MONTHLY OBSERVER'S CHALLENGE

Las Vegas Astronomical Society

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&

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FEBRUARY 2018

M41 – Open Cluster in Canis Major

"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 that's interested, and if you're able to contribute notes, and/or drawings, we'll be happy to include them in our monthly summary. We also accept digital imaging. 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 the astronomer 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 Observers Challenge. We're not excluding those with an interest in astrophotography, either. Your 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.

M41 – Open Cluster in Canis Major

Messier 41 (M41), also known as NGC-2287 and Collinder 118, is a large, loose open cluster in Canis Major. It lies almost 4° due south of Sirius and is easy to find.

It was discovered by Giovanni Batista Hodierna sometime before 1654. It's entirely possible that Aristotle even knew about it as far back as 325 BC, because it's been referenced in his writings, according to some experts.

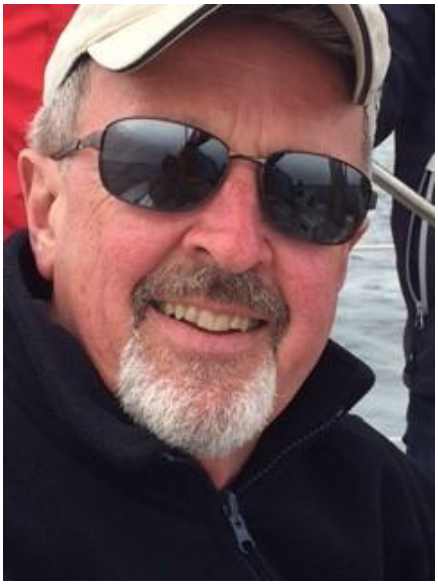
The cluster is about 25-26 light-years across and appears about the size of a full moon. With around 100 total stars of widely varying magnitudes, it contains some that include red giants. One is near the center, the red Espin star (HD49091). There are also some white dwarfs and a few yellows, among others. The cluster is also full of asterisms and certain apertures help

bring them out. The more modest apertures seem to work better, as larger apertures tend to make them blend in more and they become less prominent.

The cluster is fairly bright at mag. 4.3, and that makes it an easy target for even binoculars. This is a great challenge object for any scope!

Observations/Drawings/Photos

John Bishop: Observer from Massachusetts



On February 12 and 18, 2018, I observed M41 from the ATMoB Clubhouse in Westford, Massachusetts. I used an 8.25-inch reflector at 48X, 100X, and 192X.

The sky was clear. Seeing and transparency were both good. Contrast at the eyepiece was also good, especially considering M41's relatively low position in our southern sky, which has some glow at the horizon from artificial lighting,

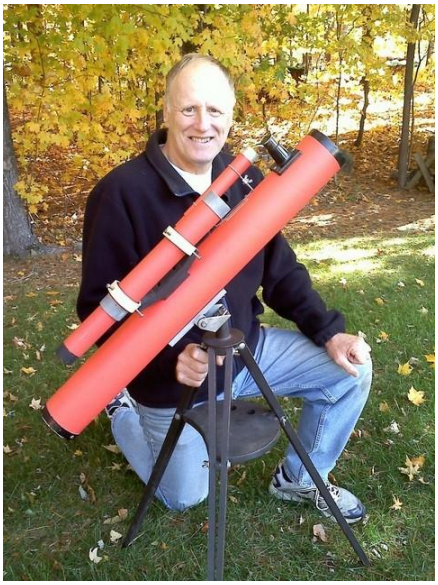
The cluster was impressive at 48X and 100X, with the entire object framed nicely within the field of view. It was a bit sparse, especially when compared to more condensed clusters. The brighter stars shined steadily, and contrasted sharply against a dark background. The stars appeared as diamonds on black velvet. It was a beautiful sight indeed.

When observing this cluster, my eyes kept trying to find a pattern. It may be that the sparse arrangement of the stars, with some of them lined up in small chains, invited this. However, I didn't, over two nights, come up with an image or pattern that satisfied my mind's eye.

I saw two reddish stars, the Espin star, HD49091, and another, HD49126, near the central area of the cluster. I thought the color of the two was faintly red, but with continued observation, the Espin star seemed to have almost a yellowish-orange color.

Conditions on February 18th were less favorable. Intermittent thin, hazy clouds were present for much of the evening, but eventually, they cleared. Observations of the cluster were consistent with those on February 12th.

Glenn Chaple: Observer from Massachusetts



M41 is a nice binocular sight, visible in the same field with Sirius in my 10X50 binoculars. It was nicely resolved in my 15X70's.

One of M41's more interesting features is a ruddy star located near the center. I learned about it in William Tyler Olcott's *Field Book Of The Skies* – my primary guide during my early days as a backyard astronomer in the mid 1960s and early 1970s. My earliest attempts with a 3-inch f/10 reflector proved disappointing. I expected a ruby red star to dominate the eyepiece field. No such luck, and it wasn't until 1977 that I saw what seemed to be a reddish star near the heart of M41. I wasn't positive this was the star Olcott referred to, and wrote, "Bright star in center seems reddish, but this may be a result of prior knowledge." I re-observed the cluster with a 4.5-inch f/8 reflector in 2004 and labeled the red star on a sketch I made (see below). Early this month, I viewed it again with a 10-inch f/5 reflector and a magnification of 80X. The "red" star appeared more orange in hue.

