Eruptive stars spectroscopy
Cataclysmics, Symbiotics, Novae, Supernovae

ARAS Eruptive Stars
Information letter n° 5 - 28-04-2014

News

PNV J17144255-2943481
Discovered by H. Nishimura, Shizuoka-ken, Japan (2014 04 11.747)
at mag C = 10.7

Identified as a dwarf nova in outburst by C. Buil's spectrum

First a word of admiration to all of you. The spectra you've been obtaining, especially of the recent novae, are really lovely and having such coverage in the earliest stages is -- well, I've used the word too many times but it applies -- revolutionary. The archive that's accumulating is better, more uniform, and more reliable than anything that's ever been available -- McLaughlin included.
Steve Shore (Notes, 28-04-2014)

Contents

Aknowledgements : V band light curves from AAVSO photometric data base

ARAS Spectroscopy

ARAS Web page
http://www.astrosurf.com/aras/

ARAS Forum
http://www.spectro-aras.com/forum/

ARAS list
https://groups.yahoo.com/neo/groups/spectro-l/info

ARAS preliminary data base
http://www.astrosurf.com/aras/Aras_DataBase/DataBase.htm

ARAS BeAM
http://arasbeam.free.fr/?lang=en

About ARAS initiative

Astronomical Ring for Access to Spectroscopy (ARAS) is an informal group of volunteers who aim to promote cooperation between professional and amateur astronomers in the field of spectroscopy. To this end, ARAS has prepared the following roadmap:

• Identify centers of interest for spectroscopic observation which could lead to useful, effective and motivating cooperation between professional and amateur astronomers.
• Help develop the tools required to transform this cooperation into action (i.e. by publishing spectrograph building plans, organizing group purchasing to reduce costs, developing and validating observation protocols, managing a data base, identifying available resources in professional observatories (hardware, observation time), etc.
• Astronomical Ring for Access to Spectroscopy (ARAS) is an informal group of volunteers who aim to promote cooperation between professional and amateur astronomers in the field of spectroscopy.
•Develop an awareness and education policy for amateur astronomers through training sessions, the organization of pro/am seminars, by publishing documents (web pages), managing a forum, etc.
• Encourage observers to use the spectrographs available in mission observatories and promote collaboration between experts, particularly variable star experts.
• Create a global observation network.

By decoding what light says to us, spectroscopy is the most productive field in astronomy. It is now entering the amateur world, enabling amateurs to open the doors of astrophysics. Why not join us and be one of the pioneers!

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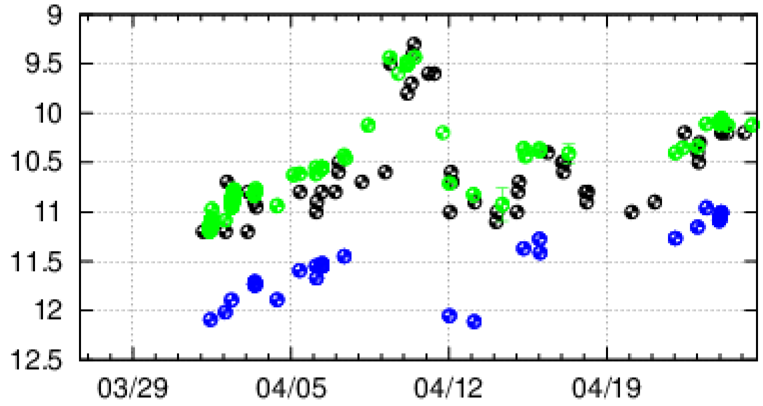
Nova Cyg 2014

Nova Cygni 2014 = PNV J20214234+3103296

Discovered by Koichi Nishiyama (Kurume, Japan) and Fujio Kabashima (Miyaki, Japan) at magnitude 10.9 the 2014 Mar. 31.790 UT

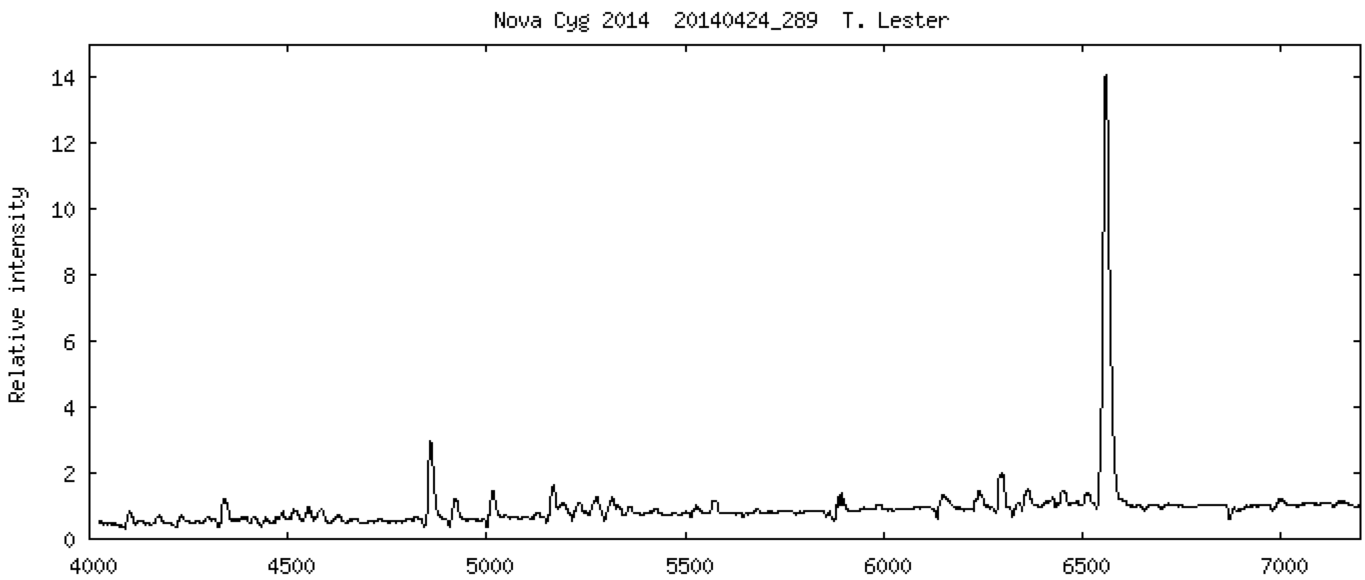
Confirmed as a nova (CBET # 3842)

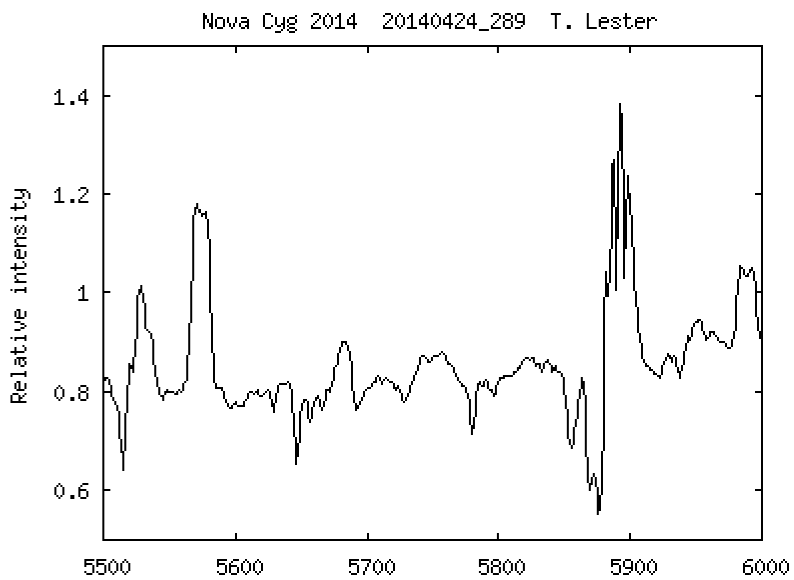
Coordinates (2000.0)	
R.A.	20 21 42.3
Dec.	+31 03 29.4



Observing : spectra required for this peculiar nova - One a day

Luminosity
Mag V = 10.2 (24-04-2014)
Unusual light curve ,
Seems to show a Plateau at maximum with jitters (see Appendix, p. 18)



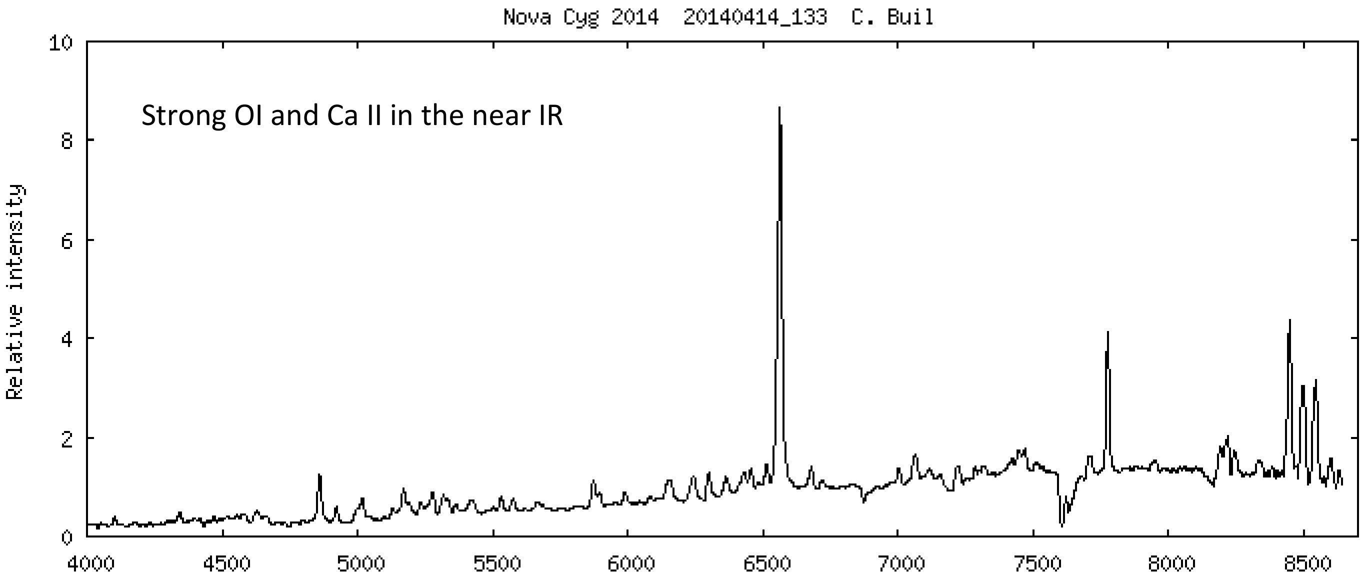


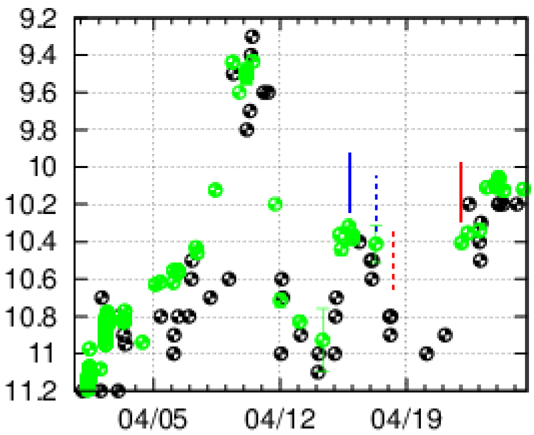
Observers : Tim Lester | Christian Buil | Paul Gerlach | Olivier Garde | François Teyssier | Jacques Montier

