Eruptive stars spectroscopy
Cataclysmics, Symbiotics, Novae, Supernovae

ARAS Eruptive Stars
Information letter n° 4 - 14-04-2014

News

Nova in Cygnus

Discovered by Koichi Nishiyama, Kurume,Japan and Fujio Kabashima, Miyaki,Japan 2014 Mar. 31.790 UT (mag = 10.9)
http://www.cbat.eps.harvard.edu/unconf/followups/J20214234+3103296.html

Confirmed as a nova, with a spectrum type Fe II near maximum on 201 Apr. 1 (CBET #3842)

The light curve around maximum is unsual. Current V mag ~10.9 after a maximum at V mag ~9.4 (9-04-2014)

Coordinates (2000.0)	
R.A.	20 h21 42
Dec.	+ 31 03 29

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

Contents

Aknowledgements : V band light curves from AAVSO photometric data base

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

NOVAE

Nova Cyg 2014

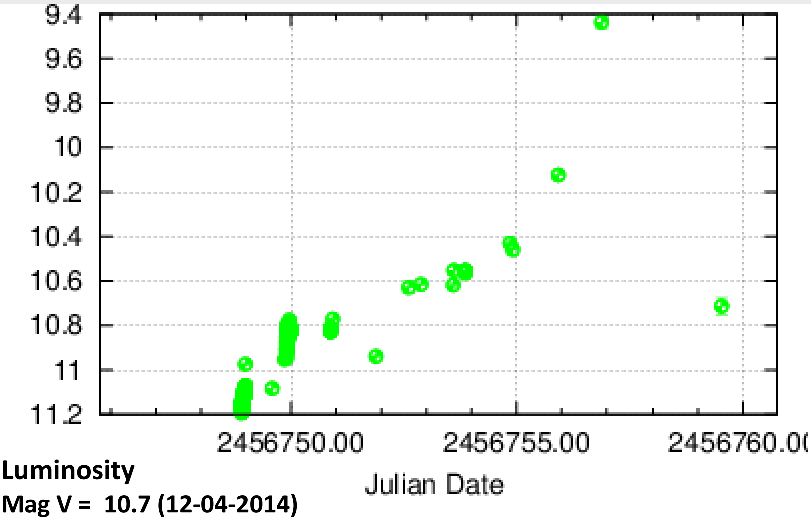
Nova Cygni 2014 = PNV J20214234+3103296

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**

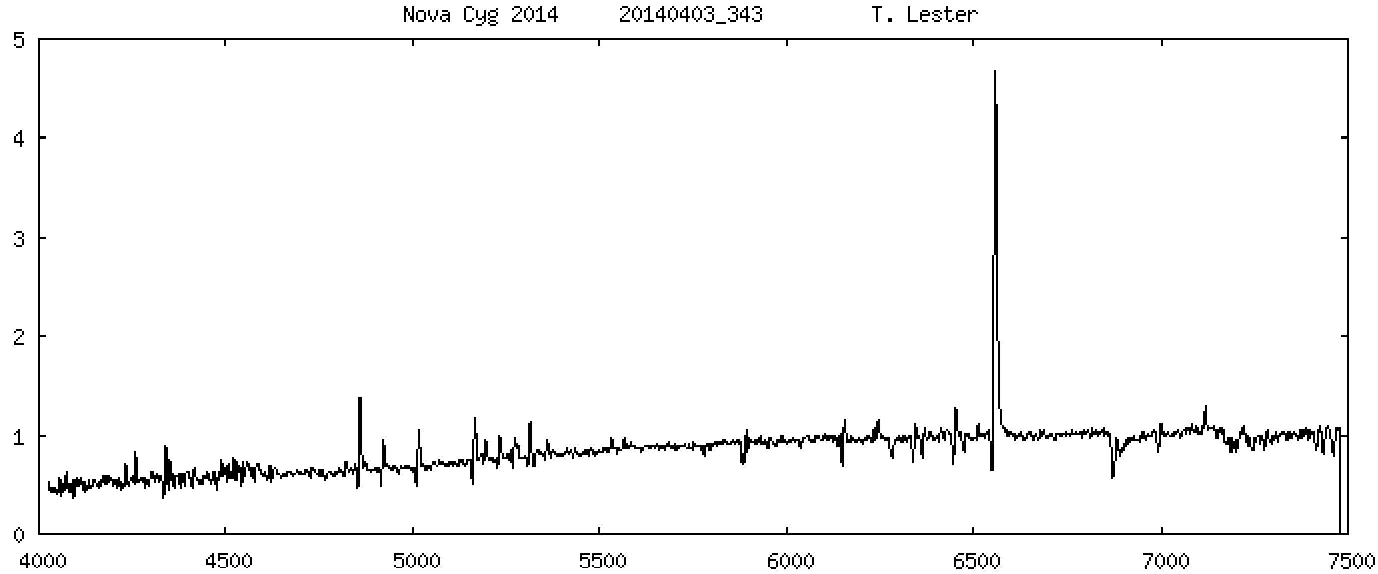
Observing : spectra required for this peculiar nova - One a day

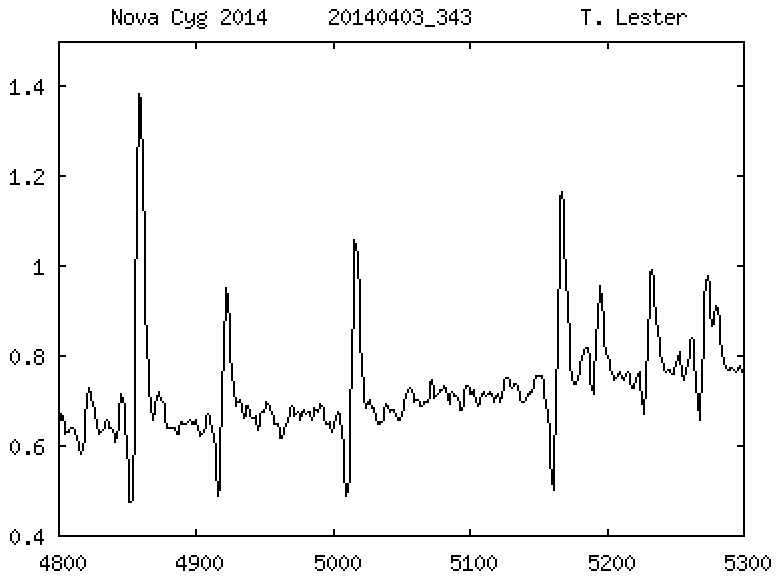


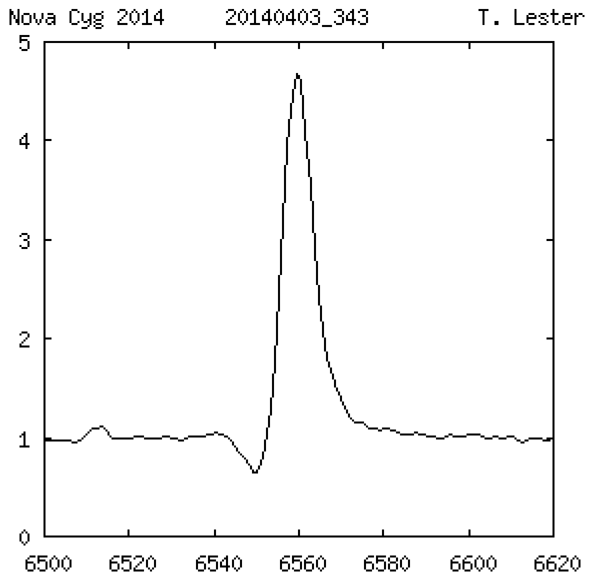
Luminosity

Mag V = 10.7 (12-04-2014)

Unusual light curve showing a slow rise of 0.4 mag in 5 days followed by a rapid rise to maximum luminosity reached V = 9.45 (9-04-2014) and a fast decline (1.3 mag in three days)





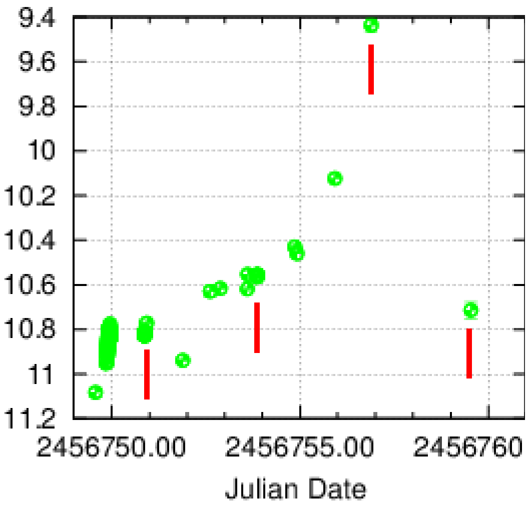


Our first spectrum, obtained by Tim Lester with a home-made spectrograph based on a 600 l/mm grating giving a resolution of more than 1500 on all the optical range. P Cygni profiles on Balmer and Fe II lines typical of the fire ball stage.

