

MONTHLY OBSERVER'S CHALLENGE

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&

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March 2024

Report #182

NGC 2440, Planetary Nebula in Puppis

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:

William Herschel discovered NGC 2440 on March 4, 1790. His hand-written journal reads: *A beautiful planetary nebula of a considerable degree of brightness; but not very well defined.*

The nebula sports a complex structure molded by episodes of mass ejections in various directions.

This 9.4-magnitude planetary nebula in Puppis resides at RA 07° 41' 55.4", Dec -18° 12' 29". You can find it by dropping 3.4° due south from the pretty star cluster Messier 46, which hosts a planetary nebula of its own – NGC 2438.

NGC 2440 dwells roughly 4000 light-years from the Sun, and given its apparent size on the sky (about 74 by 42 arcseconds), is approximately 1½ light-years across its longest dimension. As seen from Earth, the central star shines at 14th magnitude. NGC 2440 must be relatively young, as its white dwarf star is one of the hottest known, with a blazing temperature of nearly 400,000 thousand Fahrenheit degrees, and despite its small size (around 2 to 3 Earth diameters), it's about 250 times brighter than our Sun.

Uwe Glahn: Observer from Germany



Object: NGC 2440 - "Insect Nebula"

Telescope: 16" f/4.5 Newton

Magnification: 450×

Filter: [OIII]

NELM: fst 6m7

Seeing: III

Sketch Follows.

NGC 2440



Bertrand Laville: Observer from France



T254

December 4, 1999, Chabottes

x105 Meade SWA 24.5mm / OIII

The planetary nebula is small, bright, pronounced bluish color, blurred edges.

I estimated D ~ 15 to 20", and noted "outer shell?"

No central star seen (And for good reason! $m(\text{CS}^*) = 17.65\text{V}$)

Without the blinking, which confirms the NP, it could be an unresolved globular cluster.

T450

See top of page for viewing conditions

x369 Nagler 5mm without filter

Beautiful nebula, bright, structured.

Complex center, with 2 bright "lobes", L6, oriented E/W, and two outer, weaker lobes, oriented N/S. A light concentration, in the center of the outer W lobe.

T635

Date of sighting: March 16, 2009 8:00 p.m. UT

Duration of observation: 70 min

Object position: Alt: 27.7°, Az: 185.5°

Observation location: Puimoisson le Petit Telle

Instrument: TN 635 Dobson Obsession

x102 Nagler 31mm

The nebula is obvious, fuzzy, elongated, with a bright and very concentrated central zone, and an extended halo toward the NE and SE.

x890 Nagler 3.5mm without filter

I successively tried x240 Ethos13/OIII, x390 Ethos 8/OIII, x650 Nagler 4.8 without filter. Finally 890x is the best magnification, especially since the seeing is very good. The NP is relatively small, and very structured, with many details, and very numerous Surface brightness differences with complicated shapes: you have to magnify very much.

The central hole is clearly seen in and almost black. The two shiny pincers, N and S, drawn at San Pedro de Atacama, are well identified; they almost form a horseshoe, open towards the W. The halo is complex, and made up of several independent "petals". The N limit of the Halo is formed by 2 petals, which form a clear "V", open towards the N.

My observation is much more detailed than in San Pedro. NGC 2440 is a very beautiful PN, one of the most complex that I have observed: it is to planetary nebulae what the Tarantula is to diffuse nebulae.



You'll find further details and more of Bertrand's sketches at:
<http://www.deepsky-drawings.com/>

Magda Streicher: Observer from South Africa

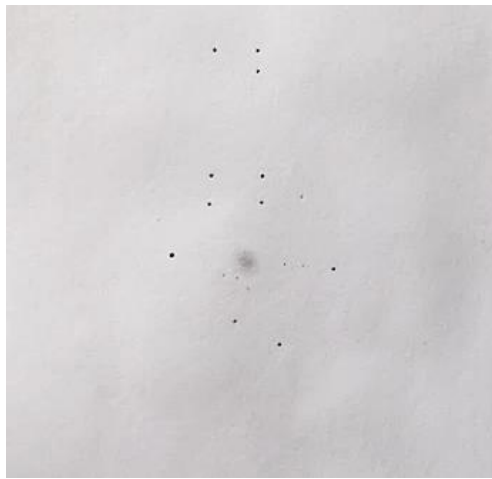


NGC 2440 – Puppis – Planetary Nebula
Site: S 23°18' 33.9" – E 28° 29'54.6"
Visibility: 6.4
Date: 10 March 2024
Fresh from the telescope....

