MONTHLY OBSERVER'S CHALLENGE

Compiled by:

Roger Ivester, North Carolina

&

Sue French, New York

May 2020

Report #136

M85 and NGC 4394, Galaxies in Coma Berenices

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.

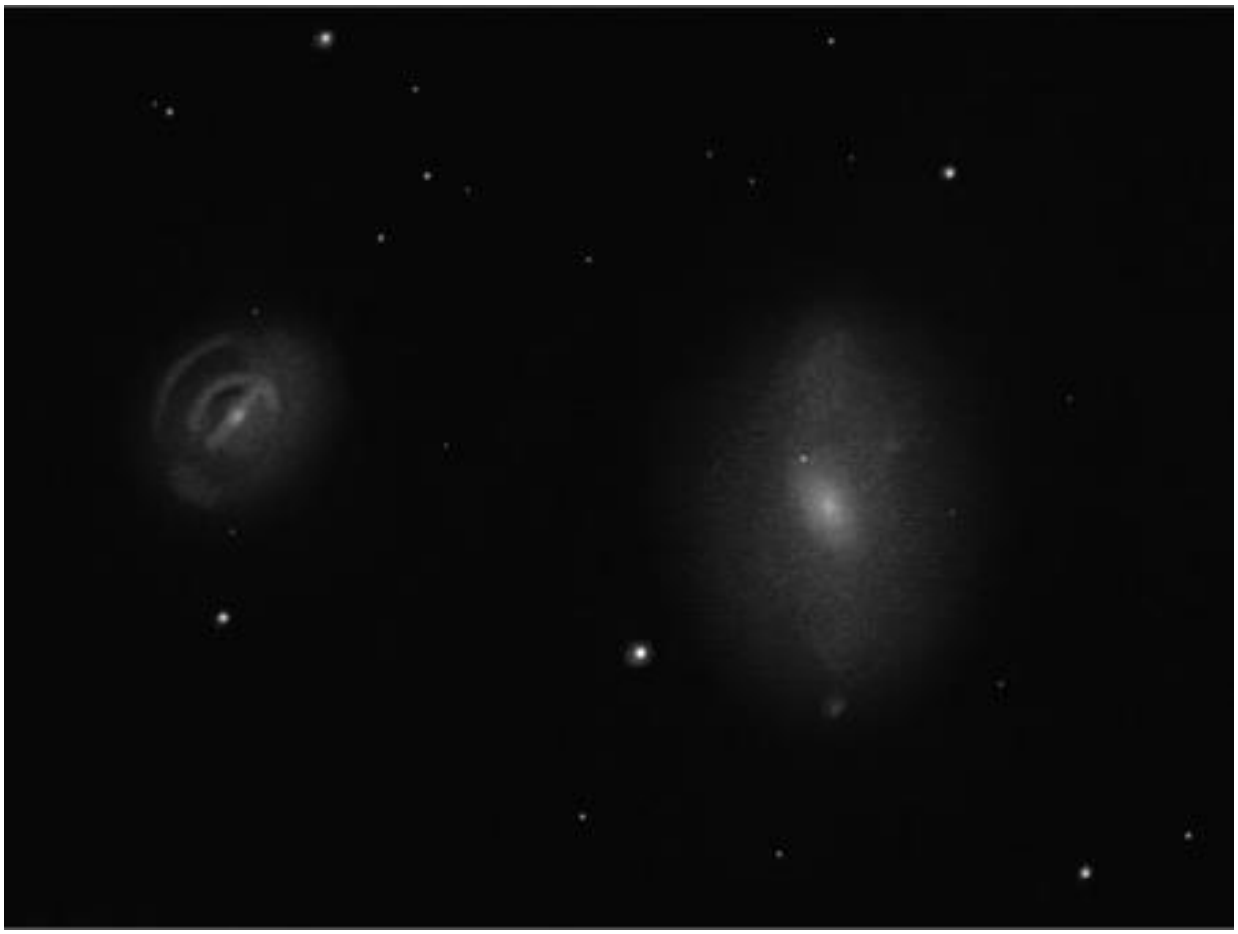
This month's targets

M85 and NGC 4394 are a pair of interacting galaxies about 50 to 60 million light-years away from us in the Virgo Cluster. M85 is usually considered a lenticular galaxy because it has some of the features of disk galaxies but shows no spiral structure. NGC 4394 is more photogenic, displaying spiral arms, a bar, and an internal pseudo-ring.

Pierre Méchain discovered M85 with a 3-inch refractor in 1781, and Charles Messier described it in his catalog as a nebula without a star. NGC 4394 was discovered three years later by William Herschel. Referring to M85 and NGC 4394, Herschel's handwritten journal entry reads, "Two resolvable nebulae; the preceding [western] is the largest and [with 157] seems to have another joined to it but with 240 it appears to be a star."

Uwe Glahn: Observer from Germany

Telescope: 27-inch f/4.2 Newtonian. Magnifications: 172× – 293×
NELM: 6.5+, Seeing: III
Location: Sudelfeld



Rony De Laet: Observer from Belgium

Telescope: 10 inch f/5 truss Dobson

Much to my delight, I was able to fit both galaxies in the same high power eyepiece. An interesting comparison! M85 is obviously the brightest of the two, but it shows no structure in my scope. It is just an amorphous elliptical glow with a stellar nucleus. NGC 4394 is the fainter companion. My Bortle 5 sky allows me to see only its central bar with a faint stellar nucleus embedded within.

