



## The AIP 2009 Women in Physics National Lecture Tour

### FREE PUBLIC LECTURE

Tuesday 19th May, 7.00 PM

**Wollongong Science Centre**

***Bookings Essential!***

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

**Assoc. Professor Christine Charles  
Space Plasma, Power & Propulsion Group,  
Research School of Physical Sciences and Engineering,  
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.

The Australian Institute of Physics (AIP) International Women in Physics Lecture Series was instituted to celebrate the contribution of women to advances in physics. Under this scheme, a woman who has made a significant contribution in a field of physics will give a series of lectures around Australia, including a Public Lecture arranged by each participating branch of the AIP. The Lecture will be of interest to a non-specialist physics audience and is expected to increase awareness among students and their families of the possibilities offered by continuing to study physics.

## ***The Speaker***

Christine Charles is Associate Professor at the Australian National University. She has a French Engineering degree in applied physics, a French Masters in materials science, a French PhD in plasma physics, a French Habilitation thesis in materials science and a Bachelor of Music degree in Jazz from the ANU. For the past twenty years, she has been working on expanding plasmas and their applications to electric propulsion, microelectronics and optoelectronics, astrophysical objects, and, more recently, to the development of fuel cells for the hydrogen economy. She is the inventor of the Helicon Double Layer Thruster, a new electrode-less magneto-plasma thruster, that has applications including satellite station keeping or interplanetary space travel. The thruster concept is based on her discovery in 1999 of the current-free double layer in an expanding radiofrequency plasma. She actively popularises her science on ABC Catalyst, Discovery Channel, radio and public lectures. She enjoys playing music, surfing, canoeing, cycling and bushwalking.

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## ***RSVP Details:***

Date: Tuesday 19<sup>th</sup> May 2009

Venue: Wollongong Science Centre, Squires Way, Wollongong.

Lecture Time: 7:00 PM - 8:00 PM

Parking: Parking is available at the Science Centre at no cost.

Cost: Free

Due to limited seating, bookings are essential.

Booking Contact: Kim Noble, Wollongong Science Centre

Phone: (02) 42865000 (menu option 3)

Email: Kim\_Noble@uow.edu.au

Event sponsored by:

The Australian Institute of Physics – NSW Branch.  
Wollongong Science Centre.  
School of Physics, University of Wollongong.