Research Assistant / Fellow in High Temperature Steam Electrolysis (Fixed-Term)

Job Summary

Applications are invited for an exciting post-doctoral research fellow (PDRF) position under the supervision of Prof Nadimul Faisal, Prof Mamdud Hossain, and Dr Anil Prathuru in the School of Engineering at the Robert Gordon University (RGU), Aberdeen, UK.

The successful applicant will join a team as part a new collaborative EPSRC project between Robert Gordon University and the University of Surrey. This project will focus on the development and application of cutting edge computational and experimental methods to explore high-temperature solid oxide steam electrolysis or hydrogen production, ultimately targeting nuclear heat as a sustainable alternative for large-scale electrolysis. They will work in a team with a Research Assistant at RGU and Research Fellow at University of Surrey to develop understanding of thermal spray coating and screen printing/spin coating routes, particularly through innovative metasurface catalyst and cell design that will warrant efficient hydrogen production with stable structure for high temperature operation (e.g., at nuclear reactors).

Ideally you will have experience in structural design and fluid flow modelling using finite element (FE) and computational fluid dynamics (CFD) modelling approaches. The project provides an opportunity to use your expertise in multi-disciplinary research and develop new research skills. It would be desirable if you have experience in leading-edge simulation and modelling (e.g., thermo-mechanical, fluid dynamics of liquid and gaseous water, or steam flow etc).

Ideally you should have experience in using leading simulation Multiphysics simulation software (e.g., COMSOL Multiphysics, ANSYS computational fluid dynamics, ANSYS thermal and finite element modelling), and the analysis of large sets of data through programming is desirable. It is also desirable to have experience in manufacturing catalyst layers using thermal spray coating techniques, materials characterisation, mechanical and electrochemical testing, or an aptitude to learn interdisciplinary methods.
You will hold (or be near completion of) a PhD in a relevant scientific
discipline and you will need to have excellent communication, team working
and interpersonal skills. You will have great opportunities for further career
development through teaching and leadership, supervising research
students, and presenting the research in the UK and international
conferences.

If you are near your PhD thesis submission or have recently submitted you
will be appointed as a Research Assistant (Grade 6) and upon successful
award of your PhD thesis, you will have the opportunity to apply and be
promoted to Research Fellow (Grade 7); whilst candidates who have
obtained their PhD award will be appointed as a Research Fellow.

You will be predominately based at the School of Engineering at Robert
Gordon University, Aberdeen. Travel will be required from time to time to
visit industrial or academic collaborators or to disseminate research.

This post is subject to a Disclosure Scotland check. For more information
visit: https://www.mygov.scot/basic-disclosure/

When appointing to this role the University must ensure that it meets any
applicable immigration requirements, including salary thresholds which are
applicable to some visas. Applicants that will require sponsorship will be
considered in line with UKVI sponsorship requirements.

This is a fixed-term contract for 12 months starting from 1 August 2022 or
soon thereafter, 1.0 FTE.

Salary on first appointment is normally to the bottom of the appropriate
scale, although in exceptional circumstances an appointment further up the
scale may be considered. Grade 6 - Research Assistant Salary £31,406 -
£34,304 per annum
Grade 7 - Research Fellow Salary £35,326 - £40,927 per annum

For further information or an informal discussion about the position please
contact Prof Nadimul Faisal at N.H.Faisal@rgu.ac.uk
Job Description

RESPONSIBLE TO: Professor Nadimul Faisal

RESPONSIBLE FOR: No supervisory responsibilities

PURPOSE OF POST: To develop computational and experimental methods to explore high-temperature solid oxide steam electrolysis or hydrogen production, ultimately targeting nuclear heat as a sustainable alternative for large-scale electrolysis. To develop materials, design and manufacturing and methodologies aimed at high performance, high value components and systems.

PRINCIPAL DUTIES:
• To carry out structural design and fluid flow modelling using finite element (FE) and computational fluid dynamics (CFD) modelling approaches.
• To conduct materials selection for specific products using informed decision-making process.
• To carry out manufacturing and materials development for specified product.
• To conduct materials/mechanical testing and physio-chemical characterisation including thermal properties, X-ray diffraction, microscopy, and spectroscopy.
• To evaluate structural-property and relevant process-property-performance relationship.
• To write research grants and publish high quality journal papers.
• To deliver presentations to immediate project team members and technical experts.
• To conduct any other duties that maybe reasonable, assigned by the line manager.
• Carries out such other related duties as may be required by the Head of School.

Person Specification

ESSENTIAL REQUIREMENTS

Qualifications and Professional Requirements
Honours degree / MSc in a subject area related to the role
A PhD in a relevant scientific discipline or nearing completion of a PhD (e.g., mechanical engineering, materials science, chemical engineering, physics, structural engineering, or relevant subjects).
Knowledge and Experience
Great deal of initiative and ability to develop and use innovative and creative approach to problem solving.
Proven knowledge in structural design and fluid flow modelling using finite element (FE) and computational fluid dynamics (CFD) modelling approaches.
Aware of research integrity and ethical issues including confidentiality. A desire to learn and lead the commercial aspects of the project.
Demonstrable interpersonal and other communication skills that enable you to communicate effectively with colleagues at all levels.

Experience
Demonstrable skill in application of Multiphysics simulation packages (e.g., COMSOL Multiphysics, ANSYS computational fluid dynamics, ANSYS thermal and finite element modelling).
Ability to write and publish high impact journal articles.
Good project planning and management skills.
Well-developed project management and research organisational skills.
Defend research outcomes at seminars or conferences and be comfortable with communicating results.

DESIRABLE REQUIREMENTS

Qualifications and Professional Requirements
Minimum of an MSc degree in Mechanical Engineering or any related field and a PhD degree.

Knowledge and Experience
Detailed CAD, FEA, and CFD skills.
Understanding of engineering materials and manufacturing, experimental design, design for manufacture and testing.
Knowledge or experience of catalyst materials (for electrolysis, hydrogen production) and structural design simulations is advantageous.

Experience
Manufacturing techniques experience in thermal spray coating (e.g., APS, HVOF). Experience in materials physio-chemical characterisation, including thermal properties (DSC, TGA), X-ray diffraction, microscopy (SEM, TEM), spectroscopy, and DMA, mechanical and electrochemical testing.
Skilled in computer analytical techniques for testing results.
Degradation or failure analysis expertise.
Experience in a research role.
Behaviours

**Behaviour 1 - Communication** - Ability to receive, understand and convey information requiring careful explanation and information of a complex or conceptual nature, in a clear and accurate manner

**Behaviour 2 - Analysis and Research** - Experience of developing hypotheses and concepts to explain data, events and phenomena, and reporting findings to a wider community

**Behaviour 3 - Service Delivery** - Experience of exploring and adapting a service to meet customers’ expectations and also identifying ways of improving standards

**Behaviour 4 - Liaison and Networking** - Experience of circulating information in an accurate and timely manner, working across team boundaries to build and strengthen working relationships and leading and developing internal networks to pursue a shared interest

**Behaviour 5 - Pastoral Care and Welfare** - Experience of calming and reassuring those with work/study related problems who may be experiencing distress and dealing with difficult welfare situations or confidential matters

**Behaviour 6 - Decision Making** - Experience of using own judgement to make decisions, making collaborative decisions with others to reach conclusions and providing advice or information that will influence the decisions of others

**Salary:** 31406.00 - 40927.00 GBP per Year

**Position Type:** Full Time, Fixed Term 12 Month 37.0 Hours per Week