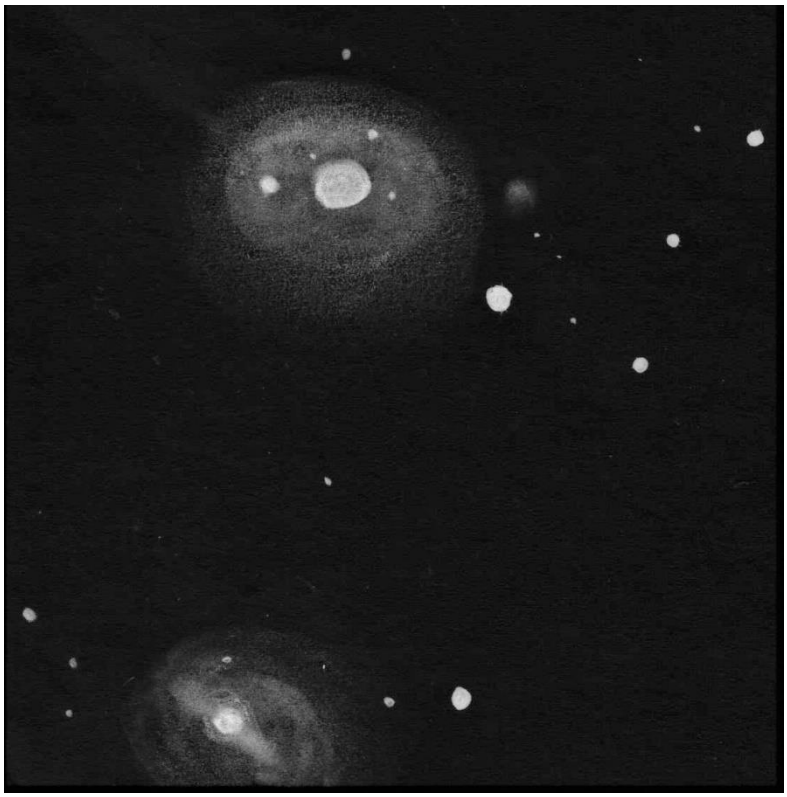
The sketch is a digital reproduction of a raw pencil sketch behind the eyepiece at 200×.

The fov is 22′.

North is up and west is to the right.

Dale Holt: Observer from England, 30 miles north of London

I use a 505mm f/3.74 Newtonian on a fork mount and an old analogue Watec 120N+ deep sky video camera with custom cooling. The camera is B&W and delivers its image in near real time, typically 15 sec exposure to a CRT monitor in my observatory office where I sketch from the screen. Most commonly I used graphite pencil on sketch paper although sometimes I use white on black hard pastels where the object is nebulous. Post drawing I scan the image and invert using paint. Limiting magnitude of my set up is around 19-20th mag.



Ed Fraini: Observer from Texas

Date: May 2020

Our observation of the galaxy pair was made on the evening of May 18th from 2140 CDT till 2200 CDT. The Houston Astronomical dark site had average conditions, meaning high humidity, so moderate seeing and an SQM of 19.45. The target field is near azimuth, located centrally between Virgo, Leo, and Coma Berenices giving us the best possible conditions.

Time 2140
40 mm (50× – 1.42º field of view)

M85 is visible, and NGC 4394 observed only with a blink of the eye. Both show as hazy circular patches with no structure other than a slightly brighter core. The core of M85 is distinct, and the outer edges of the circle are defused with no firm location. Both galaxies seem to be facing us. The star PPM 129045, to the southeast, is quite bright and clearly spaced away from the visible disk.

Time 2153
13 mm (100º AF) (147× – 41 arcseconds)

At this power, the background is extremely black. M85 is still void of structure, and the core is more distinctly differentiated from the disk. Now the gap between the bright companion star is much smaller. The thin veil of the outer disk reaches closer to it. Moved M85 out and placed NGC 4394 in the center of the field. At this magnification, NGC 4394 is oval-shaped. Two exceedingly small dim stars on a line to the southwest of NGC 4394 can barely be detected.

Time 2205
6 mm (100º AF) (318× – 18 arcseconds)

Stars very dim, no useful observations made.

These two make a nice pair, how could they not be on the Two in the View AL program? We only had about 30 more minutes of observing in this night before the clouds moved in, so this observation became the highlight of the night.

Michael Brown: Observer from Massachusetts

I observed M85 and NGC 4394 on May 13, photographed them on May 20, and observed them again visually on May 21. I cherish observing the sky in the middle of spring. Each year there is that very first truly enjoyable night, when it is finally comfortably warm and dry after the long New England winter, yet the mosquitoes have not yet appeared. I hear flocks of geese flying north overhead and owls in the woods around my house. I have a strong association between those sounds and the galaxies populating the spring sky.

My cursory research indicated that M85 is an elliptical (or perhaps lenticular) galaxy, NGC 4394 is a barred spiral, and both are members of the Virgo Cluster about 60 million light-years distant. In my 8-inch scope with the 9mm eyepiece, M85 appeared quite bright, with an extended bright center (definitely not star-like) surrounded by a faint halo. The galaxy was elliptical in shape with a north-northeast to south-southwest orientation. I glimpsed a bright spot northeast of the center. In my first observation I thought this could be either a foreground star of a bright spot within the galaxy (I have confirmed that it is in fact a star). A brighter star is visible in the field southeast of the galaxy.

NGC 4394 is in the same telescopic field east of M85. This smaller, dimmer galaxy was still fairly easy to see. However, it was simply a round smudge with no significant detail.

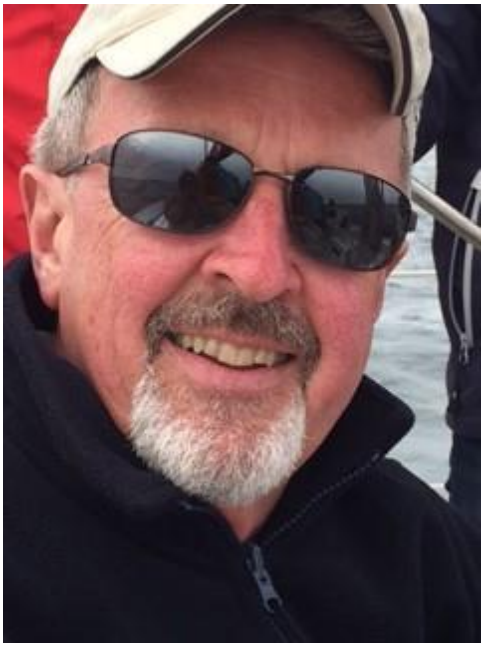
My photograph (with my Canon Digital Rebel SLR) has a total exposure of 17 minutes. The photo shows the bright core and surrounding halo of M85. The core and bar are clearly visible on NGC 4394. The two spiral arms are faintly visible, with the general appearance of two rings. I believe I see two other fuzzy objects in the photo: one beneath (south of) M85, and one to its right (west). I'd be interested in any information on these objects that anybody might have.

