Public Abstract
First Name:Adrian
Middle Name:Burgin
Last Name:Corman
Adviser's First Name:Angela
Adviser's Last Name:Speck
Co-Adviser's First Name:
Co-Adviser's Last Name:
Graduation Term:SP 2010
Department:Physics
Degree:PhD
Title:Carbon Stars and Silicon Carbide

Late in their lives, low-to-intermediate mass stars like our own Sun will become asymptotic giant branch (AGB) stars. These stars pulsate, throwing material off their surfaces, which flows out into the space around them and condenses, forming a shell of dust and gas around the star. This material can eventually become incorporated into later generations of stars, and understanding it is important for investigating many kinds of astronomical research, including star and planet formation. The research presented here focuses on a special sub-type of AGB stars called carbon stars, where there is more carbon relative to oxygen in their atmospheres. This causes the dust which forms around the star to be dominated by carbonaceous compounds, one of which is silicon carbide. By examining the light coming from the dust shell, we can identify the characteristic signature of silicon carbide, and use it to help determine the conditions present in the shell. In order to do this, we additionally obtained new, higher quality optical constants (the parameters that determine how it interacts with light) for silicon carbide, allowing us to more accurately examine this feature in observed dust shells. Finally, we generated a program which can apply size and shape dependent optical properties to optical constants, letting us model the way interactions between the dust particles and light changes as a function of the size and shape of the particles changes.