MONTHLY OBSERVER'S CHALLENGE

Compiled by:

Roger Ivester, North Carolina

&

Sue French, New York

July 2022

Report #162

NGC 6210, The Turtle Nebula in Hercules

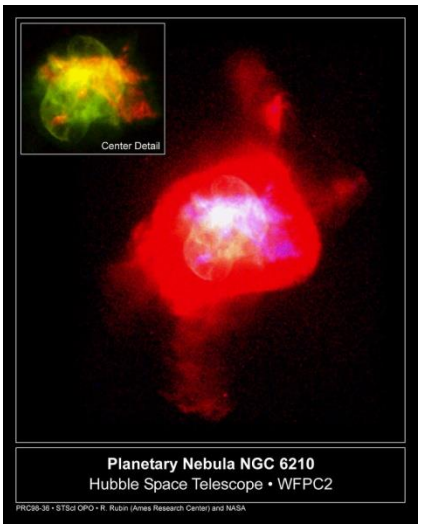
Sharing Observations and Bringing Amateur Astronomers Together

Introduction

The purpose of the Observer's Challenge is to encourage the pursuit of visual observing. It's open to everyone who's interested, and if you're able to contribute notes and/or drawings, we'll be happy to include them in our monthly summary. Visual astronomy depends on what's seen through the eyepiece. Not only does it satisfy an innate curiosity, but it allows the visual observer to discover the beauty and the wonderment of the night sky. Before photography, all observations depended on what astronomers saw in the eyepiece, and how they recorded their observations. This was done through notes and drawings, and that's the tradition we're stressing in the Observer's Challenge. And for folks with an interest in astrophotography, your digital images and notes are just as welcome. The hope is that you'll read through these reports and become inspired to take more time at the eyepiece, study each object, and look for those subtle details that you might never have noticed before.

This month's target:

Friedrich Georg Wilhelm von Struve discovered NGC 6210 in 1825 while searching for double stars with the 9.6-inch refractor at Dorpat Observatory in Estonia. The discovery was published in the appendix of his 1827 *Catalogus Novus Stellarum Duplicium et Multiplicium*.



According to Kent Wallace in his book *Visual Observations of Planetary Nebulae*, the Turtle Nebula nickname was coined by Dr. Robert Rubin, a former visiting professor of astronomy at UCLA and NASA Space Center astrophyicist. He chose the name because of its resemblance to a turtle on a Hubble Space Telescope image.

Welcome to our new contributor

Mircea Pteancu: Observer from Romania

NGC 6210 – Planetary Nebula in Hercules

Hazy object of oval shape, slightly elongated in the N-S direction, having about the same brightness over the entire surface. It has two “wings” or extensions, of much lower brightness compared to the central body, one to the East and the other to the West, both parallel to the central body. The eastern extension is narrow and less bright. The western extension is wider, approx. 1/6 of the width of the central body and slightly brighter than the eastern one.

The planetary nebula was pearl white with a slight but clearly visible shade of light-blue.

I estimated the diameter in the right ascension to approx. 20″. The diameter on declination was estimated to 25″, at most 30″.

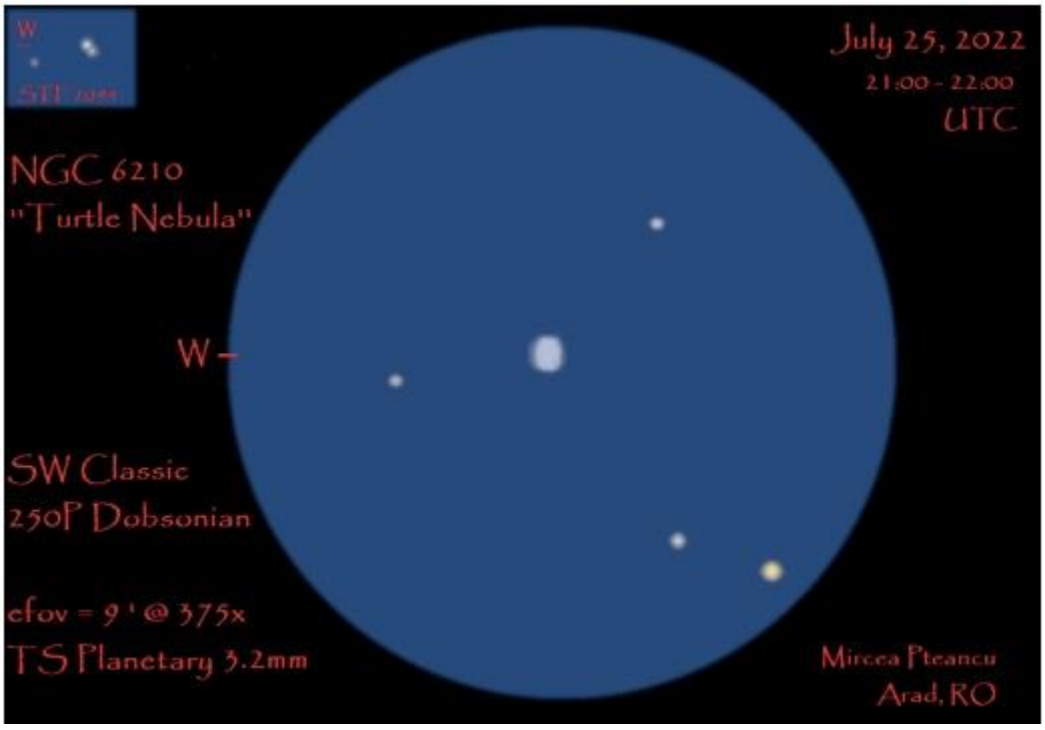
I did not saw the central star at 375×/ TS Planetary 3.2mm nor at 480×/ TMB Planetary 2.5mm.

The UHC filter did not bring new details, only the western extension seemed a bit wider.

