Title: Microscintillator Radioactivity Detector

Type of award  PhD Research Studentship

Department  Aerospace Engineering

Scholarship  £15,009 p.a. subject to confirmation

Duration  3.5 years

Eligibility  Home / EU only

Starting Date:  1 October 2019

PhD Topic Background/Description
Traditionally, Geiger counters are used as radiation detectors; however, they are limited by their inability to determine the energy of the radiation they measure. This project involves development of a new miniature radioactivity detector, a “microscintillator” which is similar to a Geiger counter, but with the added benefit that it can measure the energy of the radioactive particle. The device is able to measure count rates, analogous to a Geiger counter, but can also differentiate between the different energies of incoming particles. It is also small and low power enough for use in airborne applications; we believe it is the smallest and cheapest detector of its type available. It has already been trialled on high-altitude balloons and UAVs, and units are being sold to researchers around the world.

The goal of this project is to carry out technical development of the instrument, such as discrimination of different particle types through simple pulse shape identification, and optimization of the detector and measurement system. The student will also use both physics and engineering software to model the device’s response and better understand and characterize its measurements in the atmosphere or in space.

The project involves a collaboration with Dr Alec Bennett at Biral, a leading developer and manufacturer of meteorological technology, to investigate commercialization of the instrument for the environmental science market. Some of the project work will be based at Biral’s research and manufacturing facility near Bristol (by arrangement). This project offers an exciting opportunity to work at the interface between physics and engineering, and gain experience in industry.

Candidate Requirements
We are looking for a committed and highly motivated student holding (or close to completing) a minimum of a good (1st or 2:1) master’s degree (or international equivalent) in a physical science or engineering discipline.

If English is not your first language, please provide a recognised English language qualification at Profile E. Further information: http://www.bristol.ac.uk/study/language-requirements/profile-e
Basic skills and knowledge required.
The successful applicant will be competent in the following areas:

- Measurements and instruments;
- Basic electronics;
- Radioactivity measurement (desirable)

Equal opportunities statement
We seek an inclusive environment that respects the diversity of our staff and students and enables them to achieve their full potential, to contribute fully, and to derive maximum benefit and enjoyment from their involvement in the life of the University. We are committed to building and sustaining an excellent learning experience for our students, where staff are equally valued and respected, and students are inspired to thrive academically.

Scholarship Details
The scholarship covers the following for 3.5 years:

- full UK/EU (EU applicants who have been resident in the UK for 3 years prior to 1st September 2019) PhD tuition fees
- Tax free stipend subject to confirmation

EU nationals resident in the EU may also apply but will only qualify for PhD tuition fees.

Informal enquiries
For informal enquiries, please email Dr Karen Aplin, karen.aplin@bristol.ac.uk or Dr Alec Bennett alec.bennett@biral.com

For general enquiries, please email came-pgr-admissions@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 Aerospace Engineering Department” and specify the title of the scholarship in the “other” box below with the name of the supervisor.

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