# Eruptive stars spectroscopy
## Cataclysmics, Symbiotics, Novae

**ARAS Eruptive Stars**
Information Letter n° 37 #2017-07 09-10-2017
Supp37-1

# R Aqr Campaign
# Status 3 days before observations

**Margarita Karovska** (Harvard-Smithsonian Center for Astrophysics) **requests spectroscopic monitoring of the mira symbiotic R Aqr**
**at least one spectrum a week, low and high resolution, especially H alpha and [OIII] range**
*It is great that there are already observations covering several years.*
*We are having Chandra and HST observations currently scheduled for October 2017.*
*It will be great we we can get photometry and spectroscopy coverage starting soon, and then during the Chandra/HST observations (more dense) and a couple of months after these observations.*

**Chandra/HST scheduled observations**

| | |
|---|---|
| October 11, 2017 (Wed) | Day 284 |
| October 13, 2017 (Fri) | Day 286 |
| October 14, 2017 (Sat) | Day 287 |

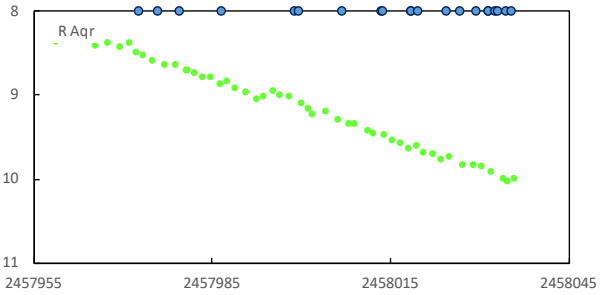
**See also AAVSO Notice:** https://aavso.org/aavso-alert-notice-589

Authors : F. Teyssier, T. Lester, U. Sollecchia, O. Garde, P. Berardi, F. Campos, L. Franco, D. Li

SYMBIOTICS

# R Aqr

| Coordinates (2000.0) | |
|---|---|
| R.A. | 23 43 49.4 |
| Dec | -15 17 4.2 |
| Mag | 10.5 (10-2016) |



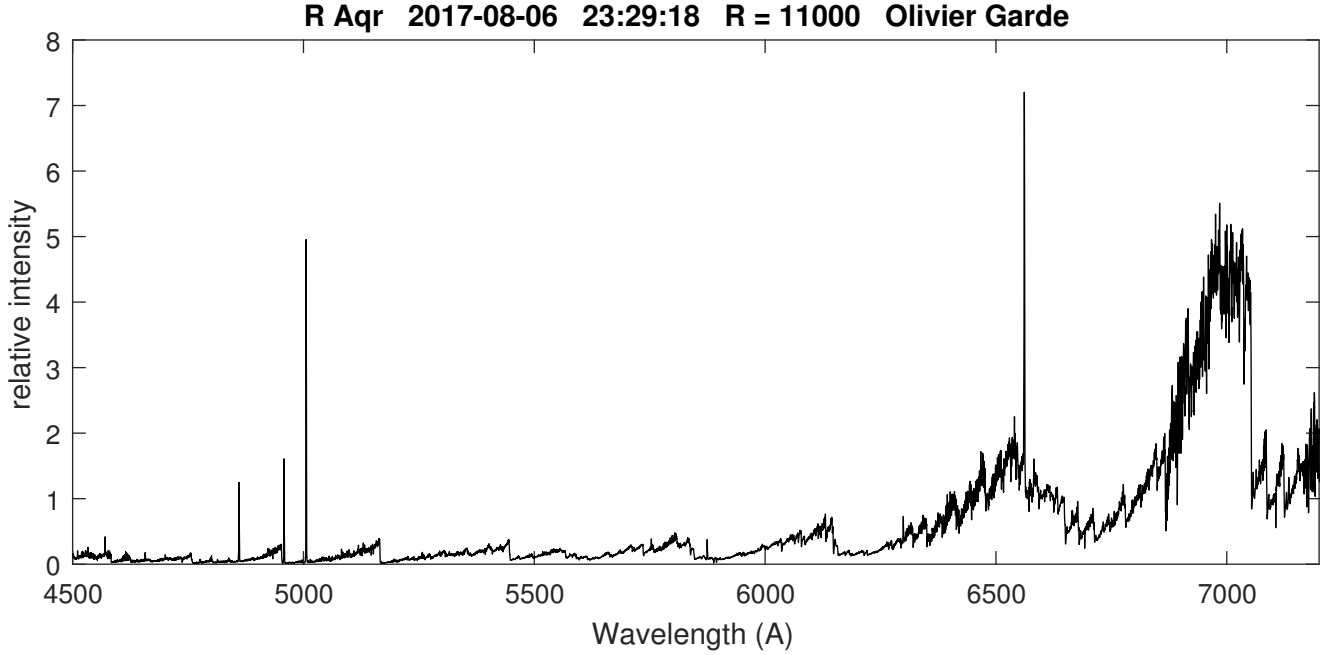

**Observations requested by Margarita Karovska**
Having R Aqr spectra starting in August , one per week,
and more often during the observation in October,
and then one per week until mid-November (December) would be really good.
I just got the "likely" dates for the Chandra/HST observations.

