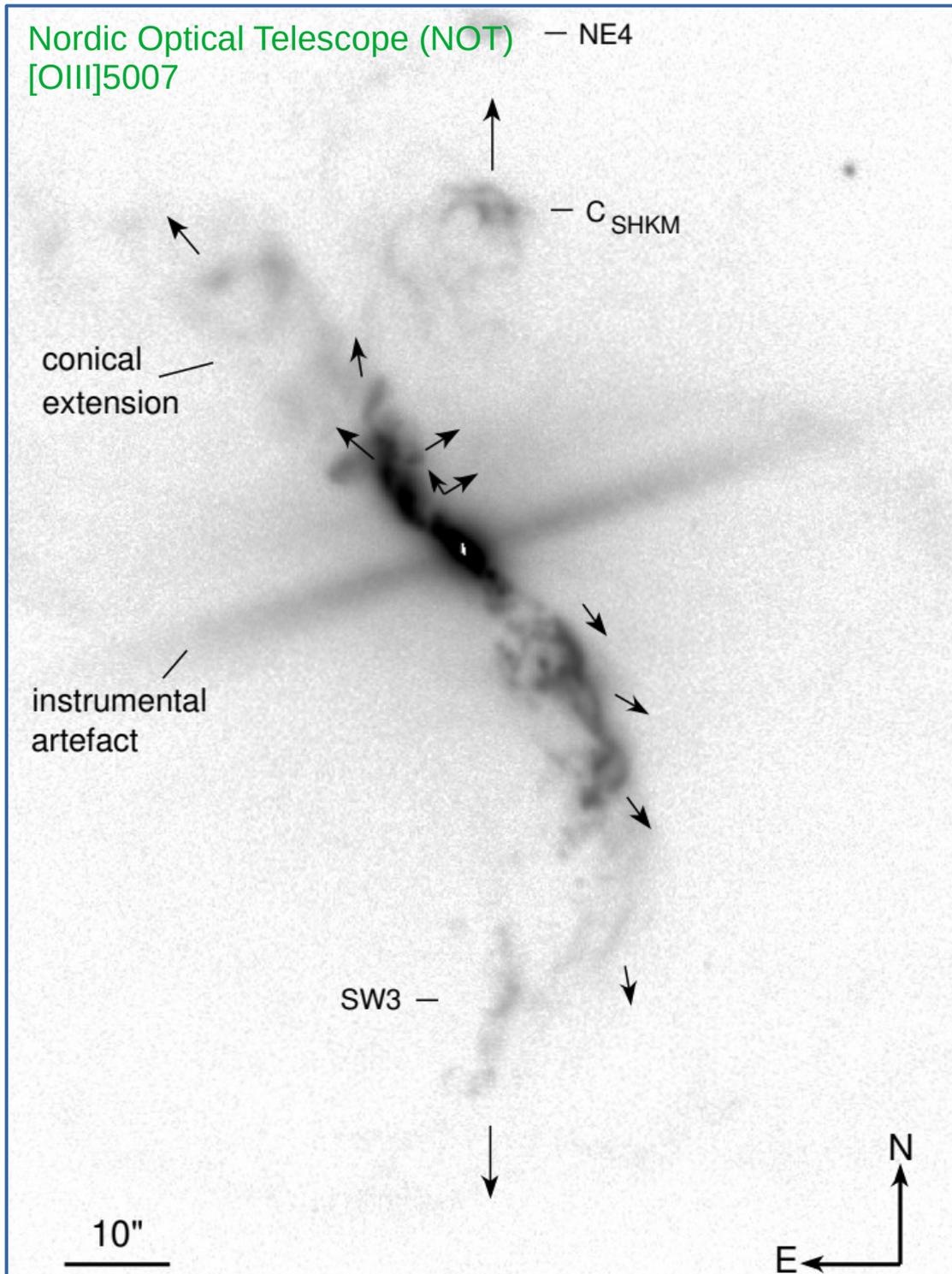


Influence of the periastron passage to the large-scale jet of R Aquarii



Tiina Liimets (ASU)
R. Corradi (GRANTECAN, IAC)
M. Santander-Garcia (OAN-ING)
D. Jones (IAC)
A. Korn (UU)



