Magnetic Processes in Solar and Laboratory Plasmas

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Scientific Background/Current Research

Magnetic processes play an important role in the storage and release of energy in plasmas. For example, in magnetic reconnection\(^1\), the topology of the magnetic field is rearranged and magnetic energy is converted to heating and accelerating the plasma. Processes such as magnetic reconnection, magnetic confinement and magnetic trapping play important roles in both fusion plasmas and solar flares, but they remain poorly understood. In laser ablation, a pulsed laser can be used to generate small volume of supersonic plasma, which enables us to study these fundamental plasma processes in the laboratory.

Project

We will investigate how a laser produced plasma interacting with a magnetic can be used to explore the fundamental physics of magnetic processes such as reconnection, confinement and trapping.

The project will involve a combination of computer simulation and laser plasma experiments and direct comparison with observations of solar flares.

Funding

Applicants should discuss funding with the Research Supervisor. They should apply for funding from the following sources: Irish Research Council (deadline 11 February, 2015), TCD PG Scholarship and School of Physics Studentship schemes.

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References