MONTHLY OBSERVER'S CHALLENGE

Compiled by:

Roger Ivester, North Carolina

&

Sue French, New York

May 2022

Report #160

Messier 106, Galaxy in Canes Venatici

Sharing Observations and Bringing Amateur Astronomers Together

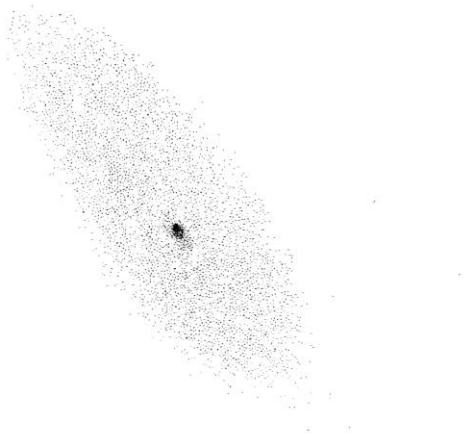
Introduction

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:

Pierre Méchain discovered this galaxy in July 1781. It was added to the Messier catalog in 1947 at the suggestion of Helen Sawyer Hogg, who found a letter from Méchain to Daniel Bernoulli that included four new nebulae he'd found, including our target for this month.

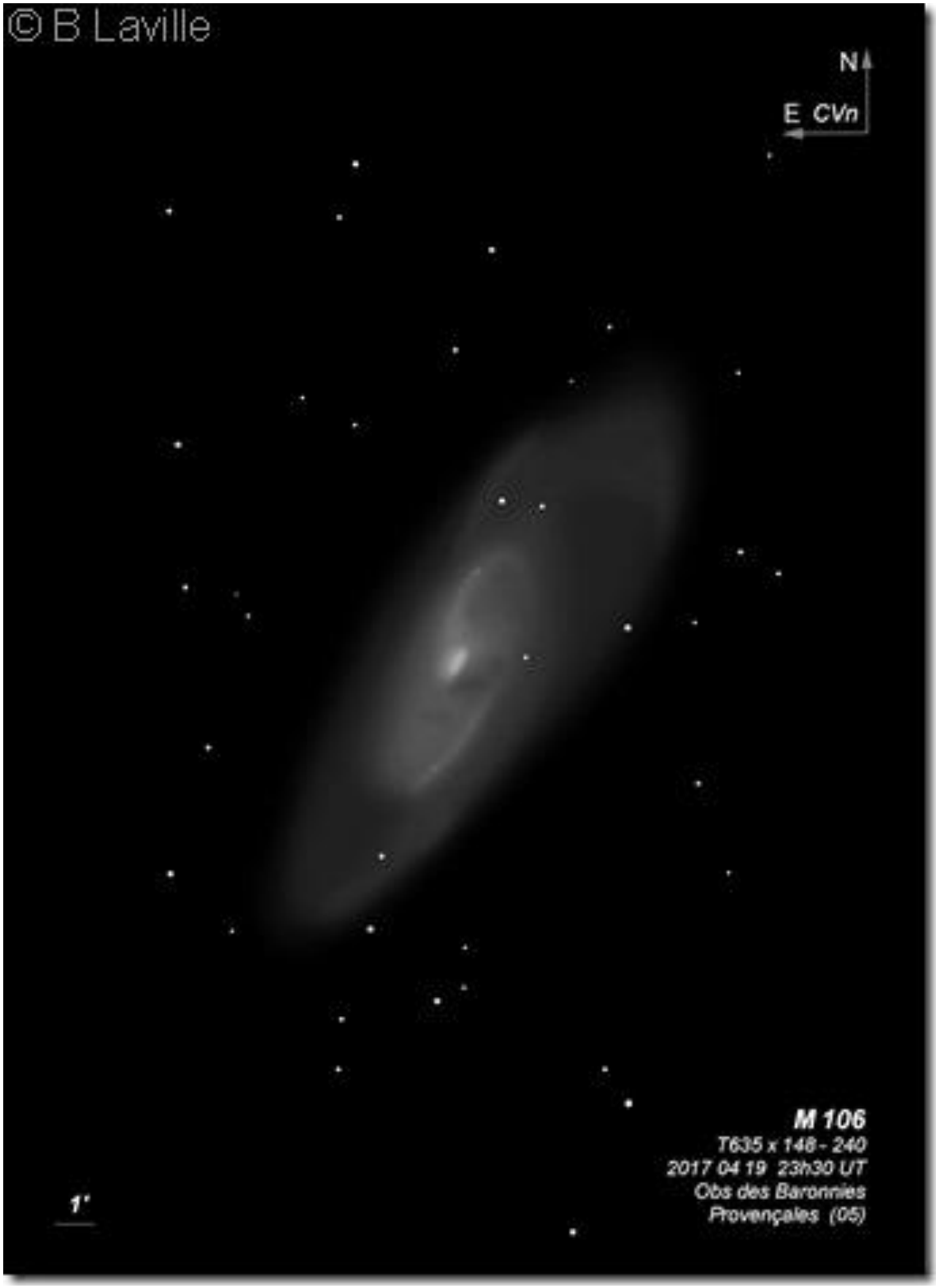
Fig. 55.



John Herschel observed M106 several times and made this sketch of the galaxy, which was included in his: *Observations of Nebulae and Clusters of Stars, Made at Slough, with a Twenty-Feet Reflector, between the Years 1825 and 1833*.

In 1918 Heber Curtis published descriptions of M106 and 761 other objects photographed at Lick Observatory in the *Publications of Lick Observatory* , Volume III, Part I. The image below was taken with Lick Observatory's 36-inch Crossley Reflector.

Bertrand Laville: Observer from France



Duration of observation:	80 mins
Date of sketch:	Apr 19, 2017 11:30 PM UT
Viewing location:	Observatory of the Baronnies Provençales
Instrument :	TN 635 Dobsonian Obsession
Main eyepiece:	Tele Vue Ethos 21mm
Magnification:	148×

As with all sightings on the three nights of April 2017, the mediocre to poor seeing prevented me from "pulling out" all possible detail from the central regions. But I noticed that the central dark area of my 2009 drawing was way too contrasty and focused.