Venu Venugopal: Observer from Massachusetts

After a few tries when clouds came to spoil the view, on 5/27 I captured the challenge objects.

Location : Chelmsford, MA
20 minutes exposure - 8 second subs. Stacked in Sharpcap, flats/darks.
Equipment: 8″ Sky-Watcher f/4, Zwo533MC , GEM45

John Bishop: Observer from Massachusetts



John Bishop: Observer from Massachusetts:

I observed M85 and NGC 4394 on 5/13/20 and 5/20/20 from a remote forest setting in Plymouth, MA, about 50 miles from Boston, MA. Both nights were clear, with good transparency and seeing. There was more moisture in the air on 5/20/20. Temperatures were in the 40s F. in the early evening, dropping into the mid-30s by midnight. It's been a cool Spring. No bugs yet!

I observed with an 8.25 inch f/11.5 Dall-Kirkham reflector at 48×, 100×, 130×, and 193×. Equatorial mount with motor drive, without goto.

The targets for the evening were well placed for observation. I first looked for them by dead reckoning and sweeping, rather than by true starhopping. With my 2-inch, 50 mm eyepiece (1º FOV), this approach is sometimes useful, especially where, as here, there are no prominent landmarks nearby. This time it worked well. In fact, on the second night, for my first view of the night, I pointed the scope at the field using the Telrad, locked the motor drive clutches, and looked in the eyepiece – there were M85 and NGC 4394, centered in the FOV!

A fellow observer likened it to a hole-in-one!

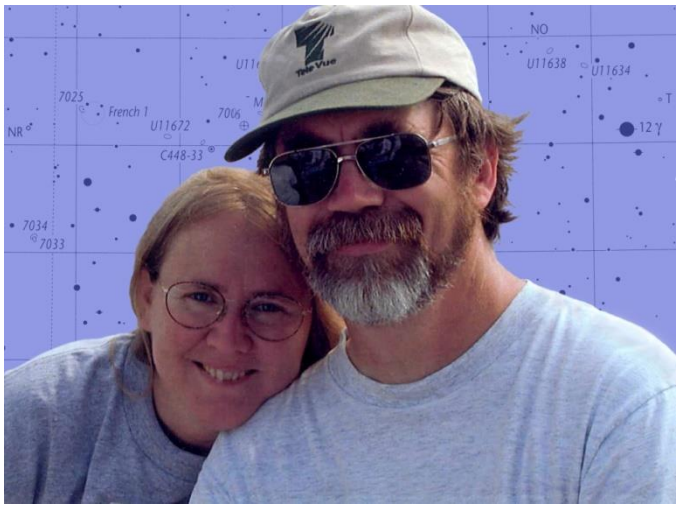
M85 was conspicuous and bright. It had a fairly large, bright center. The halo was extensive, slightly elongated, and bright. There was a star in the outer edge of the halo. At lower power the star seemed to blend in as part of some structure of the galaxy. Otherwise, I saw no structure. M85 was much brighter than NGC 4394.

NGC 4394 was smaller and fainter than M85. It was elongated, with a nebulous halo and a defined bright core. I could not see a "bar," but at higher magnification, the galaxy started to show brightening along its length.

M85 and NGC 4394 were usually in the same FOV, which is always an interesting image to me. While in the vicinity, I slid over a degree or so to NGC 4293. At low magnification, it was a large, faint, oval haze, with no nucleus or structure; featureless, like Messier 1. At higher power, the center was slightly brighter than the surrounding area.

A very interesting range of galaxies in such a small area.

