MONTHLY OBSERVER'S CHALLENGE

Compiled by:

Roger Ivester, North Carolina

&

Sue French, New York

November 2022

Report #166

NGC 7184, Galaxy in Aquarius

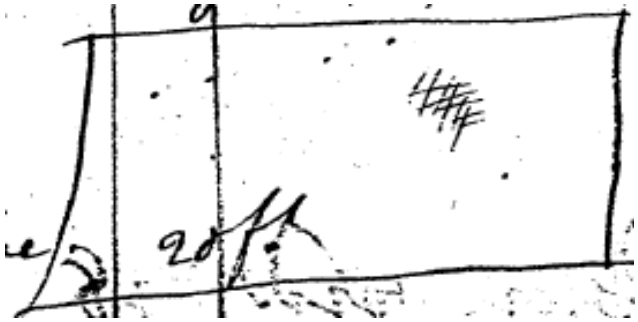
Sharing Observations and Bringing Amateur Astronomers Together

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:

William Herschel discovered this month's target with his 18.7-inch speculum metal refractor. It's the first object he logged in his second class of objects: "Faint nebulæ." His hand written observing log reads:

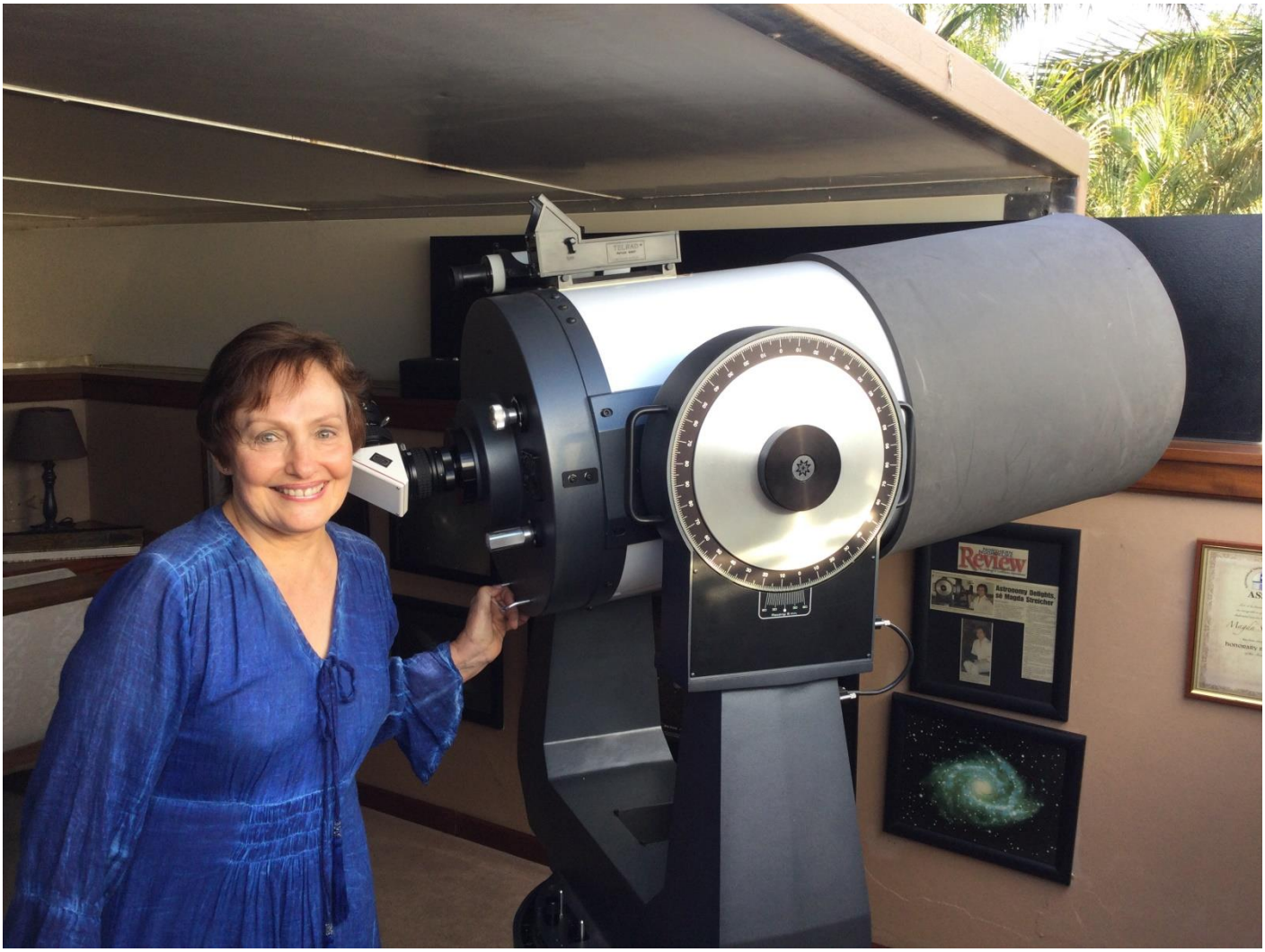


About ¼ degree north of the 41 in Aquarii [the star 41 Aqr] *& perhaps 2 or 3degrees preceding* [east] is *a very obscure Nebula. I must not hope to resolve it; but it appears as if composed of extremely small stars; I can however not see any of them. The evening pretty fine, tho' not the very best. It is in the parallel of the 41* [41 Aqr] *nearly or some minutes south of it.*

The sketch in Herschel's journal, no doubt hastily drawn, shows the distinctive line four stars strung 7 arcminutes northwest-by-west from the galaxy's southwest-by-west tip, and a fifth star that marks the galaxy's opposite tip. The hatching in the drawing shows the position of his find.

