

4 October 2016, Zeiss Cas 150/2250

## Going deep with 150mm Cassegrain

*Telescope:* Zeiss Cassegrain 150/2250

*Eyepieces:*

**ATC53P** - ATC Plossl,  $f=53\text{mm}$ , ( $42\times$ ,  $53'$ )

**ATC40K** - ATC Kellner,  $f=40\text{mm}$ , ( $56\times$ ,  $44'$ )

**O-25** - CZJ Ortho,  $f=25\text{mm}$ , ( $90\times$ ,  $28'$ )

**A-16** - Zeiss Abbe Ortho,  $f=16\text{mm}$ , ( $141\times$ ,  $20'$ )

*Time:* 2016/09/08 19:30-22:40UT

*Location:* Konojedy - old airport

*Weather:* Clear sky with light haze. Strong wind. Temperature  $4^\circ\text{C}$ .

*Seeing:* Good

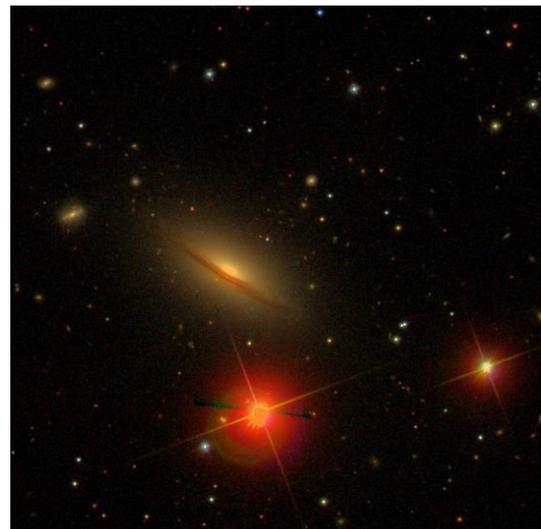
*Mount:* Zeiss 1b

*Accessories:* Baader/Zeiss T2 prism

I'm still discovering what is 150mm reflector capable of in terms of observing deep sky objects. In the past, I had small 150/750mm Newton which I was using most of the time for viewing the sky while taking images through 80mm apochromat. This was before I switched to visual observing completely and I was not a skilled observer at those time definitely. After several years of using smaller refractors solely I can definitely see through them more than I saw through the 150mm Newton. This made me wonder what I would be able to do with 150mm aperture now with all this experience.

My 150mm Cassegrain came with Zeiss 1b mount. I did not wanted the telescope but I though it would be a shame to separate the two things that belong together. I'm not able to collimate it properly and its high power performance is poor. It shows about the same level of details on Jupiter as my smallest 63mm refractor, may be even less. On deep sky objects, it is usable and I have used the telescope many times during this year late summer and early autumn. Under dark sky, it definitely shows more stuff than my smaller refractors.

For this night, I went again to my new dark sky favorite place, the old airport in



UGC 12591 (SDSS image,  $6' \times 6'$ ).

small village Konojedy. It is even further east from Prague than my observatory shed. The place is open and I felt it this night. Strong wind was shaking with the telescope most of the time. I had to lock the mount every time I found the target and I could not just push the telescope to follow the target as I'm used to in less violent times. This was a little bit annoying as I had with me no 220 V source to drive the Zeiss 1b mount obviously.

There was a danger that the strong wind would bring in quickly the clouds gath-

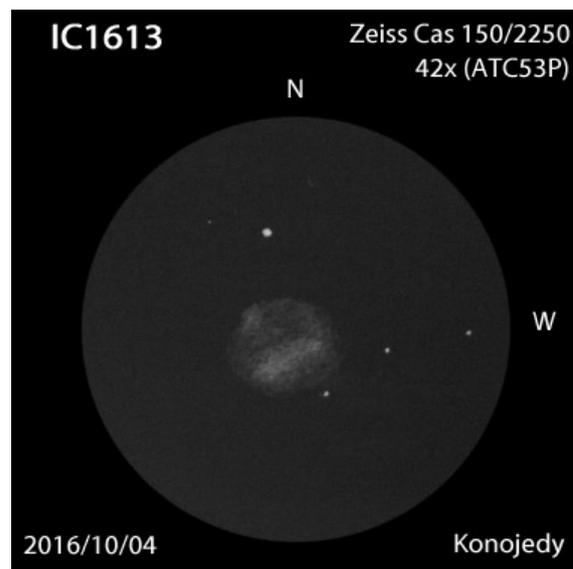
ering on northern horizon. Therefore, I started right with the most tough target that I picked for the night, distant galaxy **UGC 12591** ( $V = 12.9$ ,  $1.7' \times 0.8'$ ,  $PA60^\circ$ ) in Pegasus. My inspiration for this target came from the Steve Gottlieb's report on Cloudy Nights. He mentioned that this was in 1986 the most massive known spiral galaxy with the largest known radial velocities reaching 500 km/s.