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

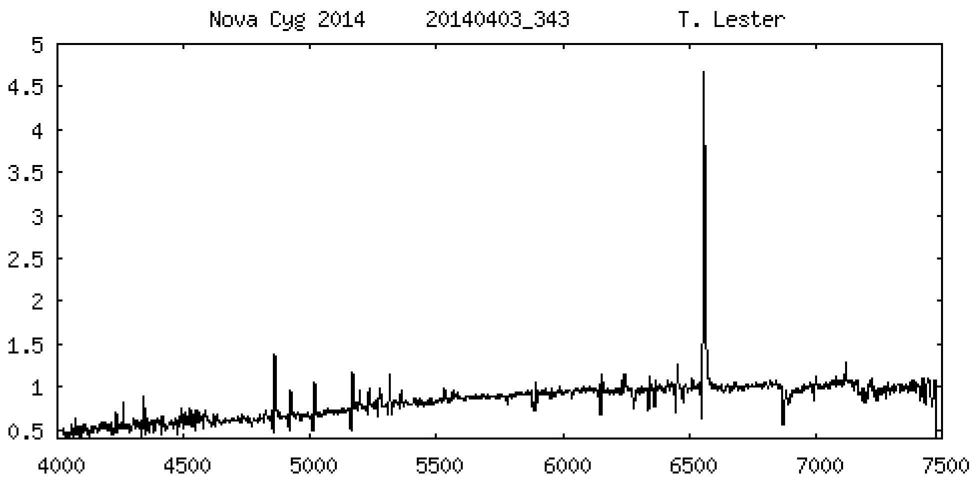
ARAS DATA BASE : 8 spectra
http://www.astrosurf.com/aras/Aras_DataBase/Novae/Nova-Cyg-2014.htm

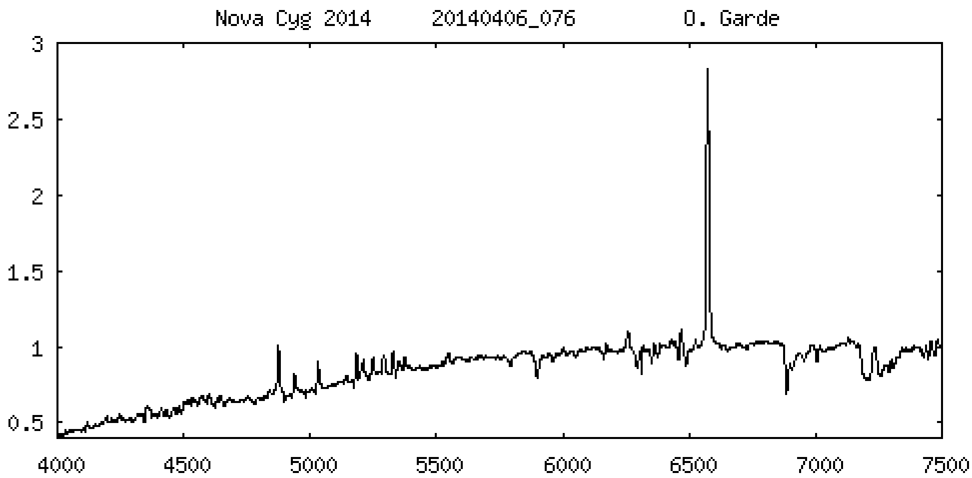
Nova Cyg 2014

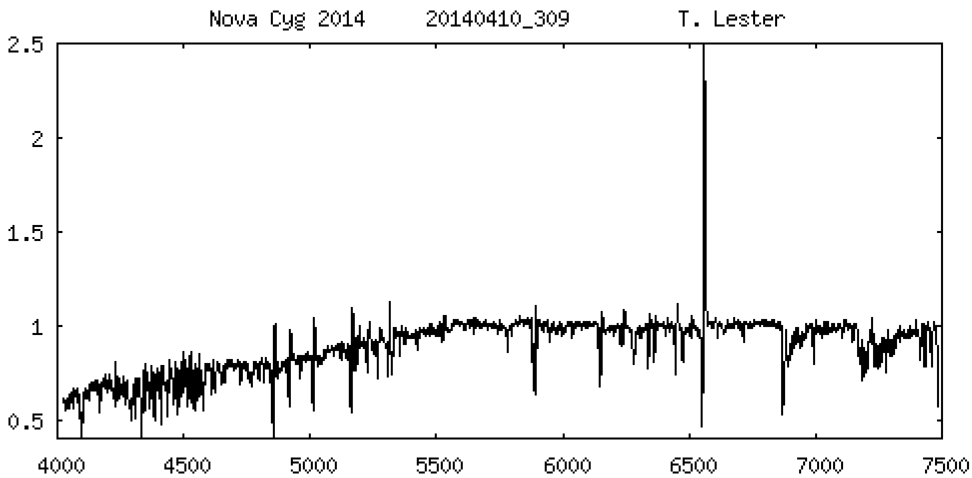


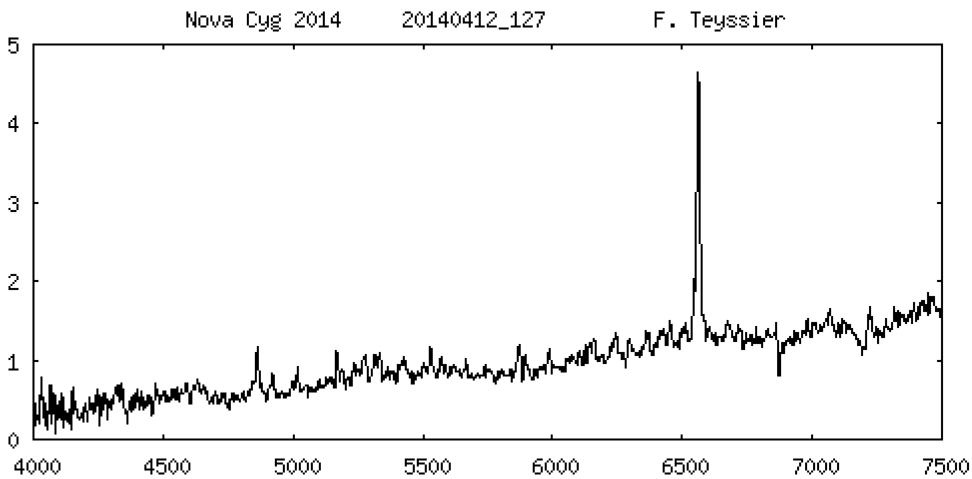
Spectroscopic changes along the unusual light curve showing the disappearance of P Cygni profiles during the slow rise, their re-emergence at maximum luminosity and fast change during the rapid decline

Resolution from 1000 to 1500





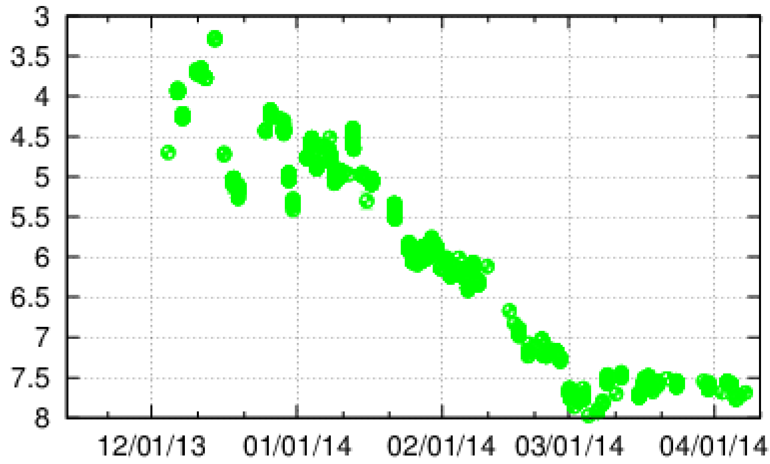




NOVAE

Nova Cen 2013 = V1369 Cen

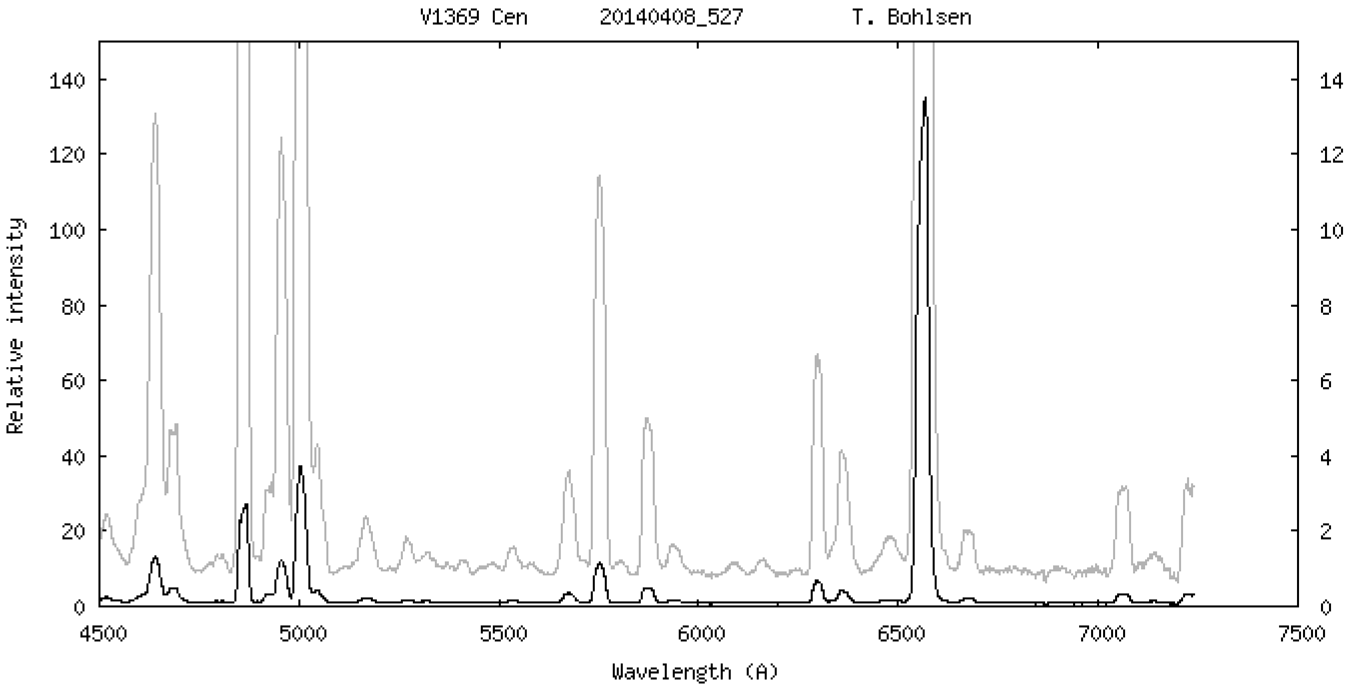
Luminosity
Mag V = 7.7 (10-04-2014)
Rebrighning a mag 7.5 after a minimum at 8.0 (05-03-2014) and now plateau phase about 4 mag under maximum

