

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

SEPTEMBER 2014

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.

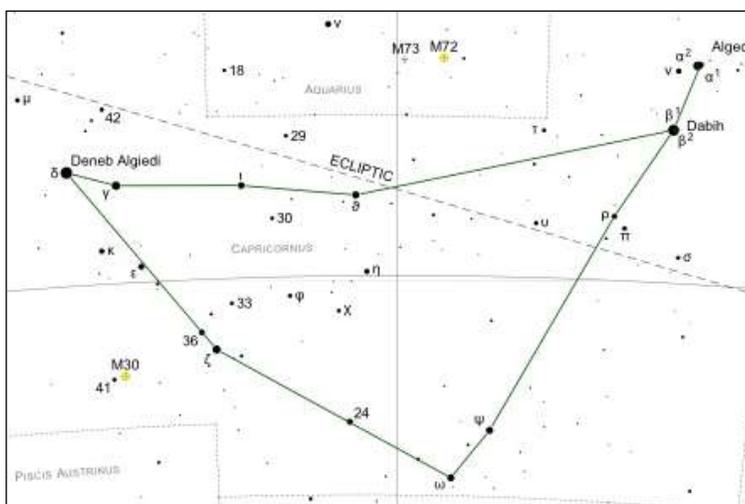
Before photography, all observations depended on what the astronomer saw in the eyepiece, and how they recorded their observations. This was done through notes and drawings and that is the tradition we are stressing in the observers challenge. By combining our visual observations with our drawings, and 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.

M30 (Messier 30) – NGC-7099 – Globular Cluster In Capricornus

M30, also known as NGC-7099 is a bright globular cluster in the constellation of Capricornus. It was discovered by Charles Messier in 1764. At a mag. 7.7, it's an easy object, even for binoculars.

About 27,000 light-years from earth, it moves in a retrograde orbit to our Milky Way, making astronomers think it was attracted to our galaxy from a satellite galaxy.

As such an easy target, the challenge comes in what details can be finessed with differing apertures and observing skills.



Observations/Drawings/Photos (Contributors listed in alphabetical order)

Gary Bruno: LVAS Member from Las Vegas



On September 9, 2014 @ 22:00, I observed M-30 from the Southeast corner of my yard. I used a 14-inch SCT at magnifications of 55mm (70X), 41mm (95X) & 23 mm (169X) EPs. The 41 mm at 95X gave the best view. The globular cluster appeared to extend outward toward one side (either 5, 7, 11 or 1:00. It was hard to say because I had the eyepiece twisted upside down so I could reach without climbing too high). Next to the cluster were two double stars. One was easy to split the other appeared to be closer. I vowed to try again the next day.

On September 12, 2014, I tried again. It was very faint, but I could pick it up. I powered up to 16mm (244X) with a deep sky filter and could make it out fairly well, considering my location. I must've been in the right location the other day because I still saw those double stars. But it was very faint and not much detail.

Glenn Chaple: LVAS Friend from Massachusetts



During October, Ophiuchus, Scorpius, and Sagittarius depart the evening sky, taking with them their ample cargo of globular star clusters. A few stragglers remain accessible to backyard telescopes – among them, Messier 30 in Capricorn.

M30 was discovered by Messier in 1764. He described it as a round nebula, containing no stars. Its stellar nature fell to the watchful eye of William Herschel, who resolved M30 twenty years later.

Recently, I observed M30 from a suburban location on an evening when the naked eye limit was about mag. 5. It was readily visible through 10X50 binoculars, appearing

as an out-of-focus mag. 7 star just a half degree west of the mag. 5.5 star 41 Capricorni. I didn't resolve any stars in a 4-inch f/10 reflector at 120X, but I did see M30's highly concentrated nucleus. In my 10-inch f/5 reflector at 208X, I resolved the outer parts of M30. The cluster spanned some 5-6 arc-minutes and seemed elongated in an east-west direction. Two stellar streams radiated outward toward the north.