I wanted to see this beast, naturally. I was ready for a long fight given the listed 12.9 visual magnitude and the presence of two nearby bright stars. Surprisingly, it was an easy prey. There was nothing at  $42\times$ . Jumping to  $141\times$ , I begun to clearly see with averted vision a faint nebular glow elongated (2:1) at  $PA \sim 40^\circ - 50^\circ$  and pointing to the bright star in SW direction. My guess is that this 340 Mly distant giant spiral galaxy could be visible even in smaller telescopes.

Then I noticed bright Fomalhaut on the southern horizon. This was an excellent opportunity to visit this part of sky not accessible from our backyard. On the way down to Piscis Austrinus, I have noticed in the Interstellarum Deep Sky Atlas unknown to me globular cluster **NGC 7492** ( $V = 11.2$ ,  $6.2'$ ) located in Aquarius. All I could see at  $42\times$ ,  $90\times$ , and  $141\times$  were just hints of very faint nebular glow. I did not wanted to spend too much time to confirm the observation and I moved on. My time was limited.

From the galaxies in Piscis Austrinus, I have picked up **NGC 7172** ( $V = 12.0$ ,  $2.5' \times 1.4'$ ,  $PA100^\circ$ ) and **NGC 7173** ( $V = 11.2$ ,  $1.2' \times 0.9'$ ,  $PA143^\circ$ ) pair. I have not noticed in the atlas that there were two additional galaxies **NGC 7176** ( $V = 11.2$ ,  $1.0' \times 0.8'$ ) and **NGC 7174** ( $V = 11.6$ ,  $2.3' \times 1.2'$ ,  $PA88^\circ$ ) in the place of NGC 7173.

I could see hints of NGC 7172 already at  $42\times$ . Power  $141\times$  showed just a very faint small nebular spot at the limit of detection with averted vision. From the NGC 7173,4,6 trio I have noticed at  $141\times$  only another single small and very faint nebular spot. No idea if it was NGC 7173 or combined glow of NGC 7174 and NGC 7176.



After that, I have decided to revisit dwarf galaxy IC 1613 in Pisces. On the way, I stopped quickly at interesting and photogenic galactic trio **NGC 474** (Arp 227) ( $V = 10.4$ ,  $7.1' \times 6.3'$ ,  $PA75^\circ$ ), **NGC 467** ( $V = 12.1$ ,  $1.7'$ ) and **NGC 470** ( $V = 11.6$ ,  $2.8' \times 1.7'$ ). Visually, the group is much less stunning, at least in 150mm telescope. From large NGC 474, I could see at  $141\times$  only small central part as a faint slightly elongated (3:2) glow at  $PA \sim 20^\circ$ . Galaxy was visible also at  $42\times$ . NGC 467 was a difficult target, just visible with averted vision at  $141\times$  as a small circular spot with two bright stars pointing to it. I have not noticed NGC 470 at  $141\times$ , although I was not looking for it hardly.

Finally I got to **IC 1613** ( $V = 9.9$ ,  $16' \times 15'$ ), a distant member of our Local Group. I was surprised how easily the galaxy was visible at  $42\times$ , remembering the hard times I got with it three years ago. It was faint roughly triangular patchy spot. There were two brighter regions. The larger one was a thick line running at  $PA \sim 120^\circ$ , following two medium bright stars. The east end was brighter. I suspected a much less pronounced brightening on the western end. In addition, there was a smaller brighter patch north of the line. Surprisingly, I have identified all main observed features on images. The thick line corresponds to the main galaxy body while the northern patch to a

distinct star-forming region.

Cassiopeia was near zenith and I thought this was a time to try again nebulae **IC 59** ( $10'$ ) and **IC 63** ( $10'$ ) near  $\gamma$  Cas. Yet again, I saw nothing for sure at  $42\times$  or  $56\times$  with or without  $H\beta$  filter, just a very vague suspicion.