Jet of R Aqr

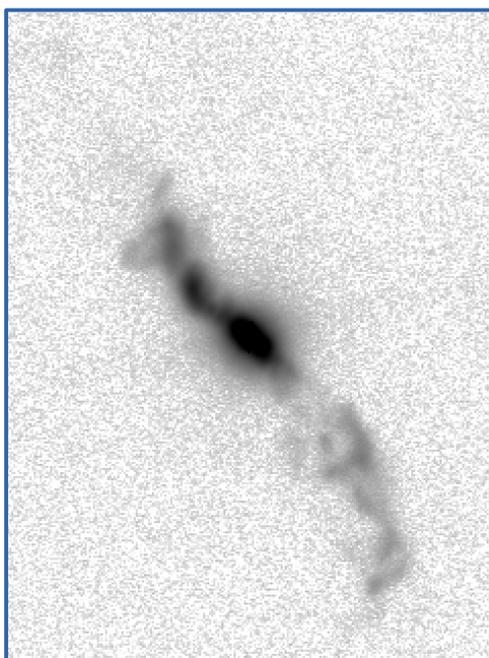
(Liimets+2018
Liimets+2021
this work)

- ★ 32 years of imaging data.
- ★ Overall ballistic expansion (max ~ +/- 100 km/s).
Fast moving lateral features!
Up to 900 km/s.
- ★ Up to ~300 years old but still active!
- ★ Structural and brightness changes of individual blobs (~10 yrs).

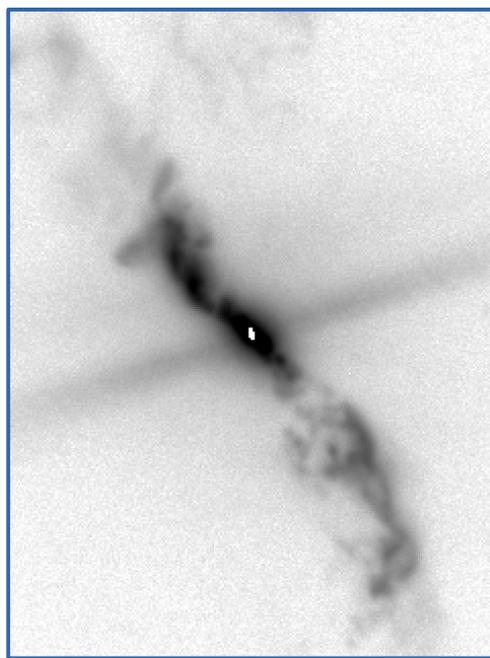
Before and at the beginning of the passage

(Liimets+2018; Liimets+2021)

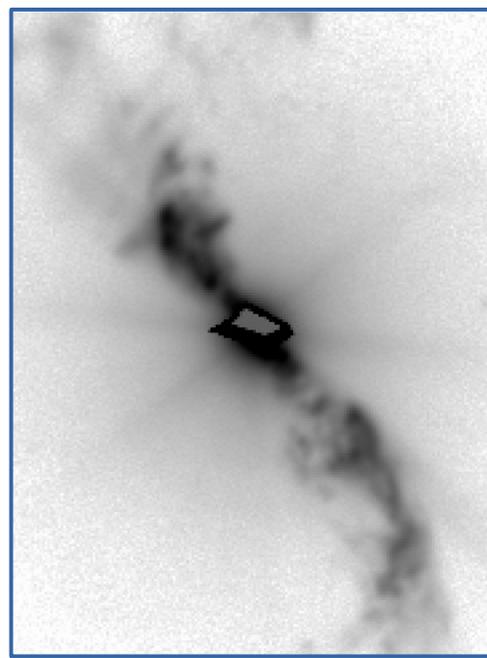
HST
2013 (Melnikov+ 2018)
2017 (archive)



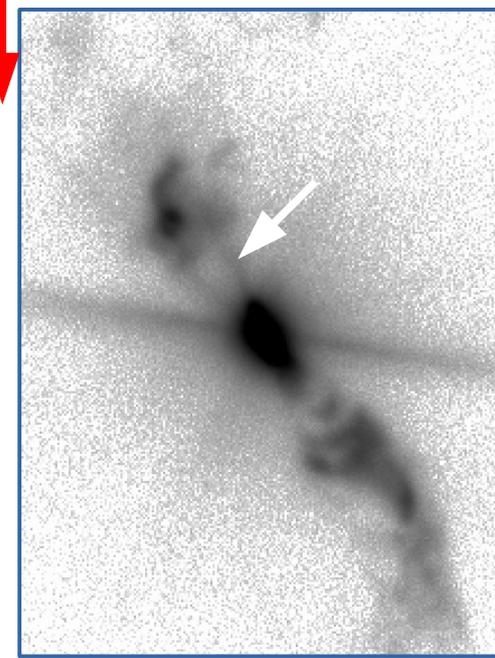
2002 NOT [OIII]



