



## Physics & Astronomy Colloquium

Fall 2010

# ***Predicting Properties of Matter at High Pressures and Temperatures***

*The goal of producing and understanding controlled nuclear fusion in the laboratory (like at the National Ignition Facility in Lawrence Livermore Lab) presents many challenges. Not surprisingly, many of these challenges are experimental- designing and maintaining high-powered lasers, developing x-ray diagnostics, etc. However, there are also a host of theoretical challenges as well, most of which relate to predicting properties of matter at or near the extreme conditions needed to achieve fusion. I will address two such problems in this talk: 1) predicting the equations of state of relevant materials at multi-megabar pressures, and 2) predicting the rate at which a gas of electrons at one temperature and protons at another temperature relaxes to a common temperature. I hope to convey that besides being relevant for fusion, these problems are extremely interesting and challenging in their own right.*

# ***Lorin X. Benedict***

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**Thursday, October 7, 2010**

**4:00-5:20 PM - MND 1015**

**Open & Free to all Students, Faculty & Public**