MONTHLY OBSERVER'S CHALLENGE

Compiled by:

Roger Ivester, North Carolina

&

Sue French, New York

October 2021

Report #153

NGC 6857 Emission Nebula in Cygnus

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 6857 on 6 September 1784. His handwritten journal for that date reads: *A patch containing some nebulosity…irregularly long.*

Heinrich d'Arrest writes of this object and his observation of it in his 1867 *Siderum Nebulosorum Observationes Havnienses*. My very loosely paraphrased English for the Latin text: Minute, faint; it is most probably a cluster. A 12th-magnitude star precedes it. – Rechecked shortly after: it was not so small; not all of the nebula is resolved, there is at least some cloudiness. I'm not surprised that this was missed by Rosse.

NGC 6857 is the brightest part of the larger, star-forming emission region Sharpless 2-100, which is a much more difficult visual target than NGC 6857.

A 2010 paper by Manash Samal and colleagues in the *Astrophysical Journal* indicates that the main ionizing source at the center of NGC 6857 is the bright, massive star at its heart. This compact nebula is estimated to be approximately 28 thousand light-years away from us, and the star is thought to have a spectral type of about *O*4III. The most likely age of the nebula is in the vicinity of 1 to 2 million years.

Uwe Glahn: Observer from Germany

Object: **NGC 6857 (in Sh 2-100), K 3-50 (PK 70+1.1)**

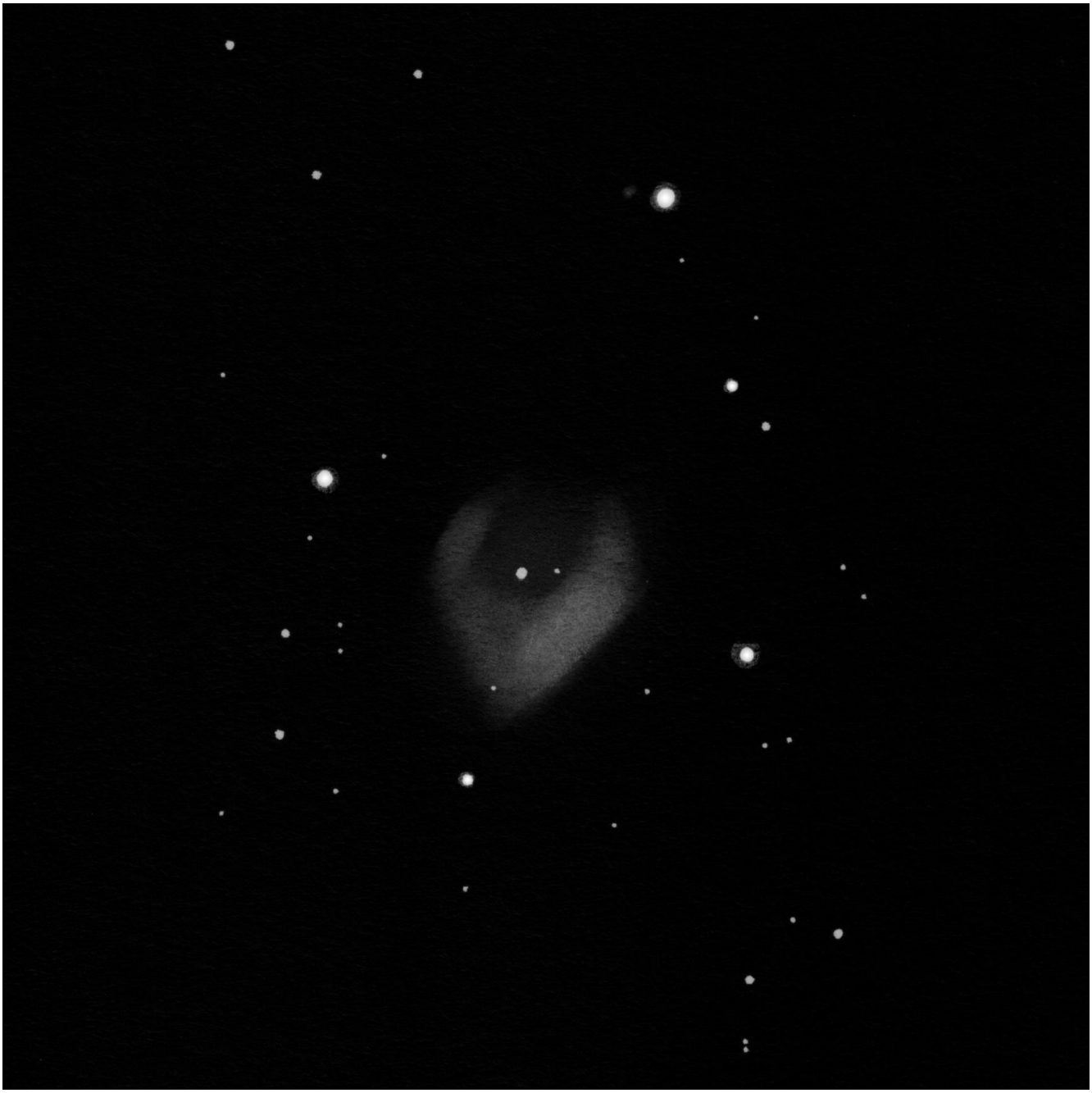
Telescope: **27″ f/4.2 Newton**

Magnification: **419×**

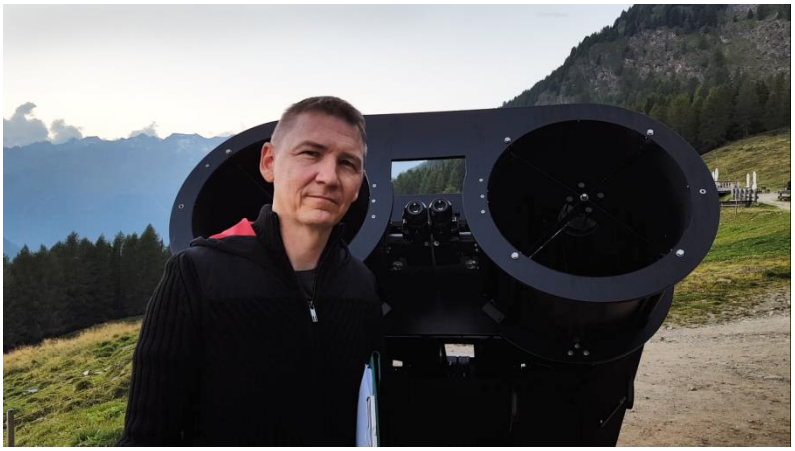
NELM: **fst 6.5+**

Seeing: **III**

Location: **Sudelfeld**

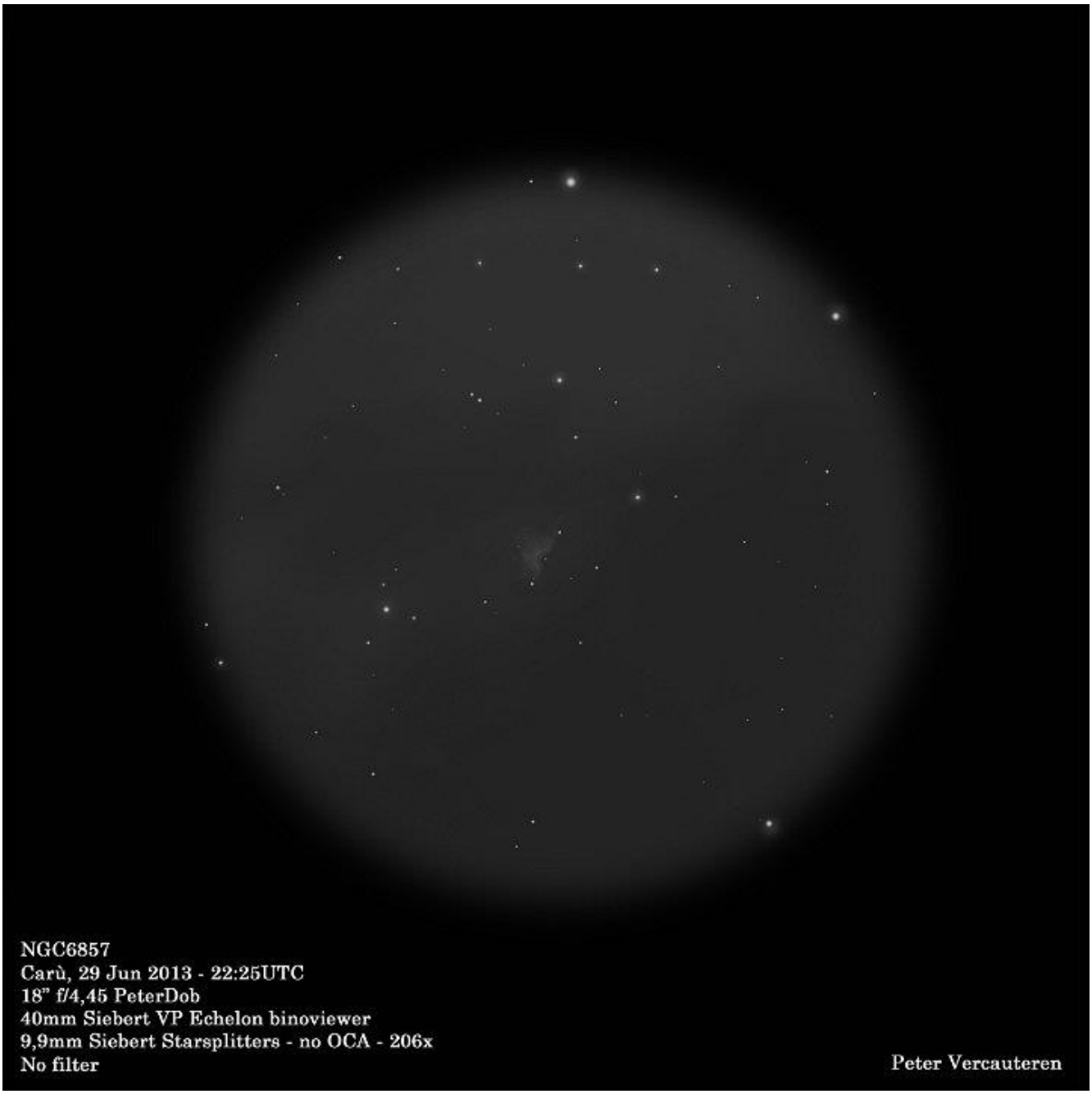


Peter Vercauteren: Observer from Italy



This rather unknown beauty (NGC 6857) in Cygnus is an emission nebula (meaning that it emits light on its own), which is part of a large star-forming region in our Milky Way.

You can see Peter's sketches here: www.astronomydrawings.com



Chris Elledge: Observer from Massachusetts

On November 5th @9:50pm EDT, I used the ATMoB 25-inch f/3.5 reflector to observe NGC 6857 from the ATMoB Clubhouse. Sky conditions were: Bortle Scale 6; NELM 4.5 near NGC 6857; Transparency: Good; Seeing: Fair.

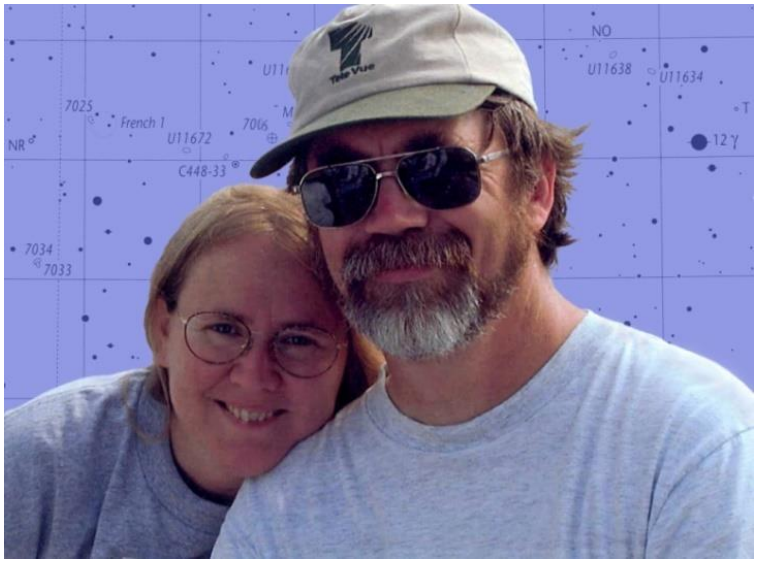
Eta Cygni nearby is easily visible with the naked eye. Placing it on the NW edge of the view of the 3° FoV finder puts NGC6857 a little to the South of the center.

