

# A New Class of Wolf-Rayet Stars: WN3/O3s

Philip Massey(1), Kathryn F. Neugent (1), Nidia Morrell (2), and D. John Hillier (3)

1) Lowell Observatory, (2) Las Campanas Observatory, Carnegie Observatories, (3) Department of Physics and Astronomy & Pittsburgh Particle Physics, Astrophysics, and Cosmology Center, University of Pittsburgh

Our new survey for Wolf-Rayet stars in the Magellanic Clouds is only 15% complete but has already found 9 new WRs in the LMC. This suggests that the total WR population in the LMC may be underestimated by 10-40%. Eight of the nine are WNs, demonstrating that the "observed" WC to WN ratio is too large, and is biased towards WC stars. The ninth is another rare WO star, the second we have found in the LMC in the past two years. Five (and possibly six) of the 8 WNs are of a new class of WRs, which pose a significant challenge to our understanding. Naively we would classify these stars as "WN3+O3V," but there are several reasons why such a pairing is unlikely, not the least of which is that the absolute visual magnitudes of these stars are faint, with  $M_V \sim -2.3$  to  $-3.1$ . We have performed a preliminary analysis with CMFGEN, and we find that (despite the faint visual magnitudes) the bolometric luminosities of these stars are normal for early-type WNs. Our fitting suggests that these stars are evolved, with significantly enriched N and He. Their effective temperatures are also normal for early-type WNs. What is unusual about these stars is that they have a surprisingly small mass-loss rate compared to other early-type WNs. How these stars got to be the way they are (single star evolution? binary evolution?) remains an open question. For now, we are designating this class as WN3/O3, in analogy to the late-type WN "slash" stars.

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Comments:

Email: [phil.massey@lowell.edu](mailto:phil.massey@lowell.edu)