2007 NOT [OIII]



2012 VLT [OIII]

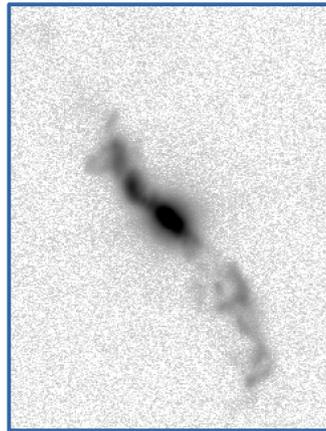


2019 NOT [OIII]

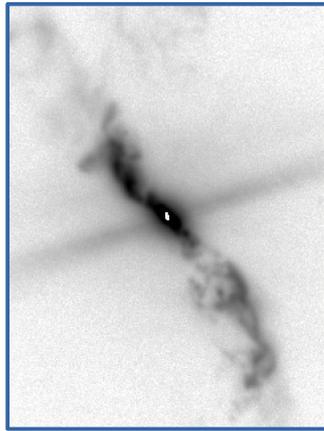
Nordic Optical Telescope (NOT)
The Very Large Telescope (VLT)
[OIII]5007

During the periastron passage

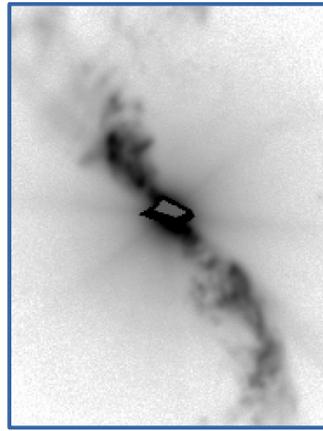
(Liimets+2018; Liimets+2021; this work)



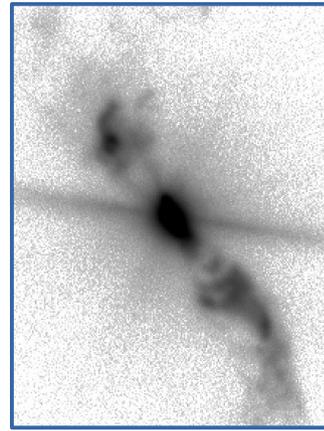
2002 NOT [OIII]



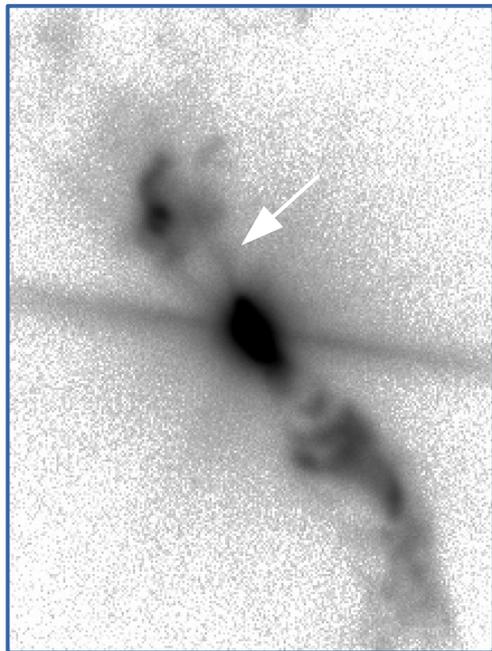
2007 NOT [OIII]



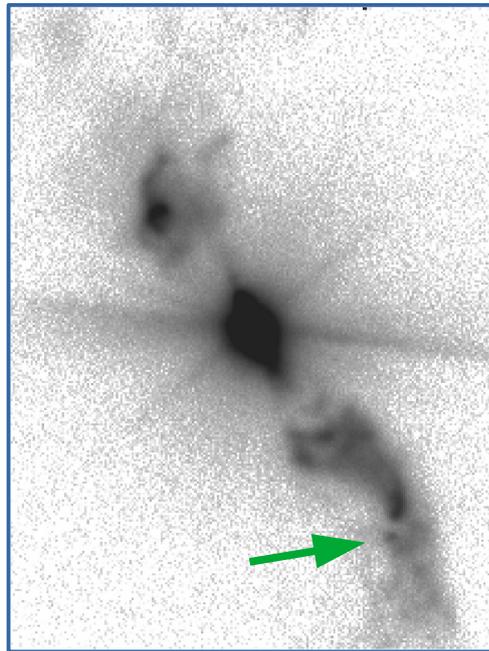
2012 VLT [OIII]