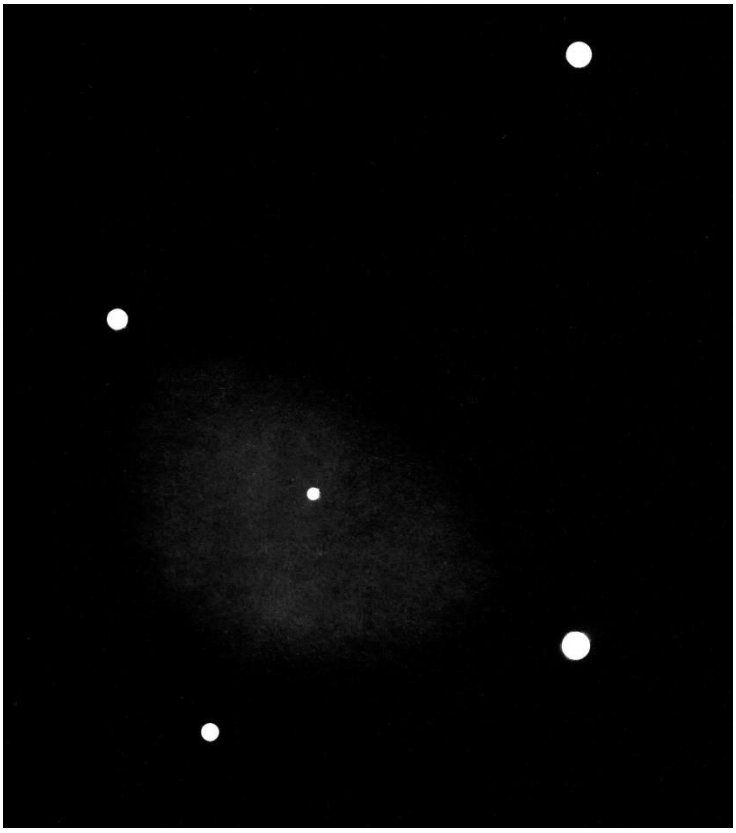
At 63× (35mm, 1.1° FoV) the field is filled with lots of mag. 8 to 10 stars making it look like a large open cluster. There's a line of 4 mag. 9 stars from NW to SE running just to the NE of NGC 6857 (HD 227169, HD 227197, HD 22730, & HD 190192). Another long line of mag.11 stars on the North run NNW to SSE and point towards the NW most start of the bright 4 (HD 227169). To the SW of the line of 4 bright stars is a horseshoe shape of mag. 10 to 12 stars. I'm unable to detect any nebulosity in the region just inside the SW tip of the horseshoe where I expect NGC 6857 to be.

At 202× (11mm, 0.4° FoV) with a UHC filter the horseshoe resolves as 7 individual stars plus a double star. NGC6857 appears as a glowing area around a mag. 13 star just to the ENE of the mag. 12 star at the SW tip of the horseshoe. The area seems elongated between the tip of the horseshoe and another mag. 13 star further beyond the one in the middle of the nebula. So the elongation of the bright part of the nebula is ENE to WSW. It's hard to get a sense of where the Southern edge of the nebula is as it fades slowly. It doesn't seem to extend past the center star on the North side.

At 473× (4.7mm, 0.17° FoV) with UHC filter NGC 6857 looks a bit like a bowl with the flat part running ENE to WSW through the mag. 12 center star. The rounded part is on the Southern side. Using an O III filter provides a very similar view, but an H-beta filter only provides the tiniest hint of nebulosity in the region.

Sue French: Observer from New York





NGC 6857 is very small but fairly bright, and I can see it as a little fuzzy spot with a faint star at one edge even in my 4.1-inch scope at 28×. A magnification to 87× helps the nebula stand out better and brings out two more faint stars off its edge plus a very faint star near its center. However, it was my first view of NGC 6857 through a 10-inch scope that captured my imagination. At 166× I saw the little nebula surrounded by a kite-shaped asterism of four stars. The star within the nebula then became the center of a miniature cross reminiscent of the much larger Northern Cross outlined by the chief stars of Cygnus. Just as the Northern Cross holds the Gamma Cygni Nebula (IC 1318) at its heart, so too does the mini-cross embrace NGC 6857. The sketch above shows the view through the 10-inch.

Glenn Chaple: Observer from Massachusetts

NGC 6857 – Emission Nebula in Cygnus (Magnitude 11.4, Size 40")

Astronomical literature notes that this month's Observer's Challenge, NGC 6857, is a planetary nebula that wasn't. It was correctly identified as a faint nebula by William Herschel, who discovered it on September 5, 1784. Because of its small size and the presence of a false central star, it was later misclassified as a planetary nebula. Only in recent decades has NGC 6857 returned to its rightful status as a nebula – an emission nebula, to be exact.

NGC 6857 is located in the heart of Cygnus at 20h 01m 48s right ascension and +33° 31′ 38″ declination. It's just 2 degrees SSE of the 4th-magnitude star eta (η) Cygni, which was my starting point for a star-hop (see accompanying finder charts).

I observed NGC 6857 with a 10-inch f/5 reflector on an evening when the magnitude limit was around 5.0. I was unable to see it without the aid of O III and narrowband filters. Even at 139×, it was small – appearing as a pale ghostly 'flame' emanating eastward from the vicinity of a 13th-magnitude star.

