The Pup

Telescope: **ATC82/1670** (oil doublet)
Eyepieces:
ATC53P - ATC f53PEX, f=53mm, (32×, 72′)
TMB16 - TMB mono 16, f=16mm, (104×, 18′)
A-16 - Zeiss ZAO-I 16, f=16mm, (104×, 27′)
A-10 - Zeiss ZAO-I 10, f=10mm, (167×, 17′)
A-6 - Zeiss ZAO-I 6, f=6mm, (278×, 10′)
XO5 - Pentax XO5, f=5.1mm, (327×, 8′)

Time: 2017/03/16 19:30-21:10UT
Location: Říčany
Weather: Medium haze.
Seeing: Excellent.
Mount: Zeiss Ib
Accessories: Baader 1.25" zenith prism

I have been trying to spot Sirius companion for several years. Numerous reports on spotting the companion even in telescopes with the modest 80mm class apertures were encouridging. Yet, so far I had no luck with this white dwarf. Living at 50° north latitude makes it a real challenge. Add also notoriously unstable weather we have beeing experiencing in last couple of winters, and the results is a very low chance to run on conditions that would allow to see this Little Pup.

I already considered this winter lost again. But when I went out on this March night and still saw Sirius reasonably well placed, I decided to give it one last try. The sky was a little bit milky, but the atmosphere was quite calm with almost no wind. Sirius was my first target. I knew that using a lens which just came out from the warm room could lower my chances but there was no time to wait - trees were quite close. I designed this 82mm oil doublet keeping in mind short winter planetary sessions and I trusted the lens to perform very well from the very beginning[1].

The image of **Sirius** at 278× was indeed unusually stable. I could see several quite well defined diffraction rings, with long, only slowly changing arcs. My excitement went up when I strongly suspected the companion in expected position, i.e. east from the bright Sirius A. However, during several minutes of concentrated efforts I could not make myself sure it was really there.

I decided to take out the zenith prism and to try to look at Sirius in straight-through mode. As Sirius was low, the position was quite comfortable. The only problem was to reach for the slow motion knobs to center the Sirius in the field of view. When I succeeded and when I focused the view as precisely as I could, using micro-focus ring, I started to see the companion with more authority. It was there! East of Sirius A and in about right distance (few diffraction rings).

When I read as a kid about the discovery of this white dwarf, both about the prediction of its existence from the observed periodical changes in Sirius A position, and the legendary observation using new 18.5" Clark lens, it never came to my mind that I would be able to see Sirius B with my own eyes. Yet, it was there and visible even in small aperture. The moment was also a little bit more special to me as the lens, through which I saw Sirius B for the first time in my life, was of my own design.

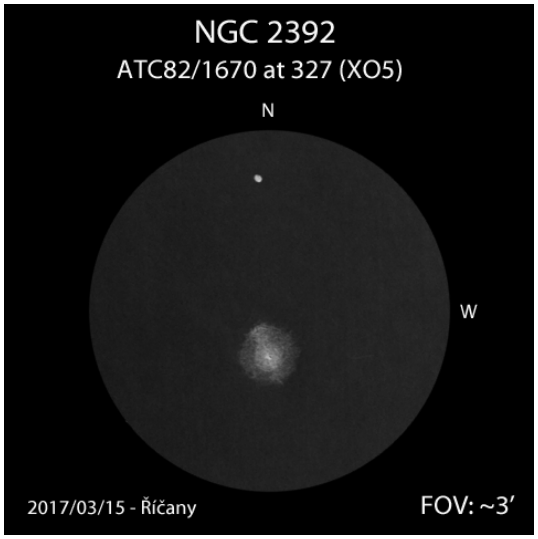
My confidence was shaken a little bit latter on at home when I compared my estimation of Sirius B position angle of PA∼ 110° with real value which is nowadays around 70°. I still feel quite confident that I saw the companion. From the past, I know that from time to time I got wrong number on position an-

[1]For details about the lens see my first light report from 27 March 2014 available here.

gle even for much easier pairs. My mount was not properly aligned, I could not see even Polaris from the place where I put it down. And I was estimating the position angle with respect to the mount movement not the sky. I could have forgotten as well that in straight-through mode there is no mirroring of the image, although I think I did take it into account. I know now that next time I need to be more careful.

I decided to take the advantage of excellent seeing and I moved the telescope, still in straight-through mode, to M42 which was just above the trees. I usually do not observe anything so west as this is the direction towards the center of the small town where I live and the sky is visibly brighter in there. In this case, I was hunting for E and F components of Trapez, and light pollution is not such big problem for double stars. In good conditions, I could see regularly E component in 80mm class refractors. I had good luck with F component only once in AS80/1200 telescope. At that time it was nothing more than a tiny faint dot showing just several times in very short fleeting moments. This night, the view of **Trapez** (ϑ_1 Ori) was indeed exceptional. At power of 167×, I could hold steadily, with some concentration, both components E and F even for several seconds. Simply beautiful. I have never experienced such a calm view.

Next target was bright planetary nebula **NGC 2392** which I was studying and sketching the previous night. I wanted to check if I could see more details in better seeing. Alas, I could only confirm at 327× my observations from the previous night and add nothing new to them. The central star was very obvious, buried in the rounded brighter core which was surrounded by a fading faint halo. There was definitely some brightening or a small tip in the northern part of halo at PA$\sim 10-20°$.



