

## V597 Puppis discovery story.

Following a long row of clear nights, the best since January 2005 when I had 28 clear dry nights, the weather had returned to the typical pattern here at Cabo da Roca. Humid, windy.. and cloudy. Few of my friends in northern Europe, suspect that while southern Portugal (Algarve) or even nearby Lisbon, may enjoy 120-180 clear nights a year, at Cabo da Roca this figure drops to about 80 !

So it had been a disappointing evening, during which I barely managed a 12 minute hasty search from Scutum to Sagittae. Fohn bank clouds left just the occasional brief open to allow seeing my memorized asterisms for a few seconds. Somewhat frustrated that I would not be able to sweep Cygnus I went to prepare and have dinner. When for some reason I cannot scan Cygnus, I always remember two things: that back in 2001 I swept twice right over a 7th mag nova there and failed to notice it, and also that I've promised my friend Reinder Bouma, to discover a nova in that constellation so that it will be well visible from his homeland in The Netherlands, contrary to my earlier finds!

Sometime around 23h, noting that there were no gaps in the clouds, I decided to go to sleep and set the alarm clock for 2h. Northern Cygnus would still be visible low over the Atlantic, and I would then have time to observe outbursting comet 17P/Holmes before scanning through Cassiopeia and Puppis.

So it rang at 2h, and as I stumbled out of bed to reach a window and check the sky, I started recalling weather maps and sat pics from the evening, and trying to figure out whether there would be any chances of clear spells before dawn. I had hopes that the wind would slightly shift from NNW to NNE, which would mean good chances for a clear, but upon looking up through the window I could see it was still overcast.

I went back to bed with the feeling I had done what I could for that night, yet still decided to set the alarm clock once again, this time to shortly before 5 o'clock. I always place the alarm clock some distance away, so that I don't repeat what I did many years ago, when I would simply reach out for the clock with one hand, turn it off, and get back to sleep! This one also does not turn off with just one button, thus requiring that I really get awake in order to turn it off. The great Norwegian observer Olaf Hassel (discoverer of Nova Her 1960) who was deaf, overcame his impairment in this regard by building an "alarm clock" that would let a pillow fall on his head at wake time!

When it again rang at 5 o'clock, I got up full of hope, and indeed it was clear. Somewhat misty close to the horizon, but with good enough conditions upwards, so I went out to observe 17P/Holmes. Afterwards, with dawn approaching, I did not have much time left, so I had to chose between scanning Cassiopeia or Puppis. And of course picked up Puppis. This constellation harbours some of the most lovely Milky Way fields. Even though it does not rise much high above my horizon (at lat 38 deg. N), the asterisms there are stunning. Besides, there is the thrill of trying to observe as far south as possible, almost into what is considered the sole province of Southern Hemisphere observers.

My friend Fraser Farrell who lives in South Australia, once told me that to see Puppis from my latitude it must be like "seeing it through a dirty window" as compared to the magnificent view he can get down under, where it is possible to view this constellation much higher in the sky. Who knows, maybe later in life I shall overcome my dislike of traveling, and go there see it for myself.

So, at 5h 30, I laid back on a mattress, and pointed the 14x100 binoculars to Puppis, and an asterism some 3 deg NE from the nova's position appeared. As I find that searches are somewhat easier if I always follow the same path, I instantly lowered the binoculars and centered on a 5th magnitude star (HIP 40678), which is surrounded by bright stars and makes up a binocular asterism that reminds me of a caravel ship. It is here that I usually start when sweeping Puppis, typically proceeding Westwards for several degrees. However, this time I did not go any further. Not even a degree!

It immediately struck me the bright new object in a position where I usually only see fainter 8-9 mag stars at my recognition limit. It looked like if the caravel's sail had this one more star to the NE of it! I had seen the field hundreds of times, and knew all too well that nothing should be there.

