PhD studentship on High Intensity Hadron Accelerators

The Intense Hadron Beams group at the University of Oxford and the Intense Beams Group at the STFC ISIS Neutron and Muon Source are seeking a DPhil (PhD) candidate to start October 2017 in the field of high intensity hadron accelerators.

Goal and background:

High intensity hadron accelerators are vital for many future scientific facilities and societal applications. They are also a fascinating area of physics research, pushing the limits of theoretical, computational and experimental techniques. In the UK, the ISIS Neutron and Muon Source is a world leading facility producing neutrons for thousands of scientific users each year. The Oxford group and STFC/ISIS/RAL group work closely together on topics relevant to future high intensity hadron accelerators, and are currently looking to develop Fixed-Field Alternating Gradient (FFAG) accelerators for a potential future neutron source.

Project description:
The selected candidate will perform research at the frontier of high intensity beam dynamics and accelerator simulation and modelling. There are many novel topics which could be addressed depending on the interests of the student, including:

- Whether beam instabilities become a limiting factor in FFAGs when the intensity increases.
- How to ensure successful operation of this unique type of machine with controlled beam losses, including beam dynamics studies and collimation schemes.
- The design of a prototype machine to demonstrate essential ingredients of the full-scale high intensity facility.
- Accurate modelling and benchmarking of dynamics in FFAG accelerators.

In addition, for the right candidate there may also be the possibility of experimental work in Japan on an existing FFAG accelerator. The student is expected to divide their time between Oxford and the STFC Rutherford Appleton Laboratory according to the needs of the project. The project will be co-supervised by Dr. Suzie Sheehy (Oxford) and Dr. Shinji Machida (STFC).

Requirements and eligibility:

We welcome applications from candidates with a first class or upper 2nd class Masters (or 4-year undergraduate) degree in physics or a related subject who have an interest in accelerator physics. Candidates must have a strong understanding of physics including electromagnetism and special relativity and display the drive and capacity to tackle many aspects of a complex problem with a large degree of independence. A keen attention to detail and some experience in computer simulations would be advantageous.

Note that this studentship is joint funded by the ISIS Neutron and Muon Source and STFC through the John Adams Institute for Accelerator Science. Eligibility criteria for the studentship can be found at http://www.stfc.ac.uk/funding/studentships/studentship-terms-conditions-guidance/student-eligibility-requirements/

Applications close at **5pm on Friday 16th June**, and must be made through Oxford Particle Physics: https://www.ox.ac.uk/admissions/graduate/courses/dphil-particle-physics

For further details or informal discussion, please contact Dr. Suzie Sheehy
suzie.sheehy@physics.ox.ac.uk

Further information on application procedures can be requested from:
kim.proudfoot@physics.ox.ac.uk