October 11, 2017 (Wed) Day 284
October 13, 2017 (Fri) Day 286
October 14, 2017 (Sat) Day 287

**See also AAVSO Notice:** https://aavso.org/aavso-alert-notice-589

Log of observations - 2017, Aug. - Oct

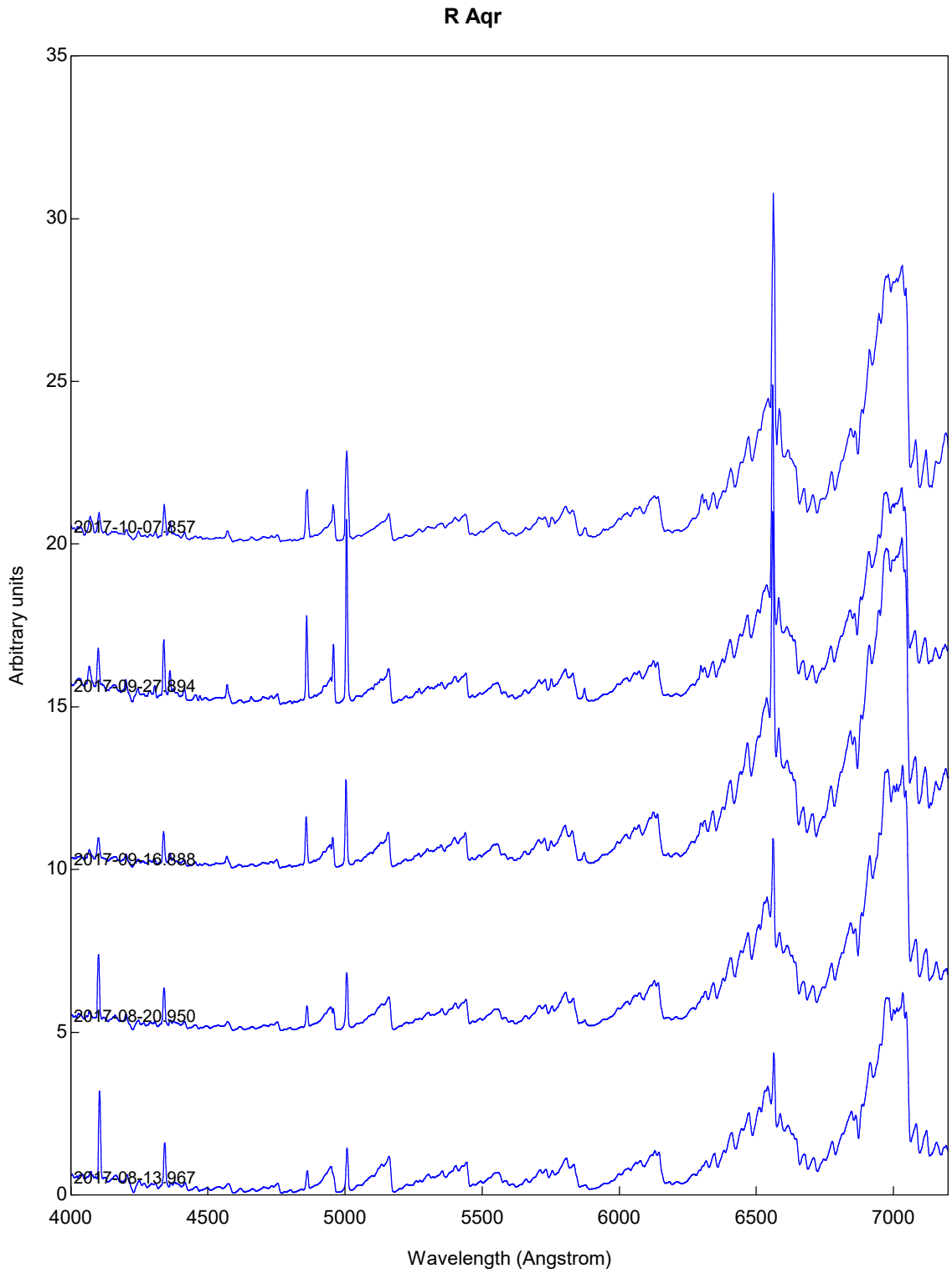
| Id. | Observer | Date | Range | | Res. |
|---|---|---|---|---|---|
| R Aqr | O. Garde | 06/08/2017 | 4186 | 7314 | 11000 |
| R Aqr | T. Lester | 10/08/2017 | 4031 | 7950 | 13000 |
| R Aqr | F. Campos | 13/08/2017 | 3803 | 7332 | 709 |
| R Aqr | F. Campos | 20/08/2017 | 3859 | 7403 | 701 |
| R Aqr | T. Lester | 02/09/2017 | 4031 | 7950 | 13000 |
| R Aqr | F. Teyssier | 02/09/2017 | 4140 | 7395 | 11000 |
| R Aqr | T. Lester | 10/09/2017 | 4031 | 7950 | 13000 |
| R Aqr | F. Campos | 16/09/2017 | 3804 | 7347 | 637 |
| R Aqr | T. Lester | 17/09/2017 | 4031 | 7949 | 13000 |
| R Aqr | P. Berardi | 21/09/2017 | 4752 | 5240 | 4052 |
| R Aqr | U. Sollecchia | 21/09/2017 | 6375 | 6770 | 7838 |
| R Aqr | F. Teyssier | 22/09/2017 | 4320 | 7150 | 11000 |
| R Aqr | F. Campos | 27/09/2017 | 3816 | 7358 | 843 |
| R Aqr | F. Campos | 27/09/2017 | 3816 | 7358 | 843 |
| R Aqr | O. Garde | 29/09/2017 | 4186 | 7314 | 11000 |
| R Aqr | U. Sollecchia | 02/10/2017 | 6365 | 6751 | 7480 |
| R Aqr | U. Sollecchia | 04/10/2017 | 6368 | 6757 | 8213 |
| R Aqr | F. Teyssier | 04/10/2017 | 4141 | 7395 | 11000 |
| R Aqr | U. Sollecchia | 05/10/2017 | 6368 | 6759 | 7992 |
| R Aqr | DongLi | 06/10/2017 | 6405 | 6739 | 4981 |
| R Aqr | L. Franco | 07/10/2017 | 3841 | 7231 | 541 |
| R Aqr | U. Sollecchia | 08/10/2017 | 6386 | 6767 | 7935 |