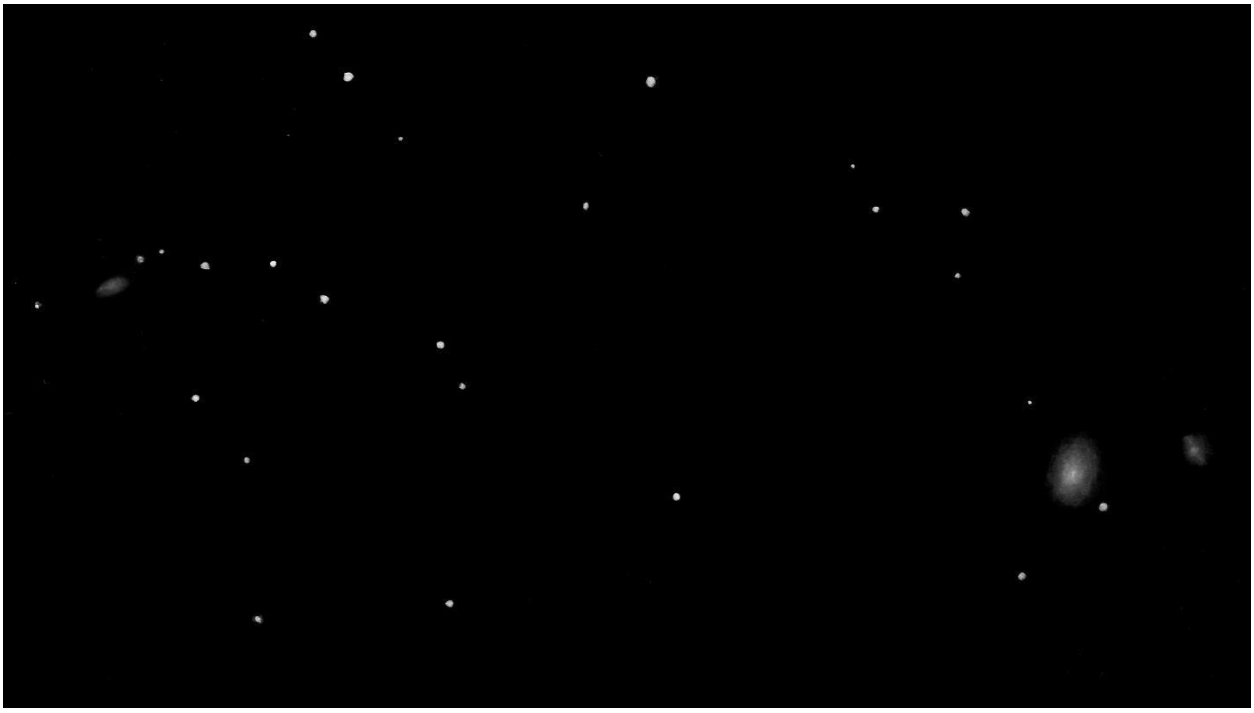
Sue French: Observer from New York



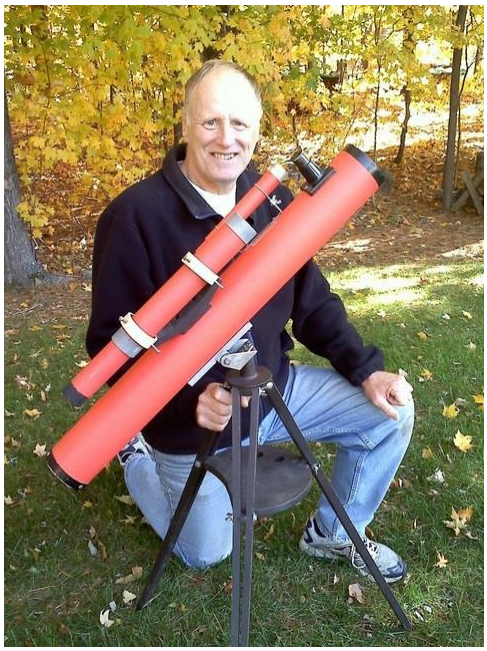
Roger and I corresponded about the galaxy NGC 4293, which is in the general vicinity of this month's targets. This inspired me to sketch the three galaxies together as seen through my 105mm refractor at 47×, with a true field of 99 arcminutes. North is up and east is to the right.

M85 is bright with a large brighter core that greatly intensifies toward the center. Its close neighbor NGC 4394 hosts a spindle-shaped interior with a small brighter bulge at its heart, all wrapped in a very faint halo. More distant, elongated NGC 4293 holds a slightly brighter center.

With more magnification, NGC 4293 is an interesting galaxy. Even at 76×, the little refractor teases out a subtle brightening that looks to me like a very shallow S curve or integral sign running the length of the galaxy. This shows better with my 10-inch reflector at 187× where the slight S shape of the broad core blends into the galaxy's slightly brighter edges, mainly along the west-northwest and east-southeast flanks.



Glenn Chaple: Observer from Massachusetts



M85 (NGC 4382) – Lenticular Galaxy in Coma Berenices (Mag: 9.1 Size: 7.1' X 5.5')

NGC 4394 Barred Spiral Galaxy in Coma Berenices (Mag. 10.9 Size: 3.6' X 3.2')

The last two Observer's Challenges, the 11th magnitude galaxies NGC 2859 (March) and NGC 3877 (April) were, well – challenges! If you'd like an easier target this month, we have something for you. If you'd like another challenge, we have something for you as well. The "easy challenge" is the 9th magnitude lenticular galaxy M85; the "challenging challenge" is its 11th magnitude neighbor, the barred spiral galaxy NGC 4394.

M85 is the northernmost Messier galaxy in the Virgo Galaxy Cluster and can be found about a degree ENE of the Magnitude 4.7 star 11 Comae Berenices. I described M85 as "easy," because it's relatively bright. I've seen it with a 3-inch reflector and a magnifying power of 30×. Here's a challenge. Can you capture it with binoculars?

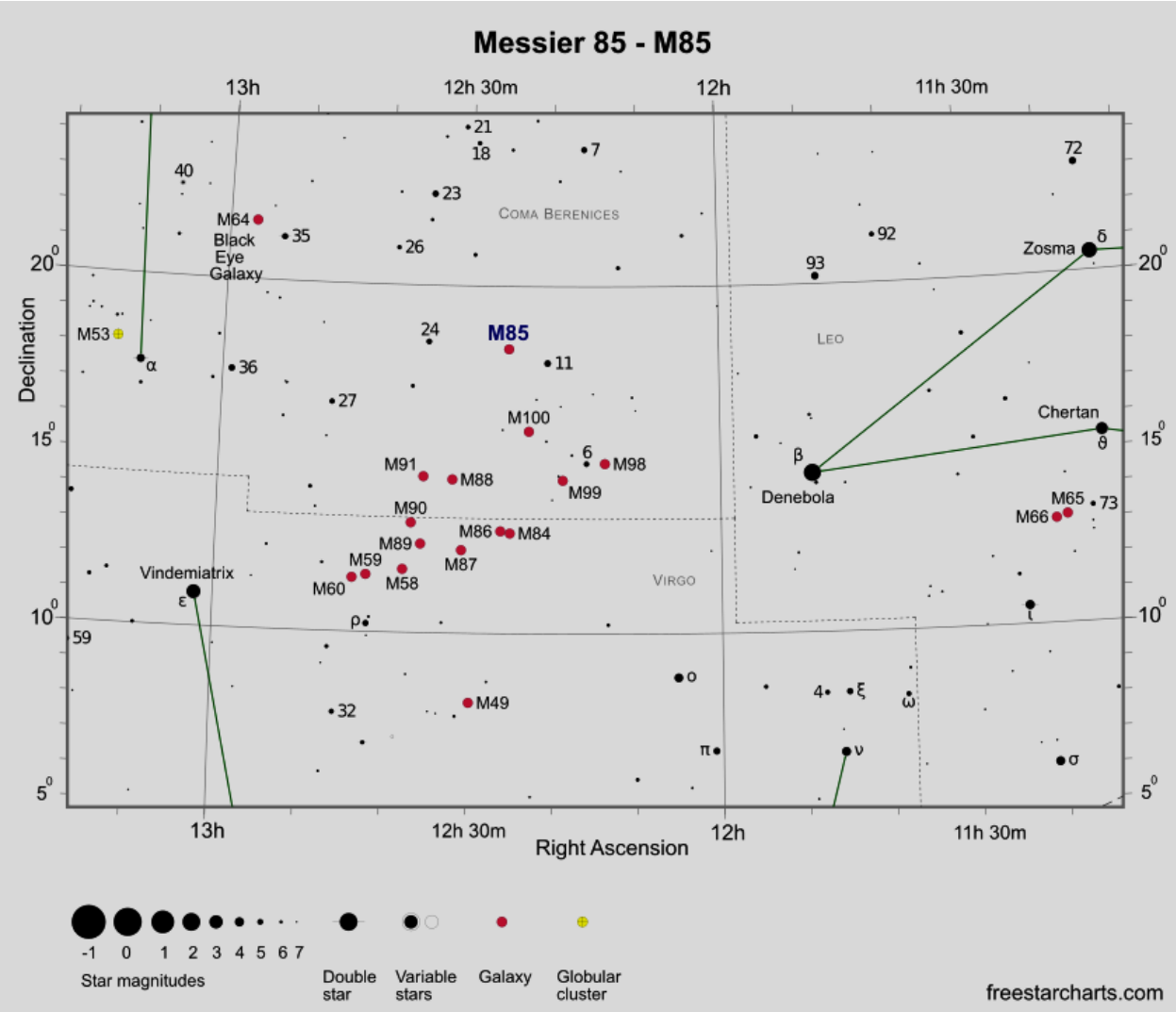
If you look 8.5 arcminutes east of M85, you'll see the faint glimmer of the barred spiral NGC 4394. Under dark sky conditions, a 10-inch scope will reveal the bar, which has a NW-SE orientation. If you're viewing NGC 4394 with a large-aperture scope, look for the outer halo, visible in the image by Mario Motta.