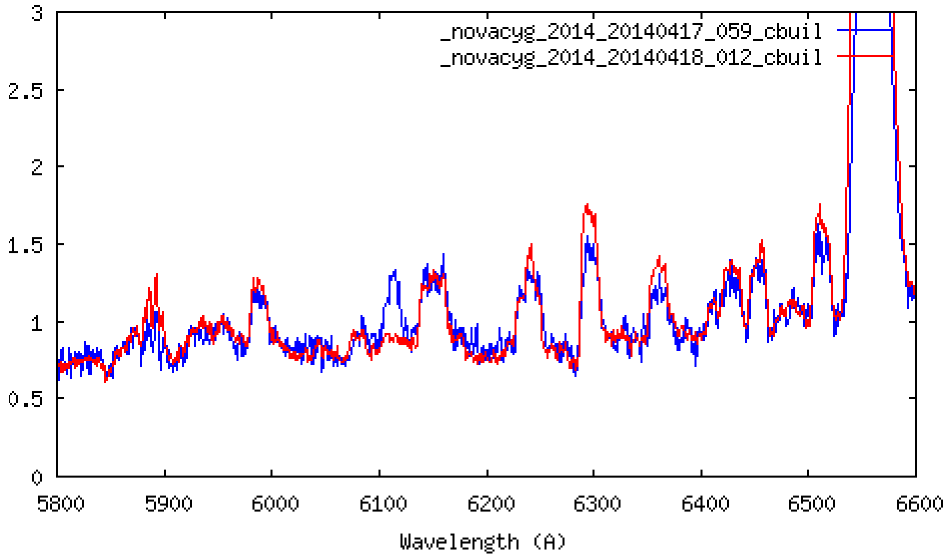
ARAS DATA BASE : 17 spectra
http://www.astrosurf.com/aras/Aras_DataBase/Novae/Nova-Cyg-2014.htm

NOVAE

Nova Cyg 2014

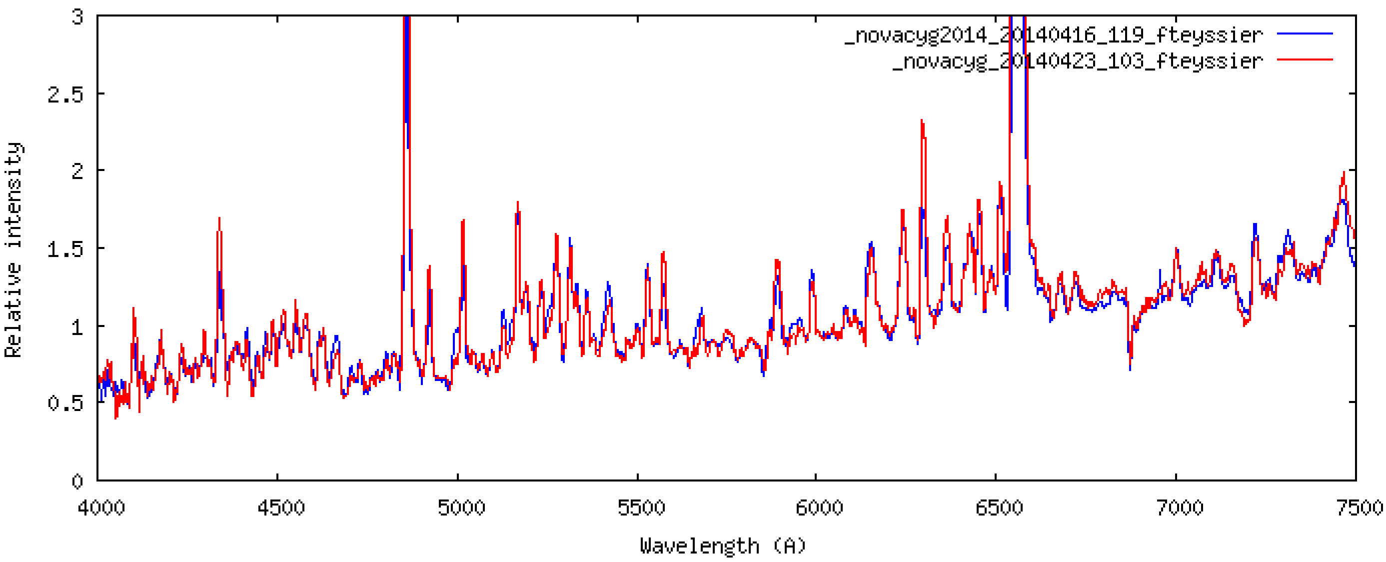






Dotted lines : spectra C. Buil

See the fast evolution of the 6113 line



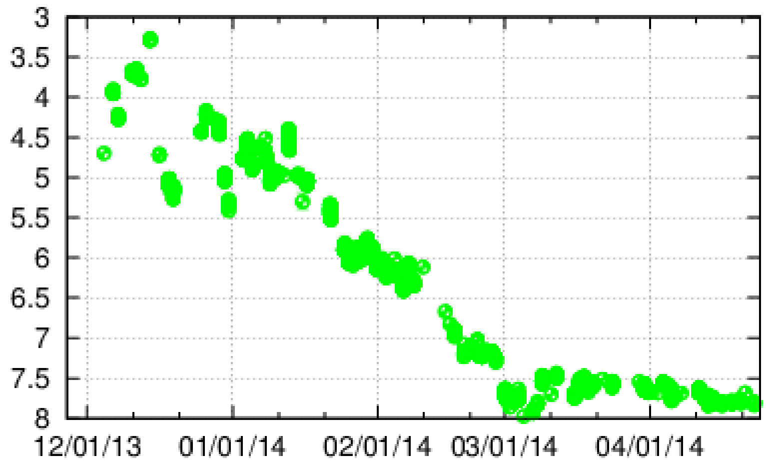
N O V A E

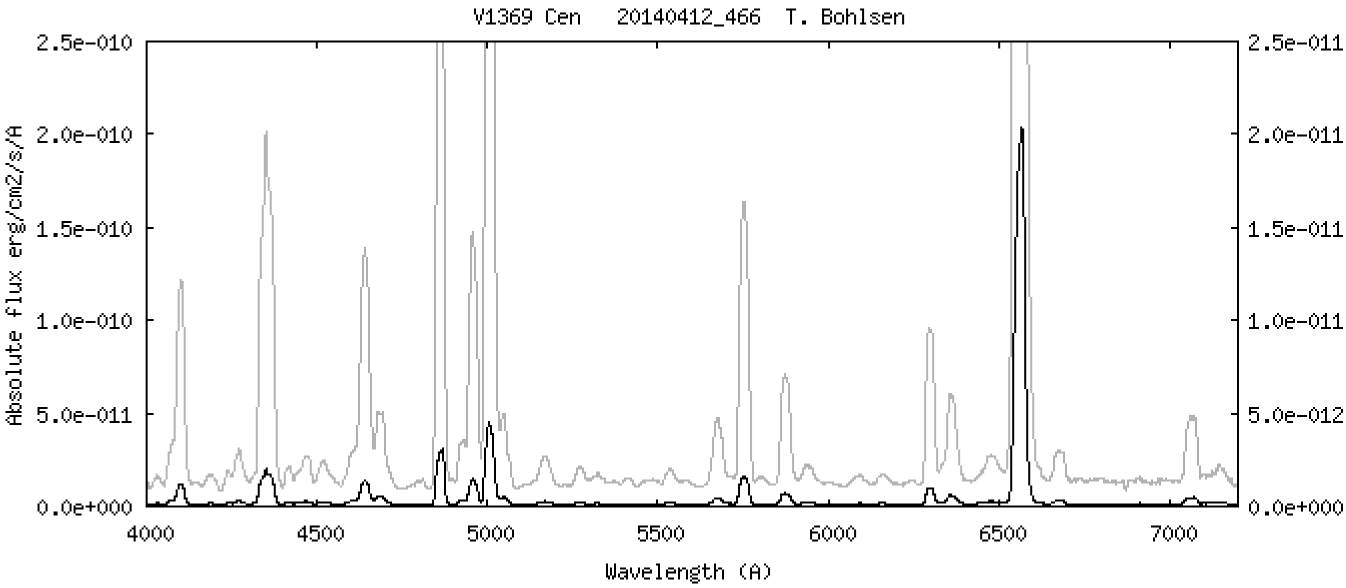
Nova Cen 2013 = V1369 Cen

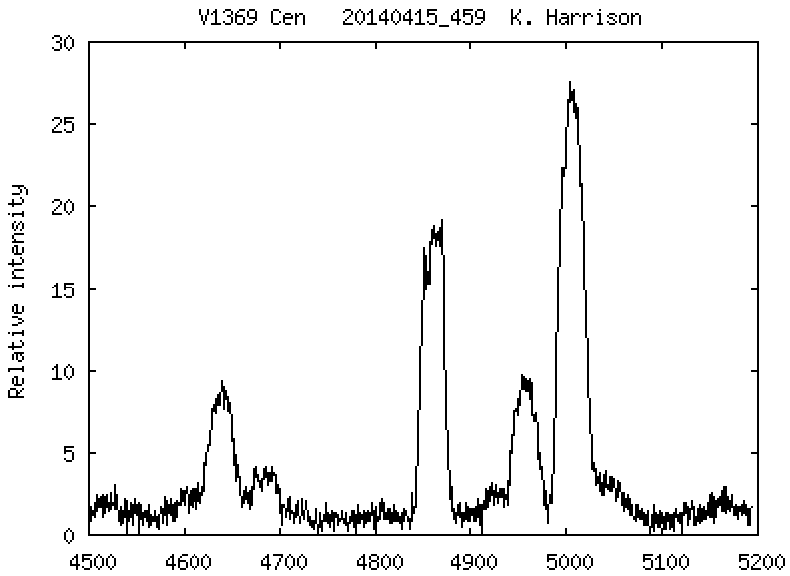
Luminosity
Mag V = 7.8 (2304-2014)
Rebrighning a mag 7.5 after a minimum at 8.0 (05-03-2014) and now plateau phase, slowy declining, about 4 mag under maximum luminosity

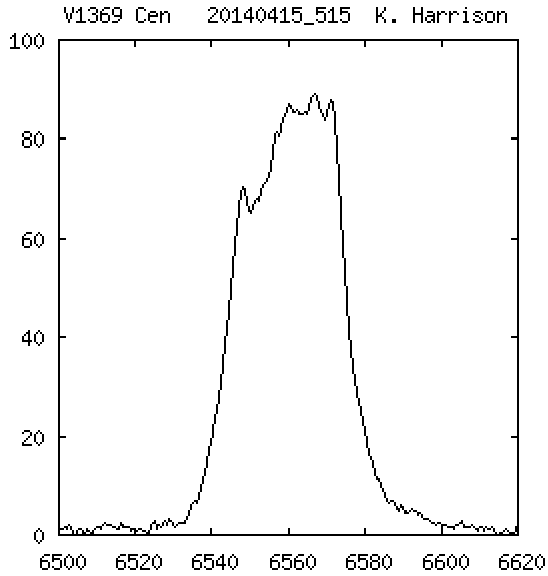
Observing
New spectra from Terry Bohlsen and Ken Harrison

Pretty constant spectrum during this plateau phase









Observers : Terry Bohlsen - Malcom Locke - Jonathan Powles - Ken Harrison - Julian West - Tasso Napoleao - Rogerio Marcon

ARAS DATA BASE : 129 spectra **http://www.astrosurf.com/aras/Aras_DataBase/Novae/Nova-Cen-**

