

Positrons in Materials Science: Metrology at the Nanoscale

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Novel materials enable advances in many high tech areas such as medicine, information technology, and energy storage. In many cases the macroscopic properties of these materials are determined by engineering the composition at the nanoscale. To understand fundamental makeup of the materials in turn, requires new probes to characterize the structure at these very small length scales. Positronium, the hydrogen-like bound state of an electron and a positron is a very sensitive probe of void structure of matter at scales down to 3 nm. Positronium Annihilation Lifetime Spectroscopy (PALS) is a unique metrology which studies the annihilation of positronium, whose mass is completely converted into energy as governed by Einstein's famous equation $E = mc^2$, to characterize the pores/voids in materials. We will discuss recent applications of PALS to novel low dielectric materials and polymer nanocomposites.

Host: Axel Mellinger

Cookies and coffee @ 3:30pm in Dow 201.