



Candidate Information

Position:	Research Fellow
School/Department:	School of Mechanical and Aerospace Engineering
Reference:	23/111486
Closing Date:	Monday 15 January 2024
Salary:	£37,841 - £40,134 per annum.
Anticipated Interview Date:	Thursday 1 February 2024
Duration:	Fixed Term 3 years

JOB PURPOSE:

To contribute to the research of the EPSRC (EP/X026337/1) funded project and to investigate the manufacturing and characterisation of 4D-printable nanocomposite materials for artificial muscles. This project aims to develop a new class of stimuli responsive electro-actuators through additive manufacturing of polymers and polymer nanocomposites. A key aspect of the project is the ability to manufacture 4D-printed layered architectures, capable of responding to their external stimuli (e.g., electrical, pressure), via additive manufacturing which will maximise efficiency, control, and strength of the resulting artificial muscles.

The post is a critical role, and as such, successful applicants will have responsibilities in independent research, supervision, planning, day to day lab management, collaborations, and outreach.

MAJOR DUTIES:

1. Contribute to the development of new 4D-printable nanocomposite materials that can facilitate an electromechanical response. These materials will be fabricated into active / passive layered polymer-based materials, resulting in new artificial muscles with improved mechanical strength and efficient electrical response versus the current state-of-the-art.
2. Apply specialist knowledge and experience to conduct research into nanofiller functionalisation and characterisation, filament and additive manufacturing, dielectric design, manufacturing, and testing.
3. Undertake the day-to-day research activity across all work packages and will have knowledge on characterisation techniques such as Micro-CT, SEM, EDX, TGA, TEM, XRD, XPS, AFM, Raman Spectroscopy, EIS, mechanical testing, electromechanical and piezoelectric characterisation, etc.
4. Carry out analyses, critical evaluations, and interpretations of experimental data and the literature using methodologies and other techniques appropriate to area of research.
5. Produce high quality research outputs consistent with project aims and commensurate with career stage. This will include collaborating and co-authoring with PI and project team (as appropriate) on outputs.
6. In consultation with the project team, promote research milestones and outputs at national and international conferences and through social media.
7. Assist grant holder in the preparation of funding proposals and applications to external bodies.
8. Carry out occasional educational supervision, demonstrating or lecturing duties within the post holder's area of expertise and under the direct guidance of a member of academic staff.
9. Undertake supplementary duties relevant to the success of the project including administrative duties and additional training and development activities as required.

ESSENTIAL CRITERIA:

1. Have, or be about to obtain, a relevant PhD in Materials Science, Engineering, Chemistry, or related discipline.
2. BSc (Hons): at least 2:1 or equivalent in Materials Science, Mechanical Engineering, Chemistry, or related discipline.
3. Research experience in manufacturing of polymer composites and nanocomposites, functionalisation of nanofillers, additive manufacturing.
4. Experience in the characterisation of functionalised nanofillers and polymer nanocomposites and composites.
5. Ability to manage and prioritise time in a dynamic environment.

6. Able to work on own initiative and as part of a team with minimum supervision.
7. Demonstrable knowledge of Health & Safety procedures and the need for good laboratory practice.
8. An excellent knowledge of written and spoken English is required for report writing and presentations.
9. Ability to prepare journal and conference papers.
10. Ability to work effectively within a team. Organised and attentive to detail.
11. Ability to meet deadlines.
12. Be prepared to supervise and interact with undergraduate and postgraduate students.
13. Willingness to travel for project meetings and site visits.
14. Willingness to work irregular hours as needed.

DESIRABLE CRITERIA:

1. Research experience with:
 - Thermoplastic polymers.
 - Solidworks.
 - Ionic liquids.
2. A track record of high-quality publications appropriate to stage in career.