Magnification 36 X

Field Diameter 1.4 °

TELESCOPE USED 4.5-inch f/7.9 reflector

EYEPIECE USED 25 mm

NOTES: Coarse cluster. Bright star near center seems reddish
visible in 5x26mm finder, easily located S. of Sirius

Richard Nugent: Observer from Massachusetts

Here we were, at the end of the month, and despite the 88% moon, the sky was finally clear with excellent transparency and reasonable seeing. I took the opportunity to observe M41 and its ruddy Espin star. Using my 20-inch Dobsonian with a 21mm eyepiece (120X/0.83° TFOV), many faint stars were visible along with a number of faint, delicate star streams. Several of the clusters brightest stars showed color. The Espin star (HD49091, mag. 6.7) was a beautiful orange color. Also orange was HD49068 (mag. 7.4). I noted a white-yellow coloration in the star HD49126 (mag. 7.4). For reference, nearby 12 CMa is a blue-white star shining at mag. 6.1. The issue I had with using the 20-inch scope was that the cluster filled the field of view and, although there were lots of stars, it didn't look like a cluster. I prefer it when star clusters are surrounded by relatively empty sky making them look sort of isolated and more cluster-like. What's a poor astronomer to do? Use another optical system.

I set up two smaller scopes and used them in their richest field configuration. Remember, every telescope has a richest field configuration. This is achieved by using the lowest power, widest field eyepiece that offers an exit pupil which matches your eye's entrance pupil. Here's a refresher…

Exit pupil=eyepiece fl/telescope's f-ratio.

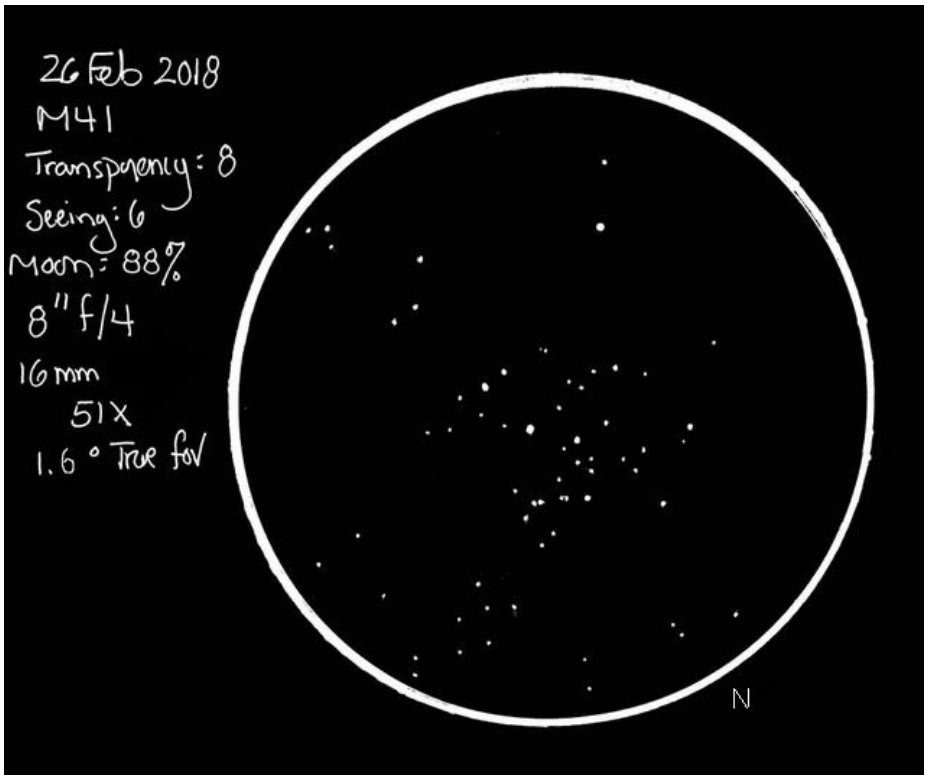
True field of view=eyepiece apparent field of view/magnification.

You should already know how to calculate magnification.

As amateur astronomers grow older, our eyes have entrance pupils around 4-5mm, but everyone's different. Ask your ophthalmologist to measure your eyes at your next visit.

For my 8-inch f/4 reflector, I chose a 16mm eyepiece that gives about 50X with a 1.6° true field. The other scope I set up was my 10-inch f/4.7 reflector. Here, I used a 22mm eyepiece to give 54X with a nearly 1.3° true field. While I couldn't see as many faint stars, now, the cluster looked like a cluster. In both scopes, the Espin star still looked orange, although I thought the colors were somewhat muted. Although HD49068 showed a very pale orange color, I saw no color in HD49126. I couldn't make out any of the star streams in the smaller scopes. I've included an eyepiece interpretation of the cluster through the 8-inch scope. Note: Clusters are really hard to draw! I'm new at this sketching business, so don't be too harsh, okay? In my haste, I incorrectly gave the field of view as 1.3° when, again, it was 1.6°. Also, I forgot to indicate north. It's toward the drawing's 5 o'clock position. (**NOTE:** Both corrected by the editor).

