MONTHLY OBSERVER'S CHALLENGE

Las Vegas Astronomical Society

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SEPTEMBER 2013

NGC-7044 Open Cluster In Cygnus

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.

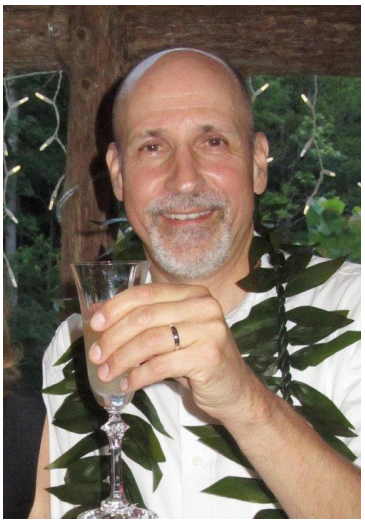
NGC-7044 Open Cluster In Cygnus

NGC-7044 is an open cluster in Cygnus and isn't too far from the North American Nebula. It shines at a very dim mag. 12.0 which is deceptively bright considering how low the surface brightness is for an open cluster. It lies approximately 20,000 light-years away and is approximately 1.2 billion years old. It's quite an old cluster, as best can be determined, and contains many reddish stars and few in the blue spectrum.

The cluster was discovered by William Herschel on October 17, 1786 and is therefore a Herschel object, H-024-6. Though not impossible to view, it's quite difficult for small scopes to see, let alone resolve. It takes dark and transparent skies to coax out of the black background. There is also a very nice little bright blue planetary nebula, NGC-7027 that lies nearby, which makes for a nice bonus while you're in the area. At mag. 10.4, it's a good bit brighter than the cluster.

Observations/Drawings/Photos

James Dire: Observer from Hawaii



NGC-7044 is a mag. 12, six-arcminute diameter galactic star cluster located in the constellation Cygnus. The cluster is located 2° southeast of the mag. 4 star Xi Cygni. It lies more than 20,000 light years away and is thought to be 1.2 billion years old. This is based on its stellar population, which is devoid of blue and white giant stars more massive than the sun.

NGC-7044 has to be the faintest star cluster I've ever observed through a telescope or imaged with a CCD camera. My first attempt to find it was using a 6-inch Newtonian on a GOTO mount. My mount was polar-aligned and accurately centering on objects I selected. The seeing and transparency were great and I was in very dark Kauai skies. However, when I sent it to this object, I could not detect any star cluster in the eyepiece.

So next, I went to my 14-inch f/6 Dobsonian telescope. I had to star hop to find it. One can star hop from Xi Cygni, using the distance I cited above. However, I found it just as easy (or difficult as it was) to star hop from Nu Cygni, located 3.25° southwest of the cluster. After centering in my 9X50 finder where I thought the cluster resides, I looked in my 82X eyepiece where I spied it.

Despite having a 14-inch light bucket, this cluster was very faint. The effect was almost 3D. The stars around it, which I assumed were foreground stars, were much brighter than the cluster stars, making it appear much farther away. The stars within the cluster all appeared uniform in brightness. It almost looked as if I was viewing a very distant Milky Way satellite galaxy.

I next imaged NGC-7044 with an SBIG STF-8300C CCD camera on an 8-inch f/8 Ritchey-Cretien Cassegrain telescope with a 0.8X field flattener/focal reducer riding atop an

equatorial mount. The exposure was two hours! Even with this long exposure, the cluster is very faint and appears overwhelmed by the closer Milky Way stars. The image does corroborate what I saw telescopically, although it doesn't display the 3D effect I saw in the telescope.

NGC-7044 is indeed the most challenging object I've found in this observers challenge!

Sue French: Observer from New York

On August 8, 1988 at 2:29 A.M., EDT, I used an 8-inch f/9 Newtonian reflector @ 56X. Seeing was fair and transparency was very good. I saw a small, faint, smudgy area only found by careful checks with a star chart. A few stars were visible, including one in the center, but they may have been foreground objects.

