Title: Reducing risk through uncertainty quantification for past, present and future generations of nuclear power plants

Type of award: PhD Research Studentship

Department: Mechanical Engineering

Scholarship Details: Scholarship covers full UK/EU (EU applicants who have been resident in the UK for 3 years prior to 1 September 2018) PhD tuition fees and a tax-free stipend at the current RCUK rate (£14,553 in 2017/18). EU nationals resident in the EU may also apply but will qualify only for PhD tuition fees.

Duration: 3.5 years

Eligibility: Home/EU applicants only

Start Date: 24 September 2018

PhD Topic Background/Description:
Set in The University of Bristol’s solid mechanics group, a world leading team in structural integrity, this project uses a multi-scale, multi-technique approach to investigate the behaviour of vital engineering materials:

* silicon ceramics used for the containment of historic nuclear waste,
* graphite used for moderating reactions in the current generation of nuclear plant,
* beryllium and tungsten used to line containment vessels for future fusion generation.

By combining high performance computer models with imaging analysis, you will build a deeper understanding of the mechanical behaviour of the materials under investigation exposed to complex deformation and fracture.

The experimental elements of the programme, using X-ray tomography to create 3D images of strain and damage inside samples and Digital Image Correlation to track real-time crack propagation, is combined with high fidelity cellular automata finite element models developed in a parallel project. The combined modelling and experimental programme will provide new insight into the behaviour of these critical materials.

The project will draw from the strengths of the interdisciplinary team to develop experts of the future. Along with rigorous error analysis, you will follow an approach that is transferable across length scales, enabling the tracking of fundamental physical mechanisms through to engineering application.
Further Particulars

Candidate Requirements
Candidates should have either a 1st or a good 2:1 degree in mechanical engineering, physics, material science or a related discipline.

Basic skills and knowledge required:
Good understanding of solid mechanics fundamentals: stress and strain tensors, strain rate, conservation laws, basic engineering fracture mechanics, good knowledge of calculus, including tensor calculus, good understanding of properties and mechanics of materials, including elasticity, plasticity, fatigue, good experimental practice and interest in experiment design and data analysis, good written and spoken English and report writing skills.

Funding Notes
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Informal enquiries
Please contact Dr Mahmoud Mostafavi (m.mostafavi@bristol.ac.uk)

For general enquiries, please email came-pgr@bristol.ac.uk

Application Details
To apply for this studentship, submit a PhD application using our online application system [www.bristol.ac.uk/pg-howtoapply]

Please ensure that in the Funding section you tick “I would like to be considered for a funding award from the Mechanical Engineering Department” and specify the title of the scholarship in the “other” box below with the name of the supervisor Dr Anton Shterenlikht.

Closing date for applications 30 May 2018

Apply now