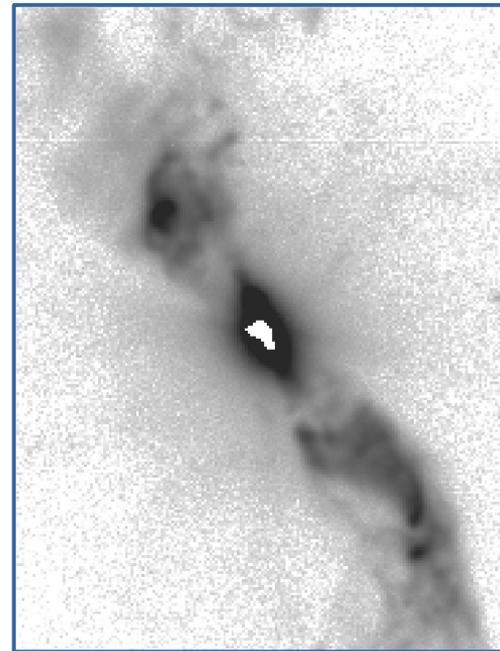
2019 NOT [OIII]



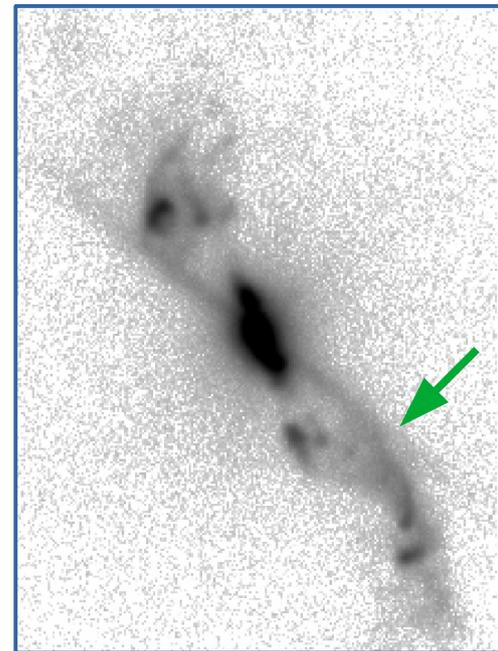
2019 NOT [OIII]



