

Micro-to-Macro Behaviour and Constitutive Modelling of Fissured High-Plasticity Stiff Clays for Landslides and Climate-Resilient Infrastructure

Applicants are invited for a PhD fellowship/scholarship at Graduate School of Technical Sciences, Aarhus University, Denmark, within the Civil and Architectural Engineering programme. The position is available from 01 November 2026 or later. You can submit your application via the link under 'how to apply'.

Title:

Micro-to-Macro Behaviour and Constitutive Modelling of Fissured High-Plasticity Stiff Clays for Landslides and Climate-Resilient Infrastructure

Research area and project description:

We are looking for a motivated and talented PhD candidate to join our multidisciplinary research team investigating climate-driven geohazards affecting infrastructure and the built environment. The successful candidate will become part of the long-term Villum Foundation research programme Civil Engineering and the Green Transition in the Built Environment (CEBE), bringing together researchers in geotechnical, structural, coastal and environmental engineering.

The PhD project focuses on the mechanical behaviour of fissured high-plasticity stiff clays, which plays a central role in landslides, slope instability and long-term ground movements. These natural soils contain fissures, slickensides, and inherited structural features that strongly influence stiffness, strength, permeability, and deformation behaviour. However, the mechanisms governing progressive degradation and failure remain poorly understood and are inadequately represented in current constitutive models.

The overall objective is to establish a mechanistic understanding of how progressive destructuration and strain localisation evolve from microstructural processes to the macro-scale mechanical response of natural clays. The project combines advanced laboratory characterisation with constitutive modelling to investigate how soil structure, fissure networks, and anisotropy influence the transition from intact behaviour to progressive degradation and failure. The resulting insights will be used to develop and calibrate physics-based constitutive models for natural clays, providing the scientific foundation for future application in advanced numerical modelling and improved prediction of climate-induced ground movements and landslides.

Project description: Applicants should submit a short research proposal (maximum 4 000 keystrokes) demonstrating their understanding of the scientific challenge, identifying key knowledge gaps, formulating research objectives or hypotheses, outlining a possible methodological approach, and explaining why their background makes them well suited for the project. The proposal will be refined together with the supervisors during the PhD.

Qualifications and specific competences:

Applicants to the PhD position must hold a BSc degree (180 ECTS) in civil engineering (or a closely related engineering discipline) and an MSc degree (minimum 90 ECTS) with a specialisation in geotechnical engineering, including advanced coursework in soil mechanics and geotechnical engineering.

Further requirements:

- Excellent communication skills in spoken and written English are required.
- Applicants are expected to have experience with advanced laboratory testing of geomaterials and constitutive modelling.
- Demonstrated programming skills (e.g. Python, MATLAB, or similar scientific programming language) are required.

Place of employment and place of work:

The place of employment is Aarhus University, and the place of work is Navitas, Inge Lehmanns Gade 10, DK-8000 Aarhus C, Denmark.

Contacts:

Applicants seeking further information regarding the PhD position are invited to contact:

- Kenny Kataoka Sørensen, kks@cae.au.dk (main supervisor)
- Felipe Prada, felipe.prada@cae.au.dk (co-supervisor)

For information about application requirements and mandatory attachments, please see our [application guide](#). If answers cannot be found there, please contact:

- admission.gradschool.tech@au.dk

How to apply:

Please follow [this link](#) to submit your application.

Application deadline is 20 August 2026 at 23:59 CEST.

Preferred starting date is 01 November 2026.

Please note:

- Only documents received prior to the application deadline will be evaluated. Thus, documents sent after deadline will not be considered.
- The programme committee may request further information or invite the applicant to attend an interview.
- Shortlisting will be used, which means that the evaluation committee only will evaluate the most relevant applications.

Aarhus University's ambition is to be an attractive and inspiring workplace for all and to foster a culture in which everyone has opportunities to thrive, achieve and develop. We view equality and diversity as assets, and we welcome all applicants. All interested candidates are encouraged to apply, regardless of their personal background. Salary and terms of employment are in accordance with applicable collective agreement.

<https://phd.tech.au.dk/for-applicants/apply-here/saeropslog/micro-to-macro-behaviour-and-constitutive-modelling-of-fissured-high-plasticity-stiff-clays-for-landslides-and-climate-resilient-infrastructure>