Date of sketch: May 28, 2009 23:15 UT
Viewing location: Puimoisson le Petit Telle
Instrument: TN 635 Dobsonian Obsession

Nagler 20mm 156×
It's a magnificent galaxy, which I didn't exceptionally memory with the LX254. This is the best magnification for the study of the external halo. It is more swollen on the SE side and better held, while thinner on the NW side, but very clear in averted vision.

Ethos 13mm 240×
This is the best magnification for the "normal" halo, i.e. the ellipse circumscribed to the two whorls. There too, a little more consistent.

Ethos 8mm 390×
This is the magnification necessary to detail the "S" formed by the central condensation and the two whorls, the whole of the "S" is L5. The two whorls are thin along their entire length, and gradually weaken towards the long axis of the galaxy. The SE spire presents two luminous condensations on either side of an HII region, absolutely stellar view, and moreover taken for a star of m16v.

Nagler 4.8mm 650×
You need this magnification to analyze the heart of the central condensation and the dark band that is attached to it at the SSE. This heart is very concentrated, with a, non-stellar center. The dark band is very clear. Three stars on the outer halo, 2 to the NW, mag 15 and 16v, and 1, mag 14v to the SE. M106 is truly a magnificent galaxy.

You can see more detailed descriptions and more of Bertrand's sketches at: http://www.deepsky-drawings.com/

Uwe Glahn: Observer from Germany

Object: M106

Telescope: 16″ f/4 Newton

Magnification: 180×-257×

NELM: fst 6m5+

Seeing: II-III

Location: Sudelfeld

Sketch follows.

You can see more of Uwe's sketches at: http://www.deepsky-visuell.de/

Rony De Laet: Observer from Belgium

Messier 106 is a bright object and an interesting galaxy. It pays off to use various magnifications to examine the different features that this beautiful galaxy has to offer. The nucleus is nonstellar. The luminous core is elongated and has a dark boundary on its SW side. The tips of the core abruptly drop in luminosity as they both bend clockwise into a long spiral arm. The N arm is the brightest and it has two consecutive branches to the W. The S arm appears smooth. The galaxy's halo is elongated and surprisingly large. A very faint star resides in the outskirts of the halo, W of the nucleus.

NGC 4248 appears as a small elongated haze next to a faint star at the NW edge of the FOV.

Site : Bekkevoort, Belgium (51° N)

