

NONRADIAL PULSATIONAL ANALYSES OF THE PULSATING CENTRAL STARS OF  
PLANETARY NEBULAE<sup>1</sup>

Summer Starrfield<sup>1</sup> and Arthur N. Cox  
Theoretical Division  
Los Alamos National Laboratory  
Los Alamos, NM

ABSTRACT. We have performed nonradial pulsation analyses of the central star of the planetary nebula K1-16. K1-16 is a very unusual nebulae which appears to have ejected material that is very rich in helium. The central star shows no evidence for hydrogen in its spectrum and the helium and carbon lines are in emission. Grauer and Bond (*Ap. J.*, 277, 211, 1984) discovered that it is pulsating with periods around 1700 sec. Although its spectral characteristics are similar to those of the PG1159-035 variables, it is pulsating in much longer periods than they are.

We have analyzed a series of stellar models that are hotter and more luminous than those that we recently analyzed to determine the helium abundance of PG1159-035. In no case was a pure carbon-oxygen composition capable of exciting the model at periods of 1700 seconds. We are continuing this study with a variety of compositions and will report on the results at the meeting. We will also discuss the connection between the central star of K1-16, the O VI central stars, and the PG1159-035 stars.

1. Supported in part by National Science Foundation Grant AST85-16173 to Arizona State University and by the DOE.
2. Also at Department of Physics, Arizona State University, Tempe, AZ.