MONTHLY OBSERVER'S CHALLENGE

Las Vegas Astronomical Society

Compiled by:

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&

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June 2009

M-13 (NGC-6205) in Hercules

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.

M-13 (NGC-6205) in Hercules

M-13, the Great Cluster in Hercules, is an easy target for everything from binoculars to the largest backyard telescopes. It is easy to spot, even in a finder as a fuzzy blob against a dark background. On good nights, you may even be able to make it out with the naked eye. If you do not know your way around the sky, it is well marked in the star charts found in *Sky & Telescope* and *Astronomy* magazines. Just look at the summer charts, and you will see it in the "body" of Hercules.

The challenge is to see more than just a fuzzy blob. There are a few features noted by observers over the years, starting with Lord Rosse back in the 1700's (see *Lord Rosse M13.jpg*). He noticed spider arms going out from the main body of the cluster, and also three dark lanes in the shape of a "Propeller".

Walter Scott Houston presented this challenge in "Deep-Sky Wonder's" in Sky & Telescope, July 1953.

In 1980 John Bortle saw the lanes with his 12.5-inch reflector at 176X. Dennis di Cicco, at Stellafane in 1981, was surprised by how easily the lanes were seen with the 12-inch f/17 Porter turret telescope at about 180X. However, even knowing their orientation and appearance, he was unable to see them at 95X with a 12-inch that was set up nearby. Sighting the lanes seems to depend upon a careful balance of aperture and magnification.

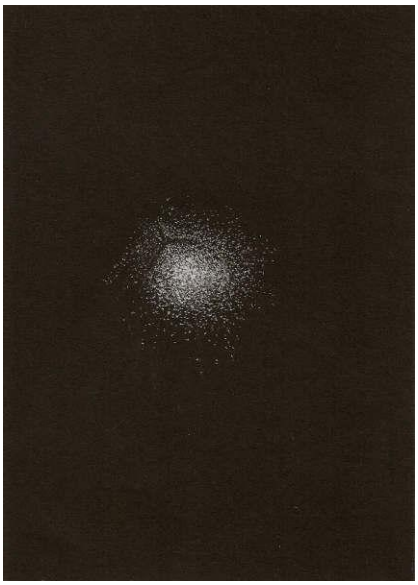
Both John Bortle and Dennis di Cicco have commented on the importance of magnification in their writings. Most observers note that they appear best at a magnification of about 200X.

Observations/Drawings/Photos

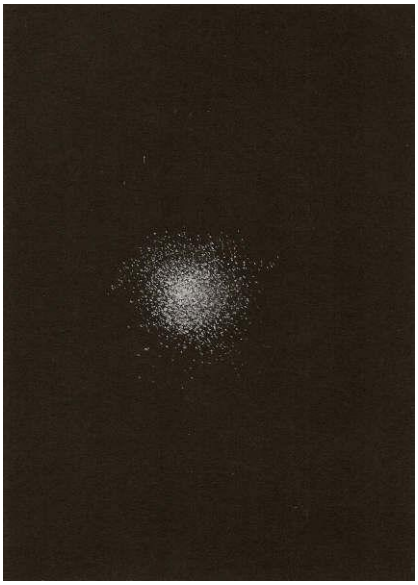
Roger Ivester: Observer from North Carolina

I saw the propeller for the first time using a 12-inch reflector at 196X. I found it very subtle and averted vision considerably improved the definition of the three dark lanes. My location was at a dark site in the South Mountains of North Carolina, only 20 minutes N of Boiling Springs, N.C.

The conditions were very good with temperatures near 50° and very low humidity. The naked-eye limiting magnitude was 6.5 at the zenith. I was with friend and fellow observer Steve Davis, who also saw the propeller for the first time. My sketch of the propeller using the 12-inch clearly shows all three of the dark lanes. Both of us very surprised that we had never seen the propeller before.



