

Abstract Submitted  
for the MAR11 Meeting of  
The American Physical Society

**A Luttinger liquid core inside helium-4 filled nanopores** ADRIAN DEL MAESTRO, Johns Hopkins University — We study the effects of confining helium-4 at low temperatures inside long narrow pores with nanometer radii using worm algorithm path integral quantum Monte Carlo. The results show that even in the phase with a finite superfluid response, the interaction between helium atoms and the surface of the pore induces radial density oscillations which decay as the center of the pore is approached. For some special radii, an “inner tube” of helium atoms exists, and a careful scaling analysis confirms that it behaves like a one dimensional Luttinger liquid at low energies.

Adrian Del Maestro  
Johns Hopkins University

Date submitted: 18 Nov 2010

Electronic form version 1.4