Sketches follow

Telescope 16-inch S/C Ultra-Wide 41mm Panoptic 107' – Fov: 40'

Very busy sprinkled starfield with various magnitude stars and with plenty look-a-like doubles, quite pleasing to the eye. Very impressive planetary nebula, slightly oval, displays a lovely light-blue to a somewhat ocean-green disk slowly brighter towards the middle. Stare directly at the centre of the core until the brightness overwhelms the eye the nebula disappears, averted the vision and the nebula reappears. A v-shaped asterism is about 8'toward the southeastern field of view.



Eyepiece: Ultra-Wide: 17mm TeleVue 300× – Fov: 23'

The oval in a north-east to south-west direction clearly shows an uneven edge with a very prominent hazy envelope and brighter middle area. A deep sky filter is the best to lift it out against the starfield. Averted vision started to reveals uneven surface areas with the south-western part slightly larger. (Averted vision is to gaze off to one side of the field of view to use your eyes' rods to detect faint light specks of the object in view).



Eyepiece: Ultra-Wide: 12mm TeleVue 350× – Fov: 17'

Eyepiece: Ultra-Wide: 8mm Meade

462× – Fov: 10.9'

The middle area could clearly be seen with a brighter inlay from the north-western edge fading towards the southern edge and what could be detected is that this brighter middle bar is not connected with the south-eastern edge of the nebula. Relatively large hazy envelope surrounded the planetary nebula fading slowly away.

Mario Motta: Observer from Massachusetts



NGC 2440, taken with NB filters, HA,O3,S2, About two hours, strong Ha, and very strong O111, not much Sulfur signal. Taken with my 32-inch f/6.5 telescope with ZWO ASI6200 camera.

Processed in PixInsight. Very hot bright central star a white dwarf reportedly 400,000° F. Central star very bright visually.



Larry McHenry: Observer from Pittsburgh, Pennsylvania

<http://stellar-journeys.org>



NGC 2440 (also known as SH2-222) is located in the winter constellation of Puppis – the stern of the great ship Argo Navis. The planetary nebula is about 4000 light-years distant and around 0.72 ly in diameter. Inside the nebula is a white dwarf star – HD62166 one of the hottest known at ~400k F.

NGC 2440 was discovered on the night of March 4th, 1790 by William Herschel using his 20 ft reflector at his home in Slough, near Windsor Castle. Herschel described the nebula as “a beautiful planetary nebula of a considerable degree of brightness, not very well defined”.

Video-Capture/EAA:

On 03/04/2024, from my backyard observatory in Pittsburgh, Pa.

Using an 8-inch SCT @ f/6.3 on a fork-wedge mount, with a CMOS color camera and narrowband filter, 15 second exposure live-stacked for 15 minutes.



Using EAA techniques, the irregular shaped nebulosity of NGC 2440 is located in a rich star-field in northern Puppis, and about 3.5° to the south of open cluster M46. Using a lower exposure, two bright bipolar condensations can be seen within the core, while with a higher stacked exposure, grainy ansae appear to either side of the core. The central star was not visible.

Glenn Chaple: Observer from Massachusetts



Observer's Challenge* – March, 2024

by Glenn Chaple

NGC 2440 - Planetary Nebula in Puppis (Magnitude 9.4; Size 74" X 42")

Our March Observer's Challenge takes us to the southern constellation of Puppis and the planetary nebula NGC 2440. It was discovered by William Herschel discovered on March 4, 1790 and described by him as "a beautiful planetary nebula of a considerable degree of brightness, not very well defined, about 12" or 15" in diameter." Modern-day images reveal faint butterfly wing-like extensions that expand its true dimensions to 74" by 42", hence its nick-name the Butterfly or Bow Tie Nebula.

NGC 2440 is located at 2000.0 coordinates $7^{\text{h}}41^{\text{m}}54.9^{\text{s}}$ right ascension and $-18^{\circ}12'29.7''$ declination. Star-hoppers will find it by starting at the bright open cluster Messier 47 and centering on a 4.9 magnitude star located one degree to its southeast. A three degree drift southward will bring you to the Butterfly.