SYMBIOTICS

# R Aqr Evolution Aug. to Oct., 2017 - Low res spectra

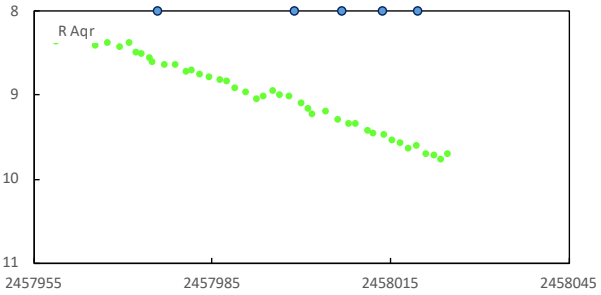
**Spectra acquired by Lorenzo Franco and Fran Campos**



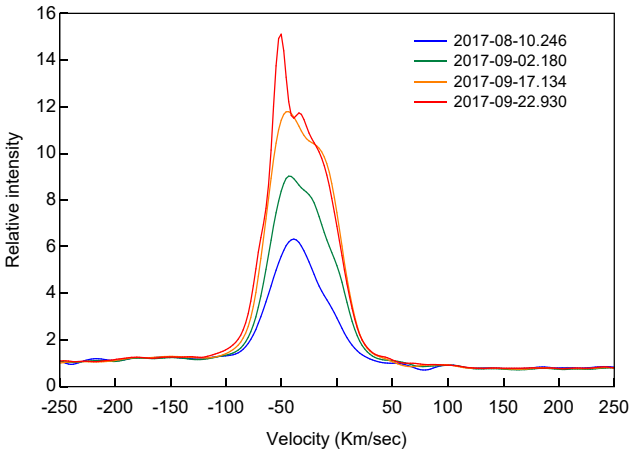
SYMBIOTICS

# R Aqr Lines evolution from Echelle spectra R =11 to 13000

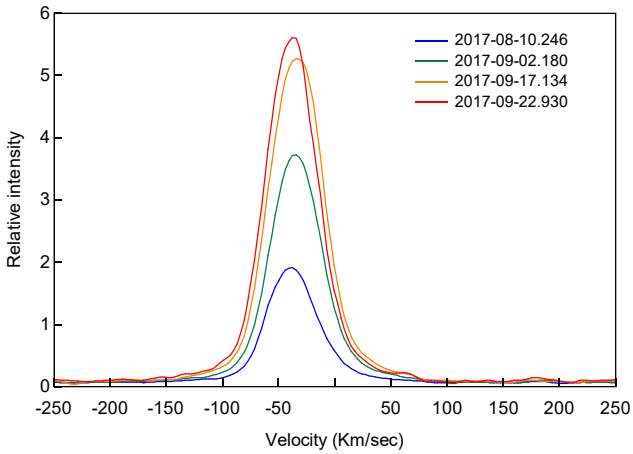
| date | JD | Obs. |
|---|---|---|
| 10/08/2017 | 2457975.789 | LES |
| 02/09/2017 | 2457998.733 | LES |
| 10/09/2017 | 2458006.731 | LES |
| 17/09/2017 | 2458013.697 | LES |
| 22/09/2017 | 2458019.444 | FMT |