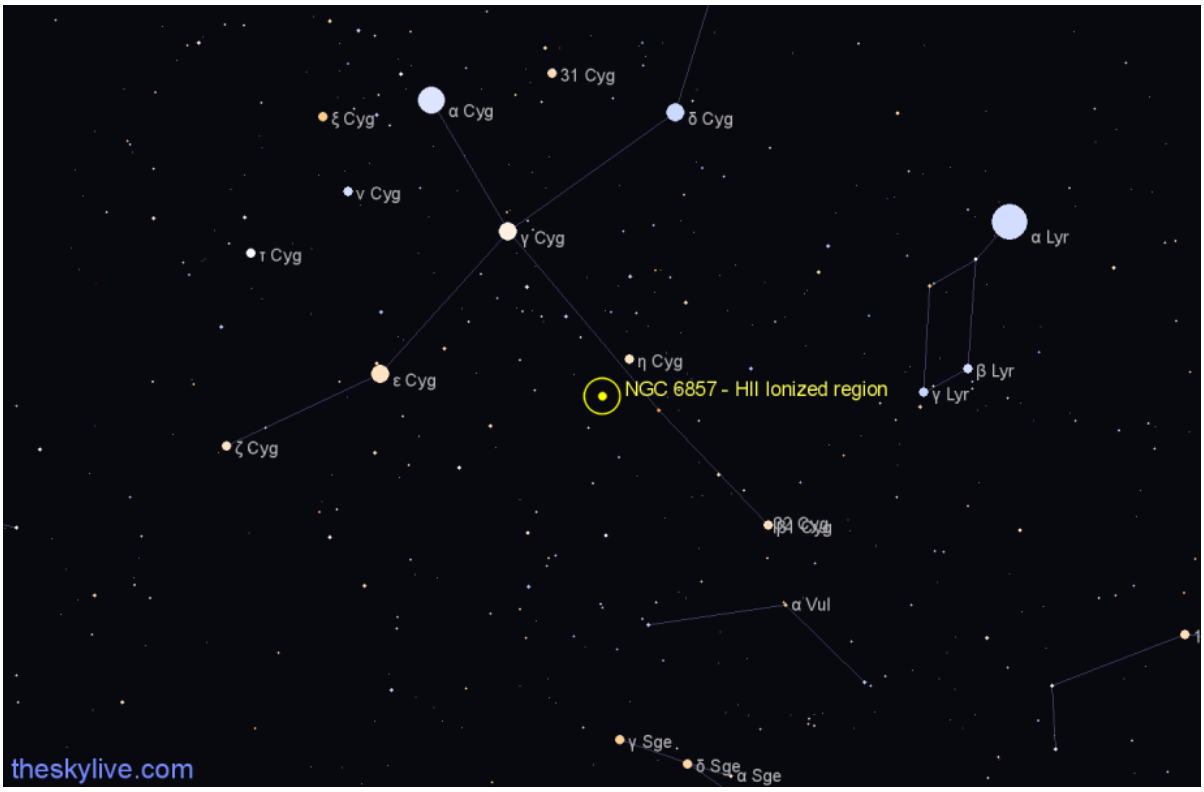
NGC 6857 is part of a much larger but fainter emission nebula Sharpless 2-100. Approximately 30,000 light-years away, its 40 arc-second apparent size translates to a true diameter of 9 light-years.

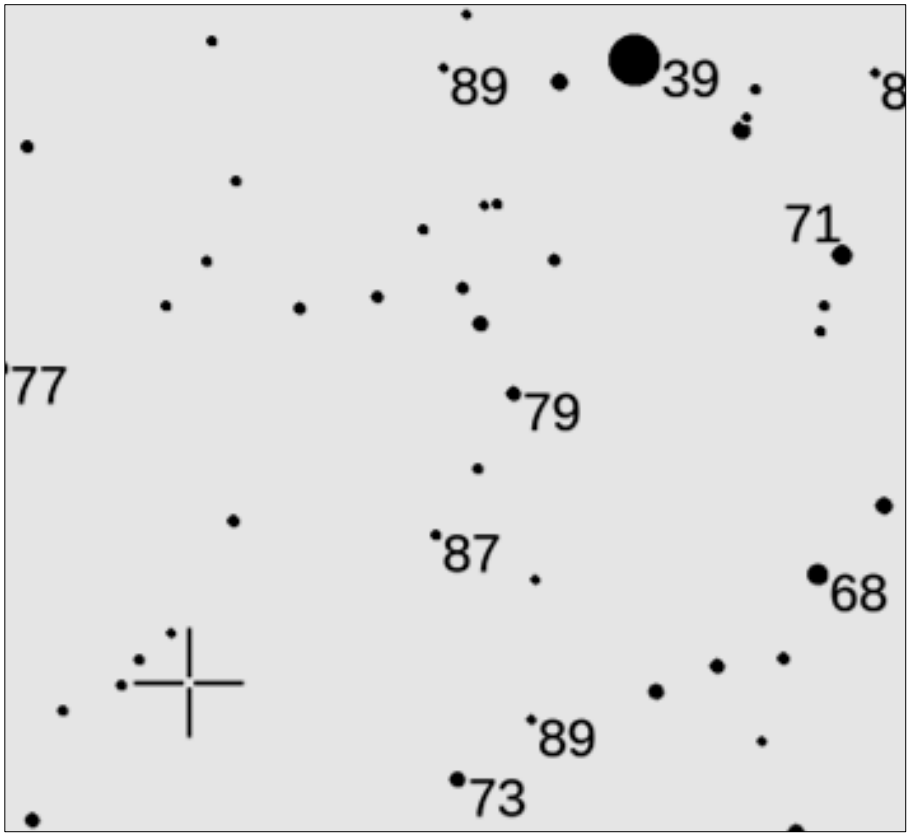
Finder Charts for NGC 6857

(Top) Chart from theskylive.com

(Middle) Chart adapted from the AAVSO's Variable Star Plotter (VSP). Numbers refer to stellar magnitudes, decimals omitted. Stars plotted to 9th magnitude. The magnitude 3.9 star is eta Cygni. North is up in this 2 degree field.

(Bottom) Chart adapted from the AAVSO's Variable Star Plotter (VSP). Numbers refer to stellar magnitudes, decimals omitted. Stars plotted to 12th-magnitude. North is up in this ½ degree field.


31 Cyg
ξ Cyg
α Cyg
δ Cyg
ν Cyg
γ Cyg
τ Cyg
α Lyr
η Cyg
ε Cyg
NGC 6857 - HII Ionized region
β Lyr
γ Lyr
ζ Cyg
α Vul
γ Sge
δ Sge
α Sge
theskylive.com


