Clouds Around a Fallen Sun: Resolving the dust forming region of Wolf-Rayet 48a

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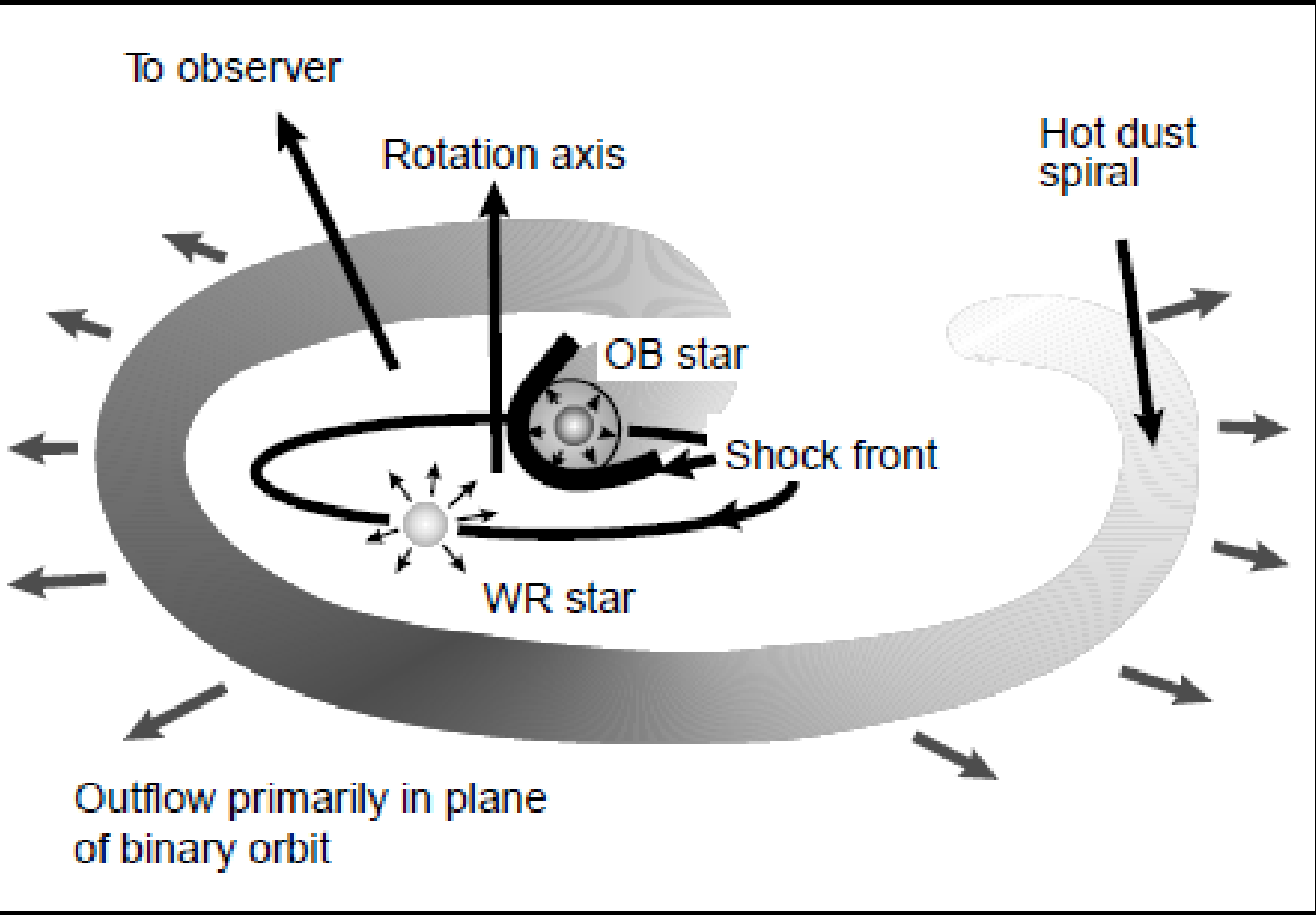
Abstract

