



# *The Thursday Thing*

Ken Jeffrey  
Department of Physics  
University of Guelph

Molecular Dynamics Near the Glass Transition:  
Information Derived From NMR Studies

A variety of NMR techniques have been devised to study the dynamics of ions in condensed matter on a time scale ranging from  $10^{-9}$  to 10 s. These techniques include the measurement of spin-lattice and spin-spin relaxation times, the observation of spectra using echoes and direct measurement of various correlation functions. In order to interpret the results it is necessary to have a good understanding of the nuclear spin system and its interaction with the surroundings. Ions such as  $\text{Na}^+$  and  $\text{Li}^+$  have nuclear spin  $I = 3/2$  and it is the modulation of the nuclear electric quadrupole interaction by the ion motion which determines the measured NMR parameters.

NMR results will be reported as a function of temperature for a series of  $(\text{LiCl})_x - (\text{Li}_2\text{O} - 2\text{B}_2\text{O}_3)_{1-x}$  glasses where  $x$  ranges from 0 to 1.5. These results will be compared to those from a very different glass forming system (glucose/water mixtures) where deuterium ( $I=1$ ) NMR results are used to monitor the reorientation motion of the glucose molecule.

Date: Thursday, July 19, 2001  
Place: MacNaughton 222  
Time: 12:30 p.m.

**Cookies will be served. Don't forget your lunch.**