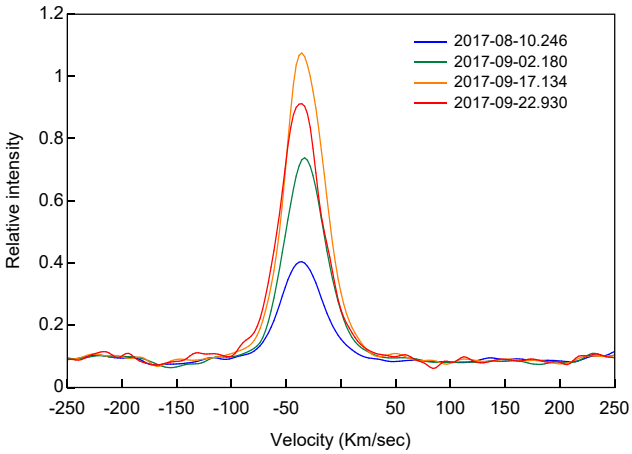

**Halpha 6562.801 - R Aqr**



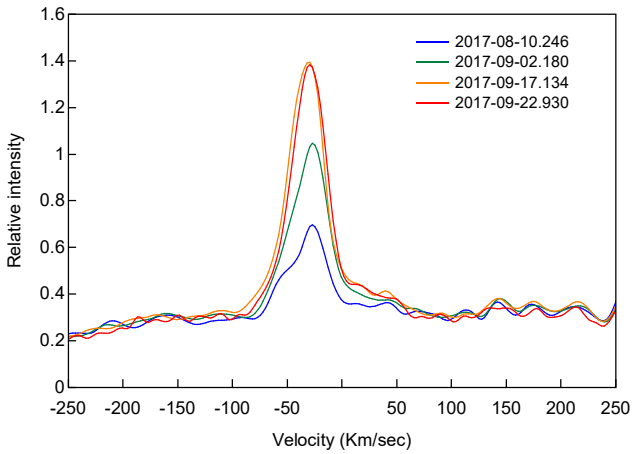

**Hbeta 4861.363 - R Aqr**



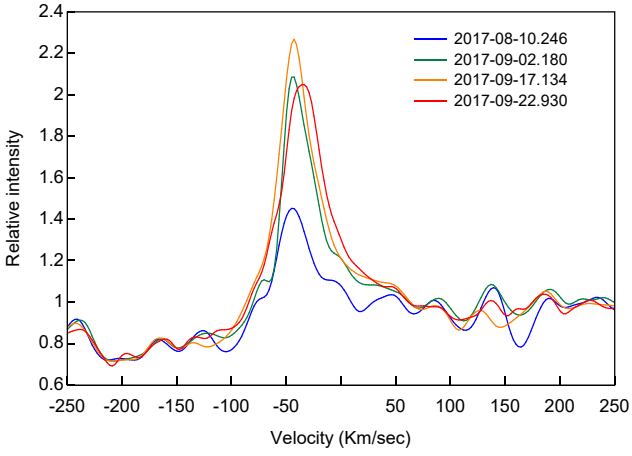