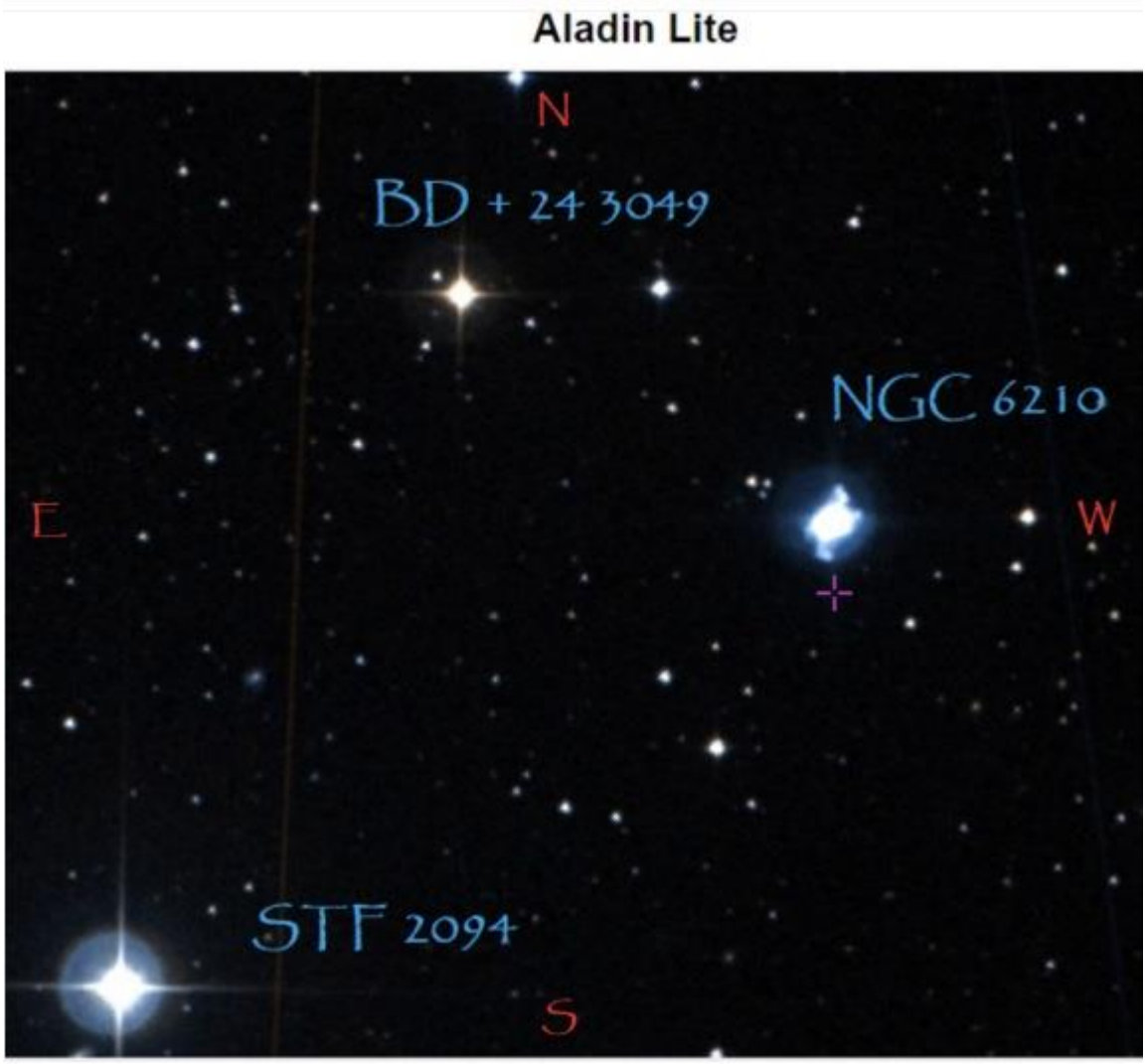
East of the planetary, and in the same field with it, there is the golden yellow star BD + 24 3049, of 9.42mv, spectral class K5.

To the West of the planetary one will see the star BD + 24 3048B of 11.3mv, white in color.

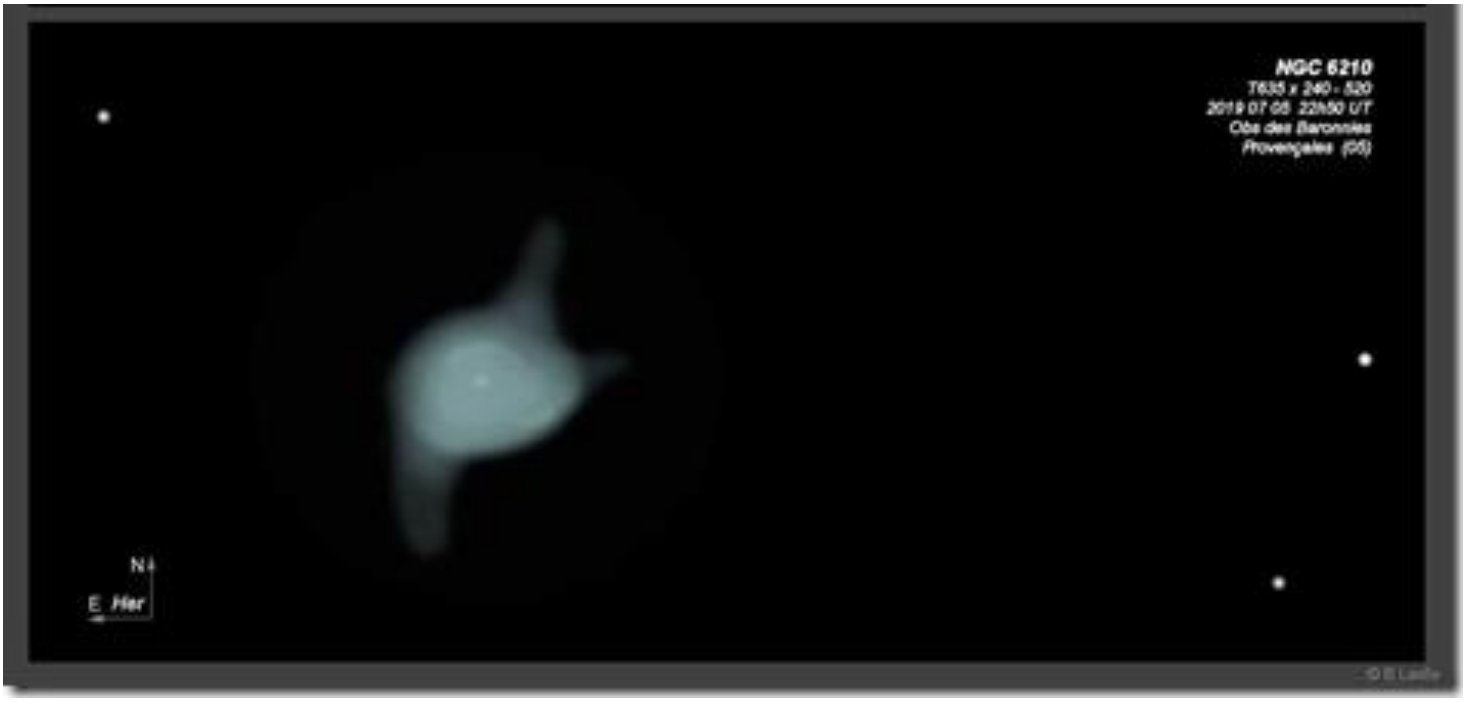
To the Southeast and forming the sharp tip of an isosceles triangle asterism, where NGC 6210 (to the West) and the yellow star BD + 24 3049 (to the North-East) are forming the base, there is the very attractive multiple star STF 2094. I split AB with a separation of 1.1″, at 375x and AC with a separation of 24.9″.