This cluster was a joy to observe. It's easy to find and visible in any telescope and most binoculars. I had no trouble seeing it using a pair of 8X42 binoculars, and it was quite apparent in my 12.5X80 finder.



Rob Lambert: Observer from Alabama

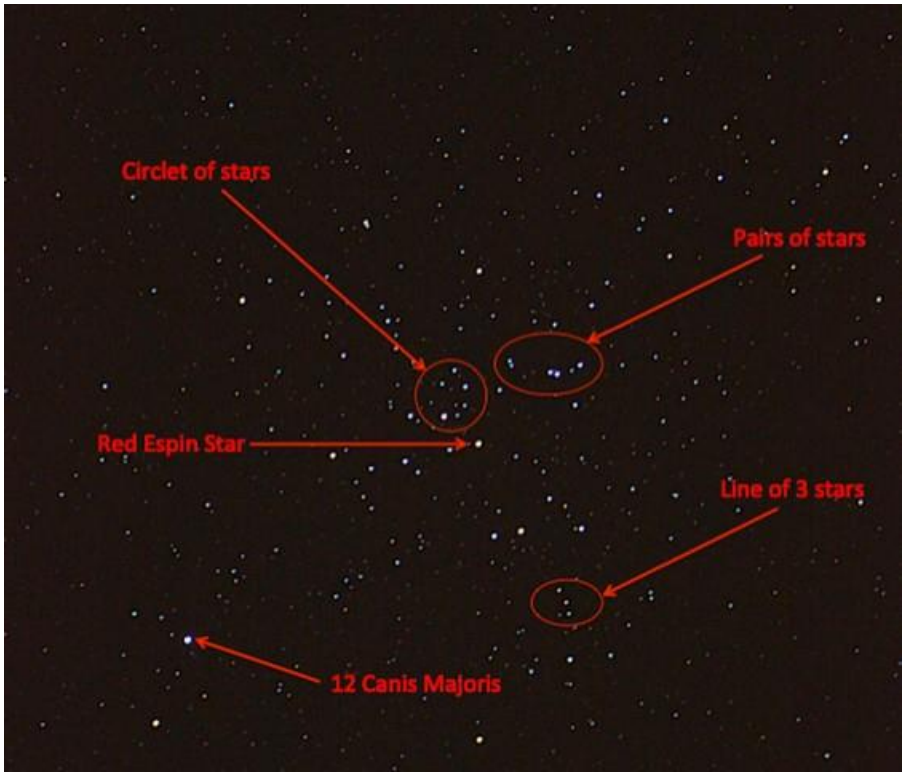
My photo of M41 was captured during a clear evening in late January, 2018. I obtained it shortly after the January Challenge object, hoping that I'd have another chance to observe it in February. There haven't been any clear, moonless nights here in Alabama to attempt another capture in February.

The image has not had any post-processing. This is as close to what I saw at the eyepiece as I could possibly get without anything extra. This is a 30-second exposure at ISO 3,200 captured with a Canon T3i through an ED127 (5-inch) refractor, riding on an unguided Orion Atlas EQ-G mount. This setup resulted in a magnification of only 20X.

I've tried to orient my image to match the most common orientation seen in magazines and other reports. The class K3, mag. 6.9, red Espin star is located almost directly in the center. A number of yellow stars are also visible throughout. It doesn't show some of the dimmer stars of the object that are visible in longer exposures, so the cluster doesn't look as dense as seen in other images.

There's an interesting array of three sets of paired stars just above and right of the Espin star. If you move down and right from the Espin to and thru the somewhat prominent yellow star, there's also a line of three stars that remind me of Orion's Belt. There's a small circlet of stars just above and left of the Espin. A brighter class B5 white star (12 Canis Majoris – mag. 6.1) is prominent in the lower left quadrant of the image (see annotated image below).

M41, easily located below Sirius in Canis Major, has always been one of my favorite open clusters to observe through small scopes or binoculars.


Circlet of stars
Pairs of stars
Red Espin Star
Line of 3 stars
12 Canis Majoris

Keith Caceres: Observer from Nevada

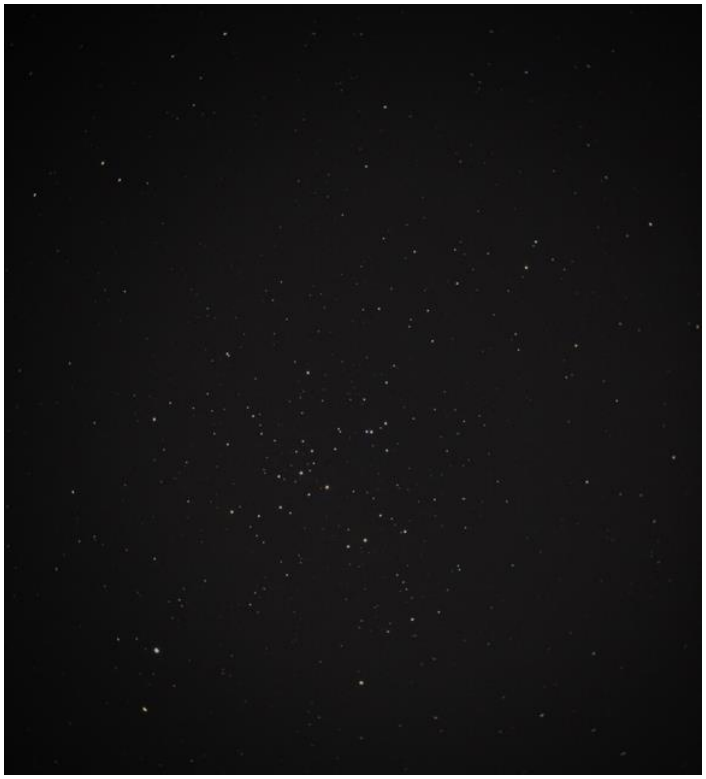
I observed M41, the open star cluster, on the evening of February 24, 2018 during our Astronomy In The Park event at Lake Mead's Boulder Beach. Conditions were less than ideal, with quite a few banks of slowly passing clouds. Transparency was fair to poor, with a lot of moisture in the air, and light pollution from Las Vegas reflecting off the clouds.