**He I 5875.65 - R Aqr**



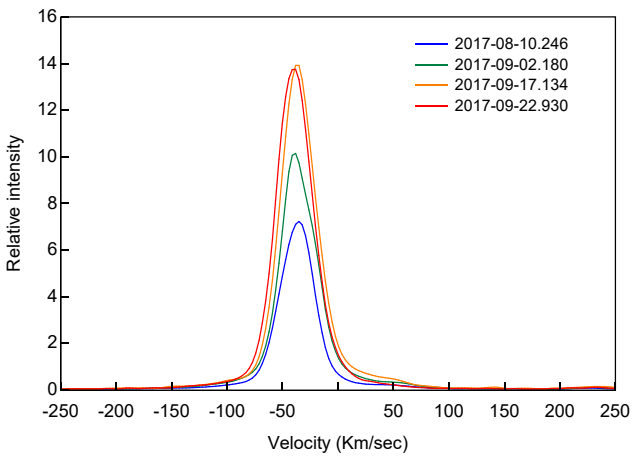

**[O I] 6300.32 - R Aqr**




**[N II] 6583.39 - R Aqr**

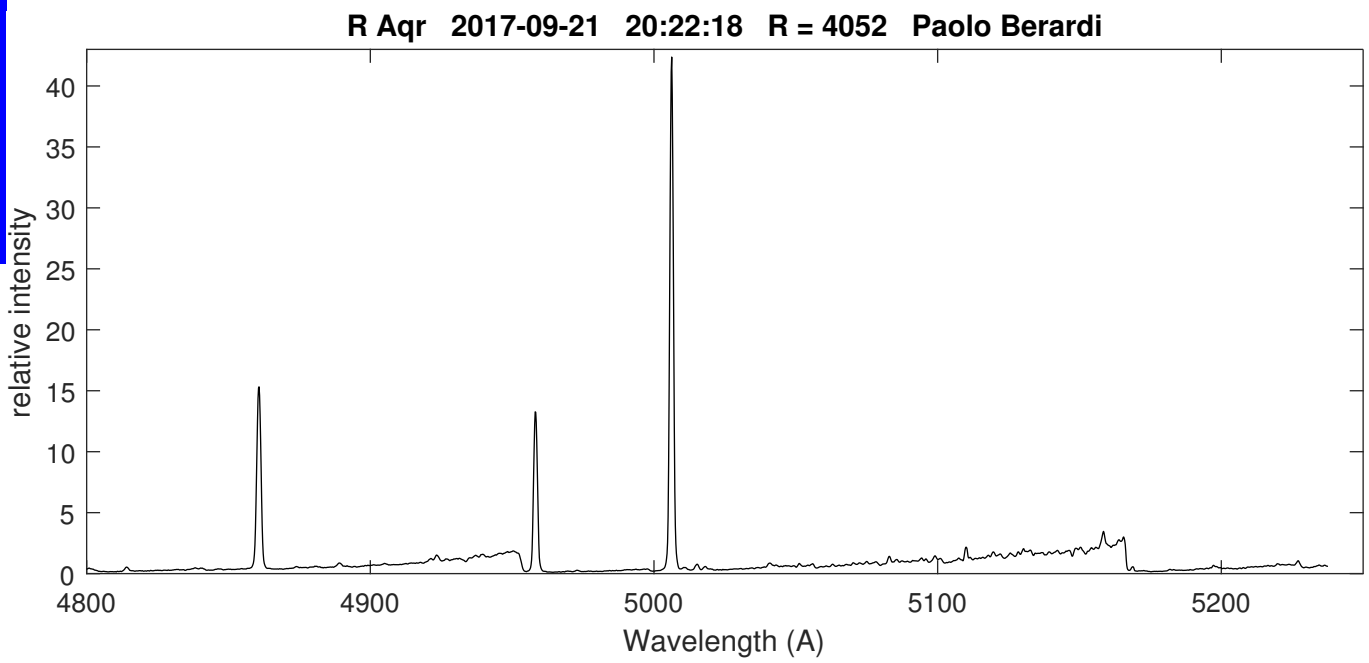


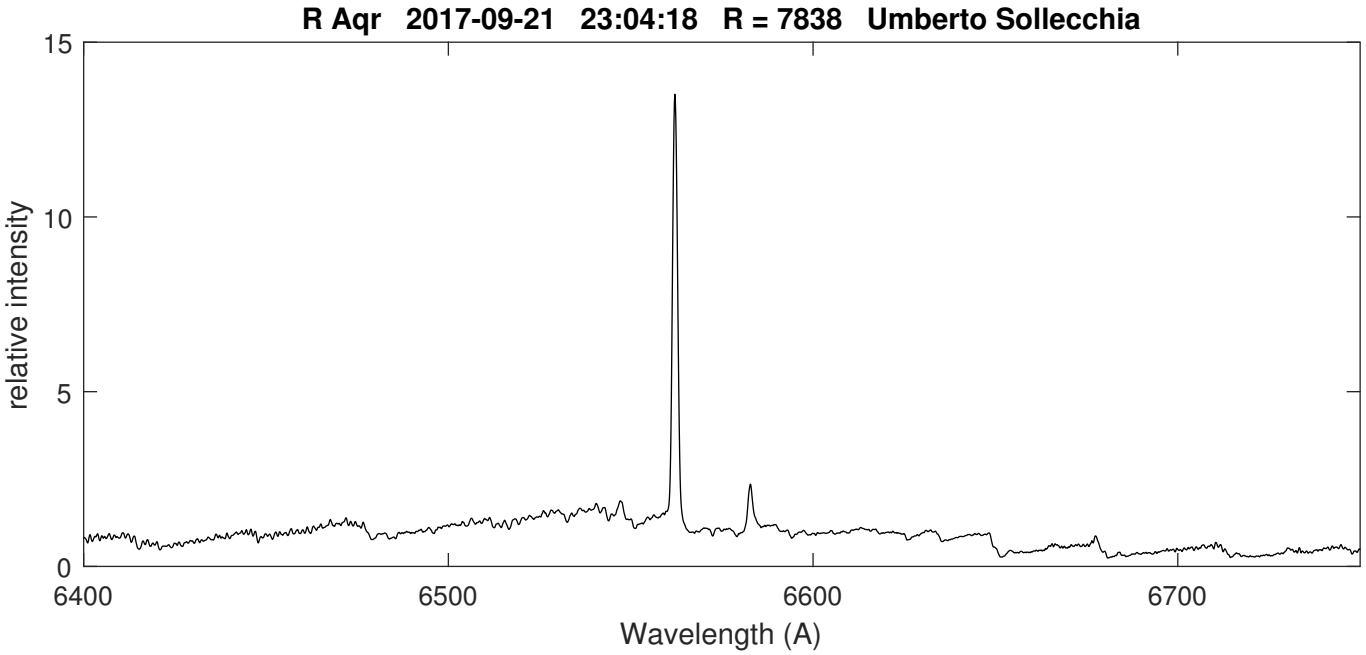