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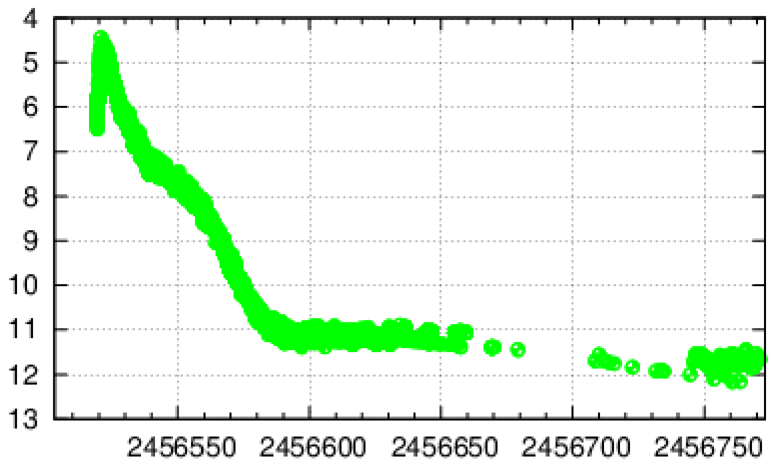
Nova Del 2013 = V339 Del

Luminosity
Mag V ~ 12 (10-04-2014)
Always in the very long plateau phase, slowly declining

Observing
Spectra required (one a week)
The nova is now higher in the morning sky and easy to observe

ARAS data base : 1114 spectra



ATEL #6088

Contemporaneous high resolution ultraviolet (HST/STIS) and Nordic Optical Telescope (NOT/FIES) spectroscopy of V339 Del = Nova Del 2013 in the Nebular Stage

S. N. Shore & al. ,22 Apr 2014; 02:24 UT

In our continuing campaign on V339 Del = Nova Del 2013, we obtained nearly simultaneous spectra with HST/STIS (medium resolution echelle, 1150 - 3000A) (ATel#5409,5624) on 2014 Apr. 19.1 UT and the Nordic Optical Telescope (FIES high resolution echelle, 3800 - 7400A) on 2014 Apr. 15.2 UT. The observations occurred after the end of the bright supersoft source phase (ATel#5967). The source continues to fade steadily in X-rays. The count rate with the Swift XRT (0.3-10 keV) was about 0.028 ± 0.005 on Apr. 13, and 0.022 ± 0.003 on Apr. 20. The UV and optical spectra show that the nova is now in the nebular stage with the dominant optical lines being hydrogen Balmer, He I, He II, [O III], 3727, 4363, 4959, 5007, [N II] 5755 (the 6548,6583 doublet is still blended with Halpha but now discernible),

N III 4636, [Ar III] 7135, [O II] 7320/7330. The [O I] lines at 6300, 6364A remain visible while O I 1302 is now absent. The Balmer profiles are similar to those of He I: asymmetric with the blue side of the line being about a factor of two stronger than the red and FWZI of about 3000 km/s.

The STIS UV spectra show a broad range of ionization stages. The excited state transitions O V] 1371 and He II 1640 show almost identical profiles, two peaks at around -500 and +600 km/s (the same as for the optical lines) with the blue to red peak flux ratio of about unity but with the blue peak broader (about 520 km/s vs. 250 km/s FWHM). N IV] 1718 is very weak if present. Some of the strongest UV transitions detected (integrated fluxes in units of 1E-11 erg/s/cm^2 with no correction for reddening): N V 1240

(1.4), C II 1335 (0.5), O IV] 1403 (0.3), N IV] 1486 (1.4), C IV 1550 (3.2), He II 1640 (0.3), O II] 1667 (0.2), N III] 1750 (1.3), C III] 1910 (2.7), N II 2143 (0.2), C III 2297 (0.04), C II 2324 (0.6), O II 2470 (showing the same profile as [O II] 7319/7330), Mg II 2800 (0.08). Most lines are about a factor of 10 weaker now than in late Nov. 2013. The line profiles vary systematically, the neutral lines have a FWZI of about 2500 km/s (e.g. O I] 6300, 6364) with weaker emission at positive radial velocities while the higher ionization lines, and the Balmer lines, show FWZI ~ 3000 km/s (e.g. N IV] 1487, C II] 1910) and more distinct emission peaks. The complex

blend at 1400 is O IV 1401. Based on the optical [O III] and [N II] lines, the electron density is about 5E6/cm^3 (Te ~ 1E4 K) and the filling factor of the ejecta appears to be moderately high, between 0.3 and 1, although all strong lines show discrete emission features with widths of ~ 200 km/s.

The Lyman alpha profile still shows weak emission at positive radial velocities, the absorption is consistent with only an interstellar contribution.

The integrated flux (1150-7400A) ~ 4.6E-10 erg/s/cm^2 corresponds to~1.8E-9 erg/s/cm^2 with **E(B-V)=0.2** applied corresponding to a band-limited luminosity of about 950 L_sun for a distance of 4.2 kpc (Atel#5410).

ARAS DATA BASE | 7 spectra| http://www.astrosurf.com/aras/Aras_DataBase/Novae/Nova-Del-2013_2.htm
ARAS Web Page for Nova Del 2013 : http://www.astrosurf.com/aras/novae/Nova2013Del.html

Nova Del 2013 = V339 Del

Further comments to Atel #5088 by S. Shore

There wasn't enough space to include the result that the HST/STIS pointing seems to be showing the same thing we saw in T Pyx -- detached, relatively isolated absorption features on N V 1238, 1242 Å. The two lines, if from N V 21238, correspond to -1900 and -1400 km.s^{-1}. The companion lines from 1242 Å are embedded in the emission. The other narrow lines are interstellar, Mg II, and there is *nothing* among the interstellar line identifications that correspond to the absorptions seen here. Unfortunately, during the last observation (28/11/2013), the absorption from the P Cyg component on N V was so strong that it

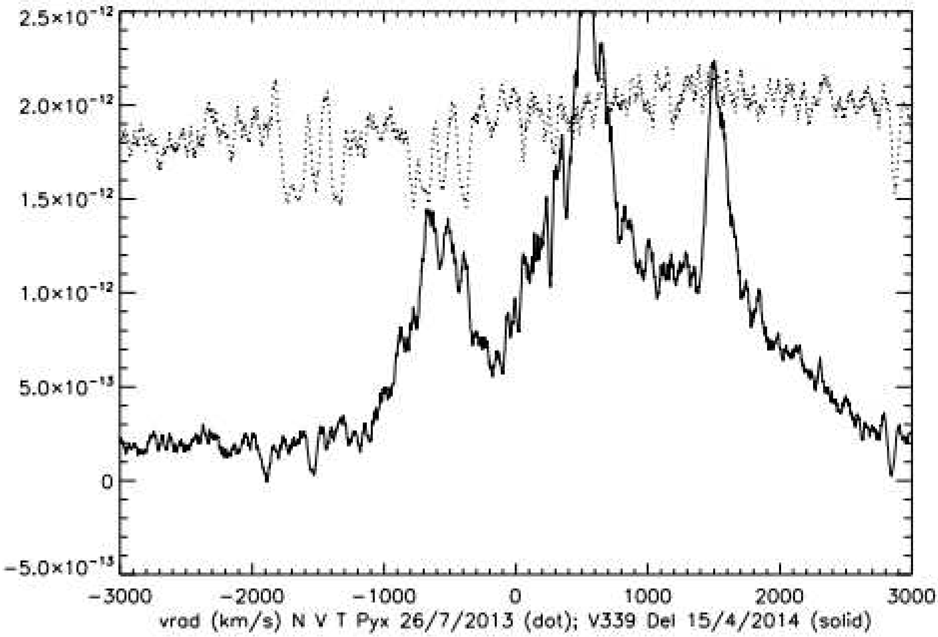


Figure 1. The N V 1238, 1242 Å absorption (and emission) line in V339 Del (20/4/2014) compared to the day 600 spectrum of T Pyx 2011. This result is still tentative but a sign of yet another essential similarity among classical novae. Remember, T Pyx is a recurrent and a very low mass ejecta.

The ionization structure is well seen in the comparison here. The [N II] line shows similar structure to the Balmer series, as we mentioned in the ATel, but also note the similarity of these lines to those in V1369 Cen now.

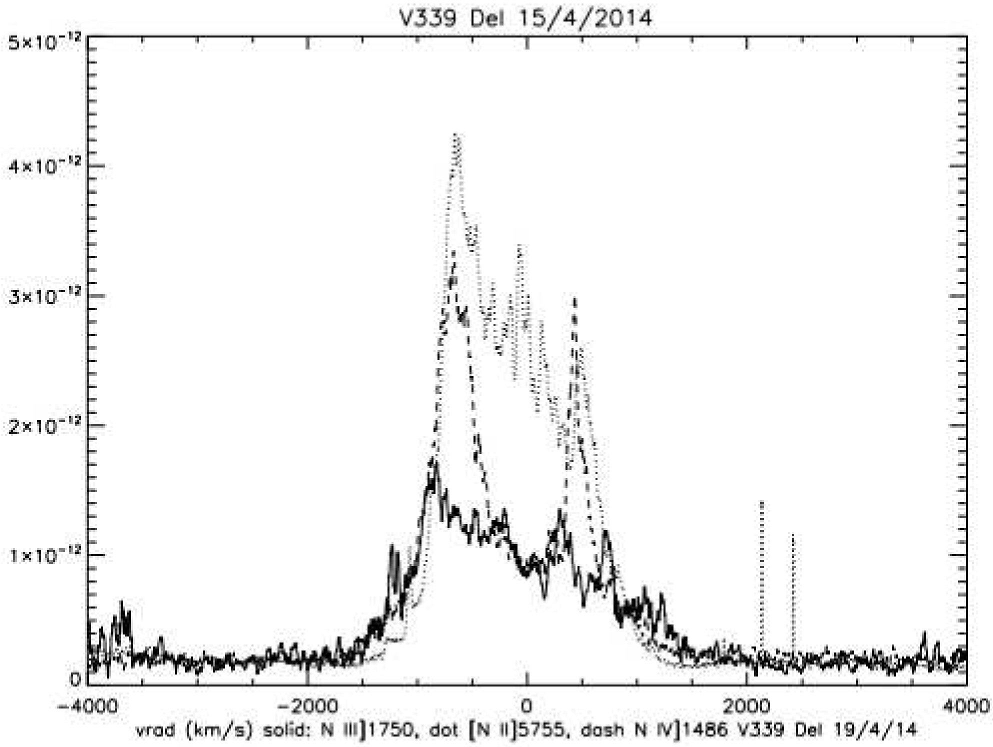


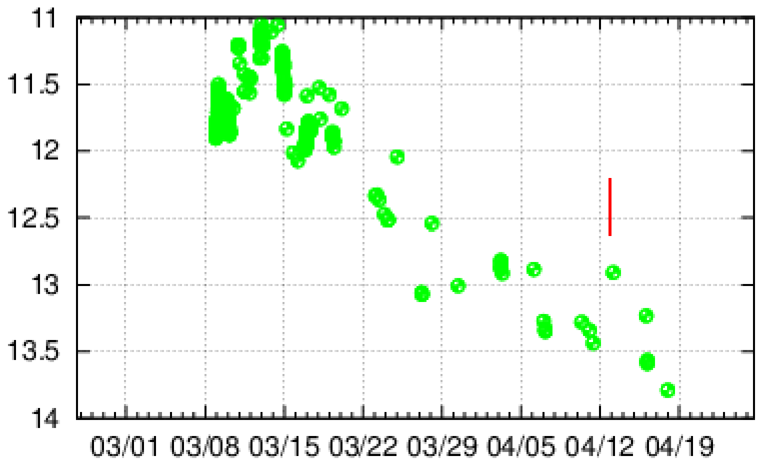
Figure 2. V339 Del from the last STIS/NOT observations.
The lines included are [N II] 5755 Å (NOT, 15/4/2014), N III] 1751 Å, and N IV] 1486 Å (STIS, 20/4/2014). This is a very clear example of the ionization stratification of the ejecta about two months after the end of the supersoft stage and about 200 days after outburst.

