

Jobbnorge ID: 284018
Deadline: 8/17/2025
Website: <http://www.ntnu.no>
Scope: Fulltime
Duration: Fixed Term

The Department of Geosciences has a vacancy for a

PhD Candidate in Rock Engineering - IV-91/25

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-yHCN5QSO>

About the position

The Department of Geosciences (IGV) has a vacancy for a full-time 100% position as a PhD candidate within the field of Rock Engineering. The prospective candidate will be part of the Engineering Geology and Rock Mechanics research group at IGV but will also collaborate with other NTNU departments and societal stakeholders.

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.

The main supervisor of the project will be Professor Hakan Basarir. And your immediate leader will be the Head of Department.

About the project

For a position as a PhD Candidate, the goal is a completed doctoral education up to an obtained doctoral degree. The work environment will be inspiring and international with other PhD candidates working within engineering geology, structural geology, hydrogeology and soil mechanics.

You will report to your closest supervisor.

The project focuses on developing an advanced, AI-integrated methodology for the design of Large Underground Structures (LUS), addressing the limitations of traditional empirical approaches. These structures are critical to sectors such as transportation, defense, mining, and urban development, yet their design is often hindered by complex geological conditions and evolving functional requirements. This project aims to create safer, more adaptable, and resource-efficient underground infrastructures.

Through collaboration with key national and Scandinavian stakeholders—including government agencies, research institutions, and industry partners—the project will establish a validated, data-driven design framework. This framework will support multifunctional and dual-use applications, enhancing the resilience of underground spaces for both civilian and defense needs. The outcomes will include best practice guidelines, a robust AI-based design tool, and a foundation for future innovation and funding in underground construction.

Duties of the position

- Conduct geological and rock engineering assessments to identify key parameters influencing underground structure design.
- Analyze existing empirical design methods and identify limitations in the context of complex geological conditions.
- Collect and synthesize data from Norwegian and international LUS case studies, including hydropower tunnels, sports caverns, and repurposed mines.
- Utilize digital tools (e.g., drones, 3D mapping) for high-resolution geological mapping and rock mass quality assessment.
- Develop and calibrate numerical models using field data and case studies to simulate various underground conditions.
- Apply machine learning and AI techniques to enhance model accuracy and optimize design parameters.
- Contribute to the development of a comprehensive, AI-based design methodology for LUS, focusing on safety, sustainability, and adaptability.
- Collaborate with stakeholders from government, academia, and industry to ensure practical relevance and knowledge exchange.

- Prepare technical reports, design guidelines, and academic publications based on research findings.
- Support the dissemination of project outcomes through workshops, presentations, and stakeholder engagement activities.
- Participate in relevant and international conferences, publication of annual reports, and write peer-reviewed journal papers to disseminate the research results.
- Complete the doctoral education until obtaining a doctorate..
- Teaching assistant

Be prepared for changes to your work duties after employment.

Required selection criteria

- You must have a relevant Master's degree in Rock engineering, Rock mechanics or Engineering geology, Geotechnical engineering, Structural or civil engineering (Specialized in underground construction), Computational engineering or applied mathematics, Data science or Artificial intelligence. Your course of study must correspond to a five-year Norwegian course, where 120 credits have been obtained at master's level.
- 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 presentation skills in 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

- Experience with numerical modelling tools/software (e.g., FLAC3D, PLAXIS, RS2, or similar). Experience in developing or calibrating models using field or case study data.
- Familiarity with AI/ML techniques and their application in engineering problems is highly desirable. Proficiency in programming languages such as Python, MATLAB, or R.
- Experience with digital tools for 3D modelling, GIS, or drone-based mapping.
- Ability to analyse complex geological and structural data.
- Ability to work effectively in interdisciplinary and multi-stakeholder environments.
- Experience in writing technical reports, academic papers, or presenting research findings.
- Good oral and written presentation skills in Norwegian/Scandinavian languages.

Personal characteristics

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

- Work independently and taking initiative in research and development tasks. Explore new ideas, technologies, and methodologies, especially in the intersection of engineering and AI/ML.
- The ability to work in a team, enjoy working in multidisciplinary teams and engaging with stakeholders from academia, government, and industry.
- Strong time-management skills. Pay close attention to accuracy and quality in modelling, data analysis, and documentation.
- Good networking skills and ability to work in a non-linear, collaborative environment where diverse viewpoints are valued and integrated into the design process.

Emphasis will be placed on personal qualities.

We offer

- 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
- Favorable terms as a member of the [Norwegian Public Service Pension Fund \(SPK\)](#)

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 doctoral work in addition to 12 months of career promotion work, such as teaching assistant and assisting on field work, in total 4 years.

For employment as a PhD Candidate, it is a prerequisite that you gain admission to the PhD programme in Engineering [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 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 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 and diplomas upon request.

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.
- Project proposal, max 2 pages
- A cover letter detailing your motivation and sustainability for the position
- 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 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 Professor Hakan Basarir, email hakan.basarir@ntnu.no or Professor Kristin Hilde Holmøy, email kristin.holmoy@ntnu.no.

If you have any questions about the recruitment process, please contact Senior Adviser HR Eli Meistad, email eli.meistad@ntnu.no.

Application deadline: 17.08.2025

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 Geosciences

We conduct teaching and research related to management of Earth's geological resources. Norway's rich resources of wind, water, oil, gas and minerals have been and are essential to the country's prosperity, and will continue to be in the future. The Department plays a key role in the development of technology and the education of graduates who enable value creation based on our natural resources. [The Department of Geosciences](#) is one of eight departments in the [Faculty of Engineering](#).

Additional information

Contact person:

Eli Meistad, Seniorrådgiver HR

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Place of service:

S.P. Andersens vei 15A 7491 Trondheim (Trondheim Municipality)