

**PHYSICS & ASTRONOMY COLLOQUIUM  
UNIVERSITY OF WISCONSIN – STEVENS POINT**

**FRIDAY, NOV 30, 2012  
2:00 PM Room A109 SCI**

**Matthew Newby**

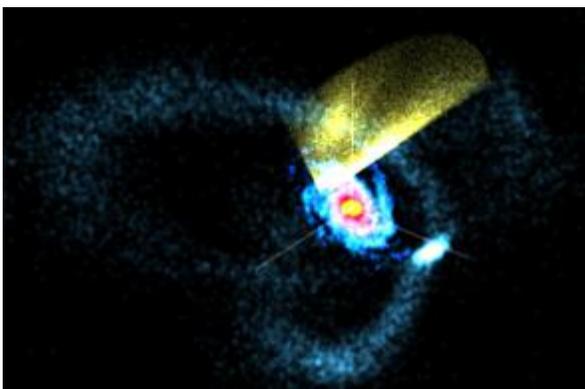
Department of Physics, Applied Physics & Astronomy - Rensselaer Polytechnic Institute

**What the Sagittarius Dwarf Tells Us about Our Galaxy and  
Dark Matter**



Matthew Newby received his B.S. in Physics from UWSP in 2008, and is currently in the final year of the Physics PhD program at RPI. He studies under Prof. Heidi Newberg in the field of “Galactic Archaeology”, piecing together the history of our galaxy by studying its large-scale structure. Currently he is studying Dwarf Galaxies and Globular Clusters that are gravitationally bound to our Milky Way galaxy. By studying the orbits and make-up of these objects, he hopes to build a better understanding of how matter - including dark matter - is distributed in our galaxy. One of the tools he uses for this is Milkyway@home, (<http://milkyway.cs.rpi.edu/milkyway/>) a 0.5 petaFLOPS ( $10^{15}$  FLoating Operations per Second) volunteer computing platform that allows the public to crunch real scientific data in the search for a better understanding of the Universe.

**ABSTRACT:** The Milky Way galaxy is currently colliding with several less massive dwarf galaxies, which are presently being torn apart and will eventually be absorbed into our Galaxy. Their disruption patterns provide vital clues to the make-up, formation history, and matter distribution (including dark matter) of our Galaxy. The largest and most dominant of these tidal streams are those belonging to the Sagittarius dwarf galaxy (Sgr), which wraps at least once completely around the galaxy and spans  $15^\circ$  of width in the sky, presenting astronomers with an excellent opportunity to test theoretical models of galaxy evolution. Using modern computational techniques on high-end computing platforms, we analyze over 4 million stars in the Sloan Digital Sky Survey in order to produce detailed descriptions of stellar densities in the Galactic halo, including the leading Sgr tidal stream. This talk will present a brief overview of hot topics in Galactic astronomy, emphasizing current progress in mapping the Galactic halo, and discuss new constraints on galaxy formation and models of dark matter.



*Faculty, staff and students are cordially invited to attend.  
Refreshments will be served beginning at 1:45 pm*