



29th November 2012 - 10:00
Building 99, Seminar Room I (EG)

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Rotational Spectroscopy of Water Clusters

The novel technique of chirped pulse rotational spectroscopy developed in the Pate group at the University of Virginia has recently been applied in that laboratory to the study of water clusters at conditions of supersonic expansion. The results, analysed in a joint effort between Virginia, Bucknell University and Warsaw, exceeded our wildest expectations. It has been possible to assign rotational spectra and to unambiguously identify many water clusters in the size range from $(\text{H}_2\text{O})_6$ to $(\text{H}_2\text{O})_{15}$. The use of ^{18}O substitution allowed determination of precise oxygen framework geometries for many of these clusters, and variation of the carrier gas provided classification of the relative stability of isomers of the same cluster size. This work represents a detailed bottom-up study of the hydrogen bonding responsible for the makeup of condensed water, and some comparisons with bulk liquid water are already possible. The first stage of the study has already been published (Perez et al, *Science* **336**,897,2012).