89
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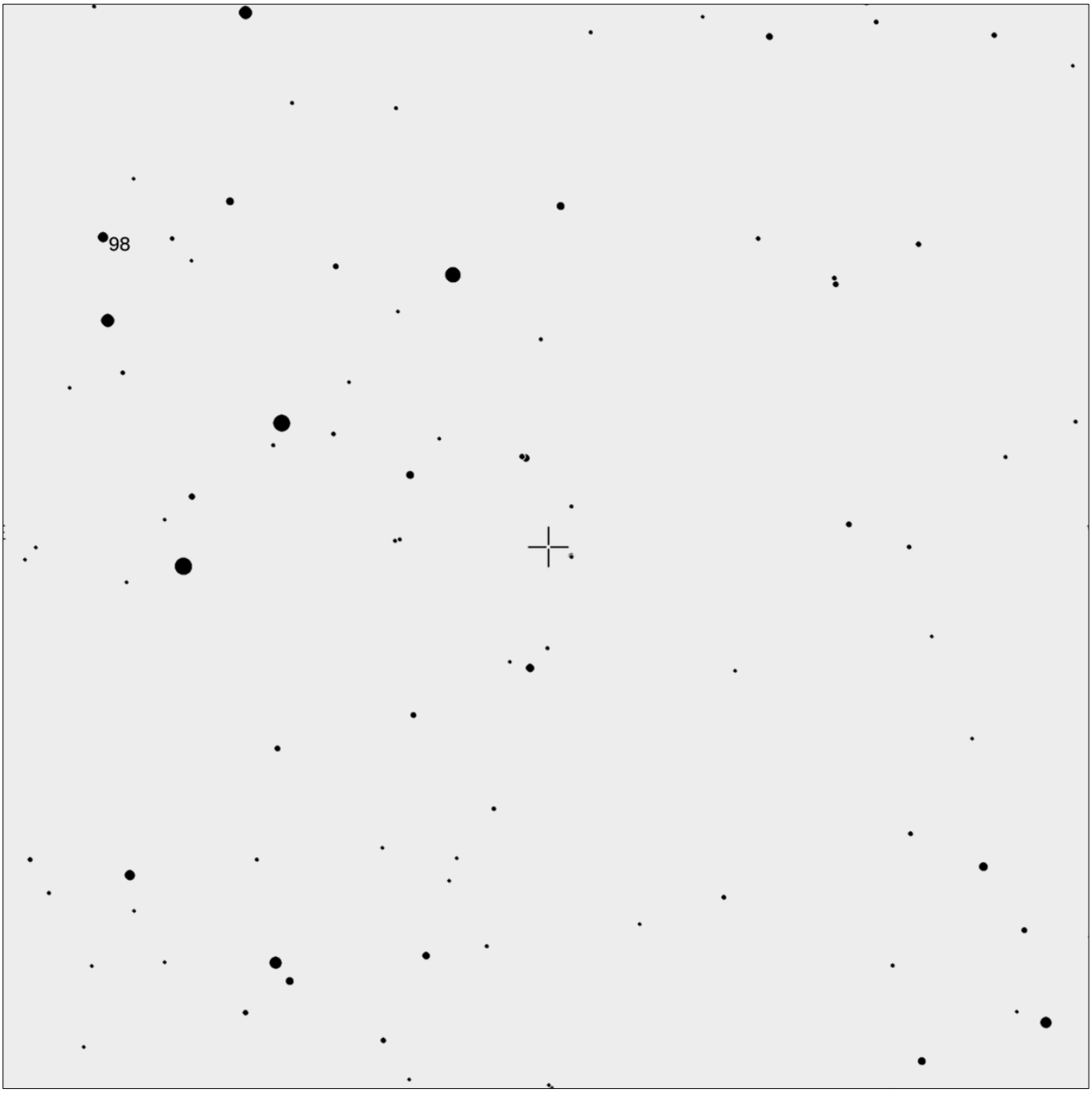
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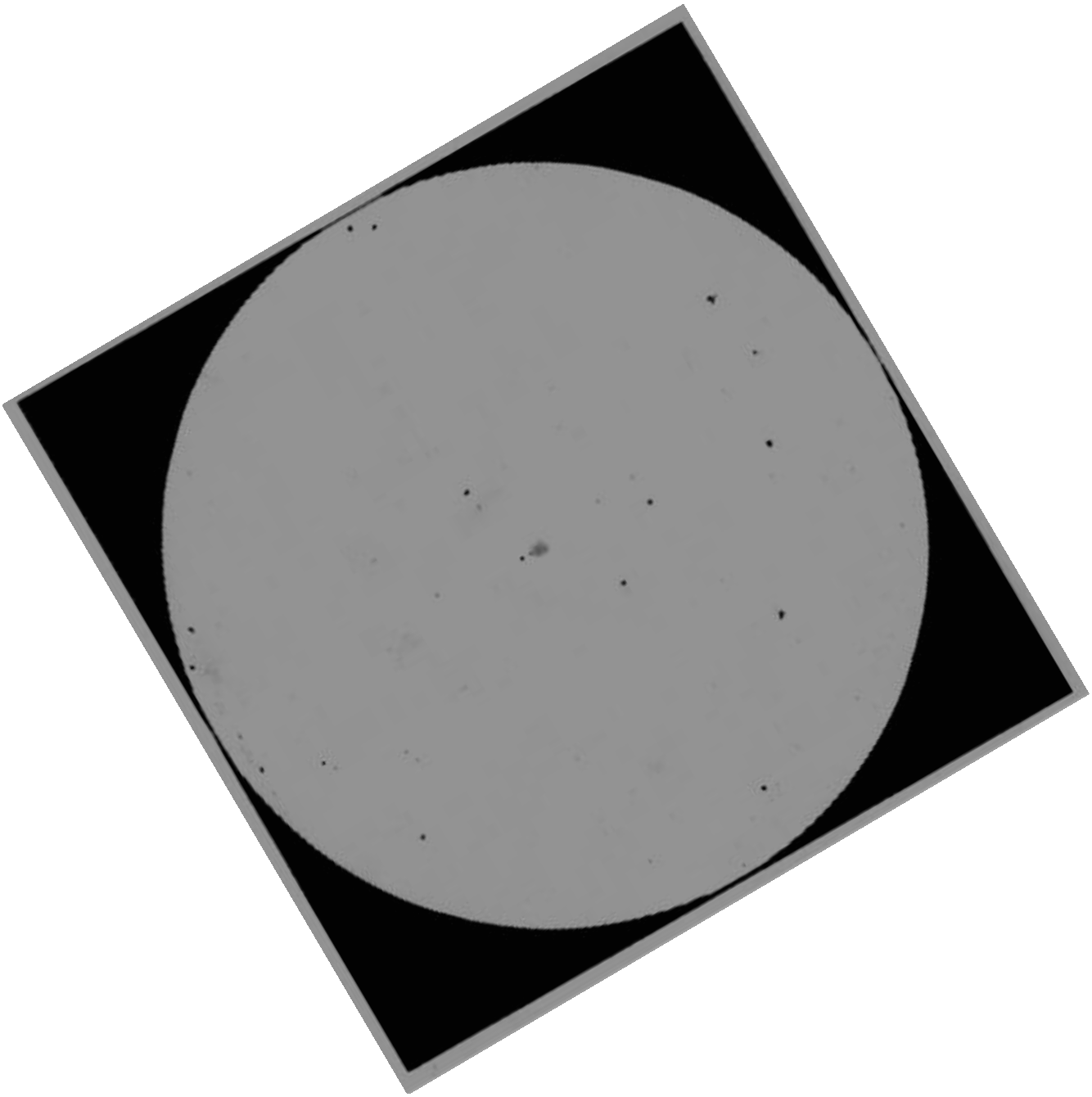
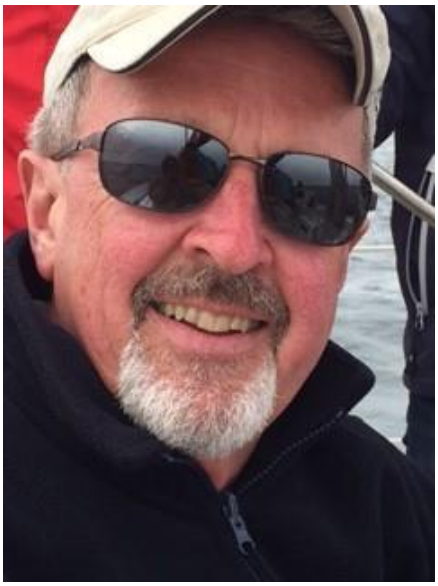
Sketch by Glenn Chaple (ATMoB) with 10-inch f/5 reflector at 139×. North is up in this 0.6 degree field.