I was able to observe the cluster during a period late in the event when the clouds had drifted away from the Canis Major/Orion part of the sky. I made both a photographic and visual observation. The first with my 8-inch SCT, f/6.3 and focal reducer, and a Canon 70D camera (see photo). The second was with my 80mm (3-inch) APO refractor riding piggyback on my SCT, using a 30mm 82° field eyepiece (16X). It was my "first light" with this new eyepiece.

The cluster was fairly bright, with several lines and curves formed by chains of stars. It covered a field of view roughly the same size as the full moon (approx. 1/2°). I was able to see the whole cluster in both observations. Several red super-giants were readily visible in both as well. My photo covers a field of view of 1.02°X1.13°, with a pixel scale of 1.01 arc-sec/pixel, according to plate-solving by astrometry.net.

Sources indicate the cluster is composed of about 100 stars, approximately 2,300 light-years away, spread over an area of about 25 light-years. The cluster's age is estimated to be around 200 million years old. It's located in the constellation Canis Major, almost exactly 4° south of Sirius (the brightest star in the sky). Both of my sources (Sky Safari and a Wikipedia source at http://www.messier.seds.org/more/m041_ari.html) indicate that Aristotle may have recorded it as early as 325 BC.

The cluster is known for a backward question mark shape formed by its stars, which I didn't notice at the time. However, it's easily visible in my photograph at center-left.



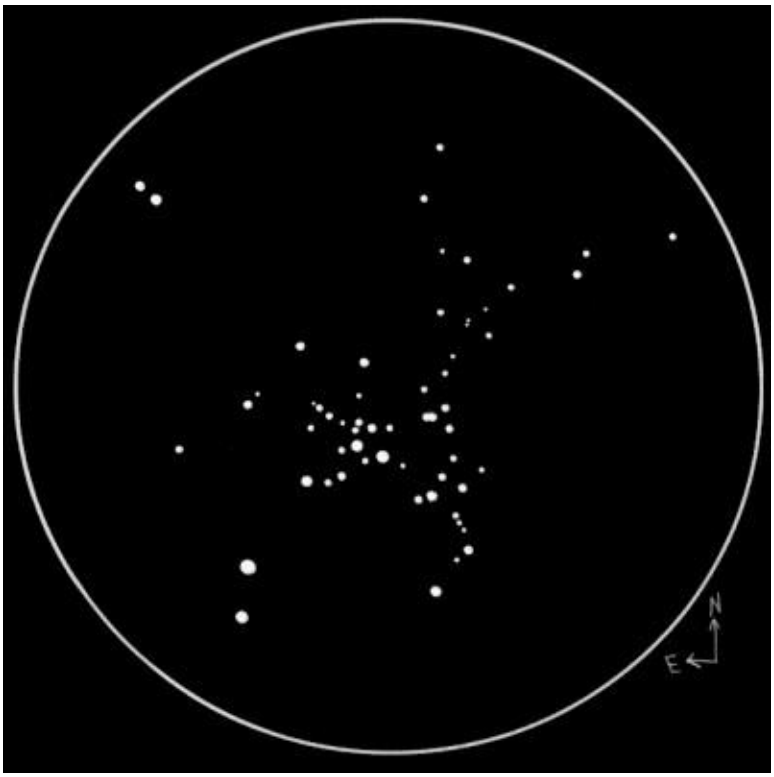
Joseph Rothchild: Observer from Massachusetts

I observed open cluster, M41 on February 14, 2018 from suburban skies in Newton, Mass. There was a light dome in the south, but I was able to observe it with a 10-inch reflector at 42X and 82X. I also observed it with a 6-inch reflector at 28X and 54X. The Espin star was clearly red in both instruments, but "popped" in with the 10-inch. I didn't note the star chains, mentioned by other observers. The most pleasing magnifications were 42X in the 10-inch and 54X in the 6-inch. The cluster was well framed in the field of view. In the 10-inch, I counted 33 stars at 42X and 35 stars at 35X. In the 6-inch, I counted 31 stars at 54X, which was pretty comparable to the 10-inch. Overall, a very pleasing cluster in fair skies.

