



UNIVERSITY OF LEEDS

CANDIDATE BRIEF

Research Fellow in Transmission Electron Microscopy, Faculty of Engineering



Salary: Grade 7 (£32,548 – £38,833 p.a.)

Reference: ENGPE1122

Closing date: 18 February 2018

Fixed-term for 24 months

We will consider flexible working arrangements

Research Fellow in Transmission Electron Microscopy School of Chemical and Process Engineering

Are you an experienced and ambitious researcher looking for your next challenge? Do you have a background in transmission electron microscopy? Do you want to further your career in one of the UK's leading research intensive Universities?

Crystallisation is a fascinating process that lies at the heart of processes as varied as the production of ceramics, pharmaceuticals, fine chemicals, nanomaterials and biominerals. Equally important is the prevention of unwanted crystallisation in the form of weathering, scale or kidney stones. Only by understanding how materials crystallise can we hope to control these processes. However, despite the importance of crystallisation, we still have a poor understanding of many of the mechanisms that underlie this fundamental phenomenon.

The project is part of a new [EPSRC Programme Grant](#) 'Crystallisation in the Real World: Delivering Control through Theory and Experiment' where this large collaborative research programme includes three experimental groups and five modelling groups from [Leeds](#) (both Chemical Engineering and Chemistry), [UCL](#), [Sheffield](#) and [Warwick](#) Universities.

The experimental programme brings to the fore such frontier analytical techniques as liquid-phase transmission electron microscopy (TEM), cryo-TEM and functional scanning probe microscopies that will allow us to study the changes in solid and solution during crystallisation as never before. This will be coupled with recent advances in modelling to perform simulations of nucleation and growth processes on comparable time- and length-scales, providing a unique opportunity to fully understand crystal nucleation and growth at the nanoscale.

You will have research experience of advanced transmission electron microscopy (TEM) techniques including use of liquid cell TEM and/or cryo-TEM as well as a proven ability to work well both individually and in a multidisciplinary team.



What does the role entail?

As a Research Fellow your main duties will include:

- Carrying out high quality research and deliver objectives according to the project plan under the supervision of the work-package leader [Professor Rik Drummond-Brydson](#) and project leader [Professor Fiona Meldrum](#) (Chemistry);
- Utilizing advanced characterisation techniques to measure and understand the early stages of inorganic crystallisation, including the recently installed FEI Titan Themis S/TEM, liquid cell TEM and cryo-TEM and correlating the data obtained by the different methods;
- Using microanalysis in the S/TEM to probe elemental composition and chemistry of crystallisation phenomena;
- Carrying out inorganic crystallisation experiments of compounds such as calcium carbonate and calcium sulphate in the laboratory as a foundation for the electron microscopy experiments;
- Characterising crystal samples using laboratory-based techniques such as FTIR, Raman microscopy, Thermal Analysis techniques and X-ray diffraction;
- Collaborating with other research fellows and PhD students associated with the project at the four different Universities, working with other experimental techniques and using atomic scale simulations to aid the interpretation of experimental data;
- Collaborating outside the direct project consortium and undertaking national and international secondments where appropriate;
- Developing research objectives and proposals and contributing to setting the direction of the research project and team including preparing proposals for funding in collaboration with colleagues;
- Evaluating methods and techniques used and results obtained by other researchers and to relate such evaluations appropriately to your own work;
- Preparing papers for publication in leading international journals and independently writing reports;
- Working both independently and also as part of a larger team of researchers, engaging in knowledge-transfer activities where appropriate and feasible;
- Maintaining your own continuing professional development and acting as a mentor to less experienced colleagues as appropriate;
- Contributing to the training of both undergraduate and postgraduate students, including assisting with the supervision of projects in areas relevant to the project.



These duties provide a framework for the role and should not be regarded as a definitive list. Other reasonable duties may be required consistent with the grade of the post.

What will you bring to the role?

As a Research Fellow you will have:

- A PhD (or close to completion) in a physical science subject;
- Considerable research experience of advanced transmission electron microscopy (TEM) techniques: conventional (CTEM) and scanning TEM (STEM) as well aberration-corrected STEM, electron diffraction and lattice imaging, energy-dispersive X-ray spectroscopy, electron energy loss spectroscopy; and experience of scanning electron microscopy;
- Detailed research experience of at least one of: liquid cell CTEM/STEM and/or cryo-TEM/STEM including plunge freezing;
- Research experience of TEM sample preparation;
- Excellent time management and planning skills, with the ability to meet tight deadlines and work effectively under pressure;
- Excellent written and verbal communication skills including presentation skills;
- Proven ability to manage competing demands effectively, responsibly and without close support;
- A proven ability to work well both individually and in a multidisciplinary team;
- A proven ability to pick up new research skills via research secondments;
- A proven track record of peer-reviewed publications in high impact factor journals;
- A strong commitment to your own continuous professional development.

You may also have:

- Experience of synthetic inorganic crystallisation;
- Experience of common techniques used for characterising crystalline samples including XRD, Thermal Analysis, IR and Raman microscopy and SEM.

How to apply

You can apply for this role online; more guidance can be found on our [How to Apply](#) information page. Applications should be submitted by **23.59** (UK time) on the advertised [closing date](#).



Contact information

To explore the post further or for any queries you may have, please contact:

[Professor Rik Drummond-Brydson](#), School of Chemical and Process Engineering

Tel: +44 (0)113 343 2369

Email: r.m.drummond-brydson@leeds.ac.uk

Additional information

Faculty and School Information

Further information is available on the research and teaching activities of the [Faculty of Engineering](#) and the School of (Subject – hyperlink to school website).

A diverse workforce

The Faculty of Engineering is proud to have been awarded the [Athena Swan Silver Award](#) from the Equality Challenge Unit, the national body that promotes equality in the higher education sector. Our [equality and inclusion webpage](#) provides more information.

Working at Leeds

Find out more about the benefits of working at the University and what it's like to live and work in the Leeds area on our [Working at Leeds](#) information page.

Candidates with disabilities

Information for candidates with disabilities, impairments or health conditions, including requesting alternative formats, can be found on our [Accessibility](#) information page or by getting in touch with us at disclosure@leeds.ac.uk.

Criminal record information

Rehabilitation of Offenders Act 1974

A criminal record check is not required for this position. However, all applicants will be required to declare if they have any 'unspent' criminal offences, including those pending.



Any offer of appointment will be in accordance with our Criminal Records policy. You can find out more about required checks and declarations in our [Criminal Records](#) information page.