M30 lies about 27,000 light-years from earth. It harbors several hundred thousand stars and has an estimated diameter of 90 light-years.

ASTRONOMY
OBSERVING LOG
(please print)

OBSERVER: Glenn Chaple EXPERIENCE (circle one): B I A
 DATE (M/D/Y): 9 / 17 / 2014 TIME: start 8:15 end 9:15 Time Zone EST
 LOCATION: 92 S. Herndon Rd., Townsend, MA, USA state/province country
 SKY CONDITIONS: SEEING (Antoniadi Scale): IV LIMITING MAGNITUDE: 5.5
 OBJECT: Messier 30 TYPE: G.C. CONSTELLATION: CAP

SKETCH (note direction of west)

NOTES:
 Cluster appears resolved. Concentrated nucleus. Two stellar streams radiate outward
 41 Cap is a double star. Magnification 210X. Observed 9/17/14

OBSERVING EQUIPMENT

Binoculars	Telescope
Size: X	Telescope Type: 10.1" Dobsonian mounted reflector
	Eyepiece Type: Greenough eyepiece
	Magnification: 250X Field Diameter: 0.8"
	Filter (if any):

James Dire: LVAS Friend from Hawaii



M30 is a mag. 7 globular cluster in the constellation Capricornus. The cluster is fairly easy to find, as it's located $1/2^\circ$ west of the mag. 5 star 41 Capricorni. To find 41 Capricorni, look 7° south of mag. 3 Beta Capricorni (Deneb Algieda) or 3.5° east and slight south of mag. 4 Zeta Capricorni. M30 and 41 Capricorni are both easily visible in the same field of view in binoculars or a 6X30 or 8X50 finder scope.

M30 is a dense globular cluster approximately 12 arc-minutes in size. The brightest star in the cluster is mag. 12.1. There is a mag. 8.6 foreground star just on the west side of the cluster's edge (see my image). The cluster is 26,100 light year away while the foreground star is 764 light years distant.

M30 was one of Charles Messier's first discoveries. He cataloged it on August 3, 1764 and like most of his globulars, described it as round nebula, containing no stars. William Herschel first resolved it around 1784. Containing around 200,000 stars, the cluster has a diameter of 90 light years. M30 is not as well known as other globular clusters since it's usually one of the last Messier Object missed during a spring Messier marathon (a night near the first spring new moon when it is possible to view all Messier objects in one night).

My image of M30 was taken with a 190 mm f/5.3 Maksutov-Newtonian reflector with an SBIG ST-2000XCM CCD camera. The exposure was 20 minutes.