Jaakko Saloranta: Observer from Finland

From a latitude of 28° north and dark skies, M41 is easily visible with the naked eye as an even-brightness glow south of Sirius with a mag. 6 star (12 Canis Majoris) at its southern tip. Despite M41's high brightness and visibility with the naked eye, it remained invisible even to my 8X30 binoculars from my latitude of 60° north. The transparency was far from good on a cold winter night with a temperature around -10°F.

My sketch represents the view using a 4.5-inch Newtonian @ 40X under dark, but moonlit skies. Even under such poor conditions, the cluster was a fine sight at low magnification. Renowned deep sky observer Stephen O'Meara saw this cluster as a fruit bat, but I always manage to see this as something more familiar - a reindeer. This is one of the best open clusters in the winter sky, with well over 100 stars visible within 30' down to mag. 13.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Mike McCabe: Observer from Massachusetts

Even though I've only been a part of the LVAS Observer's Challenge series for a little more than a year, it still felt special to participate in the February, 2018 challenge, in the month which represented 10 full consecutive years and counting of monthly challenges. Appropriately, the spectacular open cluster Messier 41 was chosen for the 10th anniversary object, and it could be said that it was a little like celebrating the event with fireworks!

Like many of us, I've seen M41 multiple times over the years, and it never fails to impress. It's big, bright, well-populated and easy to find. What could be better? M41 is easily visible with virtually any optical instrument, from the smallest binoculars right on up to the largest telescopes. Interestingly, bigger isn't necessarily better with this object. It contains enough bright components that even small instruments show a large number of stars smattered about the field of view, and even some of the more deeply colored stars begin to hint at their true hue in small telescopes.

For the task of sketching M41 for the challenge, I chose to use a medium-sized refractor on a German equatorial mount. There are a lot of stars in M41, and I wanted to be able to sit comfortably at the eyepiece without fussing with scope positioning while I attempted to capture the scene. I also got lucky in the sense that on the night I chose to sketch it, the sky was exceptionally transparent, and had half decent seeing. The evening of February 5th, 2018 was a good one indeed.

The view through the 5-inch refractor was nothing short of stunning. About 60-70 easily-visible stars populated the field of view, which at 47X and about a 1.25° TFOV, really captivated the magic of this truly special object. There were also many, many much dimmer stars in the view, and the mottled background hinted at countless background stars off in the distance. In

addition to the popularly mentioned Espin star, there were many other stars of varying degrees of color. The view could only be described as “beautiful”.

My time at the eyepiece while sketching this object was exceptionally enjoyable, and of course I often drop in on M41 whenever I’m out exploring the sky at this time of year. During this month alone, I’ve had the chance to see this remarkable cluster several times in a variety of scopes and binoculars, and I have to agree that it was a great choice for this occasion.

Happy 10th Anniversary, LVAS Observer’s Challenge!

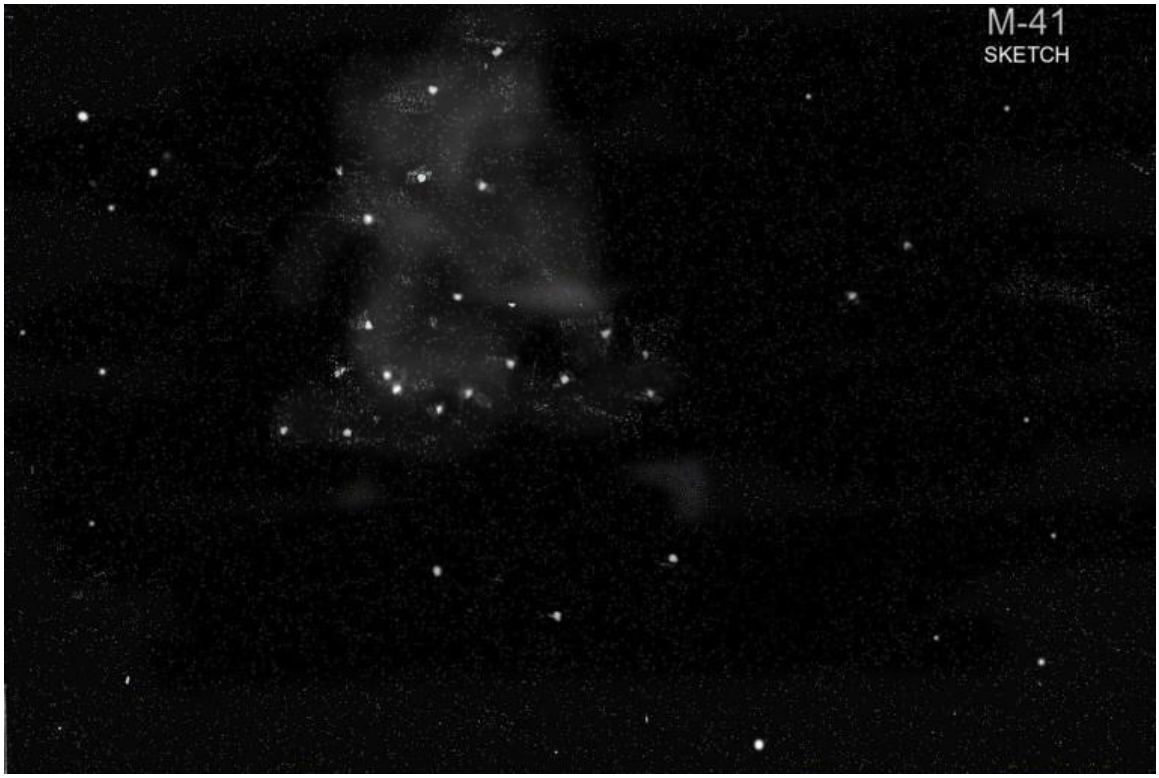
Craig Sandler: Observer from Massachusetts

I observed M41 on February 18, 2018 from Petersham, MA using an 8-inch F/10 SCT at 80X. Seeing was poor to fair and transparency was poor to fair. NELM was 6.

