SAN DIEGO STATE UNIVERSITY DEPARTMENT OF PHYSICS AND DEPARTMENT OF ASTRONOMY COLLOQUIUM

Speaker: Dr. G. Grant Williams, MMT Observatory

Topic: Probing the Three Dimensional Nature of Supernova Explosions; Results from the Supernova Spectropolarimetry Project (SNSPOL)

Time: 3:00 PM, Friday, October 2, 2015 (refreshments served at 2:45 PM)

Place: Room 215, Physics-Astronomy Building (PA-215)

Abstract:

In recent years, evidence has grown that nearly all supernovae (SNe) exhibit departures from spherical symmetry. These results, together with full three dimensional (3-D) modeling, are exposing the possibility that asymmetries are not just an observable feature of some supernovae, but may in fact be a necessity of the explosion mechanism itself. The Supernova Spectropolarimetry (SNSPOL) project aims to improve our understanding of the predominance and characteristics of asymmetries in all types of supernovae through a long term comprehensive spectropolarimetric survey. We monitor the polarimetric evolution of the brightest core collapse and thermonuclear SNe using the 61" Kuiper, the 90" Bok, and the 6.5-m MMT telescopes together with the CCD Imaging/Spectropolarimeter (SPOL). Our results provide insight into possible progenitor scenarios (e.g. binarity, rapid rotation, aspherical mass loss) as well as asymmetries in the explosion mechanism. During the past five years we've observed more than 55 supernovae with nearly 80% being observed during multiple epochs. I will provide a summary of the SNSPOL project and selected results from observations of SN 2009ip, SN 2010jl, SN 2011dh, SN 2011fe, SN 2013ej, and SN 2014J.