

Abstract Submitted
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Weighing the Most Massive Binary Star Known: An Archival Study of NGC 3603-A1¹ SARAH BODANSKY, Carleton College, PHILIP MASSEY, Lowell Observatory, LAURA PENNY, College of Charleston — NGC 3603-A1 is likely the most massive binary star ever “weighed” through its orbital mass. The system is hard to observe, as it is found in the dense core of NGC 3603, with other massive stars within an arcsecond. Analysis of VLT spectroscopy in 2008 found a mass of $116 \pm 31 M_{\odot}$ for the primary and $89 \pm 16 M_{\odot}$ for secondary (Schnurr et al. 2008, MNRAS 389, L38). As an extremely massive, double-lined eclipsing binary, this system provides unique insight into the accuracy of model-dependent methods of determining stellar masses for very high mass stars. We use previously unanalyzed archival spectra and imaging from HST to test the accuracy of the ground-based results and to increase the precision of these masses. From these spectroscopic data, we found a mass ratio of 0.72 ± 0.03 , which agrees with the VLT mass ratio of 0.75 ± 0.3 . We have also produced a light curve for A1 using HST photometry, which provides a more accurate measurement of the system’s inclination. Ultimately we hope to refine the masses of A1 with new observations.

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