UNIVERSITY OF LEEDS

CANDIDATE BRIEF

Research Fellow in Digital Chemistry and Engineering, Faculty of Engineering and Physical Sciences

Salary: Grade 7 (£41,064 - £48,822 p.a.)

Reporting to: Professor Richard Bourne

Reference: EPSPE1127

Closing date: Tuesday 26 May 2026

Fixed term (3 years - to complete specific time limited work)

Location: Leeds main campus

We are open to discussing flexible working arrangements

Research Fellow in Digital Chemistry and Engineering, Institute of Process Research and Development, Schools of Chemical and Process Engineering and Chemistry.

Are you an ambitious researcher who wants to translate cutting-edge reaction engineering and automation into real-world products? Are you an ambitious researcher who wants to pioneer the next generation of robotic, reconfigurable chemical reactors for real world impact? Do you want to further your career in one of the UK's leading research-intensive Universities?

Overview of the Role

We are seeking a Research Fellow in Reaction Automation to join the EPSRC funded programme R4PID: Reconfigurable, Robotic & Responsive Reactors for Processes through Intensified Development—a flagship project aiming to redefine how synthetic routes are designed, optimised, and prepared for pharmaceutical manufacture.

R4PID will develop digitally integrated, microvolume, reconfigurable robotic flow reactors capable of autonomously adapting to the needs of diverse synthetic reactions. These systems will:

- Generate microvolume reaction pulses with individually controlled conditions;
- Parallelise droplet based microreactor environments for massively increased throughput based microreactor environments for massively increased throughput;
- Integrate advanced inline sensors (e.g., IR, MS, NMR, UV–vis) for real time data acquisition time data acquisition;
- Connect to AI driven optimisation and process modelling tools driven optimisation and process modelling tools;
- Provide manufacturing quality process data using micro and nanomole quantities quality process data using micro and nanomole quantities;
- Enable autonomous exploration of discrete variables (catalysts, solvents, reagents);
- Build a continuous data pipeline from screening → optimisation → scale up.

Main duties and responsibilities

- Developing and testing the reconfigurable robotic reactor platforms, working alongside Professor Richard Bourne, Professor Tom Chamberlain, Dr Gillian Thomas, and Dr Adam Clayton to engineer microvolume, droplet-based flow systems with dynamic configurability. based flow systems with dynamic configurability;
- Operating and validating microreactor prototypes, including droplet flow, microfluidic, and modular reactor units, along with associated pumps, valving, sensing and heating systems. flow, microfluidic, and modular reactor units, along with associated pumps, valving, sensing and heating systems;
- Evaluating microreactor designs (e.g., CSTRs, electro/photo modules, packed beds, vortex systems) for mixing performance, heat/mass transfer, and process suitability. beds, vortex systems) for mixing performance, heat/mass transfer, and process suitability;
- Collaborating with industrial and academic partners, sharing data, participating in technical workshops, and contributing to industrial case studies;
- Maintaining high safety standards, preparing risk assessments for automated flow experimentation and ensuring safe operation of robotic systems;
- Delivering project objectives on time, contributing to team meetings, reporting, and cross disciplinary research and development;
- Generating and pursuing independent and original research ideas in the appropriate subject area;
- 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 research;
- Making a significant contribution to the dissemination of research results by publication in leading peer-reviewed journals and by presentation at national and international meetings;
- Working independently and as part of a larger team of researchers, both internally and externally, to develop new research links and collaborations and engage in knowledge transfer activities where appropriate;
- 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.

Qualifications and skills

Essential

- A PhD (or have submitted your thesis before taking up the role) in Chemical Engineering, Chemistry or a closely related discipline;
- Expertise in programming (e.g. Phython and Matlab) in the context of chemistry/lab automation;
- Evidence of research independence, demonstrated by lead author publications, platform development, or contributions to process engineering/automation. author publications, platform development, or contributions to process engineering/automation;
- Experience in designing, building, or troubleshooting experimental equipment, particularly involving fluidic, robotic, or automated systems;
- The ability to summarise research clearly and concisely, including preparing scientific publications and technical documentation;
- Strong interpersonal skills, enabling effective collaboration with industrial and academic partners;
- Good time management and planning skills, with the ability to meet tight deadlines and manage competing demands effectively without close support;
- A developing track record of peer-reviewed publications in international journals;
- Excellent communication skills both written and verbal, and the ability to communicate your research at national and international conferences;
- A proven ability to work well both independently and in a team;
- A strong commitment to your own continuous professional development.

Desirable

- Familiarity with;
    - instrument control or hardware communication protocols (e.g., serial, OPCUA, TCP/IP). UA, TCP/IP);
    - inline PAT, optical/electrical sensors, high frequency data streams or frequency data streams;
- Experience;
    - with microfluidics, droplet reactors, or robotic liquid handling systems;
    - integrating or applying machine learning (e.g., Bayesian optimisation, kinetic modelling);
    - working on commercially oriented or translational research or contributing to invention disclosures or patents;
- Skills in CAD, 3D printing, electronics, or rapid prototyping for reactor development;
- Experience of pursuing external funding to support research.

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 Richard Bourne, Professor of Digital Chemical Engineering
Email: R.A.Bourne@leeds.ac.uk

Additional information

Faculty and School Information
Further information is available on the research and teaching activities of the Faculty of Engineering & Physical Sciences, and the School of Chemical and Process Engineering.

Working at Leeds
We are a campus-based community and regular interaction with campus is an expectation of all roles in line with academic and service needs and the requirements of the role. We are also open to discussing flexible working arrangements. To find out more about the benefits of working at the University and what it is like to live and work in the Leeds area visit our Working at Leeds information page.

A diverse workforce
As an international research-intensive university, we welcome students and staff from all walks of life and from across the world. We foster an inclusive environment where all can flourish and prosper, and we are proud of our strong commitment to student education. Within the Faculty of Engineering and Physical Sciences we are dedicated to diversifying our community and we welcome the unique contributions that individuals can bring, and particularly encourage applications from, but not limited to Black, Asian and ethnically diverse people; people who identify as LGBT+; and people with disabilities. Candidates will always be selected based on merit and ability.

The Faculty of Engineering and Physical Sciences are 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.

Information for disabled candidates
Information for disabled candidates, impairments or health conditions, including requesting alternative formats, can be found under the 'Accessibility' heading on our How to Apply information page or by getting in touch by emailing HR via hr@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.

Salary Requirements of the Skilled Worker Visa Route

Please note that this post may be suitable for sponsorship under the Skilled Worker visa route but first-time applicants might need to qualify for salary concessions. For more information, please visit the Government's Skilled Worker visa page.

For research and academic posts, we will consider eligibility under the Global Talent visa. For more information, please visit the Government's page, Apply for the Global Talent visa.