Date : May 15, 2021

Time : around 23.UT

Telescope : Taurus 16″

EP: Morpheus 9mm 76°, 200× / 6.5mm 76°, 280× / 4.5mm 76°, 400×

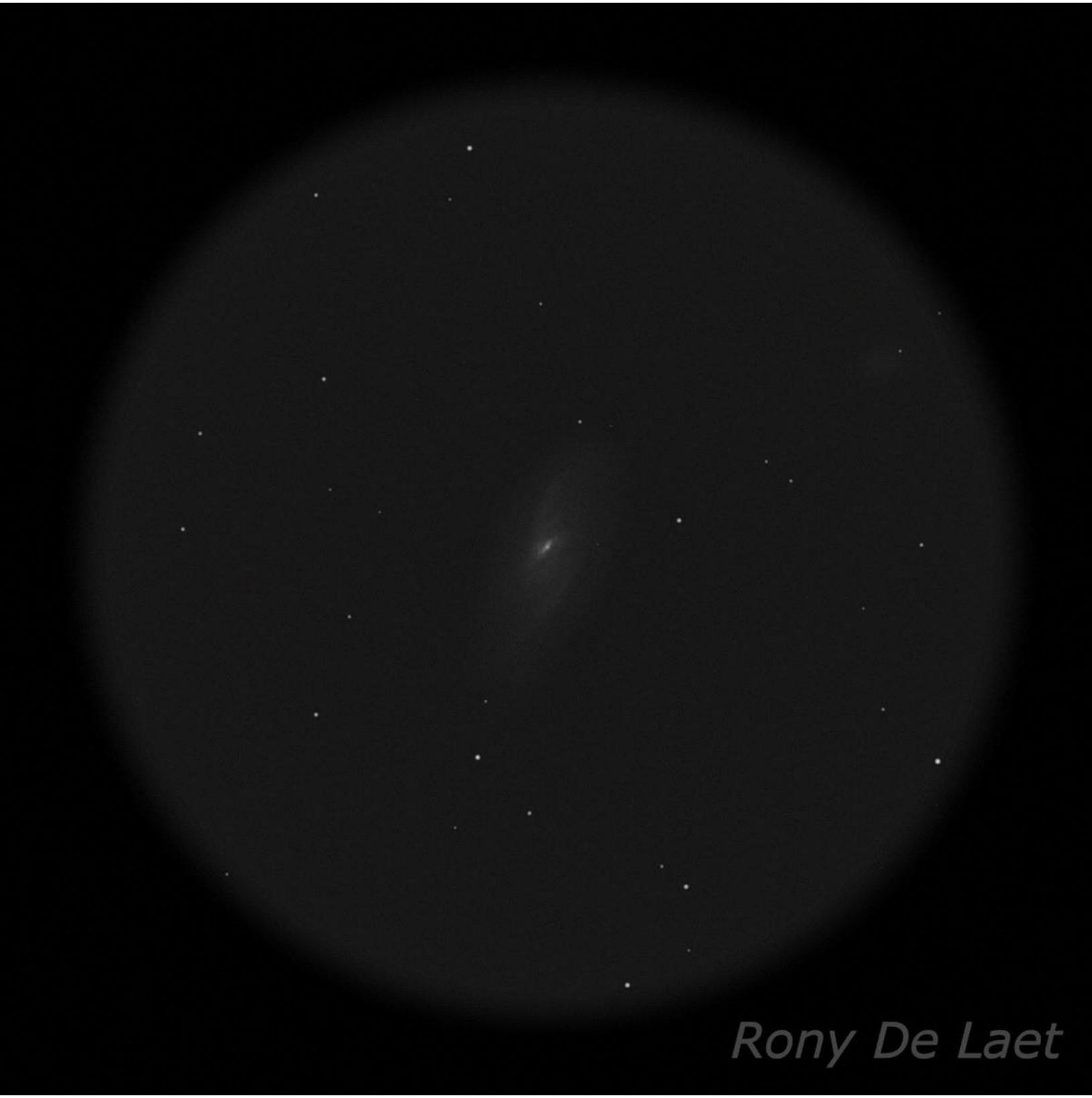
Filter : CLS

Seeing : 4/5

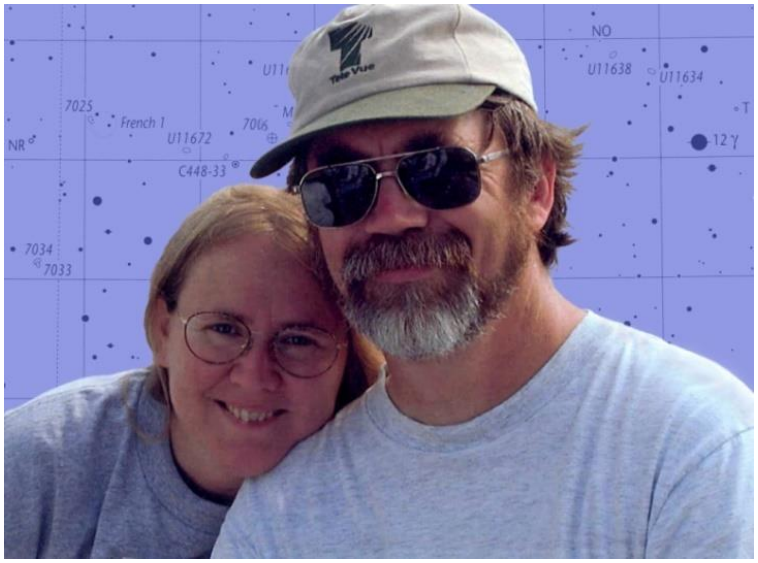
Sky brightness : 19.8 magnitudes per square arc second near zenith (SQM reading).

Sketch Orientation: N up, W right.

Digital sketch made with Corel Paint Shop Pro X2, based on a raw pencil sketch.


Rony De Laet

Sue French: Observer from New York



N

E

Sketch : 130mm refractor, 164×
Bright elongated core with bright nucleus.
The sketch shows only the innermost bright region of the galaxy. None of the outer halo was seen.

Glenn Chaple: Observer from Massachusetts

Messier 106 Spiral Galaxy in Canes Venatici (Magnitude 8.4; Size 18.6′ × 7.2′)

M106 was a late entry in the Messier Catalog, having been added by the American-Canadian astronomer Helen Sawyer Hogg in 1947, 130 years after Messier's death. It was originally discovered by Messier's contemporary Pierre Méchain in 1781, who quite likely would have added it to a future edition of Messier's Catalog.

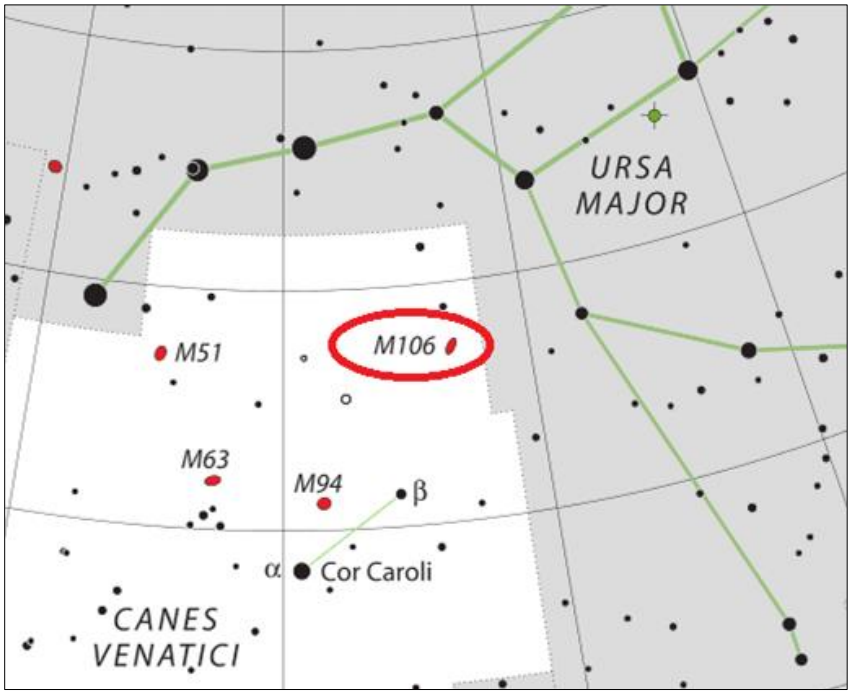
The 2000.0 celestial coordinates for M106 are: RA $12^h18^m57.5^s$, Dec $+47^o18'14''$. I found it by star-hopping 5 degrees ESE from the second magnitude star Phecda (gamma [γ] Ursae Majoris) to 5th-magnitude 5 UMa. A hop 3 degrees south and slightly west brought me to 5th-magnitude 3 UMa. M106 was spotted just 2 degrees further south.

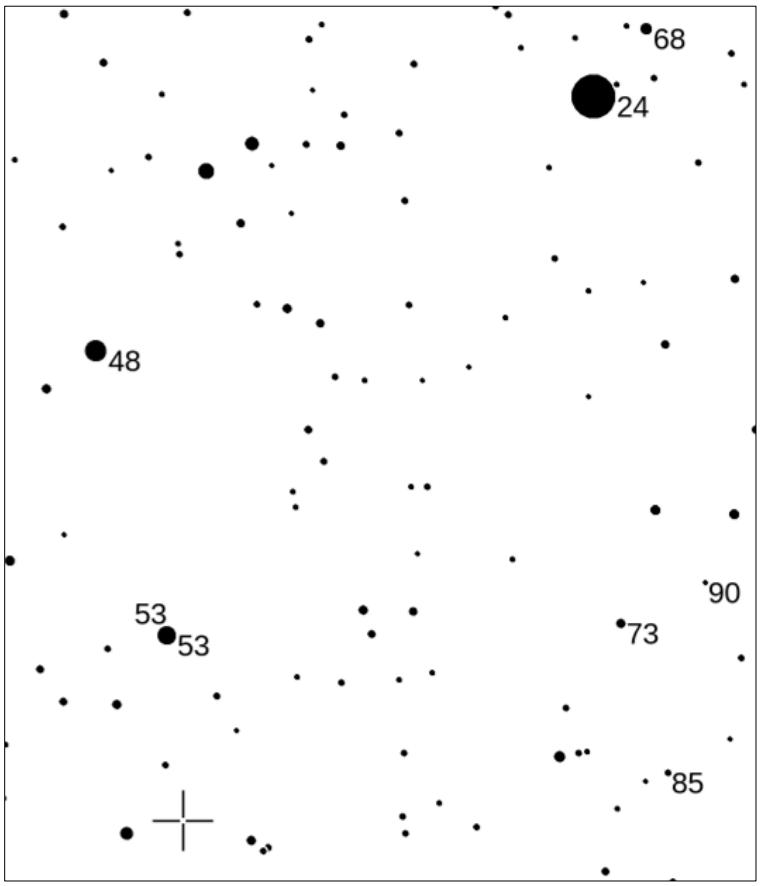
At magnitude 8.3, M106 was easily seen as an oval-shaped patch of light in my 3-inch f/10 reflector at 30×. A bright, irregularly-shaped nucleus was visible in my 10-inch f/5 reflector and a magnification of 141×.

