

MAR05-2004-020002

Abstract for an Invited Paper  
for the MAR05 Meeting of  
the American Physical Society

### **Heat Conduction in Low Dimensions**

BAMBI HU, Hong Kong Baptist University and the University of Houston

The Fourier law describing heat conduction is almost two hundred years old and yet a first-principle derivation of this simple law from statistical mechanics is still lacking. Worse still, the validity of this law in low dimensions and the necessary and sufficient conditions for its validity are also far from clear. In this talk I'll give a review of work done in this area and I'll report our recent work on heat conduction in the Frenkel- Kontorova model. Application of knowledge gained in the study of heat conduction in one dimension to the design of a thermal diode will also be discussed.