



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

**“From Stellar Nucleosynthesis to Cancer  
Therapy; what is the link?”**

**Professor Barry Allen**

**Centre for Experimental Radiation Oncology**

**Tuesday 26<sup>th</sup> May 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 creation of elements in stars is a fundamental science, upon which all life forms rest. Charged particle reactions can produce elements up to iron, but we need the fast and slow neutron capture reactions to create the heavier elements. Early in my career I studied the slow rate of nucleosynthesis of elements in stars by the sequential capture of keV neutrons up the valley of beta stability (s-process). We were able to validate this theory by the correlation of isotopic 30 keV neutron capture cross sections with solar system abundances, which showed the influence of the magic numbers across the periodic table over 5 orders of magnitude. The rapid neutron reaction process in supernovae (r process) created the neutron rich nuclides that decayed rapidly and led to the synthesis of the actinides. Some 40 years later, the products of the stellar nucleosynthesis are being used to kill cancer cells. With the development of monoclonal antibodies, a small band of biomedical scientists have brought these two Nobel prize winning achievements together to create targeted alpha therapy (TAT) for cancer. In spite of many setbacks, we have taken targeted alpha therapy for metastatic melanoma from the test tube to the bedside. Clinical trial results so far point to a very promising therapy. But then, in 2009, TAT was hit by the perfect storm!





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

Professor Allen is the Director, Centre for Experimental Radiation Oncology at St George Cancer Care Centre where he runs the Targeted Alpha Therapy (TAT) project for developing new therapeutic agents for the treatment of melanoma, breast, prostate, pancreatic and other cancers. Some 45 papers have now been published in international journals on this topic, including the world first trials of intralesional and systemic TAT for melanoma. Some 40% of end-stage melanoma patients received a benefit in the ongoing systemic trial, without any evidence of adverse events. A new approach to the regression of solid tumours was devised which points to improved therapeutic efficacy for TAT. Professor Allen has published over 300 research papers in fields as diverse as neutron physics, stellar nucleosynthesis, in vivo body composition and targeted cancer therapy. He convened the International Congress on Medical Physics

and Biomedical Engineering in 2003 at Sydney; is Past-President of the Asia Oceania Federation of Medical Physics, President of the International Organisation of Medical Physics and President-Elect of the International Union of Physical and Engineering Sciences in Medicine. He founded and is the inaugural Chair of the Health Technology and Training Task Group, which has the job of determining appropriate technology for health services in rural communities of developing countries. He has reviewed health technology needs in Vietnam, Philippines and Vanuatu.



### ***Detailed Schedule for Tuesday, 26<sup>th</sup> May 2009:***

- **6:00-6.30 pm REFRESHMENTS, Slade Lecture Theatre.**
- **6.35-7.30 pm LECTURE by Professor Barry Allen.**
- **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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