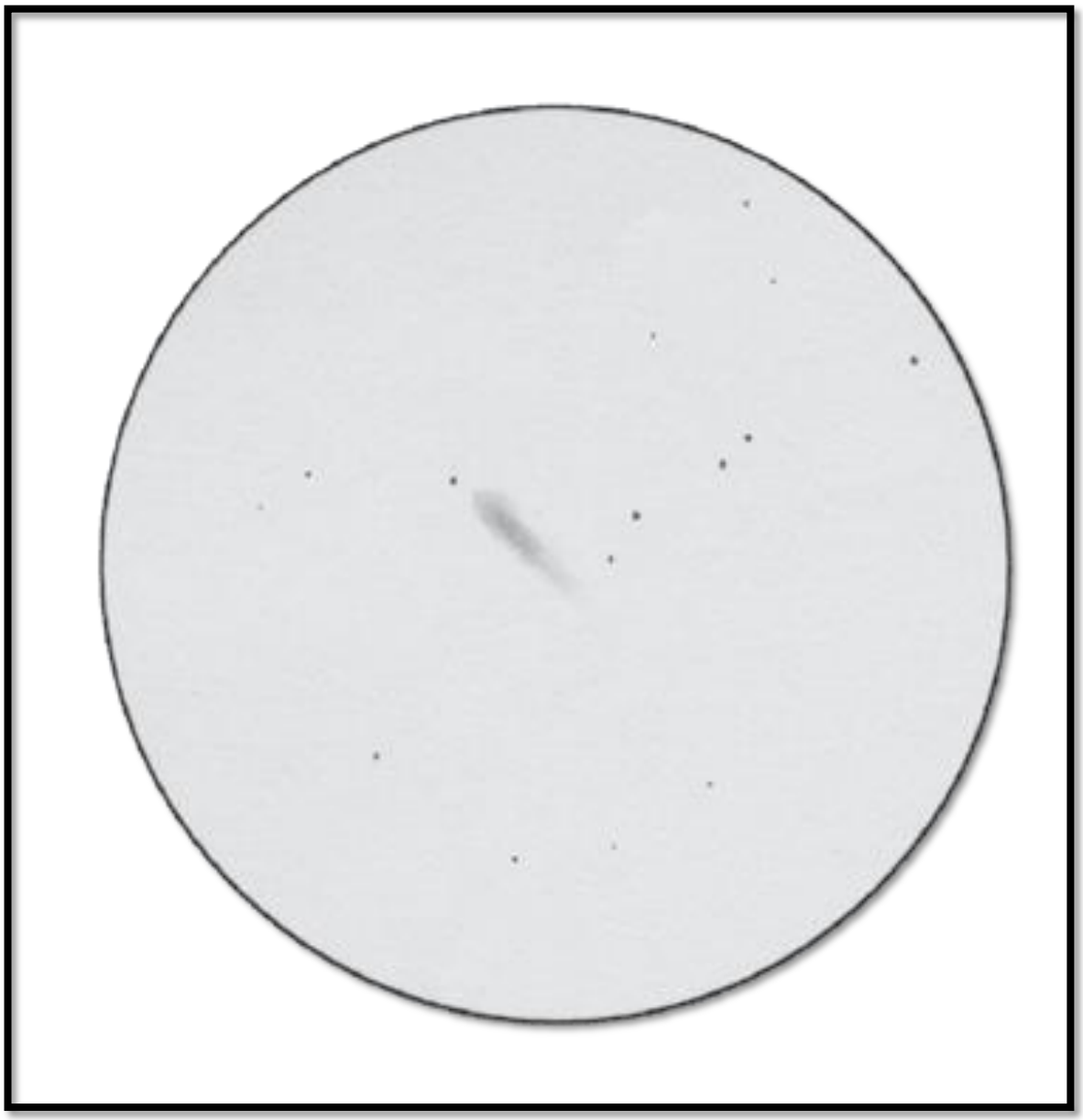
Welcome to our new contributor

Magda Streicher: Observer frm South Africa



Aquarius is home to a number of galaxies, most of which are fairly faint. **NGC 7184** is perhaps the easiest to observe situated 7 degrees south of iota Aquarii. It was William Herschel's first galaxy (H II.1), found on 28 October 1783, two days before he started regular sweeping with his 20-inch telescope. The galaxy is easy to see in moderate-sized telescopes; with higher magnification however, it shows off its almost edge-on shape with a suggestion of a concentrated brightness towards the small nucleus. It's a lovely galaxy with the south-western end thinner than the slightly rounder north-eastern end. What first caught my attention was a string of four faint stars swinging out from the south-western tip of the galaxy, reminding me of a golf putter with the galaxy the head and the stars the shaft of the putter – a good example of where the stars in the field add to a unique impression.
NGC 7184 – Galaxy

Sketch follows.



Uwe Glahn: Observer from Germany

Object: NGC 7184

Telescope: 27″ f/4.2 Newton

Magnification: 293×

NELM: fst 7m0+

Seeing: III-IV

Location: Bielerhöhe

Sketch follows.

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


NGC 7184

Bertrand Laville: Observer from France

Object information

Objects: NGC 7184 7185 7188