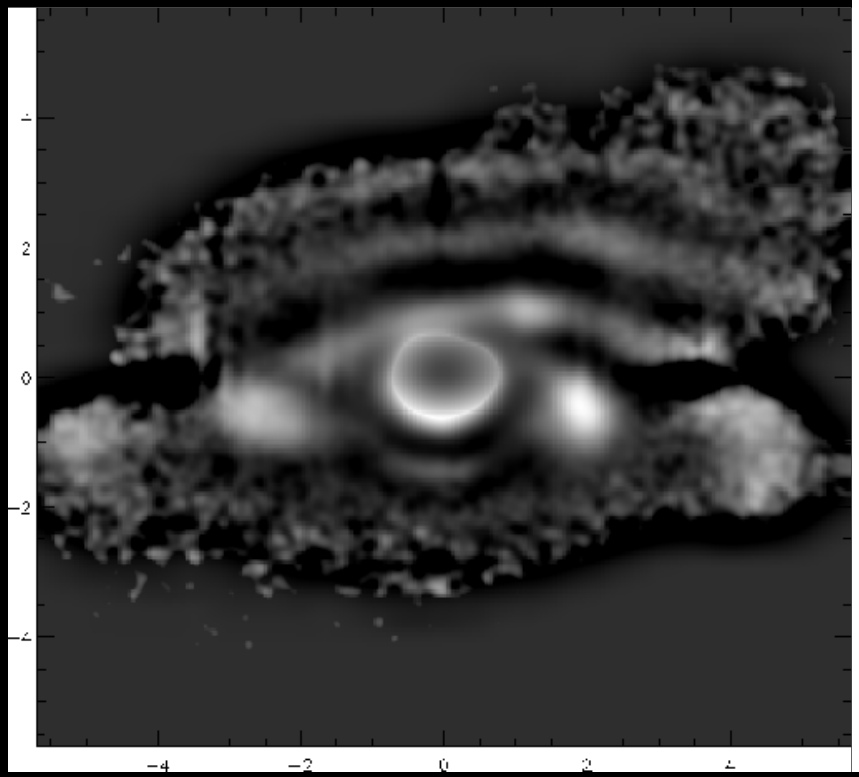
Background: The carbon rich Wolf-Rayet star, WR 48a, is shrouded in a dusty, side-on 'pinwheel-nebula'. Strong IR and X-ray emission lines allow for two physical scenarios: (i) wide WR binary with a OB companion and colliding stellars winds, or (ii) narrow WR binary with a compact companion.
Aims: We aim to spatially and spectrally resolve the dust-forming region in WR 48a with VLTI in order to establish the nature of the system and the mechanism of dust-formation.
Methods: AMBER, K-band, high res, (A1 K0 G1 J3). Optimum time between 16 March and 9 May, 2014.
Impact: The proposed observations in the K-band will establish firmly the nature of the companion, and the spatially-resolved spectral information will help us understand the process of dust formation in hot environments.

