



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

**“Beyond the Gingerbread House – Engineering
with Sugar Based Materials”**

Dr Chris Garvey

Australian Nuclear Science and Technology Organisation

Tuesday 27th July 2010 @ 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:

By contrast to technological materials engineering the plant kingdom is able construct a large range of functional structures (leaves, wood, roots etc) using a limited range of construction materials – different sugars. Diverse mechanical demands include: compressive strength, such as found in wood; the ability to flow slowly during cell extension and growth; and highly flexible structures which can endure wind shearing. The route to synthesis of such materials is combining carbon dioxide and water using the power of sunlight. At the heart of plant’s construction set is the polymer of glucose, cellulose. Despite being utilised and researched for millennia, fundamental questions remain on the molecular rearrangements that occur under conditions of load, and the role of cellulose texture during cell elongation and growth. We use modern experimental techniques, particularly x-ray and neutron scattering, to understand these fundamental questions, and provide an important background for biotechnology to harness the plant kingdom’s construction set.





Brief Biography of the Speaker:

Dr Garvey is a research scientist who applies advanced physical characterisations at the interface between biology and materials science. An underlying theme has the difference between the behaviour of molecules singly, and as ensembles, or in more complicated mixtures such as cells and their components (e.g. organelles, walls, membranes). The differences are due to the intermolecular interactions, and interactions between molecules and the host matrix. A particular focus has been cell walls of plants, and the industrially important group of materials called cellulose. As well as his research activities Dr Garvey is an instrument scientist on the new small angle neutron scattering instrument, Quokka (http://www.ansto.gov.au/research/bragg_institute/facilities/instruments/quokka), at the Australian Nuclear Science and Technology Organisation's OPAL research reactor.

Detailed Schedule for Tuesday, 27th July 2010:

- 6:00-6.30 pm **REFRESHMENTS, Slade Lecture Theatre.**
- 6.35-7.30 pm **LECTURE by Dr Chris Garvey.**
- 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:



*The Australian Institute of Physics – NSW Branch
& The University of Sydney.*

