

# MONTHLY OBSERVER'S CHALLENGE

*Compiled by:*

*Roger Ivester, North Carolina*

*&*

*Sue French, New York*

**October 2022**

**Report #165**

**Messier 39 (NGC 7092), Open Cluster in Cygnus**

*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 who's interested, and if you're able to contribute notes and/or drawings, we'll be happy to include them in our monthly summary. 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 astronomers 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 Observer's Challenge. And for folks with an interest in astrophotography, your digital 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.

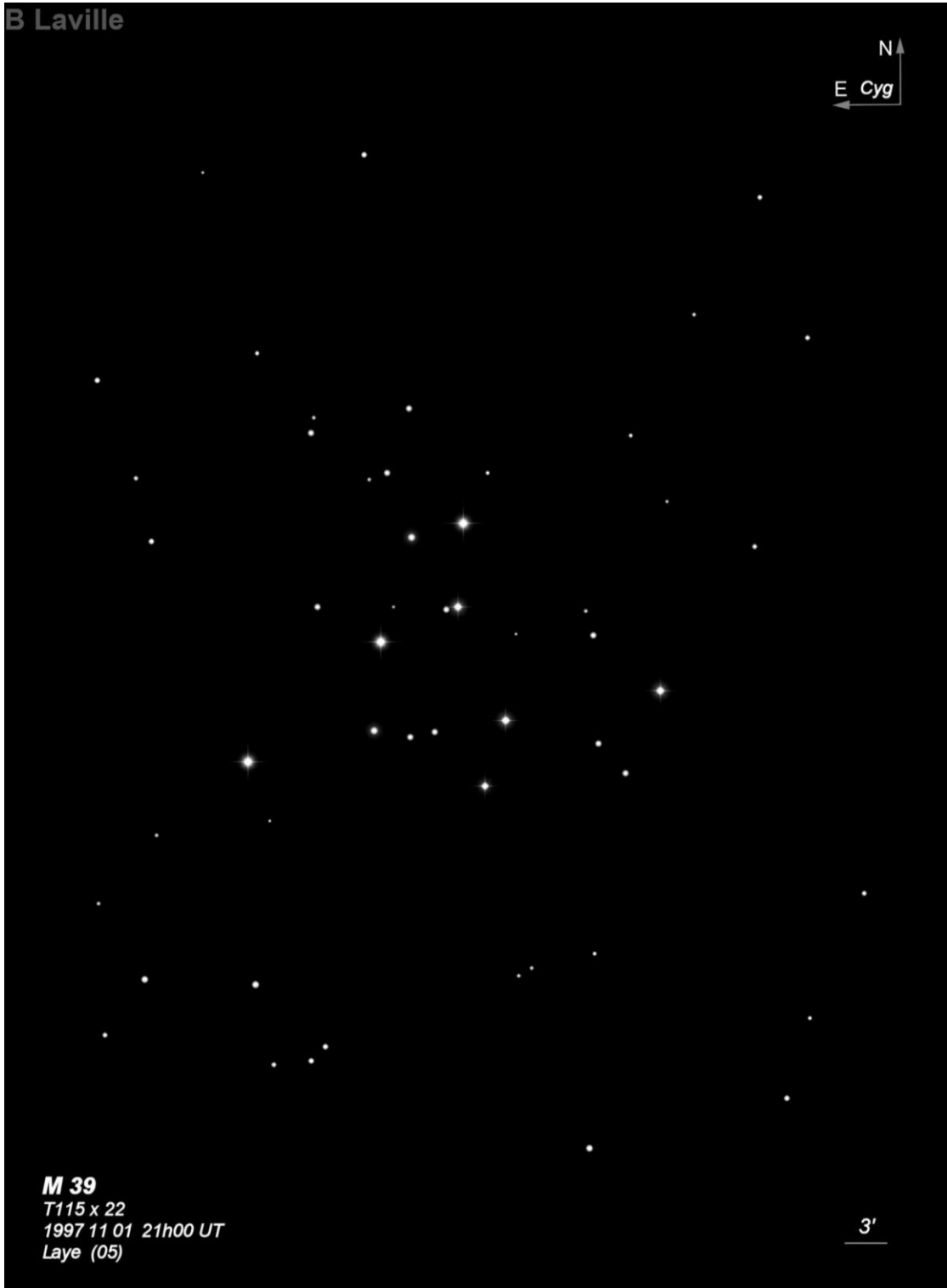
## **This month's target:**

A 2022 paper in the *Astrophysical Journal* by Xiaoying Pang and colleagues credit M39 with 303 member stars. They give the cluster's age as 350 million years and its distance as 297.1 parsecs (969 light-years). <https://ui.adsabs.harvard.edu/#abs/2022ApJ...931..156P/abstract>

While the discovery of M39 has been credited to Aristotle and to Guillaume Joseph Hyacinthe Jean-Baptiste Le Gentil de la Galaisière, both claims are quite dubious, and proper credit most likely belongs to Charles Messier. He made his discovery on October 24, 1764 and described as: "A cluster of stars near the tail of Cygnus; one can see them an ordinary [non-achromatic] refractor of 3& a half feet [focal length]." What aperture telescope Messier used for each observation is not always clear, but it seems this one was a 3½".

Other historical observations of M39 include William Henry Smyth's 1774 *A loose cluster in a splashy field of stars in a very rich vicinity. Several pairs of included*, and Nicolas Camille Flammarion's *Unusual curved runners of stars, with a compressed cluster or 20 stars difficult to separate from the rest.*

**Bertrand Laville: Observer from France**



**T115**

*Laye station, November 01, 1997, alt 63°, one of my very first deep sky observations!*

x22 Huygens HM 40mm

Open cluster, D~30 to 40', poor in number of stars, but rich in bright stars.

Very wide in the field. 25 to 30 stars, half of m 7v (?), and not much behind. Not very dense, in a rich sky.

