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Research Assistant/Associate
EPSRC Future Composites
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Research Assistant/Associate: Manufacturing Multifunctional Composites for Structural Applications

Imperial College London

Reference	EN20170273LE
Apply by	1st October 2017
Department	Aeronautics/Chemistry

Project Description:

EPSRC, under the Future Composites Manufacturing Hub core project has funded a grant at Imperial College titled "Manufacturing for Structural Applications of Multifunctional Composites" (http://gow.epsrc.ac.uk/NGBOViewGrant.aspx?GrantRef=EP/P006701/1).

In multifunctional composites the constituent materials synergistically fulfil two disparate functions. The focus of the research at Imperial College is Structural Power Composites, which simultaneously function as mechanically load bearing and store electrical energy. It is anticipated that such multifunctional composites will transform transportation and portable electronics, offering disruptive concepts for structural design. The Imperial team lead the world in creating structural supercapacitor embodiments, further details of which can be found here. This project will adopt the reinforcements/electrode materials developed by the other members of the Group, in particular carbon aerogel (CAG) reinforced carbon fibre fabrics, and explore processes by which these materials can be scaled-up such that they are amenable to the fabrication of structural configurations. Particular challenges will include ensuring control over the optimised CAG microstructure at a small (coupon) scale can be translated into larger components, and developing strategies such that the rigid and brittle nature of the carbon aerogel reinforced lamina does not impede fabrication of curved or complex structures. Finally, the role will explore systems modelling of these materials: predictive models by which end-users can identify whether these multifunctional materials will offer weight or volume savings over conventional systems assembled from monofunctional structural materials and devices.

As part of this team we are seeking to appoint a Research Assistant/Associate to focus on manufacture and scale-up of multifunctional materials. The goals will be to (i) optimise fabrication of multifunctional composite laminates, culminating in the preparation of test coupons and demonstrator structural elements; (ii) develop methods to assemble hybrid laminates, combining multifunctional laminates encapsulated within conventional structural layers; (iii) utilise and develop new methods to characterise the manufacturing quality and variability of multifunctional components; (iv) develop multifunctional system models with which to compare the performance of multifunctional materials to that of conventional monofunctional assemblies. The position will be within the Structural Power Group, but will integrate with the larger team, including dedicated electrochemists and materials scientists. The post is part of a wider collaboration with groups at University of Bristol and Nottingham University, and will entail close collaboration with industry.

The ideal candidate will be an innovative experimental composite scientist/engineer with a strong practical knowledge in composite manufacture, particularly of structural components. The candidate should have or expect to obtain a PhD (or equivalent) in composite materials or structures, with an emphasis on composite manufacture and physical and microstructural characterisation. Candidates with knowledge of nanocarbon materials are encouraged and a knowledge of the operating principles of common electrochemical energy storage devices and their associated characterisation will be beneficial. Practical experience within a strong research environment is essential, as evidenced by preparation and publication of scientific papers in relevant, high-impact, refereed journals (preferably as first author).

Duration: Fixed-term appointment until 30 June 2020

Research Assistant salary range: £32,380 - £34,040 per annum
Research Associate salary range: £36,800 - £44,220 per annum

Any queries regarding the application process should be directed to: Ms Lisa Kelly at l.kelly@imperial.ac.uk

Should you have any technical queries please contact: Professor Emile Greenhalgh at e.greenhalgh@imperial.ac.uk

Online applications:
https://www4.ad.ic.ac.uk/OA_HTML/OA.jsp?page=/oracle/apps/irc/candidateSelfService/webui/VisVacDispPG&akRegionApplicationId=821&transactionid=260436942&retainAM=Y&addBreadCrumb=S&p_svid=52496&p_spid=1854570&oapc=28&oas=Rrpl05tXYpaJmvnMbFP0mw..

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