Sue French: LVAS Friend from New York

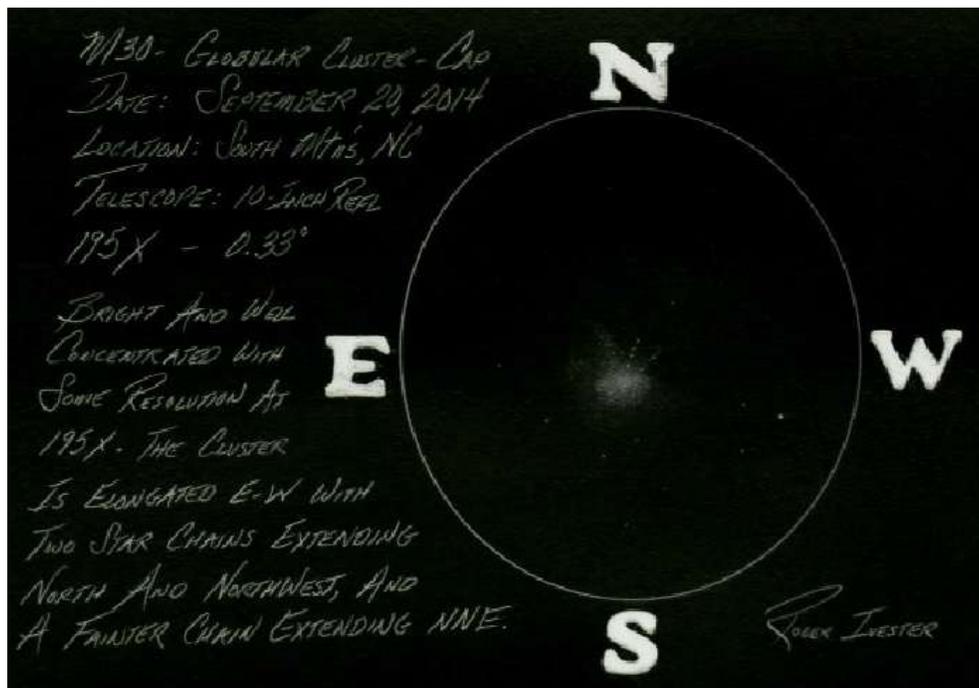
On October 6, 2010, at 9:25PM EDT, PSSG with an 130/819mm (5-inch f/6.3) APO, seeing was fair-poor, and transparency was good. At 23X, it has a granular halo $\sim 10'$. $\sim 2 \frac{1}{2}'$ core that brightens greatly toward the center. Mag. $\sim 8 \frac{1}{2}$ star at WXS edge. Mag ~ 12 star in SXW edge. At 117X, the halo shows much resolution. Core has partial resolution down to its bright center. A line of three prominent stars in inner halo to outer core point toward the center. Several mag. 12-13 stars are woven through an outer halo of fainter stars.

Roger Ivester: LVAS Member from North Carolina



Using a 10-inch reflector at 195X, M30 was small, fairly bright with a brighter more concentrated middle, elongated E-W. Two very distinct star chains radiated out toward the N and NW, and a fainter chain extended NNE. The most northerly and brightest chain was comprised of four stars. There was a bright star about $1/4^\circ$ toward the east, and south was mag. 5.5 41 Capricornus. When using a 102 mm (4-inch) refractor, I couldn't see the star chains, but the edges appeared very irregular and jagged, a brighter middle with an E-W elongation.

M30 has always been one of my favorite globular clusters, due in part to the unique star chains extending out from the very bright central region.



Gus Johnson: LVAS Friend from Maryland

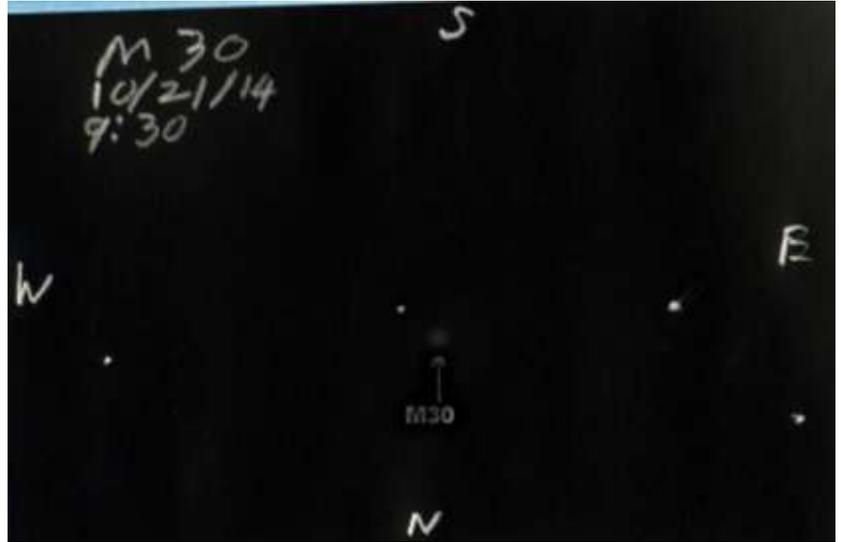


September 1979. I used an 8-inch Newtonian @ 116X. The cluster was located near a brighter star toward the WSW. It had a bright middle with two star chains extending out from the cluster toward the north and NNW. Good resolution at this magnification. The globular was visible in both a 10X40 and 6X30 finder, appearing very faint and round. The star chains were visible using a 6-inch at 118X.