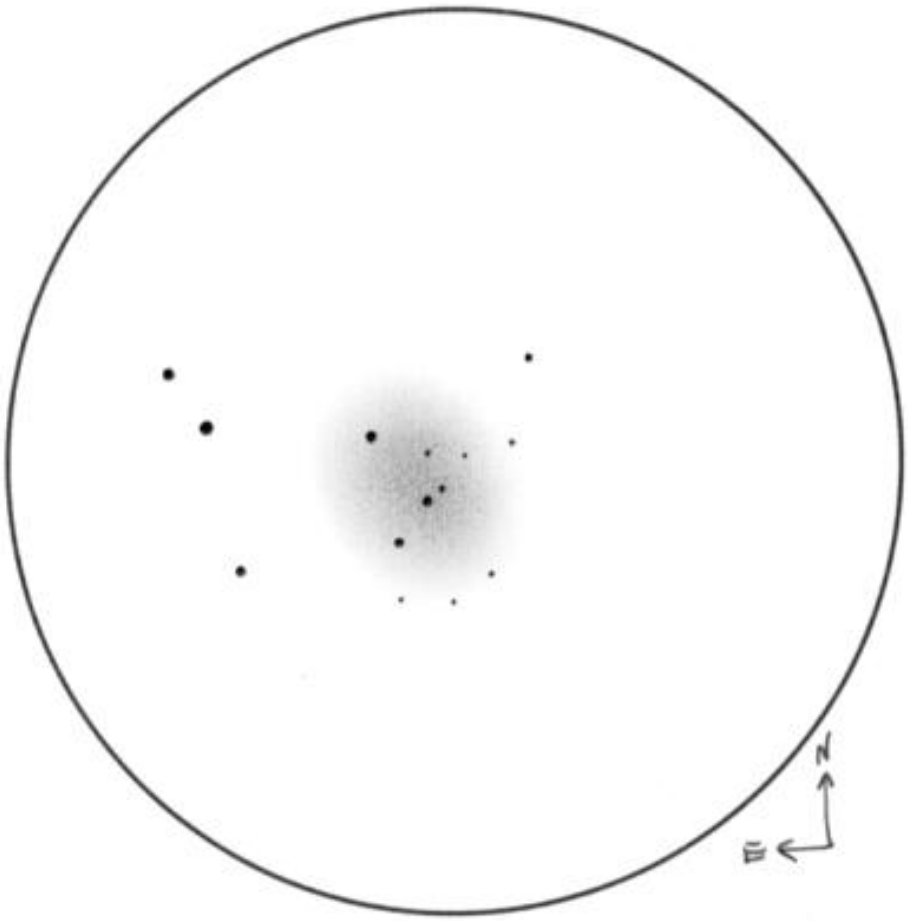
On August 6, 2002 at 11:30 P.M. EDT, I used a 10-inch f/6 Newtonian reflector @ 117X. Seeing was poor but transparency was good. It was very pretty. A diamond-dust cluster, approximately 4.5' in size with many very faint stars scattered across haze. One brighter star, about mag. 11 was at the eastern edge.

On October 12, 2004 at 10:00 P.M. EDT, I used a 105mm (4-inch) f/5.8 apochromatic refractor @ 17X. Seeing and transparency were good. I saw a small, faint fuzzy spot with one faint star. When I increased the magnification to 47X, the star was in the east side. At 87X, the star was in the ENE side, and a fainter one was in the ESE side.

Jaakko Saloranta: Observer from Finland

On September 3 and 4, 2013, from Kruununpuisto, Hyvinkää, Finland (108 m/354 ft), I used a 4.5-inch Newtonian reflector @304X (8'). The NE lim.mag: 6.0 (zenith): SQM-L: 19.80 (zenith): Background sky: 5 (average). Seeing: 3 (good). Transparency: 4 (fair). Weather: +6.8°C, humidity ~75%, 1006 hPa, no wind, scattered clouds 1/8, shrews running around. Altitude: 72°

I saw the cluster as NE-SW elongated, very faint glow roughly 3' x 2' in size. Half a dozen mag. 13 and fainter stars resolved.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Jay Thompson: Observer from Nevada

On the night of 6/07/2013, I observed from Meadview, AZ with a 17.5-inch f/4.5 Newtonian.

With an 8.8mm eyepiece (227X), I resolved NGC-7044 into about a dozen stars seen over a soft background glow. Its' angular size appeared to be about half that of NGC-5466 (June 2013 Challenge object).