2020 NOT [OIII]

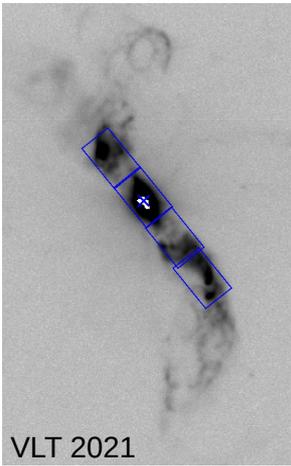


2021 VLT [OIII]

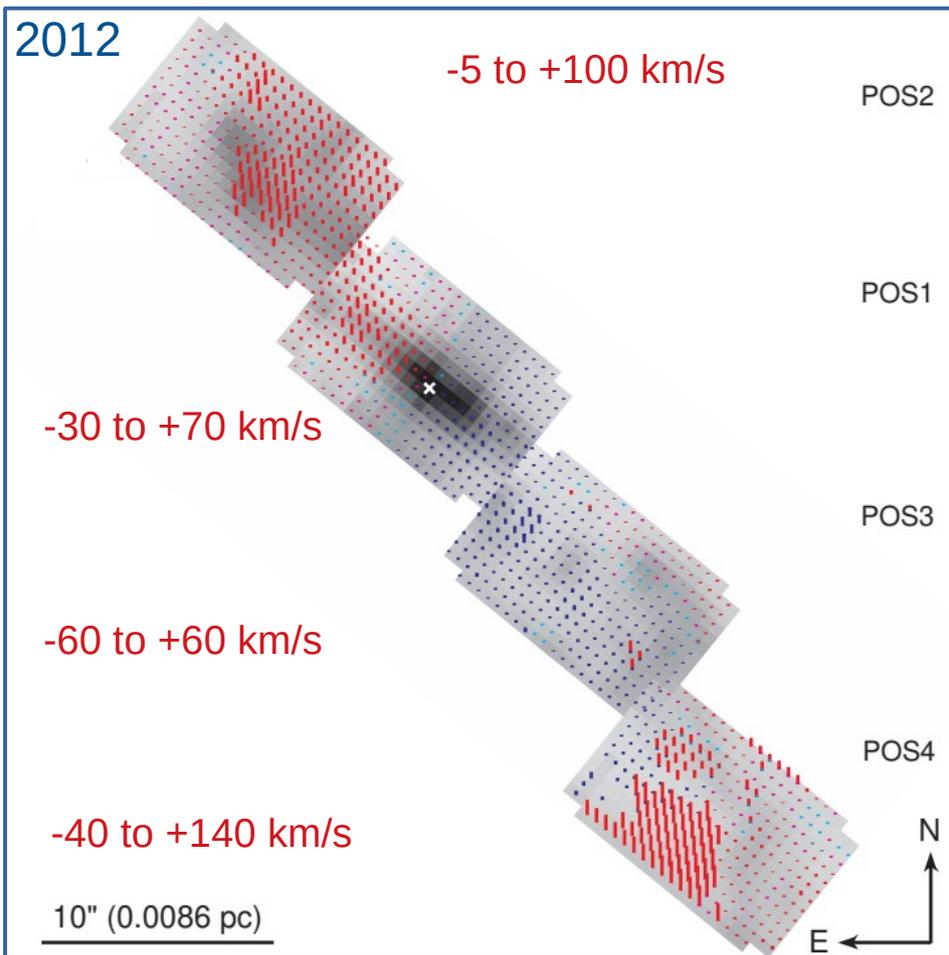


2023 NOT [OIII]

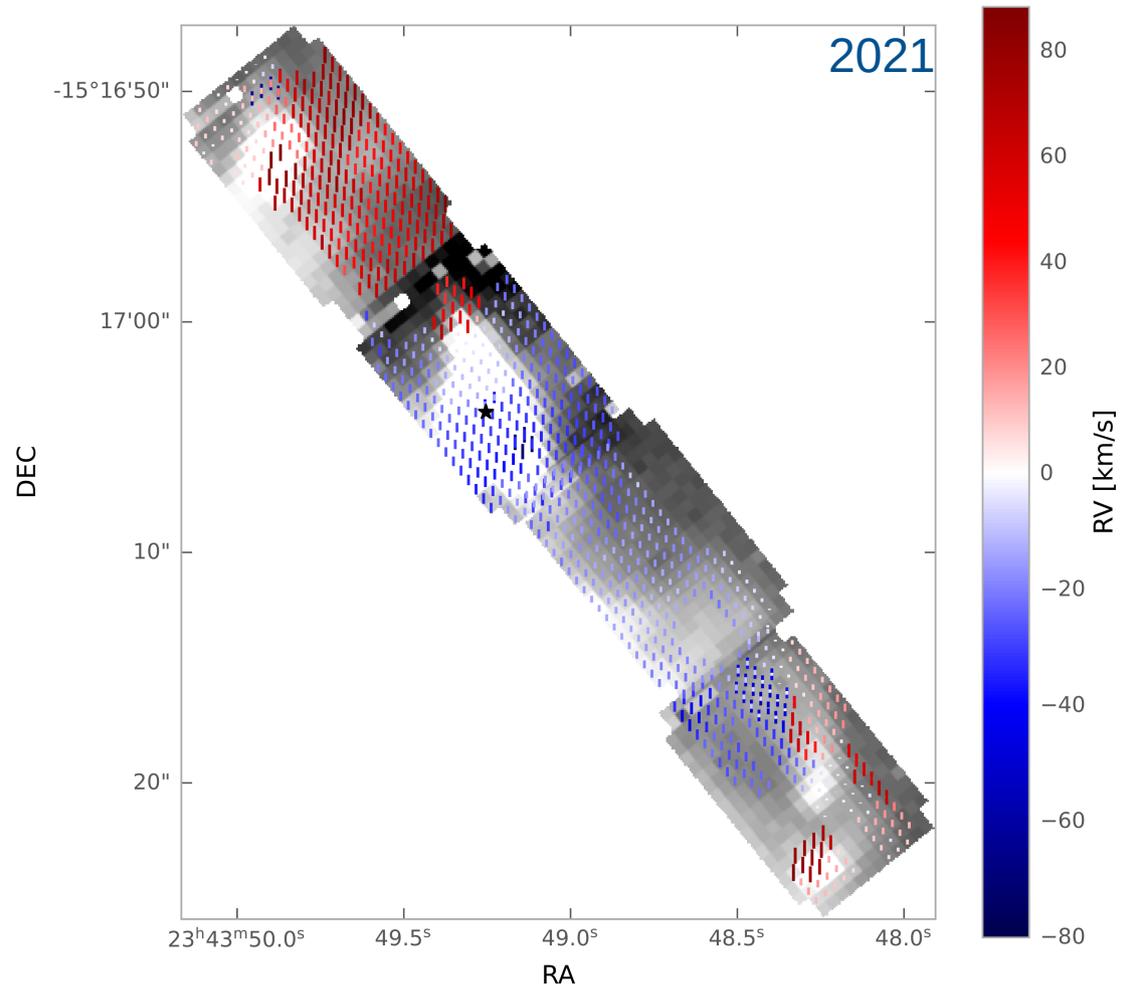
Radial velocities during the passage



★ Optical high-resolution ($R=30\,000$) spectra VLT+FLAMES
[OIII]5007

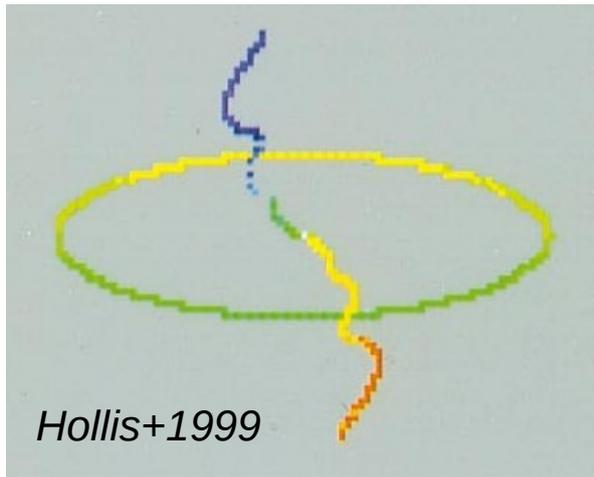


(Llimets+2018)