John Bishop: Observer from Massachusetts



This month's object was especially challenging for me to locate. I persisted too long trying to find this small, faint target by star hopping without access to a chart that showed the object.

On 11/5/21, I observed NGC 6857, an emission nebula in Cygnus. I observed from the ATMoB Clubhouse in Westford, Massachusetts. The sky was clear. Seeing and transparency were good. Temperature was in the mid-30s F at sunset; 27 degrees F at midnight. I observed with my 8.25-inch f/11.5 Dall-Kirkham reflector, at powers ranging from 48× to 192×. The scope is a portable setup on an equatorial mount with motor drive, without goto.

This was the third, and final, night I would be trying to locate NGC 6857. My charts do not show the object. Nevertheless, I was determined to find it the "old-fashioned way," i.e., star hopping and sweeping. I am a strictly visual observer. I do not use goto. I do roughly polar align each session to allow tracking for visual observing, but I don't use the setting circles. (Even if I wanted to use them, I have owned this trusty scope for so long that the template for aligning Polaris in my polar scope is currently years out of date). Borrowing from my sailing experience, I thought I could plot the coordinates for NGC 6857 on my chart, get close to the object, and sweep to it.

No luck the first two nights. The object is small and faint, and requires good contrast to be seen in my 8.25-inch scope. Without a chart to show the local field star patterns, of course, I had no path to the target, or a way to confirm I was on it if it was too faint to see. I would need luck to spot it, if I could see it at all.

On the third night, a fellow observer with a 16-inch scope was present who had previously seen NGC 6857. He generously loaned me his copy of the Uranometria star atlas, which shows NGC 6857, and enough field stars to star hop to the target. He also showed me a useful star-hopping path to NGC 6857. With this in hand, after correlating the scale of the FOV of my finder with the Uranometria chart, I was on my way.

Starting at Eta Cygni (itself barely visible at our location), a line of much fainter stars runs west, then turns south, leading to a small cluster of 5 or 6 brighter stars. Just east of the cluster are two bright "pointer stars." These stars point directly to NGC 6857, sitting at a distance about two or three times the distance between the cluster and the pointers.

Even with a bull's eye now on the target, it was difficult to locate. I started with a 2-inch format 50-mm eyepiece at 48×, producing my widest FOV, without filter (I don't have a 2-inch format UHC filter), and saw nothing. Eventually, using averted vision, I saw a small, very faint brightening. I locked the clutches on the motor drive, and increased magnification with 1.25-inch format eyepieces, with and without UHC filter.

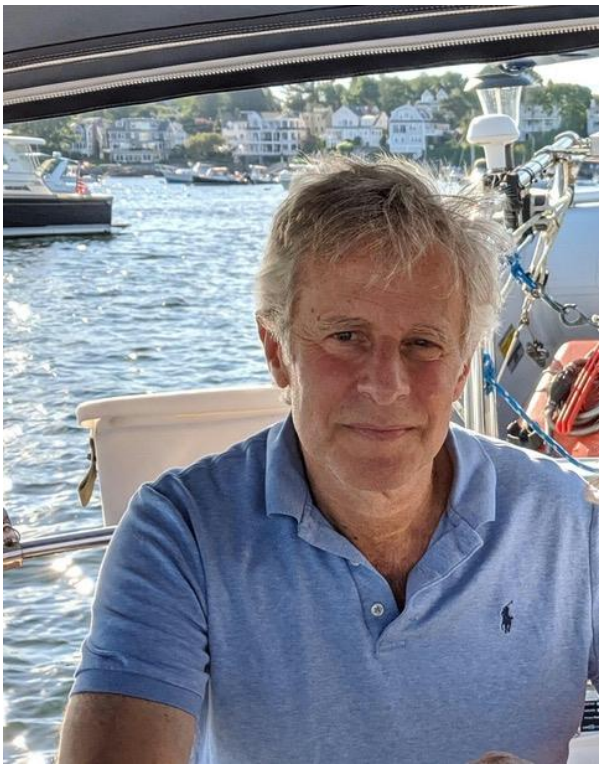
What I saw was a small, faint, nebulous patch. The shape was irregular, being more angular than round. The image was unsteady, and not well defined. Generally, the image was better with a UHC filter. The brightness and size fluctuated, as if being affected by the atmosphere. At times averted vision was not necessary, and the object was fairly visible, even without a filter. Overall, one side of the nebula was brighter, and a dark lane was sometimes visible cutting part way into the nebula. I did not see any nebulosity outside NGC 6857 itself.

When I returned later in the evening for a second look at NGC 6857, it was difficult to reacquire the object, even having viewed it an hour earlier. The seeing seemed to have deteriorated, and contrast was down. NGC 6857 was also by then lower in the western sky. I found it again, but it was not as bright.

During the evening I also looked at NGC 6857 through my generous colleague's 16-inch reflector, at high power. The object was racing through the FOV, but it was much larger, brighter and more well-defined. Aperture rules.

It was rewarding to locate this object the old fashioned way, even though it took so long. I think I will be investing in a more detailed star atlas, probably Uranometria.

