MONTHLY OBSERVER'S CHALLENGE

Las Vegas Astronomical Society

Compiled by:

Roger Ivester, Boiling Springs, North Carolina

&

Fred Rayworth, Las Vegas, Nevada

With special assistance from:

Rob Lambert, Las Vegas, Nevada

October 2012

NGC-7023 (Caldwell 4) (LBN 487) The Iris Nebula in Cepheus

Introduction

The purpose of the observer's challenge is to encourage the pursuit of visual observing. It is open to everyone that is interested, and if you are able to contribute notes, drawings, or photographs, we will be happy to include them in our monthly summary. Observing is not only a pleasure, but an art. With the main focus of amateur astronomy on astrophotography, many times people tend to forget how it was in the days before cameras, clock drives, and GOTO. Astronomy depended on what was seen through the eyepiece. Not only did it satisfy an innate curiosity, but it allowed the first astronomers to discover the beauty and the wonderment of the night sky.

Before photography, all observations depended on what the astronomer saw in the eyepiece, and how they recorded their observations. This was done through notes and drawings and that is the tradition we are stressing in the observers challenge. By combining our visual observations with our drawings, and sometimes, astrophotography (from those with the equipment and talent to do so), we get a unique understanding of what it is like to look through an eyepiece, and to see what is really there. The hope is that you will read through these notes and become inspired to take more time at the eyepiece studying each object, and looking for those subtle details that you might never have noticed before. Each new discovery increases one's appreciation of the skies above us. It is our firm belief that careful observing can improve your visual acuity to a much higher level that just might allow you to add inches to your telescope. Please consider this at your next observing session, as you can learn to make details jump out. It is also a thrill to point out details a new observer wouldn't even know to look for in that very faint galaxy, star cluster, nebula, or planet.

NGC-7023 (Caldwell 4) (LBN-487) The Iris Nebula in Cepheus

NGC-7023 is actually designated as a star cluster buried within the reflection nebula, LBN-487. However, that's a mistake as there is no cluster and the LBN nebula is actually the NGC object. There is also a Collinder 427 associated with it. This very dim mag. 13.8 loose cluster is located within a dark area just above the petal area of the "iris" shape on the east side of the nebula. There is another object, open cluster Collinder 429 that is supposed to be within the nebula (as with its' designation as an open cluster) but that's another mistake, this one made by Collinder.

Lying at a distance of 1,300 light years, it shines at a deceptive mag. of 6.8. To visual observers, the only star seen is the bright star that lights up the nebula, mag. 7 SAO 19158. Visually speaking, spotting the nebula can be quite tricky and this object is best suited for imagers. However, the haze can be spotted in small apertures when the conditions are right, depending on the observer's skills.

The biggest challenge, depending on sky conditions, might be finding the right fuzzy star. If there's any upper atmospheric haze, the object can blend in where all the stars have a halo around them and it will be missed. That's why it's important to pick a dark night with low humidity and no high thin clouds.

This is also listed as a Caldwell object and has been given the name, the Iris Nebula, due to the vague appearance shape and color of the flower as seen in photographs, certainly not visually!

Observations/Drawings/Photos

Dr. James Dire: Observer from Hawaii

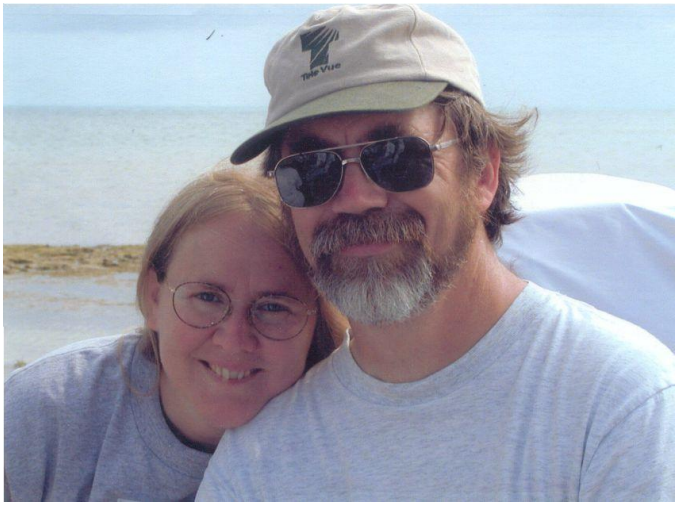
NGC-7023, the Iris Nebula, is a splendid reflection nebula located in the constellation Cepheus, about 3.5º southwest of the star Alfirk. The nebula is illuminated by the mag. 7.36 star V330 Cephei. V330 Cephei is an eruptive variable that sometimes brightens to mag. 7.10. It's 10 times larger than the Sun in diameter and 182 times more luminous.

