

Abstract for an Invited Paper  
for the MAR09 Meeting of  
The American Physical Society

**Thermodynamics of the Universe**

SAMINA MASOOD, University of Houston-Clear Lake

Properties of fundamental particles are changed in hot and dense media. This fact helps to determine the thermodynamics of the universe from the changed properties of particles in the early universe. We study the behavior of light particles including neutrinos in thermal media to find out the details about the early universe. The neutrino oscillation and the magnetic moment of neutrino, however, do not seem to change significantly enough in thermal background to fully justify the big bang model. We have to look for other properties of neutrinos including entanglement to support the standard model.