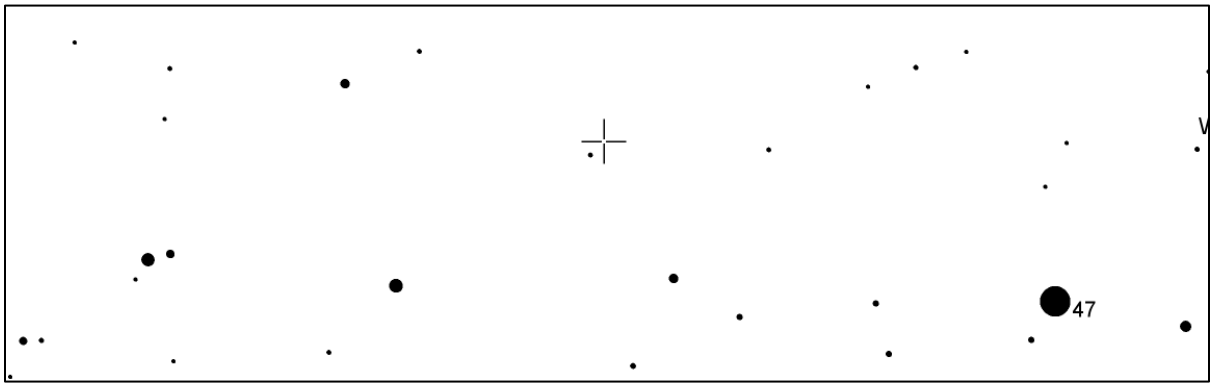
M85 was discovered by Pierre Méchain in early 1781. William Herschel picked up NGC 4394 three years later. Both galaxies are about 60 million light-years away.

Finder charts for Messier 85.

(Upper) From freestarcharts.com

(Lower) From AAVSO Variable Star Plotter. Stars plotted to magnitude 11. North is up in this 1° by 3° field. Magnitude 4.7 star is 11 Comae Berenices.





