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

**“Climate Forcing by Atmospheric Aerosols”**

**Associate Professor Michael Box  
University of New South Wales**

**Tuesday 22<sup>nd</sup> September 2009 @ 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***

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***Summary of talk:***

The Earth's climate is maintained by the atmospheric flows of solar and terrestrial radiation, which have almost no spectral overlap. Any change in atmospheric composition, or surface reflectivity, which alters one or both of these flows, is usually referred to as radiative (climate) forcing. The best known, and best understood, of these forcings is the impact of increasing levels of greenhouse gases on terrestrial (thermal) radiation, with a current estimate of about  $2.5 \text{ Wm}^{-2}$ .


Atmospheric aerosols – small particles of natural or human origin – are the second key forcing agent. As well as reflecting some solar radiation back to space, they may also modify both the albedo and lifetime of clouds, again reflecting solar radiation. Both of these processes partially counteract the effects of greenhouse gases – a negative forcing.

Unlike the greenhouse gases, aerosols are extremely heterogeneous: not only in space and time, but also in their optical/radiative properties. Black soot absorbs solar radiation, rather than reflecting it, causing local heating. Mineral dust is a mild absorber, with a question as to its net radiative effect – cooling or warming.

Australian desert dust – much redder than northern hemisphere deserts – is a major unknown. In recent years, my group has attempted to fill this gap. In this talk I will discuss the physics behind aerosol forcing, and present some results of our work.



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### ***Brief Biography of the Speaker:***

Michael has a BSc in Physics, Monash University. PhD in Physics, Sydney University. He has been four years in the US at NASA and the University of Arizona working on aerosol remote sensing, scattering, radiative transfer. Michael is currently working as an Associate Professor in Physics at the UNSW. His research comprises on particle scattering theory, remote sensing inversion theory, radiative transfer, aerosol optical properties and effects.

Michael's work covers all aspects of atmospheric aerosols (suspended particles) and their environmental impacts and has published many papers in these areas. His group is currently

investigating the distribution of aerosols in Sydney, and especially any chemical or physical variations. The work of his group is directed at studying aerosol amounts and type from space, and also at computing the climatic impact of these aerosols.



### ***Detailed Schedule for Tuesday, 22<sup>nd</sup> September 2009:***

- 6:00-6.30 pm **REFRESHMENTS, Slade Lecture Theatre.**
- 6.35-7.30 pm **LECTURE by Associate Professor Michael Box.**
- 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](mailto: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:***



***The Australian Institute of Physics – NSW Branch  
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