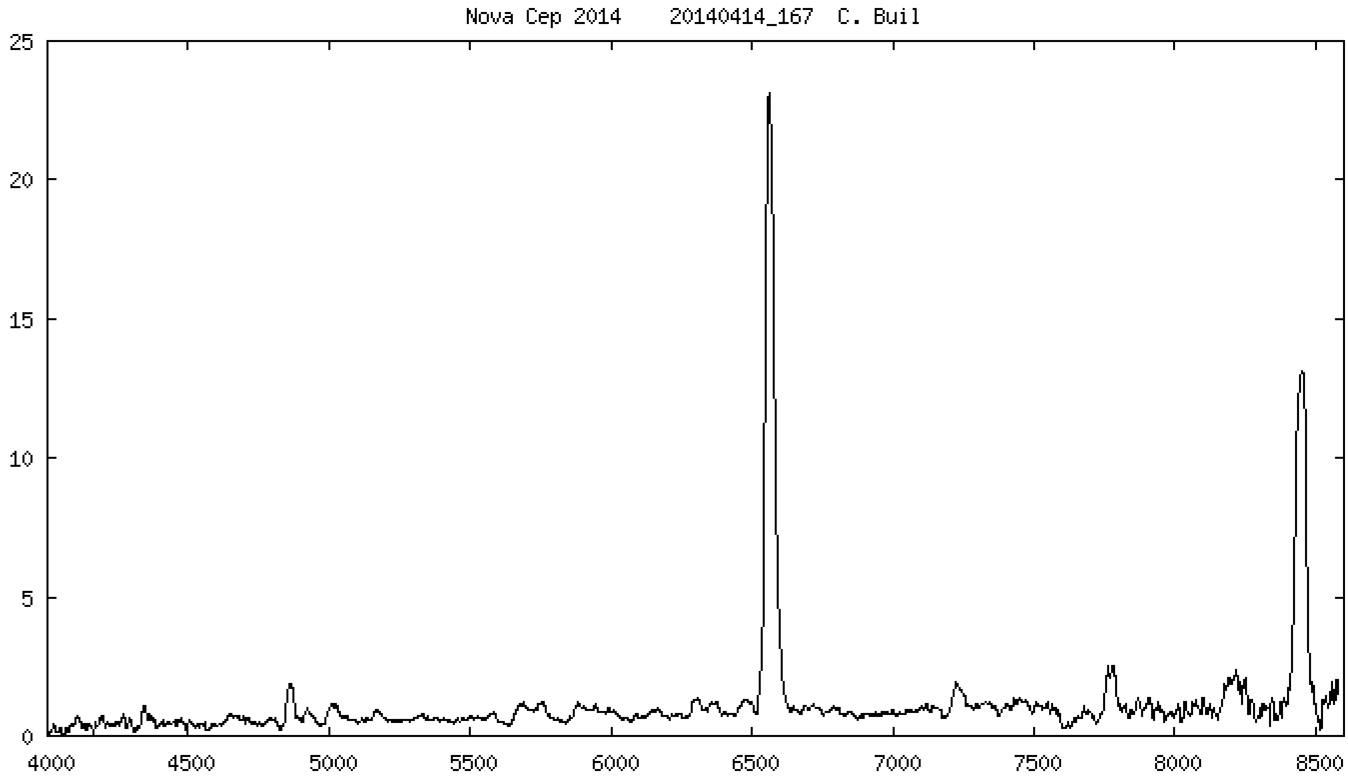
N O V A E

Nova Cep 2014 = TCP J20542386+6017077

Luminosity
Mag V ~ 13.4 (13-04-2014)
Declining

Observing :
New spectrum from C. Buil





Observers : C. Buil| R. Leadbeater | P. Gerlach | O. Garde | T. Lester

ARAS DATA BASE | 10 spectra| http://www.astrosurf.com/aras/Aras_DataBase/Novae/Nova-Cep-2014.htm

Steve Shore

The accretion process

To return to a point from the last set of notes, the symbiotic systems were originally distinguished not only by their emission strength but by the incongruous combination of high ionization emission lines and very low temperature continuum emission. The giants are all about 4000 K or cooler. Some are Mira variables, an important characteristic since as pulsational variables also have a sort of period-luminosity relation. The nature of the ionizing source is, in fact, even more clearly illustrated by a comparison of α Sco and Mira itself and any of the systems you've been observing. Antares and Mira are binaries with the companion being a more normal, main sequence star. For Mira, the companion appears to be an accreting WD. In both cases, the systems are close enough that the ionized regiona around the hot component is resolvable with radio interferometry and also UV observations (for instance, Karovska et al. 1997, ApJ, 482, L178; Sokoloski and Bildsten 2010, ApJ, 723, 1188; Hjellming and Newell 1983, ApJ, 275, 704). The ionization cavity in Antares has been imaged in radio over time and the orbital motion can be detected. This is important as a comparison with normal symbiotic systems (if ``normal'' is the right word) such as R Aqr that have resolved emission nebulae. Mira is a particularly interesting case because it *doesn't* look like a symbiotic.

In the classical symbiotics, the emission is often from very strong high ionization states of heavy elements. The first lines that were noticed, He II 4686 Å and the [O III] nebular doublet, are the first indication of something emitting at above 25 eV. But in some systems, e.g. RR Tel, the ionization has increased to [Fe VII] and higher. This is only possible if there is a strong emitting source at >50 eV. No normal star can supply such hard photons. But the clue is the the combination of luminosity and hardness. Normal stars, in hydrostatic equilibrium, have extremely opaque interiors and their nuclear sources, even those that produce 10^4 $L_\odot$ (like the O stars) transfer those photons from the boundary of the core to the surface through tens of solar masses of matter. The result is a surface temperature that rarely exceeds 50 kK. This is sufficient to produce the [O III] lines, if the surrounding medium is sufficiently low density, and [N III] but *not* the high ionization states of the iron group lines. The clue is the requirement of hydrostatic balance of a nuclear=

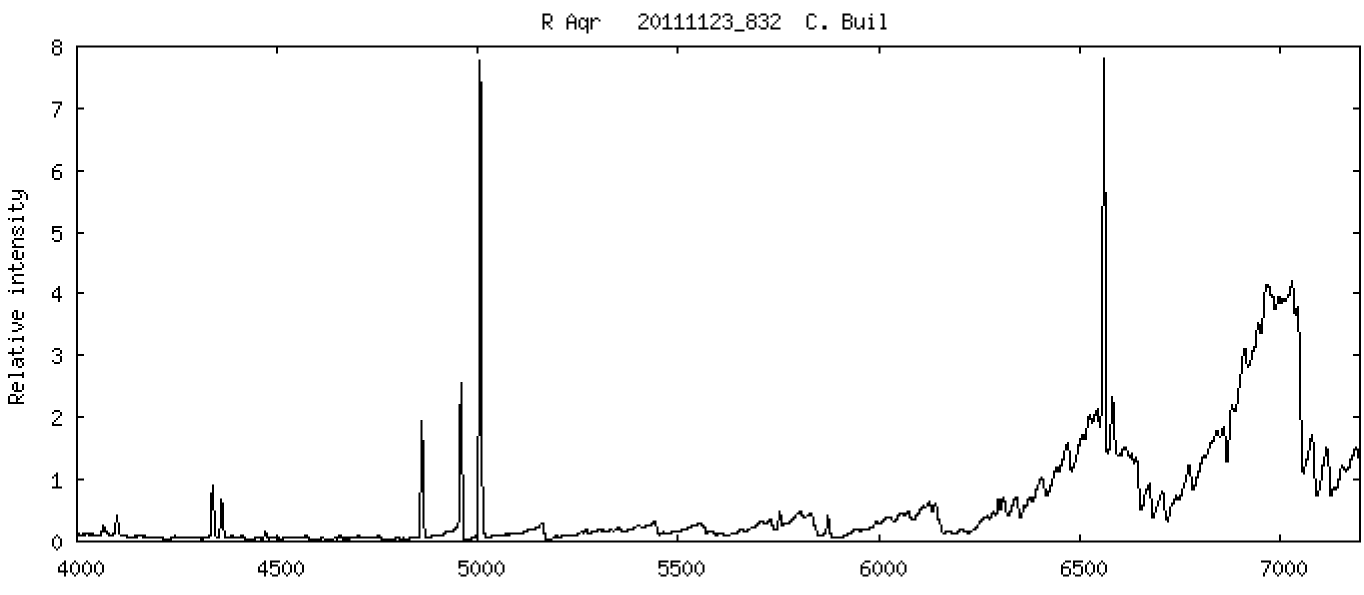


Figure 1. The Mira symbiotic star R Aqr at mag V = Strong emissions of Balmer, [O III] He II lines on the continuum of the Mira

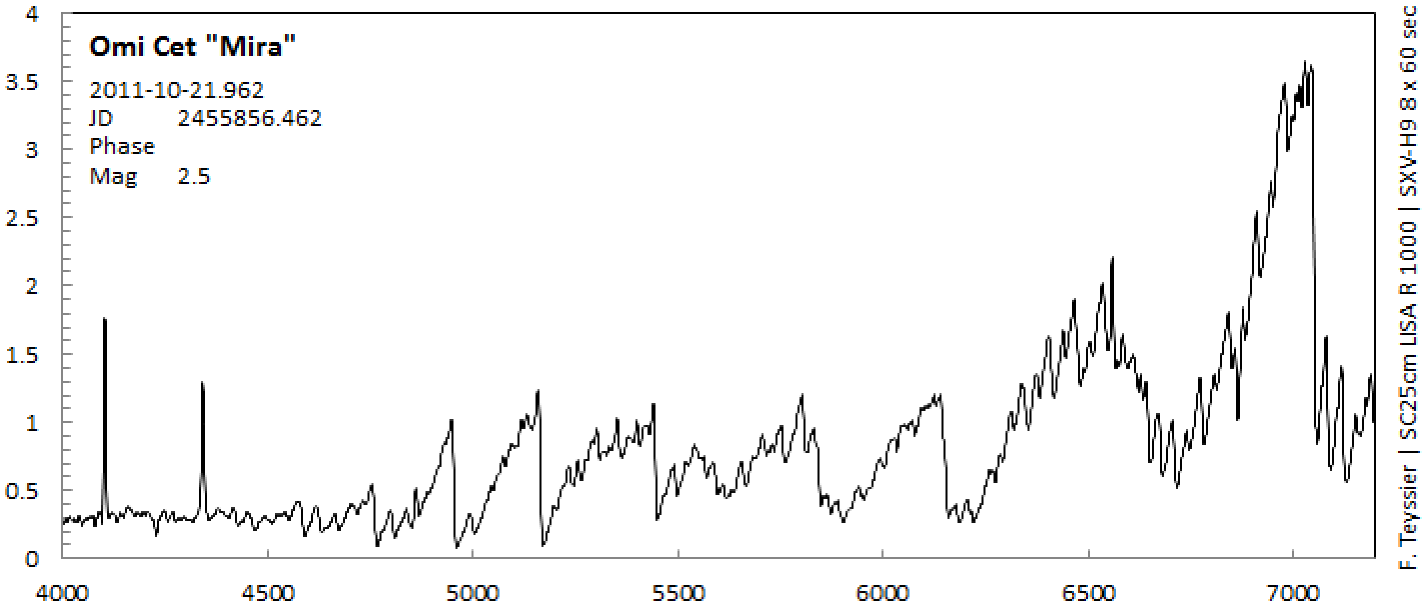


Figure 2. Mira (o Ceti) near maximum luminosity - Typical spectrum of a Mira at maximum luminosity : Bands of TiO and peculiar Balmer decrement : Hβ very faint and Hδ intense

powered source. The gas, being ideal, reacts to the high temperature produced by the core with a pressure gradient that balances the overlying layers. The result is a very large object and the radius of a normal star, on the main sequence (or later) increases with increasing luminosity. Because of the mass-luminosity relation of the nuclear powered main sequence stars -- the core temperature increases with increasing mass, hence the luminosity increases -- the surface gravity of such stars is rather low (about 30 times that of the Earth, about 10^4 cm.s^{-2}, and the escape velocity is low, < $10^3$$ km.s^{-1}. Imagine now that these stars accrete mass. The gravitational potential energy available from infall is determined by the mass to radius ratio of the gainer. For these stars, that is a decreasing function of mass. Some X-ray emission might be expected but only weakly and the density will be rather high around the star. On the other hand, let a 1 $M_\odot$ degenerate star accrete mass and the result is completely different. Degeneracy implies that the radius *decreases* with increasing mass and the gravitational potential energy available from infalling matter also increases. Immerse that star in a wind and it can capture the passing gas gravitationally if the outflow from its companion (as I discussed last time) is lower than the escape velocity. For a red giant, this is it *always* true. It doesn't matter what the mass loss rate is from the giant, it will be slow (the escape velocity from the giant is tens of km.s^{-1}. The capture rate depends on the same parameters as the rate of emission of the material, the mass to radius ratio of the white dwarf, and so does the temperature. So the matter, falling onto the surface, will release energy at X-ray energies (temperatures of 10^7K) and with a luminosity that depends only on the rate of mass accretion (the luminosity is proportional to the accretion rate).