The following is a screenshot from Aladin Lite, showing the location of NGC 6210 and STF 2049. As a note, AB was already resolved, but not split at 150x with a Baader Mark III zoom eyepiece.



Bertrand Laville: Observer from France



Date of sketch: July 15, 2019 00:00 UT
Viewing location: Observatory of the Baronnies Provençales
Instrument: TN 635mm Dobsonian Obsession
Main eyepiece: Tele Vue Ethos 13mm

125× Explore Scientific 100°
The planetary nebula is small, and what dominates is its blue color. The central star is very difficult but certain, even blue, seen in second observation.

240× Tele Vue Ethos 13mm/UHC-NB1?
It is the best filter; the central star is perceived for the first time, difficult. Three legs of the turtle are perceived, difficult, but in the right place and with the right length, which validates the observation. No coucougnettes perceived. The shape of the carapace, with the round back, is exactly that drawn with the 47-inch at the Observatoire de Haute-Provence.

520× Ethos 6mm without filter
The central star is no longer seen, and the legs are borderline and uncertain. The NB1, OIII-12, 2nb filters bring nothing, except solar continuum, which confirms the central star, luminous and white, but not brilliant.

You'll find more detailed descriptions of Bertrand's sketches at: http://www.deepsky-drawings.com/

Uwe Glahn: Observer from Germany

Object: NGC 6210

Telescope: 27″ f/4.2 Newton

Magnification: 837×

NELM: fst 6m5+

Seeing: II

Location: Fuscher Törl

Sketch follows.

You can see more of Uwe's sketches at: http://www.deepsky-visuell.de/

Rony De Laet: Observer from Belgium

NGC 6210 is a small but bright planetary. I could identify it at 100× as a non-stellar object. With increasing power, the core of this planetary displays a bright and complex structure. The core is elongated and filled with bright knots and darker cavities. The brighter knots seem to build a ring-like structure along the perimeter of the core. Even at a magnification of 400× the nebula is so bright that I can't detect the central star. The legs of the turtle remain invisible in this high-power view. But there is more to see when switching to a lower power and adding an O III filter. The halo starts to show more detail than I suspected at first. It is not a dull and evenly lit disk. When I start studying the circumference of the halo I can discern darker bays and brighter spokes. It takes time and patience to really see these subtle differences with such a bright core in the middle of the view, but the result is very rewarding. Two of the turtle's extensions are faintly visible under my light polluted skies. They are much weaker than pictures show. Can you discern these extensions in the sketch below?

Site : Bekkevoort, Belgium (51° N)

Date : July 29, 2022
Time : around 23:30 UT

Telescope : Taurus 16″
EP: Morpheus 9mm 76°, 200×; Morpheus 4.5mm 76°, 400x
Filter : with and without OIII
Seeing : 4/5
Sky brightness : 20.1 magnitudes per square arc second near zenith (SQM reading).
Sketch Orientation: N up, W right.
Digital sketch made with Corel Paint Shop Pro X2, based on a raw pencil sketch.


