

Three Ph.D. positions in experimental sedimentology, geophysics and ocean modelling related to modelling carbonate particle transport and chalk reservoirs. Faculty of Science, University of Copenhagen, Denmark.

The Department of Geography & Geology, University of Copenhagen has 3 Ph.D. positions available within the fields of **Experimental chalk sedimentology; Time lapse cross-hole ground penetrating radar imaging;** and **Modelling Cretaceous chalk ooze transport/deposition.** The positions are funded by a large cross-disciplinary research effort funded by Maersk Oil and University of Copenhagen, which aims to improve the qualitative and quantitative understanding of chalk depositional systems and heterogeneity of chalk reservoirs. The studies take place within the framework of a newly established chalk research centre and students will also spend a period undertaking their research at Maersk Oil.

The goal of the project is to develop new methods for the quantification of reservoir properties from geophysical data and investigate the sedimentological controls on metre-scale reservoir heterogeneities. The project will establish: 1) New fluid flow/transport models based on small-scale high-resolution time-lapse geophysical measurements, modelling on surficial rocks of the Chalk Group onshore Denmark, and extrapolating the results to seismic scale. 2) Quantification of the physical behaviour of chalk ooze to develop new predictive facies models, evaluating the influence of depositional processes on reservoir properties, and relating the results to palaeoceanographic models as a control of facies distribution.

PhD 1: Experimental chalk sedimentology. The applicant will participate in an experimental sedimentological study of the basic physical behaviour of carbonate mud with special reference to chalk ooze. The main tasks of the Ph.D. student will be to develop experimental techniques as well as designing and producing suitable experimental sediments. We are seeking a creative and innovative student with experience with experimental sedimentology/fluid dynamics or monitoring of natural sedimentary/fluid systems. Relevant backgrounds include physical geography, engineering, fluid dynamics, environmental sciences, marine sciences, geology or similar.

PhD 2: Time lapse cross-hole ground penetrating radar imaging. The PhD project will aim at establishment of metre-scale high-resolution models of fluid and gas flow in chalk based primarily on time lapse cross-hole ground penetrating radar imaging. Fluids (water) or gasses (CO₂) will be injected into the studied chalk formation, and the flow characteristics will be described based on radar measurements made hours, days and possibly weeks after the injections. The successful candidate is expected to conduct field work in different parts of Denmark and analyze large amounts of ground penetrating radar data with numerical tomographic algorithms. A part of the work will be focused on development/tailoring of the tomographic methods. The cross-hole ground penetrating radar data may be supplemented with surface reflection ground-penetrating radar data, cross-hole electrical resistivity tomography, cross-hole seismic measurements, core analysis and/or borehole logging.

PhD 3: Modelling Cretaceous chalk ooze transport/deposition. The PhD student will work on numerical modelling of the Cretaceous palaeoceanography, in particular focusing on the fluid dynamics, sediment transport and deposition in the benthic boundary layer. This work should be related to the observed sedimentology of the Chalk Sea and result in model predictions of the distribution of sediment properties at the reservoir scale. The creative and innovative applicant ideally should have experience in numerical modelling in geoscience with a solid geological

understanding. Relevant backgrounds include geophysics, geology, physical geography, fluid dynamic, environmental sciences, or marine sciences.

Terms of employment

In the regular 3-year program, the successful Ph.D. candidate will be offered a full-time Ph.D. position for a period of three years, contingent on a satisfactory performance, with the specific intent that it results in a Ph.D. degree and scientific publications. In the 4-year program, the successful Ph.D. candidate will be paid in accordance with the Danish State Education Grant and Loan Scheme Authority Order for the first two years until awarded a M. Sc. and as a full-time Ph.D. for the remaining two years.

The salary depends on seniority, as agreed between the Ministry of Finance and the Danish Confederation of Professional Associations, and is within the range of 23,000-30,000 DKK/month (approximately 3,100-4,000 Euro/month) in the 3-year program and 10,000-12,000 DKK/month for the first two years of the 4-year program.

Further information can be obtained from Professor Lars Stemmerik (PhD 1, e-mail: ls@geo.ku.dk), Associate Professor Lars Nielsen (PhD 2, e-mail: ln@geo.ku.dk), or Associated Professor Christian Bjerrum (PhD 3, e-mail: cjb@geo.ku.dk). General information on the Department of Geography and Geology can be found at www.geo.ku.dk.

How to apply

Applications, including (i) a motivation for the application (0.5 A4 page), (ii) a statement of research interests, (iii) curriculum vitae including list of publications, (iv) a copy of MSc diploma or equivalent, (v) a short abstract of the M.Sc. thesis or equivalent, and (vi) the names, e-mails, telephones and addresses of 2-4 referees, must be submitted as a single pdf file by e-mail to: job@geo.ku.dk. Please write “Ph.D. – Chalk Geophysics” for PhD 1, “Ph.D. – Chalk Sedimentology” for PhD 2, or “Ph.D. – Chalk Modelling” for PhD 3 in the subject field of the e-mail.

The deadline for application is February 15th 2012.

The University wishes our staff to reflect the diversity of society and welcomes applications from all qualified candidates regardless of personal background.