Now let me step back for a moment. The matter doesn't fall in like stones dropped from any radial position. These are binary systems, not isolated WDs, and the matter has a small but not negligible angular momentum. To be more precise, the angular momentum depends on the orbital period but also on the rotation of the giant. If we ignore the latter, there is still a deviation of the material on its passage from one star to another and the accretion is not symmetric around the line of centers. This deviated matter, when captured, orbits WD. But being a continuous flow, when it intersects itself it isn't like a particle trajectory (although such analogies have been erroneously used to describe such flows). The returning matter slams into the incoming gas at supersonic speeds, resulting in a shock. Oblique intersection produces streaming, strong emission (again, X-rays), and turbulent fluctuations that act like a viscosity, re-directing the flow and producing a circulating, hot, turbulent disk. At least this is the standard picture and it's quite consistent with the observed phenomena. We don't' understand the details of what happens next, but the big picture is pretty certain: some form of turbulent coupling of the shearing gas, whether magnetic or fluid or both, produces a strong tendency of the circulating matter to dissipate energy. The disks are heated by this process, vertically inflating to maintain pressure balance in the gravitational field of the mass gaining star, and the surface radiates locally like a photosphere. the main difference here is that the gravitation is not local, it's a tidal force produced by the central star, so the temperature varies across the surface of the disk with distance from the center. In other words, the disk {\it never} looks like a star. The shear, which is the source of the heating, increases as the matter gets closer to the center (assuming the disk is approximately in Keplerian motion so the orbital velocity varies as $r^{-1/2}$, and the inner par is hotter than the outer. This produces an integrated spectrum that looks like a power law continuum with a high energy cutoff (from the innermost orbit). The energy lost by this frictional heating comes from the kinetic energy of the circulating matter. In Keplerian motion, this is the same as a loss of angular momentum and the matter slowly drifts inward and accretes onto the star. What happens at the inner boundary is also not well understood but there must be a layer where the matter goes from circulation to infall, producing a shock when it hits the WD surface, and the ret of the energy is radiated there. The temperatures thus produced by this whole process vastly exceed anything that could be obtained from a normal star, even an accreting one, and this ionizes the surrounding gas. In a close binary system, such as a classical nova, there isn't anything but the disk surrounding the WD so the emission is coming only from the disk. In the symbiotics, the ambient wind of the red giant is high enough density and sufficiently extensive that the hard emission from the WD can be absorbed and radiated in emission lines. This is the i*onization bounded* region I mentioned in the last notes.

This process of forming a disk is a very general one in binary systems. The nature of the mass gainer is less important than the fact that the captured matter has sufficient shear and density to produce some kind of internal frictional coupling. Another way of seeing this is to consider what viscosity does. Imagine three radial annuli circulating around the WD. The inner one has higher velocity but lower angular momentum, the outer the contrary. Thus, any frictional coupling makes the outer region speed up at the expense of slowing down the innermost. This coupling is the same as a diffusion of orbital kinetic energy outward and, if the matter is bound, produces an inward drift. One usually says that viscous torques produce a slow inward drift whose rate depends only on the shear and the viscosity. Whether the mass is supplied by a stream, as in the close systems (and also Algol-type binaries, any system that is close enough to have one of the stars reach its dally limited radius will send matter toward its companion; this is the Roche surface) or a wind from a more distant star doesn't matter. The lower the angular momentum, the more nearly radial will be the accretion but a disk inevitably forms. In the boundary layer, there may be a very large shear (since the accreting star is a slower than Keplerian rotator) and this can produce intermittent accretion (and flickering on short, second, timescales), another signature of accretion in the symbiotic systems. The disk, if luminous enough, can also power outflows. These will be axially symmetric, since flow off the surface of the disk preserves angular momentum but can expand along cylinders, and the collimations jet-like. Such effects have been reported for a number of symbiotics, e.g. CH Cyg and Z And. The kinetic energy in these jets, which may be episodic, depends on the luminosity of the disk, hence on the mass accretion rate.

Steve Shore

I hope this makes sense. It's complicated phenomenologically but actually quite simple in its basis. Every step depends on the intensity of the central gravitational field. The more mass you pile onto the WD, the brighter the disk will be until radiation pressure itself governs the structure and produces an outflow (from the disk surface). You can maintain a wind and accretion at the same time if the disk viscosity is high enough. The problem, central to all such models (including when there are central black holes) is the origin of the viscosity. While one can model the process assuming a simple form for the friction, usually taken as a traction of the disk pressure for the stress producing the viscous torque, the origin of the high values required to account for the inward drift rates remains a subject of heated debate. Something that acts like turbulence is required, that is something macroscopic. The normal microscopic (molecular level) viscosity that causes a spinning bowel of soup to reach solid body rotation and eventually stop won't work because the densities are too low and the speeds too high. One of the ways to understand this is from the emission lines. Their luminosity is powered by the accreting source so by obtaining the energy balance and the timescales one can estimate what the viscous torque must be. From that, the mechanism should be discernible. At least that's the hope.

OK, I'll stop here and hope that any of this made sense. The next time I'll include some cartoons for illustration. In the meantime, I strongly recommend trying some experiments with spin-up of cups of coffee (take the cup and spin it without stirring around on its plate, you'll need an American-size cup, I'm afraid, and a low friction plate but I assure you it'll be worth it). The spin-up timescale is a very good measure of the viscosity and, by reversing the picture, will give you a feeling for how the accretion is taking place.

Steve Shore, 28-04-2014

Steve's notes download

Novae - First part
http://www.astrosurf.com/aras/novae/Images_NovaDel2013/SteveNotes.pdf

Novae - Second part
http://www.astrosurf.com/aras/novae/Documents/NotesSteve_II.PDF

V339 Del

http://www.astrosurf.com/aras/novae/Nova2013Del.html

Symbiotics

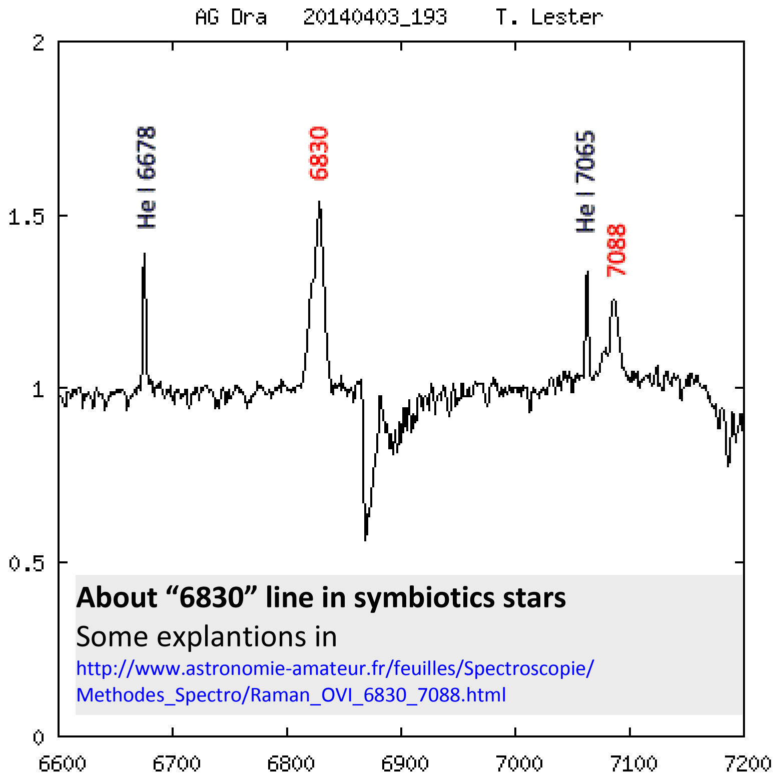
Selected list of bright symbiotics stars of interest

Target						Refrence Star					
#	Name	AD (2000)	DE (2000)	Mag V *	Interest	Name	AD (2000)	DE (2000)	Mag V	E(B-V)	Sp Type
1	AX Per	1 36 22.7	54 15 2.5	11.6	++	HD 6961	01 11 06.2	+55 08 59.6	4.33	0	A7V
2	UV Aur	5 21 48.8	32 30 43.1	10		HD 39357	05 53 19.6	+27 36 44.1	4.557		A0V
3	ZZ CMi	7 24 13.9	8 53 51.7	10.2		HD 61887	07 41 35.2	+03 37 29.2	5.955		A0V
4	BX Mon	7 25 24	-3 36 0	10.4	+	HD 55185	07 11 51.9	- 00 29 34.0	4.15		A2V
5	V694 Mon	7 25 51.2	-7 44 8	10.5	++	HD 55185	07 11 51.9	- 00 29 34.0	4.15		A2V
6	NQ Gem	7 31 54.5	24 30 12.5	8.2		HD 64145	07 53 29.8	+26 45 56.8	4.977		A3V
7	T CrB	15 59 30.1	25 55 12.6	10.4	++	HD 143894	16 02 17.7	+22 48 16.0	4.817	0	A3V
8	AG Dra	16 1 40.5	66 48 9.5	9.7	++	HD 145454	16 06 19.7	+67 48 36.5	5.439	0	A0Vn
9	RS Oph	17 50 13.2	-6 42 28.4	10.4	++	HD 164577	18 01 45.2	+01 18 18.3	4.439	0	A2Vn
10	YY Her	18 14 34.3	20 59 20	12.9	++	HD 166014	18 07 32.6	+28 45 45.0	3.837	0.02	B9.5V
11	V443 Her	18 22 8.4	23 27 20	11.3	++	HD 171623	18 35 12.6	+18 12 12.3	5.79	0	A0Vn
12	BF Cyg	19 23 53.4	29 40 25.1	10.8	++	HD 180317	19 15 17.4	+21 13 55.6	5.654	0	A4V
13	CH Cyg	19 24 33	50 14 29.1	7	+	HD 184006	19 29 42.4	+51 43 47.2	3.769	0	A5V
14	CI Cyg	19 50 11.8	35 41 3.2	10.5	++	HD 187235	19 47 27.8	+38 24 27.4	5.826	0.02	B8Vn
15	StHA 190	21 41 44.8	2 43 54.4	10.3	+	HD 207203	21 47 14.0	+02 41 10.0	5.631	0	A1V
16	AG Peg	21 51 1.9	12 37 29.4	8.6	++	HD 208565	21 56 56.4	+12 04 35.4	5.544	0	A2Vnn
18	Z And	23 33 39.5	48 49 5.4	9.65	++	HD 222439	23 40 24.5	+44 20 02.2	4.137	0	A0V
19	R Aqr	23 43 49.4	-15 17 4.2	9.9	++	HD 222847	23 44 12.1	- 18 16 37.0	5.235	0	B9V