M106 is classified as a SABbc type galaxy- a form intermediate between spiral and barred spiral galaxies. Due to its energetic nucleus, likely a result of activity generated by a massive central black hole, it is also classified as a Seyfert galaxy. It lies approximately 24 million light-years away. With a diameter of 133,000 light-years, M106 is similar in size to the Andromeda Galaxy.

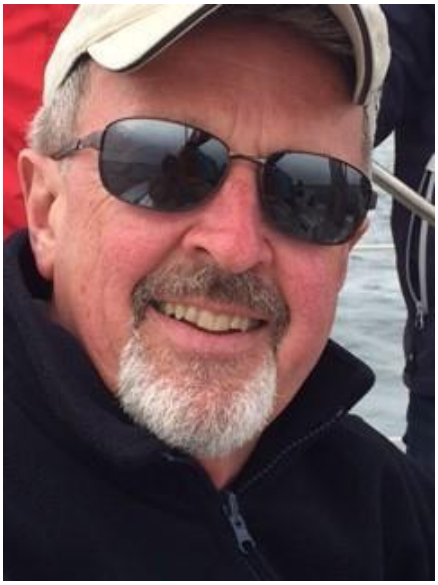
Messier 106 Finder Charts

(top) From messier-objects.com – adapted from IAU/Sky & Telescope chart
(bottom) Created using AAVSO's Variable Star Plotter. Numbers indicate stellar magnitudes, decimals omitted. Magnitude 2.4 star is Phecda (gamma [γ] Ursae Majoris). Stars plotted to 9th magnitude. North is up in this 9 by 7 degree field.


URSA
MAJOR
M51
M106
M63
M94
β
α
Cor Caroli
CANES
VENATICI


68
24
48
90
53
53
73
85

John Bishop: Observer from Massachusetts



On May 29, 2022, I observed M106 (a/k/a NGC 4258), a spiral galaxy in Canes Venatici. I observed with an 8.25 inch f/11.5 Dall-Kirkham reflector, at magnification of 48× to 192×. It is a portable setup, with a motor driven equatorial mount, without go-to. While waiting for the late sunset, I took the time to properly polar align the mount, which I don't always do for visual observing. I observed from the ATMoB Clubhouse in Westford, Massachusetts. The sky was clear and the seeing was steady. Transparency was fair, but probably degraded as the night went on. Dew appeared on equipment late in the evening. Dew heater strips kept my optics more or less clear. Temperatures had been pleasantly warm during the day, then dropped to 56 degrees F. by 1:00 am. Mosquitoes, uncharacteristically, were not much of an issue. I did apply DEET to skin and clothing, the usual precaution, but, at this location, that isn't always 100% effective, especially if you miss even a small area of skin. Care must be taken not to let the oily solution pass from one's hands to eyepieces, etc.

M106 is a bright, well known object that I have observed in the past. It is easy to see once you are on it, due to its size and brightness. The challenge to locating it by star-hopping is that there are few visible landmark stars in the vicinity, especially in the (barely) magnitude-5 skies at this site. To begin, I confirmed the alignment of my Telrad and 7×50 finder. Then I put the Telrad bullseye on my estimated position for M106. A lucky shot. My finder, with a 6.3 degree FOV, framed a rough right triangle formed by 3 Canes Venatici, a sixth magnitude star, and a small, unnamed, loose cluster of brilliant white stars (how could stars so faint be so bright?). In the finder, M106 was a hazy patch lying along the short leg of the triangle.

In the eyepiece at 48×, M106 was a large, uniformly bright oval halo. There was slight brightening in the center, but no distinct core. With increased magnification, dark areas appeared, and the halo was no longer uniformly bright. At the same time, the bright center became more prominent. The boundaries of the center, and its overall shape, were not well defined. I did not make out more definite structure than this.

Luginbuhl and Skiff report that nearby companion galaxy NGC 4248 is "visible" in a 12 inch scope. It is small and faint. I looked for it, but was unable to see it. I also did not see NGC 4217, which is near the little cluster mentioned above. These objects are near the limit of visibility in my scope, and transparency was not optimal this night. Possibly I did not spend enough time on them. I did spend some time looking for June's Challenge object, NGC 5474, and I was able to see it, barely, this night. That is the subject of next month's report.

Joseph Rothchild: Observer from Massachusetts

I observed spiral galaxy M106 with my 10× reflector under dark, but hazy skies on Cape Cod. Transparency was poor. This is a fairly bright spiral and was easily found star hopping from 5 Canes Venatici. It was well seen at 53× and 102×.

Little detail was seen visually. There was a stellar core and L/W ratio of about 2:1. It was an oval, but comparison with photographs confirmed that I was only seeing the inner part of the galaxy and not the faint outer spiral arms.

Mike McCabe: Observer from Massachusetts

OBSERVATION LOG - OBJECT: M106 / NGC 4258

DATE 5/21/22 /Z TIME 21:45 /Z EDT LOCAL OBSERVING LOCATION CENTENNIAL FIELD

SCOPE/APERTURE 120mm ACHROMAT

EYEPIECE 32mm MAGNIFICATION 32x

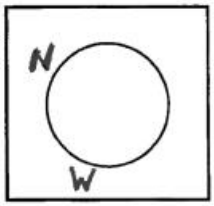
FILTER — SEEING 2/5 TRANSPARENCY 2/5

TEMP 70°F BARO PRES. — WIND CALM

COMMENTS:

UNSEASONABLY WARM, VERY DEWEY, HAZY SKY AFFECTING TRANSPARENCY.