Rony De Laet

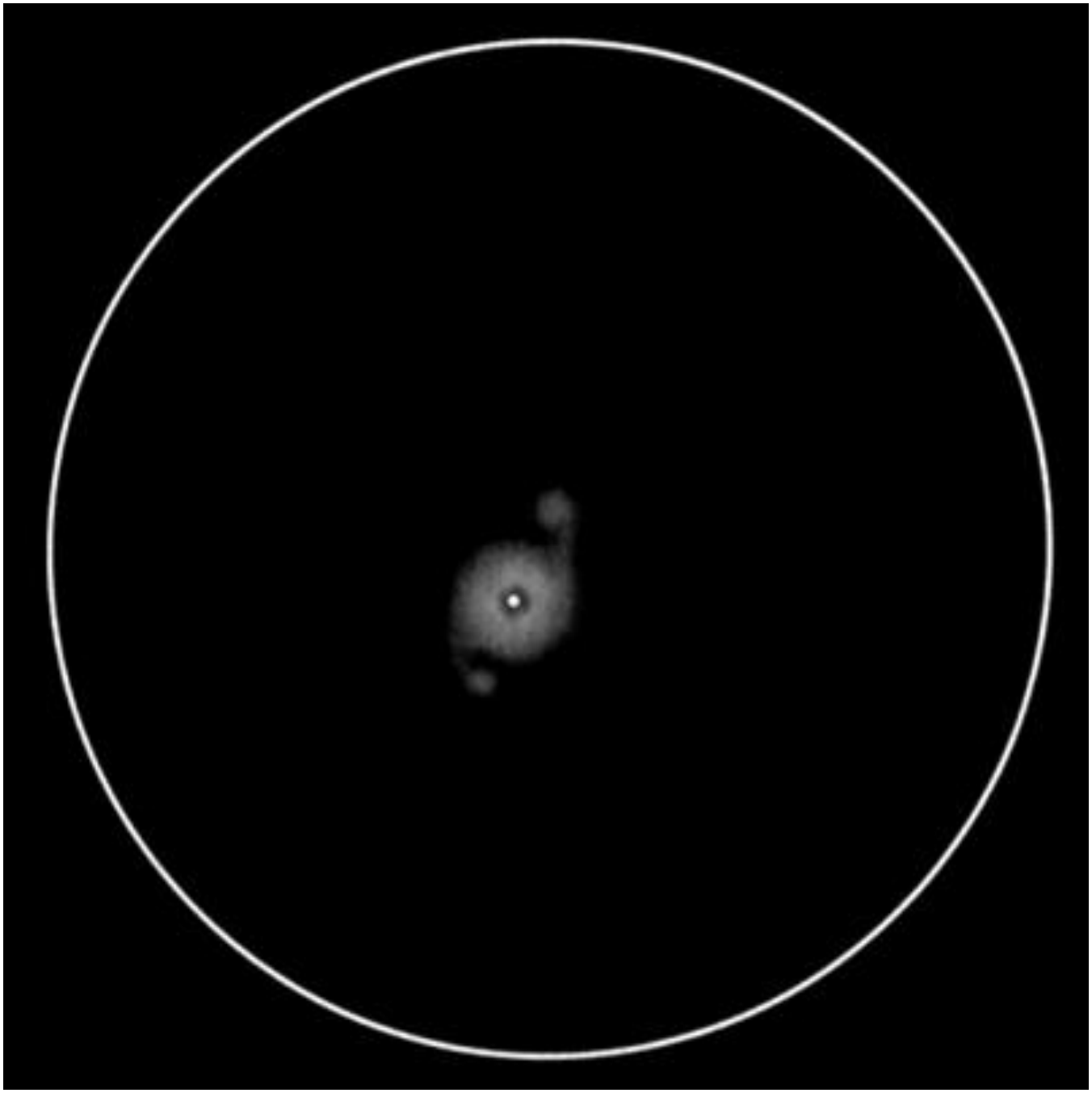
Jaakko Saloranta: Observer from Finland

8" Orion DSE

Object: NGC 6210
Obs. place: Pornainen, Finland
Date: 1./2.10.2010
NE Lim.mag: ~6.8 (zenith - HD 172922)
SQM-L reading: 20.91 (zenith)
Background sky: 6 (good)
Seeing: 6 (good)
Transparency: 6 (good)
Weather: +4.0 - +1.0°C, humidity ~81%, 1030HPa.

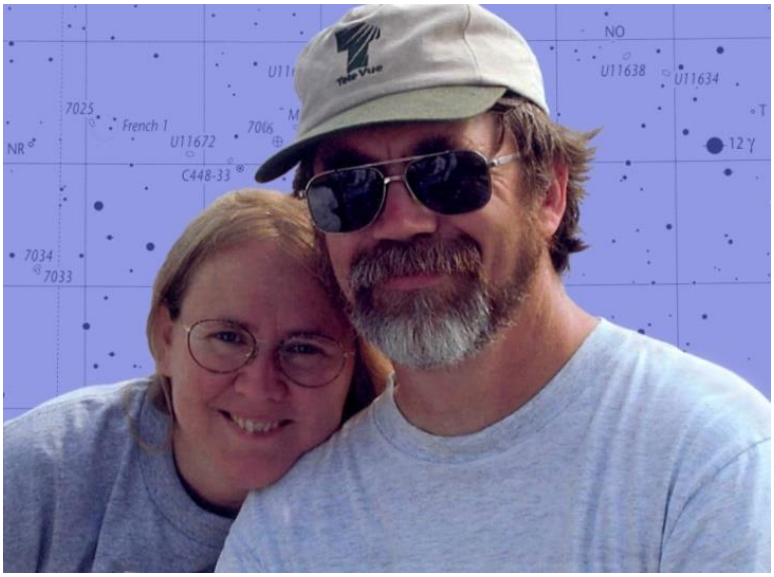
Description: Bright, easy and of slightly greenish hue. Round in shape but with high magnification mottled and irregular. With 400×, the core shows signs of a ring structure and some mottling near the brighter area surrounding the core. Central star is difficult but high magnification does the trick. Two "tails" picked up with UHC filter, NW and SE from the center.

Sketch follows.



NGC 6210 with 8" Orion DSE @ 600× + UHC filter

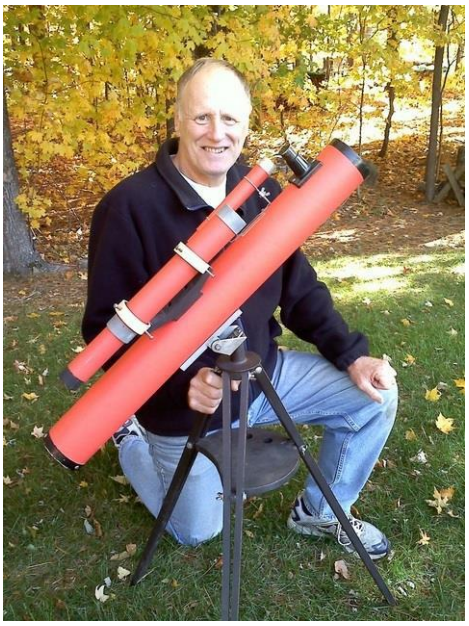
Sue French: Observer from New York



NGC 6210 is a fetching little gem, most easily spotted by its color at low magnifications. Through my 105mm refractor at 17×, it's as a tiny but obvious blue dot, while at 122× it appears bright, pretty, bluish, round, and it wears a faint halo. At the higher magnification, the 12.6-magnitude central star is visible despite the high surface-brightness of the nebula, but the star pops in and out of view. A faint halo rims the planetary.

Through my 10-inch reflector at 43×, the central star is visible, and the surrounding nebula strikes me as having a robin's-egg blue tint. The field of view harbors a distinctly orange, 9.5-magnitude star 4.6′ distant from the planetary in position angle 57°. The magnitude-7.3 star sitting 8.9′ in position angle 123° from the nebula shines golden. At 115×, NGC 6210's profile displays a nearly east-west oval mantled by a thin, fainter cloak. At 213× with an OIII filter, the halo looks quite a bit larger. Alas, I saw no turtle.

Glenn Chaple: Observer from Massachusetts



NGC 6210 Planetary Nebula in Ursa Hercules (Magnitude 8.8; Size 20″ X 13″)

A majority of the non-Messier deep sky objects featured in the Observer's Challenge were discovered by the German-English astronomer William Herschel during surveys conducted in the latter part of the 18th century and early years of the 19th. One of Herschel's more notable "misses" was this month's Challenge, the bright planetary nebula NGC 6210 in Hercules. Perhaps its relatively small size (a mere 20 by 13 arc-seconds and almost stellar-looking when viewed with low magnification) was to blame. But Herschel was able to detect the non-stellar appearance of Uranus when he discovered the planet in 1781, and its disc is just 4 arc-seconds across. Whatever the reason, NGC 6210 remained undetected until stumbled upon by the German-born Russian astronomer Wilhelm Struve while searching for double stars in 1825.

NGC 6210, nick-named the "Turtle Nebula" for its appearance in astroimages and visually through large-aperture scopes, is situated south of the "Keystone" of Hercules at 2000.0 coordinates RA $16^h44^m29.5^s$ and Dec +23°47′59.5″. It's about 4 degrees northeast of the 3rd-magnitude star beta (β) Herculis, a good starting point for star-hoppers working with a low-power eyepiece (refer to Finder Chart B). You'll know you've hit the mark when you arrive at a thin triangle 18 arc-minutes long and comprised of two 7th magnitude stars and a slightly out-of-focus 9th-magnitude object (NGC 6210).

Even the smallest of astronomical telescopes will pick up NGC 6210. I first saw it on the evening of May 27, 1978, using a 3-inch f/10 reflector. In my logbook, I wrote, "At 30×, this object is still nearly star-like. At 60×, it seems more diffuse, and at 120× is definitely nebulous." I saw no indication of color.

