Seismic studies of solar and stellar magnetic activity

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Helioseismology uses the Sun's natural resonant oscillations to determine conditions beneath the visible surface of the Sun, in the solar interior. At any one time there are thousands of acoustic oscillations trapped inside the Sun and by observing their properties, such as their frequencies, we can build up profiles of conditions in the solar interior. The properties of the acoustic oscillations are impacted by the presence of a magnetic field and so vary systematically through the Sun's approximately 11year magnetic activity cycle. The same effect can be seen in other stars as well through asteroseismology, which is the study of stellar oscillations. Cycle-like variations in the parameters of stellar oscillations to study solar and stellar magnetic activity is important because the magnetic fields are generated in the interiors of the Sun and stars by a dynamo. However, there is much we do not yet know about how and where this happens. The main aims of this project will be to use seismic observations of solar and stellar magnetic activity to tease out new information that could be used to inform solar and stellar dynamo models.

The successful candidate will be based in the Centre for Fusion, Space and Astrophysics (CFSA). Research at CFSA focuses on plasma physics applied to the grand challenges of fusion power, space physics, solar physics, and astrophysics. Our work spans fundamental theory, observation, and the analysis of experimental data, combined with high performance computing. For more details of the CFSA see http://www.warwick.ac.uk/go/cfsa/

We plan to interview in person at Warwick University in late February but please get in touch before that with any informal enquires, if you have any questions or if you'd like to know more about the project.