Job Title:	Research Fellow A

Responsible to:	Prof Qiong Cai

Responsible for:	Not applicable

Job Summary and Purpose:
To undertake research in accordance with the specified research project(s) under the supervision of Prof Qiong Cai

Main Responsibilities/Activities
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. 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, conferences, and other outputs as required and/or appropriate. Attend relevant meetings and conferences for the purpose of disseminating research results on personal development. The post holder may also contribute to writing bids for research grants and contribute to collaborative decision-making with colleagues in research areas. Continually update knowledge, develop skills, and translate knowledge of advances in the area into research activity. 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. 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. The post holder may occasionally be required to supervise more junior research staff.

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 of 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.

Addendum to Role Profile

Role Purpose Addendum:	Research Fellow (1A) in 3D Electrode Microstructure Imaging and Modelling for Hydrogen Technologies

Job Summary and Purpose:

This information sheet should be read in conjunction with the accompanying generic Research RA1A Role Profile and will be used for shortlisting processes. More specifically, the post holder will be expected to:

Become a research team member in the Energy and Materials group in the School of Chemistry and Chemical Engineering. The project's focus is to understand the electrode microstructure evolution for solid oxide cells for clean energy generation and hydrogen production.

The team requires a dedicated researcher to develop a phase field model to capture the evolution of the 3D porous electrode materials for solid oxide cells, and use advanced machine learning methods to correlate with the experimental investigation for model augmentation and validation.

This project is jointly funded by the EPSRC Impact Acceleration Acount (IAA) at the University of Surrey and Ceres Power.

Main Responsibilities/Activities

The candidate will:

- Develop a computational modelling framework for simulating the evolution of the 3D porous microstructures of solid oxide cells during the electrolysis process; Correlate the model prediction with the experimentally obtained 3D tomography data of the real electrode microstructures and use machine learning methods to augment/validate the model.
- Perform critical analysis of the results and report to supervisors regular updates, perform extensive literacture review to keep up-to-date with the research progress in the field, and write scientific papers for publications.
- Be fully engaged with industry partners and abide by the grant conditions and agreement. This will involve scientific exchanges, frequent meetings with the R&D team at Ceres Power, and travel inside and outside the UK (workshops, conferences, courses).
- Assist in the production of intellectual property and/or high-impact papers for the benefit of both team members and the University of Surrey.
- Assist with the supervision of students in the group (postgraduate, undergraduate, and overseas visitors).

Person Specification
The post holder must have: **Essential** • A PhD in Chemical Engineering, Mechanical Engineering, Material Science, Physics. We will also consider the graduates in Mechanical Engineering Science, or the PhD holders of the other relevant major degrees with Significant research experience in 3D imaging and modelling. • Direct research experience in meso-scale materials modelling, development of computational models. **Desirable** • Prior experience in computational modelling using the phase field theory • Prior experience in solid oxide materials • Prior experience in coding and writing computational programme

Relationships and Contacts
The post holder will be led by Prof Qiong Cai and will be expected to work with Dr Michael Short at the University of Surrey, and collaborate with the R&D team at Ceres Power.