**[O III] 5006.84 - R Aqr**



# R Aqr

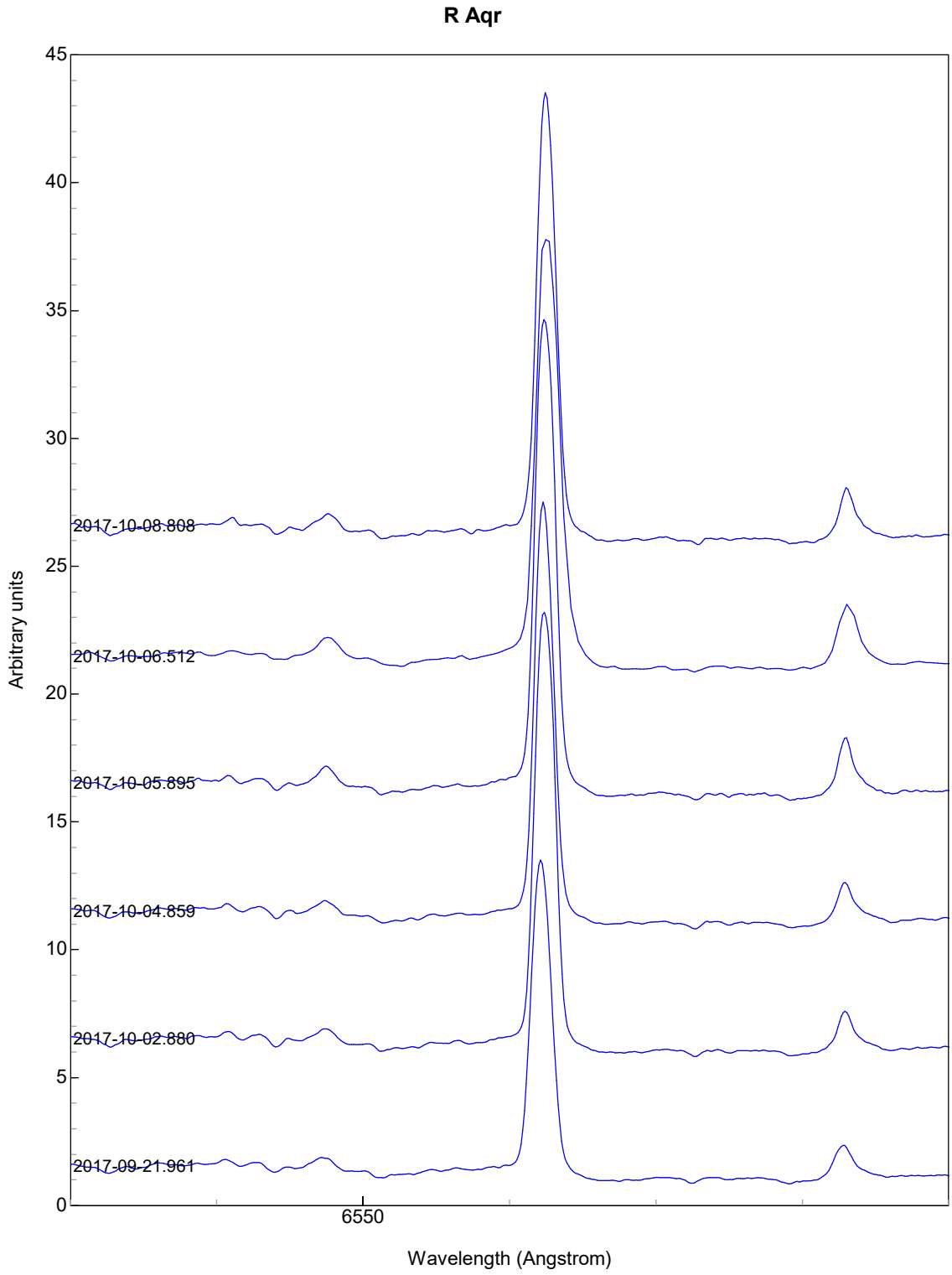
H alpha and H beta ranges respectivly obtained by Paolo Berardi (Lhires III - 1200 l/mm) and Umbert Solleccchia