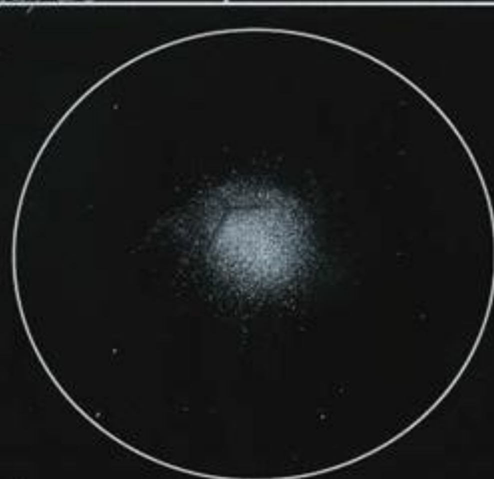
I also observed M-13 and the propeller from my backyard within the city limits of Boiling Springs, N.C. using my 10-inch reflector at 200X. Warmer temperatures, higher humidity and ambient lighting reduced the naked eye limiting magnitude to a 5 or maybe slightly less, but the stability of the atmosphere and seeing were excellent. I was able to use 266X, obtaining excellent resolution, but no propeller. A magnification of 200X seemed to bring out the dark lanes. Both Bortle and di Cicco had mentioned this in 1980 and 1981 respectively, noting their success with a magnification of near 200X.



I had extreme difficulty seeing the propeller from my backyard. I could only glimpse the two inner lanes using averted vision, and couldn't hold them constantly. I was unable to see the outermost lane that extends out from the cluster. It's of my opinion that if I'd observed from a dark site, I would've been able to see all three of the dark lanes using my 10-inch.

Sketch Observing Log

Name: Rick Ivester	**Object:** M-13 and Propeller
Date:	**Constellation:** Hercules
Time:	**Instrument:** 12-Inch Reflector
Location: South Mountains, N.C.	**Eyepiece:** 7mm Nagler
Conditions: Very Good	**Filter:**



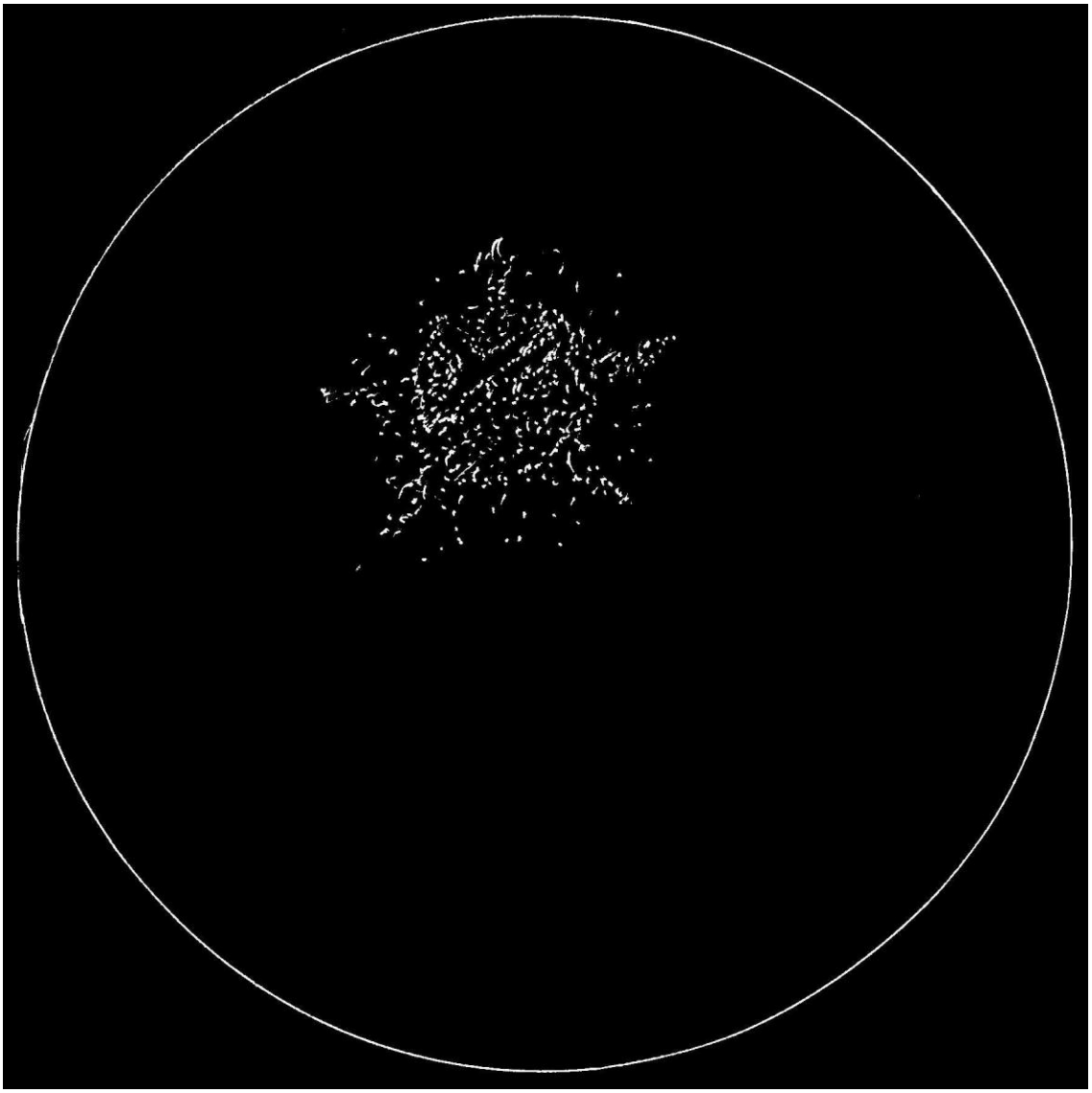
Notes: Seeing: Good Trans: Excellent Magnification: 196X
Fairly Difficult, Averted Vision Required To
See Propeller. Excellent Resolution of Stars.
During Each Scan using Averted Vision, A Different
Dark Lane would Be more Prominate.

