

Research Role Profile

Job Title:	Research Fellow (1A)
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Responsible to:	Head of research group, or principal investigator
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Responsible for:	Not applicable
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Job Summary and Purpose:
To undertake research in accordance with the specified research project(s) under the supervision of the principal investigator.

Main Responsibilities/Activities
<p>To undertake a range of research activities within a specified research area, assuming responsibility for specific areas of projects and making use of new research techniques and methods, in consultation with the research award holder or supervisor. This may include fieldwork, interviews, laboratory experimentation, critical evaluation and interpretation, computer-based data analysis and evaluation or library research.</p> <p>Using initiative and creativity to identify areas for research develop new research methods and extend the research portfolio. Analysing and interpreting results of own research. Write up results and prepare papers for submission to appropriate journals and conferences, and other outputs as required and/or appropriate. Attend appropriate conferences for the purpose of disseminating research results of personal development. The post holder may also contribute to writing bids for research grants and will contribute to collaborative decision making with colleagues in areas of research.</p> <p>Continually to update knowledge and develop skills, and translate knowledge of advances in the area into research activity.</p> <p>To plan and manage own research activity in collaboration with others. To carry out administrative tasks associated with specified research funding, for example risk assessment of research activities, organisation of project meetings and documentation. Implementation of procedures required to ensure accurate and timely formal reporting and financial control.</p> <p>To contribute to teaching in the Faculty by carrying out student supervision and/or demonstrating within the post holder's area of expertise and under the direct guidance of a member of departmental academic staff, as appropriate.</p> <p>The post holder may occasionally be required to supervise more junior research staff.</p>

Research Role Profile

Person Specification

The post holder must have:

A doctoral degree in a relevant discipline (although individuals who have almost completed a doctoral degree may be appointed). Consideration may also be given to individuals who do not hold a doctoral degree but have required skills based on a number of years experience in specified / relevant fields.

The post holder will have authority over some aspects of project work and must be capable of providing academic judgement, offering original and creative thoughts and be able to interpret and analyse results.

Relationships and Contacts

Direct responsibility to the principal investigator or academic supervisor. The post holder may be asked to serve on a relevant Faculty committee. There may be additional reporting and liaison responsibilities to external funding bodies or sponsors. The post holder may work on original research tasks with colleagues in other institutions.

Special Requirements

To be available to participate in fieldwork as required by the specified research project

All staff are expected to:

- Positively support equality of opportunity and equity of treatment to colleagues and students in accordance with the University of Surrey Equal Opportunities policy.
- Help maintain a safe working environment by:
 - Attending training in Health and Safety requirements as necessary, both on appointment and as changes in duties and techniques demand
 - Following local codes of safe working practices and the University of Surrey Health and Safety Policy
- Undertake such other duties within the scope of the post as may be requested by your Manager.

Research Role Profile

Addendum to Role Profile

Job Title:	Postdoctoral Research Fellow in Computational Fluid Dynamics for Sustainable Spray Coating
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Job Summary and Purpose

Do you have a passion for your work to make an impact on the world around you? We are looking for a postdoctoral research fellow to join our project team developing sustainable bottle technology in collaboration with our industrial partner Pulpex Ltd. (<https://www.pulpex.com>). Plastic packaging remains in the environment and is difficult to recycle. There is a growing demand for alternative materials to use as containers for liquids. Pulpex Ltd. are developing a new type of bottle made from cellulose fibres. The Pulpex bottle uses sustainable materials, can be recycled in existing paper waste-streams, can naturally degrade if not recycled, and has a carbon footprint 30% less than poly(ethylene terephthalate) bottles.

The University of Surrey is a global community of ideas and people, dedicated to life-changing education and research. We are ambitious and have a bold vision of what we want to achieve - shaping ourselves into one of the best universities in the world, which we are achieving through the talents and endeavour of every employee. Our culture empowers people to achieve this aim and to collectively, and individually, make a real difference.

