



PHYSICS AND ASTRONOMY SEMINAR

Dr. Iris Dillmann,
TRIUMF

“Alchemy in the laboratory – How we bring the stars into the laboratory”

Abstract

“Every atom in our body and around us originates from radioactive and stable atoms that were produced in the interior of stars billions of years ago. How do we (re)produce and investigate the “star stuff” that we are made of in laboratory experiments?

Dedicated detector setups at so-called “Radioactive Beam Facilities” around the world have been developed to measure the short-lived “star stuff” that is produced during the rapid neutron capture (r) process and extract important physical properties like how heavy these nuclei are (mass), how long they live (decay half-life), if they decay under emission of elementary particles like neutrons or protons, etc. This experimental information is an important input parameter for the computer modelling of the stellar nucleosynthesis that has occurred for example during the recent binary neutron star merger event which created the gravitational wave detected on Aug. 17th, 2017 (GW170817).

The efficient interplay between the astronomical observation with various telescopes and detectors, the computer modelling of these astrophysical events, and the experimental data input is an important prerequisite for a better understanding how all the elements around us have been created. 150 years since Dmitri Mendeleev has for the first time ordered the elements into the Periodic Table of Chemical Elements (www.iypt2019.org) I will describe which atomic nuclei we can produce at modern radioactive beam facilities and how we can measure them, what the limitations of these facilities are and how these measurements will help to improve the understanding of the origin of every atom in our body.”

Wednesday, July 17, 2019

12:00 p.m.

Elliott Building – Room 060