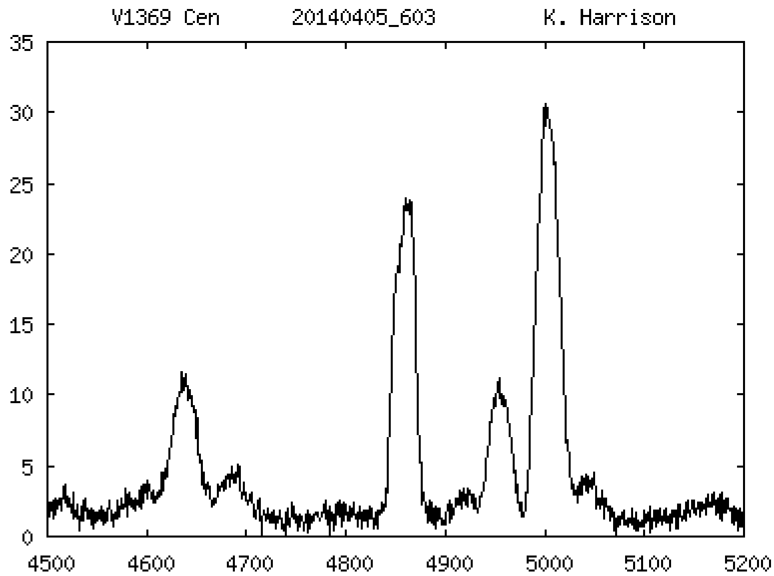


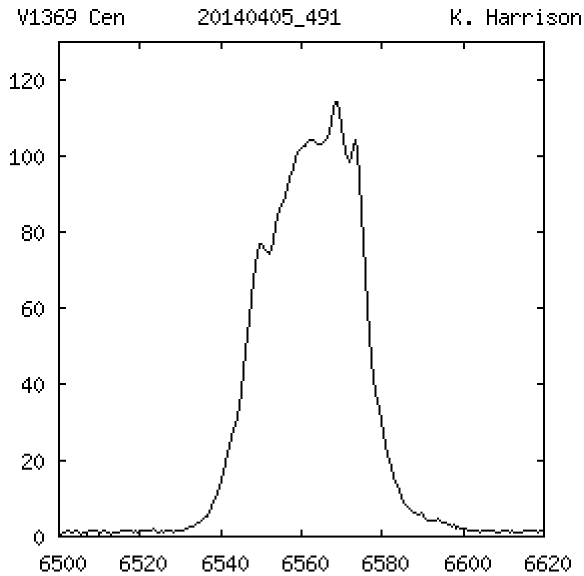
Observing

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

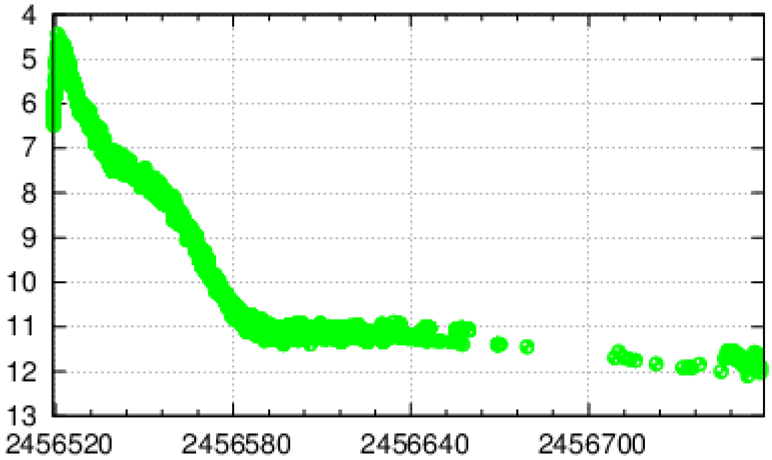
ARAS DATA BASE : 129 spectra **http://www.astrosurf.com/aras/Aras_DataBase/Novae/Nova-Cen-**

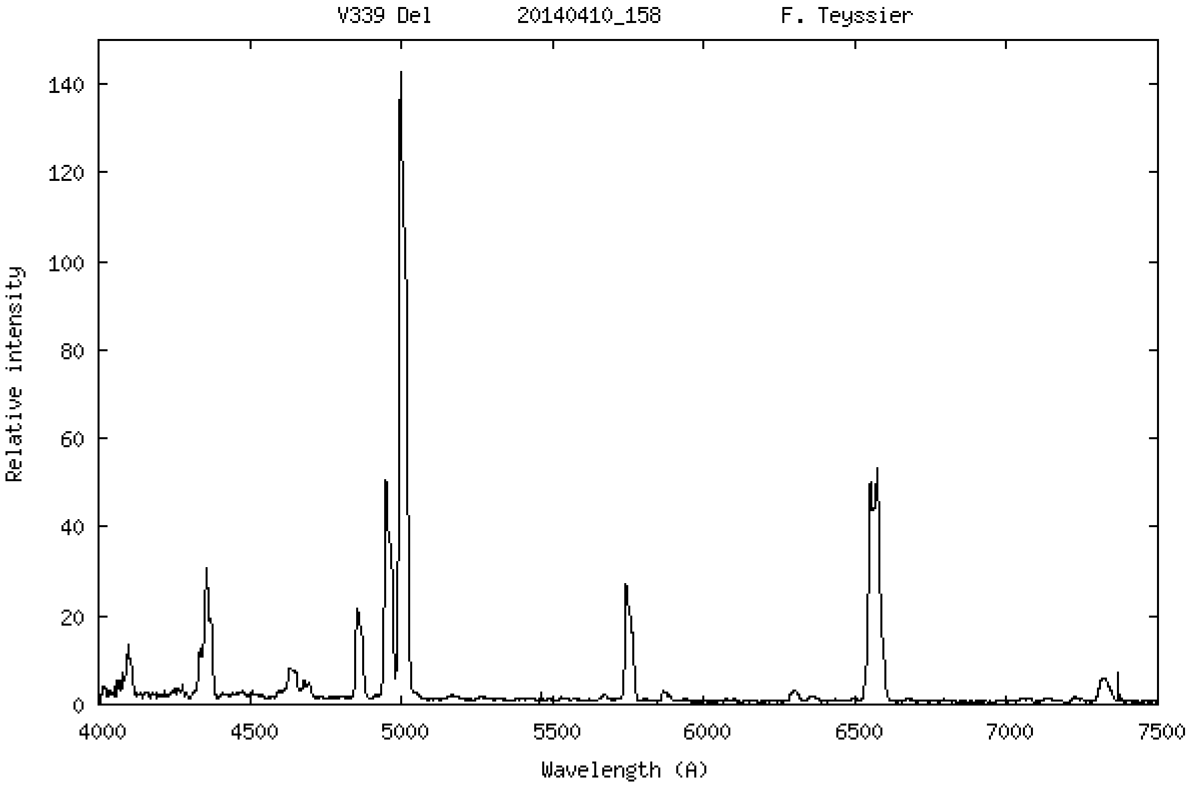
N O V A E

Nova Del 2013 = V339 Del

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

Observing :
New spectra from C. Buil and F. Teyssier
Spectra required (one a week)
The nova is now higher in the morning sky and easy to observe





Nebular stage, with huge [OIII] 5007 and 4959 emissions

Observers (2014)
C. Buil
F. Teyssier

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

N
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V
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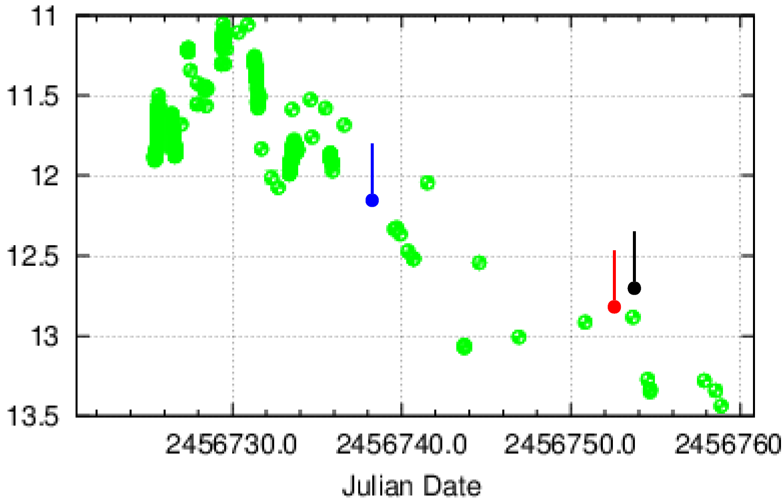
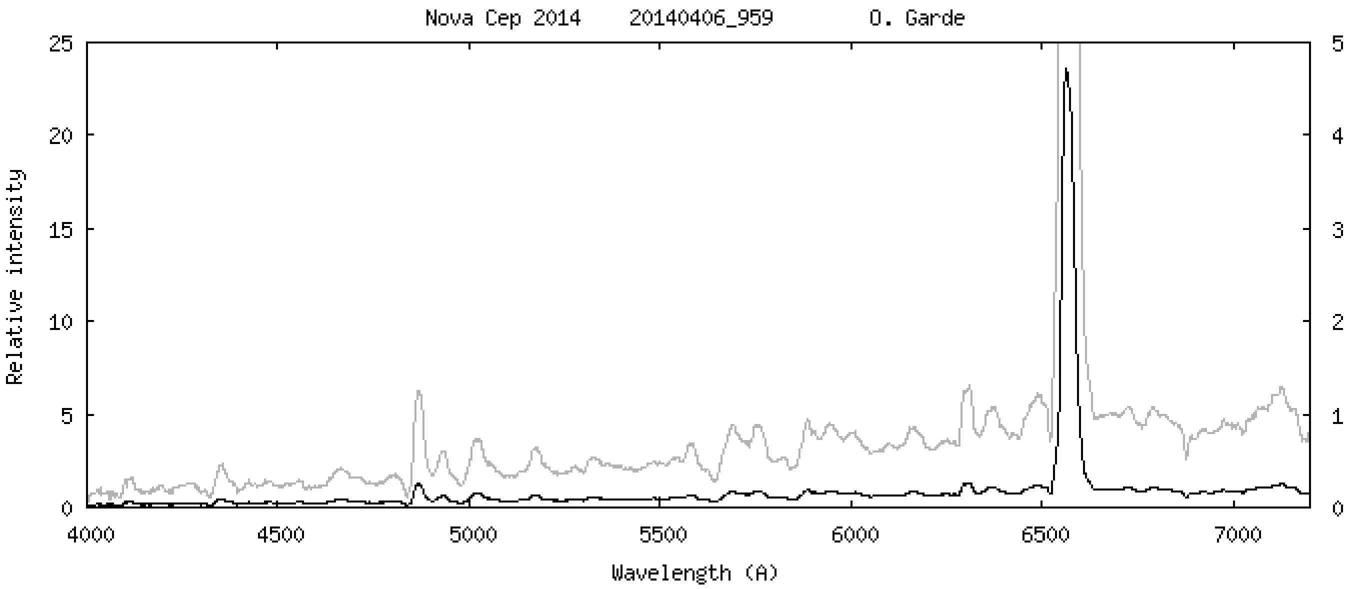
Nova Cep 2014 = TCP J20542386+6017077