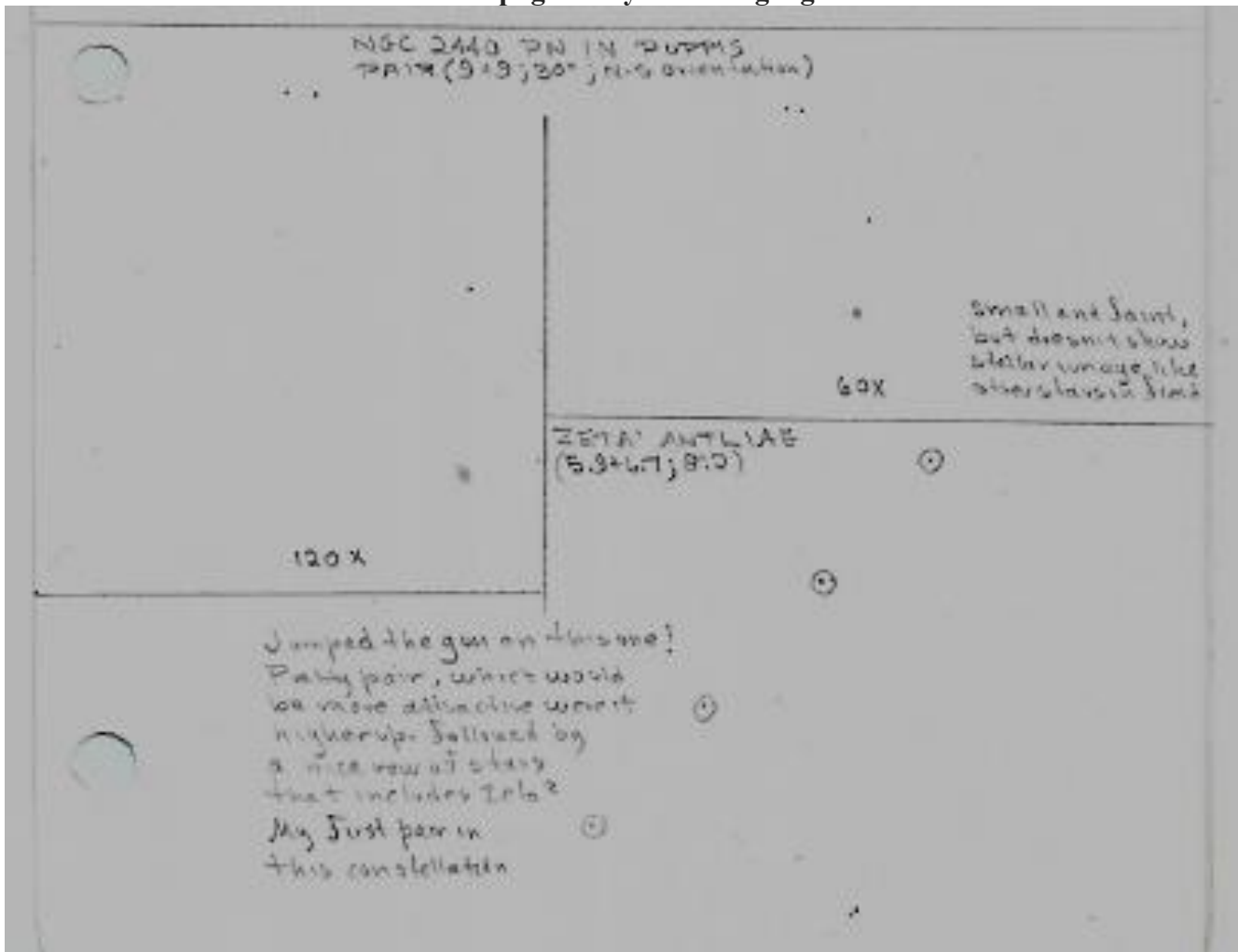
I first saw NGC 2440 on the evening of March 21, 1979, using a 3-inch f/10 reflecting telescope and a 60X eyepiece. At that magnification, the nebula appeared like a 9th magnitude star. At 120X, it took on a fuzzy appearance when compared to an 8th magnitude star a few arc-minutes to its east. Further east and to the south was a double star whose components were oriented north-south and estimated by me to be 9th magnitude with a 30 arc-second separation. The nebula itself appeared to be a few arc-seconds in diameter – the outer regions were obviously too faint for such a small instrument.

