Physics Colloquium

Thursday, October 15th at 3:30PM in SC 234

Dr. Roger Lichti

Texas Tech University

Muonium (Hydrogen) Acceptor States in Si-Ge Alloys

Recent progress in characterizing the acceptor states in high Ge content Si-Ge alloys will be presented. Following a very brief introduction to the properties of hydrogen in semiconductors and methods used to study its ultra-light muonium isotope, we will discuss a few significant results obtained over the past 5-10 years in order to set the stage for our most recent efforts to understand the conditions under which muonium forms a shallow acceptor in Ge and the high Ge content alloys. Specifically, we will present the dependence of three separate $Mu_T(-/0)$ thermodynamic acceptor levels on alloy content and the local T-site configuration. Whenever the energy level for Mu_{T^-} falls within the valence band, a shallow acceptor state can be formed. Very recently we completed measurements of hyperfine interactions for the neutral charge state of shallow Mu acceptors from the RF-MuSR resonance spectra associated with the h^+ that is weakly bound to a Mu− located in the T(Ge_4), T(Si_1Ge_3) and T(Si_2Ge_2) interstitial sites in these alloys. We present these hf spectra as well as those for the shallow Mu acceptor in Ge.

Refreshments at 3:00PM in SC 103