## T254

Date of sighting:

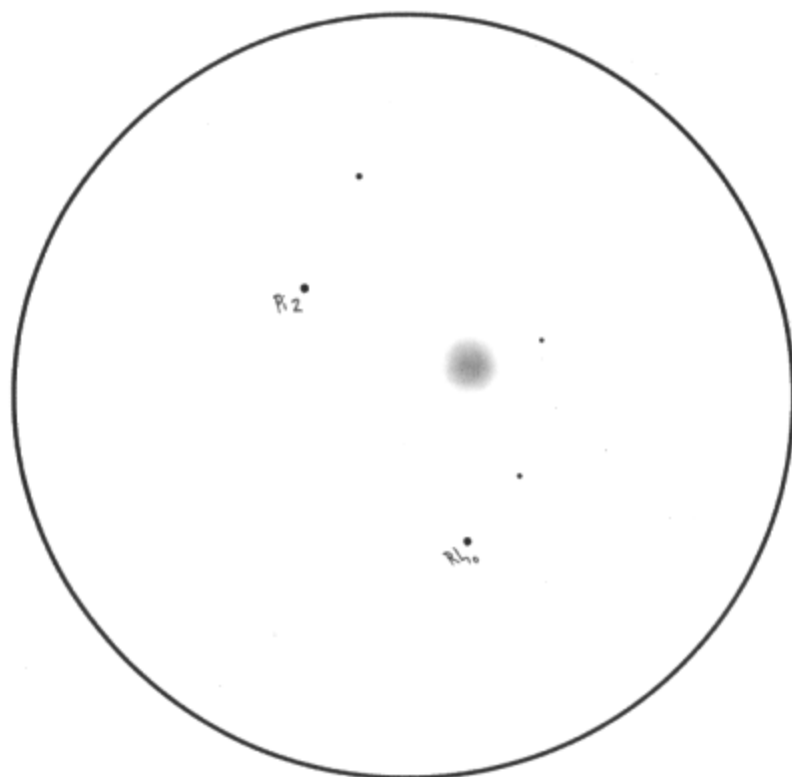
Jun 29, 2003 1:20 a.m. UT

x65 Meade SWA 2"/40mm

Triangular cluster, loose, 35 to 40 stars, which can be counted one by one, including 4\* from m7v, 20\* from m8 to 9v, and 15 from m10 to 12v

You'll find more detailed descriptions of Bertrand's sketches at: <http://www.deepsky-drawings.com/>

**Jaakko Saloranta:** Observer from Finland



**Naked eye**

Object: Messier 39

Obs. place: Koivukylä, Vantaa, Finland

Date: 14./15.9.2009

Bortle class: Class 5 (suburban sky)

NE Lim.mag: 6.0 (Cas)

SQM-L reading: 19.37 (zenith)

Background sky: 3

Seeing: 2-3

Transparency: 2-3

Weather: +8.0°C, humidity ~79%, 1029

HPa, calm, quite nice

Description: Brighter center.

Messier 39 with naked eye

## 8" Orion DSE

Object: Messier 39

Obs. place: Koivukylä, Vantaa, Finland

Date: 27./28.7.2010

NE Lim.mag: ~4.5 (south)

SQM-L reading: 17.25 (object)

Background sky: 1

Seeing: 6-7

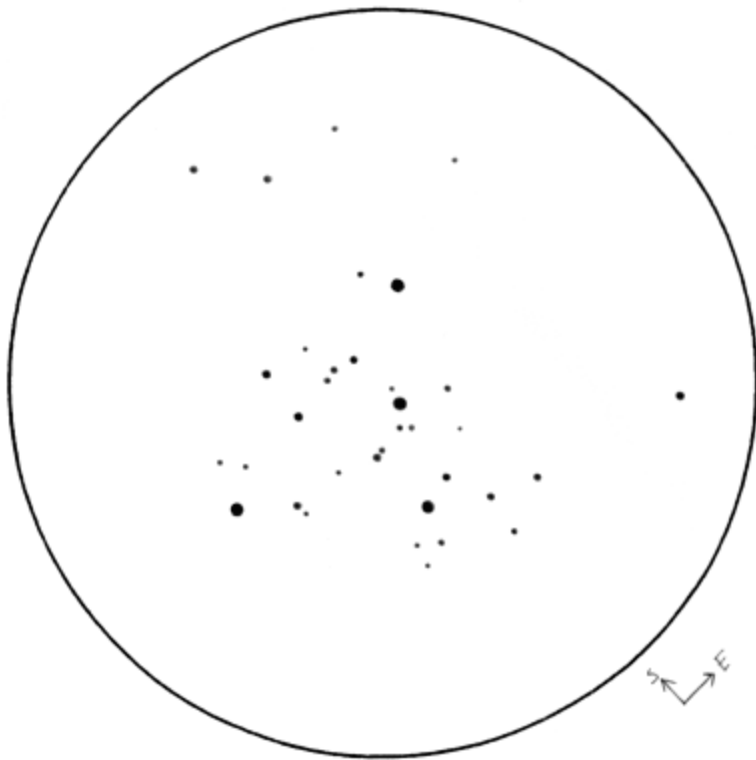
Transparency: 2

Weather: Nautical twilight. +22.0 - 19.0°C, humidity 82 - 91%, 1016 HPa, calm, NCLs in the northern sky, 97% moon in Aquarius, heat lightnings (2.45 am ->) above the sea to the south. Mosquitoes!

### Description:

38x: Triangular group with four bright 7th magnitude stars. Fairly well detached from the background and without a doubt partly due to the poor observing conditions and twilight. All of the stars appear white in poor transparency with roughly 30\* visible. The brightest star in the middle of the group. No obvious double stars.

