UNIVERSITY OF TEXAS AT DALLAS - DEPARTMENT OF PHYSICS

PHYSICS COLLOQUIUM

http://www.utdallas.edu/physics/lectures/info/

Wednesday, January 16, 2008; 4:00-5:00 PM
Room: ECSS 2.312

Dusty Physics

Professor Truell Hyde
Center for Astrophysics, Space Physics and Engineering Research, Baylor University

Dust grains are ubiquitous across a number of research areas within physics. Dust within low temperature plasma becomes charged through collisions with free electrons and ions. If the ratio of the inter-particle potential energy to the average kinetic energy is sufficient, particles form disordered or ordered structures depending on whether short or long range ordering dominates. In higher temperature plasmas like that found within the International Thermonuclear Experimental Reactor (ITER), dust contamination problems are of great concern due to dust / wall interactions and possible instabilities created within the plasma by such particulates. Dust within astrophysical plasmas is integral to both the structure and evolution of protostellar / protoplanetary aggregates and also dependent upon the charge acquired during the coagulation process. Finally dust, which makes up one component of the orbital debris population, is a constraint on the long-term health of spacecraft located within either low or high-earth orbit. Recent research within these areas along with a brief overview of CASPER will be discussed.

About the speaker: Dr. Truell W. Hyde received the B.S. in physics and mathematics from Southern Nazarene University in l978 and the Ph.D. in theoretical physics from Baylor University in 1988. He is currently at Baylor University where he is the Director of the Center for Astrophysics, Space Physics & Engineering Research (CASPER), a Professor of Physics and Vice Provost for Research for the University. His research interests include astrophysics, shock physics and complex (dusty) plasmas in which he has published more than 100 peer-reviewed papers.