Recently, I returned to NGC 6210 with a 10-inch f/5 reflector. Again, low power (this time, 40×) revealed little more than a near-stellar image. A switch to higher magnification (208×) brought out a slightly bluish hue, but there was no sign of the outer extensions that form the "Turtle's" head and appendages. I also failed to pick out the 13th-magnitude central star. Darker skies (mine had a limiting magnitude of 5) and/or more aperture would have done the trick.

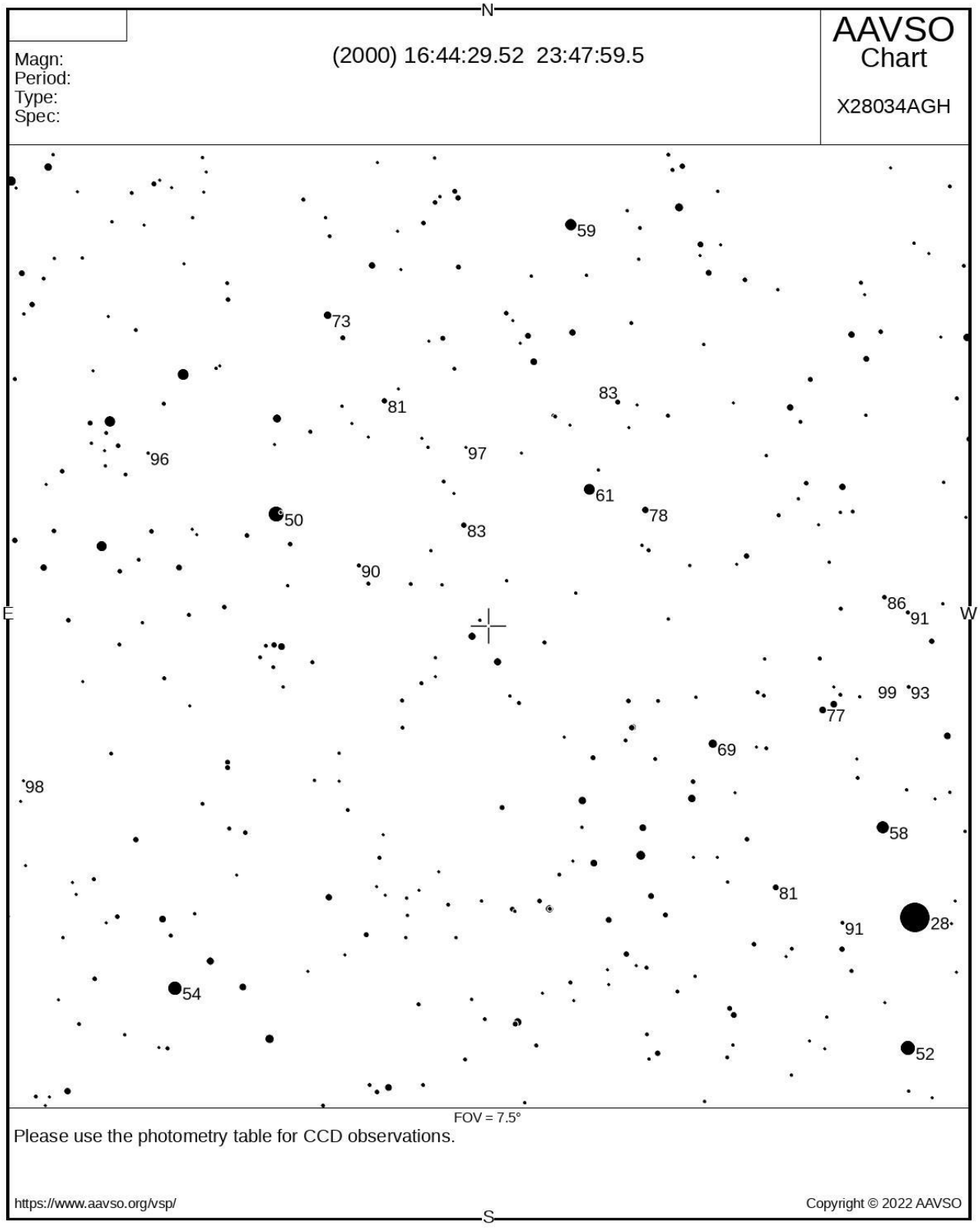
After giving NGC 6210 its due respect, turn your gaze to the 7th-magnitude triangle member that lies 18 arc-minutes south and slightly west. This is the tight double star Struve 2094 (Σ2094). Its magnitude 7.5 and 7.9 component stars are just 1.1 arc-seconds apart, so I recommend using a scope with minimum aperture of 4 inches and a magnifying power of at least 200× on an evening when the seeing conditions are as steady as possible. An 11.7-magnitude third component lies 25 arc-seconds northwest of the main pair.

NGC 6210 is about 6500 light-years away. The bright central portion is roughly one-half light year in diameter, while the "Turtle" spans 1.6 light-years.