80x: The cluster has lost its beauty. No additional detail seen. The cluster fills the field of view - size ~40'



Messier 39 with 8" Orion DSE @ 38x

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## 8" Orion DSE

Object: Messier 39

Observing place: Koivukylä, Vantaa, Finland

Date: 4./5.9.2009

Bortle class: Class 5 (suburban sky)

NE Lim.mag: 5.4 (UMi)

SQM-L reading: 18.07 (UMi)

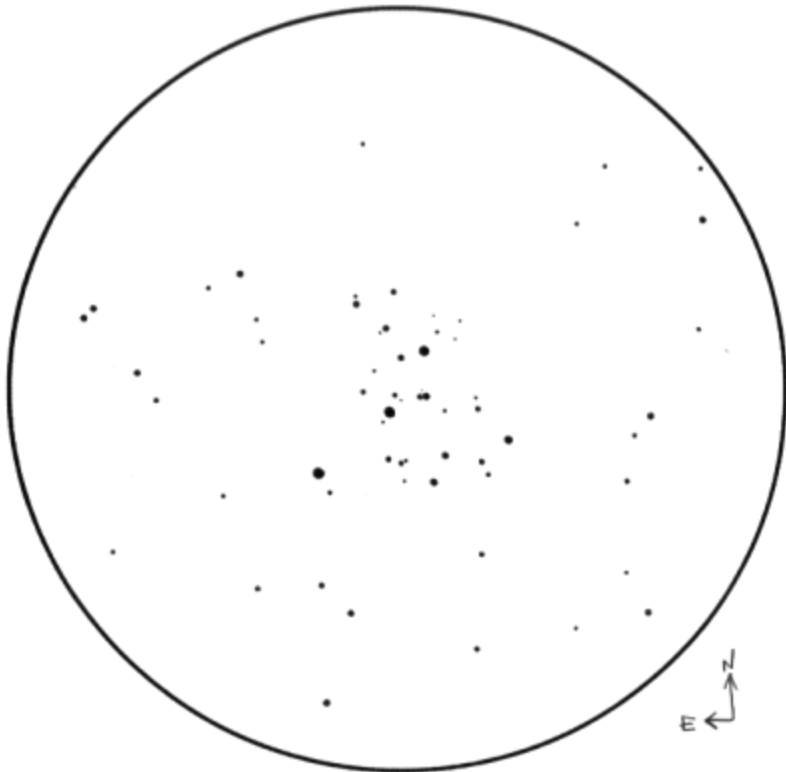
Background sky: 5

Seeing: 3

Transparency: -

Weather: +12.0°C, humidity ~94%, air pressure 1005.1 HPa, S wind 4.0 m/s. 99% moon in Aquarius.

Description: -



Messier 39 - 8" Orion DSE @ 30x

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### **8" Orion DSE**

Object: Messier 39

Obs. place: Rajakylä, Vantaa, Finland

Date: 28./29.7.2005

NE Lim.mag: ~5.0<sup>m</sup>

Background sky: 5

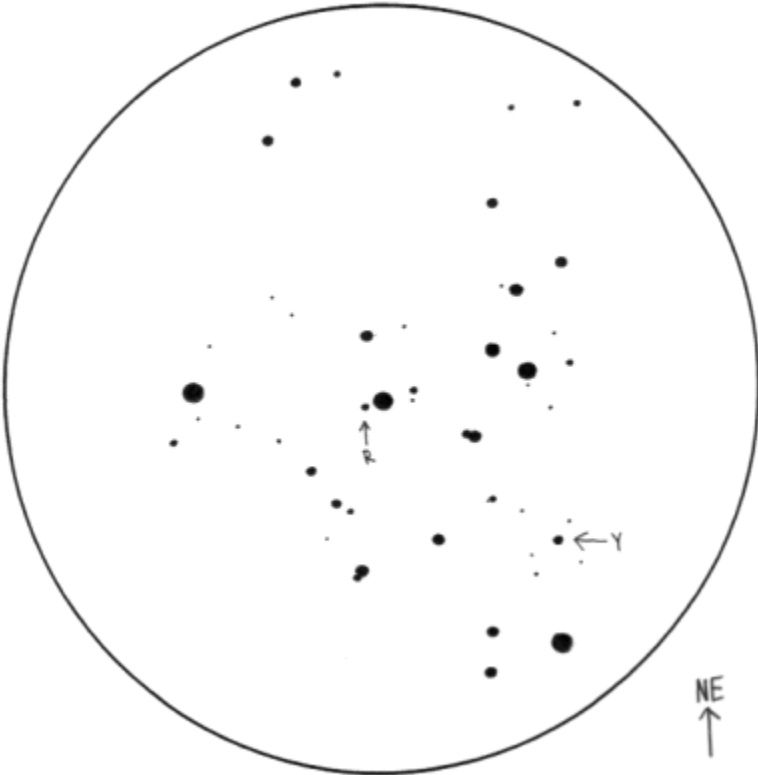
Seeing: 2

Weather: Twilight, strong winds & good.

Description: Very large (~35'), very bright (~4th magnitude) cluster with almost striking brightness range (estimated Trumpler type III 3 p). Four 6th magnitude stars stand out well from the cluster. Mostly magnitudes 8-10 with less than 30 stars counted @ 122x. Only a few faint (mag 11+) stars visible. Looks more like an asterism than an open cluster, just too loose. Stars mostly light blue - with a red star just S from the brightest member (in the middle) and a yellow star in the W edge of the cluster (see the arrows).

Notes: Teutsch J2128.2+4813 (9') was visible - but very difficult to discern from the rich background sky -

SW from Messier 39 as a sparse group of very faint stars magnitude 12 and fainter.



Larry McHenry: Observer from Pittsburgh, Pennsylvania

<http://stellar-journeys.org>



**M39** is located in the Summer constellation of Cygnus – “The Swan.”

The star cluster is about 800 light-years distant (one of the closer star clusters to us and moving in our direction), and about 250 million years old, about 7 light-years in size, and contains around 30 stars.

Initially discovered by French astronomer Guillaume Le Gentil in 1750 (and possibly first noted by Aristotle in 325 BC), M39 was “re-discovered” by Charles Messier from his observatory in Paris on October 24<sup>th</sup>, 1764 using his 3.5-foot focal-length Dollond refractor with a fixed magnification of 120x. Messier describes it as “a cluster of stars near the tail of the Swan.”