Mag V * : 01-04-2014

From 13-04 to 30-04

New spectra	
ZZ CMi	4
NQ Gem	4
T CrB	6
AG Dra	2
RS Oph	1
YY Her	1
V 443 Her	2

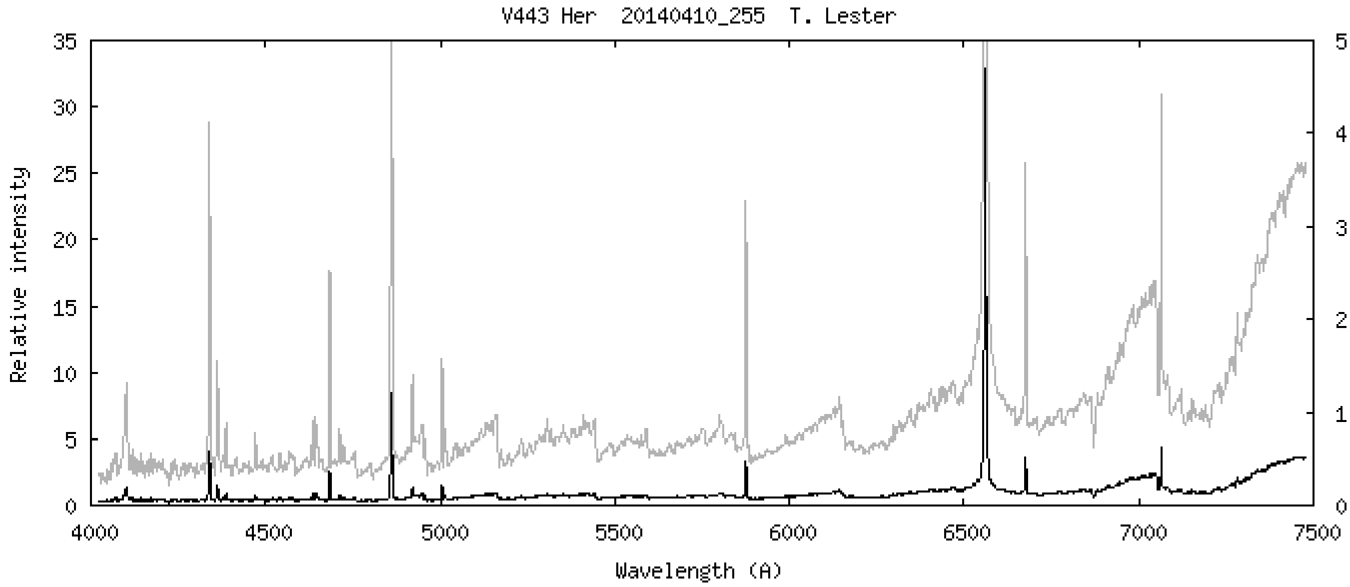


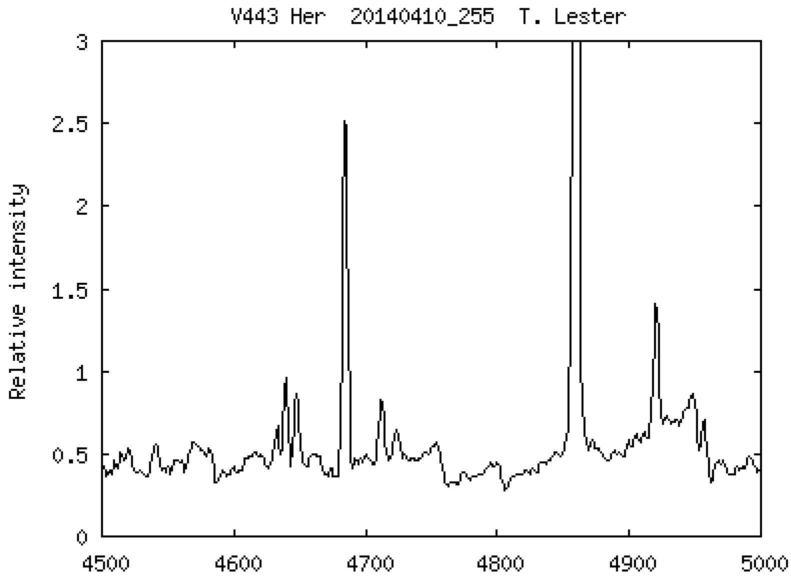
About "6830" line in symbiotics stars
Some explantions in
http://www.astronomie-amateur.fr/feuilles/Spectroscopie/Methodes_Spectro/Raman_OVI_6830_7088.html

