Job Description

Job title	Research Associate
Department/School	Department of Mechanical Engineering
Job family	Education and Research
Grade	7
Reporting to	Dr Fulvio Pinto
Responsible for	There may be a requirement for: day to day supervision of other staff e.g. technical staff or, co-supervision of doctoral or undergraduate students
Location	University of Bath premises

Background and context

The appointment is for a full-time Research Associate to work on an EPSRC funded project titled AEGIS, starting in November 2019 and lasting 15 months. The main objective of AEGIS (Advanced EnerGy-Absorption polymer for Impact-resistant Smart composites) is to develop a new approach for the production of long fibres-reinforced polymers, specifically designed to tackle the current limitations of composite components. Indeed, the development of a new generation of advanced fibrous composite materials plays a key role in the future evolution of the aerospace sector due to their very high weight-to-strength ratio that can lead to higher operating efficiencies per revenue passenger kilometre.

However, while the fibre dominant properties guarantee excellent in-plane load-bearing characteristics, traditional composite materials exhibit weak resistance to out-of-plane loads, making them susceptible to delamination damage under impact loads. AEGIS is aimed at the development of a novel hybrid composite material with exceptional impact resistance and energy absorption property which is based on the development of a new “smart” “pseudo non-Newtonian” polymer that can be used in traditional manufacturing processes of plate-like components and sandwich panels.

The project will fill the gap between the different approaches followed over the past years by developing a material solution in which a novel smart polymer coating will be designed and optimised to increase the out of plane properties of traditional aerospace parts without affecting the desired in-plane properties and without dramatically affecting the total weight of the structure.

Job purpose

This is an ambitious research project with a very strong multi-disciplinary nature, requiring knowledge of chemistry, polymer science, composite mechanics and material characterisation; therefore, the post will combine polymer production and composite structures manufacturing and characterisation.

As a Research Associate you will be undertaking experimental and theoretical research, analysis and knowledge transfer, writing reports, giving presentations and engaging with industrial partners and other researches in MAST. The role includes planning the research activities and collaborate with a highly motivated research team composed of undergraduate and postgraduate students, carrying out engineering laboratory work, and travelling to conferences and industrial meetings in UK, Europe and US. You will be offered extensive opportunities for collaborative work, both within and external to the University of Bath.

The successful candidate will hold a PhD in Mechanical Engineering, Material Science, Chemistry or Chemical Engineering with a proven track records in composite design, manufacturing and characterisation.

A solid understanding of polymer chemistry and composite mechanics is required. Candidates with expertise in impact testing and in the preparation of polymeric films and their physical and chemical characterisation would be advantageous.

Experience in handling collaborations with EU/UK project and work with frequent deadlines is also highly desirable, as well as experience of managing own workload.

Main duties and responsibilities	
	Responsible to Dr Fulvio Pinto for the following main duties:
1	Support the execution of tasks for the project. Provide subject-specific research expertise and undertake specific research work to a Principal Investigator (PI) and their research team. Design and upgrading of experimental facilities, execute simulation and practical laboratory experiments, collect and analyse data using qualitative and quantitative techniques
2	Provide support to PI and other research staff with project management (for example, organising meetings and corresponding with partners). Contribute to the design and execution of the project e.g. timetabling and meeting project milestones; participating in regular discussions with collaborative partners
3	Contribute to the production of research reports and publications in high-quality peer-reviewed journals.

4	Participate regularly in group meetings and prepare and deliver presentations to research team.
5	Assist with supervising undergraduate student projects.
6	Continually update knowledge and understanding in field or specialism to inform research activity.
7	Disseminating results of research project as appropriate to the discipline through activities such as • overseas research visits • conference presentations • public engagement activities
8	Contribute to the development of research objectives and proposals for own or joint research projects, with assistance of a mentor, if required.
9	Disseminate knowledge of research advances to inform departmental teaching.
11	Identify sources of funding and provide assistance with preparing bids to funding bodies. Develop ability to secure own funding e.g. travel grants.
	You will from time to time be required to undertake other duties of a similar nature as reasonably required by your line manager. You are required to follow all University policies and procedures at all times and take account of University guidance.

Person Specification

Criteria	Essential	Desirable
Qualifications		
A PhD degree in subject area of direct relevance for the project (e.g. Material Science, Mechanical Engineering, Chemical Engineering, Chemistry) or equivalent significant relevant experience and professional qualification	√	
Experience/Knowledge		
Post doctoral experience		√
Experience in polymer chemistry (manufacturing and characterisation) and composite materials	√	
Experience or strong background knowledge in material science, films preparation and impact testing		√
Experience in working in a laboratory environment in the field of polymer synthesis and mechanical testing	√	
Experience of leading or contributing to open source or other open projects		√
Demonstrated potential to publish in high quality, peer reviewed journals	√	
Experience of interdisciplinary research environments		√
Skills		
Ability to synthesise existing knowledge	√	
Ability to prepare research proposals, to conduct individual research work and to disseminate results		√
Ability to organise and prioritise own workload to meet required deadlines	√	
Ability to write research reports and to effectively disseminate outcomes	√	
Proficient oral, interpersonal and written communication skills	√	

Ability to use appropriate tools to systematically collect, analyse and present data (e.g. Matlab)	√	
Attributes		
Commitment to working within professional and ethical codes of conduct	√	
Innovation and developing creative solutions	√	
Commitment to excellence in research	√	
Interest for the topic of Open Source Hardware	√	
Enthusiasm and self-motivation	√	
Tenacity – working to achieve own and team objectives and to overcome obstacles	√	
Ability to be an effective team worker	√	
Commitment to safe working practices	√	