

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

AUGUST 2015

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.

M16 (NGC-6611) Open Cluster/Diffuse Nebula (Eagle Nebula) in Serpens

Messier 16 is comprised of the star cluster NGC-6611, also known as CR-375 or Collinder 375, and the nebulosity known as IC-4703. It's known by the popular name the Eagle Nebula (because of the shape seen in some photos and large backyard telescopes) and is also sometimes known as The Star Queen Nebula or The Spire. It was originally discovered by Jean-Philippe de Cheseaux in 1745-46. The nebula contains the Pillars Of Creation, made famous from those Hubble Space Telescope images.

The cluster part shines at a relatively bright mag. 6.0 while the nebulosity, being a diffuse emission nebula, is quite a bit dimmer and does not have a listed magnitude. It is about 7,000 light-years away. The cluster is an easy object for even binoculars. However, the nebulosity can be tricky. While it has been seen with apertures as small as 2-inches, it usually takes 8-inches and larger to get a hint of it. It all depends on sky conditions, transparency being the key. All-in-all, a great object to study.

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

Gary Ahlers: LVAS Treasure and Member From Pahrump, Nevada



The Eagle Nebula, also known as M16, is a large, diffuse region of HII gas which, heated by some 460 class O stars has formed an emission nebula. There are several areas of active star forming. These class O stars are extremely massive and hot. They will last only a short few million years before exploding. It is home to several famous formations – Pillars of Creation and Star Queen Nebula. If you want to observe this beauty you'd better hurry, there is strong evidence that there has been a recent Super Nova that will blow away most of the nebula's interior, so you only have maybe a thousand years before it's gone!

At mag. 6.5, M16 covers an area of 7 arc-mins and is 7000 light-years distant. It's only around 5.5 million years old. I find the mag. designation a bit deceiving. While the star cluster is certainly bright, the diffuse gas emission nebula is much dimmer and is easily washed out by light pollution and moon glow. The

photo is a stack of 25 frames at 40 sec exposure. No filters, darks etc. Touched up in Photoshop. Optic train was a 10-inch SCT at F/5. The camera was a Mallincom 418XT.



Gary Bruno: LVAS Member from Las Vegas, Nevada



M16, the Eagle nebula came in pretty well. I could see the four stars that make up one part of one wing and three stars make up the other part of the other wing. The two legs and feet were kind of pointing off to one side, the head was tilted the opposite direction of the feet, the eyes were very, very bright.

I forgot to mention that I was able to see the beak of the eagle also, and as it moves further south west as the month goes on I'll be able to see the beak better, at least I was able to see it better last year.

Keith Caceres: LVAS Member from Las Vegas, Nevada



I observed Messier 16 on the evenings of July 21, 2015 (right after our Camp Lotza Fun star party -- the same night as my July NGC-6503 submission); and again during the Camp Potosi Pines star party that Julian Schull organized on August 3, 2015. I've attached the August 3rd image capture because it's the better of the two.

I used my 8-inch SCT and MallinCam Jr. Pro to obtain the image before the Moon rose for the evening. The scope was focal-reduced to around an f/3 focal-ratio (estimated). It's a single unprocessed capture with an integration time of about 30 seconds. The plate solve of my image from astrometry.net

indicates my field of view is 43.5 X 32.6 arc minutes (0.73 X 0.54°).

The object is a large cluster and emission nebula with very intense star creation at its center. Looking at its bright center, I can see various gaseous structures and filaments, including the outlines of the three "Pillars of Creation" (oriented diagonally with their tops pointing roughly toward the upper-left corner of the image).

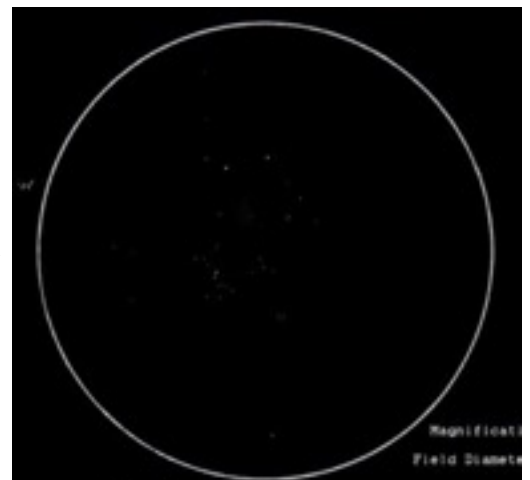


Glenn Chaple: LVAS Friend and Author from Massachusetts



On 19 Sep, 2012, from 88 Turnpike Road in Townshend, Md, I used a 4.5-inch f/7.9 reflector at 75X to observe M16. The seeing was 6/10 and transparency was 5/6.