NGC-7023 lies within a dark dusty part of the Milky Way. The nebula is very irregular in shape and glows blue due to the strong radiation from the bright B-class star reflecting off of dust grains. The pedal-shaped regions surrounding V330 Cephei take on their shape due to the dark dust and gases embedded within the nebula. The extended area around the Iris glows red due to hydrogen gas.

I viewed the nebula in a small refractor in mid October 2012, but could not see anything except the mag. 7 central star. I've never looked for it in a larger instrument but suspect some nebulosity would be apparent in my 14-inch Newtonian.

My accompanying image was a three hour exposure taken over the nights of October 12-14, 2012 with an SBIG ST-2000XCM CCD camera on a 102mm (4-inch) apochromatic refractor at f/6.3. The seeing was around 2 arcsec and the transparency was excellent from my west Kauai location. The image captures the inner "Iris"-part of the nebula and picks up some of the fainter outlying nebulosity. Longer exposures will show this gas dominating the extended region around NGC-7023. The star V330 Cephei is not resolved from the central part of the nebula as it is embedded in gas and dust. The bright star on the right side of the image about 1/3 way up from the bottom is a mag. 9.6 red giant star. To the right of the blue Iris region is a three lobed dark region that contains a 4 arcminute diameter open star cluster known as Collinder 427. This star cluster has a combined mag. of only 13.8!

Sue French: Observer from New York



November 10, 2007, 8:15 pm EST with a 254/1494mm (10-inch f/5.9) Newtonian. The seeing and transparency were fair. At 43X, this bright nebula spanned about ¼º and was brightest around a mag. 7½ star in the center. At 68X, the bright central region of the nebula was elongated north-south, 3 arcminutes tall, with pinched sides and a faint star off the southeastern edge. At 213X, the pinch was prominent south of the mag. 7½ star, and the nebula section south of the pinch was fainter than the northern part.

October 2, 2010, 9:15 pm EDT, with a 130/819mm (5.1-inch f/6.3) apochromat. The seeing and transparency were fair. At 23X, there was a bright glow around a fairly bright star. At 37X, the star was in the southern part of a 1¾ arcminute glow. A fainter, 1-arcminute glow continued south from the brighter one. UHC or O-III filter not helpful. At 63X, the southern part showed nicely, and there was a faint star in it. At 102X, the southern part was curved concave west so the whole thing looked like a fat comma in my mirror-reversed view.

David Blanchette: Observer from Nevada

Difficult to see visually, I wasn't sure how it would photograph. Image is 8 minutes at f/6.3 prime focus. I took this at the Cathedral Gorge Star Party, where I had really nice alignment and tracking.

Bradley Ivester: Observer from Nevada

It's been quite a few years since I've observed a deep-sky object on a serious basis. On Thursday night, October 10, 2012, using a 10-inch reflector from my childhood home in Boiling Springs, North Carolina, I observed reflection nebula, NGC 7023. I was using a 20 mm eyepiece for a magnification of 57X. The nebula was a bit subdued, and appeared as little more than a faint haze around a fairly bright star.

It was great to be back home in North Carolina for a visit with my family. I was the one responsible for getting my Dad back into amateur astronomy during the mid-80's. I decided that I wanted a telescope and my Dad was very accommodating and purchased me a small telescope. We joined the local astronomy club and both he and I were amateur astronomers together for a period of time.

Above is reunion picture of my brother, Chad and I at his home in Kershaw, South Carolina. (I am on the right.) It was a great to see all of my family, but it's good to be back home in Las Vegas.

Rob Lambert: Observer from Nevada

NGC-7023, or the Iris Nebula, first appeared to only be a fuzzy star at about 35X in my 4-in refractor visually and through my Mallincam Video Camera. Upon closer inspection through my 10-inch SCT, it was still a fuzzy star but with a bit more detail. It is, in fact, a fuzzy star that hasn't yet blown away its birth cocoon. Although primarily a reflection nebula, I detected some pink color, which hints that there's still some ionized hydrogen in the cloud that surrounds the young, bright, hot star at its center. The cloud has an uneven, mottled appearance, typical of this type of nebula. Other than the bright central star, it's difficult to tell which, if any, of the other stars are associated with the nebula. The nebula appears to extend outward about twice the distance of the brighter inner region and has a more uniform circular shape and density.