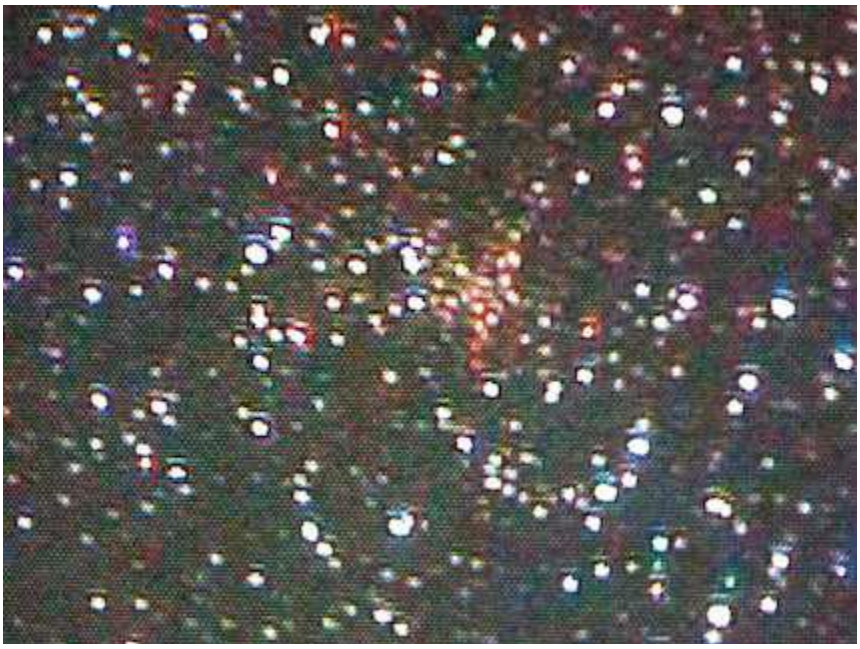
Rob Lambert: Observer from Nevada

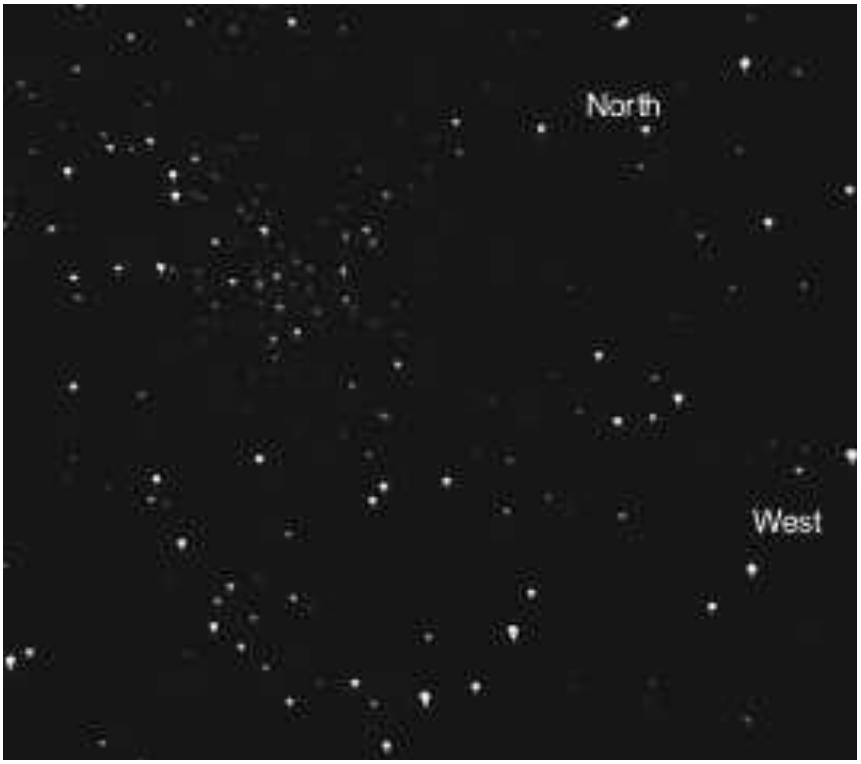
Even with my video-assisted observing, I almost didn't recognize NGC-7044 as an open star cluster when it first came into the field of view. The stars that actually make up the cluster are only mag. 12 to 15 and should be almost impossible to see in a small telescope. Luckily, with the Mallincam almost quadrupling the objective of my 5-inch refractor, the cluster's stars are actually quite visible. After checking my notes as to what I should be expecting, and realizing the cluster was much dimmer than most open clusters with which I'm familiar, it was easy to determine where the cluster resided in my telescope's field of view. I'm not sure if the 6 or so brighter stars superimposed on the cluster are actually part of the cluster or are foreground stars. I could resolve about 30 stars of mag. 12 to 15 that are obviously part of the cluster.

The image on the left is a snapshot of a 20-second integration displayed on a 9-inch CRT monitor. This image indicates that most of the stars associated with the cluster are older and cooler yellow and red stars, while the stars that appear to be in the foreground are blue and white in color. The left image also seems to possibly display some nebulosity overlaying the cluster. This 20-second integration shows the natural richness of the star field associated with this portion of the Milky Way. The image on the right is a video captured 7-second integration that more closely resembles the view one might actually see at the eyepiece. The images were captured on different nights about a month apart.