STILL, THE GALAXY WAS FAIRLY EASILY SEEN AND THE POSITION ANGLE WAS ABLE TO BE DISCERNED.



ORIENTATION AND/OR ROTATION

May 21st, 2022 – Evening Into Night:

The temperatures during the day soared into the low 90's on what was forecasted to be the first of two days of exceedingly and unseasonably high temperatures, and by suppertime I'm feeling the effects. My mind may have its days where it wants to deny my place on the scale of life, but my body sure puts in a big effort these days to set it straight. As I chowed down on an exceptional dish of fresh grilled salmon, rice medley and broccoli spears I was starting to rethink my bigshot thoughts of a day ago when I put out a notice to the group about gathering to observe at the field tonight. But in my heart of hearts I know we have to take advantage of the clear nights presented to us. Just for kicks I put a sweatshirt that would likely never get used in the truck and headed over to Norwell.

As usual, I'm one of the later arrivals for an observing gathering and when I get there Louis has got his big Dob almost all assembled, Mike has got his scope and camera ready to go, and Bob and Steve are meandering around the court in the early twilight. There's still plenty of time before the observing can begin so I take it slow in setting up the rig I've dubbed the "truck scope", so named because it's a setup that rides perpetually in the back seat from where it can be deployed anytime, anyplace. It's actually a pretty competent gathering of bits and pieces sourced from Craigslist finds and stuff that was included with other purchases, and although not 'premium' by any version of the definition, it's still not bad.

When darkness finally arrived the court became a quiet beehive of activity. Louis was wielding actual wrenches and screwdrivers on his optics in an effort achieve precise collimation, Mike was going through the steps required to land tiny targets in the sky on the tiny chip in his camera, Bob was supervising the both of them and making sure they did it right, and Steve found that lying flat on his back in the middle of the court improved his binocular experience. Me, I was fiddling with the too-small setting circles on the LX70 mount in an effort to land the dim Observer's Challenge object in the eyepiece.

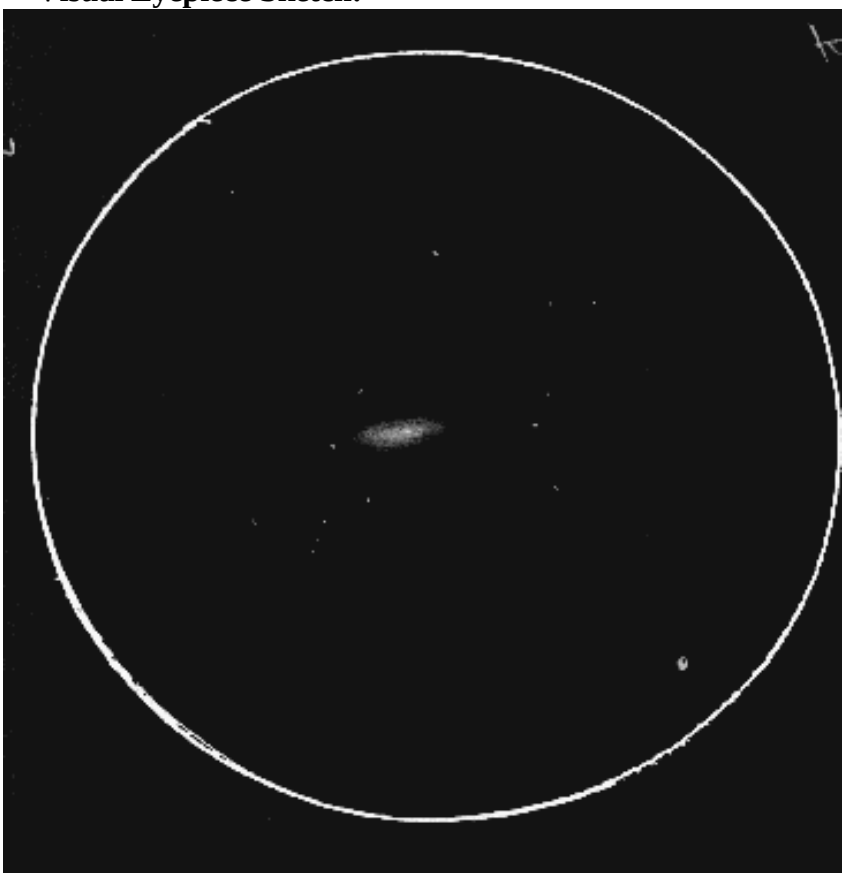
As for the Observer's Challenge object, this month it was the galaxy M106 in Canes Venatici. At magnitude 8.5, M106 is a reasonable target from the skies of Centennial Field in Norwell, MA, which at its very best is never better than a category '6' on the Bortle Scale. This particular night was not the best that we'd seen there, and I pegged the transparency at a 2 out of 5, with 5 representing the best it can get. Regardless, the galaxy was nearly 82° above the horizon and was well seen in the eyepiece of the 120mm refractor that I was using to view it. The LX70 GEM that the scope was riding on is a CG5-class mount, which on targets at this altitude puts the eyepiece way down towards the ground. It's actually too low for the observing chair which just tips forward when you try to sit in it at that height, so on my hands and knees I was to get my sketch. I was happy to be able to discern the position angle orientation of the galaxy, and all things considered I thought it was a good observation.

In the end a good time was had by all. Louis resolved most of his collimation issues and then reveled in the murky sky as he galaxy-hopped around behind the lion. Mike found that minimal focuser adjustments made maximal improvements in his EAA practices, Steve chased satellite after satellite across the sky, and I got my observer's challenge observation. We then spent some time sharing the views of various targets with each other, and an hour later we were all broken down, packed up, and headed home. And just in case you were wondering, the sweatshirt never did get worn!

Larry McHenry: Observer from Pittsburgh, Pennsylvania

Located in the spring constellation of Canes Venatici, 'The Hunting Dogs', spiral galaxy M106 was discovered by Charles Messier's associate Pierre Méchain in July of 1781, and is located near the 5th-magnitude star 3 CVn. It is about 24 Million light-years distant, and is estimated to have a diameter of about 135,000 light years.