Vladislav Mlch: Observer from Massachusetts

Date: April 18 and May 13, 2020

Location: White Mountains National forest, New Hampshire

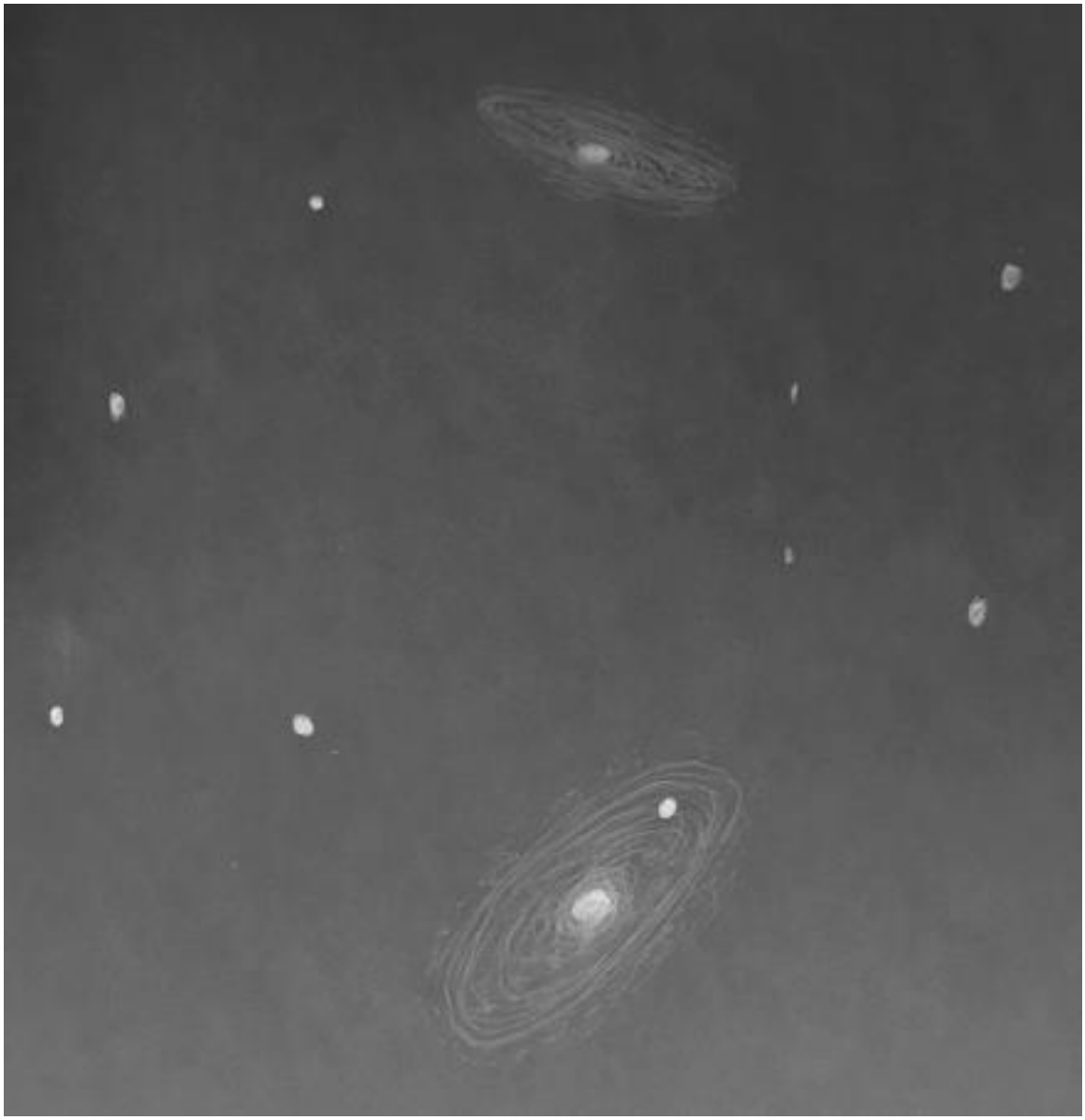
Conditions: Bortle 2, average seeing

Telescope: 22-inch f/3.3 DOB with 10mm eyepiece (185x, FOV=33′)

Filter: No filter

Notes: M85 (NGC 4382) and NGC 4394 are located among about a dozen of foreground stars. Even thou NGC 4382 is lenticular galaxy and NGC 4394 is a barred spiral galaxy they looked alike to me. Besides bright central regions I did not note any other details.

Pencil sketch as following:



Gus Johnson: Observer from Maryland

May 1985: 12×50 binoculars, fairly dim. Mostly round, with a brighter middle. 6-inch reflector (1967) both M85 and NGC 4394 very easy and bright. M85 @ 58× (1977) has a brighter center with an elliptical shape. A foreground star was noted at the edge of the galaxy @ 116×. 3-inch reflector @ 39× (1991) galaxy M85 is dim and diffuse, with a "fake" supernova.

Mike McCabe: Observer from Massachusetts

For the May Observer's Challenge I was able to view the galaxies M85 and NGC 4394 together in the eyepiece on the nights of May 13th and May 22nd.

On the 13th I used a 6″ refractor under a Bortle 6 sky, with a transparency rating of 3/5 and a seeing rating of 2/5. M85 was obviously brighter at the core, but no orientation was evident, nor was any structure such as arms seen. NGC 4394 was a significantly dimmer nebulous patch, with brightening towards the center seen with averted vision.

On the 22nd I used a 10″ Newtonian reflector under a Bortle 7 sky, with a transparency rating of 2/5 and a seeing rating of 2/5. In the 10″ a new star was visible embedded in the outer nebulosity, and the brighter core of NGC 4394 was now seen with direct vision. The poorer sky quality on the 22nd negated most of the advantage of wielding a larger instrument on the targets.

Observation Log - Object: M85 / NGC 4394

Date 5-18-20 / 5-22-20 /z Time 22:45 / 22:30 /z EDT Local Observing Location 42°N 71°W

Scope/Aperture 6" F8 Refractor / 10" F5 Reflector

Eyepiece 14mm + 12.4mm Magnification 86x + 104x

Filter — Seeing 2/5 Transparency 3/5 + 2/5

Temp 44°F Baro Pres. — Wind Calm

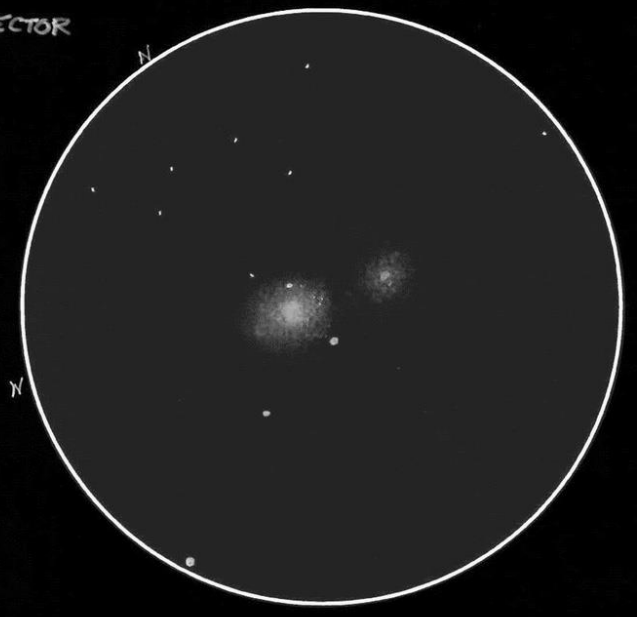
Comments:

6" refractor: M85 bright core w/significant nebulosity, no orientation witnessed. NGC 4394 a nebulous patch with brightening toward the center with averted vision.

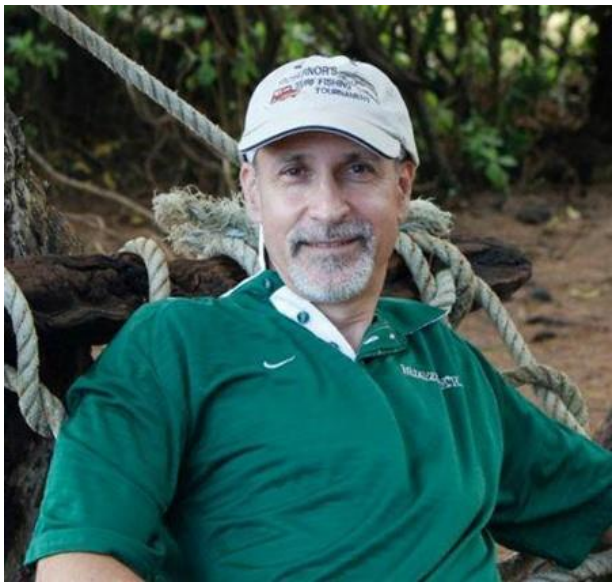
10" reflector: new star appeared embedded in M85 nebulosity, core of NGC 4394 also visible with direct vision. Transparency poorer during 10" observations, thus limiting advantage of aperture increase.