NGC 2440 is of particular interest to professional astronomers because of its complex, chaotic structure. The central star is an extremely hot white dwarf with a surface temperature of 200,000 degrees C (360,000 degrees F). At magnitude 17.5, it's too faint to be seen with most backyard scopes. Most sources place NGC 2440 at a distance of 4000 light years.

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NGC 2440 Sketch

Glenn Chaple (ATMoB) Observed on March 21, 1979 with 3-inch f/10 reflecting telescope. Sketch is a scan from a page in my observing logbook."

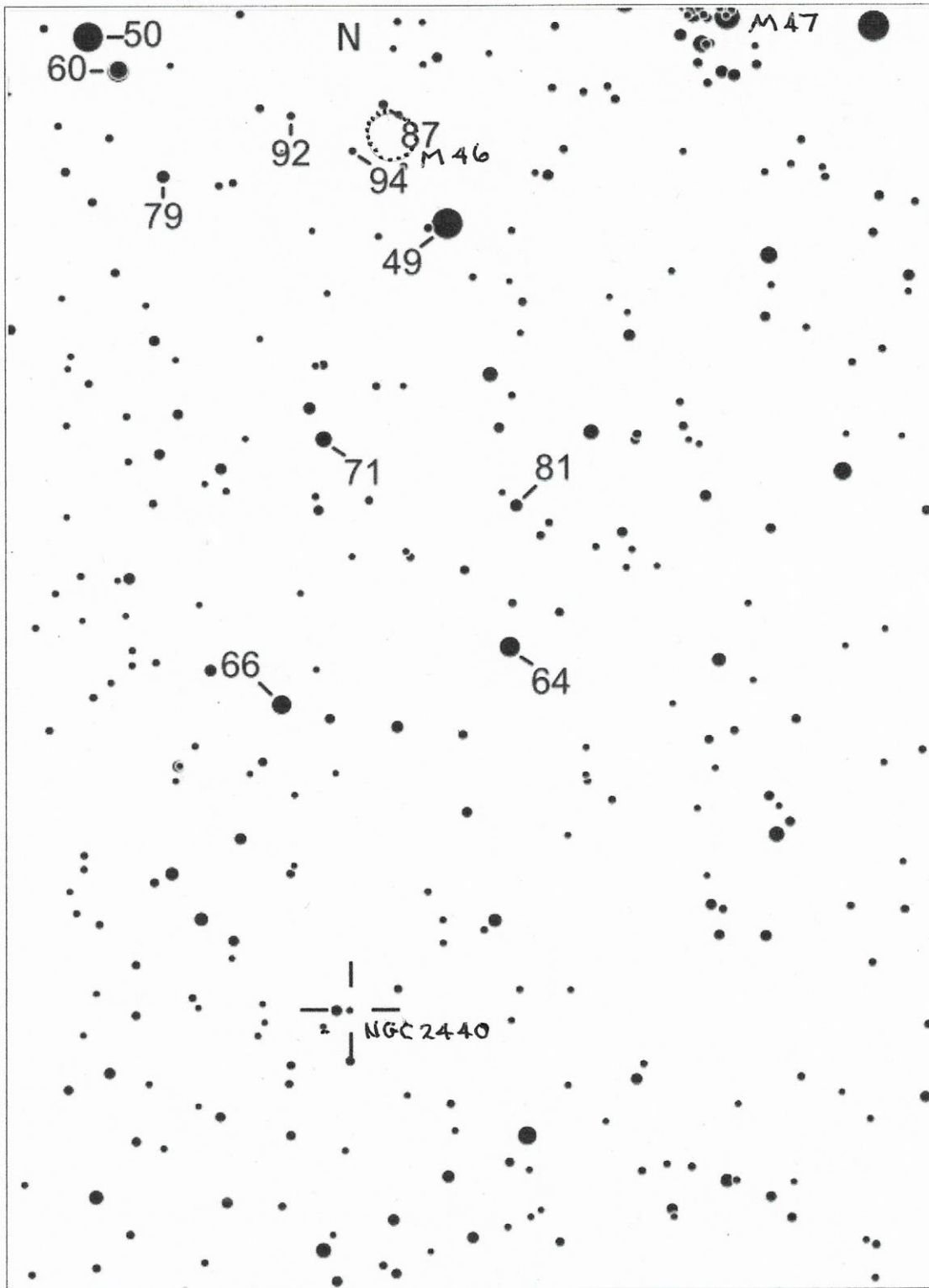


NGC 2440 Finder Chart A
(www.deepskycorner.ch)