The accompanying image is a 25-second exposure, captured with a 10-inch SCT, and the Mallincam VSS+ video camera without any filters. The optical path included an f/6.3 focal reducer, resulting in a magnification of approximately 195X. The image is a single frame with no post-processing and represents what I saw at the eyepiece of the SCT.

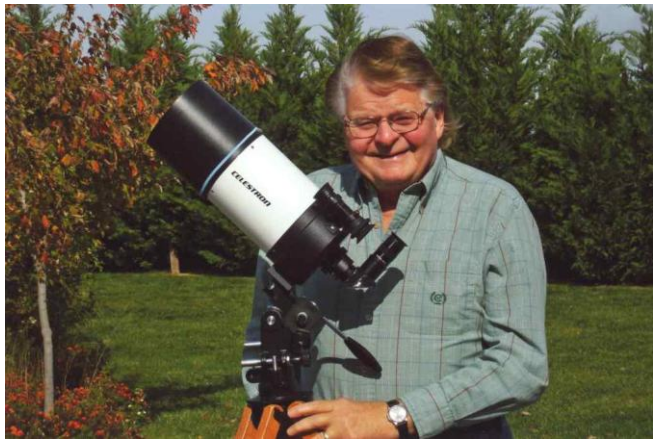
Gus Johnson: Observer from Maryland.

NGC-7023 can be plotted, and sketched, using AAVSO "b" chart 210868 T. Cephei. It surrounds comparison star 71.

With my 6-inch at 95X, on September 22, 1984, it was an ill-defined haze around star 71, fading away from the star. I got the same result with my 8-inch reflector at 48X on November 26, 1984. A UHC and H beta filter did not improve. My notes indicate that there was an excellent photo of NGC-7023 in *Sky & Telescope*, February 2006 on page 109.

James Mullaney: Observer from Delaware

.



The best thing I can contribute is to share a remark about this object made by Scotty Houston: "Real bright - I question why it is not plotted in Norton's Star Atlas."

Also of interest - Herschel classified this as a planetary nebula (his H-IV-74).

Buddy Barbee: Observer from North Carolina

This observation was made from my heavily light-polluted backyard in Winston-Salem, NC at 12:55am EDT on Saturday, September 15, 2012. After a summer of mostly cloudy weather, we finally had four consecutive nights without clouds or moon to interfere with some observing. The sky, with high humidity, was bright in town as it always is in the summer time. It was 63º F with no wind. The elevated humidity (87%) allowed a naked eye limiting magnitude of 4.3.

You'll find NGC-7023, sometimes referred to as the Iris Nebula, about 3 1/2º southwest of mag 3.2 Alfirk (Beta Cephei). Through my 5-inch Mak-Cass with direct vision, using a 19mm eyepiece at 100X, NGC-7023 appears as a uniformly bright, circular haze about two arc minutes in diameter and surrounding the mag. 7 star HD 200775. Adding a Sky Glow filter to my 24mm eyepiece, yielding a magnification of 79X, and using some averted vision, the nebula grew to almost ten minutes in diameter that was a rounded square shape. With light pollution in town, the nebula resembled a distant light seen through a fogged up window, although there was no fog visible around any other stars.

On Friday, September 12, 2012, I was out with my 10X50 binoculars and located what I thought was NGC-7023. Using the line of four stars, alpha Cephei, 6 and 7 Cephei and beta Cephei, I placed beta Cephei on the northeast edge of my 6º field-of-view. I looked for the little equilateral triangle of mag. 7 stars with another mag. 7 star just west of the southwest star. Having located this triangle of stars near the center of the field-of-view, I began to use averted vision to observe then. The southwestern star in this triangle was slightly bloated and didn't appear stellar like the other stars. It's hard for me to believe, but I was able to detect this nebula with my 10X50 binoculars.

DEEP-SKY OBSERVATION SKETCH FORM

CONSTELLATION: Cepheus **OBJECT No.:** NGC 7023, The Iris Nebula

Observer: BLB Location: Home in W-S, NC

Day & Date: Sat., Sept. 15, 2012

Time (local): 12:55 AM EDT

Telescope/Aperture: ETX-125/5"

