

Advances in Explosive Nuclear Astrophysics

Dr. Gavin Lotay
University of Surrey, UK

Monday, March 31 ♦ 4 P.M.
Room 124 Nieuwland Science Hall

Breathtaking results from the Planck satellite mission and Hubble space telescope have highlighted the key role modern Astronomy is playing in our understanding of Big Bang Cosmology. However, not so widely publicized is the similar wealth of observational data now available on explosive stellar phenomena, such as X-ray bursts, novae and Supernovae. These astronomical events are responsible for the synthesis of almost all the chemical elements we find on Earth and observe in our Galaxy, as well as energy generation throughout the Cosmos. Regrettably, understanding the latest collection of astounding data is currently severely hindered by large uncertainties in the underlying nuclear physics processes that drive such stellar scenarios, impeding our ability to describe the chemical evolution of the Universe.

In this talk, a variety of experimental methods used for the investigation of explosive astrophysical reactions will be considered. Direct studies play a key role in this field, but equally important, are indirect methods that use both stable and radioactive ion beams. Such investigations often require innovative new techniques, coupled with the latest developments in detector technology, and highlight the close relationship between nuclear structure and astrophysics.