



UK Atomic
Energy
Authority



SOUTH WEST
NUCLEAR HUB

Fusion and Fission Graphite Analysis and Treatment

Fully Funded PhD Studentship starting September 2022

Project Description:

Graphite has been used in many nuclear energy applications such as a moderator in civil nuclear fission reactors and as plasma-facing material inside the Joint European Torus. Irradiated graphite comprises a significant volume of the Intermediate Level Waste inventory in the UK, so its disposal poses unique challenges to our society – but also an exciting opportunity to extract isotopes with potential uses in high tech R&D such as diamond batteries.

The objective of this project is to develop techniques for processing graphite waste to reduce the volume of the waste needing disposal, initially on a lab-scale, by extracting key isotopes with potentially useful applications. Working with real samples of irradiated graphite from both fission and fusion reactors, you will be designing and testing processes to treat this fascinating material using chemical and physical techniques.

Working on the techniques for decommissioning is a contribution to supporting the UK's clean energy aspirations and makes this PhD very applied rather than theoretical, where a large component of the project will be experimental. In addition to working in labs, interpersonal skills will also be important because interactions, collaboration and joint work with industry partners will be routine. You will develop a range of transferable practical skills relevant to nuclear industries, in particular fission and fusion.

This project is funded by the UK Atomic Energy Authority (UKAEA), based in Culham, Oxfordshire. The student will work closely with experts at UKAEA, who are developing significant new capabilities in this area for the national nuclear programme.

As this project is fully funded, the student will be paid a tax-free stipend of £17,609.00 per year, for the 4 years project duration. The PhD project will start in September 2022. Unfortunately applications are only open to UK nationals.

The research group you will be joining has around 30 PhD students and 20 staff researchers. Known as the "Interface Analysis Centre", we originated from the UK's famous Berkeley Labs which used to support the generating nuclear stations. We are also part of the South West Nuclear Hub which brings together industry and academic expertise for joint projects for exchange of knowledge and new technologies. Our labs in the School of Physics at the University of Bristol are all LEAF accredited, which is an award for environmental sustainability. <http://www.southwestnuclearhub.ac.uk/>

The Interface Analysis Centre offers you the chance for training on cutting-edge materials analytical equipment, the opportunity to build new experimental equipment, and build your

skills in directions that suit you. For more information see <https://www.bristol.ac.uk/physics/research/materials/iac/>

We welcome applications from all backgrounds and particularly encourage those from under-represented sections of society to apply. We are signatories to the Athena Swan Charter, which encourages and recognises commitment to advancing gender equality.

Informal enquiries are encouraged, so please contact Dr Chris Hutson (chris.hutson@bristol.ac.uk) with any questions you may have about the project.

Your application will be very welcome, please submit it via <http://www.bristol.ac.uk/study/postgraduate/apply/>, choosing "Physics PhD" as course, and mention Graphite/Chris Hutson