I found it with a short star hop from Gamma Scutii. The cluster appears to be bathed in a faint nebulosity. The cluster is dominated by a double star.



James Dire: LVAS Friend from Hawaii



M16 is a bright star-forming nebula located in the constellation Serpens Cauda. Enough stars have formed out of the nebula's gases to create a young open star cluster. The star cluster is known as NGC-6611 while the nebula is cataloged as IC-4703. IC-4703 is commonly known as The Eagle Nebula and less commonly known as the Star Queen Nebula.

M16 is an easy spy through binoculars. It lies midway between the stars Kaus Borealis (the lid star in Sagittarius' teapot asterism, magnitude 2.8) and Eta Serpentis (magnitude 3.2). Using setting circles, M16 is found by going 11.5° north of Kaus Borealis and then 2.5° west. M16 is 2.4° north of M17 and the two can be seen simultaneously in wide field of view optics.

M16's open star cluster was discovered by Jean-Philippe de Cheseaux around 1745-1746. Charles Messier came upon it in 1764. He noted the star cluster was immersed in a faint nebular glow. He was most likely the first astronomer to see the Eagle Nebula, although it was not known as such for many more years. M16's open cluster was added to the New General catalog by John Herschel with no mention of the nebula. E.E. Barnard photographed M16 in 1895. Isaac Roberts photographed it in 1897 and added the nebula to the Index Catalog as IC-4703.

NGC-6611 shines at mag. 6.4 with the brightest star in the cluster, SAO161303, at magnitude 8.2. The star cluster is 6-7 arc minutes in diameter. M16 is an impressive object in 8-inch and larger telescopes where the nebula extends more than 30 arc minutes in size.

The Eagle Nebula is 7000 light-years away in the Sagittarius-Carina spiral arm of the Milky Way Galaxy. This spiral arm is closer to the center of the galaxy than our home planet. The cluster is 15 light-years in diameter. The nebula is 70 light-years at its widest point. The cluster is estimated to be 5.5 million year old. The hottest O-class stars emit high-energy ultraviolet light exciting the atoms in the nebula to radiate visible light.

In July, I viewed the nebula in a 6-inch refractor. The cluster was easily resolved and swirling gray gasses are mixed with dark dust regions. The entire complex was more readily resolved in my 14-inch Dob, although I saw no color.

I took my image of M16 with a 4-inch apochromatic refractor at f/6.3. The exposure was 90 minutes with an SBIG ST-2000XCM single shot color CCD camera. Even with this small aperture, dark dusty pillars of gas are easily seen. These are the types of pillars magnificently imaged and made famous by the Hubble Space Telescope. The red glowing hydrogen gas does take the shape of an eagle. Faint glowing gases extending beyond The Eagle are part of a larger complex, which includes the neighbor M17 nebula.



Jim Gianoulakis: LVAS Observatory Project Leader from Las Vegas, Nevada



The Eagle Nebula, also known as Messier 16, M16, and NGC-6611 is a young open star cluster in the constellation Serpens. The object was originally discovered by Jean-Philippe de Cheseaux in 1745-46. Its name derives from its shape that is thought to resemble an eagle. It contains several active star-forming gas and dust regions, including the famous "Pillars of Creation", photographed by the Hubble Space Telescope. These pillars are visible in the photograph (but not as spectacularly as the Hubble image).

Courtesy Wikipedia.

About the photo. This photo was originally taken in 2010 from my backyard in Las Vegas, Nevada. The camera was an Orion StarShoot



Pro V2 and the optics were an 8-inch Ritchey–Chrétien. The image is a stack of 70 X 120 second exposures. Nebulosity was the camera control program in use. Bias, darks and flats were applied to the image.



Roger Ivester: LVAS Member from North Carolina



I observed M16 in October 1996 from my moderately light-polluted backyard with my 10-inch reflector at 57X and a 1.1° FOV. The transparency was poor and NELM was 5.0.

I counted about 30 mostly faint stars, with a greater concentration on the NNW edge. There was a pair of mag. 8 stars located on the W side. I also spotted a faint and small triangle of mostly equal mag. stars located just outside the nebula on the NNE edge. The nebula was mostly faint. When using averted vision and patience, the nebula made a cross shape, as you can see in the following pencil sketch. I easily saw it with my 8 X 50 finder, appearing as a faint nebulous patch.

My backyard is a poor location to observe this object. Ambient lighting from a couple of unshielded streetlights glare onto my observing site. This object would be best observed from a true dark site, and with the use of an O-III or UHC filter.