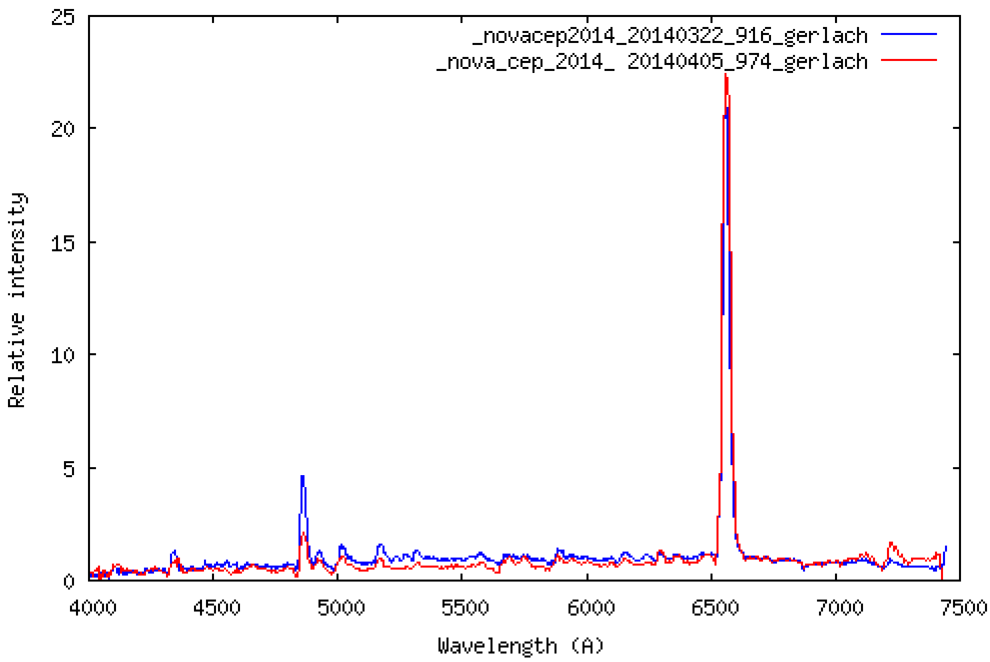
Luminosity
Mag V ~ 13.4 (13-04-2014)
Declining

Observing :
New spectra from P. Gerlach, O. Garde, T. Lester





Comparison of 22th, march and 5th, April spectra from P. Gerlach



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

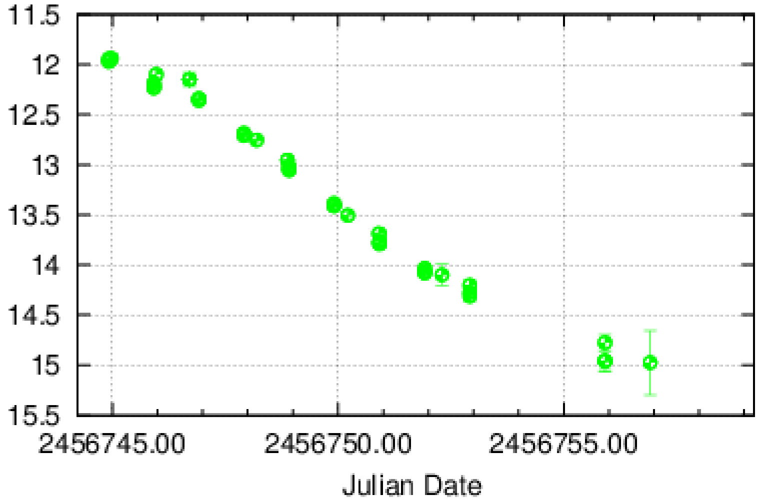
ARAS DATA BASE | 9 spectra| http://www.astrosurf.com/aras/Aras_DataBase/Novae/Nova-Cep-2014.htm

N O V A E

Nova Sco 2014 = TCP J17154683-3128303

Discovered by Koichi Nishiyama (Kurume, Japan) and Fujio Kabashima (Miyaki, Japan) at magnitude 10.1 the 2014 Mar. 26.8487 UT (TCP J17154683-3128303)

Coordinates (2000.0)	
R.A.	17 15 46.8
Dec.	-31 28 30.3



Luminosity

Rapid decline for this fast nova (T2 ~7 days)

X rays detection

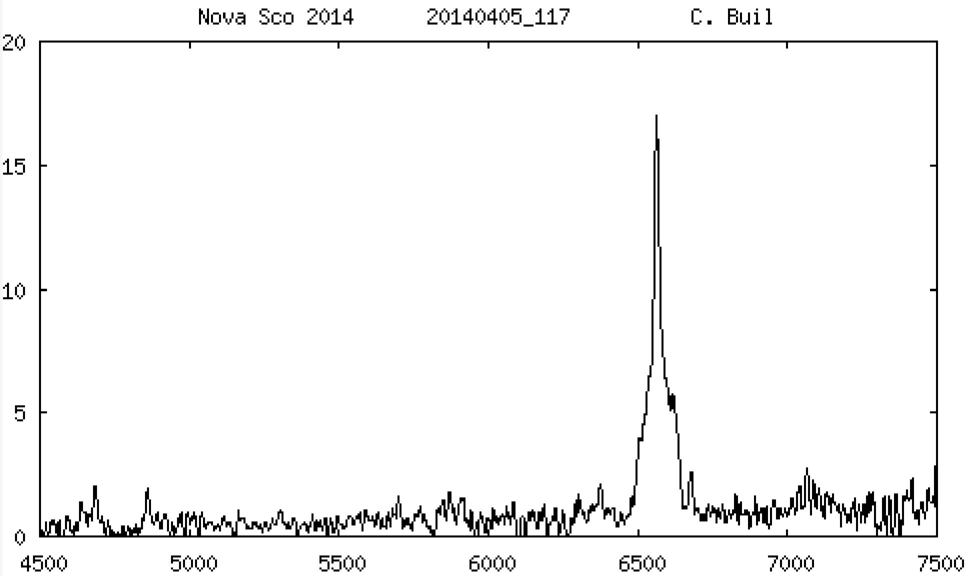
Nova Sco has been detected in X rays by SWIFT 7.3 and 8.4 hours after the discovery (i.e., on UT March 27 03:39-03:51 and 04:42-04:51)

The observations " indicates most of the absorption is intrinsic to the source, and would be consistent with an (expanding) shell in a nova" (**Atel #6015**)

Spectroscopic confirmation
Extract from CBET #3841

K. Ayani and S. Maeno, Bisei Astronomical Observatory (BAO), Ibara Okayama, Japan, obtained a low-resolution spectrogram (range 400-800 nm; resolution 0.5 nm at H-alpha) of TCP J17154683-3128303 on Mar. 27.8 UT with the BAO 1-m telescope. The spectrum shows broad emission lines of the Balmer series; He I 501.6-, 587.8-, and 706.5-nm; and probably of O I 777.3-nm.

The H-alpha line has a FWHM of 7000 km/s and EW of about 90 nm. This indicates that the variable is a nova in early phase. Their spectrum is visible via website URL http://tinyurl.com/nw6pv7x. Ayani adds that consultation with A. Shafter (San Diego State University) leads them to agree that this may be one of the relatively rare He/N-type novae.



Nova Sco 2014 has been observed by C. Buil the 5th of march when it was at about mag 14 (V) at very altitude (Toulouse is 43° North). Challenging target !
The spectrum shows the H alpha line with a wide piedestial (FWZI about 7200 km.s^{-1}) and narrower peak. (See Atel#6032)

Caracterised as a symbiotic-like nova by Near IR Spectroscopy (ATel#6032)

Near-IR photometry and spectroscopy of TCP J17154683-3128303 = Nova Scorpius 2014 was obtained on 2014 March 31 with the Mount Abu 1.2 meter telescope and the Near-Infrared Imager/Spectrograph (NICS) at R ~ 1000 in the 0.85-2.4 micron region. ...

The NIR spectra, which are dominated by broad Hydrogen lines of the Paschen and Brackett series and strong HeI lines at 1.083 and and 2.058 (HeI 1.7002 is also seen), are typical of the He/N class of novae (Banerjee & Ashok 2012, BASI, 40, 243). The Lyman beta fluoresced OI 1.1287 line is also seen with significant strength. However, the most striking feature is the presence of first overtone absorption bands of CO at 2.29 microns and beyond. Such bands are similarly seen in other symbiotic systems such as V407 Cyg, RS Oph and V745 Sco but much later after their respective outbursts when the contribution from the M giant secondary becomes significant relative to the fading nova emission. From the above it would thus appear that Nova Sco is also a symbiotic system.... All emission lines are broad. The H and He lines show a reasonably rectangular shape, often seen in He/N novae, but with the profile tops having considerable structures most pronounced of which is a sharp narrow central component in emission. This narrow component could likely emanate from the secondary giant's wind. The OI 1.1287 line lacks this narrow emission component. The FWZI's of Pa beta, Br Gamma, HeI (2.057micron) and OI (1.1287 micron) are 8900, 9500, 10100, 8800 km/s respectively.

A caracterisation confirmed by SWIFT (Atel#6035) . The temperature of the optically thin emission during this time is close to constant, with a mean value of 6.4 +1.1/-0.8 keV. The unabsorbed 0.3-10 keV flux was 7.3 x 10-11 erg cm-2 s-1 during the first observation on March 27 and 5.5 x 10-11 erg cm-2 s-1 twelve hours later. Since then, the flux has remained between 3-4 x 10-11 erg cm-2 s-1. This observed behaviour appears consistent with that expected for a shock emerging from a secondary star wind, as expected in a symbiotic nova.

Steve Shore

So now that yet another symbiotic-like nova has appeared, Nova Sco 2014 (see C. Buil's spectrum p.7, editor's note), and V745 Sco has faded into memory, and some of you are interested in such systems, I thought it might be useful for you all to have a few notes on symbiotic stars and accretion disks. The two are not unrelated although they seem very different when considering the timescales for their orbits and constituents but I'll try to relate them.