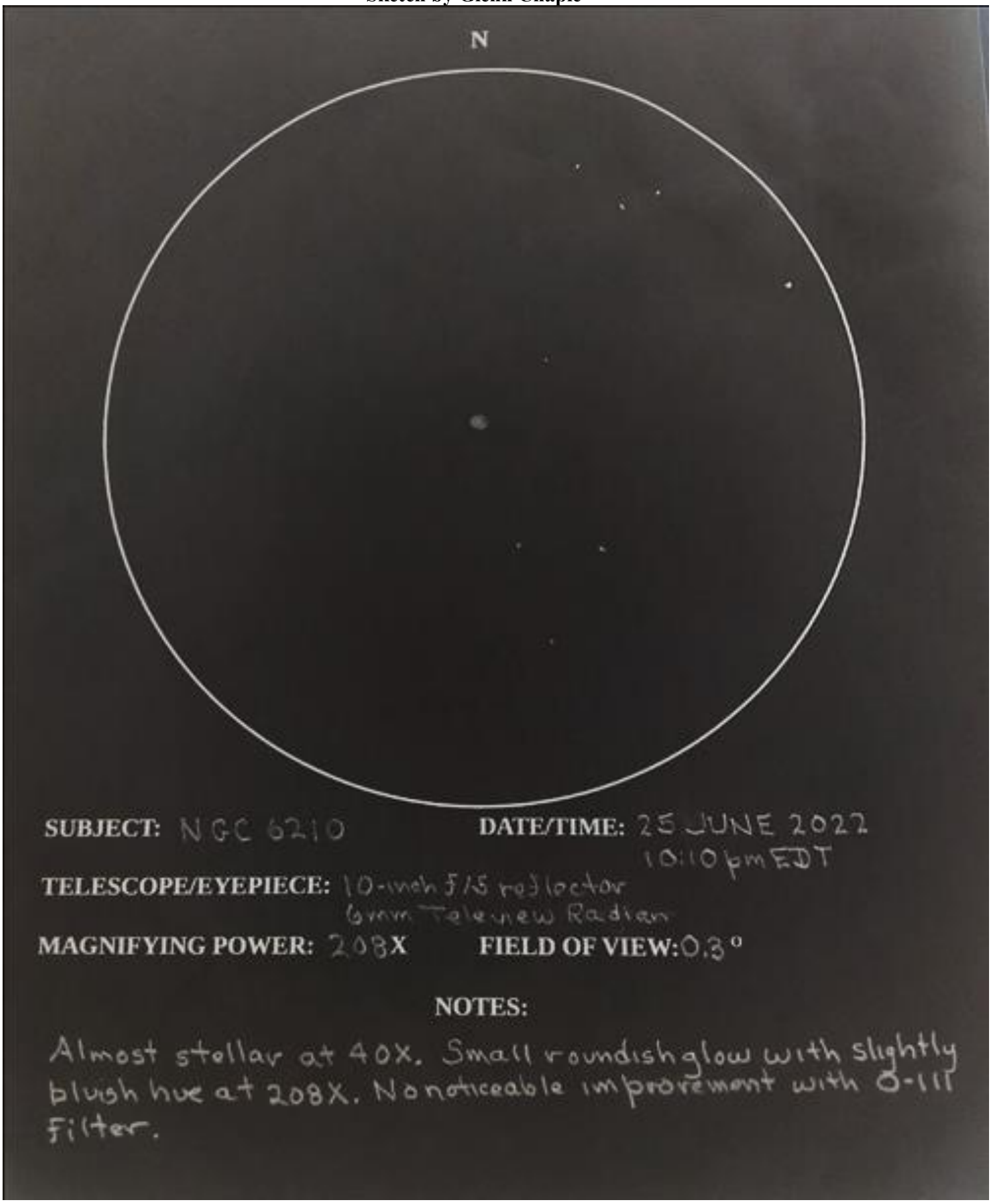
NGC 6210 Finder Chart A

NGC 6210 Finder Chart B

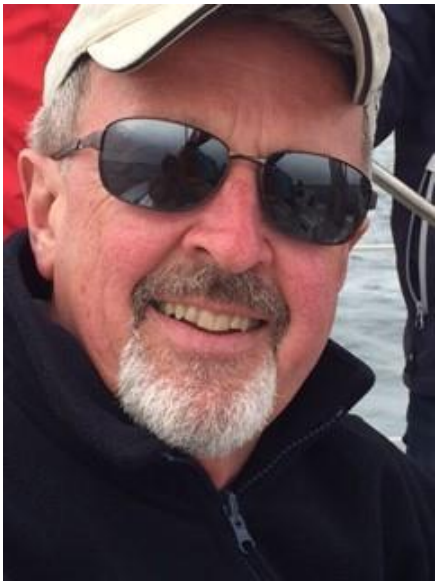
Chart created using the AAVSO's Variable Star Plotter (VSP). The location of NGC 6210 is marked with a crosshair. Numbers are stellar magnitudes, decimals omitted. The 2.8 magnitude star is beta (β) Herculis. Stars plotted to 10th magnitude. North is up in this 4 X 4 degree field. The star just below and slightly right of NGC 6210 is Struve 2094**.**



Sketch by Glenn Chaple



John Bishop: Observer from Massachusetts



On July 20, 2022, I observed NGC 6210, a planetary nebula in Hercules. This object was new to me. I observed with my f/8.1 long-tube 5 inch apo refractor, at magnification ranging from 35× to 139×. It is a portable setup, on a motor driven equatorial mount, without go-to. I observed from a site not far from the harbor in Wellfleet, Massachusetts. Observing conditions were very good. The sky was clear and steady, with a light breeze at ground level. Humidity was low for this location. Temperature remained in the 70s F. during the evening. I used DEET to keep mosquitoes at bay.

Small planetaries have always been an observing challenge for me. Especially at low power, they look star-like and are difficult to distinguish from field stars. I was reminded of this while searching for NGC 6210.

I started the search by locating Beta Herculis in my 7×50 finder. From there, on the chart the path to our object was a line northeast, through a loose rectangle of 6th- and 7th-magnitude stars, and on to a pair of stars, 6th- and 7th-magnitude, that form a small triangle with NGC 6210. In my finder, the supposed NGC 6210 looked like a faint, fuzzy star. In the main eyepiece at 35×, however, at a quick glance it also looked like a star. I thought I was in the wrong location, so I retraced my steps. When I came back to the same spot, it occurred to me (after looking more closely at the fuzzy "star") to use more power, which of course was the answer.

At 58×, the "star" was obviously not a star, but the nebula. At 83× NGC 6210 was an evenly bright bluish disk with a defined edge, and no surface detail. It looked like a perfectly round pale blue ball. At 139× it was larger, still bluish, but not so round; the edge of the disk was softer, and there was a hint of the extensions seen in astroimages. An O III filter increased contrast, but no surface detail was seen.

At this point, I should have added power, as I think there was more to tease out of this object. I still had a 5 mm eyepiece and a Barlow lens in my eyepiece case. But the Moon was rising, I had managed to squeeze in an observing session after an anniversary dinner, and it was late. I called it a night.

My overall takeaway for the night was how magnification was needed to bring this small object out, and how big, bright and blue it was when that power was applied.

Anas Sawallha: Observer from Jordan

This month's challenge object is planetary nebula, NGC 6210 (Turtle nebula) in Hercules.

Thankfully the seeing condition at the time of my observation was a phenomenal 8/10 on Pickering's scale.