I was a busy person this night! After days of clear skies forecast, I got to my site only to find things overcast and seemingly not getting any better. However, the forecast was so definite I decided to wait things out, and eventually ended up dodging clouds and seeing what I could see in the clear patches, which wasn't much. M 41, which I seldom let go without a once-over during winter sessions, contained perhaps 15 stars (the Epsin star recognizably among them) on first view at say…7 pm. Conditions did indeed improve, though they never reached the promised perfection. At about 9:30 pm, the same cluster contained 60 stars. A frustrating, but ultimately rewarding, exercise.

John Lourdes Pierce: Observer from Nevada

I observed the open star cluster, M-41, some time back during an observing session from a dark sky location. It stood out from the star field background and I seem to remember it appeared to have a little luminously to it, though not too obvious. I was using a 10-inch reflector with 90X magnification.



Chris Elledge: Observer from Massachusetts

On February 13, 2017 @8:00pm, EST, I used a 10-inch f/5 reflector to observe M41 from my house in Arlington, MA. Sky conditions were, Bortle Scale 8, NELM 4.0, transparency fair, and seeing was fair.

I located the cluster starting from Sirius, since the high light pollution near my home made picking out the fainter stars nearby difficult. From Sirius, I went through Nu3 and Nu2 Canis Majoris. From Nu2, I went through a pair of mag. 7 stars HD48314 and HD48203 toward M41.

At 35X (35mm, 1.9°FOV), the cluster filled up the middle third of the view. I counted 33 stars easily visible in the cluster. There was an arc of stars on the northern side, with the inside of the arc facing south. There was a line of 3 stars on the south side offset toward the west. A line of 5 stars with another pair of stars to the north of it sat in a parallel line. The western end of the line of 5 stars was redder. The brightest two stars in the middle sat as a pair at mag. 7. One was definitely a redder color (HD49091), with the other sitting to its northeast being bluer (HD49126).

At 50X (25mm, 1.4° FOV), it still didn't fill the eyepiece. HD49091 still looked redder than the others, but not as noticeably as in the 35mm eyepiece. There were at least 50 stars at mag. 10 and brighter. The line of 5 stars had a fainter star just to the southwest of the middle star in the line. The orientation that I was viewing placed the northern arc on the lower right of my view, which made it look like there was a stream of stars spilling out of the west side of the arc down to another set of 5 stars in a pool below it in the northwest. It was composed of a line of 3 stars, reaching toward a square of 4 with a 5th offset from the middle to the south.

At 127X (10mm, 0.6° FOV), the object completely filled the view. The red in HD49091 was just barely apparent. The patterns that I observed at 25mm were no longer as easy to pick out with all the stars spread further apart. It was more like I was just looking into a field of stars than looking at a cluster. Fifteen of the stars stood out as distinctly brighter than the rest, at mags. 7 and 8. All throughout the cluster, little arcs of faint stars caught my attention.

At 270X (4.7mm, 0.3° FOV), HD49091 still had a redder color than nearby HD49126, but looking at it on its own, I'd never have called it red. Overall, 127X provided a much better view.

Dr. James Dire: Observer From Hawaii

M41 is a beautiful galactic star cluster located 4° south of the bright star Sirius. It can be seen naked eye from a dark site with an easy mag. 4.5, and is 39 arcminutes in diameter. It lies 2,350 light-years away.

Aristotle noted M41 in 325BC as being a cloudy patch in the sky. The cluster was first cataloged by the Italian astronomer Giovanni Batista Hodierna in 1654, and then John Flamsteed in 1702. Charles Messier added it to his catalog in 1765.

M41 has about 100 stars. The brightest is a mag. 6.9 red giant star near the apparent center of the cluster, cataloged as HD49091. This K3 star has the brightness of 700 suns.

The cluster is estimated to be 190 to 240 million years old and has a chemical composition similar to the sun.

My image of M41 was taken with a 102mm (4-inch) f/7.9 refractor using a 0.8X focal reducer field flattener with an SBIG ST-2000XCM CCD camera. The exposure was 30 minutes. North is up, and east to the left.

The brightest star in the image is near the bottom edge, left of center. That star is 12 Canis Majoris, or HK Canis Majoris. HK is a mag. 6 blue giant star with a surface temperature of 18,000K. HK is only half the distance of M41 and thus is not a member of the cluster. The next brightest star in the image is HD49091 (the Espin star), the red giant near the center of the cluster.

Gus Johnson: Observer from Maryland

I observed M41, which was easy to locate, 4° south of Sirius. It was relatively sparse, but bright and I easily saw it with 7X30 binoculars.

In January, 1970, I observed it with a 6-inch reflector. The Espin star appeared orange.