Symbiotic stars: misbehaving degenerate dwarfs and self-important giants

The symbiotic stars, discovered by Fleming during the **Henry Draper** spectroscopic survey at the beginning of the XX century, so named by Merrill and summarized for the first time in Payne-Gaposchkin's monograph *The Galactic Novae*, were first distinguished by their bizarre (by the standards of the time) spectra. In the same spectral interval, the visible, these stars show the absorption spectrum and continuum of a very cool star, a red giant (sometimes even a Mira variable) along with a blue continuum (seen shortward of about 5000 Å) and emission lines from highly excited states of the iron group elements (mainly Fe II but also others), the Balmer series, **and** [O III], He II 4686, 5411Å, and even higher ionization species (see Fig.1 ndlr)

That these should co-exist in the same spectrum is physically difficult to arrange with a single star (notwithstanding there were ingenious, although misguided models to the contrary). A clue is the blue continuum. While it's possible to have emission from a 10^6 K plasma if there is a non-thermal source for heating, for instance in the solar coronal gas that's energized by waves and reconnection of the magnetic field of the outer solar atmosphere, it isn't plausible that there should also be optically thick gas. The latter is required for the continuum, which must be either free-free (thermal bremsstrahling, from collisions of free, charged particles) or recombination from an ionized gas. But at a temperature indicated by the emission lines, these processes would be optically thin and would not give the colors associated with the symbiotics. The answer came almost immediately on observing these systems with the International Ultraviolet Explorer (IUE) satellite, a spectrographic instrument in geosynchronous orbit no larger than some of your telescopes, that operated between 1170 - 3300 Å and lasted for 18 years.

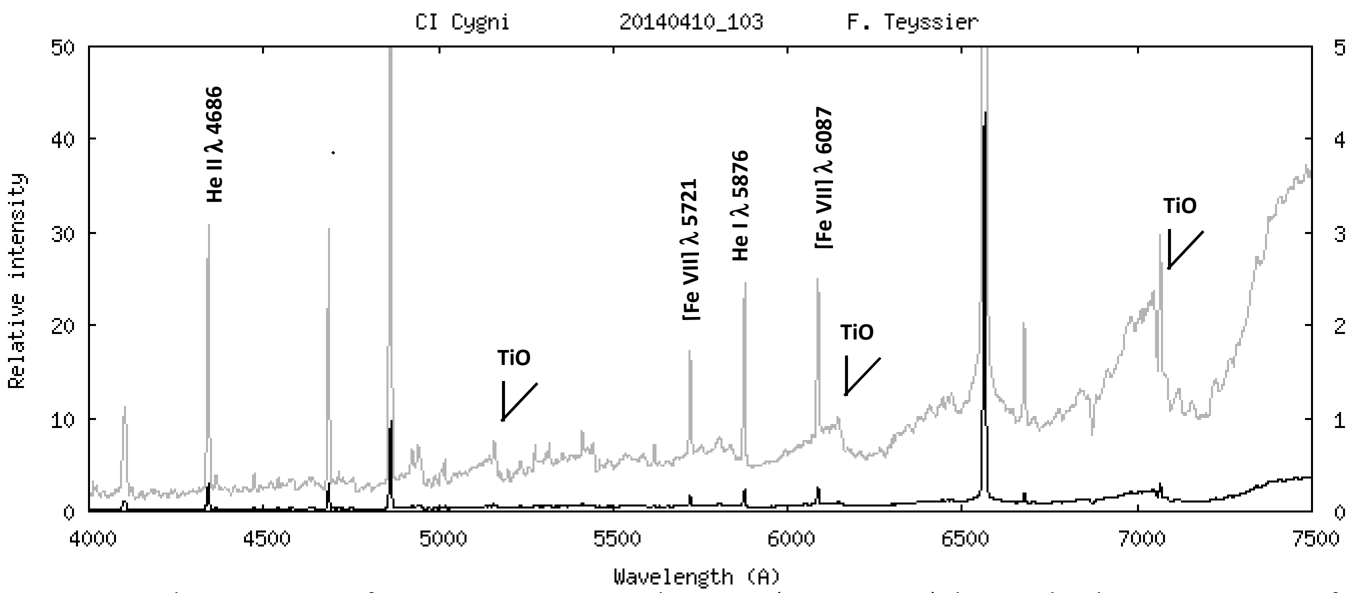
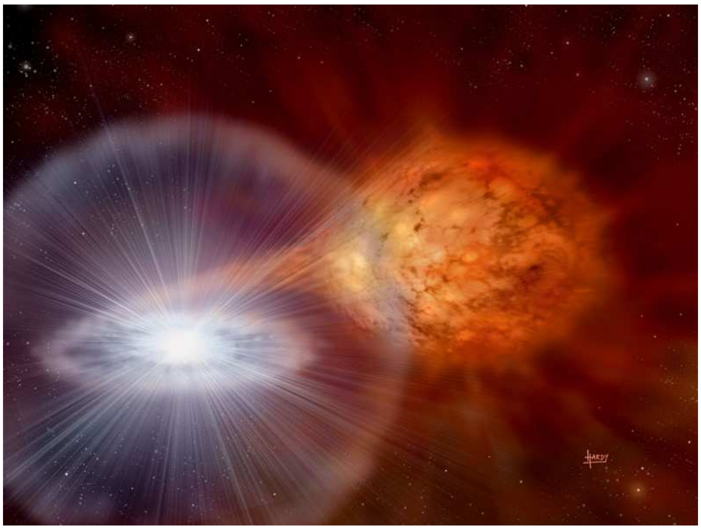


Fig. 1 - Low resolution spectrum of CI Cygni, a prototype Symbiotic Star (Kenyon, 1986) showing the absorption spectrum of the cool star (here a M6III giant) and its TiO bands, and examples of low ionisation species (He I), high ionisation (He II) and very high ionisation ([Fe VII])

The original model proposed in Payne-Gaposchkin's treatise is correct : these are wide binary systems with a red giant in whose wind sits a hot white dwarf (that took a little bit of sorting out, *it could* have been a hot subdwarf not yet at the stage of degeneracy) that produces the equivalent of a planetary nebula around itself because of its hard continuum. Planetaries have a hot WD sitting in their centers. These stars, in the stage called post-asymptotic giant branch stars, produce compact high density H II regions within their old winds. To put this more precisely, in the last stages of intermediate (around 10 $M_\odot$ mass stellar evolution, after the core has gone through carbon burning and when the star goes into an nuclear source-unstable phase of shell flashes, the envelope is removed by a very strong wind. This leaves the core exposed, and because of the reduced circumstellar density, the ultraviolet continuum below 912 Å strongly ionized the material. But not all of it! Planetary nebulae are *ionization bounded*, the available ultraviolet photons are only sufficient to ionize a fraction of the surroundings because there are recombinations on a timescale sufficiently short to balance the ionizations and still leave a part of the environment neutral. If this seems technical, don't be worried. It's really quite simple: every ionization produces an ion (surprise). Once ionized, hydrogen is transparent so if the photons keep coming they pass through the previously ionized medium and continue to ionize the medium. If, on the other hand, before the arrival of the next photon (statistically) the ion recombines with an ambient electron, it can again be ionized, thus increasing the opacity in the far UV and limiting the advance of the ionization front. In fact, if it reaches balance (called a Strömgren sphere), its radius will remain constant. This is what one means by ionization bounded. If, on the other hand, the medium, even recombined, is fully ionized, the region is called *density bounded*. H II regions are typically this latter state. Now if, instead, the medium is the outer wind of a star, which if the mass loser is a red giant is rather slow and dense, then the hot source will be surrounded by an *ionization* bounded region. You know from images of planetaries that they are remarkably well



An artist view of symbiotic RS Oph. The red giant loose matter which forms an accretion disk around the white dwarf and emits a strong stellar wind. Disk and wind are excited by the white dwarf (editor's note)
Credit : David A. Harty http://www.astronet.ru/db/xware/msg/1214949

This is the key for understanding the symbiotics. How they get into such a strange evolutionary state is still an active research topic but the fundamentals are clear. The WD and giant are well enough separated that they would be in simple orbital motion were it not for the wind. That's what makes identifying such systems' precursors so hard, before you have a red giant these stars look like ordinary red giant binaries. The WD is not an idle orbiting mass, however, it can deflect the outflowing wind and deviate it because of gravitational attraction and focusing of the wind and accrete some of the passing gas. That matter can't fall directly onto the WD. It has orbital motion despite being an outflow, and in being deviated does not lose its vorticity (angular momentum). So when it is being accreted, it forms a disk around the WD. While the structure of the accretion environment is poorly known, the disk is certainly present. Flickering on orbital timescales for matter at the WD surface radius (of order 0.01 $R_\odot$, such as seen in MWC 560, signals the boundary layer and accretion interface in the inner portion of a circulating disk. The energy release and angular momentum transfer happen because of something like internal fluid friction, *viscosity*, although the origin of this in *any* disk-accreting system is still far from well understood (a phrase that, from here on, will keep recurring). The loss of energy for an orbit around a point mass -- the loss of *kinetic energy*-- is balanced by an inward flow since the gravitational energy is negative (it's one of those cute features of gravitation, energy loss means the system contracts and, in this case, heats up). But because energy and angular momentum are directly related for a Keplerian orbit, this causes a loss of angular momentum -- hence the inward drift. The inflow is subsonic unil just about at the stellar surface here it infalls and, on being slowed by the pressure gradient of the WD envelope, produces a shock. Thus, the inner boundary of the disk is very hot, of order $$10^6-10^7$$K, and the emission extends from the X-rays into the visible and even infrared. The luminosity from the shock depends only on the rate of mass accretion since the mass and radius of the WD are fixed. In effect, then, the accretion from the wind powers the emission from the WD while, slowly, increasing its mass. Only a small fraction of the outflow is captured, the so-called *gravitational capture radius* but the rate of energy loss (luminosity) depends on the accretion rate through the velocity of the wind and the mass of the WD.