MTM

Orientation and/or Rotation



James Dire: Observer from Illinois



Located in Coma Berenices, M85 is a lenticular galaxy. Its integrated magnitude is estimated between 9 and 10. Because it is nearly face-on, M85 appears as an elliptical galaxy. Were it more edge on, its disk might be more apparent.

M85 was discovered by Pierre Méchain in 1781 and confirmed by Messier soon thereafter. The galaxy measures 6.9 by 5.4 arcminutes. The galaxy is 60 million light-years away.

Less than 10 arcminutes east of M85 lies the barred spiral galaxy NGC 4394. NGC 4394 shines at magnitude 11.3. The galaxy has a star-like core with a very bright bar running from northwest to southeast. While apparently close to M85 in the sky, in the literature distance estimates to NGC 4394 range from 39 to 121 million light-years away. The most reliable distance is 58 million light years away, putting it close to M85. Both galaxies have the same redshift; more evidence they are physically close in the heavens.

I took the wide field shot of M85 and NGC 4394 on May 24, 2020 using a Stellarvue 70mm f/6 Apo along with a 0.8× field flattener, focal reducer. The image was a 110-minute exposure using a SBIG ST-2000XCM CCD camera. The mount was a Celestron CGEM II.

In the image the galaxy pair reside on the left side (east) of the image. The shot was framed to include the nearly edge on spiral galaxy NGC 4293 which lies one degree away from M85 (right side of the image). NGC 4293 is a 10th-magnitude galaxy measuring 6.2 × 3.6 arcminutes in size. The bright star on the lower right side of the image is 11 Comae Berenices, which shines at magnitude 4.75. This is a binary star with the fainter component shining at magnitude 12.9 located 8.8 arcseconds northeast of the primary.

My second image has M85 and NGC 4394 centered. It was taken using an 8-inch f/8 Ritchey–Chrétien with 0.8× focal reducer/field flattener. This 50-minute exposure also used a SBIG ST-2000XCM CCD camera. This image shows the bright core of M85 and its spiral-armless halo. NGC 4394's bar is clearly visible as well as its faint spiral arms.

All of the stars in the image embedded in M85's halo are foreground objects. The brightest star, just southeast of M85's halo is magnitude 10.5. The small, faint smudge 10 arcminutes to the east of M85 is IC 3292. It is magnitude 15.3. This galaxy is visible in the wide field shot of M85. Just on the south edge of M85's halo lies a 17th-magnitude galaxy PGC 40512, barely visible on the narrow-field shot.

Chris Elledge: Observer from Massachusetts

On February 22nd @11:47pm EST, I used a 10-inch f/5 refractor to observe M85 from the ATMoB Clubhouse. Sky conditions were: Bortle Scale 6; NELM 5.0; Transparency: Average; Seeing: Average.

11 Comae Berenices was barely naked-eye visible with averted vision. I was able to use that star to locate M85 since it is a little over a degree to the West of the galaxy. At 36× (35mm) M85 is a faint smudge with a single faint mag. 10 star to its SE (BD +18 2609). Its companion galaxy NGC 4394 is very difficult to detect against the background. A ring of 6 bright mag. 7 to 9 stars surround the pair of galaxies (HD 108468, HD 108547, HD 108300, HD 108187, HD 108022, & HD 108023).

At 115× (11mm) there are 3 stars in an arc ranging from mag. 10 to 13 (TYC 1445-1858-1, BD +18 2609, & GAIA 3947037565924683008). The middle and brightest star in the arc has M85 just to its NW. The third and faintest of the arc has NGC 4394 to its North. M85 is the brighter of the 2 galaxies and appears slightly larger. There is a very faint star just to the North of M85's core which is contained within the glow of the galaxy. M85's diameter looks about the same as the distance between its core and BD +18 2609. There is a slight North to South elongation to the galaxy. NGC 4394 is much more difficult to detect, but it seems to have a NW to SE orientation.

Taking the power up to 270× (4.7mm) M85 is easy to see even with direct vision. With averted vision, the faint mag. 13 star embedded in it is visible. It still seems to have a North to South elongation, but that could be affected by the embedded star since it is on the same axis. NGC 4394 is still visible with averted vision. It seems to have a NW to SE elongation in the core possibly from a bar.

Mario Motta: Observer from Massachusetts

M85 and NGC 4394 image taken through 32-inch telescope for two hours integration time, with my new ZWP ASI6200 camera, processed in PixInsight. It is 60 million light years away, has faint shells in its structure, and a cloud of globular clusters swarming around it.

NGC 4394 is another nice example of an ansae type barred spiral.

Joseph Rothchild: Observer from Massachusetts

I observed M85 and NGC 4394 on May 21, 2020 on Cape Cod with my 10-inch reflector. M85 was easy to locate by making a square out of the three stars forming the constellation Coma Berenices. M85 showed a condensed core, and there was a field star overlying the galaxies outer glow.

Nearby NGC 4394 formed an isosceles triangle with M85 and a field star and was approximately 1/4 the size and brightness as M85. No structure could be seen, nor the central bar.

Richard Nugent: Observer from Massachusetts

For many observers, the sheer number of galaxies in the Virgo-Coma Cluster make this area of the sky a difficult one to navigate! I enter these waters by finding the large T-shaped asterism (containing 6 Comae Berenices) just to the east of Denebola, Beta Leonis. To find our monthly challenge, I push my telescope north and east to the 4.7-magnitude star, 11 Comae Berenices. Messier 85 can be found a little over a degree to the east and a little north of this star. The galaxy is bright and relatively easy. I was able to observe this object many times using my 10-inch and 20-inch scopes. In addition, there are several neighboring galaxies worthy of our attention.

