

---

# Spatially resolved imaging of the AR Pup post-AGB binary disk with VLT/SPHERE

Steve Ertel<sup>\*1</sup>, Michel Hillen , Devika Kamath , Hans Van Winckel , Peter Scicluna , Julien Milli , Henri Boffin , Rajeev Manick , Gesa Bertrang , Jack Soutter , Jonathan Horner , Siyi Xu , Roger Wesson , Lizette Guzman-Ramirez , Eva Villaver , and Carlos Eiroa

<sup>1</sup>University of Arizona, Steward Observatory (UofA) – United States

## Abstract

Spatially resolved imaging of disks around post-Asymptotic Giant Branch (pAGB) binary stars is the critical next step in their characterization. The presence of a disk indicates the transition from the primary's AGB phase toward the planetary nebula phase, triggered by a major mass loss event. The details of this process are, however, poorly understood. We have used the extreme adaptive optics instrument VLT/SPHERE to image the disk around AR Pup with the diffraction limited angular resolution of an 8-m-class telescope in the visible! The disk is well resolved at multiple wavelengths. We also have obtained auxiliary photometric time series to properly link the appearance of the disk to the specific phase of the RV Tauri and RVb variations of the system. In addition, we obtained a new, critical sub-mm flux and collected archival infrared data for our detailed, multi-wavelength, radiative transfer modeling of the disk architecture and dust properties. The next step will be the numerical modeling of the disk evolution. We will present our results and discuss future prospects for the imaging of such disks and the revolutionary studies enabled by the data obtained.

**Keywords:** postAGB, Binary, Disk, Evolution, SPHERE, Imaging

---

\*Speaker