



AUSTRALIAN INSTITUTE OF PHYSICS

South Australian Branch

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Notice of a **FREE PUBLIC LECTURE** presented
in conjunction with the **Women-In-Physics Group**, by the
Australian Institute of Physics (SA branch)

The Claire Corani Memorial Lecture

The South Australian Lecture in the 2009 Women in Physics Lecture Tour

at **7:30pm** on **Wednesday 23rd September 2009**

in the **Napier 102, Napier Building,**
University of Adelaide



**“To planets or just to the
shops, Plasmas pave the
path”**

by **Associate Professor Christine Charles**

Plasma Research Laboratory, Australian National
University

Plasmas have existed since the very first moments of the Universe. It is the stuff of stars. It fills the space between stars. It gives us the beautiful northern and southern aurorae. Our houses have plasma TV displays, plasma lights (fluorescent tubes). Everywhere we look, there is plasma. But we stand on solid earth and the solid state accounts for less than one percent of the total mass of the Universe. The rest is plasma, a hot ionised gas containing positive and negative charges (except, perhaps, for dark matter). By properly harnessing the plasma state we can make microchips for computers, we can make plasma engines (thrusters) to get to the planets and we can make fuel cells to take people just down to the shops. The discovery in Australia of a current-free electric double layer (a cliff of potential like a river waterfall which energise charged particles falling through them) in a laboratory plasma is the basis of a new space engine: the Australian Helicon Double Layer Thruster.