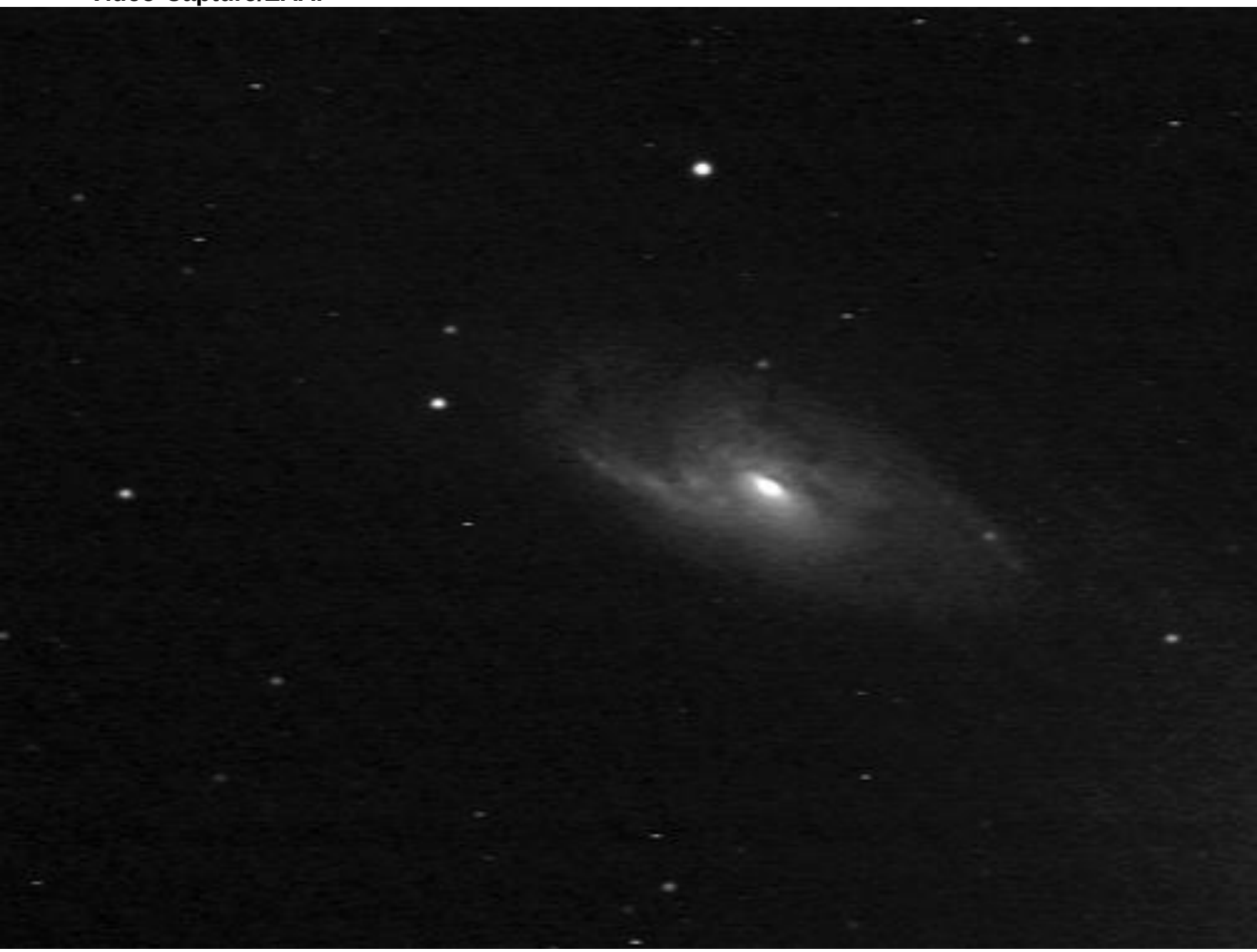
Visually in the telescope, M106 has a large inclined oval shape with a bright central core, and star-like nucleus. **Visual Eyepiece Sketch:**



06/09/1991 from amateur observatory near Pittsburgh, PA, using an 8" f4.5 Dob Reflector and 16mm eyepiece (57×).

Using EAA techniques, M106 displays nicely in any type of optics. It is a fairly bright inclined spiral, displaying dark lanes and knots, with tight diffuse arms on either end of the elongated galaxy's core.

Video-Capture/EAA:



05/09/2016: from Cherry Springs State Park, PA, with an 8″ SCT @ f/6.3 on a CGEM Mount, using an analog video-camera & IR filter @ 35 seconds, unguided single exposure.

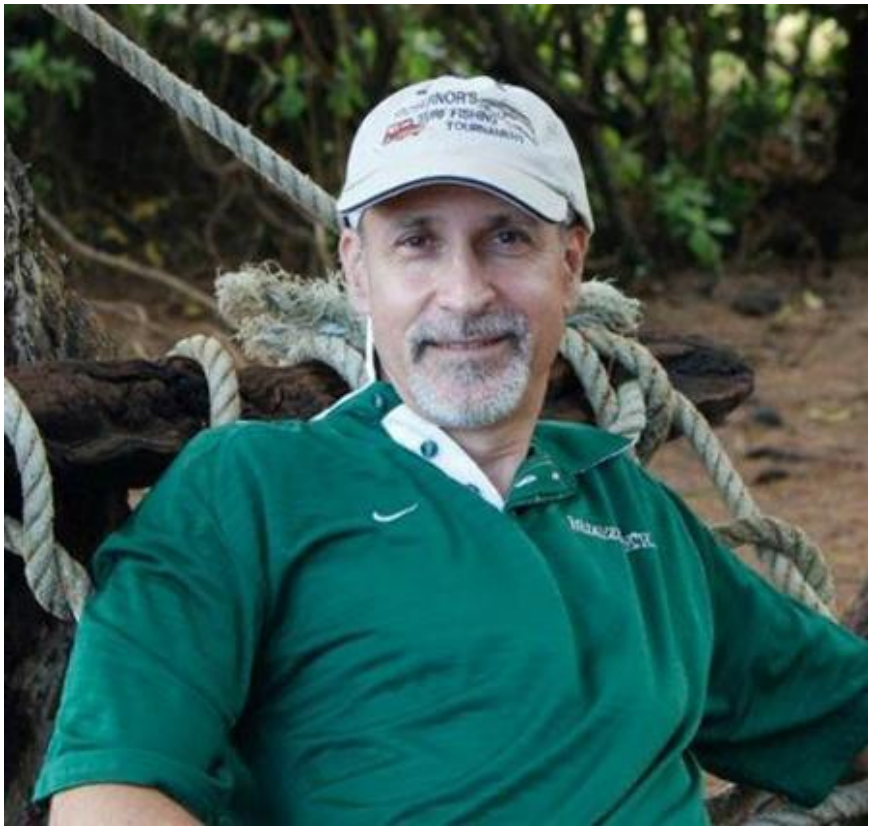
Mario Motta: Observer from Massachusetts

