

Job Description

To support the research and knowledge transfer activities of Dr Daniel Brown in the School of Engineering and Computing / Jeremiah Horrocks Institute. The research project is to investigate how sunspot dynamics influence solar activity and is funded by the Science and Technology Facilities Council (STFC). The post holder will investigate the types of motions that are manifested by sunspots (such as mergers, splitting, rotation, and shear) and compare them to the resultant solar activity (such as solar flares and coronal mass ejections) to determine what type of motions are linked with eruptive events. This will be achieved by employing and developing automated detection algorithms to identify and analyse the kinematics of sunspots in long duration sequences of solar observations to create a large sample of motions and events that can be used to statistically address questions about the connections between sunspots and solar activity. The project will be carried out under the direction of Dr Daniel Brown.

Duties

1. Using automatic detection and tracking techniques, develop a large statistical sample of sunspots and their motions over different periods within the solar cycle from solar observations
2. Develop automated techniques to assign solar activity (such as flares and coronal mass ejections) to active regions identified in the statistical sample and carry out analysis to identify common mechanisms that result in solar activity.
3. Develop estimates for the energy injected into the coronal magnetic field by sunspot motions and the energy released by solar activity and determine whether different mechanisms are capable of powering solar activity.
4. Write up results of research and contribute to the production of papers for publication and research reports, and writing/delivering presentations at conferences and meetings.
5. Assist in the supervision of student research projects and to support others in undertaking work within the Solar Physics group of the Jeremiah Horrocks Institute.
6. Assist Dr Daniel Brown to maintain a good working relationship with external collaborators.
7. Attend project-planning meetings as required.
8. Support outreach activities within the Jeremiah Horrocks Institute.
9. To carry out any other duties appropriate to the post as determined by Dr Daniel Brown.
10. With regards to the nature of your role and its impact upon our students, make an active contribution to and support the improvement of the student experience.

Person Specification

Knowledge, Skills, and Behaviours (Essential)

- Recent research experience in an appropriate academic or professional setting, including conducting qualitative and/or quantitative research and undertaking literature reviews (Application/Interview).
- Experience of conducting research in Solar Physics, particularly in observational analysis of solar data (Application/Interview).
- PhD in Solar Physics or have recently submitted their PhD thesis and are awaiting viva (Application/Interview).
- Ability to work on individual and joint research projects and to contribute to the publication of research papers (Application/Interview).
- Ability to work with external partners (Application/Interview).
- Excellent communication, planning, and organisations skills (Application/Interview).
- Ability to work effectively in a team (Application/Interview).
- Willingness to travel (Application/Interview).
- An understanding of and demonstrable commitment to the University's Values of Achieving Together, Being Proud, Creating Opportunity and Supporting All, as a framework for decisions, actions and behaviours (Application/Interview).

Knowledge, Skills, and Behaviours (Desirable)

- Experience working with observations of sunspots and the solar photosphere (Application/Interview).
- Experience using automated identification techniques to generate large samples of solar phenomena (Application/Interview).