As happened with my previous discoveries, for a few seconds I expected to see it move, like a slow satellite, an airplane or a weather balloon. However, as seconds elapsed nothing happened. The object stayed put. Then I immediately looked around for potential comparison stars and made an estimate of its brightness and position. The later was not so easy to pinpoint as with previous finds.

It was somewhat misty at an elevation of just 16 degrees above the horizon, and the faint stars around the nova were not prominent objects.

Back at the computer, I got the position with the mouse on my planetarium software and checked the magnitude of the stars I had used for comparison. Then I started the usual careful checks: no known solar system objects there, no stars close to its estimated 7.0 magnitude brightness on blue POSS2/UKSTU plates, no variable stars there either.. The object was ostensibly a galactic nova. I filled the relevant data onto the e-mail template I always have ready to go. Then I went out to see the object one last time before sending the mail.

No change in position, or brightness. Time to send the mail to CBAT, and immediately back again to the nova to make follow up estimates of its brightness, this time armed with a good sequence of selected non reddish comparison stars. I noted that there were several potential comparison stars that looked quite close in brightness to the nova but had to be discarded because they were K spectrum stars.

Meanwhile twilight was increasing and the observations were cut short after a couple of magnitude estimates which showed no change; contrary to what happened with V1494 Aql and V4739 Sgr which showed definite rising trends in the minutes following discovery.

It was only when back at the computer that I did notice that this time I had not continued to nova search after sending the discovery mail. With dawn approaching there was no time left and I'm afraid this morning Puppis went unscanned for the most part.

After having breakfast, I started checking global sat pics to see who would have clear skies to do follow up on the nova. This was my first "morning" discovery, so it was rather late into the night, even in longitudes significantly west of me, when CBAT requested confirmation. As the hours passed, I kept wondering: was the nova brightening ? fading ? What would the spectra look like ? Would a progenitor be found as a result of precise astrometry ? It was once again a painful wait, just like with the previous finds. I walked a lot back and forth, checking the mail/web at a few minutes intervals the whole day! Confirmation finally came around dinner time, as I was preparing for another search session.

Half of my discoveries were made with 14x100 binoculars tripod mounted (V4739 Sgr and V4740 Sgr), the other half, hand-held (V1494 Aql and V597 Pup). Between the discoveries of V4740 Sgr in 2001 and V597 Pup, 625h of search time elapsed. The grand total since I started binocular patrol on a significant enough scale (back in June 1991), is 1250h.

My second and third discoveries had come just 10 days (7 hours effective search) apart, now it took over 6 years (and 625 hours effective search time). My friends were very surprised in both instances, nevertheless, in both cases it was "business as usual" for me. I think this is part of the necessary frame of mind in this endeavour.

Years pass and colleagues that don't see my name on the IAU circulars start wondering what I'm doing; and if they see the occasional observation of a bright (or otherwise interesting) object published they ask me if I'm "back to astronomy". Yet, I'm nearly always here, searching for about 3h each clear night regardless of the Moon or broken clouds. As long as conditions allow me to see my memorized patterns, I search.

Memorizing the binocular constellations is very easy, since what is involved is recognition memory, not recall memory. This point is paramount to understand, and a source of many misunderstandings. Much more difficult is to keep the necessary assiduity, and indeed there happen occasional gaps when for a few months (mainly due to other commitments) I do not search. I have family, friends, and other interests like composing music, besides daytime commitments like everyone else.

Today this field is more competitive than it ever was, and those using imaging devices for their searches are picking up more and more novae when still faint. The discovery magnitude has been getting gradually fainter due to the efforts of great nova searchers like Liller, Camilleri, Nishimura, Haseda, Nakamura, Takao, Sakurai and numerous others. I have the highest regard and friendly feelings for all these individuals.

Further, most of my forebears in this endeavour did not have to contend with so much light pollution. It is a waste of energetic resources and a crime against the planet to burn coal at a power station just to send light into the sky or driver's eyes! I have heard of residents who could not ascertain whether there

was a robbery going on in the neighbourhood because of lights shining on their window instead of down on the street!