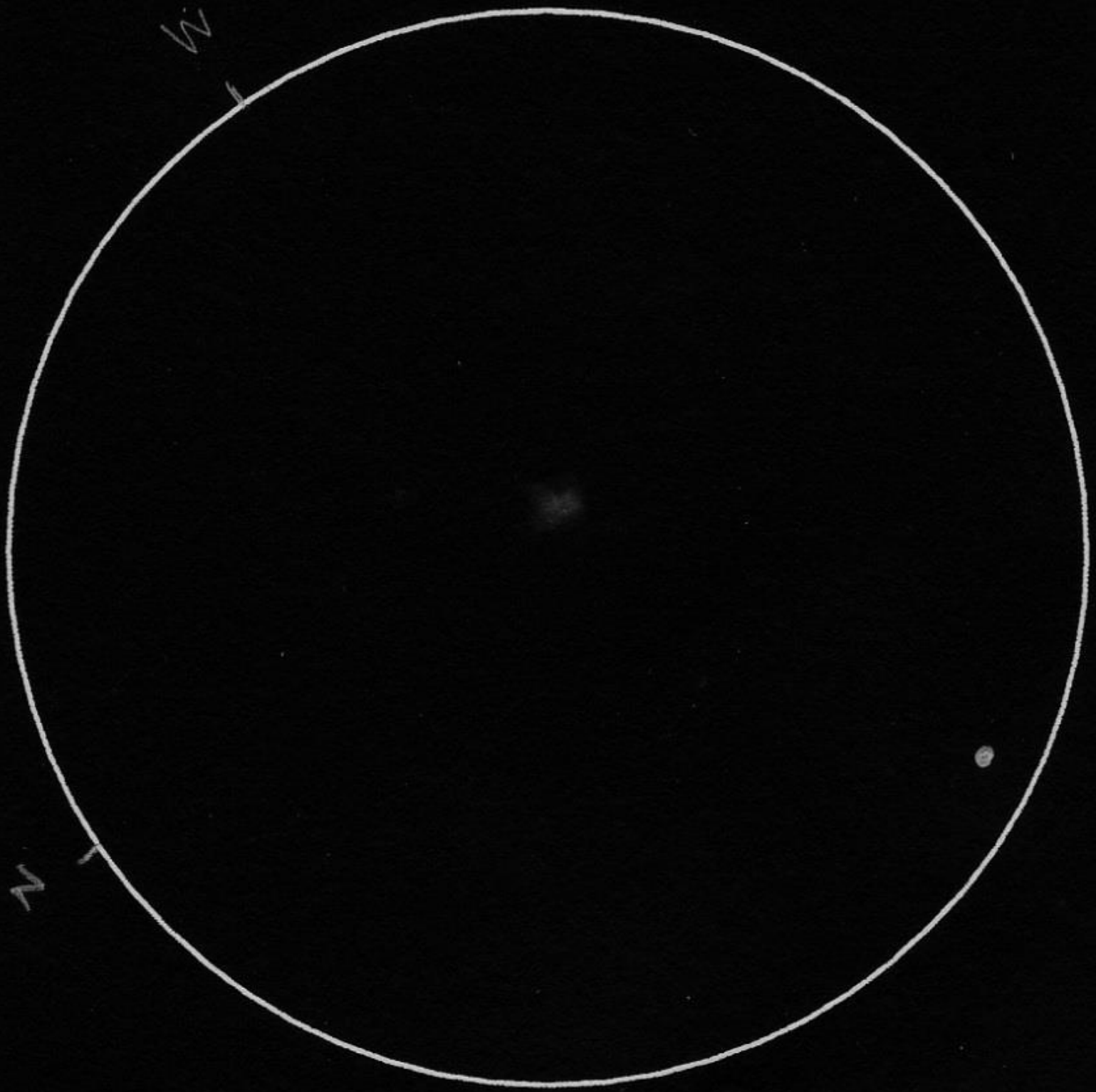
At low power this nebula has a beautiful bluish color and could be easily seen as non-stellar. At high magnification, it appeared to me not round, but somehow rectangular in shape with cornered nebulosity, and with a depression in the box in the SW.

I tried to observe the planetary with an O III filter, but preferred to sketch without a filter.

True FOV: 0.20º

The observation and sketch was made using a 5-inch telescope at 240×, from a Bortle 4-5, located in the desert of eastern Jordan.

Sketch follows.



EP:	12.4mm 3x Barlow	Mag:	240X
Filter:	—	FOV:	

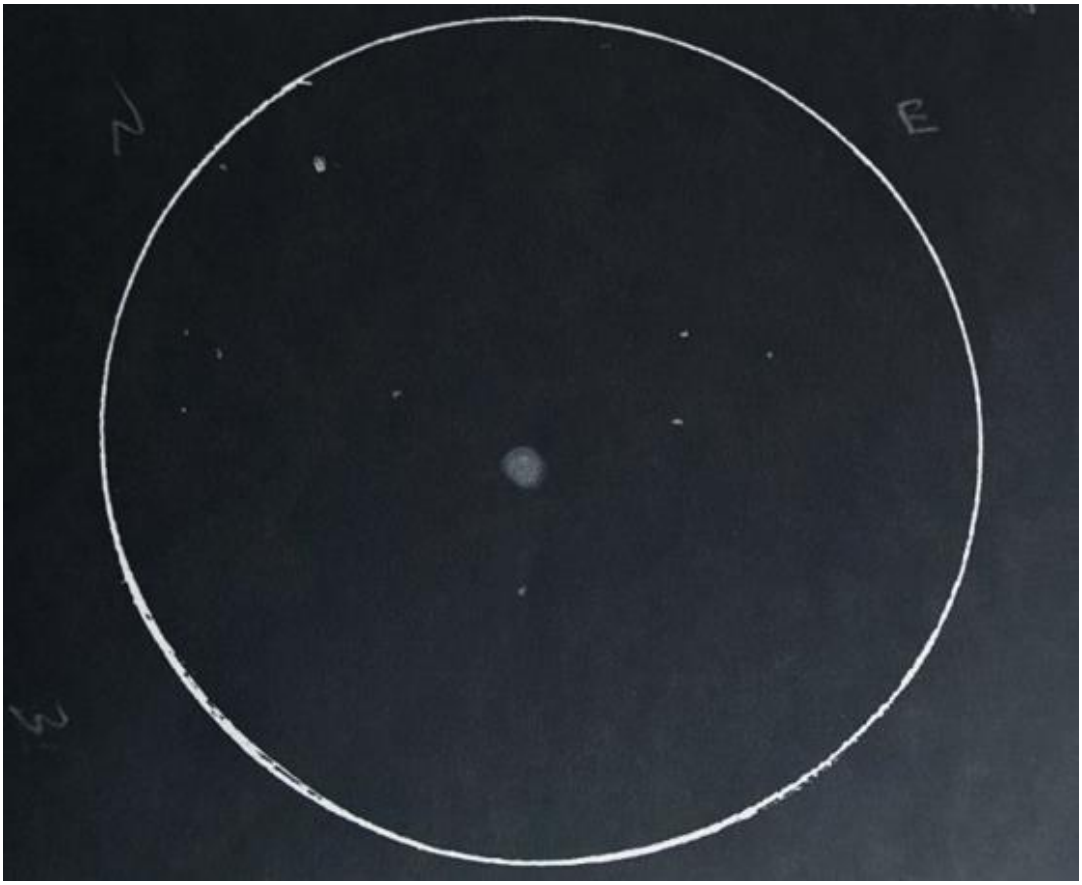
Larry McHenry: Observer from Pittsburgh, Pennsylvania

NGC 6210

The planetary nebula NGC 6210 (nicknamed the "Turtle Nebula") is located in the summer constellation of Hercules. This 9th magnitude planetary is about 6500 light years in distant, and spans a size of about 1.5 light years. The "turtle" shape of the nebula is due to several bipolar jets.