Eyepiece/Mag.: 24mm / 79x

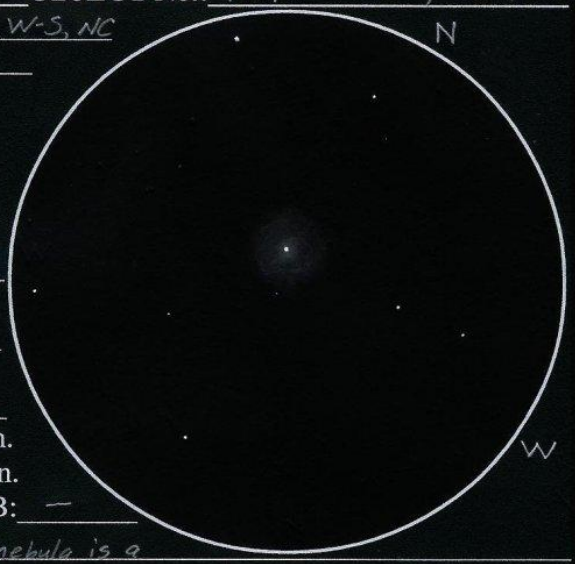
Field-of-View: 00° 52'

Filter: Orion Sky Glow

Seeing (1-5): 4 Transparency (1-7): 3

NELM: 4.3 Temp.: 63°F

Wind: Calm Humidity: 87%



OBJECT:

Type:

RA: 21 hr. 01.6 min.

Dec.: +68° d. 10.2' min.

Listed Size: 10'x8' Mag.: 7 SB: —

NOTES: with averted vision the nebula is a misty spot about 10' in diameter, the nebula is around a 7th mag star and almost looks a little boxie in shape, it looks like a distant light through a foggy window.

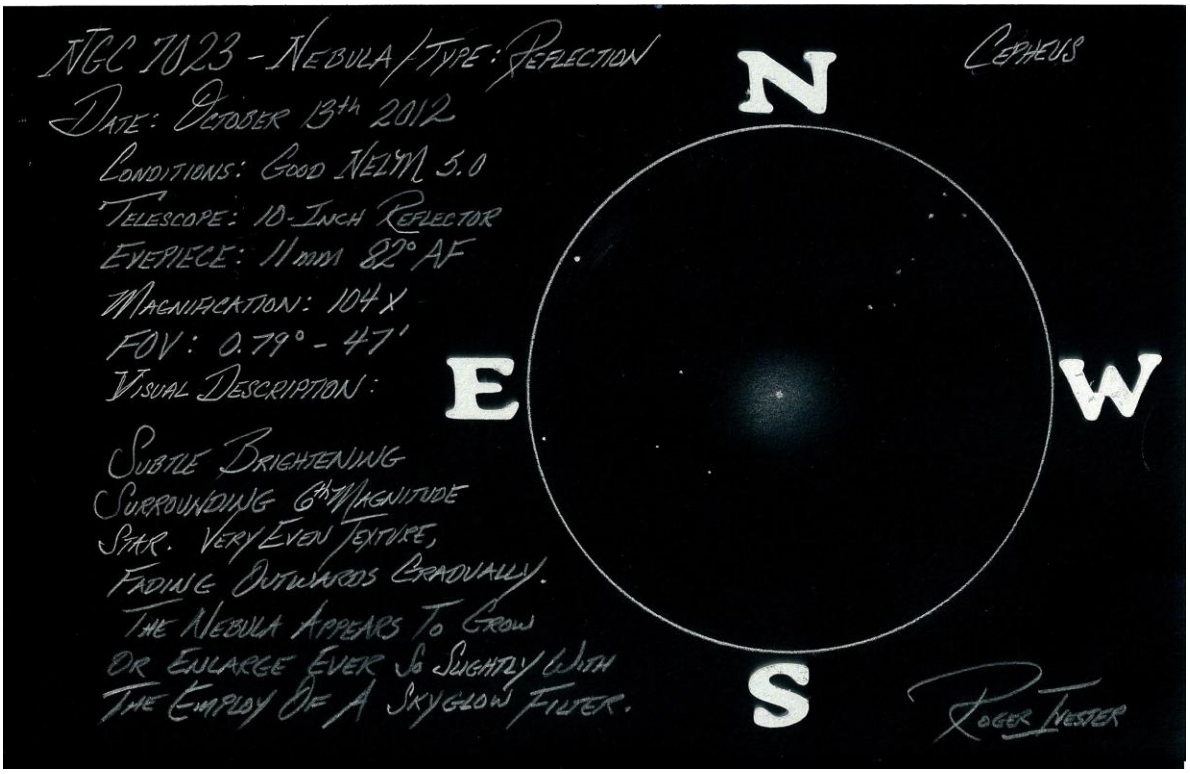
Roger Ivester: Observer from North Carolina

December 10, 1996: 10-inch reflector @ 57X, and a Skyglow filter. This nebula appeared as little more than a misty haze surrounding a mag. 6.8 star. The shape had a slight NS elongation, and I noted an uneven texture.