Francisco Silva: Observer from Nevada

On February 25, 2018, at 4:20 UTC, I observed M41 using a 5.6-inch reflector at 67X. The field was 0.8°. The temp was 44°, humidity 20%, wind 1-3mph and the moon was waxing gibbous. Transparency was 5 out of 5 and seeing was 1 out of 5.

This open cluster was very easy to locate using a magnification of 40X. I was able to increase power to 67X, and was still able to nicely frame the entire cluster using a 15mm EP. This allowed me to enjoy this object a lot! What caught my attention was the variety of different category of stars and the variation of colors. One of the more interesting features of this cluster was the red star near the center, fairly bright at mag. 6.9. This star is known as the Espin star.

Jay and Liz Thompson: LVAS members and observers from Nevada

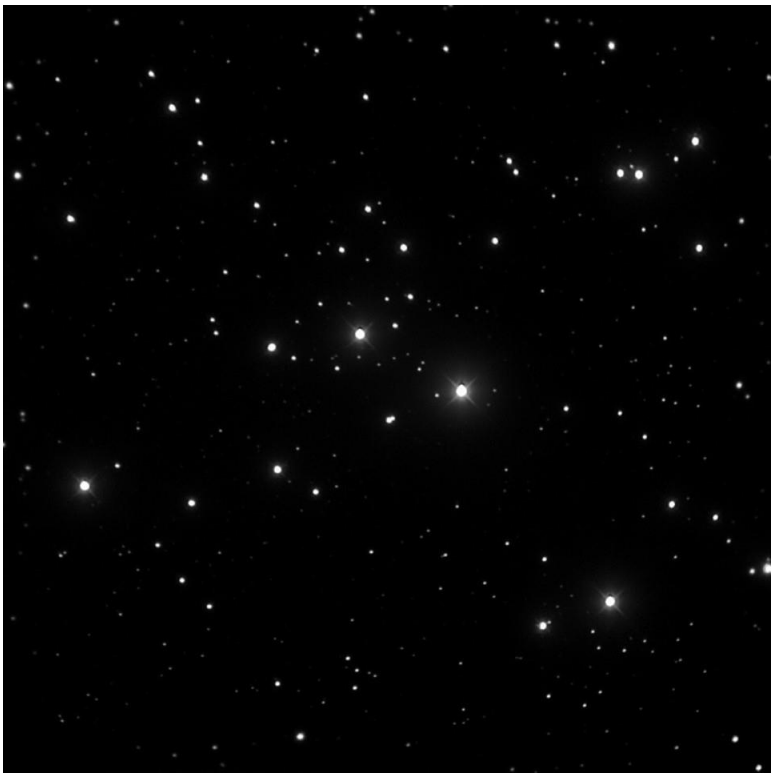
We observed M41 from several locations with a variety of telescopes. It showed up well, even from our backyard. Due to the large size, our favorite views were with small telescopes (60mm (2.4-inch) and 80mm (3-inch) refractors, as well as a 3-inch f/4 Newtonian at around 12X magnification.

At this low magnification (12X), with a moderately wide-field eyepiece, we saw both M41 and brilliant Sirius in the same field of view, with M41 resolved nicely. The attached image shows Sirius at the top and M41 at the bottom.

Mario Motta: Observer from Massachusetts

Done with a 32-inch reflector.

I have an image from the 32-inch, but the field of view is too narrow and it only shows the inner section. So, I took a second image with my 6-inch refractor. They're stacked, a few images from 10 sec up to 20 sec.



32-inch inner area.

6-inch wide-field shot.

Roger Ivester: LVAS Observer from North Carolina

Messier 41 (NGC-2287), at mag. 4.5, is visible without optical aid. I often enjoy viewing this cluster with a pair of 7X21 mini-binoculars. It's easily located at about 4° south of Sirius, and NW of the mag. 6.0 star, 12 Canis Majoris.

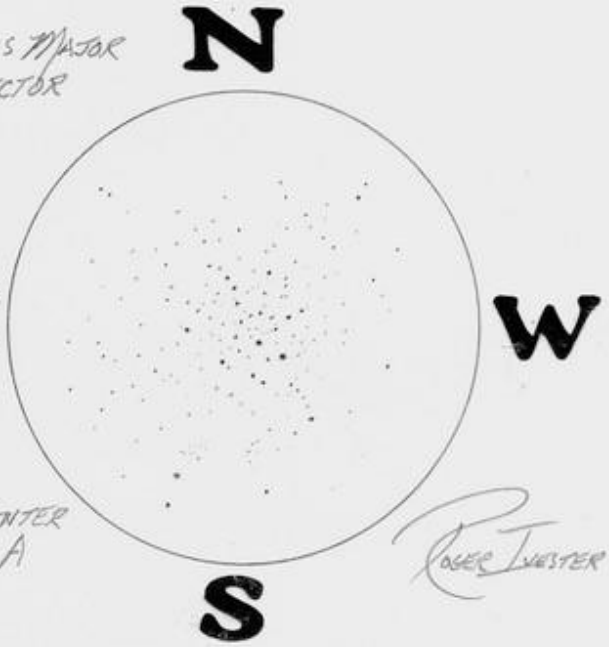
It was a beautiful, but sparse cluster, with a very irregular shape, with several small chains of stars. The most noticeable star chains were on the SW and NE.