Barry Yomtov: Observer from Massachusetts



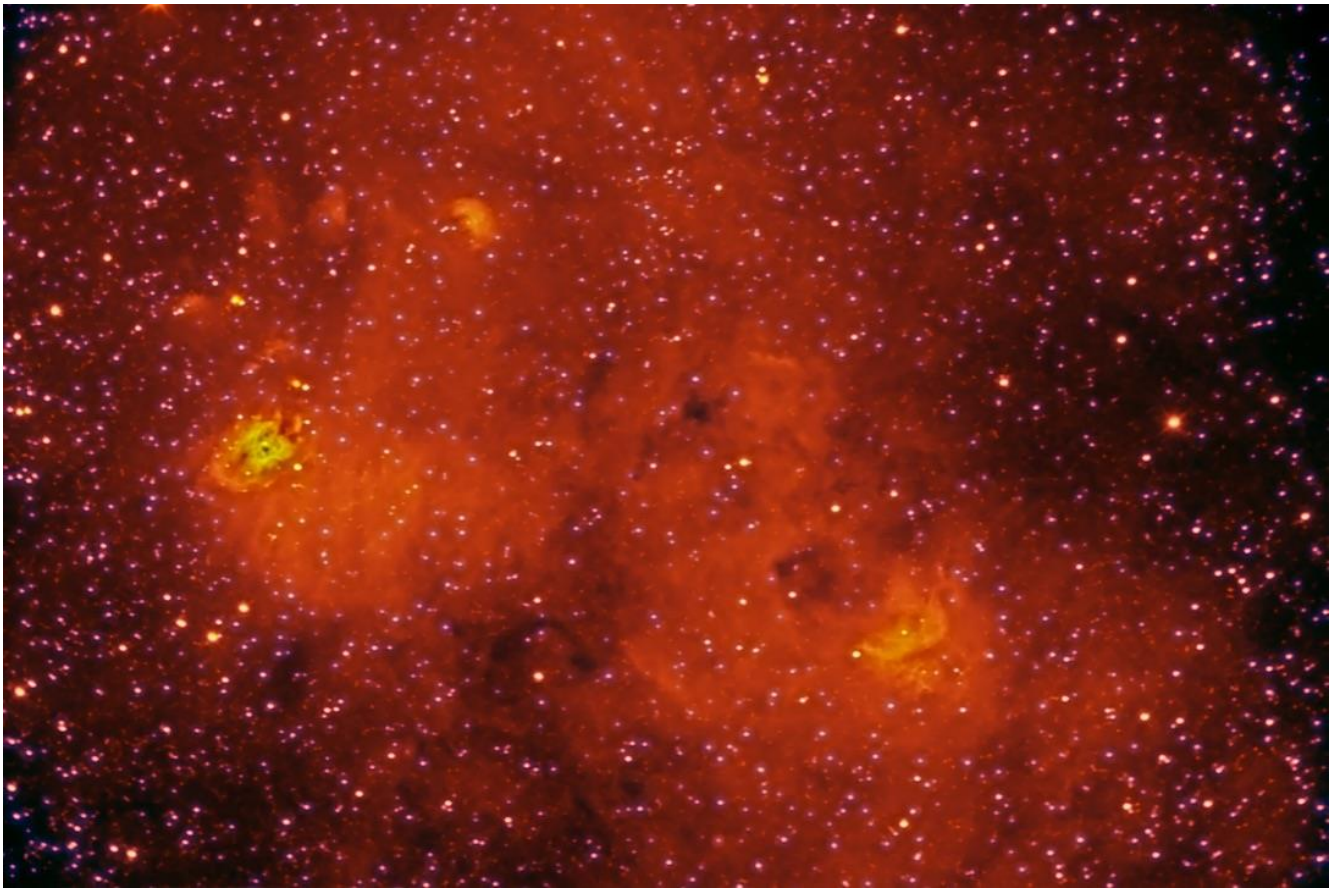
This month's object is a very small, but concentrated nebula, NGC 6857 located in a wide-field nebulous region within the constellation Cygnus. The image was taken with the RASA 11 f/2.2 optics using the ZWO 183 MC-pro CMOS camera. The images were taken with a 12 nm Hα narrowband filter and is presented in greyscale. There are 49 sets of the Hα images at 60 second exposure for a total of 49 minutes. What I noticed when processing the image is how bright the core of the nebula is. The wide field image also exemplified the nebulosity of the surrounding region.

Venu Venugopal: Observer from Massachusetts

The image above was taken using a 8-inch Newtonian, H-alpha, H-Beta, O II filter with a Zwo533MC 20 minutes exposure, 30 second sub frames at the ATMOB clubhouse in Westford, MA on 10/7/21.

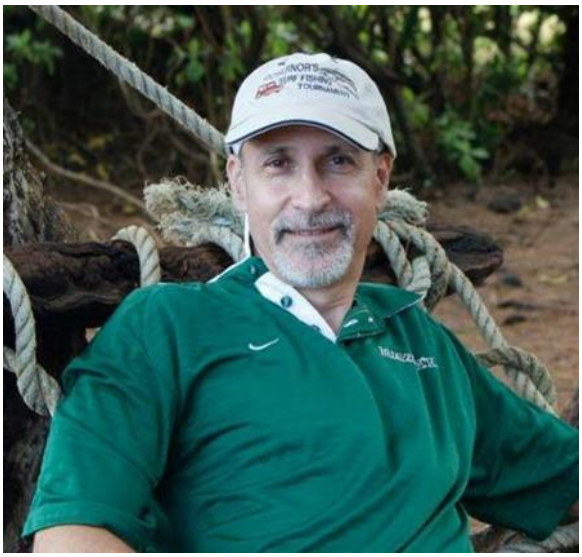
NGC 6857 is a H II ionized region in the Cygnus constellation. It is a small (~1′) compact nebula. 3 stars in a row NE-SW, SW one brighter, the other two equal. The middle star is surrounded by nebulosity. The “hidden treasure” in the center of Cygnus was found in 1784 when William Herschel discovered a “faint glow, among Milky Way stars.” It shows a triangular shape with a darker center and hard, defined, V-shaped straight edges.

Mario Motta: Observer from Massachusetts



An interesting object, initially thought to be a planetary nebula, but upon careful inspection, clearly is not. NGC 6857 is the bright "knot" to the left (East) in the following image. The nebula is 40 arc sec in size, but is embedded in Sh 2-100, a faint H-Alpha emitting region. It's really just a bright, but very small section of that nebula. The image was taken with my 32-inch telescope, 3 hours, 1 hour each Ha, S2, O3 filters, processed PixInsight, touched up in Photoshop.

