

# Seminar

Friday, 9th October 2009

11 am - Room 701

[Dr Chris Tout](#)

The Institute of Astronomy (IoA),  
at the University of Cambridge

## ***The Origin of High Magnetic Fields in White Dwarfs***

White dwarfs with surface magnetic fields in excess of 1MG are found as isolated single stars and relatively more often in magnetic cataclysmic variables. Some 1,253 white dwarfs with a detached low-mass main-sequence companion are identified in the Sloan Digital Sky Survey but none of these is observed to show evidence for Zeeman splitting of hydrogen lines associated with a magnetic field in excess of 1MG. If such high magnetic fields on white dwarfs result from the isolated evolution of a single star then there should be the same fraction of high field white dwarfs among this SDSS binary sample as among single stars. Thus we deduce that the origin of such high magnetic fields must be intimately tied to the formation of cataclysmic variables. The formation of a CV must involve orbital shrinkage from giant star to main-sequence star dimensions. It is believed that this shrinkage occurs as the low-mass companion and the white dwarf spiral together inside a common envelope. CVs emerge as very close but detached binary stars that are then brought together by magnetic braking or gravitational radiation. We propose that the smaller the orbital separation at the end of the common envelope phase, the stronger the magnetic field.

*All Welcome*

### Contact Details

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