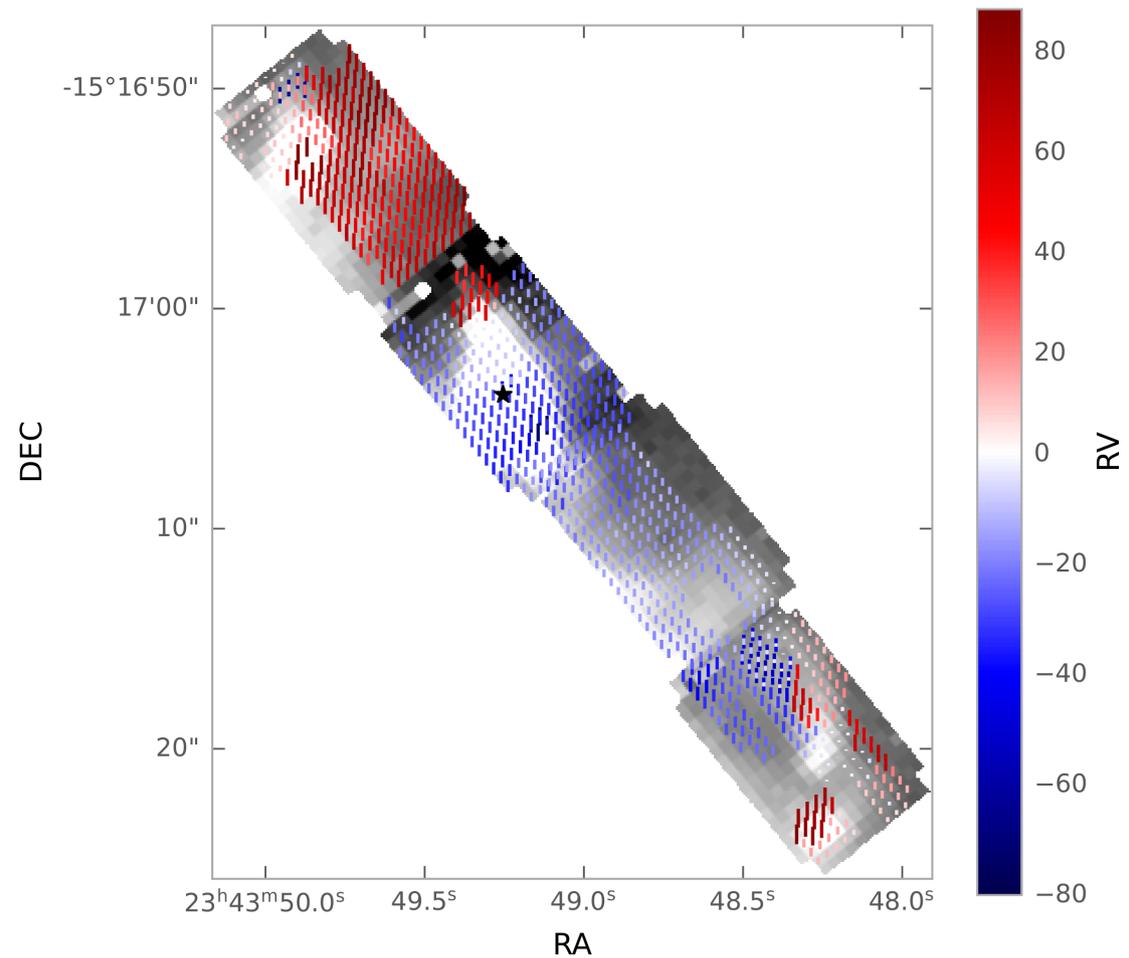
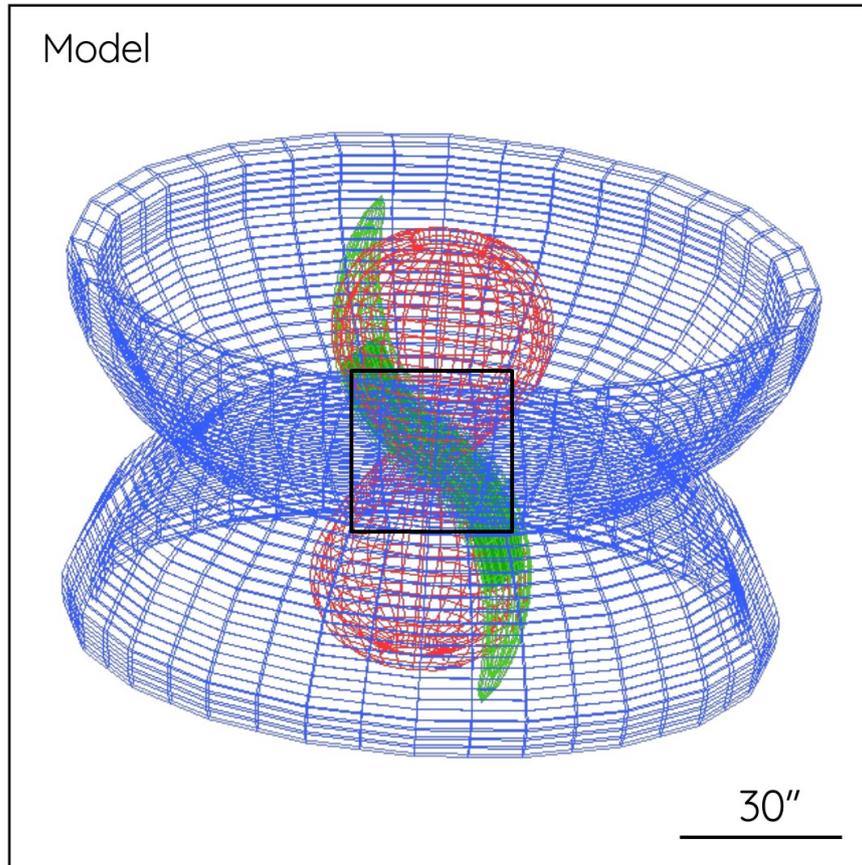


(this work)

