PHYS 3446 – Lecture #18

Wednesday, Oct. 29, 2008
Dr. **Andrew Brandt**

1. Particle Detection

- Scintillation Counters
- Time of Flight
- Cerenkov Counter

***Grades are posted, please review them

(Lowest 1 Q and 1 HW dropped)

*** Olsen colloquium on Higgs and Mass at 4pm

(cookies at 3:30!)

Scintillation Counters

- Ionization produced by charged particles can excite atoms and molecules in the medium to higher energy levels
- The subsequent de-excitation process produces light that can be detected and provide evidence for the traversal of the charged particles
- Scintillators are material that can produce light in visible part of the spectrum

Scintillation Counters

- Two types of scintillators
  - Organic or plastic
    - Tend to emit ultra-violate
    - Wavelength shifters are needed to reduce attenuation
    - Faster decay time (10^{-8}s)
    - More appropriate for high flux environment
  - Inorganic or crystalline (NaI or CsI)
    - Doped with activators that can be excited by electron-hole pairs produced by charged particles in the crystal lattice
    - These dopants can then be de-excited through photon emission
    - Decay time of order 10^{-6}sec
    - Used in low energy detection