During the second week of May, I spent all of one clear night capturing M106 in color. A difficult object, though the center is relatively bright, the faint blue outer arms are exceedingly faint. So I actually then added my Lum images from 3 years ago to last week's images, thus a total of about 3 hours Lum, 1 hour each of Red/Blue/Green each, and then I added H alpha 1 hour as well, so this is a total of 7 hours imaging.

Quite a bit of processing to get this just right, redone several times! Those outer arms are very difficult to obtain. However, I learned quite a bit on this one (and I have been imaging for more than 30 years), which will make my next set of galaxies much easier.

M106 is 25 million light-years away, and it is a Seyfert active galaxy. When adding the Hydrogen alpha overlay, I was surprised to see a strand of gas coming out of the nucleus. You can see it in my image left upper of center. At first I thought may be artifact, so looked at professional images, and the Hubble view… that red sprite of gas is a real structure (very well seen by Hubble in fact), part of the active center !!
This was gratifying to see, and my color matches the Hubble and others so I think I did this correctly. Again, the monthly object has fascinating secrets to show.

James Dire: Observer from Illinois



Date/Location	April 19 & 21, 2020 Jubilee College State Park, Illinois
Camera and Settings	SBIG ST-2000XCM CCD camera -20°C
Telescope	8-inch f/8 Ritchey–Chrétien Cassegrain (with a Televue 0.8× focal reducer/field flattener yielding f/6.4)
Mount	Paramount MyT
Exposure	180 min (18 × 10 min)
Processing	CCDOpts, Image Plus 6.5, Photoshop CS6
Other	Magnitude 10.0 galaxy in Ursa Major, 4.0 × 1.7 arcminutes in size.

Phil Orbanes: Observer from Massachusetts

My image of galaxy M106 in Ursa Major It includes 18 hours of imaging taken in 2014,15,16 and again last month. I had a pretty good image by 2016, but the real challenge of M106 is to reveal the faint area between its colorful core and bright extended outer arms. I hadn't quite achieved this. So I decided to add more imaging time before reprocessing and submitting to the Observer's Challenge report. I was able to bring out the faint areas and also the unusual Ha jets perpendicular to the plane of the galaxy, caused by its very active core and supermassive black hole. Also visible is NGC 4248, one of M106's companion galaxies.

I used a 14-inch PlaneWave reflector and FLI 16803 CCD camera. The exposure time was divided evenly between R, G and B, Ha filters.

David Rust: Observer from Bloomington, Indiana

Image specifications:

TPO R-C 8-inch f/8.0

ZWO ASI2600 Pro Color CMOS camera

iOptron CEM40 w/iPolar mount

Hutech IDAS HEUIB-II filter (RGB narrow bands plus Ha, Hb, OIII, Na)

ASIair Pro controller

PixInsight for first stretch, the rest in Photoshop

20X300sec subs for 1:40 integration

The following image was made from my driveway under a Bortle 4 sky.

Sameer S. Bharadwaj and Andrea Bergamini: Observers from Massachusetts

Collaborators: Sameer Bharadwaj and Andrea Bergamini
Object: M106
Equipment: 10″ RC at 1600 mm
Location: Remote observatory in Spain near Fregenal de la Sierra