Main Responsibilities/Activities

This research post is part of the EPSRC-funded Prosperity Partnership project "SustaPack" between the University of Surrey and Pulpex Ltd. (<https://www.surrey.ac.uk/news/multimillion-pound-research-project-aims-advance-production-next-generation-sustainable-packaging>). You will join a collaborative research team, consisting of the academic leads, two other post-doctoral research fellow, a PhD student at the University of Surrey and engineers in Pulpex, to help to make the paper bottle a reality through the development of mechanistic models for of spray coating process, enabling uniform coating of the Pulpex bottles to prolong shelf-life of liquid products.

The work will focus on the development robust computational models for spray coating of liquid drops at both microscopic and product scales. The models need to be able to consider the impact of the liquid formulation properties, substrate characteristics, as well as the process conditions, as well as predict the quality of the spray-coated thin films.

Key responsibilities include:

1. leverage advanced computational methods (e.g., **CFD, SPH, LBM, or DPD**) to i) Design models integrating fluid properties, substrate interactions, and process parameters. ii) Collaborate with experimentalists and industry engineers to bridge simulation and real-world application.
2. Conduct verification of newly developed models to ensure they accurately simulate intended processes, and validate these models using experimental data to ensure

Research Role Profile

accuracy and reliability.

3. Apply the developed models to spray coating processes, performing sensitivity analyses and optimisations to identify key parameters and improve process efficiency.
4. Analyse simulation results, write detailed technical reports and research papers, and actively disseminate findings at national and international conferences to advance knowledge and best practices in the field.
5. Mentor and supervise postgraduate and undergraduate students involved in related research projects, guiding their technical and professional development.
6. Organise project meetings, seminars, and other professional activities to facilitate collaboration, knowledge exchange, and progress tracking among project team members and stakeholders.

This role requires an ability to work independently and as part of a team, with a proactive approach to problem-solving and innovation in pharmaceutical process modelling.

Research Role Profile

Person Specification

The ideal candidate will possess a strong numerical background and proficient computer programming skills (essential). They must demonstrate a proven research track record through publications and code development, as well as experience in developing computational models (essential). A good understanding of high-performance computing techniques is desirable, though not essential. Candidates should exhibit a high degree of research independence, collaborative aptitude, and the ability to engage effectively with academic, industrial, and international partners (essential). Prior experience in developing or applying numerical models for spray coating would be advantageous but is not a requirement.

Applicants must hold or be nearing completion of a doctoral degree in a relevant discipline; exceptional candidates without a doctorate but with extensive field experience may also be considered. The role requires sound academic judgement, the ability to formulate original ideas, and expertise in analysing and interpreting complex research outcomes.

Responsibilities include guiding project work, contributing innovative solutions, and applying specialist knowledge in computational modelling. Key areas of focus include computational fluid dynamics (CFD), alternative approaches such as smoothed particle hydrodynamics (SPH), Lattice Boltzmann method (LBM), or dissipative particle dynamics (DPD), spray coating modelling, code development, model validation, and multiscale modelling. Excellent communication skills are critical, including the ability to convey scientific findings to diverse audiences, including industrial clients, alongside strong teamwork capabilities.

The position offers opportunities for professional development, conference participation, and visits to collaborator sites, supported by mentorship to advance personal and career growth. This project serves as an entry point into the rapidly expanding field of sustainable materials innovation. We actively encourage applications from underrepresented groups, including women, and are committed to fostering diversity within our research community.

Special Requirements

This project involves collaboration with universities and industrial partners both within the UK and internationally. Strong teamwork and communication skills are essential for effective collaboration.

Relationships and Contacts

Direct responsibility to the principal investigator or academic supervisor. The post holder may be asked to serve on a relevant Faculty committee. There may be additional reporting and liaison responsibilities to external funding bodies or sponsors. The post holder will work on original research tasks with colleagues in other institutions.