Object type: Galaxy Trio
Magnitude: (7184) 11.80

Observation Details

Date of sighting: Oct 22, 1998 7:15 PM UT
Duration of observation: 30 mins
Object position: Alt: 24.4°, Az: 175.1°
*Observing conditions:*SQMZ~21.5
Viewing location: Chabottes-les-Auberts
Instrument: TSC LX200/254 Meade
Main eyepiece: Meade SWA 13.8mm
Magnification: 184×

The three galaxies form an isolated trio, in a field of 20'NS × 10'EW. The two most northerly, NGC 7180 and 7185, were found without knowing where or how they were, only with *Astronomy* 10/98, p82: “the careful observer can note 2 galaxies, considerably fainter (than NGC 7184), to the north, in the same medium magnification field”. The three galaxies were observed at 104×, then 185× (Meade SWA 13.8 mm.)

Note that NGC 7188, 10′ north of NGC 7185, and PGC 67893, 10′ south of NGC 7184, not known at the time of the sighting, were neither searched nor seen.

NGC 7180
The galaxy is slightly elongated, a/b~1.5, D~2'x1′ (or 3'x2′), concentrated center

NGC 7184
It's the easiest galaxy. Well seen, like a large elongated spot, a/b~3, D estimated 6'x2′, maybe more, well seen elongated bulb.

NGC 7185
It is the least luminous galaxy, by glimpses. The gradient and the bulge are seen at the limit.
About the same dimensions as NGC 7180, a/b > 1.5 => maybe 2.5 or 3? but much paler.

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

Sketch follows.