Fred Rayworth: Observer from Nevada

I was not able to get out in June, but got a good representation of M-13 in mid May. I used a 16-inch, f/4.5 Dobsonian. My eyepieces were a 26mm (70X), a borrowed 20mm (91X), and a 18mm (101.5X). I observed from Sawmill Trailhead, Lee Canyon, Nevada (7,400 feet).

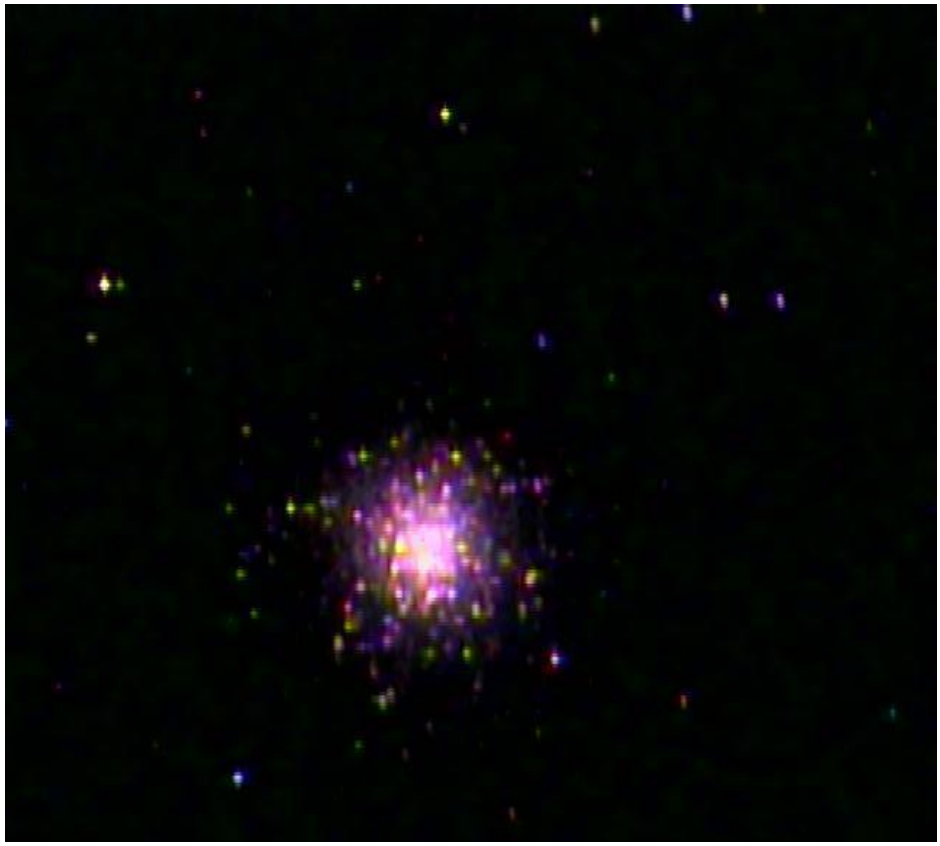
On May 16, 2009 at Sawmill Trailhead, despite the much higher altitude, the sky wasn't very dark and an annoying cold wind hampered my observations by making my eye water constantly as I tried to look through the eyepiece.

