SPEAKER: **Dr. Steve F. Son**
Los Alamos National Laboratory
Los Alamos, New Mexico

TOPIC: **OVERVIEW OF ADVANCED ENERGETIC MATERIALS**

DATE: Tuesday, January 24, 2006

TIME: 3:30 p.m.

PLACE: 138 DeBartolo Hall

Abstract

The Advanced Energetic Materials (EMs) effort at Los Alamos has two major thrust areas: Metastable Intermolecular Composites (MICs) and High Nitrogen Materials (HiNs). Applications of traditional composite energetic materials have been limited because of slow diffusion controlled energy release rate even though energy can be higher than classical EMs. MIC nanoscale composite energetic materials can potentially "change the rules" by producing reaction rates increased dramatically, and with a tunable energy release rate. Applications include green (lead-free) primers and igniters. High Nitrogen Materials utilize a Nitrogen backbone instead of carbon in classical EMs. This is advantageous because there is much more energy released by forming strong nitrogen bonds rather than through oxidation chemistry. Applications of these materials include microthrusters, as a propellant ingredient, and as a pyrotechnic ingredient. An additional use of HiN metal complexes is to generate ultra-low density high-surface area metal foams. In this talk I will present a general method to access unprecedented ultra-low density, nano-structured monolithic transition metal foams, utilizing self-propagating combustion synthesis from novel transition metal complexes containing energetic ligands with high nitrogen content. In investigating the decomposition characteristics of the high-nitrogen transition metal complexes, nanostructured metal monolithic foams were formed having remarkably low densities (0.011 g/cm3) and remarkably high surface areas (258 m2/g).

NOTE: ***If you are interested in meeting individually with Dr. Son, please contact Evelyn at 631-5431.***