Newcastle University PhD Studentship award

Title
PhD Physics project: Buoyant magnetic fields in the Sun

Value of award
100% UK tuition fees and a tax-free stipend of £14,777 per year. We will consider covering the EU/international fees for outstanding students and where possible.

Number of awards
1

Start date and duration
42 months from September 2019

Application closing date
31 January 2019

Overview
The School of Mathematics, Statistics and Physics is offering a fully-funded PhD studentship in the theoretical and computational study of magneto-hydrodynamics (MHD), with a focus on magnetic buoyancy in the solar interior. Magnetic buoyancy is believed to be the cause of the complex magnetic structures (coronal loops and prominences) that appear on the Sun’s surface. The magnetic field is stretched and amplified at the bottom of the Sun’s convection zone, until it becomes buoyant and rises to the surface. However, the details of this magnetic buoyancy process are poorly understood, and are strongly affected by the Sun’s rotation and compressibility. This project will combine analytical theory with high-resolution numerical simulations, to determine how magnetic buoyancy operates under the conditions of the solar interior. We will also address the role that the rising magnetic field structures play in the Sun’s overall dynamo process. The studentship is related to a project funded by EPSRC to develop a “sound-proof” fluid model that accurately describes convection and magnetic buoyancy without the need to resolve sound waves.

You will join a team consisting of Dr Toby Wood and Dr Paul Bushby, within the Astrophysical & Geophysical Fluids research group. The group consists of eight academic staff, four research associates and eight postgraduate students.

You should have a strong background in fluid dynamics or magneto-hydrodynamics (MHD). Computational skills and interest in computational methods is also desirable.

As well as the above stipend and fees, the studentship includes the provision of a new desktop computer and travel allowance. Successful participants will also have the opportunity to undertake teaching related activities supported by training workshops.
Sponsor
EPSRC / School of Mathematics, Statistics and Physics

Name of supervisor(s)
Dr Toby Wood and Dr Paul Bushby

Eligibility Criteria
This studentship is available to candidates who have/expect a 2:1 honours degree in computing science, mathematics, physics, statistics or another strongly quantitative discipline, or an international equivalent. Applicants whose first language is not English require a minimum of IELTS 6.5. International applicants may require an ATAS (Academic Technology Approval Scheme) clearance certificate prior to obtaining their visa and to study on this programme.

How to apply
You must apply through the University’s online postgraduate application form http://www.ncl.ac.uk/postgraduate/apply/ Please include the following information:
• insert the programme code 8080F in the programme of study section
• select ‘PhD Mathematics – Applied Mathematics’ as the programme of study
• insert the studentship code MSP015 in the studentship/partnership reference field
• attach a covering letter and CV. The covering letter must state the title of the studentship, quote reference code MSP015 and state how your interests and experience relate to the project
• attach degree transcripts and certificates and, if English is not your first language, a copy of your English language qualifications

Contact
Dr Toby Wood (toby.wood@ncl.ac.uk)