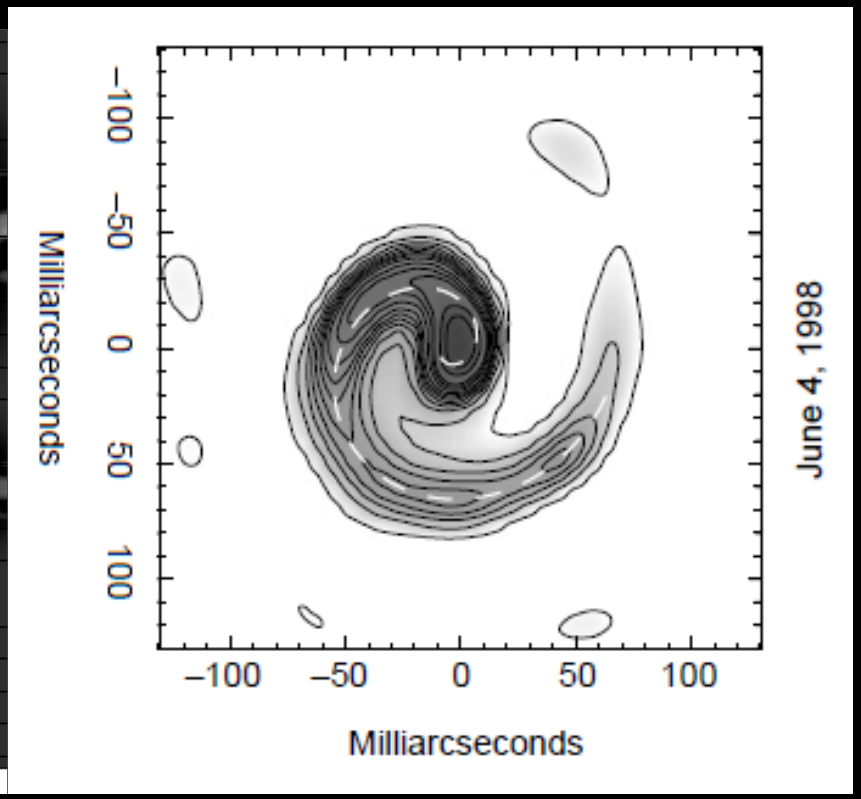
Pinwheel Nebulae



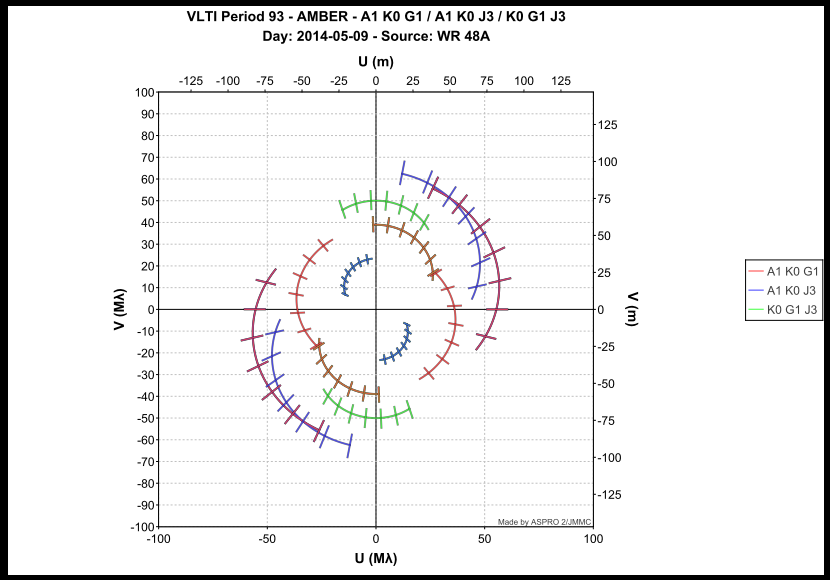
WR 48a

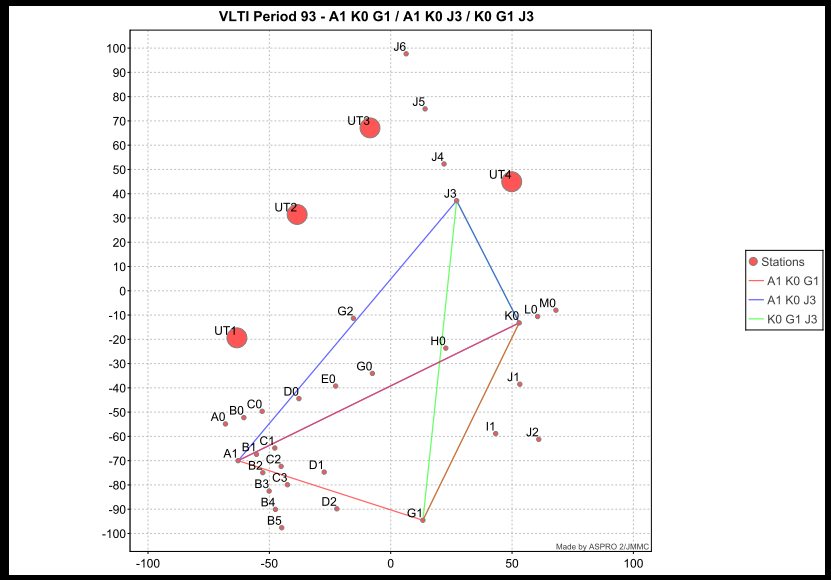
Left: Image of WR 48a at 12.5 μm (Michelle/Gemini North). The North-South periodic pattern suggests a pinwheel spiral seen at a high inclination. Right: Prototypical pinwheel nebula WR 104.





Configuration and Calibrators





Name	Type	Sp. Type	Sep (°)	Size (mas)	K mag
WR 48a	Target	WCe+O	-	∼5	5.08
HD 115669	Cal	K3III	0.9	0.77	4.05
HD 114083	Cal	G7III	3.8	0.43	5.25
HD 112410	Cal	G8III	3.4	0.64	4.40