In both images, there is a fairly significant curved chain of brighter stars southwest of the cluster that appear to curve from the west to the east upward toward and actually back into the cluster. This is probably an optical coincidence since it is thought that the brighter stars are not related to NGC-7044.

I can easily see how NGC-7044 might truly be a challenge to the visual observer.




North
West

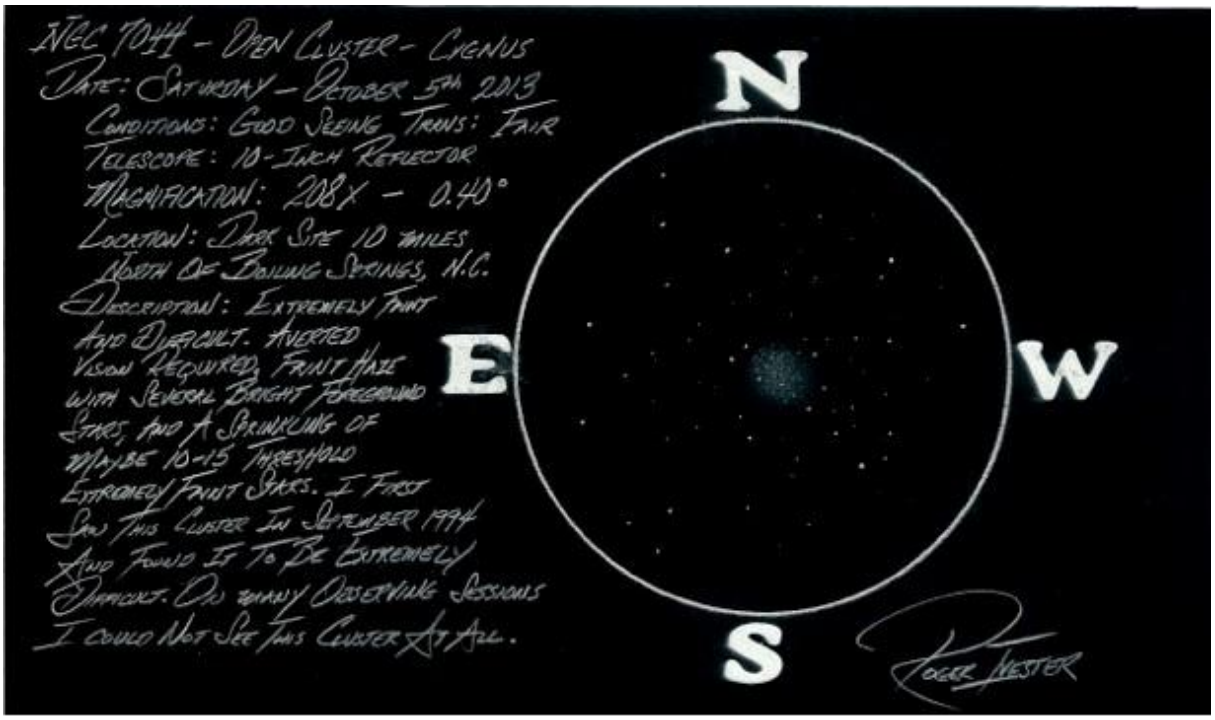
Roger Ivester: Observer from North Carolina

On September 30, 1994, I used a 10-inch reflector at 114X to observe NGC-7044 from my backyard in the foothills of North Carolina. The naked eye limiting magnitude was 5.2.

It was an extremely faint and difficult open cluster at 114X. I had to continue to check my star chart to ensure the correct position, and it took well over an hour to finally see it. When I increased the magnification to 250X and used averted vision, I saw a beautiful sparkling of faint stars appearing as pinpoints of light. I also saw maybe five or more brighter members superimposed over it, possibly foreground stars? A pair of faint, unequal stars were on the NE edge.

During the months of September and October 2013, I made over five observations on different nights and locations. Using the same 10-inch reflector as in 1994, this cluster seemed almost invisible, even from a dark site. During moments of steady viewing at a magnification of 208X, a sudden sprinkling of very faint stars would appear, but I couldn't hold it constantly. During two of those observing sessions, with a naked eye limiting magnitude of at least 5.5, I couldn't see the cluster at all, using a variety of magnifications.

The following sketch was made with a No. 2 pencil, and a blank 5 X 8 note card, with the colors inverted using my scanner. The sketch presents the cluster quite a bit brighter than how I saw it visually.