James Dire: Observer from Illinois



NGC 6857 is a small emission nebula in the Constellation Cygnus. The nebula is located two degrees southeast of Eta Cygni, a magnitude 3.9 yellow star, which is part of the Northern Cross.

NGC 6857 is an H II emission region a mere 36 arcseconds in size. Because of its size and the fact that the eye cannot see color very well at the eyepiece, the nebula is easy to confuse with a planetary

nebula. This is especially true because of a faint star that appears to be at the center of the nebula. The nebula is part of a larger region of H-II emissions that extends to the west of NGC 6857 several tens of arcminutes.

My image of NGC 6857 was taken with a WO 132mm f/7 apochromatic refractor using a 0.8x focal reducer/field fattener to yield f/5.6. The exposure was 110 minutes using an SBIG ST-2000XCM CCD camera. On the image north is up and east to the left. The star in the center of the nebula is magnitude 13.2

Mark Helton: Observer from Massachusetts

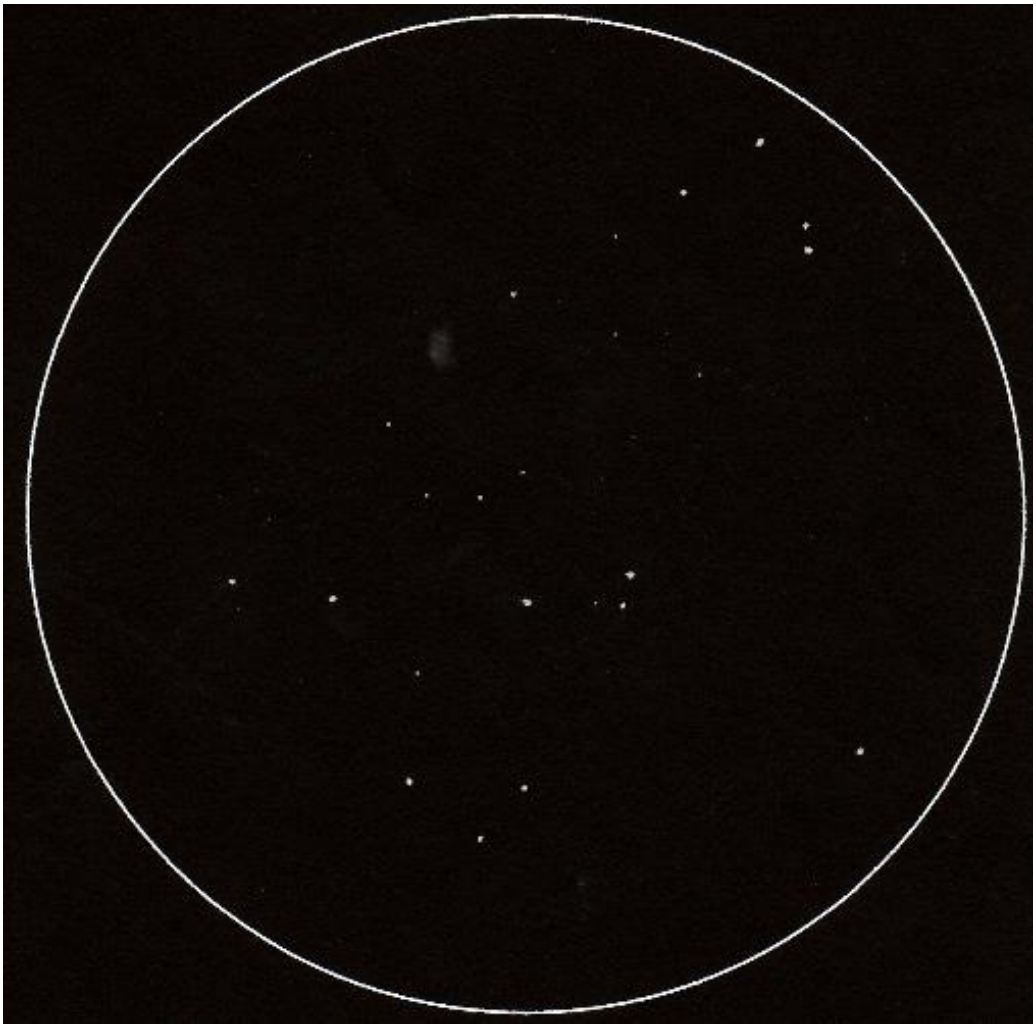
Had a short stretch of clear skies on October 18, so I thought that I would go for this month's Observer's Challenge. This is NGC 6857, a bright patch of nebulosity within a much larger region of hydrogen red nebula in the constellation of Cygnus. It is very bright and also very small for my 535-mm Stellarvue 102T-R scope. It becomes that MM with my .08 Reducer/Flattener. I shot this with my ZWO533MC Pro camera which has a one inch by one inch sensor. Using a OPT Tirade Filter. I only had about an hour and a half before the clouds rolled in, so this is 40, 180 sec images at medium gain. Stacked in Nebulosity, and processed by Dave Rust, a new member of our club and friend of mine out in Bloomington, Indiana. He has been introducing me to some new processing techniques so, I wanted him to give this target a try. We are both using Photoshop, and Topaz Labs DeNoise for final processing. Cygnus is just chock full of wonderful nebula, it was fun to find this one.


GREAT NECK OBSERVATORY
Ipswich, Massachusetts

Anas Sawallha: Observer from Jordan

This month's challenge object is Emission nebula NGC 6857 in Cygnus.

Observed from Bortle 4 site using a 5-inch Newtonian reflector and 12.4-mm EP with the employ of a UHC filter.



Roger Ivester: Observer from North Carolina

NGC 6857 – Emission Nebula – Cygnus

Date: September 27th 2021

Telescope: 10-inch f/4.5 Newtonian Reflector

Sketch Magnification: 291×

Eyepiece Combination: 11mm + 2.8× Barlow

NELM: ~ 4.9

After two nights of failure to see the emission nebula, NGC 6857 I gave up, but thought I'd give it one more try on the following night. So, on the third night after two hours of careful observing using mostly averted vision and a high magnification of 291×, the nebula made its intermittent appearance.

The nebula could best be described as very small and having an arc shape on the NE side of a faint star.

Pencil sketch as following:

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

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