When using a 6-inch reflector, I counted ~60-70 stars. A small circlet of stars enveloped the central region.

M41 contains the famous red star, known as the Espin star (HD49091), at mag. 6.9 and in the K3 spectrum. The star was named after Rev. T.E. Espin (1858-1934). I normally see this star as deep-orange in color.

Messier 41 - Open Cluster - Canis Major
Telescope: 6-Inch f/6 Reflector
Eyepiece: 20mm Erfle
Magnification: 46x
True Field Of View: 1.3°

Beautiful, But Sparse Cluster, Very Irregular Shape. Can Count 60-70 Stars. A Small Circlet Of Stars Enveloping The Central Region. The Famous Espin Star Located Near The Center On The SW Edge Appears As A Deep Orange.



Roger Ivester

Messier 41 - Open Cluster - Canis Major
Telescope: 6-Inch f/6 Reflector
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Magnification: 46x
True Field Of View: 1.3°

Beautiful, But Sparse Cluster, Very Irregular Shape. Can Count 60-70 Stars. A Small Circlet Of Stars Enveloping The Central Region. The Famous Espin Star Located Near The Center On The SW Edge Appears As A Deep Orange.

Roger Ivester

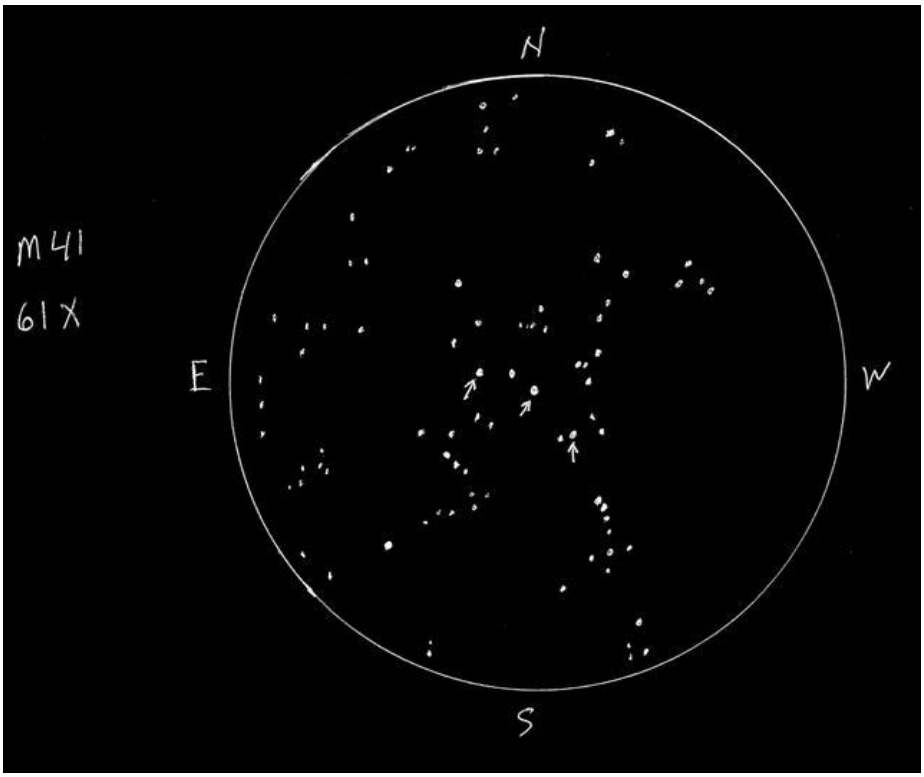
Fred Rayworth: LVAS AL Coordinator and Observer from Nevada

I've logged M41 eleven times according to my database and have observed it, I don't know how many more times, without noting anything. The first time I logged it was in December 1984 in Spain, using my home-built 8-inch f/9.44 reflector. Even then, I noted "the huge orange star."

For this Challenge, I got a fresh observation from my usual dark site at the "undisclosed location" on the north shore road at Lake Mead, Nevada on February 17, 2018. It was clear, cool and calm. It pretty much stayed that way except right around 22:00, when gusty breezes picked up a bit. They weren't consistent, but enough to knock everything around for a moment, then die off for a few minutes, then pick up again. Seeing was nothing to write home about, but the transparency was pretty good. There was a band of clouds to the SSE, but they never crept up into view above the ridge to the south. I saw them on the way to the site and that's how I know they were in the area. It got immediately cold as soon as the sun went down, but never enough to put my hat on. When I left, the truck thermometer still said 50°.

The cluster was a nice, but sparse open. Maybe 40-50 stars total stood out, of very uneven mags, with hints of haze in the background indicating even more. At the time, I wasn't sure if they were actual members or just background stars. The cluster was full of all kinds of asterisms from the brighter members. There was the bright red Espin star, roughly in the middle, the center of a trio that formed a flattened L shape. The other two on each end appeared red to me, as well. I saw mostly blue-white-gray stars with a hint of yellow (maybe) here and there. The best view was at 61X. I tried 102X, but it didn't look as good.

In the drawing, the arrows point to the three reddish stars with the Espin being the middle one.


M41
61X
N
E
W
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