

Research Associate in Pore-network Modelling of Multiphase Flow in Carbonates

Institute of GeoEnergy Engineering,
School of Energy, Geoscience, Infrastructure and Society,
Heriot-Watt University,
Edinburgh,
United Kingdom

Job Description

Salary: Grade 7 (£34,308 - £42,155)

Contract: Full-time (35 hours per week), Fixed Term (12 months)

This research associate position is part of a large multidisciplinary research project on maximising CO₂ storage in complex carbonate rocks. The candidate will benefit from interactions with other team members with expertise in X-ray imaging, 3D image processing, *in situ* multiphase flow experiments at subsurface pressure and temperature conditions, pore-network modelling, direct numerical simulations and machine learning.

The successful candidate is expected to lead multiphase flow modelling research, especially by integrating pore-network modelling with direct numerical simulations. We are particularly interested in using pore-network models to upscale multiphase fluid flow processes in heterogeneous carbonate rocks. The modelling framework will be validated using experimental imaging data obtained at different spatial resolutions.

Key Duties & Responsibilities

The successful appointee will be expected to undertake the following:

- Develop a pore-network modelling approach for two-phase immiscible fluid flow in rocks.
- Benchmark algorithms using numerical simulations and X-ray imaging data obtained from *in situ* flow experiments at different length scales.
- Work closely with the PI and undertake independent research.
- Participate in regular project meetings with team members and project sponsors.
- Provide guidance as required to support staff, research students and any other students who may be assisting with the research.
- Disseminate research results in peer reviewed journals and interdisciplinary conferences.
- Contribute to the development of project reports.
- Use initiative and creativity to identify areas for research, develop new research methods and extend the research portfolio.
- Continue to update personal knowledge and develop skills within own specialist research area.

Qualifications

- A PhD degree in engineering, applied mathematics, physics or a related field.

Essential Criteria

- Experience in pore-network modelling and upscaling of multiphase flow in porous media.
- Excellent team working and organisational skills.
- Excellent verbal and written communication skills, and ability to write professional reports.
- Ability to work to deadlines.
- A record of peer-reviewed publications and conference presentations.

Desirable Criteria

- Experience in machine learning.
- Experience in direct numerical simulations using OpenFOAM.
- Experience in 3D X-ray image processing.
- Experience in working with industry environment.
- Experience in supervising research students.

How to Apply:

Applications can be submitted until midnight on the **15th of January 2023**, [using this link](#).

Potential candidates who wish to discuss the post informally can contact Dr Kamaljit Singh (k.singh@hw.ac.uk).