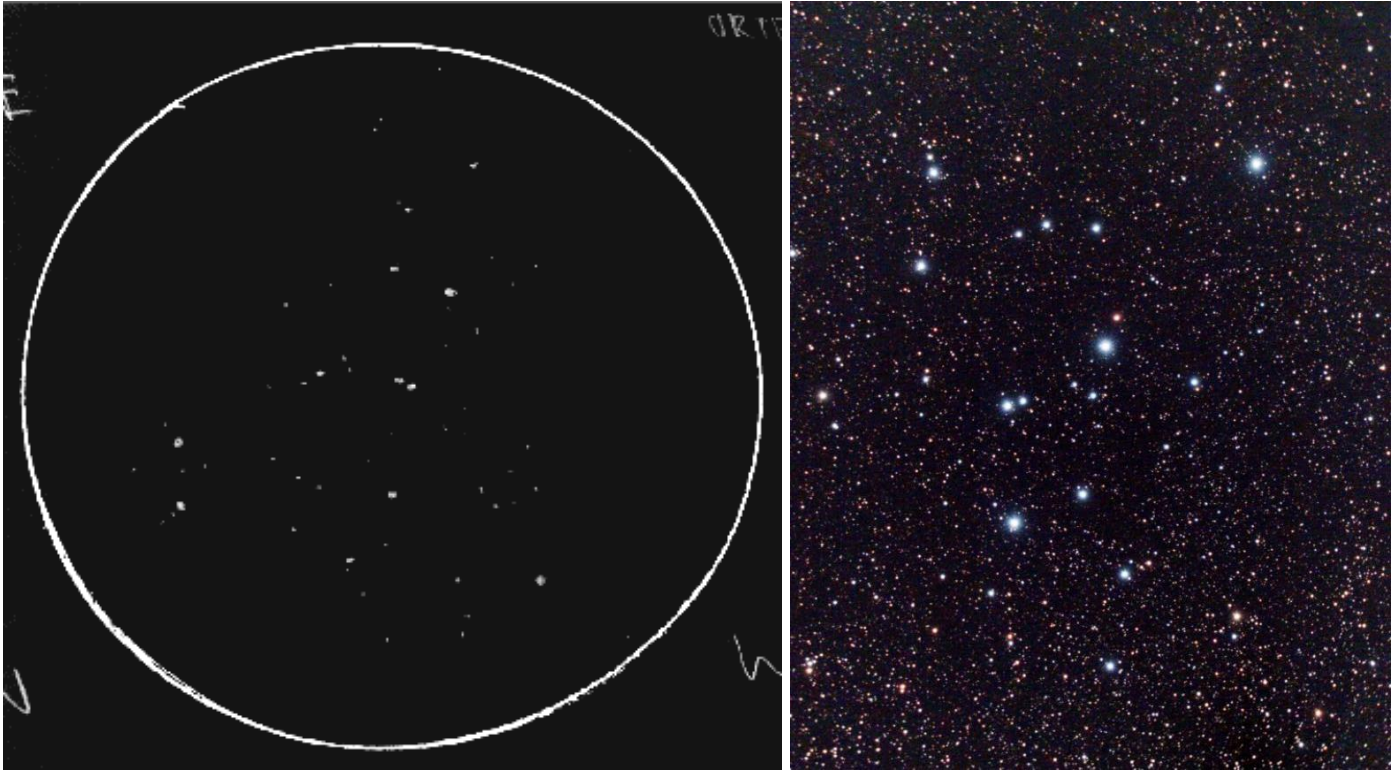
Visually, M39 is a large, bright 5<sup>th</sup>-mag open cluster that can be seen by the naked-eye in a dark country sky near the bright star Deneb In the direction toward the constellation of Lacerta. It has an apparent size larger than the full Moon.

**Sketch and video capture follow.**



**Visual Sketch:** “Loose bright cluster, easy to find. Requires low power.” West is to the lower-right.

08/18/1987 from backyard in Louisville, KY, using a 13.1-inch f/4.5 Dob reflector and 40mm eyepiece at 28x. Loose bright cluster, easy to find. Requires low power.

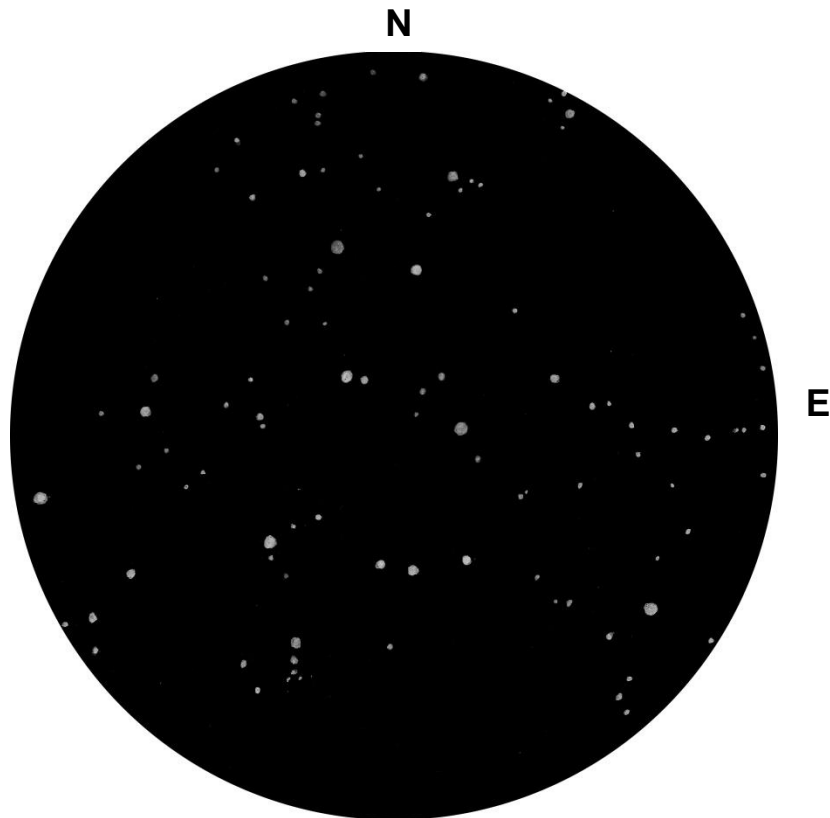
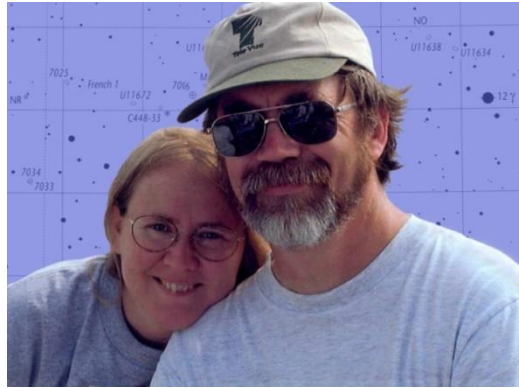


**Video-Capture/EAA:**

On 08/23/2022, from the ORAS Observatory, PA, using an 8" SCT optical tube @ f6.3 on a GEM mount, with a CMOS color camera and broadband filter, 15-second guided exposure, live-stacked for 15 minutes, image cropped.