B. Laville
N
E
Aqr

Larry McHenry: Observer from Pittsburgh, Pennsylvania

http://stellar-journeys.org

Galaxy **NGC 7184** is located in the fall zodiacal constellation of Aquarius – "The Water Bearer."

The barred spiral is about 100 million light years distant, and is about 175,000 light-years in size.

NGC 7184 was discovered on the night of October 28, 1783 by William Herschel using his 20-ft reflector,

(with an 18.5-inch speculum-metal mirror), during his first full night of using his newly completed telescope in the back garden of his house, located in the small village of Datchet, about a mile from Windsor Castle. Herschel described the object as: "*Faint, considerably large, much extended, brighter in the middle. Easily resolvable*". NGC 7184 was the first deep-sky object discovered by William Herschel using his system of 'sweeping the sky' and became the first object of Herschel's Class-II – "Faint Nebulae" which consists mostly of galaxies.

Video-Capture/EAA:

On 09/20/2022, from Cherry Springs State Park at the Black Forest Star Party.

Using an 8-inch SCT optical tube @ f/6.3 on a GEM mount, with a CMOS color camera and broadband filter, 180-second guided exposure, live-stacked for 30 minutes, image cropped.

Using EAA techniques, the 11th –mag NGC 7184 displays as an elongated, inclined mottled spiral with a bright oval core surrounded by a distinct circular 'arm' wrapping like a ring around the sides and foreground of the large core.

Image follows.

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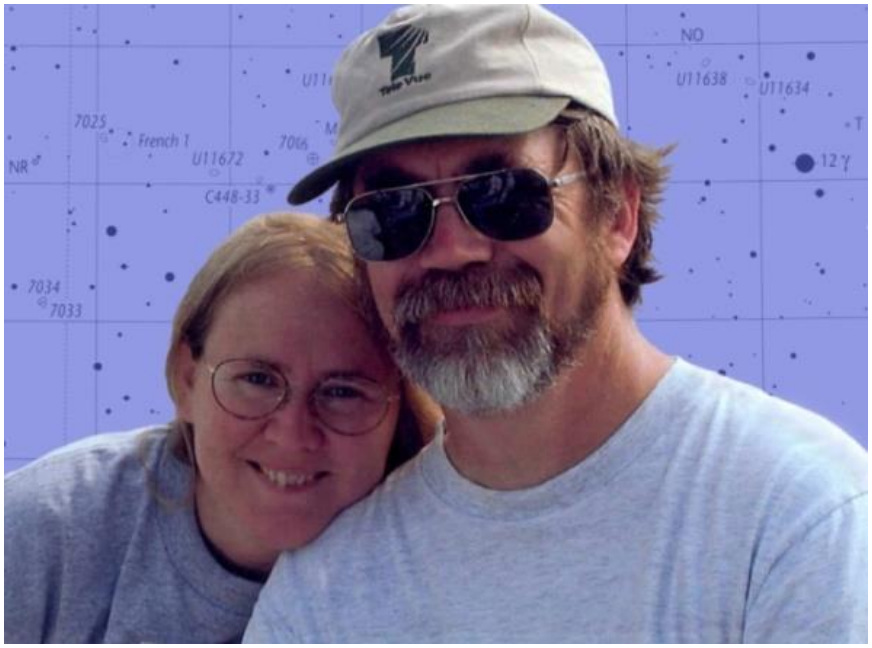
Sue French: Observer from New York

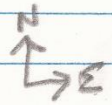


NGC 7184 (& NGC 7185) Aqr Gxs ②

9-11-05 1am EDT 254/1494mm Newt 13mm Nagler S:fair T:fair Aurora Share FOV. 7184 fairly large ~ $3\frac{1}{2}' \times \frac{3}{4}'$. Weakly brighter core. Elusive stellar nucleus. Runs ENE-WSW. One faint star off eastern tip, two northwest of western tip. Extremely faint star along south side, east of center. 7185 very small, faint, oval NNE-SSW. 9mm Nagler: faint stellar nucleus. faint star at SSW tip.

