

# 武汉物数所理论交叉学术交流系列报告

第五十二期

## ANU-WIPM Colloquium

Prof. Stephen J. Buckman

Director, Research School of Physics and Engineering  
and ARC Centre for Antimatter Studies  
Australian National University, Canberra

### I. Low Energy Interactions of Antimatter with Matter

2013年5月7日(周二)上午10:00-11:00

频标楼1楼报告厅

**Abstract:** Positrons (the electron antiparticle) are ideal vehicles for scientific research as they not only hold much fundamental interest in the way in which they interact with matter, but also have considerable applications in fields such as material science and medical diagnostics.

This talk will review what we know about positron-matter interactions, touch on some of the experimental and theoretical challenges that their study poses, reveal some of the exotic complexes they form such as positronium and positronic complexes, and discuss some of their interesting applications and how fundamental studies can help underpin those.

### II. Opportunities for Collaboration in the Physical Sciences

2013年5月7日(周二)上午11:20-12:00

频标楼1楼报告厅

The Research School of Physics and Engineering represents Australia's largest university based research and teaching activity in the physics discipline. The School consists of nine departments, based around broad research themes. However much of our work is interdisciplinary, spanning different departments within the School and the across the University: Applied Mathematics, Atomic & Molecular Physics, Electronic Materials Engineering, Laser Physics, Nonlinear Physics, Nuclear Physics, Plasma Research Laboratory, Quantum Science and Theoretical Physics. The School is also the host to a number of major national facilities such as Australia's largest accelerator for nuclear physics, the H1-NF National Stellarator Facility, National Facilities for materials fabrication and characterisation, and a National Positron Facility. A testament to the Schools success is its involvement in four ARC Centres of Excellence and its hosting of three Australian research networks. This critical mass of researchers is of fundamental importance in fostering the kind of interdisciplinary interactions that create modern research excellence.

I will attempt to highlight some of these aspects of research and opportunities for collaboration.

# About the Speaker



ANU

THE AUSTRALIAN NATIONAL UNIVERSITY

**Prof. Stephen J. Buckman**

**Director, Research School of Physics and Engineering  
and ARC Centre for Antimatter Studies  
Australian National University, Canberra**



Stephen Buckman is currently the Director of the Research School of Physics and Engineering, ANU. He has been involved in atomic and molecular physics research since completing his PhD at Flinders University in 1979. After postdoctoral work in the UK (Manchester) and the USA (JILA, Colorado) he established a broad-based atomic collisions research activity at the ANU in the mid 1980's.

This research has focused on absolute scattering measurements of low energy, electron-driven processes in atoms and molecules, scattering from excited atoms and molecules and the elucidation of resonance excitation mechanisms in electron collisions. Current interests involve benchmark studies of positron collisions with atoms and molecules, positron bound and quasi-bound states (resonances), positron and electron interactions with bio-systems and positron beam technology for atomic, molecular and materials science studies. A prolific researcher, he has more than 190 publications mostly in Top Tier 1 journals over the last 20 years, has an h-index of 31, and more than 3200 citations. Since May 2012, he holds the position of Distinguished Visiting Professor at Univ. of Malaya.

His career has spanned a spectrum of positions at leading laboratories such as Nuffield Postdoctoral Fellow, Univ. of Manchester (1980-81), JILA, Univ. of Colorado (1981-83). He returned to Australia in 1983 as a Research Fellow (1981-87), Atomic & Molecular Physics Laboratories (AMPL), ANU. He was Head of the Atomic and Molecular Physics Department between 1996-2001, and 2010-2012. More recently he has also served as Director of the ARC Centre of Excellence for Anti-Matter Studies (2005-2012).

He holds the prestigious Fellowship of APS (1998) as well as the Fellow of the Australian Institute of Physics (1997) and Fellow of IOP, UK (2003). Other visiting positions held include NIST Visiting Scientist (1989); JSPS Visiting Scientist (1999, 2011); Fulbright Senior Scholar (2000-2001). He was awarded the Inaugural Distinguished Alumni Award, Flinders Univ., 2006, and the Flinders University Convocation Medal for 2012. He served as a member of the Editorial Board of the New J. of Phys. for 10 years from 2003, and has recently been appointed as Editor-in-Chief of a new open access journal, European J. of Phys. TI. He is reviewer for some of the leading journals in AMP - Nature; New J. of Phys.; JPB; JPD; PRA; PRL; Phys. Reports; Australian J. of Phys.; Rev. Sci. Instrum.; Measurement Science and Technology; Phys. Scripta; Nuovo Cimento; CPL; JCP; Earth and Planetary Sciences; Geophysical Research Letters; APL; EPL.

He has been an external assessor for funding agencies in the USA, Canada; NATO; Serbia, Switzerland, the European Union; and the Australian Research Council.