John Lourdes Pierce: LVAS Member from Las Vegas



Despite the poor viewing conditions available from within Las Vegas, I was able to view September's Observer's Challenge, M30. Using my 6 inch reflector with 60X magnification, it was very dim but was noticeable once I came across it. However it was dim enough that if I had not been looking for it, I most likely would've never noticed it in the Vegas sky conditions.



Fred Rayworth: LVAS Vice President and AL Coordinator from Las Vegas



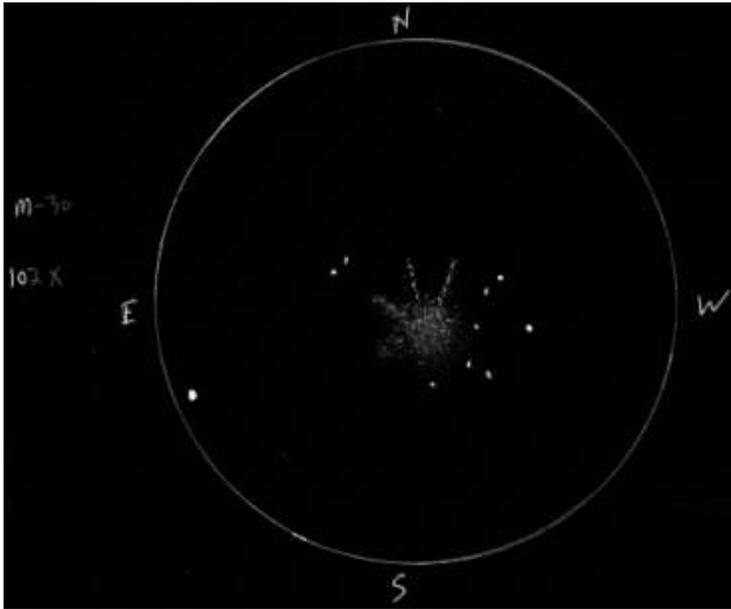
The first time I saw M30 was on August 1, 1984 with my home-built 8-inch f/9.44 reflector from Eurovillas, Spain at 4,387 feet. It was a beautiful night at 2AM. At 60X, all I noted was that it didn't look too bad, but I couldn't resolve much.

My next opportunity came on July 24, 1988, once again, from Eurovillas, Spain. It was very clear but a little over 1/2 moon made any delicate seeing almost useless. This time, I had my home-build 16-inch f/6.4 reflector. At a magnification of 70X, it looked like it had two off-center legs in it.

I spotted it at Okie-Tex on October 25, 1995 from Lake Murray, Oklahoma at 872 feet. It was clear, but with some high cirrus clouds and it was a bit windy. I was once again using the 16-inch f/6.4. At 60X, I only noted it had an odd shape and was bright, but not real dense.

My first Nevada observation was on September 17, 2009 from Cathedral Gorge State Park at 4,800 feet. It was calm and pleasant. However, there were clouds moving through, making it hard to spot key stars. Still I got in some good viewing before I got too tired. At 70X, the cluster had a dense, but blotchy core. Two lines of uneven mag. stars in a V were superimposed in front of it pointing toward the core. I couldn't tell if they were part of the cluster or were foreground stars.

