

## **Research Associate / Assistant (36 Months, Full time)**

### **Façade Engineering: FRP sandwich panel systems for free-form building envelopes**

The University of Cambridge wishes to recruit a **Research Associate / Assistant** to undertake a 3 year collaborative project between Newtecnic Ltd. and the University of Cambridge. The project involves the development of a new generation of fibre reinforced polymer (FRP) sandwich panel systems and associated design methods suitable for geometrically complex (free-form) buildings.

The position is funded by Innovate UK, EPSRC and the industrial partner Newtecnic. The research and development in this project brings together the knowledge in façade engineering research at Cambridge's Glass and Facade Technology Research Group ([www.gft.eng.cam.ac.uk](http://www.gft.eng.cam.ac.uk)) and the design expertise on complex high profile buildings of the industrial partner, Newtecnic ([www.newtecnic.com](http://www.newtecnic.com)). It involves a high degree of creativity with bespoke materials, transfer of novel techniques from other industries such as aerospace and close co-ordination between the design and manufacturing processes. The outcomes of this project will play a central role in Newtecnic's current and future building design projects.

Applicants should have a Masters degree in Engineering or related Science subject in addition to: either a PhD in a relevant subject **or** experience in façade engineering design. The Research Associate / Assistant will be based at Newtecnic's office in **Central London, UK**, but will collaborate closely with the Cambridge-based Glass and Facade Technology Research Group.

## **The Research**

There is a growing trend and demand for building envelopes with complex geometries, particularly on high profile projects around the world and Newtecnic has a growing international reputation for designing and developing solutions for such complex building envelopes.

The current approach on these projects consists of multi-layer systems, where each layer addresses a specific performance requirement in turn (e.g. structural integrity, thermal performance, and architectural finish). This is costly and inefficient. Emerging technology in fibre-reinforced sandwich panels provide an opportunity to develop structurally and thermally efficient building envelope components and assemblies for geometrically complex buildings that out-perform existing multi-layer build-ups. The obvious advantages are in reduced costs and high quality, a breakthrough which is already exploited in other industries such as aerospace. One of the principal challenges is to devise efficient connections for the FRP sandwich panels, together with associated design methods. These connections should be visually unobtrusive and should mobilise the full strength potential of the panel. This would ultimately provide FRP sandwich panel systems for free-form building applications that are efficient, easy to manufacture / assemble and aesthetically pleasing.

The aim of this 36-month project is to develop this new generation of FRP panel system, including the load bearing connections, and the associated design methods This will involve:

- Transferring and adapting the fundamental research embedded in the academic partner and elsewhere.

- Developing a suitable range of connections by means of numerical modelling and experimental validation.
- Developing user-friendly design tools and specifications.
- Implementing the research on real-world prototypes and fast-moving live projects.

## **The Role**

The research programme planned for this project involves a high degree of creativity and the ability to implement research into real-world projects with strict deadlines. The technical demands of the tasks require the implementation of existing doctoral-level research and the transformation of this research into user friendly and reliable design tools and specifications. In particular the Associate / Assistant requires an in depth knowledge of nonlinear finite element analysis (including scripting), mechanics of materials, and first-hand experience of physical testing at material and structural levels.

The key responsibilities and duties are:

### *1. Research and scholarship*

Develop research objectives related to the current project; conduct individual and collaborative research and development tasks; write up / communicate research work for presentation and publication; continually update knowledge and understanding in field or specialism; manage own research and administrative activities, with guidance if required; assist in the preparation of proposals and applications to external bodies.

### *2. Teaching and learning support*

May assist in the supervision of student research projects; may provide limited supervision/instruction to classes; may plan and deliver seminars relating to research area.

### *3. Liaison and networking*

Liaise with colleagues at the industrial partner and at the university; build internal and external contacts and participate in networks for the exchange of information and to form relationships for future collaboration.

### *4. Planning and organising*

Plan and oversee the use of research resources, laboratories and workshops as appropriate; plan and manage own research activity in collaboration with others.

The successful candidate will:

- Have obtained or is close to obtaining a PhD in a relevant specialist subject **or** have a master's degree in a relevant subject and 1 to 3 years' experience in façade engineering design / construction.
- Have knowledge and experience of the experimental characterisation and/or numerical modelling of structural materials, preferably with direct experience in advanced composites, and/or adhesives.
- Have a strong theoretical understanding of fundamental mechanics of materials.
- Communicate effectively with a wide range of stakeholders e.g. other senior and junior researchers, industrial partners, practitioners etc.
- Have experience of managing own workload.
- Have the right to reside and work in the UK.

In addition to the technical skills and knowledge gained from this project the research Associate / Assistant will:

- Be encouraged and mentored to achieve Chartered Engineer (CEng) status through the Institution of Civil Engineers (MICE) or the Institution of Structural Engineers (IStructE).

- Become fully involved in the running of live international projects at Newtecnic linked to this research.
- Interact with leading architectural practices, top consulting engineers and specialist manufacturers.
- Be affiliated with an established and dynamic research group at the University of Cambridge with access to excellent computing and laboratory resources and an international network of researchers.

On the successful completion of this project, the Associate / Assistant will have acquired a unique combination of technical expertise, real-world experience and commercial acumen that would make him/her a real asset to any company operating in the field of high-performance building envelope systems.

### **How to apply**

To submit an application for this vacancy, please do so online via the University's Job Opportunities pages (<http://www.jobs.cam.ac.uk/job/6373/>)

Please ensure that you upload a covering letter, your Curriculum Vitae (CV) including a list of research outputs / portfolio of real-world projects. You may provide further detailed information on up to 3 of your research outputs / real-world projects by for example attaching electronic copies of the relevant papers or a more detailed account of your role in the real-world projects.

For further details about the research project or if you have any questions about this vacancy please contact: Mrs Lorna Everett-Walters (email: [lje31@cam.ac.uk](mailto:lje31@cam.ac.uk) Tel: +44 01223 332725)

**Closing date:** 18<sup>th</sup> March 2015

**Start Date:** 1<sup>st</sup> May 2015 (or soon as possible thereafter)

**Salary Range:** £24,775 to £37,394 (Including London weighting)

**Contract duration:** 36 months