NGC 7044 - Open Cluster - Cygnus
Date: Saturday - October 5th 2013
Conditions: Good Seeing Trans: Fair
Telescope: 10-Inch Reflector
Magnification: 208X - 0.40°
Location: Dark Site 10 miles
North of Boiling Springs, N.C.
Description: Extremely Faint
And Difficult. Averted
Vision Required, Faint Haze
With Several Bright Foreground
Stars, And A Sprinkling of
Maybe 10-15 Threshold
Extremely Faint Stars. I First
Saw This Cluster In September 1994
And Found It To Be Extremely
Difficult. On Many Observing Sessions
I Could Not See This Cluster At All.
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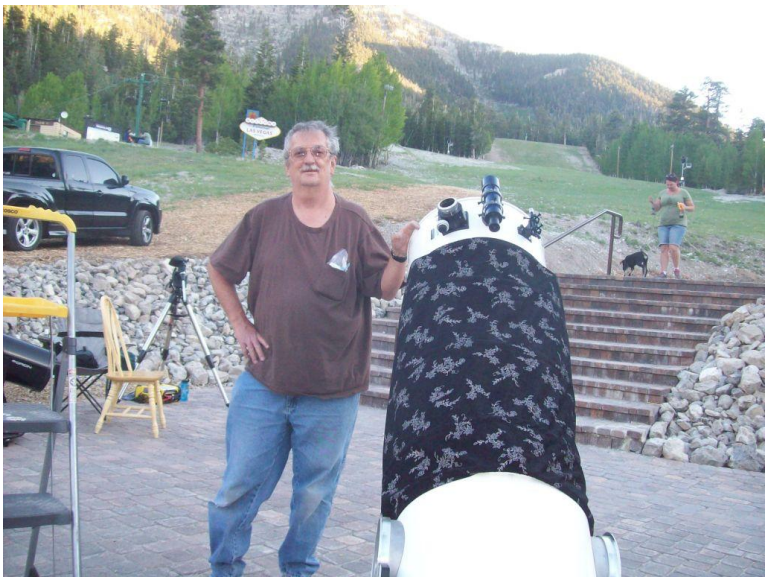
Roger Hester

Fred Rayworth: Observer from Nevada



This challenging object first came to my attention as part of the Herschel 400-1 observing list. I first observed it from Lake Murray near Ardmore, Oklahoma at Okie-Tex 97 on October 10, 1997. It was cool and clear with a slight breeze at an elevation of 872 feet. I used a 16-inch f/6.4 Dobsonian with a magnification of 70X and didn't see much but about twenty stars and a slight fog behind that. It was hard to tell from the background. I drew it for my Herschel list and it wasn't near as dense as later observations.

On July 5, 2010, I had another chance at it from Redstone Picnic Area on the North Shore Road at Lake Mead, Nevada at an elevation of 2,100 feet. It was clear and warm. There was a slight breeze that gusted occasionally throughout the night, but it was never a big problem. The skies to the east were pristine, especially about 45° up. The skies at zenith and to the west were not so hot. This time I used a 16-inch f/4.5 Dobsonian at 70X. The cluster was small, a clump of stars that barely stood out against the background.

On September 5, 2013, I had my best observation from Cathedral Gorge State Park, Nevada. At an elevation of 4,800 feet, it was warm with dying winds but high bands of humidity moving over the area. Also, thunderstorms were on the horizon, at least the clouds, but hadn't seen any activity by the time I quit for the evening. An occasional gust came up, just enough to be annoying. Wasn't sure if I'd be able to see much that night, and it turned out, I didn't. Though the sky darkened quite a bit toward midnight, I stayed at it from 10 through midnight and only found a dozen objects. I couldn't break the mag. 14 barrier at all. The transparency just wasn't there. That high humidity was still lingering up there. I gave up in frustration at 00:15 am. Still, I obtained my best view of NGC-7044. It reminded me of NGC-6791. It was a very subtle sprinkling behind foreground stars. I could just resolve some of them which all appeared

to be about the same magnitude. This was one of those objects that kind of sneaks up on you, like that cluster in Lyra. I could be staring right at it and never see it on most nights. Yet on that great night, it slapped me right in the face. The more I stared at it, the more stars I absorbed, though they were way too faint to resolve with either much detail or any color. The overall color was the usual flat gray-white monochrome, though I've heard the cluster is dominated by lots of red giants. Not too far from it was a nice bonus in the bright blue and small planetary nebula NGC-7027.

I tried for this cluster twice more, so far, once from my back yard and once from Spring Mountain ranch. My house is in the severely light-polluted east side of the Las Vegas Valley while Spring Mountain Ranch, though it can get quite dark, wasn't even close, with over half the disk of the moon washing out the sky. Oh well, at least I tried!