

TWO PLANETARY NUCLEI WITH RECENT MASS-LOSS EPISODES

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I will describe recent space- and ground-based observations of two planetary-nebula nuclei (PNNi) that have shown episodes of mass loss in the recent past. 1. **V605 Aquilae**, the hydrogen-deficient central star of the PN Abell 58, underwent an outburst around 1919, attributed to a final helium shell flash in a WD at the top of the cooling track. I will describe our recent imaging of V605 Aql with the *Hubble Space Telescope (HST)*. We obtained both a continuum image through polarizing filters, and direct images in [O III] and [N II]. The narrow-band images show a resolved nebula with a diameter of about 1"; comparison with earlier *HST* images clearly reveals angular expansion, consistent with ejection of the nebula during the 1919 outburst. The compact nebula has a dark band passing across its center, interpreted as a dense dusty disk surrounding the PNN. Remarkably, the large and faint PN A 58, ejected many thousands of years ago and long before the final-flash event, has the same axis as this newly ejected material. The continuum image, dominated by C IV emission from the PNN, shows a "hot spot," adjacent to the dark band, which we believe is the central star—now hot for a second time—viewed through considerable dust extinction. 2. **Longmore 4** is a second PN containing a hydrogen-deficient central star, a pulsating member of the PG 1159 class of WDs. I have monitored the optical spectrum of Lo 4 regularly over the past several years, using the SMARTS 1.5m telescope at Cerro Tololo. At irregular intervals, the spectrum of Lo 4 changes from PG 1159 white dwarf to a W-R spectral type for a few days, indicating episodes of mass ejection. I will review our current knowledge of this remarkable and unexplained phenomenon.