ARAS DATA BASE | http://www.astrosurf.com/aras/Aras_DataBase/Symbiotics.htm

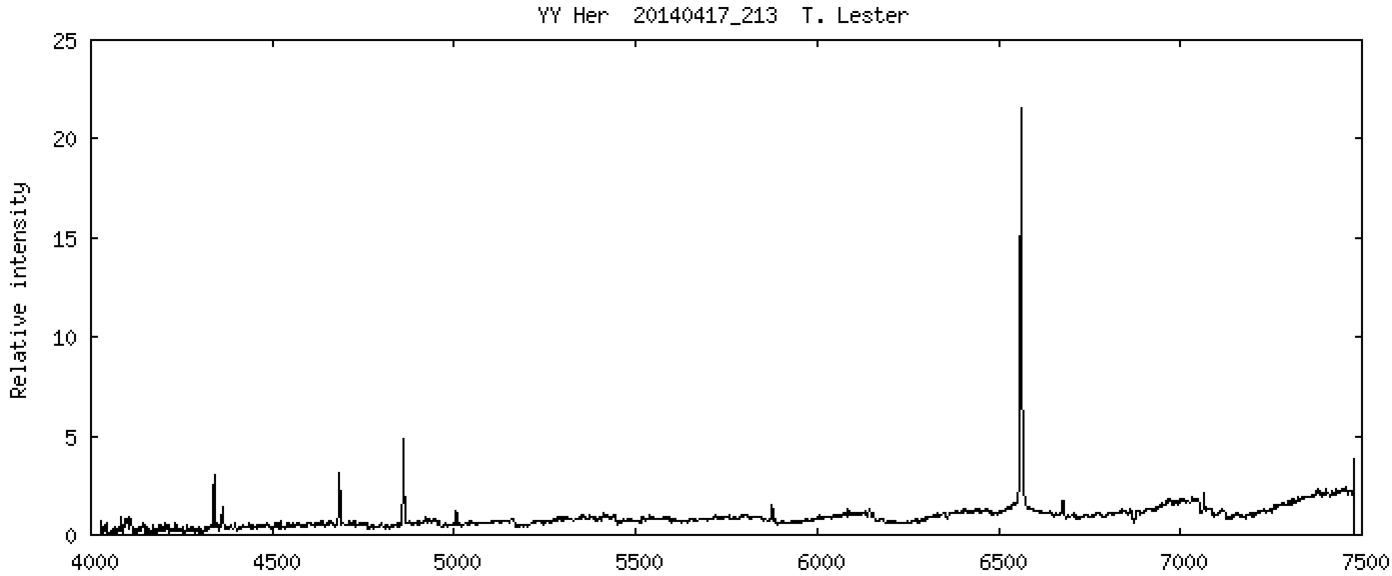
S y m b i o t i c s

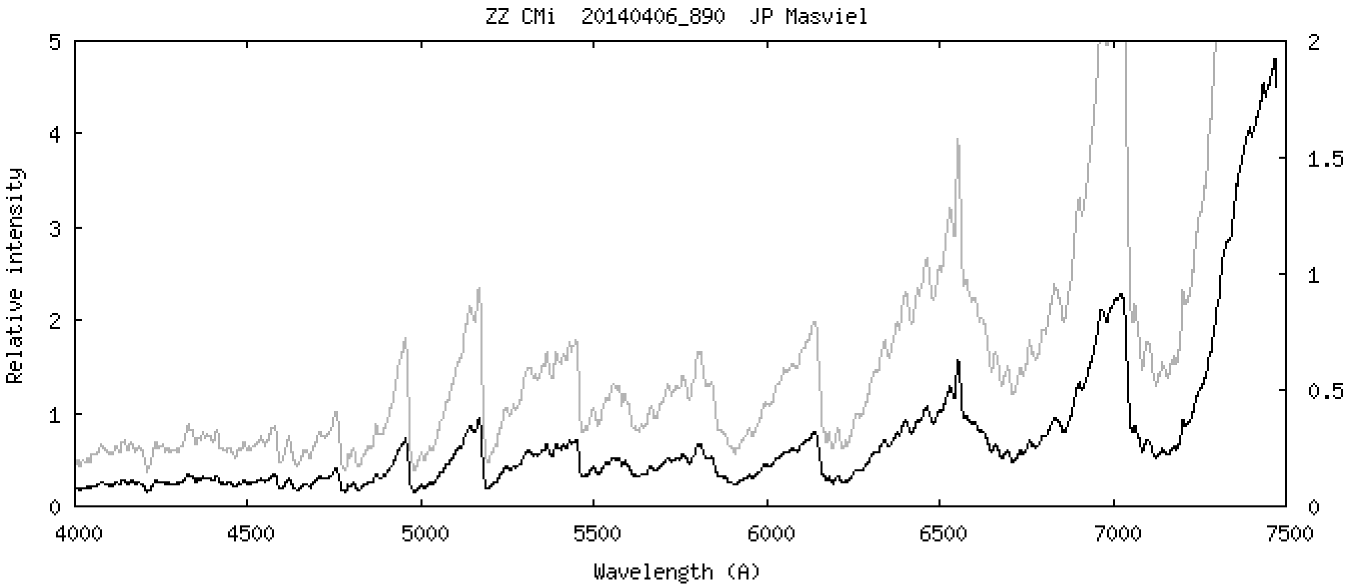
V443 Her

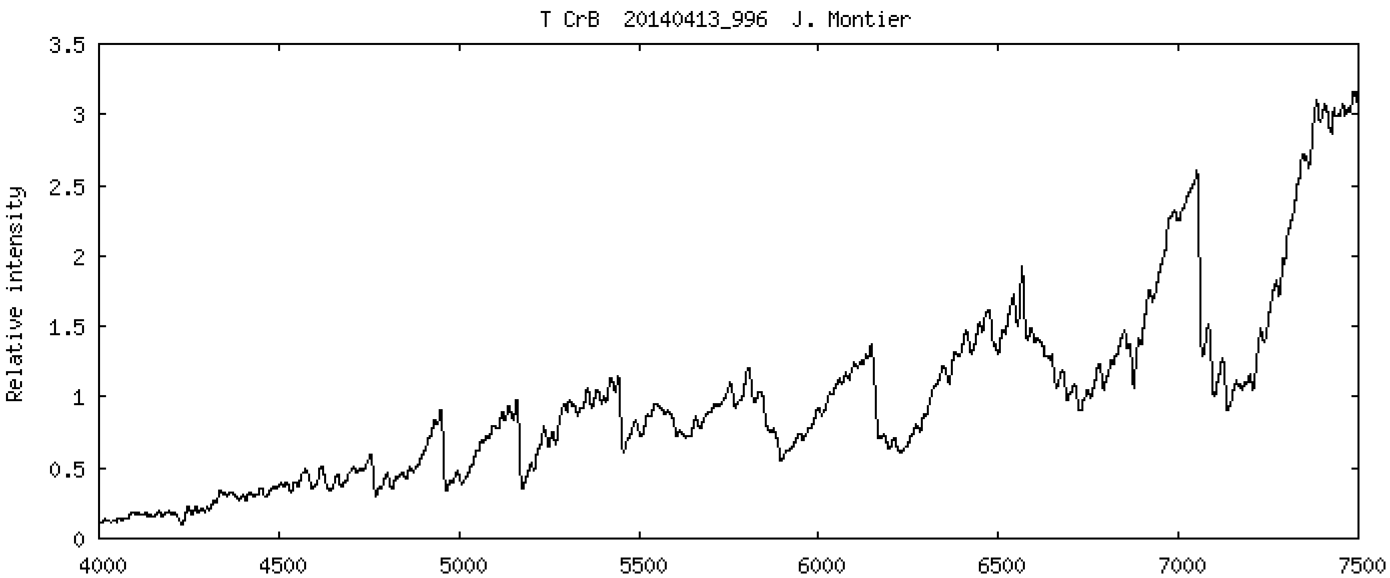




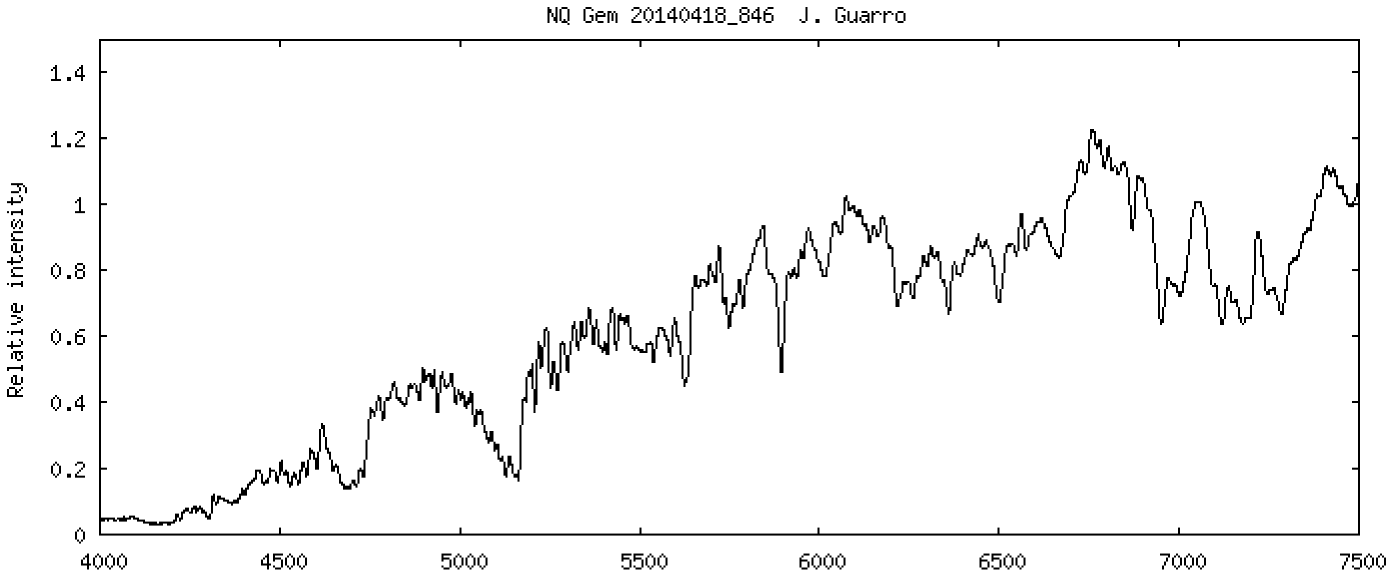
YY Her ZZ Cmi T CrB recent spectra

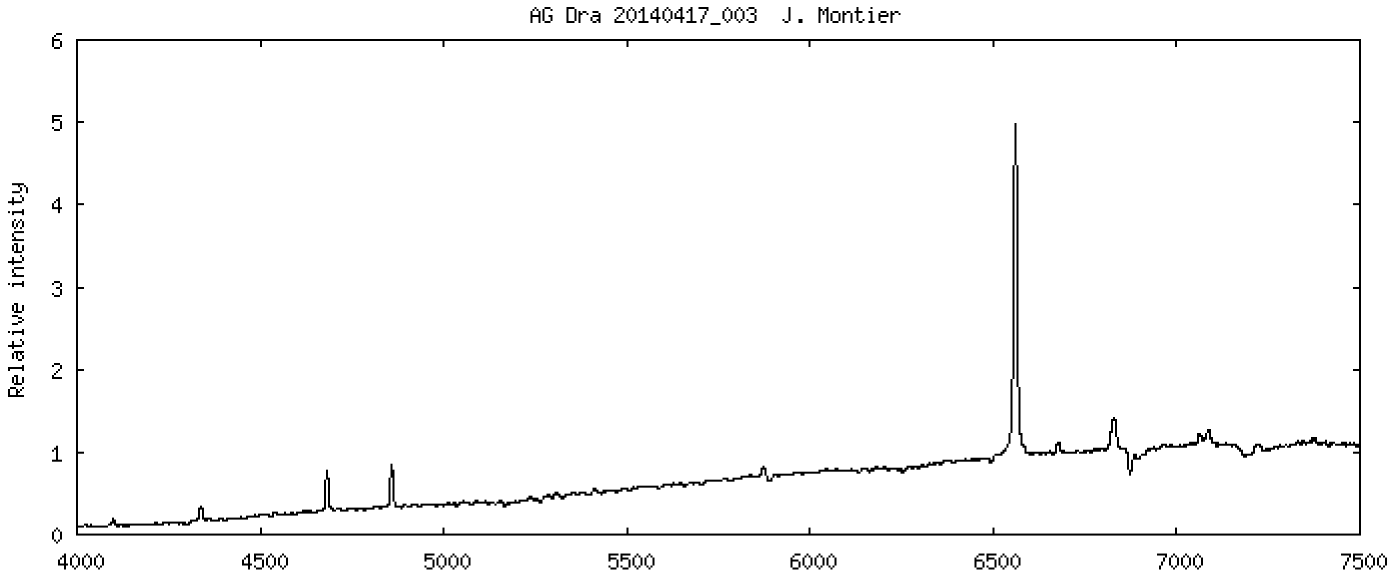


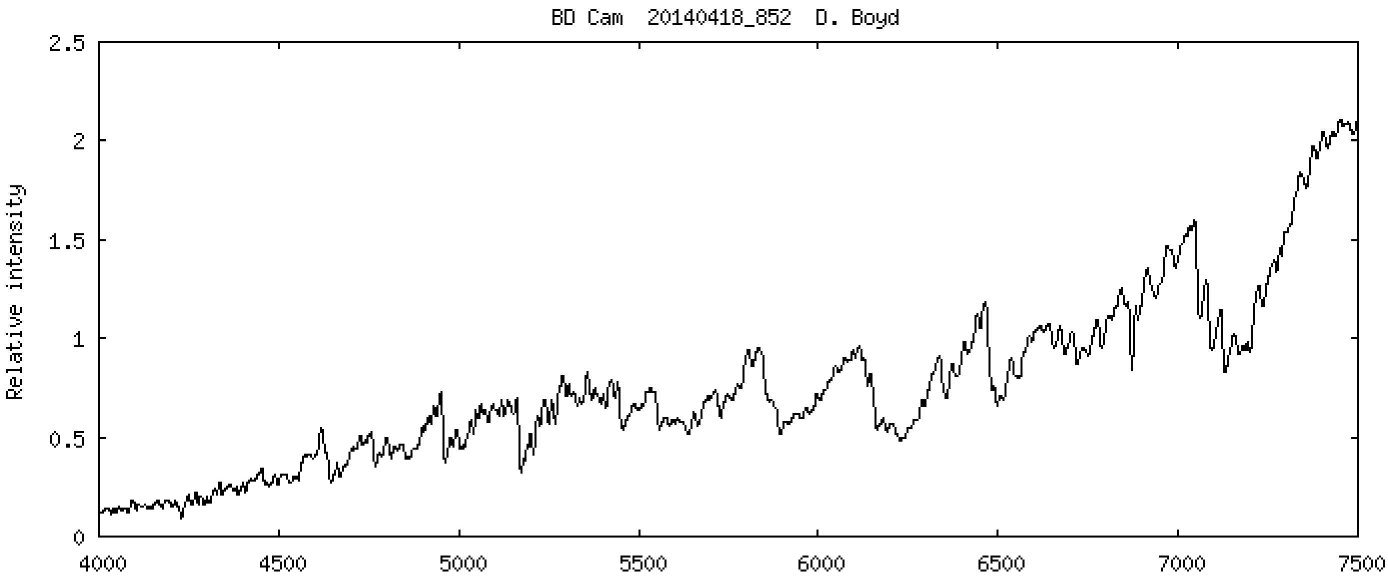




NQ Gem AG Dra BD Cam recent spectra







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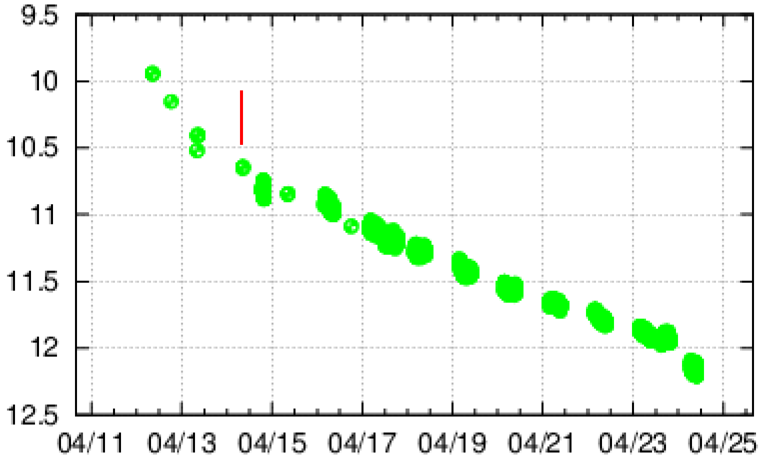
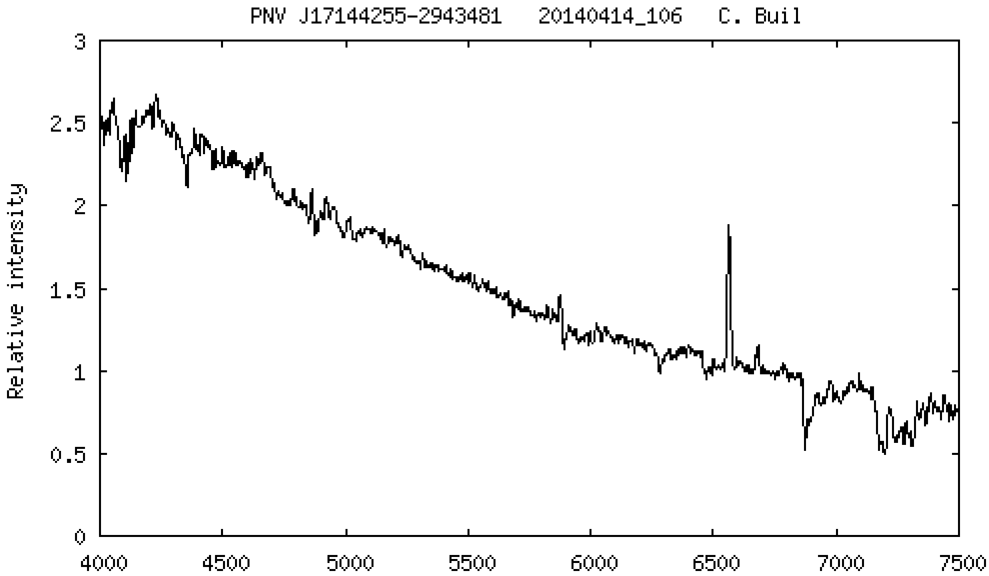
PNV J17592412+2520317