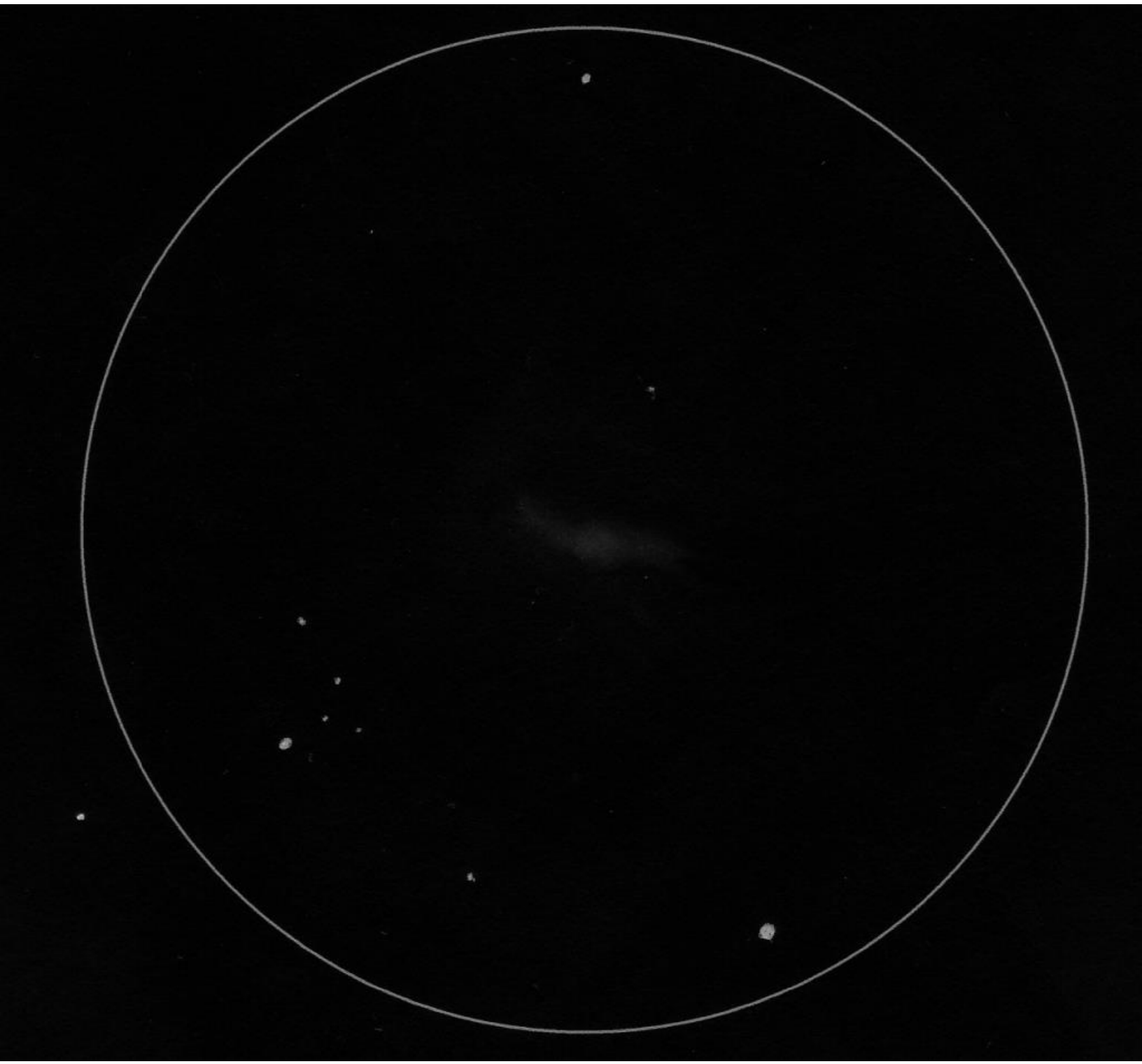
Dates: multiple nights in April 2022

Anas Sawallha: Observer from Jordan

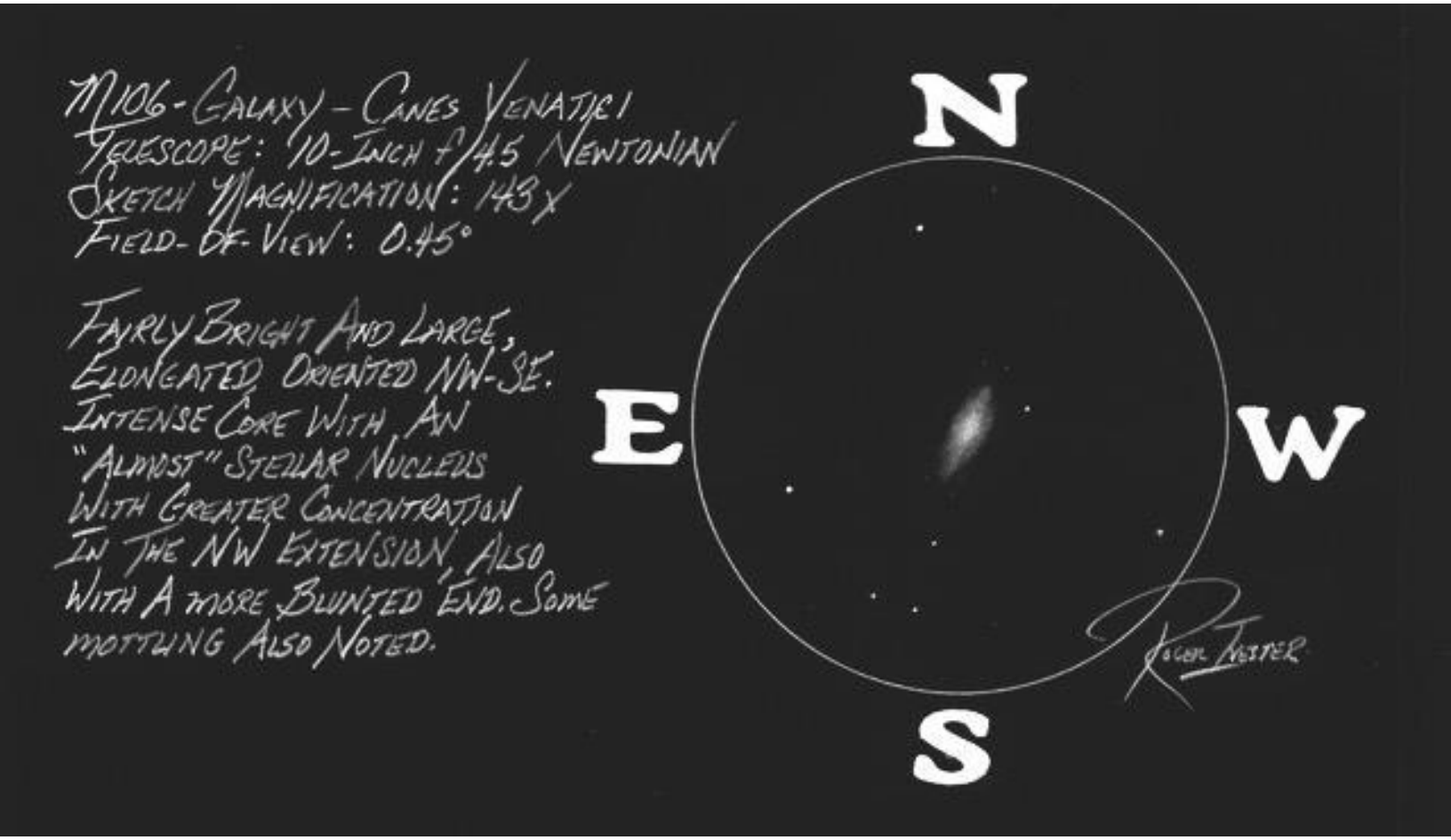
Finally after months of bad weather and very bad sky conditions, I was able to observe this month's challenge object, galaxy M106 in Canes Venatici.

The galaxy was observed through a 12.4mm eyepiece and 5-inch Newtonian and was imaged using an 80mm refractor and CCD camera

The image and sketch follow:



Roger Ivester: Observer from North Carolina



M106 - Galaxy in Canes Venatici
Telescope: 10-inch f/4.5 EQ Newtonian
Sketch Magnification: 143×
Field-of-View: 0.45º

Fairly bright and large, elongated, oriented NNW-SSE. An intense core with an "almost" stellar nucleus with greater concentration in the NW extension, also with a blunted end. Some mottling noted.

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

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