to a wider audience.

Required selection criteria

- You must have a professionally relevant background in solid mechanics, structural engineering, mechanical engineering or similar fields.
- Your education must correspond to a five-year Norwegian degree program, 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 doctoral program from the Faculty of Engineering (https://www.ntnu.edu/studies/phiv)
- You must be fluent in spoken and written English.

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

The appointment is to be made in accordance with NTNUs guidelines for recruitment positions 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

- Knowledge of plasticity theory.
- Knowledge of constitutive modelling of materials.
- Knowledge of non-linear finite element methods.
- Knowledge of aluminium alloys
- Experience using non-linear finite element software, e.g., Abaqus.
- Experience with programming using Python and Fortran.
- Experience with conducting experimental work and data analysis.

Personal characteristics

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

- Highly motivated.
- Able to work independently.
- Curious and enthusiastic.
- Strong ability to systematically carry out goal-oriented work.
- Enjoy and contribute to interdisciplinary research.
- Keen interest in learning and working in teams.
- Good skills to deliver oral and written presentation of research results.
- Strong interest in combining theory and practice through experimental and numerical research.

Emphasis will be placed on personal qualities.

We offer

- Exciting and stimulating tasks in a strong international academic environment
- SFI FAST facilities, industrial network, and a joint PhD environment
- An open and inclusive work environment with dedicated colleagues
- Favorable terms as a member of the Norwegian Public Service Pension Fund (SPK)
- Excellent research infrastructure for experiments and modelling
- Salary and conditions according to NTNU's PhD regulations

As a PhD Candidate 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. (delete if not applicable)

Salary and conditions

In the position of PhD Candidate, code 1017, your gross salary will normally be NOK 550 800,-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 the doctoral work in addition to 1 year of career promotion work. (A minimum of three work years of the total term period must be dedicated to doctoral work.)

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 through out the period of employment.

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. In addition, all candidates qualified for this position that are outside NATO-countries must be approved by partners in the SFI's consortium.

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

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:

- CV and certificates.
- Name and contact information of three references.
- 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 work 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 either Associate Professor David Didier Morin, telephone +4773591300, email david.morin@ntnu.no or Associate Professor Miguel Costas, telephone +4773594518, email miguel.costas@ntnu.no.

If you have any questions about the recruitment process, please contact HR Consultant June Hovde, e-mail: june.b.hovde@ntnu.no.

Application deadline: 16.03.2026

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 - 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 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)