Using EAA techniques, M39 displays embedded in a rich Milky-Way star-field as a large inverted “V” shaped open cluster of colorful blue-white stars.

**Sue French: Observer from New York**



October 29, 2022, 8:30pm to 12 midnight  
130mm refractor at 102×

The sky was a bit milky, but as I became dark adapted, more and more stars revealed themselves. I finally gave up searching for faint stars as the cluster was being eclipsed by a nearby tree.

The view is mirror-reversed, as seen through the telescope.

**Glenn Chaple:** Observer from Massachusetts



### **Messier 39 Open Cluster in Cygnus (Magnitude 4.6; Size 31')**

Cygnus is a relatively large constellation centered on the star-rich fields of the Milky Way. It's surprising, therefore, that it's home to just two Messier objects – the open clusters M29 and M39. The latter, the larger and brighter of the pair, is this month's Observer's Challenge.

Credit for its discovery goes to Charles Messier himself, who observed the cluster on October 24, 1764. Some sources suggest that it may have been seen by Messier's fellow countryman Guillaume Le Gentil 14 years earlier, while others note a possible naked eye observation by Aristotle in 325 BC.

M39 is located at the 2000.0 coordinates RA  $21^{\text{h}}31^{\text{m}}48.0^{\text{s}}$ , Dec.  $+48^{\circ}26'00''$ . I found it by star-hopping 3 degrees roughly north of 4<sup>th</sup> magnitude rho ( $\rho$ ) Cygni. This star can be found by tracing an imaginary line from delta ( $\delta$ ) Cygni through Deneb and extending it an equal distance beyond (refer to the two finder charts).

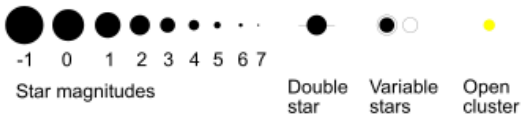
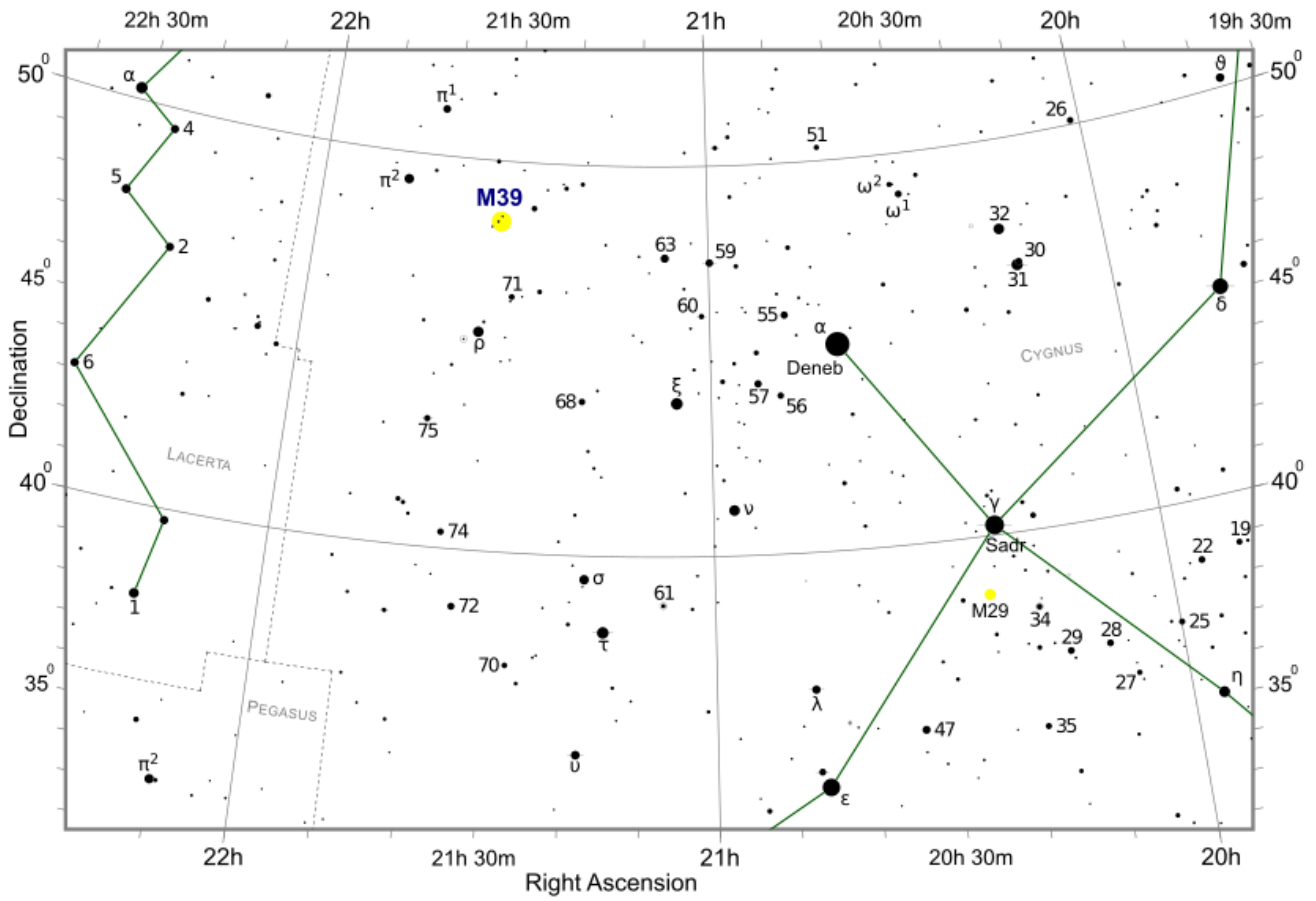
My first encounter with M39 came on the evening of November 11, 1977, when I observed both it and M29 with a 3-inch f/10 reflector and a magnifying power of 30X. I was able to prove for myself that M39 is indeed larger and brighter – bright enough to be visible in the scope's primitive 3X25mm finderscope. During a small-scope survey of all Messier objects conducted between the years 1996 and 2013, I revisited M39 with a 3-inch f/6 reflector and 39X eyepiece. In my logbook, I wrote "Large, sparse cluster, triangular in shape. Over 2 dozen stars down to 11<sup>th</sup> magnitude." For a fresh impression of M39, I viewed it on September 15, 2022, with a 60mm (2.4-inch) refractor, again with low power (this time, 25X) to capture its entire full-moon-sized span. I counted about 20 stars, which is two-thirds of the recognized cluster membership.