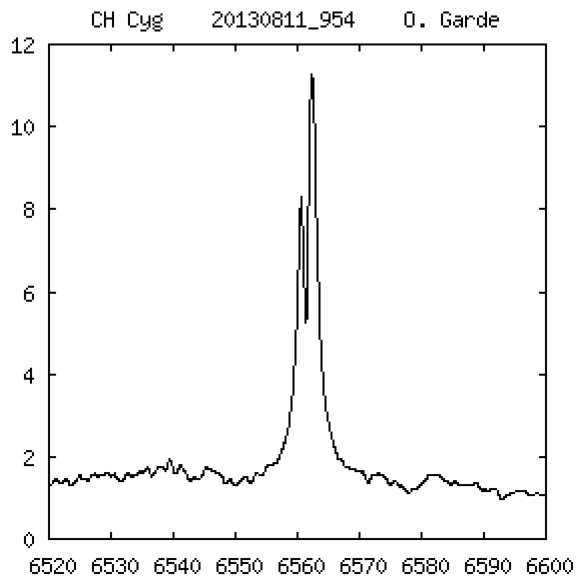
This is the basic mechanism, the reason why a degenerate would be able to maintain such high temperatures instead of simply cooling. Unlike a normal star, you'll recall from discussions of novae that WDs are degenerate -- their pressure depends only on density. So if they accrete, they must compress to increase the pressure gradient that counterbalances the star's own weight. One of the current interests in symbiotics, like novae, is that here is a maximum stable mass for a degenerate star, the so-called **Chandrasekhar mass** (about 1.4 $M_\odot$ above which it can't become stable again until it collapses to nuclear densities. So if you could arrange the accretion to continue to the point of core collapse for the WD, it would have a fixed limit and all supernovae so produced would be nearly identical: enter the Type Ia supernovae, the distance scale, standard candles, and cosmologists.

The connection with novae

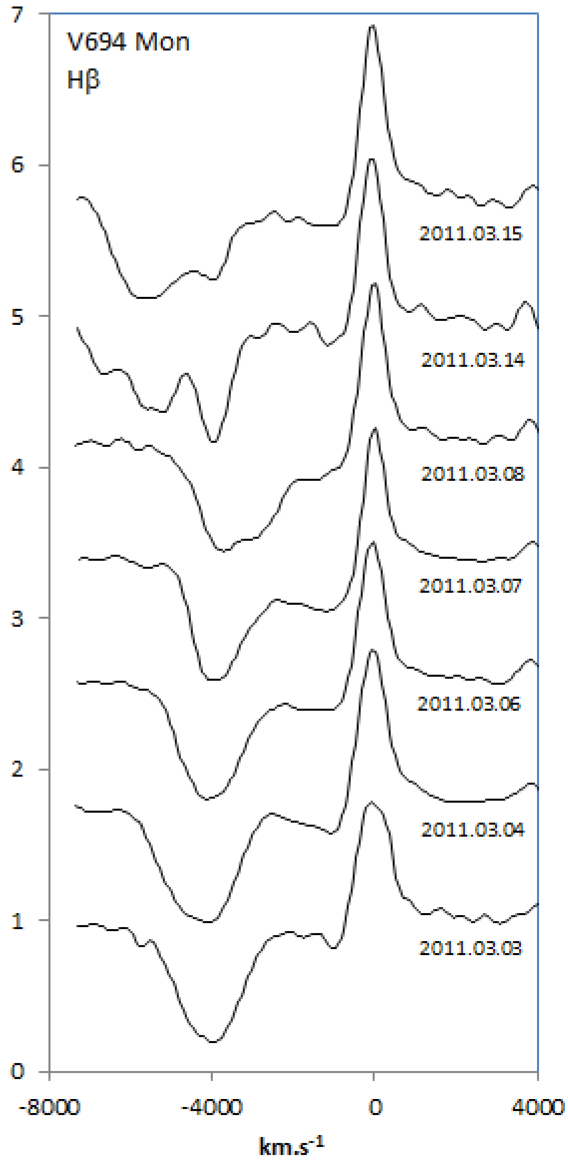
The connection with novae, and of course there {\it *must*} be that, is the WD itself. Any degenerate can ignite a nuclear source if enough mass accumulates. Whether this ultimately explodes or fizzles is a question of the mass of the gainer. One of the basic features of a WD, the mass-radius relation, results from the pressure law - the more massive the star the denser it must be to remain in hydrostatic balance, so its radius decreases. This increases its surface gravity and since the critical pressure for thermonuclear ignition depends on that quantity, the more massive WD will produce a more violent runaway. The nuclear reactions go very far from their equilibrium abundances, but in a lower mass WD the same thing happens with less violence. There can be a wind, if the increase in luminosity is sufficient, but the matter never becomes completely ``ideal'' so there's no final explosion. Instead, like the supersoft phase of a post-explosion nova, the WD continues to chug away in nuclear burning until the accumulated, mixed hydrogen is spent. During this -- potentially very long -- time, the WD becomes a strong ionizer of its environment. The event is a *symbiotic nova* (alas, too close in terminology to a *symbiotic-like recurrent nova* such as RS Oph or V745 Sco) with an increasingly circumstellar ionization zone of increasing ionization state. The best example I can recommend is RR Tel, which has displayed everything from [Fe VII] to [Fe XIV] and even higher as the state of ionization has changed (Thackeray's classic study is, fortunately, available on the ADS:
http://adsabs.harvard.edu/abs/1977MmRAS..83....1T
To say this is a *must read* is an understatement, it is one of the great observational studies of the last century. The UV has been also extensively studied, for instance in:
http://adsabs.harvard.edu/abs/1993ApJS...87..337A
and you'll find lots of material on this particular system. These are also important for atomic physics, especially identification of energy levels and tranbsitions inaccessible in the laboratory because of the required low density (strongly forbidden lines of high ion species, especially iron peak elements),

and as such they have been exploited for decades by atomic structure types to tease out transitions that are important for cooling very hot, low density astrophysical plasmas. The bright state persists for years or decades in some systems, but others go through intermediate states of activity, such as AG Dra (a figure in one of our papers, apologies for self-citation, may be useful:
http://adsabs.harvard.edu/abs/2012BaltA..21..139S
but see also:
http://adsabs.harvard.edu/abs/2004A%26A...415..273L

http://adsabs.harvard.edu/abs/2009A%26A...504..171B
These outbursts are less extended and, consequently, involve much less energy liberated but their origin is at least partly nuclear. It still isn't clear whether or how much is due to an accretion disk but the systems that undergo such events, including CH Cyg, AG Peg, EG And, and Z And, often show something that looks a lot like jets at velocities that may exceed a few hundred km.s^{-1}. Perhaps the best example of this is MWC 560 that shows extreme outburst events with several thousand km.s^{-1} absorption lines that are detached (like those in V339 Del and V1369 Cen) but with what may be a characteristic timescale of years (see figure). At least two systems, CH Cyg and R Aqr, have extended spatially resolved jets that are even visible in the UV (and have been so studied).



Hα profile by O. Garde (eShel R = 11000)



Perhaps the best example of this is MWC 560 that shows extreme outburst events with several thousand km.s^{-1} absorption lines that are detached

Absorptions in the blue edge of H béta line during High state of MWC 560 (V694 Mon) - F. Teyssier LISA R = 1000

The systems also show extended circumstellar matter that produces a thermal (and perhaps also nonthermal) radio halo and in the case of an analog system α Sco (Antares) -- the H II region has even been resolved with radio interferometry. This certainly also contributes to the spectra if not resolved but how much is an open question. Again, it's enough to keep in your mind that the symbiotics and symbiotic-like recurrents are really the same phenomenon on different timescales from the observational point of view. Physically they're different but that has to be separated from the dynamics and the energetics, many of the same processes show up radiatively so we can transfer experience from one system to another. The symbiotic giants divide by mass into those that have cold enough winds to show dust (the D-type) and those that don't (S-type, for ``star'') based on their infrared colors and energy distributions. If the red giant has the right mass and evolutionary state it may pulsate, regularly (as in V407 Cyg, a long period Mira) or some of the shorter period systems. The high luminosity and dense wind (or rather, extensive wind with slow velocity) is a good amplifying medium for masers and some symbiotics are also maser sources (this for another set of notes). But in general, the easiest way to understand the complexity of the phenomenology is that the red giant is evolving *independently*, its internal processes are *not* governed by the companion, although in a few cases there may be a strong enough tidal interaction to distort the giant (Mikolajewska, Fekel, Kenyon, and collaborators have spent a great deal of effort cataloging this and it's worth looking at their papers!).

So I'll stop here to not overwhelm you all and hope this helps put some of your work in another perspective. The next thing to treat is the accretion process and that will take some graphics (cartoons, really). The V339 Del STIS/optical observation is this week so there'll be more on that as well.

Second part in the next issue

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

Steve's notes download

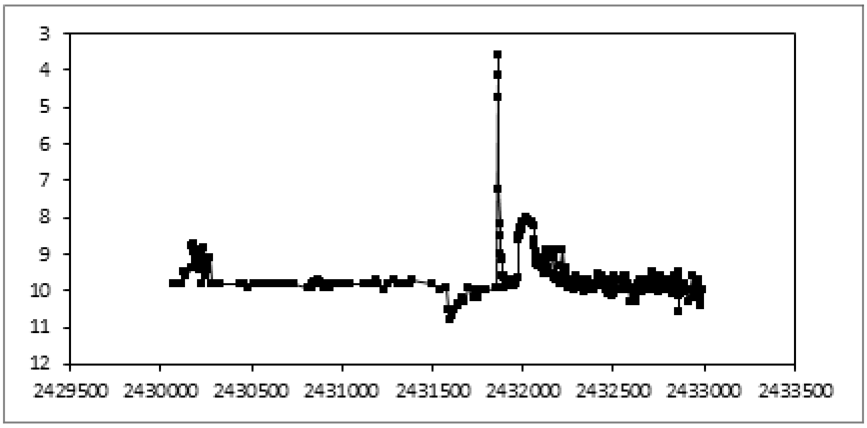
Selected list of bright symbiotics stars of interest

