

Plenary Talk

## INVESTIGATIONS ON THE HOT AND MYSTERIOUS STAGES OF LATE STELLAR EVOLUTION

N. Reindl<sup>1</sup>

<sup>1</sup>*Department of Physics and Astronomy, University of Leicester, University Road,  
Leicester LE1 7RH, UK*

The vast majority of stars will evolve through the asymptotic giant branch (AGB) and end their lives as white dwarfs. The post-AGB phase is arguably one of the least understood phases of the evolution of low- and intermediate-mass stars. During this late, hot stage of evolution stars evolve on relatively short time scales and consequently the number of known hot (pre-) white dwarfs is rather low. The detection and analysis of these objects is therefore crucial to improve their statistics and to obtain a better understanding of the late, hot stages of stellar evolution.

During the first part of the talk, I focus on the detection and analysis of hot, He-dominated post-AGB stars. The formation of these objects is a challenge for stellar evolution theory, because it is difficult to explain their unusual surface compositions. I will show that these stars contribute in a significant amount to the total number of H-deficient stars, which make up about 20% of the post-AGB stars. Finally I will discuss how a He-dominated stellar evolutionary sequence might look like.

The second part of the talk concerns studies on SAO 244567, an unusually fast evolving star that offers us the rare opportunity to study stellar evolution in real time. Between 1971 and 1990 it changed from a B-type star into the hot central star of the Stingray Nebula. This observed rapid heating has been a mystery for decades, since it is in strong contradiction with the low mass of the star and canonical post-AGB branch evolution. To address the evolution of the properties of SAO 244567 quantitatively for the first time, I carried out a comprehensive spectral analysis based on all available spectra taken from 1988 to 2006. I will present these results along with the latest outcome of the analysis of recently obtained Hubble space telescope observations, which finally allow us to shed light on the evolutionary history of this extraordinary object.