**Recent Developments in Spectral Diagnostics of Supernova Remnant Plasmas**

"Supernovae (SN) and supernova remnant (SNR) plasmas represent some of the most extreme and unusual objects in the universe.  X-ray spectra of supernova remnant plasmas are key to understanding the mechanism and dynamics of supernova explosions.  In recent years, there have been observations of Cr and Mn X-ray emission lines from a wide range of supernova remnant plasmas.   This should allow one to determine the ion stage abundance and elemental abundances of these elements in the SNR plasma.  This in turn can determine whether the SN was a type Ia or type II explosion, and allow one to diagnose the ionization age of the supernova.  Diagnostics that use these emission features are currently hampered by a lack of atomic data for these Fe-peak elements.  I will first give an   
overview of supernovae and their remnant plasmas, then describe new atomic data that was calculated at Auburn for the Fe-peak elements. I will conclude with a brief analysis of two SNR plasmas, W49B and Tycho, showing that W49B is overionized and that Tycho's ionization balance  
is more complex than first thought."