On all three occasions, I sketched M39. Reviewing them, I noticed a common denominator besides the triangular shape. Near the middle was a faint (for my small-sized instruments) double star. A search of the Washington Double Star Catalog (WDS) identified it as ARN 78, whose magnitude 7.6 and 8.8 components are separated by 50.0 arc-seconds. The WDS listed several other pairs within the bounds of the cluster – all too faint or close for ordinary backyard scopes.

At a distance of 800 light-years, M39 is one of the nearest Messier objects. Its true diameter is around 7 light-years.

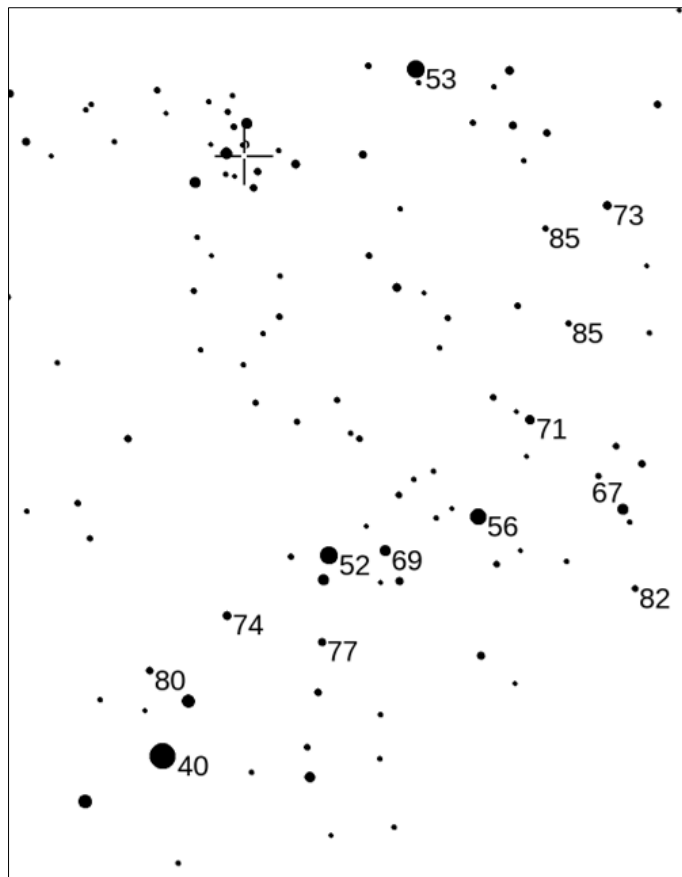
# Messier 39 Wide-Field Finder Chart

## Messier 39 - M39



## Messier 39 Finder Close-up Chart

Created using the AAVSO's Variable Star Plotter (VSP). Numbers are stellar magnitudes, decimals omitted. The magnitude 4.0 star is rho ( $\rho$ ) Cygni. Stars plotted to 9<sup>th</sup> magnitude. North is up in this 2 by 4 degree field.



And finally, here's a sketch I made of M39 with a 60mm refractor.



**John Bishop:** Observer from Massachusetts



On October 27, 2022 I observed M39, a large, loose open cluster in Cygnus. I observed with an 8.25-inch f/11.5 Dall-Kirkham reflector. It is a portable setup, with a motor driven equatorial mount, without go-to. I observed from the ATMob Clubhouse in Westford, Massachusetts. The sky was clear, and transparency was good. Seeing was fair. Light breeze helped ensure that dew did not accumulate on the equipment. Daytime temperatures in the 50s F. dropped to 42 degrees F. by midnight.

M39 was easy to find. It forms a triangle with Pi Cygni and Rho Cygni, and is big and bright enough to pick up by sweeping. Prior to that night, I had only observed M39 once or twice, ever. It is buried in the thicket of clusters, nebulae, doubles, and the Milky Way itself, in the Cygnus region. M39 has its charms. In my 2-inch 50mm eyepiece at 48x, I saw 20 or 30 uniformly bright, blue-tinted stars forming a triangle. The cluster was nicely framed in the FOV, with good background contrast. It was a very attractive view. My scope was polar aligned, and the image of M39 in the FOV was as still as a photograph. I stared at it for some time – my reward as a visual observer. For a little compare-and-contrast, I also looked at M45 and the Double Cluster. Beautiful open clusters in three different flavors!

M39 is one of those objects whose inclusion on the Messier list could be puzzling, at least based on the image in the eyepiece. Who could mistake that field of sparkling blue stars for a comet, even with 18th century optics? On the other hand, at magnitude 4.6, M39 is theoretically visible to the naked eye (but not my naked eye). Presumably, M39 appeared as a suspect fuzzy patch, naked eye, to Messier & Co. But then, why are the Pleiades on Messier's famous "not-a-comet" list?

**Mike McCabe: Observer from Massachusetts**



After months of hyper-challenging visual objects like barely-there galaxies and planetary nebulae, the organizers of the challenge must've decided to throw us a bone for the month of October. M39 would hardly be rated as "difficult" in most experienced observers books, but once in while it's fun to stop in on the bright and splashy stuff for a gander.