I had another opportunity to observe M16 with a 3.5-inch Maksutov-Cassegrain in September 1997 at 52X. I didn't note the observing conditions at the time.

I counted about 15 stars, with a prominent double star located on the western edge. The surrounding nebula was very faint and appeared without a definite shape, encompassing the cluster. There was a faint and small triangle of stars located on N edge.



Gus Johnson: LVAS Friend from Maryland



I observed M16 in June 1979 using an 8-inch reflector @ 85X. The transparency was poor.

I saw a dim nebulosity surrounding an open cluster of approximately 25 stars. The shape of the nebula was mostly irregular, with some areas being brighter or having greater concentration. There was a dark peak of nebulosity toward the NE. A chain of four stars showed on the SW edge, with a fairly bright double star embedded in the nebula.

With a 2.4-inch refractor, I saw a faint glow with a scattering of stars toward the NNW.

Rob Lambert: LVAS President from North Las Vegas, Nevada



M16 has been one of my favorite celestial objects ever since I observed it for the first time back during the Summer of 2005. I remember seeing it through my 10-inch reflector, noting that the open cluster was the more visible aspect of the object. Since that time, I've had the opportunity to see it through various scopes, but none with detail that I'm able to see through by 5-inch Apochromatic Refractor with my Mallincam Video Camera. It's always one of the objects I show guests at our Astronomy in the Park public star parties in the summer. Even though the accompanying image isn't as sharply focused as I would like, the detail visible in this short 15-second single frame image is still awe-inspiring. When you think about stars being in the birth process in the Pillars of Creation here, you have to stop and imagine the forces of creation being at work. The presence of ionized hydrogen, the building block of stars, is obvious in the red light being emitted from the nebula.

It's my understanding that all of the brighter stars in this region of the sky were born out of the cloud of gas and dust seen in this image. One can easily see why this is referred to as the Eagle Nebula. It doesn't take much imagination to see the body of the Eagle starting near the center of the frame and stretching upward to the right. Just below and center of the body are the Eagle's talons, stretched wide open as though they are about to grasp its dinner. Then, the wings above the body, sweep back as the Eagle swoops down toward its target.

The greater concentration of stars is located in front of the Eagle or to the upper right of the central nebula, but there's an obvious dark cloud of dust below and left of the Eagle that provides a contrasting backdrop for the less dense stars in that area of the image. Close inspection reveals tendrils of dust below and stretching downward away from the Eagle.

Catch a glimpse of this incredible celestial sight before mid-October, when it slips out of view until next summer.



Greg McKay: LVAS Member from Las Vegas, Nevada



NOTE: We want to welcome Greg to the Challenge. This is his first input and we look forward to many more.

This is my first time to submit to the observers challenge and I have to admit that I did not actually observe M-16 visually. I was fortunate enough to be up at the LVAS dark sky site on Mount Potosi and have my gear set up to capture a few images between the clouds that were rolling through. I imaged with my trustee little 140mm (5.5-inch) scope that I've had since I purchased it in 1985 for Halley's Comet. It's a great little fast scope, 500mm f3.65. I used my Canon 5D Mark II and the exposure was for 2 minutes at ISO1600. I managed to fire of 10 individual shots but the included image is just a single exposure processed in

Photoshop CC. It's heavily cropped to just the center sweet spot of the image as this fast scope vignettes very badly and also has really bad coma around the edges. The image was taken on August 18, 2015 at 10:52pm local time.