October 11, 2012: 4-inch refractor @ 95X. The nebula appeared very dim and required averted vision. The small refractor presented a very subtle brightening around the illumination star. It would've been impossible for me to have seen NGC-7023 if I hadn't known the location.

October 13, 2012: 10-inch reflector @ 104X, using an 11mm eyepiece with an 82º apparent field. I was observing from my moderately light-polluted backyard with a NELM of 5.0, with unshielded streetlights in relative close proximity. The nebula appeared as a very subtle brightening, a mostly round shape, and fading very gradually outward. Using a Skyglow filter, the nebula appeared to enlarge ever so slightly. A zigzag line of uneven stars lay just NNW. A dark site with an inky black sky would improve the contrast of this object, allowing for a much-improved view.

The following sketch was made using a No.2 pencil, on a blank 5 X 8 notecard. The color was inverted using a scanner.


NGC 7023 - Nebula / Type: Reflection
Cepheus
Date: October 13th 2012
Conditions: Good Nelm 5.0
Telescope: 10-Inch Reflector
Eyepiece: 11 mm 82° AF
Magnification: 104 X
FOV: 0.79° - 47'
Visual Description:
Subtle Brightening Surrounding 6th Magnitude Star. Very Even Texture, Fading Outwards Gradually. The Nebula Appears To Grow Or Enlarge Ever So Slightly With The Employ Of A Skyglow Filter.
N
E
W
S
Roger Ivester

Debbie Ivester: Observer from North Carolina

On the night of October 14, 2012, I observed the reflection nebula NGC-7023 in the constellation of Cepheus. I wanted to use the 4-inch refractor, which I call the little scope. Roger told me that the nebula would be difficult, especially with a 4-inch scope. I wore a pair of Orion Astrogoggles for an hour or longer in a darkened setting before going outside, to improve my night vision. I used a magnification of 42X, which allowed a nice wide field of view.

The illumination star was easy to see, however, Roger already had the scope trained on the designated target. When studying the star, I couldn't see anything, but after using my newly acquired skill, averted vision, I saw a faint condensation surrounding the star. This was a difficult object for me.

Hey, I'm getting pretty good at this observing stuff...

Fred Rayworth: Observer from Nevada

The first time I checked out NGC-7023 was with my 16-inch f/4.5 from Redstone Picnic Area on the north shore road at Lake Mead, Nevada on October 25, 2008. It was one of only five nights for the entire year I was able to get out, and I made the best of it. As it turned out, it was probably the best evening of the year. The sky was clear, calm and very dark.

The nebula was a bright clump of haze around a star. At that time, I also noted Collinder 427, but didn't recognize it as a separate cluster at the time because I thought it was part of the nebula, as erroneously shown on the charts. Turns out, since researching this Challenge, I was able to add another object to my database! This extremely faint cluster was just a vague clump of uneven mag. stars, maybe a dozen in all that only stood out because they were in a rather dark area compared to the rest of the faint haze in the general area.

At that time, I tried an O-III filter and it helped a slight bit, but not by much. This observation was done at 70X.

The next time I got a crack at it, for this Observer's Challenge, was on September 13, 2012 from Cathedral Gorge State Park in central-eastern Nevada. With an altitude of over 4,000 feet, you would have thought the view would've improved over the 1,500 foot Redstone location. I used the same 16-inch f/4.5 but with a magnification of 102X. However, that night my notes read as follows: "A faint haze around a bright star. Seemed to cover quite an area. However, when I tried filters, it blacked out completely from both the UHC and O-III. Not a thing. There was supposed to be an open cluster there also but I couldn't find anything even resembling a cluster in the area."

Keep in mind that the open cluster I was referring to was NGC-7023 itself, which I thought was doubling as Collinder 427. I'd forgot that it was separate and if I'd looked closer at my finder chart (right in front of my face!), I would've noticed it was a separate object! Doesn't matter though, because I never saw the cluster, or at least recognized it. I picked out a few brighter stars within the field of view but nothing that I'd call the cluster I saw in 2008. When I observed it, that must've been when a band of high thin clouds moved overhead.

I’m glad I caught both objects (nebula & Collinder cluster) back in 2008. I also want another chance at it with filters to see if they make a difference.

The drawing is a composite of my 2008 and 2012 observations, showing the cluster but the view of the nebula as I saw it without any filters.

Jay and Liz Thompson: Observers from Nevada

We observed NGC-7023 from Cathedral Gorge State Park, NV on September 14, 2012 with a 10-inch f/6.3 SCT and on September 15, 2012 with a 17.5-inch f/5 Newtonian. With both telescopes, NGC-7023 appeared as a star with a reflection nebula glow around it. No open cluster was apparent.