I happen to really enjoy a nice open cluster in the eyepiece, so was looking forward to this month's object. M39 isn't the splashiest of open clusters for sure, but it isn't dull either. It's easily found about a quarter of the way along a path between Deneb in Cygnus and Caph in Cassiopeia, and is bright enough to be rendered even in binoculars. At this time of year it's very high in the sky from our parts around early evening, so quite convenient in that regard. I especially enjoy these types of objects in a nice refractor that puts up pinpoint stars with a relatively dark background. For this observation I set up the 6-inch f/9 ED APO on a GEM mount. It's nice to be able to sit at the eyepiece and draw an object while the telescope is tracking.

Things were going along just dandy in the beginning. I finally landed on the best orientation for the scope and mount combo so that the tripod legs wouldn't be an issue, and was sitting there gazing into the eyepiece and putting my dots on the paper. Then a little while into the observation I began to notice something funny happening. As I scanned over my drawing and was reviewing the positions of my renderings, I started noticing that things I had put on the paper weren't in the eyepiece anymore. DEW!!! Gosh darn it! That dampness had set in fast and hard on this evening, and I wasn't expecting it so hadn't set up any anti-dew measures.

When dew sets in with that kind of speed and robustness you aren't going to switch on a dew heater and just watch it magically disappear. That's going to take some time, and so depending on how much time you're willing to give up, more aggressive measures might be in order. A 1500 watt hair dryer would certainly speed the process up, and that's the path I chose.



And this is where things got stupid. Not wanting to compromise my dark adaptation and generally knowing my way around the garage, I went in and got the hair dryer and an extension cord...a 100-foot extension cord mind you...and brought them outside. The scope was probably 50-foot from the electrical outlet. Well, you can probably guess where this is going. Have you ever tried to untangle a 100-foot mess of cord using just feel because you really can't see it? (of course it was orange, which really couldn't be seen with my red headlight) Of course you haven't, because you're probably better prepared than I was. Well, eventually I got the necessary 50-feet of cord freed up albeit with a big knot on one end, and then the lens cleared up with the blast of hot air, but by then my enthusiasm for the whole process was starting to wane. Not long afterward I shut things down and put everything away, the cord landing in a wad on the garage floor to be dealt with in the morning.

So the motto of the story is, some nights are better than others. While the target may have been an easy one, peripheral difficulties stole some joy from the experience. I went back the very next night, again with a 6-inch refractor but with much less dew present and checked my work from the night before, then proceeded to embark on a spectacular tour of the celestial dome. It more than made up for the rat's nest of wire the prior night, and the lesson has been learned...prepare everything before the observation. I usually do. I must be getting lazy.

**OBSERVATION LOG - OBJECT:** MESMER #39

DATE OCT 15 '22 /z TIME 20:10 /z EDT LOCAL OBSERVING LOCATION 42°N 71°W

SCOPE/APERTURE 6" F/9 REFRACTOR

EYEPIECE 24mm /68° MAGNIFICATION 56x /1.2°

FILTER — SEEING 2/5 TRANSPARENCY 3/5

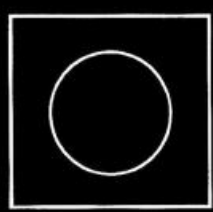
TEMP — BARO PRES. — WIND CALM

COMMENTS: —

STAR-PACK, WIDESPREAD  
OPEN CLUSTER.

ABOUT TWO DOZEN BRIGHTER  
MEMBERS.

GOOD BINOCULAR  
OBJECT.



ORIENTATION AND/OR ROTATION



*MJM*

**Joseph Rothchild:** Observer from Massachusetts



This month's object, the bright open cluster M39 in Cygnus, is easily seen with binoculars and I have observed it many times before.

This month I first observed under suburban skies in Newton Massachusetts with a 130 mm f/5 reflector. The cluster was distinctly triangular-shaped. I first observed with a 27mm eyepiece (24x) and counted a total of 19 stars. With 18mm eyepieces and binoviewer (36x) and with a 14mm single eyepiece (46x) I counted 22 stars, including 7 bright stars and one wide double star.

Four days later I again observed M39, this time under darker skies on Cape Cod with a 150 mm f/5 reflector. I expected to see significantly more stars, but using the binoviewer with 18mm eyepieces (42x), I counted only 29 stars and the overall appearance was the same.

**Mario Motta:** Observer from Massachusetts

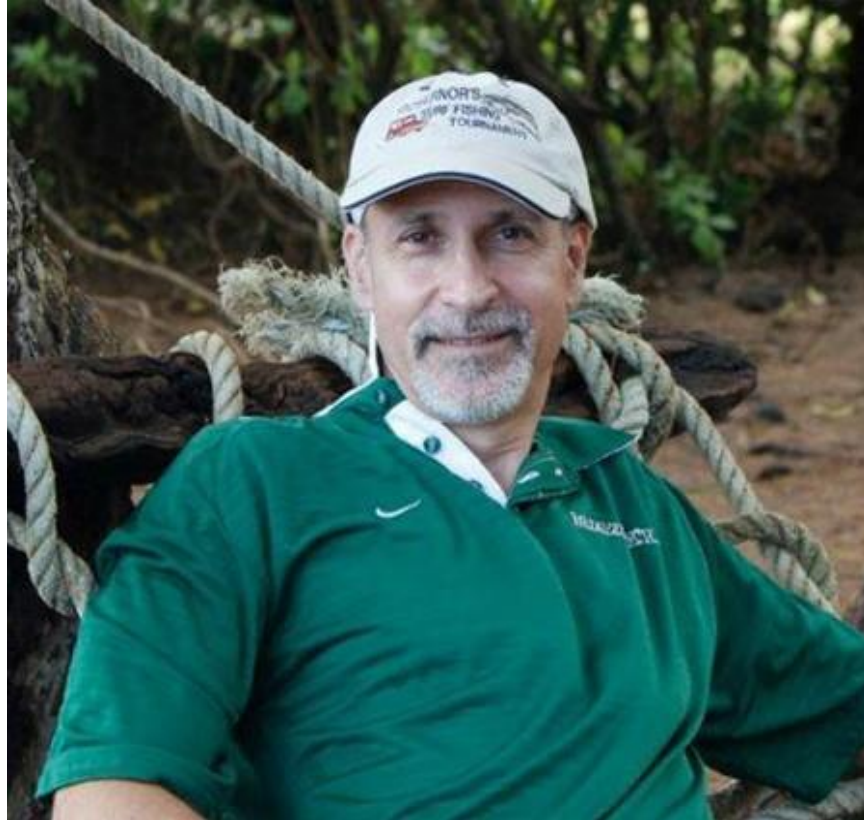




This was taken through my 6 inch refractor about 1 x 1 degree field of view.