For this Challenge, my most detailed observations came on October 24 and 25, 2014 from Furnace Creek in Death Valley at -190 feet. Friday, it was the first time observing from the golf course driving range, rather than the airport. It could've been a great site, but there was a street light issue from general store with three of them shining from the south and basically ruining the southern sky, and for that matter, interfering with a good portion of the rest of the sky peripherally from shining into the side of my eye. Also, the date palms obscured the horizon the south, so viewing down low into the "notch" wasn't an option. The night was clear, calm but



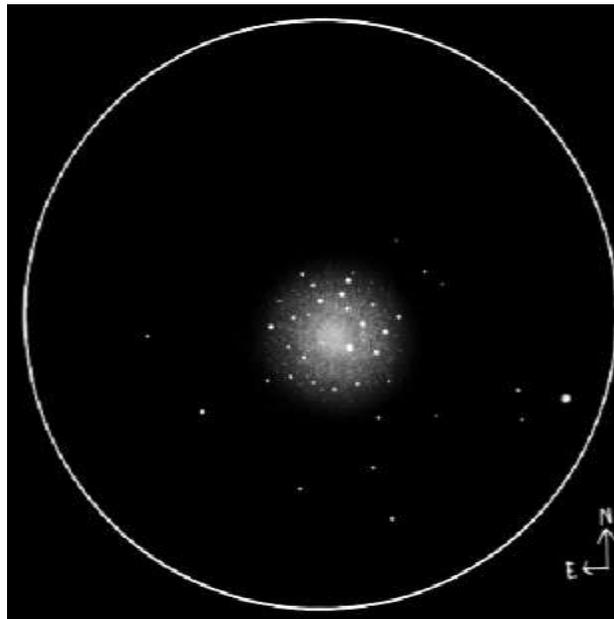
seeing was lousy. As the night progressed, it became apparent that transparency was a huge issue also. I never found a single faint fuzzy, though I tried for several and gave up in frustration. The tourist objects were readily available but nothing to write home about. Still, it was a fun evening. As for Saturday, it was extremely windy, with high, thin clouds. The winds were supposed to die down at dusk, but they actually got worse. The clouds finally went away after dark but the winds brought in lots of turbulence and dust. Seeing was terrible and transparency, forget it. However, I finally got a few fuzzies, which amounted to two Herschels. That was it. Still I enjoyed the night. The ironic thing was that the winds died at midnight, but the sky disappeared at the same time. Go figure.

As for M-30, it was a weird-shaped globular. A main V of strong star chains emanated from the core. After looking at it a bit longer, I noticed two more subtle arms counterclockwise from those two V arms. The first one was a bit more distinct while the second was more vague, but seemed to be fatter. The core was grainy and I could resolve some stars there, as well as all around the halo. A nice cluster. It looked best at between 102X and 131X. At 48X, the features were there, but not very distinctive. On Saturday, it was nice and bright, with all four arms showing.

Jaakko Saloranta: LVAS Friend from Finland



Because Messier 30 never rises much higher than 6° in Southern Finland, it can be quite difficult to observe from here under urban skies. With small apertures, the globular cluster appears simply as a nebulous glow with a brighter nucleus. Under rural conditions, the view changes dramatically as the globular cluster becomes fairly well resolved from the edges and displays a slightly elongated nucleus. Visual size is roughly 4'. Observing from an altitude of 4,500 feet in Sedona, Arizona this often neglected cluster appeared as such, using a 4.5-inch Dobsonian @ 228X (13').



Jay Thompson: LVAS Member from Henderson, Nevada



Jay: I observed M30 with a 3-inch f/4 Newtonian, a 90mm (3-inch) Maksutov, and a 17.5-inch on May 31, 2014 from Meadview, AZ.

The cluster was visible in the 3-inch f/4 finder at 18X but I couldn't resolve it. Similarly, it was visible but I couldn't resolve it using the 90mm Maksutov at magnifications up to 101X. In the 17.5-inch at 227X, I could well resolve it, and it was not huge, but bright and pleasing.

Liz: On August 16, 2014, I imaged M30 with a 14-inch SCT at its f/11 focus from Henderson, NV. Despite considerable thermal noise due to the high ambient temperature, I was able to capture the cluster with a 5-minute exposure. As you can see in the attached image, the cluster is well-resolved. The image approximates the visual appearance in the 14-inch SCT and 17.5-inch Newtonian.

