Public Abstract
First Name: Suklima
Middle Name:
Last Name: Guha Niyogi
Adviser's First Name: Angela
Adviser's Last Name: Speck
Co-Adviser's First Name:
Co-Adviser's Last Name:
Graduation Term: FS 2011
Department: Physics
Degree: PhD
Title: Using infrared observations of circumstellar dust around evolved stars to test dust formation hypotheses

Asymptotic Giant Branch (AGB) stars are evolved, low to intermediate mass (0.8 to 8 Solar mass) stars. These stars lose a significant fraction of their mass through stellar pulsation. As a result, they are surrounded by gaseous, dusty circumstellar envelopes. They are major contributors of material to the interstellar medium (ISM), new stars, planets and also produce the majority of the dust complement of galaxies. Consequently, understanding the dust around AGB stars is critical to our understanding of the contribution of dust to many aspects of astrophysics. This thesis focuses on a sub-type of AGB stars called oxygen- rich AGB stars, where there is more oxygen relative to carbon in their atmospheres. The dust grains around AGB stars are heated by absorbing starlight and reemit photons at infrared (IR) wavelengths. The precise nature (composition, lattice structure, size, and shape) of the dust grains all affect the resulting IR spectrum, as do the temperature and density distribution of the dust within the circumstellar envelope. This thesis aims to study these properties of dust grains around oxygen-rich AGB stars. Additionally, this thesis provides a better understanding of how these dust properties vary with the pulsation cycle of the star and how the variation in spectral dust features (temporally and spatially) can be explained by different competing dust formation hypotheses.