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

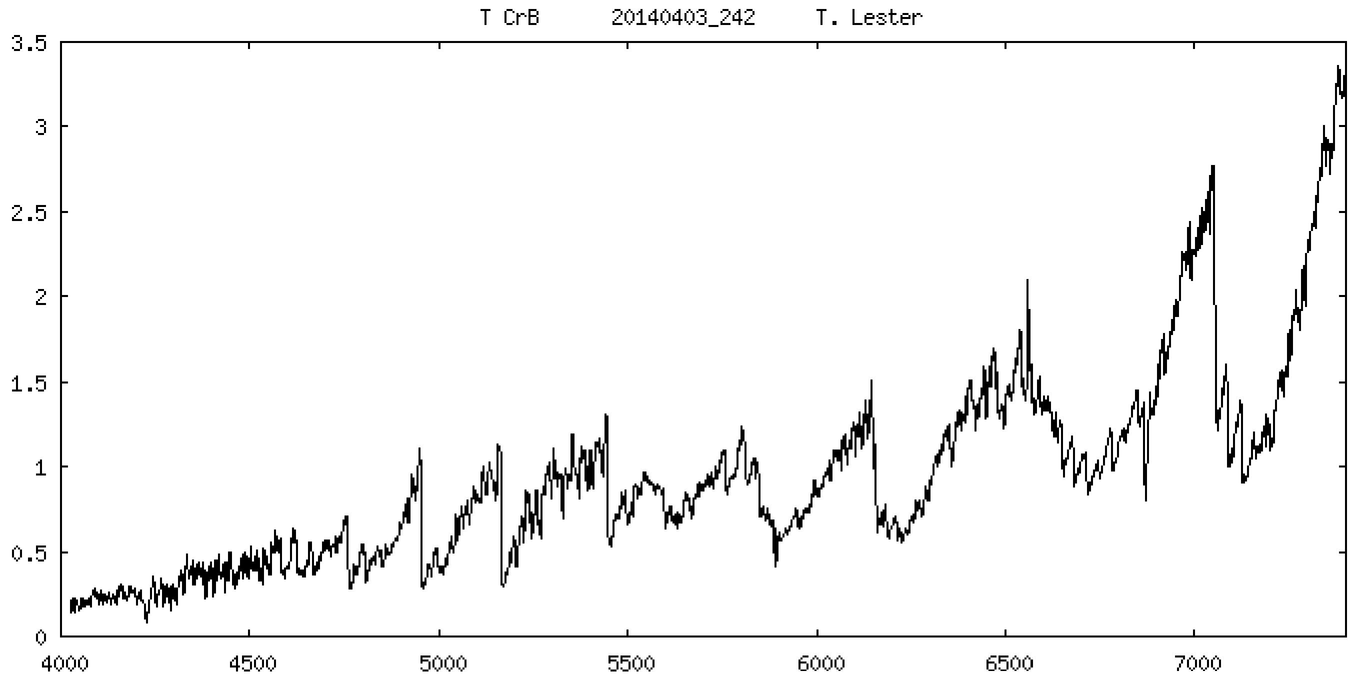
Mag V * : current value

T CrB

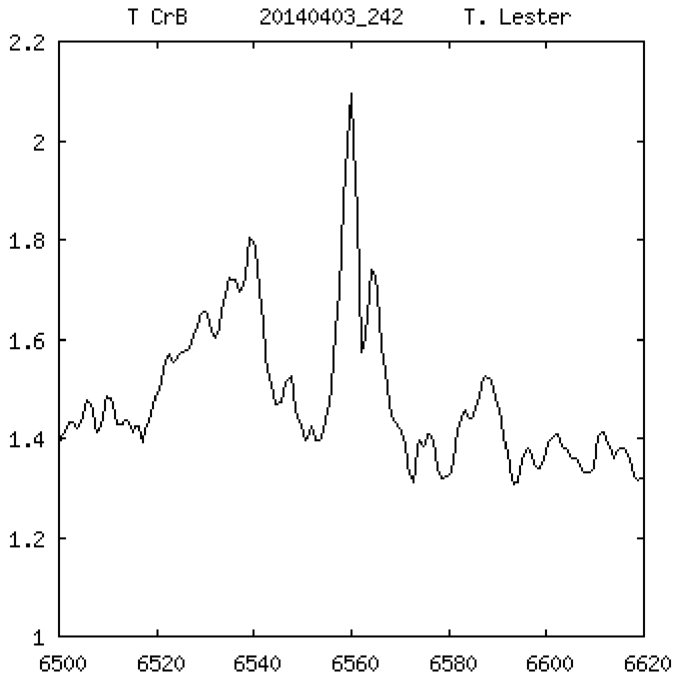
The symbiotic star T CrB is a recurrent nova (1866 and 1946). T CrB could produce a new nova event at any moment.
An **intensive amateur survey** could provide spectra of pre-outburst and during the rising



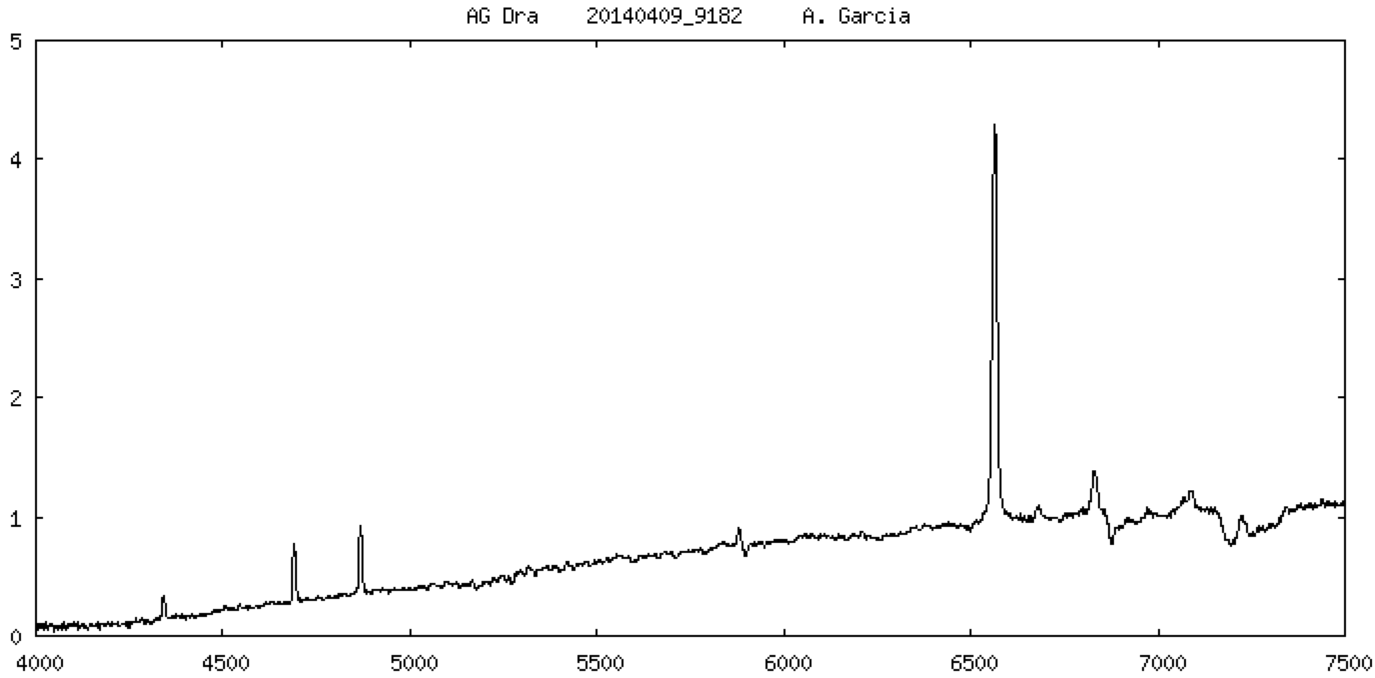
The nova outburst of RS Oph in 1946 (AAVSO visual data base)
During the short outburst, the luminosity raised mag 2. It has been preceded by a sudden decrease and followed by a longer, but weaker outburst

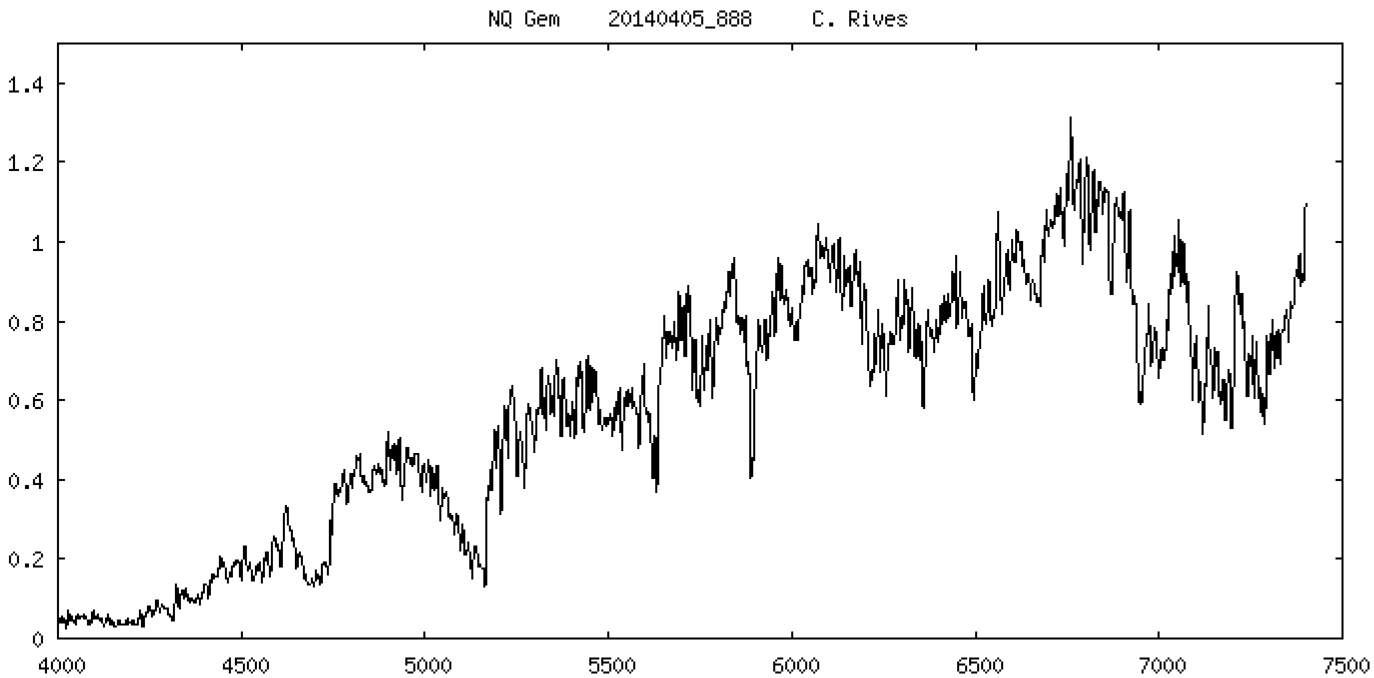


Low resolution spectrum by Tim Lester
The H alpha line is resolved and shows the central absorption often observed in symbiotics