I always wonder: if cars are not allowed to point their strongest headlights to incoming traffic, then how come it is possible to have high power lights shining horizontally into roads? The local authorities should realize that people need better visibility, not stronger lights pointed at their eyes, which cause glare and end up reducing security. They will spend huge sums on publicity to have consumers save power in their house-hold appliances, but I think they should also reconsider their outdoor lighting policy.

My search area is ~3000 square degrees, with several thousand stars memorized, and includes parts of: Sgr, Sco, Oph, Sct, Ser, Aql, Her, Lyr, Sge, Vul, Cyg, Cep, UMi, Lac, Cas, And, Aur, Gem, Tau, Ori, Pup, and Pyx. Generally I search down to mag 7.5-8.0, but in some areas try to go deep to mag 8.5-9 (if necessary using my old rich-field 15-cm f/4 Newtonian at 26x).

Variable stars and asteroids are usually picked up when around mag 8.5, but the location of the object within memorized patterns is important. Pallas easily caught up in Pup at mag 8.5, later when at mag 7.5, there were occasions when its position "disguised" it a bit. Also if humidity is high, the sodium lit sky will tend to obliterate an orangish nova (e.g. V4740 Sgr) as opposed to a whitish nova (e.g. V4739 Sgr).

Optimizing the design of one's asterism patterns is not easy, because of variable field orientations and seeing limits. I think that the observer has a natural tendency to move from asterism to asterism, and the gaps may not get properly checked, and a bright nova be missed there. I always try to have this present and make an effort to go check those gaps. Visual patrol may have its flaws, but has the advantage of an extremely prompt alert, and I am very happy that my swift reports provided the opportunity for very early stage observations at four occasions.

I would take the present chance to call the attention of those with access to large apertures and CCD's, to V4739 Sgr. According to Livingston et.al. in IBVS 5172, this object was the fastest classical novae ever recorded. I wonder what is the current magnitude, and what was the magnitude range of this object. The light curve reminded me of some fast recurrent novae, however the spectra does not quite match. I would be very grateful if any of the readers can obtain deep CCD images of this object next year when Sgr gets well visible again. Even negative results will be interesting.

Nova searching also has its hazards. A couple of years ago I was scanning Sgr and put down the binoculars on the mattress to check a suspect. When I got back and grabbed the binoculars I felt an initially slight burning pain on my little finger. I still lifted the 14x100's wondering what it was, but as the pain was increasing by the second I realized I must have got bitten by a spider. I quickly laid down the binoculars and turned on the lights. There it was, running away from the mattress; a huge Tegenaria Agrestis (Hobo Spider)! Fortunately there were no consequences besides swelling and pain, but I gather the outcome might also have not been so fortunate.

The most extreme weather I ever experienced during nova searching, came on 1/2 August 2003, when at midnight the temperature was +34 C, with a strong hot East wind! If I did not see it was night, by the feeling of the hot wind on my body, I would believe to be sunbathing on the beach! I will note that the maximum temperature ever recorded here in 30 years climate records, was +35 C, which of course happened during the day.

In closing, I would like to thank Gunnar Glitscher who kindly provided the 14x100 binoculars and was one of the few persons who believed I could find a nova, back in those days when I was just a "wanna-be" nova searcher; Reinder Bouma was also among those few who encouraged me in this endeavour. Besides being a loyal friend and outstanding observer, he is without doubt and by far the person with whom I learned more astronomy; Rui Goncalves is a long time friend, who also provided invaluable help in my early days of searching via access to a reliable photo-atlas to check suspects against; Fraser Farrell was also very helpful, among other things in overcoming the shortcomings of having a slow computer like I did back in the 90's, and was also great chatting with; I'm also deeply grateful to those who contributed the countless comet observations to my web site, many of whom encouraged me a lot; and last but certainly not least, my parents, Helena and Vitor; without their support all this would not have been possible.

Alfredo Pereira

Cabo da Roca, 18 November 2007.