I started with 70X, and M-13 was just a fuzz ball with a few individual stars and the spider arms (which are not the same as the propeller). I then tried the 20mm at 91X but saw no significant difference, except the field was flatter. Then I boosted the magnification to 140X with the 26mm and a Barlow, and saw the propeller flashing in and out. When I increased magnification to 203X by using the 18mm and a Barlow, I saw the propeller better, but had trouble keeping it in the field because of the gusty winds, blurring in and out of focus, and my eye watering. Another observer, Ryan Rogers, looked at it and I asked him to describe what he saw. Ryan also saw the propeller. I then knocked the magnification back down to 140X and had no trouble seeing it from then on, though it was still a bit erratic because of the sky conditions. I did a drawing of what I saw at 140X.



Rob Lambert: Observer from Nevada

I observed from Kaibab Lodge, at the entrance to the Grand Canyon. The conditions were not anywhere near perfect. I had to look between some clouds and it was also quite breezy. I couldn't get consecutive image captures because the wind was strong enough to rock the scope with the Mallincam on it. After showing about 20 people some of the night sky wonders earlier in the evening, I was able to view M-13. Unfortunately, since it was at the zenith, I couldn't use the SCT with its Alt/Az mount. At zenith, the optical path with an extension tube and the Mallincam was too long to go between the arms of the scope to point straight up. Instead, I had to use only the 4-inch refractor, but reduced the focal reduction to get a larger image.



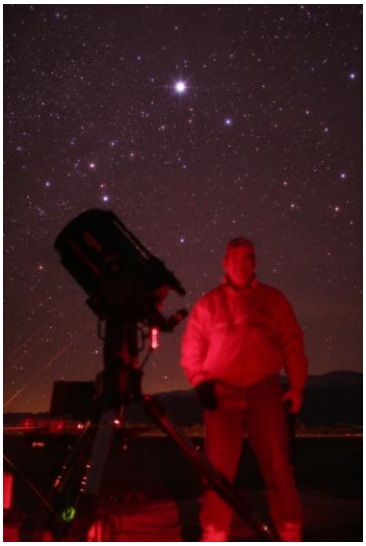
Even with the less than ideal conditions, I was able to see the propeller. The two blades extending into the cluster were obviously more prominent, but the one extending outward was definitely there, just not as long in length as the other two. The core was still somewhat washed out, so the next time, I will turn the gain down even more. I was somewhat embarrassed to send a representative image, since with the wind, the focus was horrible. However, it gives everyone an idea of what I saw on those moments when the wind let up just for a brief moment.

For the first time while observing through the Mallincam, I was able to observe color in the stars not contained in the core. I noted yellow and bluish-purple stars (clearly visible in the accompanying image). One should also notice another dark lane on the lower side of the image, opposite the propeller blades that extend into the core. It reminded me of the "T" that TeleVue uses in their logo. In the image, it looks like a wide bar with a significant bump left of center. There are chains of stars extending from the cluster that suggest M-13 may have had a more spiral structure in its past. Without any supporting research, the image suggests the cluster had a counterclockwise spiral. I was sure it had undergone significant change in its 13-billion year life.

