

PG 1144+005 AND THE ROLE OF NITROGEN IN THE EVOLUTION
AND PULSATION OF GW VIR STARS

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The first of the three classical instability strips of white dwarf pulsators, the GW Vir strip, contains stars of PG 1159 and [WC] spectral types. These hot and compact PG 1159 stars (H-deficient, He-/C-/O-rich) are thought to be formed as a result of a “born-again” episode: either a very late thermal pulse experienced by a hot white dwarf during its early cooling phase, or a late thermal pulse that occurs during the post-AGB evolution when H burning is still active. This evolutionary history is reflected in their chemical abundances. In contrast to the purity of the DAV and DBV instability strips, only some 30% of the stars in the GW Vir domain pulsate. Consequently, the DA and DB pulsators are otherwise normal white dwarfs and their interiors represent the interiors of all white dwarfs, which is not the case for the PG 1159 stars. Several explanations for this discrepancy have been proposed, based on different elemental abundances, metallicity, and the role of helium. The case of nitrogen is particularly interesting, as there is an observed nitrogen dichotomy: N-rich stars are pulsators, whereas N-poor stars are all non-pulsators. The only culprit in the current view of the excitation theory and abundance patterns of these stars was PG 1144+005, the only N-rich star that was not previously shown to pulsate.

In this talk, I will summarize the current view and present our discovery of pulsations in PG 1144+005.