10 images 30 sec exposure each stacked, with my ZWO ASI071 MC pro camera. (color)

**James Dire:** Observer from Illinois



M39 is a very loose galactic star cluster located in the plane of the Milky Way approximately nine degrees northeast of the star Deneb. The cluster has an integrated magnitude of 4.69. Distance estimates range from 800 to 1060 light years. The cluster is 29 arcminutes in diameter.

M39 may have only 80 member stars. The brightest members are magnitude 7 and 8 O and B stars; that is, stars that are blue to blue-white in color. The cluster does not contain any red giants, making it a very young star cluster. Age estimates place the cluster around 250 million years old. Most of the stars in the cluster are red dwarfs, too faint to see in binoculars or small telescopes.

M39 can be seen naked-eye from a dark site with excellent sky transparency. It is best viewed with binoculars. I took an image of M39 using a 190mm f/5.3 Maksutov-Newtonian telescope with a Canon 30D camera. I did not record the ISO setting, but my best guess was ISO 200. The exposure was 20 minutes.

**Image follows**



**Phil Orbanes:** Observer from Massachusetts



Here is my photo of M 39 in Cygnus, which lies 1,010 light years away.

It includes 8 hours of imaging with my 14-inch Planewave reflector and FLI 16803 CCD camera. The exposure time was divided evenly between R, G, B, filters.

M39 is a naked eye open cluster (mag. 5.5) and appears to be about the size of the full moon. It is estimated to contain the mass of 232 of our suns. Of its fifteen brightest stars, (which are very pretty blue giants), six form binary star systems.

**Barry Yomtov:** Observer from Massachusetts



This was taken on October 15, 2020 with my RASA 11 f/2.2 optics with the ZWO MC183 OSC Pro. It is a nice representation of the open cluster with pin-point colorful stars.





**Roger Ivester:** Observer from North Carolina



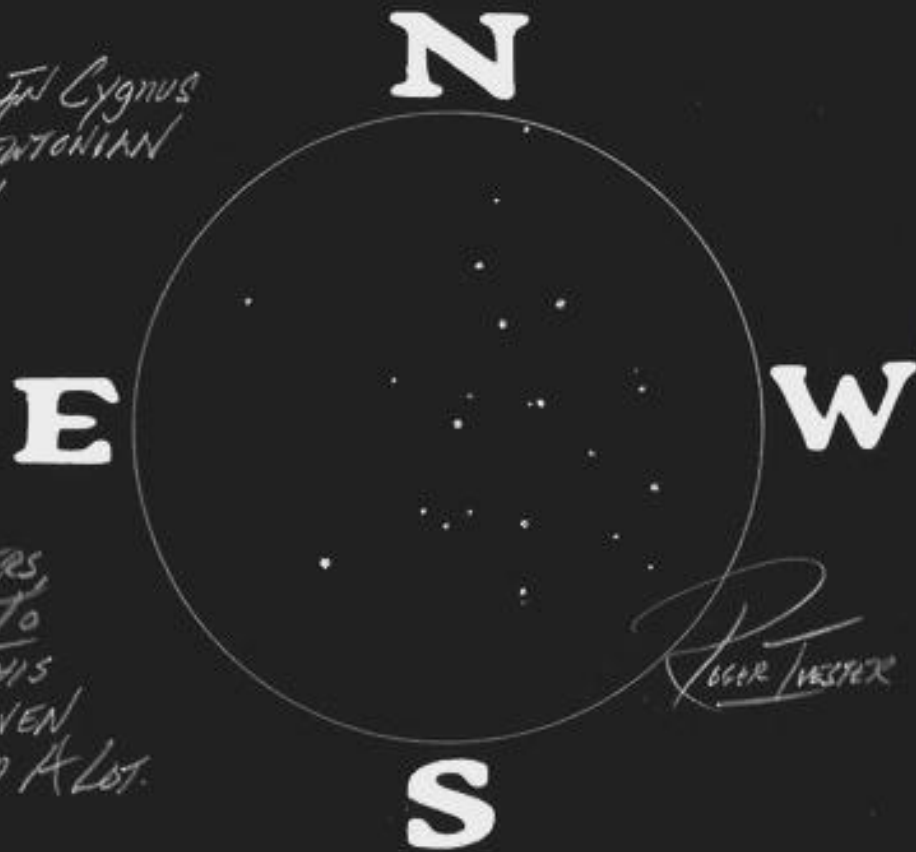
Open cluster M39 is a bright but sparse and scattered cluster with all brighter members being mostly white in color.

The following sketch was made with a 6-inch f/6 Newtonian at 46x, and with a 1.3° FoV. As all open clusters, I find them very difficult to sketch. However, for this one, I was using a driven mount, which helped a lot.

**Sketch Follows**

DATE: OCTOBER 27, 2022  
OBJECT: M39 OPEN CLUSTER IN CYGNUS  
TELESCOPE: 6-INCH F/6 NEWTONIAN  
SKETCH MAGNIFICATION: 46X  
FIELD OF VIEW: 1.3°

BRIGHT, BUT SPARSE OPEN  
CLUSTER, VERY SCATTERED  
WITH ALL BRIGHTER MEMBERS  
BEING MOSTLY WHITE IN  
COLOR. AS ALL OPEN CLUSTERS,  
I FIND THEM DIFFICULT TO  
SKETCH. HOWEVER FOR THIS  
ONE I WAS USING A DRIVEN  
EQ MOUNT, WHICH HELPED A LOT.



The following is the complete listing of all Observer's Challenge reports to-date.

<https://rogerivester.com/category/observers-challenge-reports-complete/>