Physics Colloquium

"Binding Energy of Positronium Hydride and Low-Energy Positronium-Hydrogen Collisions"

Denton Woods
UNT Physics Graduate Student,
University of North Texas

Tuesday,
April 19, 2011
3:30 p.m., Room 104,
Physics Building

Refreshments
3:00 p.m., Room 113
Physics Commons Room

Abstract: Proposed measurements of positronium-alkali atom scattering at St. Olaf College have prompted a theoretical investigation of Ps scattering from simple atoms. For the first step of this investigation, we have computed the binding energy of the fundamental four-body Coulomb system positronium hydride. We have used a very flexible trial function of Hylleraas form which includes all inter-particle distances. Our most accurate value of the binding energy compares favorably with previous calculations. For the second stage, we have used the Kohn variational method and a number of variants of the method to compute the singlet and triplet S-wave phase shifts for the very low-energy elastic Ps-H scattering process. We compare our results to the earlier Kohn and inverse Kohn calculations as well as to other theoretical calculations. Theoretical work on the P-wave Ps-H scattering problem will also be discussed.

University of North Texas
Department of Physics
Denton, TX 76203-1427

http://www.phys.unt.edu **tel: (940) 565-2626** **fax: (940) 565-2515**