# R Aqr H alpha range medium resolution

H alpha range at medium resolution (R = 5000 to 8000) by Umberto Sollecchia and Dong Li



SYMBIOTICS

# R Aqr Lines evolution Sept - Oct, 2017

Lines evolution from Echelle spectra - Resolution 11 to 13000

Tim Lester, Olivier Garde, François Teyssier

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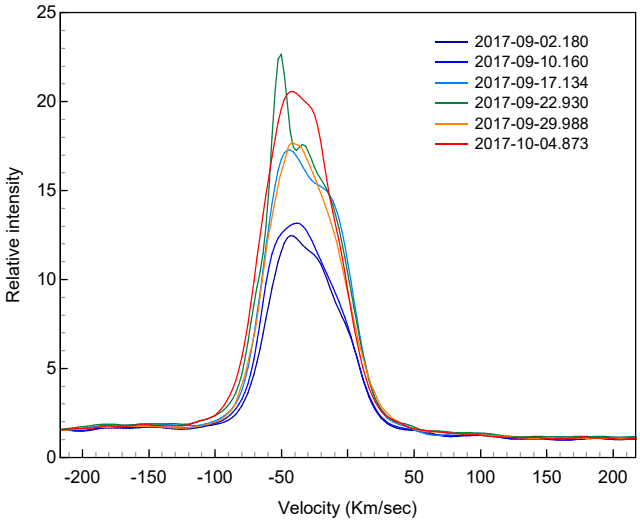


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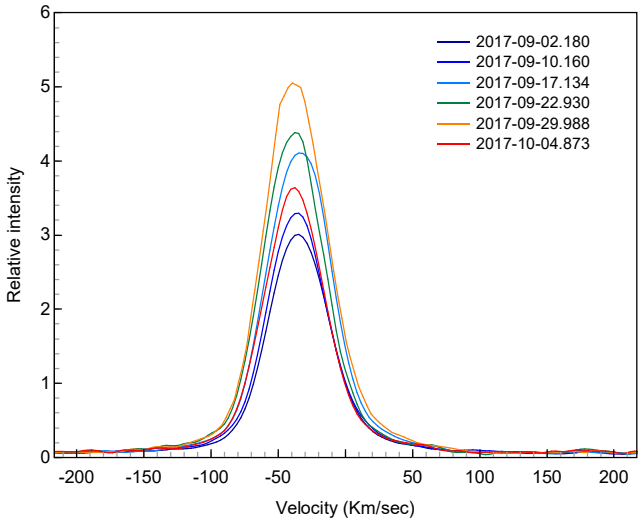


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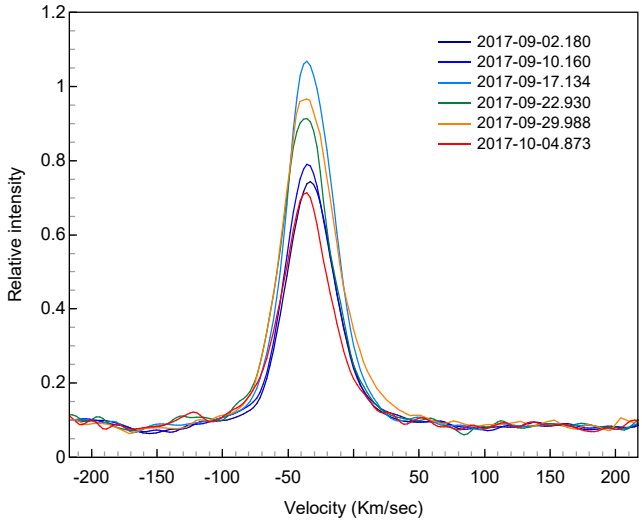