Curved jet of R Aqr



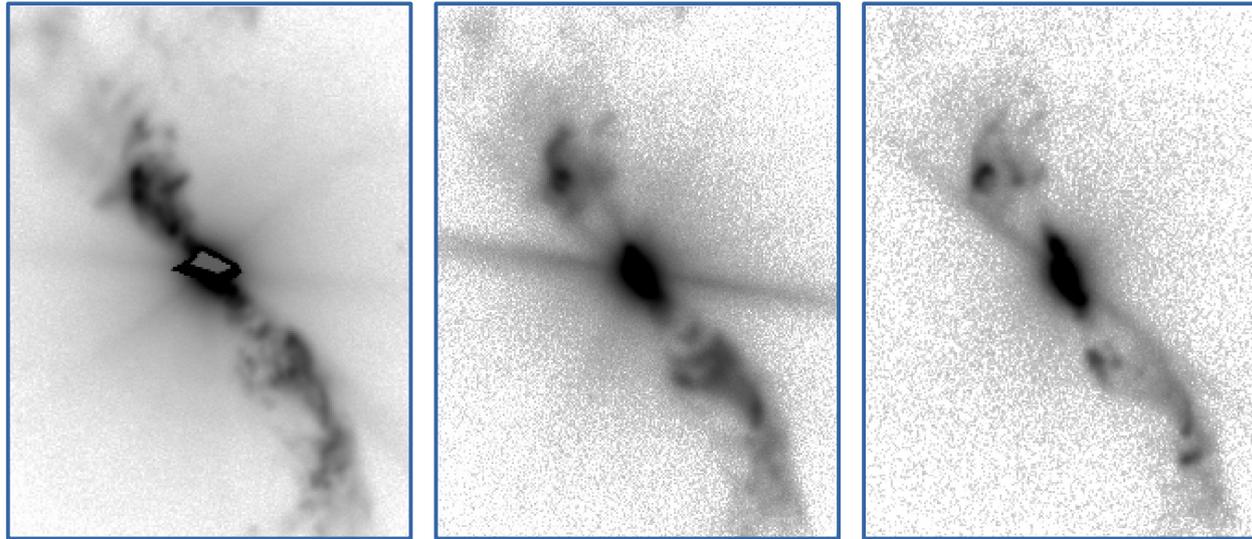
★ Optical spectra VLT+FLAMES [OIII]5007



Santamaria+2024

(this work)

WHY? WHEN/WILL it recover?



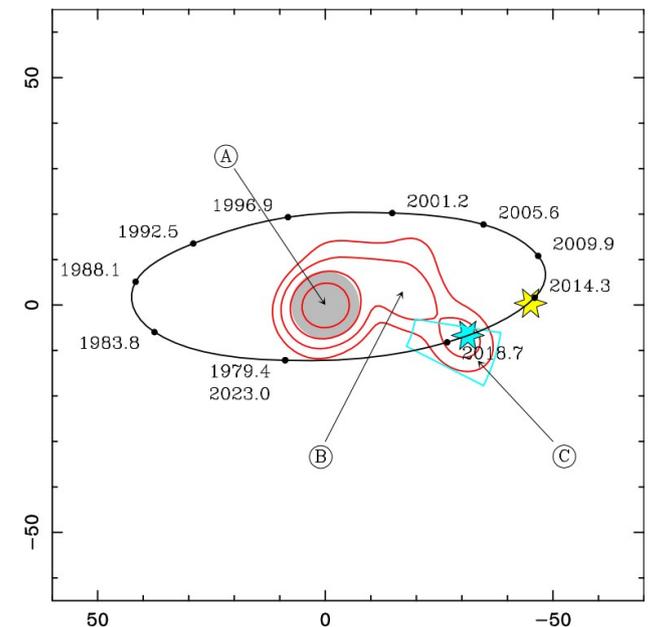
2012 VLT [OIII]

2019 NOT [OIII]

2023 NOT [OIII]

- ★ Changes are similar in other emission lines / no big changes in RVs > recombination
- ★ Combination of all other sources > very complex!
- ★ WD 'eclipsed' by the Mira or by the matter from the enhance mass-loss?
- ★ **Changes related to the periastron passage!**

- ★ Ionizing source is the WD.
- ★ Physical matter moving?
Changing ionization/illumination/shocks?
Recombination?



Bujarrabal+2018

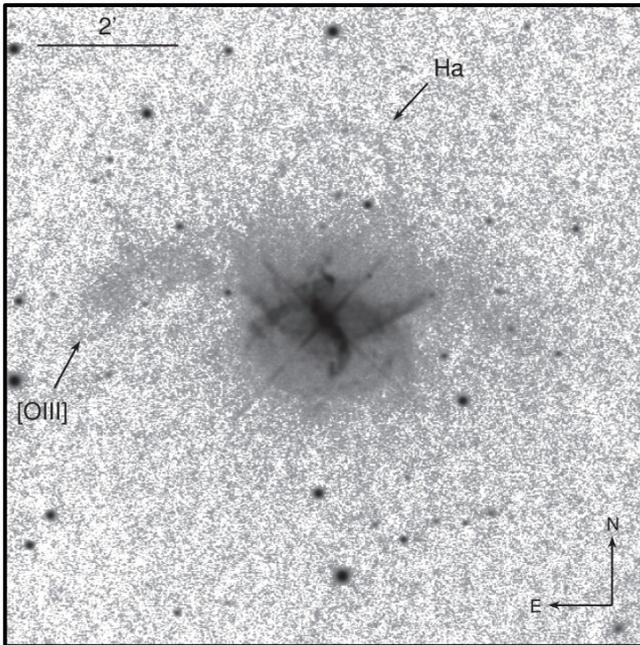
The largest structures around R Aqr - Amateurs invaluable contributions!

Promoter: **Sakib Rasool**



★ Age ~ 10 000y

Discovery 2016:
Mike Sidonio
Australia



Credit: *Liimets+2018*

Follow up (2023)
Peter Goodhew
Spain



Credit: *imagingdeepspace.com*

