

## Research Project/Studentship Description

<b>Studentship Ref Number: DTC12-22-34</b>	<b>Closing Date: 28 May 2024</b>
<b>School</b>	Engineering and Computing
<b>Centre</b>	Jeremiah Horrocks Institute
<b>Proposed Director of Studies</b>	Timo Laitinen
<b>Contact Details</b>	tlmlaitinen@uclan.ac.uk
<b>Programme</b>	PhD (via MPhil)
<b>Duration of Studentship</b>	3.5 years
<b>Hours</b>	Full Time
<b>Tuition Fees</b>	UK Fees covered (International Students to make up the difference between UK and International Fees)
<b>Maintenance Grant</b>	UKRI Level Stipend (Currently £19237 per annum)
<b>Any Entry Requirements</b>	UK Bachelor of Science degree (or equivalent qualification) at 2:1 or above in Mathematics, Physics, Astrophysics or equivalent, or a UK Masters level qualification
<b>Any Special Requirements</b>	
<b>Project Title</b>	
Forecasting Solar Energetic Particle Risk for Space Weather	
<b>Project Description</b>	
<p>The Jeremiah Horrocks Institute (JHI, <a href="http://www.star.uclan.ac.uk">www.star.uclan.ac.uk</a>) at the University of Central Lancashire is currently seeking candidates for a 3.5-year PhD project on Forecasting Solar Energetic Particle risk for Space Weather. The successful candidate will work with the Solar Group at the JHI, as well as with personnel at the Met Office Space Weather Operation Centre (MOSWOC).</p> <p>Solar Energetic Particles (SEPs) are ions and electrons accelerated during solar eruptions, up to relativistic energies. As they reach Earth, they pose a radiation risk to spacecraft instrumentation and humans in space and at aviation altitudes. To mitigate this risk, the Solar Group at JHI has developed a physics-based SEP forecasting tool, SPARX, which uses simulations of the propagation of SEPs in the turbulent interplanetary space to predict their arrival at Earth, and to evaluate the Space Weather hazard they may cause.</p> <p>The successful candidate will work on developing SPARX to include an improved description of interplanetary turbulence which takes into account SEP propagation perpendicular to the mean interplanetary magnetic field. They will also analyse SEP event observations in order to investigate the significance of different physical processes on the accuracy of the SEP forecasts. The improved model is foreseen to replace the initial version of SPARX installed at MOSWOC, and the successful candidate will participate in the process, interacting with the MOSWOC Space Weather forecasters.</p> <p>Students holding DTC Studentships are encouraged to take up opportunities to gain teaching experience within the remit of the DTC Stipend up to a maximum of 6 hours class contact per week.</p>	

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<b>Centre:</b>	Jeremiah Horrocks institute		
<b>Contact:</b>	<a href="mailto:tmlaitinen@uclan.ac.uk">tmlaitinen@uclan.ac.uk</a>		

<b>Attributes</b>	<b>Essential</b>	<b>Desirable</b>	<b>Measured By</b>
<b>Education/ Qualifications</b>	BSc in Mathematics, Physics, Astrophysics or equivalent, at 2:1 or above	Master's level qualifications such as MPhys or MSc	Application form
<b>Experience</b>	Undergraduate project work	Further research, such as internship	Application form and interview
<b>Skills/Abilities</b>	<p>Problem-solving skills. Ability to work as part of a team</p> <p>Skills in scientific programming (e.g. python, C, C++, Fortran, IDL)</p>	<p>Experience in developing/improving a piece of software, e.g. a model, and/or running simulations.</p> <p>Experience of programming in a Unix/Linux environment</p> <p>Good presentation and communication skills</p>	Application form and interview