Magnetospheric dynamics at Jupiter

Project Description

Jupiter possesses the strongest magnetic field and brightest auroras in the solar system. The dynamics of Jupiter’s magnetosphere are dominated by the planet’s rotation, rather than the interaction with the solar wind as at Earth. In this respect, Jupiter acts as an analogue for more distant rotationally-dominated astrophysical bodies such as exoplanets, brown dwarfs, and pulsars. Jupiter’s high latitude polar region is replete with bright and dynamic auroras of undetermined origin, though the main component of Jupiter’s auroras, known as the main oval, is known to driven by the centrifugal outflow of plasma originating from Io. However, there are many questions about how this system responds to changing conditions in the solar wind and the rate of output from Io. For example, theoretical studies suggest that the main oval should dim in response to increased solar wind dynamic pressure, but this appears to be the opposite of its observed behaviour. It is also unclear how the changing rate of output from Io affects the magnetic field and the resulting auroral emission.

It is presently an exciting time for the study of Jupiter’s magnetosphere. The arrival in July 2016 of the NASA Juno spacecraft heralded an interval of unprecedented observation of the giant planet, including substantial programmes of observation of Jupiter’s FUV auroras using the Hubble Space Telescope. In this project, Juno and Hubble data will be compared with theoretical models of Jupiter’s magnetospheric dynamics to determine how this giant magnetosphere works.
References


Application Instructions

When applying, please ensure we have received all of the following required documents by Wednesday 29th January 2020:

- To apply – please refer to the guidelines and application link at https://le.ac.uk/study/research-degrees/funded-opportunities/stfc-studentships
- 2 academic references
- STFC Research Interests Form
- CV
- Undergraduate transcripts
  - If you have completed your undergraduate degree, we will also require your undergraduate degree certificate
  - If you have completed a postgraduate degree, we will also require your transcripts and degree certificate

If we do not have the required documents by the closing date, your application may not be considered for the studentship.