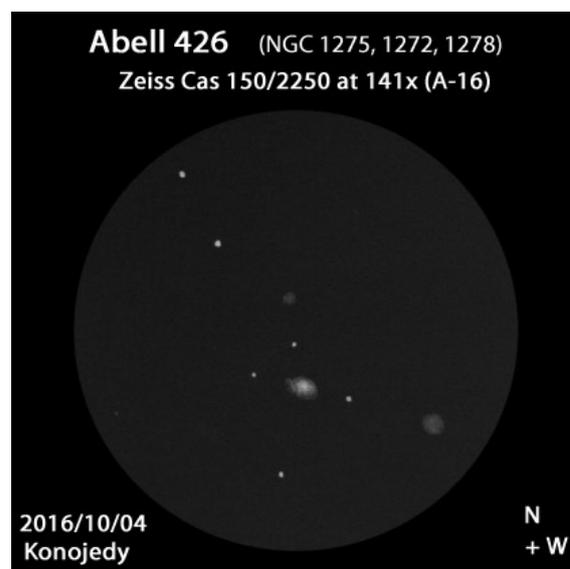
I quickly checked giant spiral galaxy **NGC 772** (Arp 78) ( $V = 10.4$ ,  $7' \times 4'$ , PA $130^\circ$ ) in Aries which I was observing couple of days before in the same telescope from our backyard. The arm was well visible at  $141\times$  but I did not notice any new features under better sky, neither I could see its small companion, galaxy **NGC 770** ( $V = 13.0$ ,  $1.2' \times 0.9'$ , PA $15^\circ$ ).

Recently, I made quite some effort to observe galaxy **NGC 660** ( $V = 11.4$ ,  $8' \times 3'$ , PA $170^\circ$ ). I had nothing more than vague glimpses of this interesting galaxy from our light polluted backyard. Under darker sky, I was not able to see the galaxy at  $42\times$ . At  $141\times$ , it was well visible with averted vision as distinct rounded nebular glow. From time to time, it seemed elongated at PA $\sim 40^\circ - 50^\circ$ . I was probably picking up the central brighter parts.

At this point, I have dismantled the  $H\beta$  filter from the 40mm Kellner eyepiece. Having it in hand, I have tried to look through it on **California Nebula**, **NGC 1499** ( $160' \times 40'$ ). To my surprise, it was indeed there. With concentrated averted vision, I could see from time to time elongated nebular patch. The position, orientation and size agreed well. There was no doubt it was indeed the nebula.

I picked up 240 Mly distant galaxy cluster **Abell 426** in Perseus for the last target of the night. I was curious, if I can see more members than just the central galaxy **NGC 1275**.

I had no image of the cluster with me. I was relying on the detailed map in *Uranometria 2000.0* and I made a quick sketch for later identification. Overall, I saw three galaxies. Two members, **NGC 1275** ( $V = 12.0$ ,  $2.2' \times 1.7'$ , PA $110^\circ$ ) and **NGC 1272** ( $V = 12.7$ ,  $2.0' \times 1.9'$ ), were already detectable at  $42\times$ . I have added **NGC 1278**



( $V = 12.7$ ,  $1.5' \times 1.3'$ ) at  $141\times$ . Interestingly, Herschel discovered in 1786 fainter and smaller **NGC 1278** while he missed completely the two larger galaxies. They had to wait for another 77 years to be discovered by d'Arrest in 1863 through 11in Merz refractor in newly built Copenhagen observatory.

The supergiant elliptical galaxy **NGC 1275** (type cD) is very spectacular on images. There are numerous filaments streaming from the active nucleus of this Seyfert galaxy with super massive central black hole. Astronomers found out that **NGC 1275** is a system of two galaxies, the large galaxy is colliding with another star island.

I have noticed some irregularities in **NGC 1275** in the eyepiece at  $141\times$ . The bright nucleus was a little bit north-west of the geometrical center and the body was elongated at PA $\sim 90^\circ$ . I have also noticed a tiny tip or brightening at the eastern end.

At home, I consulted my observations with O'Meara's in his book *Deep sky companion: Caldwell Object*. He did not mention any of these features. However, Luginbuhl and Skiff<sup>1</sup> noticed in 300mm telescope that the nucleus was a little bit west of the center.

Thanks to the strong wind I was feeling quite cold even though the temperature was

<sup>1</sup>Ch. Luginbuhl, B. Skiff: *Observing Handbook And Catalogue of Deep-Sky Objects*

4°C, not freezing yet. It was definitely time to go home and get some sleep.

**Alexander Kupčo**