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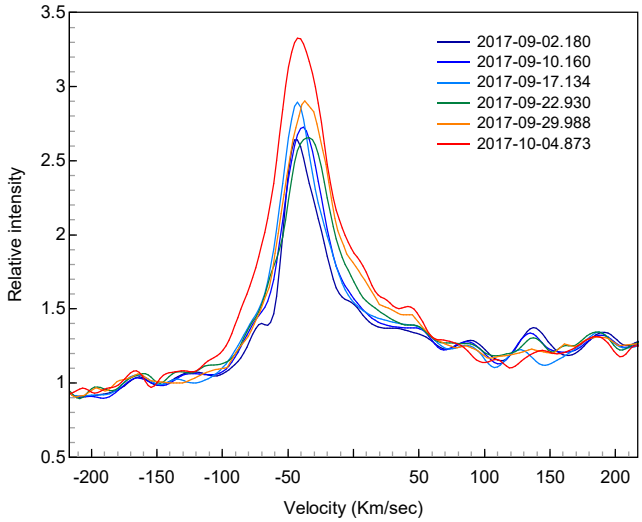


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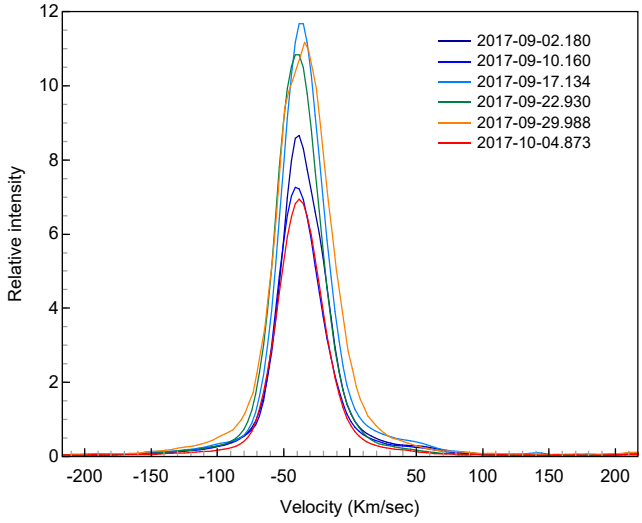


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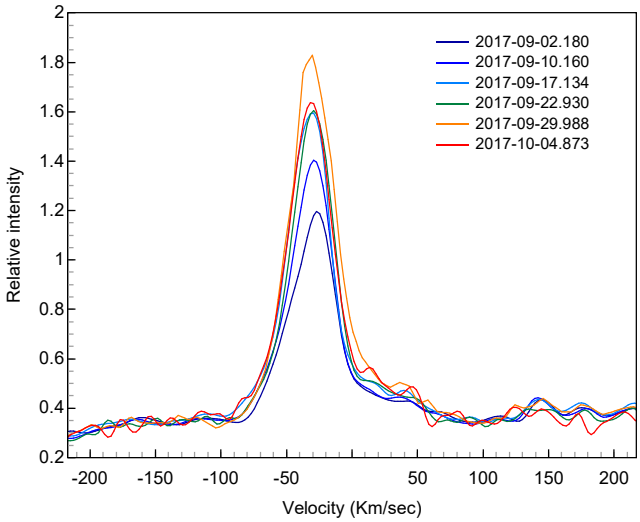

# Campaigns: R Aqr

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**ARAS Database for R Aqr: http://www.astrosurf.com/aras/Aras_DataBase/Symbiotics/RAqr.htm**

**FROM AAVSO Notice#589**

**A**ugust 4, 2017: Dr. Margarita Karovska (Harvard-Smithsonian Center for Astrophysics) has requested "visual, photometric, and spectroscopic observations of the symbiotic variable R Aqr in preparation for and in support of Chandra and HST observations currently scheduled for October 2017."

Dr. Karovska continues: "R Aqr is the nearest symbiotic system at a distance of only about 200 pc. It contains a white dwarf accreting from a mass-losing Mira-type star with binary separation of about 20 AU. The aim of the multiwavelength observations of this fascinating object is to study the physical characteristics of this system and including the multi-scale components of the powerful jet, from the central binary region to the jet-circumbinary material interaction region and beyond.

"AAVSO observations are requested in order to monitor the state of the system and correlate with the satellite observations.

"Visual observations and CCD/PEP observations in the U, B, V, I, J, and H bands are requested." DSLR photometry is also welcome.

"Optical spectroscopy, including in the Halpha, [OIII]5007A region is also requested.

"Also requested is high-speed photometry in U and B bands (a cadence of as low as a few seconds would be ideal, but a cadence of about a minute may also be all right) to reveal any possible high-speed variations in the central binary.

"Weekly observations now through...November would be very much appreciated, with increased frequency of observations to twice a week..." beginning four weeks before the Chandra and HST observations and continuing at that frequency until the end of the campaign. "This [level of coverage] will provide solid optical data crucial to interpreting the satellite data."