Fred Rayworth: LVAS Vice President and AL Coordinator from Nevada



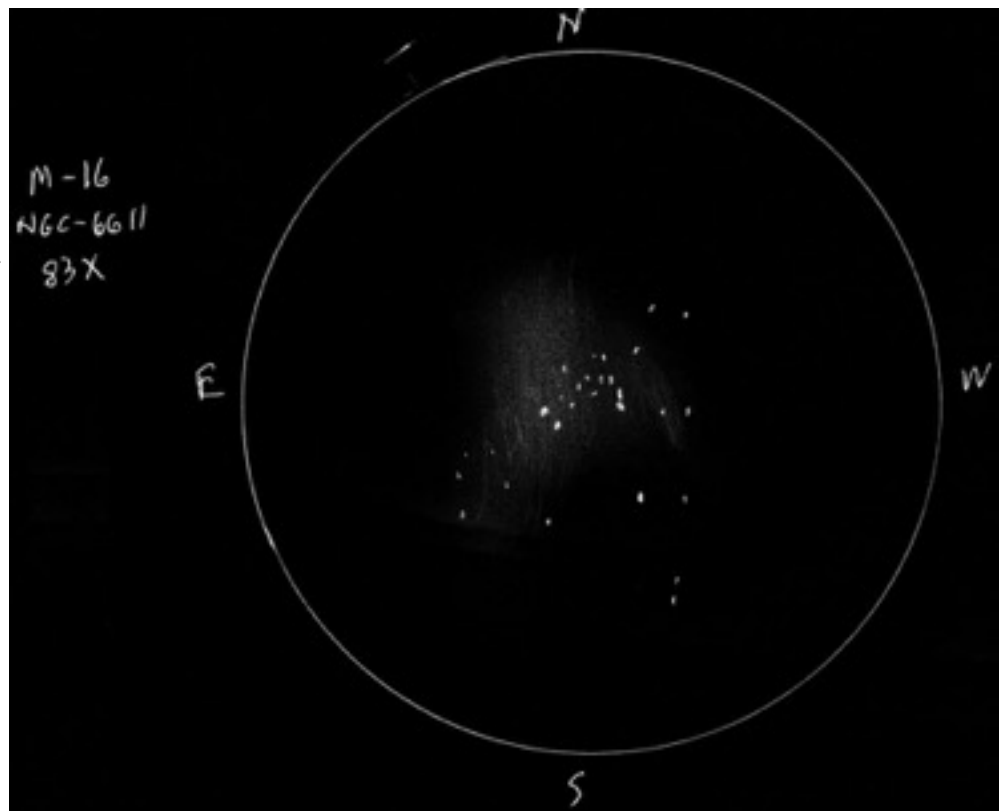
I've observed M16 multiple times over many years but not since 2007 and not with my 16-inch f/4.5. The last time I observed it was with my home-built 16-inch f/6.4 in 2007, right before I purchased my first commercial scope since 1966!

With observations from 1983 with my home built 8-inch f/9.44, to the 16-inch, I will present a summary of my observations.

On July 3, 1983 I observed M16 with my 8-inch f/9.44 from Eurovillas, Madrid, Spain. At 4,387 feet, the sky was beautiful once I popped the circuit breakers on all the street lights. At 60X, it was a loose grouping of stars with two blotches, very loose. I didn't note any nebulosity.

From 1988 through 2007, I observed it with my 16-inch f/6.4 all at the same magnification of 83X from different sites around the world including Eurovillas, Oklahoma and Las Vegas. The view, under roughly similar observing conditions, despite the differences in altitude, were roughly the same except for my official Messier certificate observation, for which I didn't note any nebulosity due to transparency. In several of the observations, I had the same issue of transparency which wiped away the nebulosity. Also note that I didn't see any nebulosity with the 8-inch either. However, a good half of the observations brought out a faint trace of it and with careful averted vision, I was able to see the background haze in a rough oval and a little hook extending over to the west. I never saw anything that looked like an eagle and always wondered why it was called that.

The O-III brought out the nebulosity a bit but it was still pretty much shapeless, just there. In my drawing for the Messier certificate, I noted one particularly bright star in the middle of the cluster, or at least it seemed to dominate the rest of the star. However, subsequent observations and drawings didn't show it quite as bright. I also noted the double star which shows in the drawing on the east side. My drawing represents what I usually saw without that one dominant bright star, maybe because that brighter star just stood out or flared? I don't know. The next time I view it, I want to try the O-III again as well as the UHC and even the H-Beta, all at 102X and see if that makes a difference.



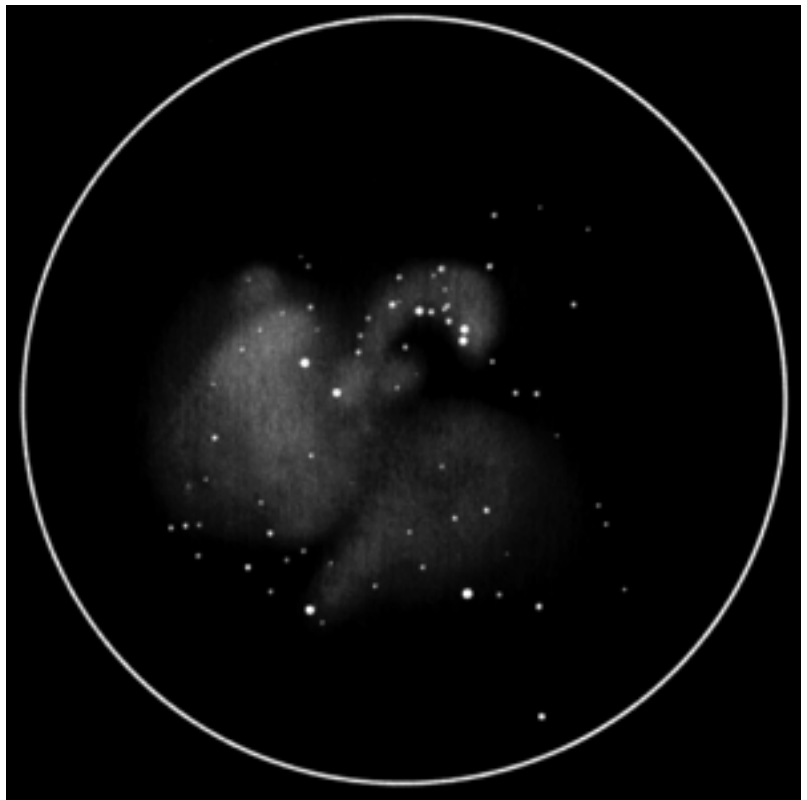
Jaakko Saloranta: LVAS Friend from Finland



