

**Department of Physics and Physical Oceanography and
The Harlow Shapley Visiting Lectureship Program of the
American Astronomical Society
Colloquium**

“The Saga of Helium-3”



**Robert T. Rood, Professor of Astronomy
University of Virginia**

As the Universe expanded and cooled it experienced a number of phase transitions. During each of these the characteristics of the Universe changed dramatically. The last of these when the electrons and nuclei combined to make neutral atoms is observed directly as the microwave background. The preceding phase transition occurred when nucleons combined to make deuterium, helium-3 and 4, and lithium-7. Substantial fractions of the present amount of these isotopes came from this epoch. By studying these isotopes we can in some sense observe the universe when it was 3 minutes old. Unfortunately, for closet cosmologists helium-3 should be made by stars as well. Disentangling the stellar and cosmological helium-3 is part of the problem. The problem is exacerbated because even though we theorists think stars should be making lots of helium-3, the stars don't seem to know about this. Life is never as simple as it first seems. If it had been the case for helium-3, I would have finished this project 20 years ago.

Friday, April 3, 2009

2:00 PM

DeLoach Hall, Room 212

Refreshments served at 1:45