NGC 2440 Finder Chart B

Chart adapted from AAVSO Variable Star Plotter. Numbers are stellar magnitudes, decimals omitted. Stars plotted to 10th magnitude in this 3½ by 5 degree field,



Joseph Rothchild: Observer from Massachusetts



I observed NGC 2440, a planetary nebula in Puppis. I observed under cold, windy, dark skies with fair transparency on Cape Cod with my 10" reflector.

I star hopped from open clusters M46/M47 in Puppis, then 4 Pup, QY Pup, and then 6 Pup. The planetary was small, slightly oval, and with high surface brightness. It was similar in appearance to IC 418 in Lepus, and I could not see any detail.

Roger Ivester: Observer from North Carolina

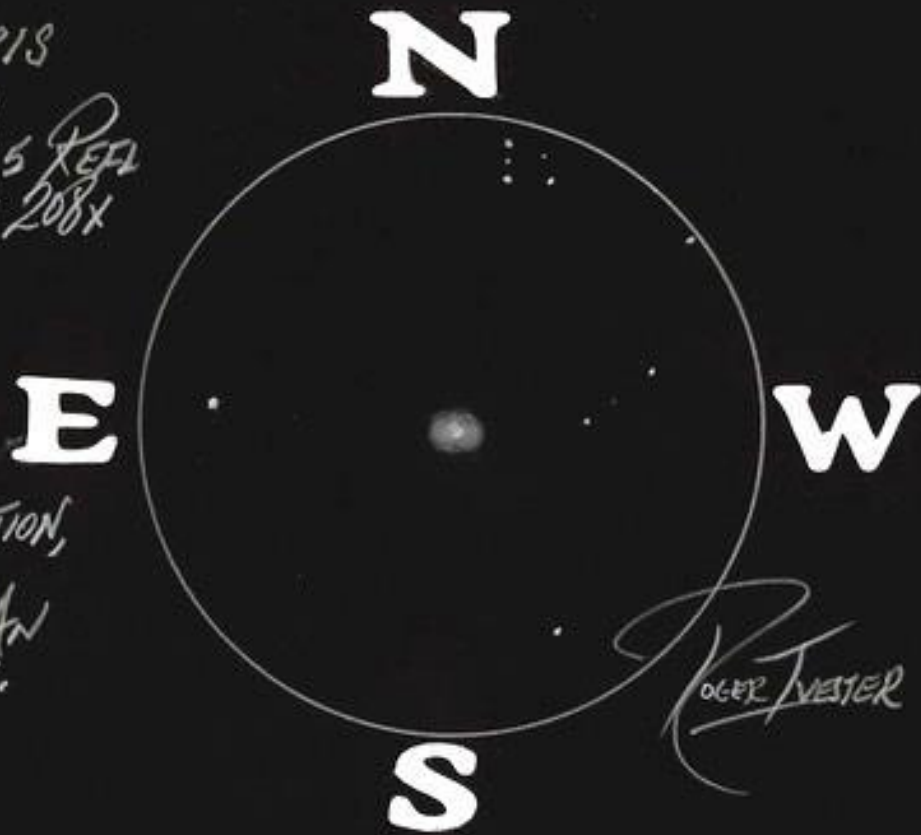


Date: February 2024 – Telescope: 10-inch f/4.5 EQ Newtonian – Sketch Magnification: 208x – Field of View: 0.39°

Small, bluish, ill-defined edges, elongated, oriented E-W, brighter middle with an almost stellar nucleus. Bright star east of the nebula.

NGC 2440 - PN - PUPPIS
DATE: FEBRUARY 2024
TELESCOPE: 10-INCH F/4.5 REF
SKETCH MAGNIFICATION: 208X
FOV: 0.39°

SMALL, BLVISH, ILL
DEFINED EDGES,
MOSTLY ROUND, BUT
WITH A SUBTLE ELONGATION,
ORIENTED E-W.
BRIGHTER MIDDLE, WITH AN
ALMOST STELLER NUCLEUS.



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

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