AG Dra and NQ Gem recent spectra

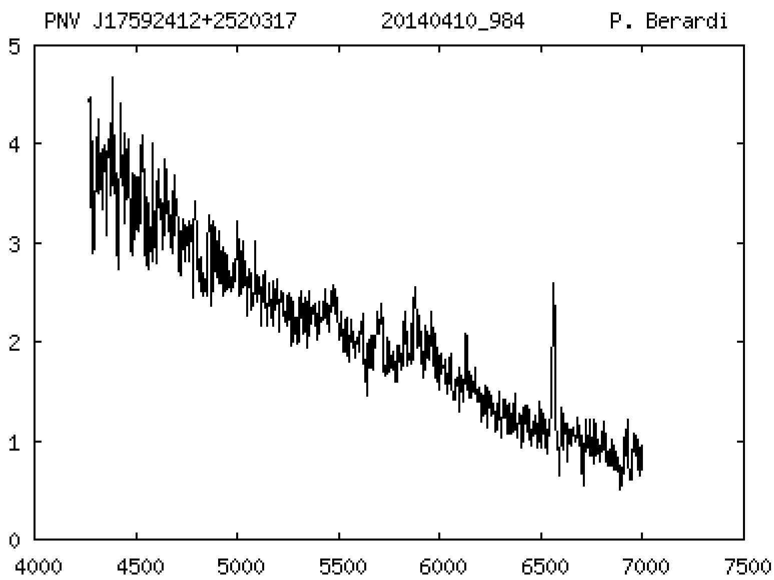


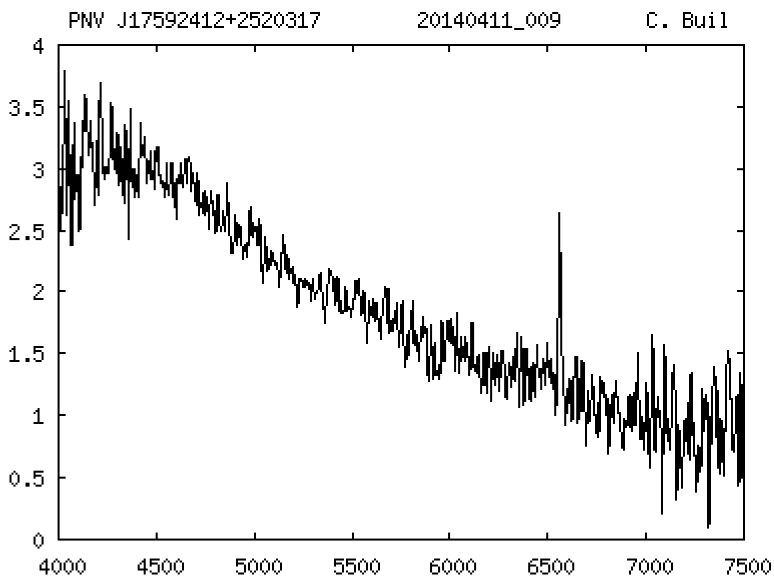


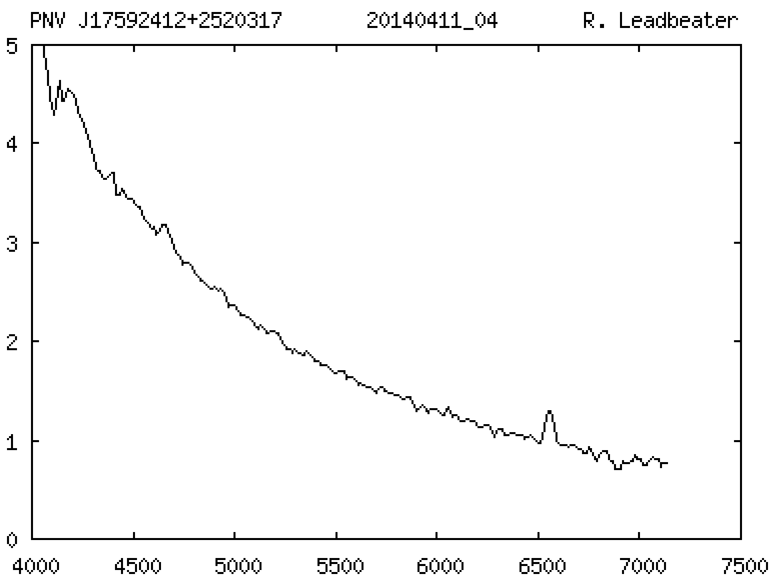
PNV J17592412+2520317

Superoutburst of a WZ Sge cataclysmic
In Herculis
PNV J17592412+2520317
http://www.cbat.eps.harvard.edu/unconf/followups/J17592412+2520317.html

3 spectra of this transcient comptatible with a dwarf nova outburst (Type WZ Sge, Delta mag > 8) : blue continuum, Balmer lines in emission/absorption (emission from a hot accretion disk)
Link to spectra in CBAT "Transient Object Followup Reports"





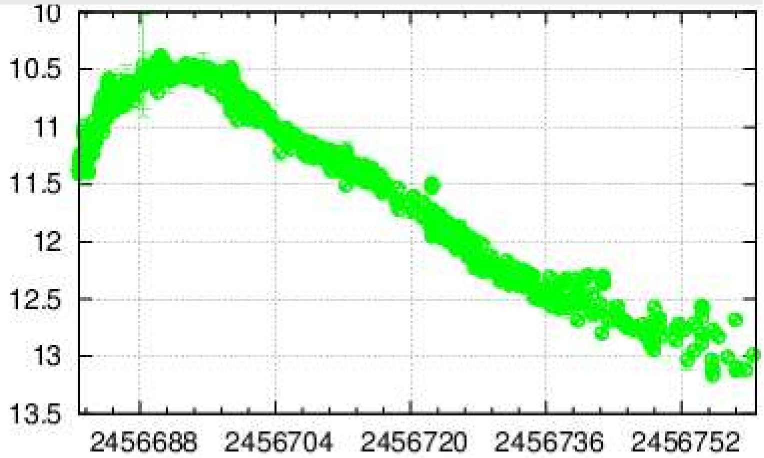


Spectrum from Robin Leadbeater using a modified Alpy with a 200 l/mm grating

Supernovae

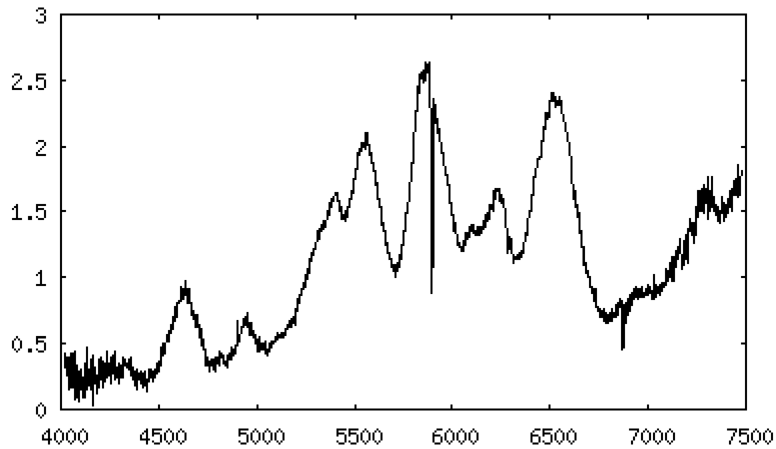
SN 2014J in M 82 Type Ia

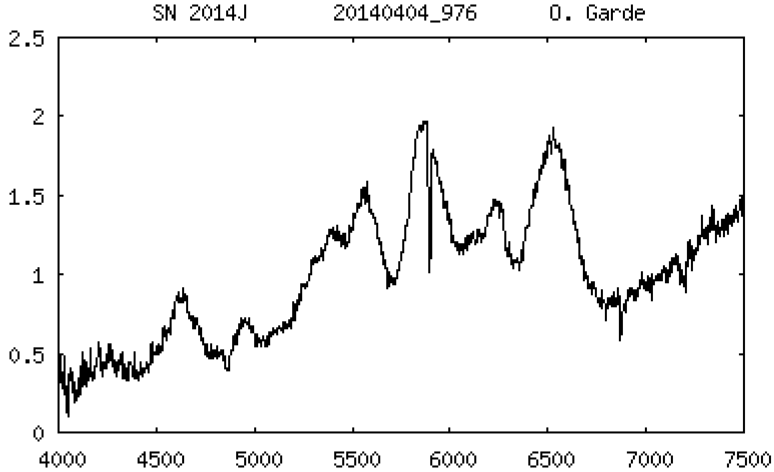
Luminosity
Mag V ~13.1 (13-04-2014)



Observing

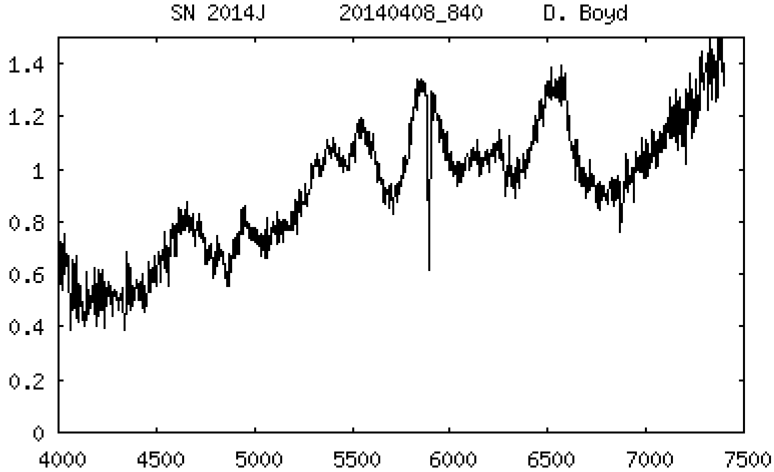
Ungoing campaign, more than 60 days after maximum luminosity
68 spectra in ARAS data base
New spectra from C. Buil, O. Garde, T. Lester





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



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!

Contribution to ARAS data base
From 30-03 to 12-04-2014

P. Gerlach
C. Buil
T. Bohlsen
D. Boyd
K. Harrison
O. Garde
J. Guarro
C. Rives
F. Teyssier
R. Leadbeater
P. Berardi
A. Garcia

Further informations :
Email francoismathieu.teyssier at bbox.fr

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