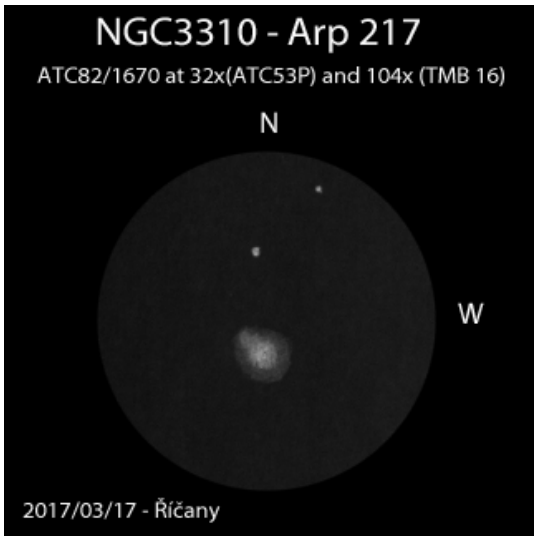
Sketch of NGC 2392 from previous night

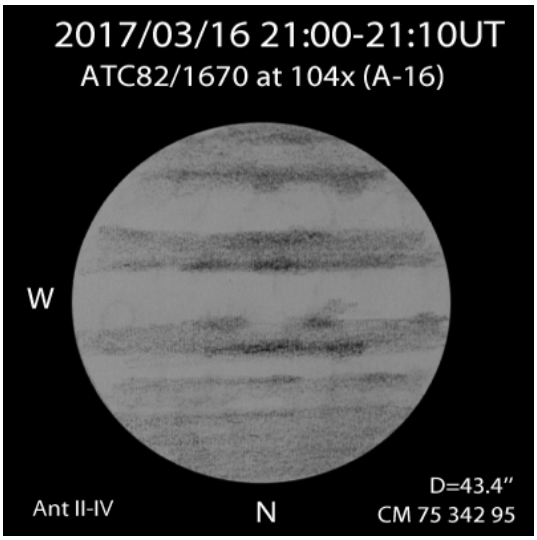
Then I quickly stopped at nearby open cluster **NGC 2420** which I have visited last time five years ago. At 32×, it was delicate silverish small nebular cloud sparkling with hints of very faint stars. Beautiful sight. The cloud was resolved at 104× to about five very faint stars on slightly milky background. Estimated diameter was $2'-3'$.

Despite of slightly misty sky, I decided to check some galaxies in Ursa Major where the sky was the darkest. I wanted to check galaxy M108 but I did not make to it at the end. My eye caught in the Interstellarium Deep Sky Atlas an asterism called **Broken engagement ring** west of β UMa. At 32×, there were five brighter stars forming letter J.

The brightest star, in the middle of the arc, was showing clearly slightly golden hue. Exactly of the same type I see for very hot stars. At home, I have found out that this star is indeed of spectral type B9V. Just for fun, I put the name of the star, **HD93847**, into Google. To my surprise, I have found out that data from ROSAT suggest an existence of possible white dwarf companion. So this star is kind of modern equivalent of Sirius. By the way, there are not many known white dwars accopmanying a hot star.

Then I saw in the atlas a line of three bright Arp galaxies and I decided to check them. The first one was spiral galaxy **NGC 3310**, Arp 271 ($V = 10.4$, $3.1' \times 2.4'$). It was almost stellar at 32× but definitely misty, compared to a very faint star north of it. I could see in ZAO-I 16mm eyepiece at 104× some hints of irregularities and I switched to my ultimate DSO eyepiece, TMB monocentric 16mm, hoping that I would see them in a more clear way. They were still elusive. Central bulk was rounded with a bright stellar spot in the middle. The shape of galaxy was changing with averted vision. From time to time, I saw the galaxy slightly elongated at PA$\sim 70°$. It felt like a tip or brightening at the eastern edge. Images show indeed a bright short arm in this place.





I had no luck with the next target, galaxy **NGC 3631**, Arp 27 ($V = 10.6$, $5.0 \times 4.8\times$). Although it is similarly bright as NGC 3310, I could not see it clearly neither at $32\times$ or $104\times$. Data suggest that the surface brightness of this galaxy is much lower than the brightness of NGC 3310. This was probably a reason why I could not locate it. In addition, there where no nearby stars in the atlas to pin down the location at $104\times$. I went home to pick up more detailed Uranometria 2000.0 but it did not help much.

At least, I have noticed nice double star when looking for NGC 3631. It was lovely pair of brighter white stars, quite close at $32\times$. I have identified it later at home as **Σ 1520** (6.5+7.8, 12.4″).

The third Apr's galaxy in the line was **NGC 3718**, Arp 214 ($V = 10.6$, $8.1' \times 4.0'$, PA15°). I could just glimpse it occasionally. It had misty, almost stellar core. With keen averted vision it sometimes looked like a thin line elongated at PA$\sim 20°$.

Final target of the evening was Jupiter. It was quite low and in the direction of nearby roofs. Yet, the seeing was very good. The image was very still at $104\times$ and the whole surface was covered by rich texture. I started with sketching feeling hopeless. As it was nine month since I draw and observe the planet last time, I had a feeling that I would not be able to capture on paper all I can see. I was right but from completely different reason. After couple of minutes of observing and sketching, just when I put down the main observed features, the image became suddenly much worse and it did not improve in the following minutes. I guess Jupiter was hit by some hot air from the roofs. Here is at least the quick result of my effort.

It was time to pack the telescope and go to home. I'm sure there will be better opportunities to observe Jupiter in the upcoming apparition.

Alexander Kupčo