JOB DESCRIPTION

Job Title:	Post-Doctoral Research Fellow	Grade:	AC2
Department:	School of Computing and Mathematical Sciences (CMS)	Date of Job Evaluation:	February 2024
Role reports to:	Associate Professor in Applied Mathematics	SOC Code:	2119
Direct Reports	N/A		

This role profile is non-contractual and provided for guidance. It will be updated and amended from time to time in accordance with the changing needs of the University and the requirements of the job.

PURPOSE OF ROLE:

The Computational Science and Engineering Group (CSEG) is looking for a Post-Doctoral Research Fellow investigate the effects of time dependent magnetic fields on microstructure evolution during solidification.

The purpose of the role is to utilise our bespoke numerical models code "ThermoElectric Solidification Algorithmn" (TESA) to predict the effect magnetic fields have on microstructure evolution.

The role will be primarily on the numerical side, including building computational models to address the magnetohydrodynamic problem and its influence on bulk inter-dendritic flows. There will also be opportunities to partake in experiments conducted at synchrotron light sources and to then using image processing to analyse the experimental data and compare with numerical predictions. The simulations and image processing will utilise our High-Performance Computing Cluster.

KEY ACCOUNTABILITIES:

Generic:
- Integrate solutions for time dependent magnetic fields (e.g. pulsed, high frequency AC) with microstructure solidification modelling.
- Use this to understand / capture mechanisms that influence solidification (e.g. magnetohydrodynamic, thermos-solutal – remelting, structural mechanical) leading to improved microstructures (e.g. grain refinement)
- Engage in experiments conducted at X-ray (lab and synchrotron) sources.
- Use image processing to analyse the data.
- Integrate the numerical and image processing developments into a High-Performance Computing (HPC) environment.
- Engage in the dissemination of the research into high impact journals.
- Attend and present results internally and externally to project partners and at international conferences.
- Support / participate in the supervision of PGR students.

- Work with experimental partners as necessary to generate research data.

Managing Self:
- Plan day-to-day research activity guided by the project workplan.
- Co-ordinate with external partners and internal co-investigators.
- Work in a flexible manner to ensure the research objectives are met.
- Ability to take the initiative, but request support when needed.
- Ability to work within a research team.
- Attend project meetings.
- Show consideration to others.

Core Requirements:
- Adhere to and promote the University's policies on Equality, Diversity and Inclusion and Information Security
- Ensure compliance with Health & Safety and Data Protection Legislation
- Support and promote the University's Sustainability policies, including the Carbon Management Plan, and carry out duties in a resource efficient way, recognising the shared responsibility of minimising the university's negative environmental impacts wherever possible
- Adhere to current legal requirements and best practice relating to digital content and accessibility, including Web Content Accessibility Guidelines when creating digital content.

Additional Requirements:
Undertake any other duties as requested by the line manager or appropriate senior manager, commensurate with the grade.

This is a professional, demanding role within a complex organisation with an ambitious strategic plan and agenda for change. The role holder will be expected to show flexibility in working arrangements, including working hours, to ensure that CSEG delivers the required level of service.

KEY PERFORMANCE INDICATORS:
- Documentation provided by deadlines.
- Project outputs delivered.
- Research activity co-ordinated and managed.

KEY RELATIONSHIPS (Internal & External):
Internal
- Principal Investigator – Dr Andrew Kao
- Other members of CSEG e.g. lecturers, research fellows and PhD students.
- Members of the University from other departments such as HR and finance.

External
- Project partners / Collaborators

PERSON SPECIFICATION	
Essential	**Desirable**
Experience • Time-dependent magnetic fields • Lorentz forces and Magnetohydrodynamics • Microstructure solidification • Image processing	**Experience** • X-ray Synchrotron Imaging • Practical experience of developing, designing and building experiments • Experience of supervising research students • Experience of applying for external funding.
Skills • Commercial Codes e.g. COMSOL – specifically Electromagnetic solvers • Ability to write articles for scientific journals. • Ability to work both independently and as part of a team. • Good Communication skills.	**Skills** • Programming / scripting
Qualifications • Undergraduate degree in STEM subject (Maths, Physics, Engineering) • PhD in a related subject area	**Qualifications** • N/A
Personal attributes • We are looking for people who can help us deliver the values of the University of Greenwich: Inclusive, Collaborative and Impactful	**Personal attributes** • N/A