

This is a seminar being offered by the Department of Chemistry that should be of interest to some physicists.

900 MHz to 0.1 Hz: Pushing the limits of NMR Spectroscopy in Inorganic Solids and in Biomolecules

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DATE: Thursday, November 8, 2012

TIME: 1:00 pm

PLACE: C2004

ABSTRACT: The availability of very high magnetic field strengths for NMR spectroscopy is particularly beneficial to the study of quadrupolar nuclei (spin $>1/2$) in solids. In addition to the added sensitivity from which all nuclides benefit at high field, the central-transition spectra of quadrupolar nuclei also sharpen considerably, thereby increasing resolution and rendering feasible the observation of many traditionally obstreperous elements through NMR. Since about 70 % of the spin-active nuclides in the periodic table are quadrupolar, Canadian solid-state NMR research has blossomed in recent years due to the availability of the 900 MHz spectrometer at the National Ultrahigh-field NMR Facility for Solids. In this presentation, I will discuss my group's recent work in the development and application of chlorine, bromine, and iodine solid-state NMR. We have demonstrated how information on local structure, symmetry, hydrogen bonding environment, and polymorphism can be related to the spectra of inorganic compounds. These findings have an application in the burgeoning field of NMR crystallography. We have also applied our methods to study the halogen bonding interaction in a variety of systems. This work has led us to develop QUEST software for the exact treatment of quadrupolar and Zeeman interactions for solid powdered samples. Finally, I will also highlight our collaborative research in the direct detection of weak CH/ δ interactions through J couplings as small as 0.1 Hz in proteins.

ALL ARE WELCOME!!!