Jobbnorge ID: 205621
Deadline: 6/7/2021
Website: http://www.ntnu.no
Scope: Fulltime
Duration: Temporary

The Department of Geoscience and Petroleum has a vacancy for a

PhD position in Numerical Analysis in Energy Geomechanics - IV-142/21

This is NTNU

At NTNU, creating knowledge for a better world is the vision that unites our 7 400 employees and 42 000 students.

We are looking for dedicated employees to join us.

You will find more information about working at NTNU and the application process here.

Video: https://www.youtube.com/watch?v=clgKd1SwGLI

About the position

We have a vacancy for a 3-year PhD fellowship at the Department of Geoscience and Petroleum (IGP). The position is within computational energy geomechanics. The research will include development and implementation of models for finite element method (FEM) analysis with poro-elasto-plasticity. The PhD student will be assigned to the Department of Geoscience and Petroleum (IGP) and will be supervised by Prof. Rune Holt and co-supervised by Dr. Euripides Papamichos from SINTEF Industry.

You will report to the Head of Department.

Duties of the position

- The goals of the PhD project are to develop, implement and test a robust finite element simulation tool for chalk (Chalk FEST) within the framework of existing finite element software to simulate observed behavior in the lab including the failure mechanisms of chalk under anisotropic stresses and fluid flow.
- The Chalk FEST will incorporate:
  - Poro-elastoplastic model(s) with fluid flow that capture both shear failure and compaction failure/pore collapse. Model(s) need to address destructuration and softening of chalk due to compaction and pore collapse.
  - Water sensitivity.
  - Creep and rate dependency.
  - Compaction dependent permeability.
- Analysis and prediction of laboratory experiments and implications of various parameters in chalk influx and solids production.
- Simulation of field conditions relevant to production and analyses of field cases.
- If desired, there is possibility for laboratory tests within chalk influx and solids production as well as material characterization.

The work will be carried out in collaboration with SINTEF Industry, Ecole des Ponts Paris Tech, and industrial partners.

Required selection criteria

The PhD-position's main objective is to qualify for work in research positions. The qualification requirement is that you have completed a master's degree or second degree (equivalent to 120 credits) with a strong academic background in engineering/physics or equivalent education with a grade of B or better in terms of NTNU's grading scale. If you do not have letter grades from previous studies, you must have an equally good academic foundation. If you are unable to meet these criteria you may be considered only if you can document that you are particularly suitable for education leading to a PhD degree.

The appointment is to be made in accordance with the regulations in force concerning State Employees and Civil Servants and national guidelines for appointment as PhD, post doctor and research assistant.

Other required selection criteria

- Documented and relevant background in one of the following fields: computational mechanics and engineering; computational physics, applied mathematics.
- Documented knowledge of solid mechanics, theory of elasticity, theory of plasticity.
- Documented knowledge of numerical analysis (computation and/or program development).
- Documented scientific programming skills (C++, Fortran, Python, Matlab).
- Excellent written and oral English language skills and expression.

Preferred selection criteria

It is advantageous if the candidate:

- Has a solid knowledge of the theory of finite element method.
- Has previous knowledge of poromechanics.
- Is familiar with modern software development principles.
- Has hands-on experience with commercial finite-element software packages, e.g., ABAQUS, ANSYS, COMSOL.
- Has published articles in English.

Personal characteristics

We are looking for students who are:

- Passionate about numerical modeling and research.
- Creative thinkers and good communicators.
- Working independently as well as part of a team in accordance with the project objectives.
- Responsible and dependable.

We offer

- exciting and stimulating tasks in a strong international academic environment
- an open and inclusive work environment with dedicated colleagues
- favourable terms in the Norwegian Public Service Pension Fund
- employee benefits

Salary and conditions

PhD candidates are remunerated in code 1017, and are normally remunerated at gross from NOK 482 200 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 without required duties.

Appointment to a PhD position requires that you are admitted to the PhD programme in engineering (https://www.ntnu.edu/iv/doctoral-programme) within three months of employment, and that you participate in an organized PhD programme during the employment period.

The engagement is to be made in accordance with the regulations in force concerning State Employees and Civil Servants, and the acts relating to Control of the Export of Strategic Goods, Services and Technology. Candidates who by assessment of the application and attachment are seen to conflict with the criteria in the latter law will be prohibited from recruitment to NTNU. After the appointment you must assume that there may be changes in the area of work.

The position is subject to external funding.

It is a prerequisite you can be present at and accessible to the institution daily. (Temporary exceptions may be enforced due to the covid pandemic.)

About the application

The application and supporting documentation to be used as the basis for the assessment must be in English.

Publications and other scientific work must follow the application. Please note that applications are only evaluated based on the information available on the application deadline. You should ensure that your application shows clearly how your skills and experience meet the criteria which are set out above.

The application must include:

- CV, certificates and diplomas
- Name and address of three referees

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.

In the evaluation of which candidate is best qualified, emphasis will be placed on education, experience and personal suitability.

NTNU is committed to following evaluation criteria for research quality according to The San Francisco Declaration on Research Assessment - DORA.

General information

Working at NTNU

A good work environment is characterized by diversity. We encourage qualified candidates to apply, regardless of their gender, functional capacity or cultural background.

The city of Trondheim is a modern European city with a rich cultural scene. Trondheim is the innovation 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.

As an employee at NTNU, you must at all times adhere to the changes that the development in the subject entails and the organizational changes that are adopted.

In accordance with The Public Information Act (Offentleglova), your name, age, position and municipality may be made public even if you have requested not to have your name entered on the list of applicants.

If you have any questions about the position, please contact professor Rune Holt, e-mail: rune.holt@ntnu.no and/or Dr Euripides Papamichos, e-mail: euripides.papamichos@sintef.no. If you have any questions about the recruitment process, please contact Anne-Lise Brekken, e-mail: anne.lise.brekken@ntnu.no

Please submit your application electronically via jobbnorge.no with your CV, diplomas and certificates. Applications submitted elsewhere will not be considered. Diploma Supplement is required to attach for European Master Diplomas outside Norway. Chinese applicants are required to provide confirmation of Master Diploma from China Credentials Verification (CHSI).

Please refer to the application number IV-142/21 when applying.

Application deadline: 07.06.2021.

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 Geoscience and Petroleum

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 Geoscience and Petroleum is one of eight departments in the Faculty of Engineering.

Additional information

Place of service:

Institutt for geovitenskap og petroleum 7491 Trondheim (Trondheim Municipality)