



**UNIVERSITY OF LEEDS**

## **CANDIDATE BRIEF**

**Research Fellow in Advanced X-ray Characterisation**

**Faculty of Engineering**



**Salary: Grade 7 (£33,199 – £39,609 p.a.)**

**Reference: ENGPE1169**

**Closing date: 24 July 2019**

**Fixed term to 31 Dec 2019**

**We will consider flexible working arrangements**

## Research Fellow in Advanced X-ray Characterisation School of Chemical and Process Engineering

**Are you an experienced and ambitious researcher looking for your next challenge? Do you have a background in Advanced X-ray Characterisation of Materials and Processes with Synchrotron Radiation? Do you want to further your career in one of the UK's leading research intensive Universities?**

The team at University of Leeds is part of the EPSRC [Future Continuous Manufacturing and Advanced Crystallisation Hub](#), a consortium of 7 UK Universities and more than 25 industrial companies. The aim of the Hub is to deliver new predictive tools and design approaches for products, processes and supply chains, to enable the potential of Quality-by-Design (QbD) and Industry 4.0 initiatives to be realised. These regulatory and industry-driven initiatives have set out ambitious visions, but the enabling tools do not yet exist. However, by bringing the latest advances in underpinning fundamental molecular science to bear on prediction tools and technologies we can realistically hope to facilitate a step-change in practice.

The role of the University of Leeds team is to provide leadership in advanced X-ray characterisation with synchrotron radiation techniques to the consortium. Latest advances in analytical X-ray technologies for *in situ* and *operando* studies of molecular materials and processes have established a virtually unexplored landscape for structure/performance studies, determining properties at all length scales from molecular to macroscopic dimensions complementing established X-ray crystallography, X-ray scattering and X-ray imaging techniques with advanced X-ray probing of local structure, notably through synchrotron techniques such as X-ray pair distribution function (XPDF) measurements, near-ambient pressure X-ray photoelectron spectroscopy (NAP XPS) and near-edge X-ray absorption fine-structure (NEXAFS). Further opportunities for process studies arise from fast imaging and tomography with coherent synchrotron X-rays.

You will have a PhD (or close to completion) in a physical science or engineering subject, with a strong background in synchrotron radiation X-ray techniques and experience with synchrotron-based *in situ* X-ray characterisation beyond diffraction-based X-ray crystallography. Essential techniques: X-ray pair distribution (XPDF), X-ray photoelectron spectroscopy (XPS), and X-ray absorption fine structure (XAFS).





## What does the role entail?

As a Research Fellow your main duties will include:

- Carrying out high quality research and delivering objectives according to the agreed plans in the CMAC Group in the Research Complex at Harwell, under the supervision of Professor Sven Schroeder;
- Sample preparation, conducting X-ray experiments, data analysis, and writing reports;
- Writing proposals in collaboration with colleagues, for synchrotron radiation experiments at national and international facilities;
- Providing leadership for synchrotron radiation experiments at Diamond Light Source, including liaising with Diamond's user office and acting as a team leader during experiments at Diamond;
- Preparation of manuscripts for publication in high impact scientific journals and disseminating research results through other recognised outputs, such as; research consortium meetings and conferences;
- X-ray Pair Distribution Function data analysis;
- X-ray Photoelectron Spectroscopy data analysis;
- Working both independently and as part of a larger team of researchers on similar or related projects;
- 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.
- This role will involve regular national travel for up to two consecutive weekdays for meetings with the research partners, and several times a year for longer duration (up to two weeks at a time) for research at central facilities, or with collaborators, both nationally and internationally.

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 Postdoctoral Research Fellow you will have:

- A PhD (or close to completion) in a physical science or engineering subject;
- A strong background in synchrotron radiation X-ray techniques;
- Experience in leading and managing teams during experimental synchrotron radiation sessions;
- Experience with synchrotron-based *in situ* X-ray characterisation beyond diffraction-based X-ray crystallography. Essential techniques: X-ray pair distribution (XPDF), X-ray photoelectron spectroscopy (XPS), and X-ray absorption fine structure (XAFS);
- Proven experience in synchrotron experiments under non-ambient conditions, e.g. variable temperature and/or pressure;
- Demonstrated ability to write scientific papers for high quality journals;
- A proven ability to work well both individually and as part of a multidisciplinary research team;
- Excellent written and verbal communication skills including presentation skills ;
- Proven ability to manage competing demands effectively, responsibly and without close support;

You may also have experience in some of or all the following:

- Advanced data analysis techniques for characterising local structure;
- Molecular dynamics simulations;
- Construction of sample environments for *in situ* / *operando* X-ray analysis;
- Complementary non-synchrotron analytical techniques, notably laboratory spectroscopy techniques;
- Electronic structure calculations, e.g., using density functional theory methods;
- Experience in research collaboration with external partners;
- Collaboration with industrial partners.



## 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 Sven Schroeder](#)**, Bragg Centenary Chair in Engineering Applications of Synchrotron Radiation

Tel: +44 (0) 113 343 2401

Email: [s.l.m.schroeder@leeds.ac.uk](mailto:s.l.m.schroeder@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 [School of Chemical and Process Engineering](#).

### 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](mailto: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.