Frank Barrett: Observer from North Carolina

Frank allowed us to present this outstanding photo of M-13 from his web site Celestial Wonders celestialwonders.com/. It clearly shows the propeller. Also note the multi-colored stars. The image was taken with an 80mm (3-inch) ED, 600mm f/7.5 refractor, with an SBIG ST-2000XCM camera and a Losmandy G11 mount, from Gastonia, North Carolina.

Jim Gianoulakis (see *Jim Gianoulakis.jpg*): Observer from Nevada

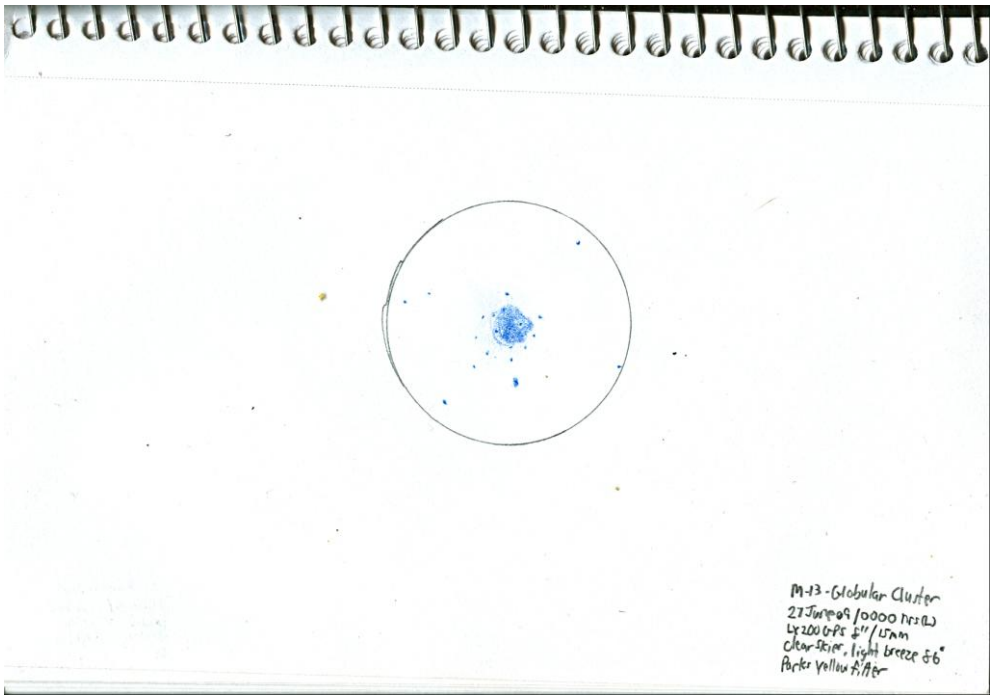


I was in Bryce Canyon National Park, as a volunteer for the astronomy outreach program for the last two weeks, with little access to communication. It was unseasonably warm and cloudy, but they had a few decent nights. The skies were magnificent. It is said the skies there were mag 7.4, and it is striking compared to the light dome of Las Vegas. I shot an image of M-13 between the clouds. I noted that now that I know what to look for, I can't help but see the propeller.

Jason Snyder: Observer from Nevada

M-13 was at my zenith and the seeing was fair, with considerable light dome from N. Las Vegas, NV up to about 45º. I used an 8-inch SCT with a 15 mm eyepiece. There was a light breeze and the temp was around 86º. I tried using a blue filter to bring out some detail, but switched to a yellow one instead. I couldn't pick out the dark lanes or the "propeller". I had to use averted vision to see any stars available because of the light from the city.

I made a drawing of what M-13 looked like with the few stars I could see at 00:00 hrs.



Later in the evening, approx. 01:39 hrs. I took the following pictures. The first one was taken with a Rebel EOS, XT bulb setting, 20 sec. exposure through Lumicon GEG, through the 8-inch SCT.

The second one was taken with a Cannon, Rebel EOS, XT. Exposure was a 15 sec. bulb through a Lumicon GEG with the same scope. The seeing was better, but I moved onto other targets for a brief session.