Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Inelastic light scattering investigation of the pyrochlore superconductor Cd2Re2O7 CHRISTOPHER KNEE, JOAKIM HOLMLUND, JAKOB ANDREASSON, MIKAEL KALL, LARS BORJESSON, Department of Applied Physics, Chalmers University of Technology and Gothenburg University, SE-41296, Gothenburg, Sweden, STEN ERIKSSON, Department of Inorganic Chemistry, Gotheburg University, SE-41296, Gothenburg, Sweden — The Structural phase transitions of the pyrochlore superconductor $Cd_2Re_2O_7$, $T_c \approx 1.5$ K, are investigated by Raman light scattering. The cubic to tetragonal transition at 200 K is characterized by the gradual appearance of a broad phonon mode originating from motion of the oxygen ions that form the apices of the ReO_6 octahedra. In contrast, the rapid growth of well-defined low frequency modes below the 120 K transition indicates that it is driven by ordering of the Cd ions within the channel voids of the distorted pyrochlore. A physical model describing the consecutive phase transitions in terms of the interplay between the Re-O and Cd-O networks will be presented.

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Date submitted: 01 Dec 2004 Electronic form version 1.4