Title: PhD studentship in Medical Imaging of Soil-Water Processes

Value of award:
Full UK/EU fees (eligibility criteria applies to EU students) and annual living allowance of £14,777 (at the 2018/19 UKRI rate)

Number of awards: 1

Start date and duration: September 2019 for 3.5 years

Application closing date: 31st January 2019

Overview
This PhD aims to improve our understanding of soil-water transport processes in hydrology and geotechnical engineering scenarios through the use of medical imaging techniques.

Understanding how water moves through soil is critically important for maintaining sustainable infrastructure and for understanding and mitigating natural hazards. Yet the basic question ‘where does water go when it rains?’ is made complex by the dynamic and heterogeneous nature of natural and engineered ground. Our ability to ‘see inside the soil’ and trace the movement of water through it is limited. The medical imaging community has faced precisely the same technological challenges involved in visualising comparable phenomena such as blood flow through vessels and the movement of chemical agents.

Using non-destructive imaging techniques developed for medical applications (e.g. MRI, CT and PET), this project will investigate water-soil particle interactions at unrivalled resolution. These approaches will allow us to identify water presence and track water movement, in some cases dynamically and in 3D.

Aligned with major EPSRC funded programmes in the School of Engineering, this work will contribute to research into the resilience of UK infrastructure to the changing climate. Working alongside established Researchers in the field, the successful candidate will join a vibrant, multi-disciplinary team and benefit from the opportunity to interact with key stakeholders in infrastructure engineering and environment policy and practice. The development of novel imaging agents for these applications will provide opportunities to design and implement new radiosynthetic strategies and characterisation techniques.

Training in the necessary radiochemistry skills (such as radiochemical synthesis, characterisation methods and medical imaging techniques) will be provided within the School of Natural and Environmental Sciences. The combination of these techniques and their novel application in ground engineering will position the candidate as an authority on water flow in porous materials and equip them to develop a stimulating and successful career.

Sponsor: Engineering and Physical Sciences Research Council

Name of supervisor(s):
Dr Ross Stirling
Dr James C. Knight
Dr David Milledge
Dr Colin Davie
Eligibility Criteria

The studentship is available to UK/EU citizens with a first-class or 2.1 degree, or equivalent qualifications and/or experience. Ideally, students should have a BSc or MSc degree in engineering, environmental science or other relevant field. Experience in a laboratory environment is desired.

The studentships are open to applicants satisfying EPSRC home/UK or EU fee criteria, and are eligible for home fees. EU candidates may only be available for a partial award.

English language skills (if English is not your native language): an overall score of IELTS 6.5 or equivalent, with individual scores of 6.0 in each of the four sub-skills: writing, reading, speaking and listening.

How to apply

You must apply through the University's online postgraduate application system. To do this please 'Create a new account'.

The following information will help us to process your application. You will need to:

- insert the programme code **8040F** in the programme of study section
- select **PhD CIVG (FT)** as the programme of study
- insert the studentship code **ENG039** in the studentship/partnership reference field
- attach a covering letter and CV. The covering letter must state the title of the studentship, quote reference code **ENG039** and state how your interests and experience relate to the project
- attach degree transcripts and certificates and, if English is not your first language, a copy of your English language qualifications

Contact

Ross.Stirling@ncl.ac.uk; or James.Knight2@ncl.ac.uk