Observing in these COVID times has been limited to my Framingham home with its typical 4.8-magnitude skies. One evening in April was particularly clear and offered a NELM closer to magnitude 5.1! On that evening I was using the smaller scope but was able to make observations of not only M85 but it's neighbors, NGC 4394, 4293, and 4450.

In the 10-inch scope, M85 shows a bright nucleus and an extended diffuse glow. I could see no hint of any structure. This galaxy is adjacent to the 10.4-magnitude star, BD +18 2609 and is involved with a fainter, 13.2-magnitude star. This fainter star is near the galaxy's nucleus and might easily be mistaken for a supernova!

Just 7′ 38″ to the East lies the 10.8-magnitude, barred spiral, NGC 4394. In the 10-inch scope under the 5.1-magnitude skies this galaxy could be seen with direct vision. It appeared as a faint, uniform, diffuse patch of light. Under the slightly brighter skies, this galaxy took on a ghostly appearance…it's there most of the time, but its location and borders are sometimes difficult to pin down.

In the 20-inch scope both of these galaxies are quite pretty. In the larger scope, NGC 4394 was easier and could be observed with direct vision. No structure could be seen in either galaxy.

I visited two other neighboring galaxies. Just 1° west of M85 a stream of five, 10th- to 12th-magnitude stars lead to the 10.8-magnitude-galaxy, NGC 4293. This 6.2 × 3.7 arcmin, low-surface-brightness galaxy appeared as an extremely faint diffuse oval glow. Ghostly in the 10-inch scope but easier with the 20-inch. Still, a darker sky would make this galaxy pop out!

Moving 1.3° south-east from M85 lies the 9.9-magnitude spiral galaxy, NGC 4450. This object is brighter than NGC 4293 but still appeared ghostly in the 10-inch scope. In the 20-inch the object was more impressive. The galaxy appeared brighter in the middle, surrounded by a uniform, diffuse glow that was easy to view with direct vision.

Before leaving this area be sure to visit the beautiful double star, 24 Comae Berenices. Just 3½ degrees east of 11 Comae Berenices, this pair of orange and blue stars, magnitudes 5 and 6.3, are separated by 20 arcseconds.

Roger Ivester: Observer from North Carolina

M85 and NGC 4394

Date: April 16, 2020

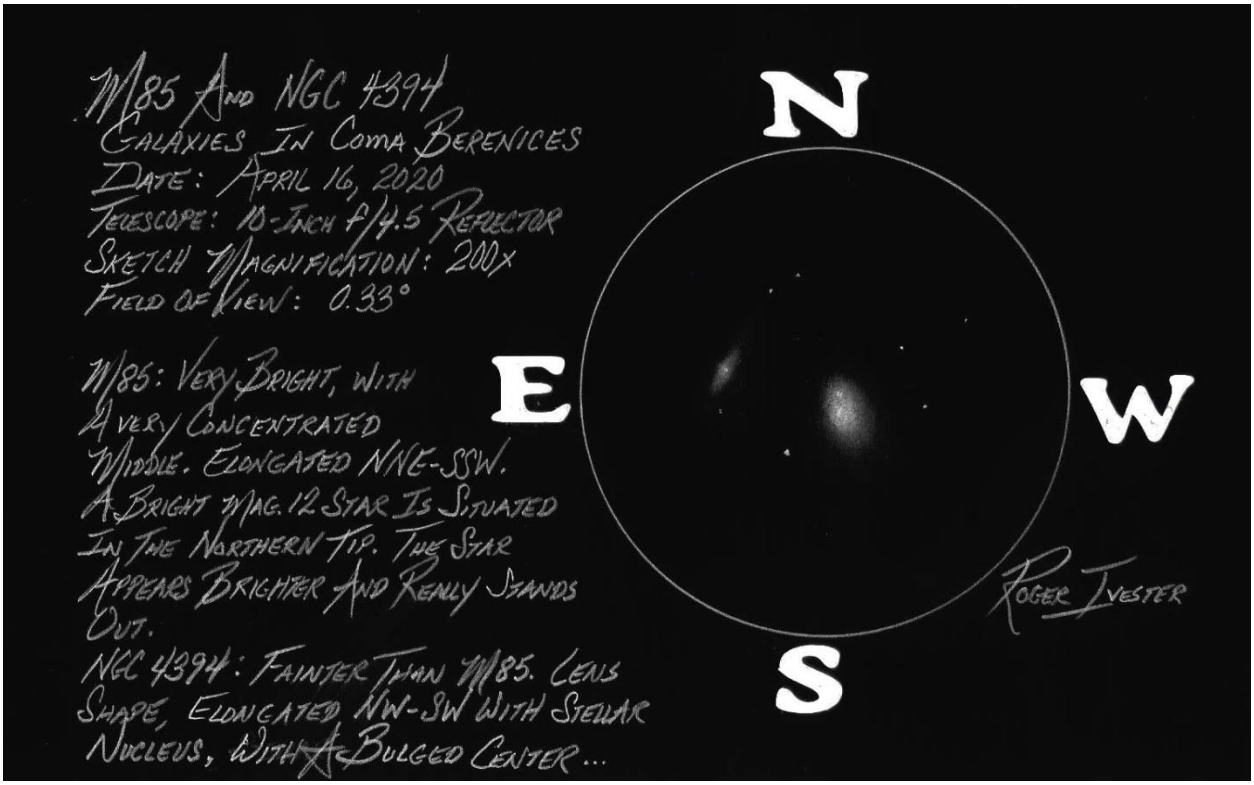
Telescope: 10-inch f/4.5 reflector

Sketch Magnification: 200×

Field of View: 0.33º

M85: A bright, high surface brightness galaxy with a subtle elongation, oriented NNE-SSW. The galaxy is much brighter and very concentrated in the central region with a faint outer halo. A mag. 12 star lies on the north tip, seemingly a bit brighter, and it stands out very well at all magnifications.

NGC 4394: Smaller and much fainter than Messier 85, with a bright stellar nucleus, lens shaped and elongated NW-SE.



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

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