



CAMS SEMINAR

Positron annihilation on molecules

Prof. Gleb Gribakin

Department of Applied Mathematics and Theoretical Physics
Queen's University, Belfast

11 am
Thursday, 20 April

Conference Room, Research School of Physical Sciences and Engineering

Abstract

Positron annihilation in atomic or molecular gases is usually expressed in terms of Z_{eff} - the effective number of electrons per target atom or molecule that contribute to annihilation. Naively, one expects that this number is comparable to the actual number of target electrons Z . However, it has been known for half a century that in some polyatomic gases positrons annihilate very rapidly, with Z_{eff} exceeding Z by several orders of magnitude! For example, while Z_{eff} of methane (CH_4) is 150, the Z_{eff} of hexane (C_6H_{14}) is 120,000. Incidentally, some of the earliest experiments in this field were performed in 1960's in Australia. Working at UNSW, S. J. Tao found that Z_{eff} of molecular chlorine is about 1500.

In the talk I will describe how this puzzle can be resolved by considering positron capture into molecular vibrational Feshbach resonances. I will also show the latest experimental data on positron-molecule annihilation obtained with a high-resolution positron beam, which gives some answers and poses new questions about this phenomenon.

Further information available from the CAMS office, Tel. 61253329

www.positron.anu.edu

ALL WELCOME