

My research experience has been in computational physics and data reduction and analysis. Both have been focused in astrophysics. On the computational side, I've modeled electron acceleration in plasmas as well as the response of gratings to incident X-rays (for the Reuven Ramaty High Energy Solar Spectroscopic Imager – RHESSI). I've analyzed both X-ray data primarily from the Rossi X-ray Timing Explorer (RXTE) as well as radar data for the department of defense. Currently, I'm attempting to branch out into experimental optics. Some projects I would like to work on are:

- measuring the index of refraction of gases.
- building a single photon interference experiment (for tests of quantum mechanics).
- measuring evanescent waves.
- learning how to characterize beams of light.
- any well-designed optical experiment that a student might find interesting.

I'm also happy to work with a student on any well-designed project in any particular field. My past 399/485/486 projects include

1. *Magnetar Timing Analysis* with Robert Leach. We examined light curves from a particular X-ray source and looked for a periodic signal in the data, indicating the rotation rate of the source. 2005
2. *Catalog of SGR Events from Rossi X-ray Timing Explorer* with Abram Bos. We stepped into the world of data reduction and analysis in order generate catalogs of bursts from a particular type of X-ray source. 2006
3. *A Study of Solar Movements in Polar Regions* with Tim Major. While Tim visited McMurdo Station in Antarctica he studied the motion of the sun under my guidance, plotting both the analemma during antarctica's summer months, as well as attempting to use the sun's position to determine his own longitude on Earth. 2006
4. *Analysis of Radio Emissions from Multiple Celestial Sources* with Patrick Minor. We began the attempt to set up a dipolar radio antenna to watch for radio emission from both the Sun and Jupiter at GVSU. The design was based on NASA's Radio JOVE program. 2008
5. *Using Mechanics to Better Understand Successfully Landed Figure Skating Jumps* with Jessica Stark. We used video analysis software to analyze a particular figure skating jump in order to see if we could use physics to improve technique as well as understand what makes a more stable jump. 2009