Visual Sketch:

07/17/1987 from a suburban backyard in Louisville, Ky. Using a 13.1-inch f/4.5 Dob Reflector (Coulter blue-tube) 12.5mm eyepiece (91x). The nebula is bright, easy to find, and a bluish tinged oval.



Video-Capture/EAA:

05/30/2022: from the ORAS Observatory, PA, using an 8-inch SCT optical tube @ f/6.3. Mounted on a GEM mount, with a CMOS color camera and narrowband filter @ 60-second guided exposure, live-stacked for 30 minutes.

Using EAA techniques, NGC 6210 is presented as a fairly bright blue oval, with several extensions coming off of the sides, giving the object its “turtle” nickname.

Mario Motta: Observer from Massachusetts

The July object, planetary nebula NGC 6210 I imaged twice. The first was overexposed, second better but still difficult to get any central detail possibly because a windy night. I may try again, but felt I should send in now as it's near the end of month

This following image was taken with H alpha and O3 filters, each about 1 hour, through my 32-inch scope with an ASI 6200 camera.

Phil Orbanes: Observer from Massachusetts

This is my photo of planetary NGC 6210, the Turtle Nebula, in Hercules, which lies about 5,400 light-years away

It includes 16 hours of imaging with my 14-inch PlaneWave reflector and FLI 16803 CCD camera. The exposure time was divided evenly between R, G, B, Ha and O3 filters.

NGC 6210 is small at 40″ x 30″ in size, which is a challenge for my f/4.8 scope. It consists of two parts, a bright varied inner region and a fainter outer area with tubular structures. What's left of its once sun-size star is a very hot O/H dwarf, which is still ejecting material. This accounts for the turbulence in the inner region.

Roger Ivester: Observer from North Carolina

Telescope: 10-inch f/4.5 EQ reflector

Date: July 29, 1995

Eyepieces: 16mm and also a 2.8× Barlow

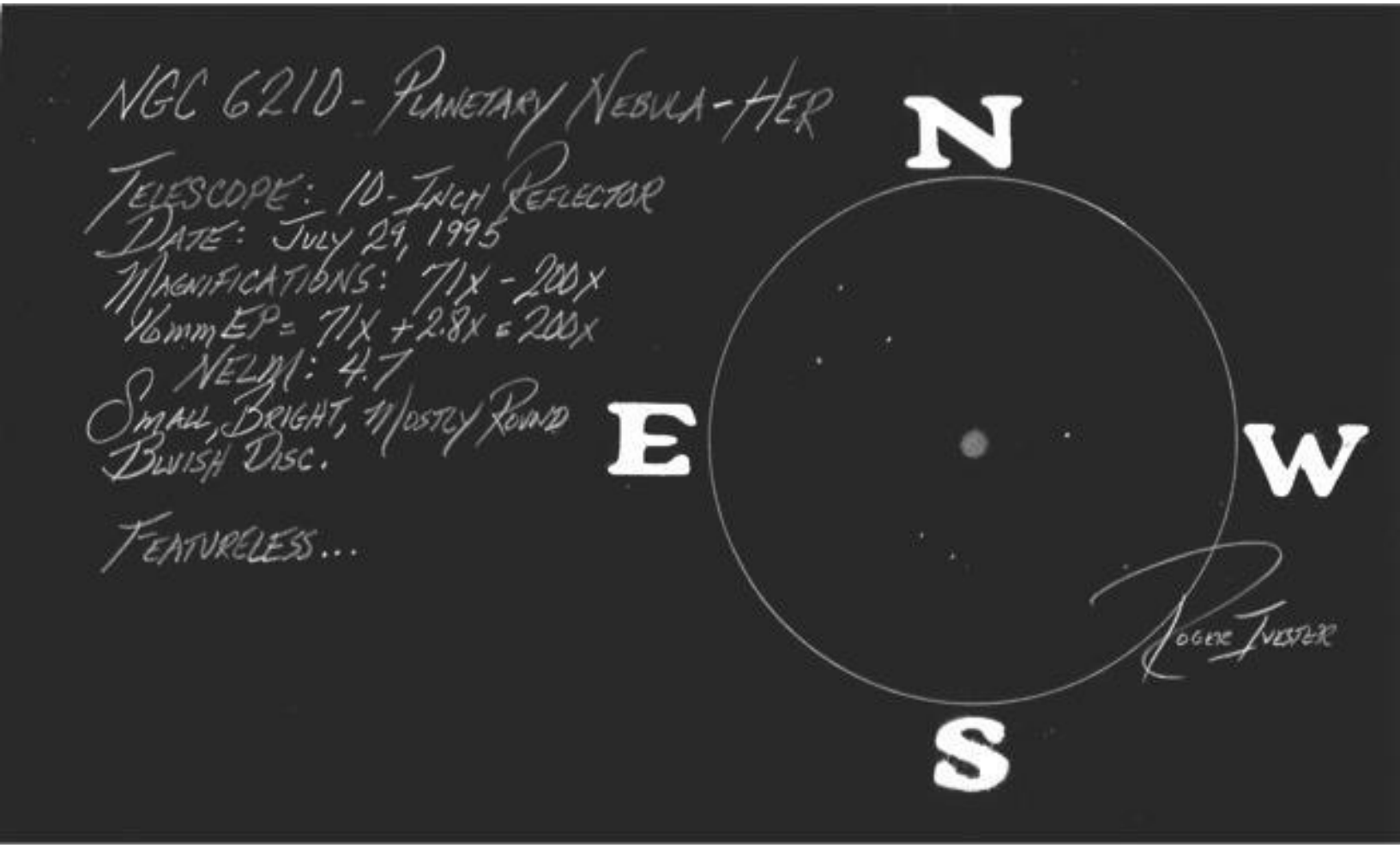
Sketch Magnifications: 71× and 200×

NELM: 4.7, so transparency was very poor with lots of moisture in the air.

It was my hope that I'd be able to make a new observation, but the skies have been cloudy for at least the past two months, and also afternoon thundershowers. So, this is my notes and sketch from July 29, 1995.

I saw NGC 6210, as small, bright, round, appearing as a bluish disc, but mostly featureless.

Sketch follows.



The following is the complete listing of all Observer's Challenge reports to-date.

https://rogerivester.com/category/observers-challenge-reports-complete/