



**Australian Institute of Physics
NSW Branch (May Public Talk)**

Darkness Visible: The Search for Dark Energy

Professor Matthew Colless

Director, Anglo-Australian Observatory

Tuesday 29th May 2007 @ 6.00PM

At the

Slade Lecture Theatre, School of Physics, University of Sydney

Public talk arranged by: The Australian Institute of Physics (NSW Branch)

Entrance is FREE

Summary of talk:

The existence of "dark energy" with properties closely resembling Einstein's cosmological constant is now well-established by a number of lines of evidence, most dramatically by the observed acceleration of the expansion of the universe. However the nature of this dark energy is unknown, making it the most remarkable unexplained phenomenon in physics and a potential clue to fundamental physics outside the standard model. Not surprisingly, therefore, enormous efforts are being made to measure basic properties of the dark energy, principally its energy density and equation of state. A variety of astrophysical observations can address these questions by examining the evolving geometry of the universe and the growth of structures since the Big Bang.

Observing programs using supernovae, gravitational lensing, the cosmic microwave background, and the large- scale structure of the galaxy distribution are being initiated. I review the current state of knowledge about dark energy and the prospects for these new observing programs.





Brief Biography of the Speaker:

Matthew Colless is the Director of the Anglo-Australian Observatory. He obtained his BSc at Sydney, his PhD at Cambridge and has held positions at Durham, Kitt Peak, Cambridge and the ANU. Most of his research has involved carrying out ever-larger redshift surveys of galaxies in order to understand their evolution and distribution. The 2dF Galaxy Redshift Survey provided the first precise measurements of the total density of matter in the universe, and also established the relative densities of dark matter, baryons and neutrinos. He is now involved in two new surveys: the 6dF Galaxy Survey to map the motions as well as the positions of galaxies, and the WiggleZ survey to tighten existing constraints on the dark energy equation of state.

The Anglo-Australian Observatory is currently competing in a design study to develop a powerful new spectrograph for an 8m-class telescope that will map millions of galaxies at high redshifts and determine the evolution of the dark energy equation of state over most of the history of the universe.

Detailed Schedule for Tuesday, 29th May 2007:

- 6:00-6.30 pm **REFRESHMENTS, Slade Lecture Theatre.**
- 6.35-7.30 pm **LECTURE by Professor Matthew Colless.**
- 8.00 pm **DINNER with the Speaker at Buon Gusto (Italian), 368 Abercrombie Street, Chippendale.**
E-mail Dr Fred Osman (fred_osman@exemail.com.au) if you will be able to join us for dinner.

Travel Directions:

- Train to Redfern station and walk to the **School of Physics**.
- Buses 422, 423, 426, 428, 448, and 450 from Circular Quay to City Road / King, or 412, 435, 438, 470, 483 etc. along Parramatta Road from Circular Quay.
- Drive and park in various parking lots. You will need to pay for parking (**\$6 flat-rate after 4 pm**) and display the ticket in your car. You may also find parking places on public roads outside the Uni.

Event sponsored by:



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