EXPLORING BINARITY WITH THE VLTI

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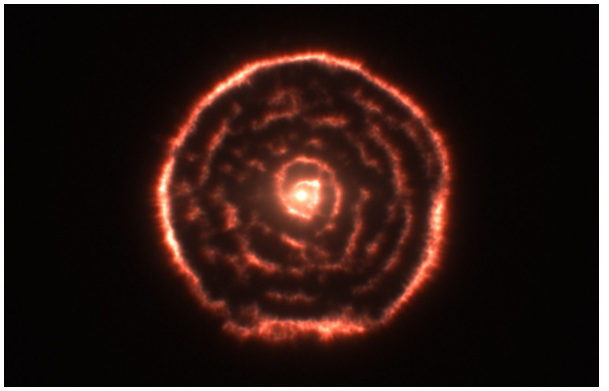
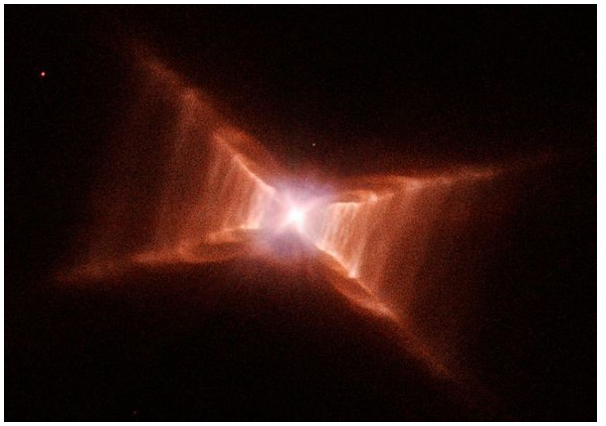
SCIENTIFIC JUSTIFICATIONS:

- Study binary evolution using AGB and Post-AGB dusty structures as probes.
- The shaping of asymmetries seen in PN is thought to be assisted by the dusty structures around these objects, and they are induced by binarity.
- Stellar evolution: 30% of the stars evolvs on the RGB as binary → we want to analize them.
- We want to study the effect of binarity on the circumstellar ejecta.

- 2 targets that are binary:
  - AGB star R Scl
  - Post-AGB star Red Rectangle
- AGB: **R Scl** is a pole-on star with a binary



- Post-AGB **Red Rectangle**: bipolar nebula with an equatorial torus and edge on



Target	R Scl	Red Rectangle
Sp. Type	C	B8V
N [mag]	-1.4	-2.3
H [mag]	0.66	5.14
V [mag]	5.77	9.02

EXPECTED OUTCOMES

- Using AMBER and MIDI to study the thermal stratification of the dusty structures.
- We expect to resolve dust close to the sublimation radius
- Tracing binary evolution

Target	R Scl	Red Rectangle
Telescopes	ATs	ATs
Configurations	**MIDI:** A1-D0 (short B: inner part) D0-I1 (larger B: outern part) K0-I1 (short B: inner part) **AMBER:** D0-G1-I1 (outern part) B2-C1-I0 (inner part)	**MIDI:** A1-D0 (short B: inner part) D0-I1 (larger B: outern part) K0-I1 (short B: inner part) **AMBER:** D0-G1-I1 (outern part) B2-C1-I0 (inner part)
Spectral mode	**MIDI:** SCI-PHOT+GRISM (shorter integration time, higher resolution) **AMBER:** low-JHK	**MIDI:** SCI-PHOT+GRISM (shorter integration time, higher resolution) **AMBER:** low-JHK
Observing time	**MIDI: 6 hrs** **AMBER: 18 hrs** (11/2014)	**MIDI: 9 hrs** **AMBER:** 18 hrs (11/2014)
Special constraint	---	---
Calibrators	**MIDI:** HD8498 (K5) **AMBER:** HD6629 (K4)	**MIDI:** HD48217 (M0) **AMBER:** HD6629 (K4)