Here are my short notes and sketch of M16. I didn't get quite as good a view/sketch as I had hoped but I no longer can revisit the object as the moon is so large. Notes:

Messier 16 - 4.5-inch reflector @ 101X (30')

A beautiful nebula with a modest open cluster. The star cluster consists of 15* mags. 8-12 within 5'. The cluster was surrounded by an arc of nebulosity. Around and mostly south and east of it lay the nebula. Best visible with UHC filter and @ 76X (46') using the 4.5-inch reflector. The shape was complex with several brighter areas and darker bays visible. Size of nebula 16'. At and altitude of 8°. Fainter detail not preserved. SQM-L reading: 20.10 near zenith despite astronomical twilight. Sky conditions average, background brightness poor. Temperature 48°F around the time of sketching.



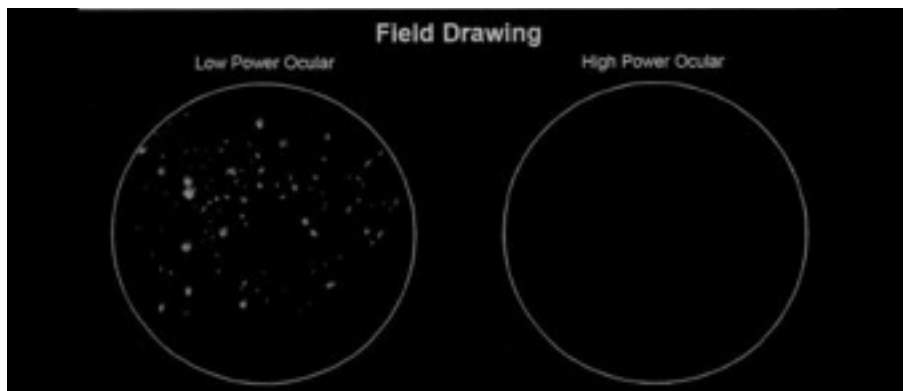
Francisco Silva: LVAS Member from Nevada



On February 27, 2015 I observed M16 from Mt Potosi, Nevada using an 8-inch Dobsonian. The seeing was 2 and transparency 5.

To find M16, I used M17 because it was easier to recognize through the eyepiece to get to the correct spot.

I used a 40mm (40X) eyepiece and it was the only way to see all of the cluster. I have not been able to draw all of the stars that I saw so I only drew the ones that caught my attention. I didn't see any of the nebulosity.



Jay Thompson: LVAS Member from Nevada



I observed M16 on several occasions from the dark skies of Meadview, AZ with a 17-inch Newtonian. I also viewed M16 from my backyard at the edge of Henderson, NV with a 14-inch SCT.

The appearance of the nebulosity in M16 is highly dependent on sky conditions. My best-ever view was on the night of May 31, 2014 from Meadview with the 17-inch. At 227X with a UHC filter, I could see the eagle shape of M16 distinctly along with detail in middle.

During a Messier Marathon on March 20, 2015 at Meadview, I viewed M16 when it was about 20° above the horizon. At 63X, I could see the cluster easily but the nebulosity was very faint. At 125X, the nebulosity showed up better, but it was still not as good as when viewed at a higher altitude.

On August 20, 2015 I viewed M16 from Henderson with the 14-inch SCT at 186X. With a nebula filter, I could see the brightest central part of the nebulosity, but it was quite dim without much contrast against the background sky. Without the nebula filter, the contrast was too weak to see the nebulosity.

M16 is near much brighter M17. If M17 is washed out, I often skip M16 because of its much lower surface brightness. However, if M17 shows up well, M16 can be very pleasing to observe.