Superoutburst of a WZ Sge cataclysmic
In Ophiucus
PNV J17144255-2943481
http://www.cbat.eps.harvard.edu/unconf/followups/J17144255-2943481.html

Spectrum obtained by C. Buil
2014-04-14
At mag = 10.8



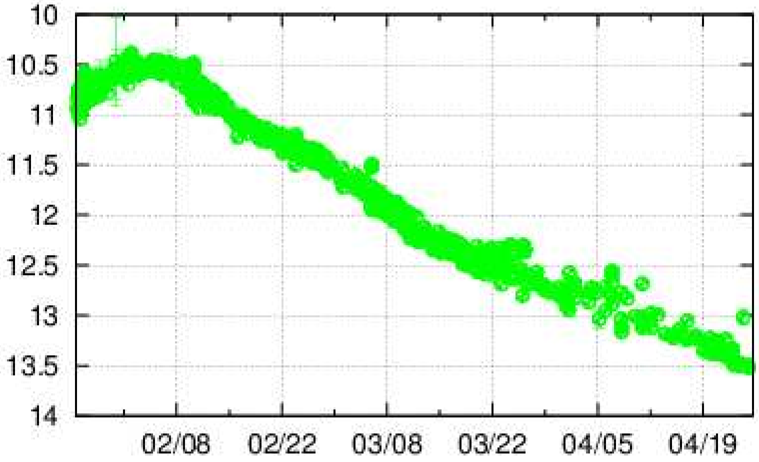


The spectrum obtained by Christian Buil is typical of a dwarf nova outburt : strong blue continuum ; Balmer lines with narrow emission component in a broad absorption. The Balmer decrement is much steeper in the emission than the absorptions line which give Ha in emission. He I 6678 and 5876 in emission. CIII/NII blend 4640 and He II 4686 in faint emission.

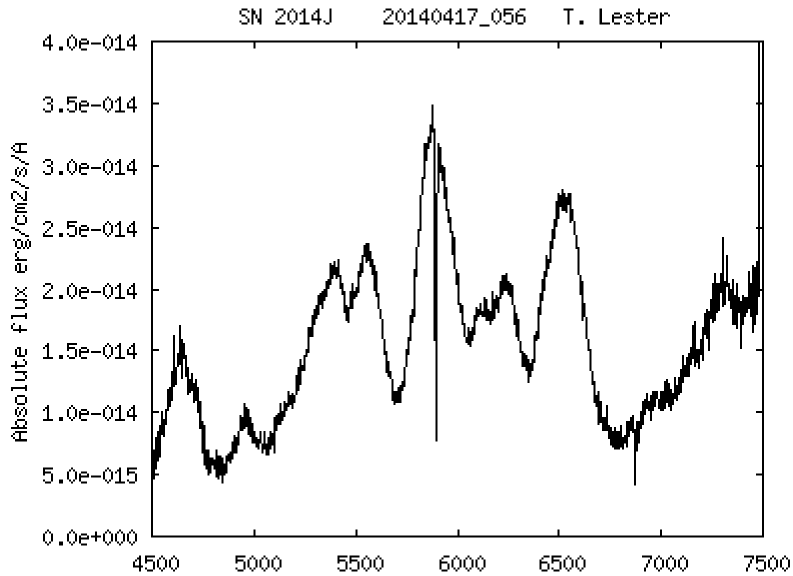
Supernovae

SN 2014J in M 82 Type Ia

Luminosity
Mag V ~13.5 (25-04-2014)



Observing
Ungoing campaign, more than 60 days after maximum luminosity
68 spectra in ARAS data base
New spectra from C. Buil, O. Garde, T. Lester



Tim Lester calibrated SN 2014J to absolute flux (using HD89343 as the calibration star)

The magnitude back out using the V Bessel function is 13.3 which is in pretty good agreement with AAVSO data data on the AAVSO light curve

Observers
P. Berardi
D. Boyd
F. Boubault
C. Buil
P. Gerlach
O. Garde
J. Guarro
O. Garde
A. Heidemann
R. Leadbeater
T. Lester
J. Montier
JP Nougayrede

ATEL #6099

Early gamma--ray emission from SN2014J during the optical maximum as obtained by INTEGRAL
J. Isern & al. , 25 Apr 2014; 17:22 UT

http://www.astronomerstelegram.org/?read=6099

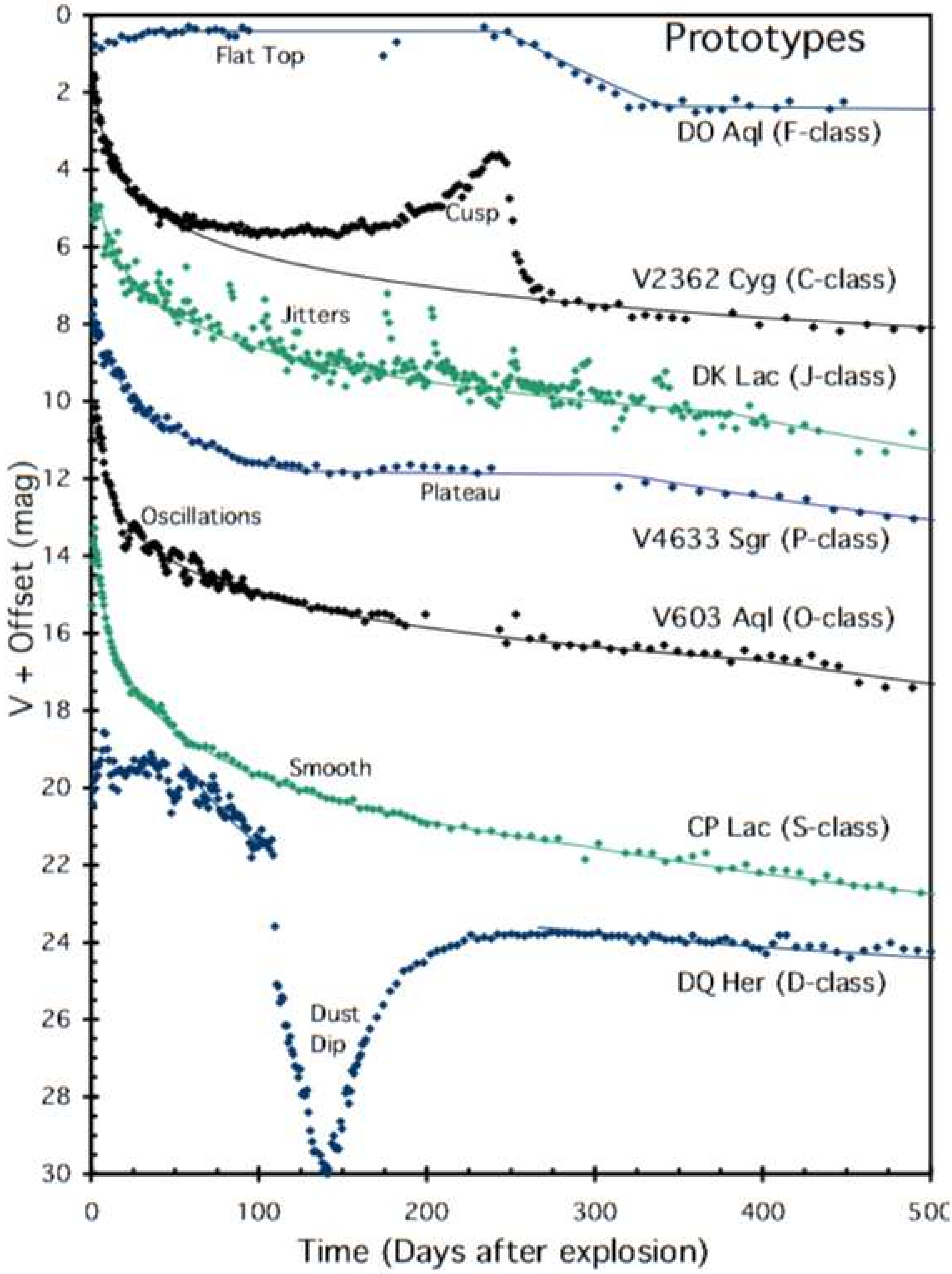
The light curve obtained with the optical monitor OMC in the V-band was corrected with the background previously obtained by this camera before the explosion. The maximum, V(max) ~10.6, without correcting for extinction, occurred at JD 2456692±1 (February 3d, 2014) and ∆m15(V) ~ 0.6.

ARAS DATA BASE | 69 spectra | http://www.astrosurf.com/aras/Aras_DataBase/Supernovae/SN2014J_M82.htm
ARAS Web page : http://www.astrosurf.com/aras/Aras_DataBase/Supernovae/SN2014J.htm

Appendix

Catalog of 93 Nova Light Curves: Classification and Properties

Strope & al. (2010) Classified the lightcurves of novae into 7 types



Catalog of 93 Nova Light Curves: Classification and Properties
Strope, Richard J.; Schaefer, Bradley E.; Henden, Arne A.
The Astronomical Journal, Volume 140, Issue 1, pp. 34-62 (2010)
http://adsabs.harvard.edu/abs/2010AJ....140...34S

Recent publications

Novae

The 2011 Outburst of Recurrent Nova T Pyx: X-ray Observations Expose the White Dwarf Mass and Ejection Dynamics
Laura Chomiuk & al.
http://arxiv.org/pdf/1404.3210.pdf

A search and modeling of peculiar narrow transient line components in novae spectra
Larissa Takeda, Marcos Diaz
http://arxiv.org/ftp/arxiv/papers/1403/1403.4952.pdf

Shortest Recurrence Periods of Novae
Mariko Kato, Hideyuki Saio, Izumi Hachisu, Ken'ichi Nomoto
http://arxiv.org/pdf/1404.0582.pdf

Supernovae

Analysis of blue-shifted emission peaks in type II supernovae
J. P. Anderson, & al.
http://arxiv.org/pdf/1404.0581.pdf

Photometric and Spectroscopic Properties of Type II-P Supernovae
Tamar Faran & al.
http://arxiv.org/abs/1404.0378

Supernova 2014J at maximum light
D.Yu.Tsvetkov, V.G. Metlov, S.Yu. Shugarov, T.N. Tarasova, N.N. Pavlyuk
http://arxiv.org/pdf/1403.7405.pdf

Contribution to ARAS data base
From 13-04 to 30-04-2014

C. Buil
T. Bohlsen
D. Boyd
K. Harrison
O. Garde
J. Guarro
T. Lester
JP. Masviel
J. Montier
F. Teyssier

Submit your spectra

Please :
- respect the procedure
- check your spectra BEFORE sending them

Resolution should be at least R = 500
For new transcients, supernovae and poorly observed objects, SA spectra at R = 100 are welcomed

1/ reduce your data into BeSS file format
2/ name your file with: _novadel2013_yyyymmdd_hhh_Observer
novadel2013: name of the nova, fixed for this object
yyyy: year
mm: month
dd: day
hhh: fraction of the day, beginning of the observation
Observer: your pseudo/name
Exemple: _chcyg_20130802_886_toto.fit

3/ send you spectra to
Novae Symbiotics : François Teyssier
Supernovae : Christian Buil
to be included in the ARAS database

Further informations :
Email francoismathieu.teyssier at bbox.fr

Download previous issues :
http://www.astrosurf.com/aras/novae/InformationLetter/InformationLetter.html