7-25-12 Landis 1:35am EDT 105/610mm apo S:good T:very good

17mm Nagler: very faint, very elongated NExE-SWxW.
8mm Sthos: much easier.
7mm Nagler: sketch. To the north, NGC 7185 is a very, very faint oval, PA ~30° and NGC 7180 is



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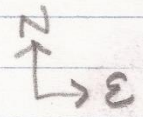
NGC 7184, 7185, 7180, 7188 Aqr gxs

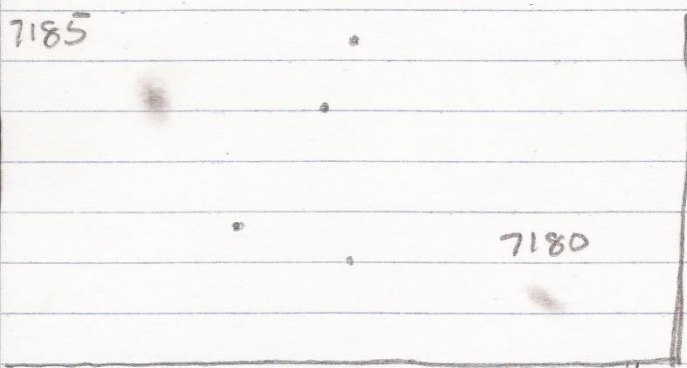
a very, very faint oval WSW-ENE. Second sketch.



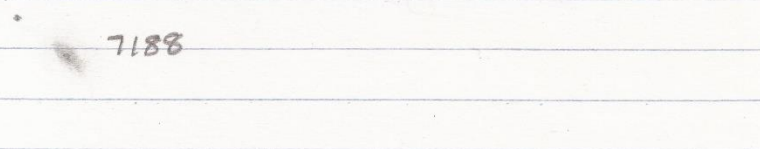
7180

8-22-12 12:15am EDT 254/1494mm Newt S:good T:fair-good
35mm Panoptic: 7184 is faint and highly elongated ENE-WSW. Gentle brightening toward center.
13mm Nagler: Low surface brightness 7184 sketch. Placing 7184 at northern edge of the FOV brings 7180 and 7185 into view. Sketch next page.

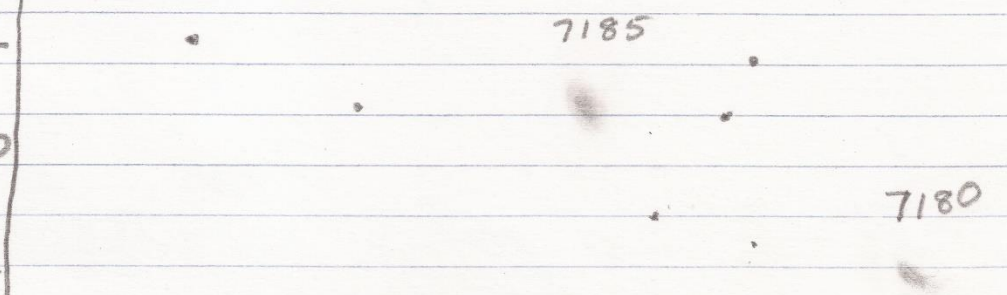
NGC 7184, 7185, 7180, 7188 Aqr gxs



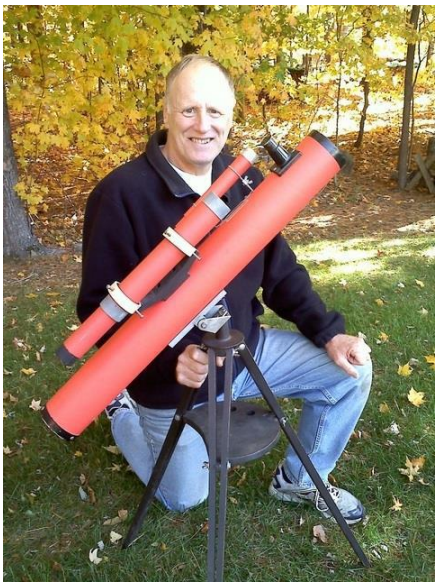
Shoving the scope a bit NExN, 7188 can share FOV with 7185 & 7180.



8mm Ethos: Best view. 7184 is very pretty ~5'x1'. 7185 and 7180 stand out well. 7185 ~ 1½' long and two-thirds as wide with large somewhat brighter core. 7180 ~1' long and half as wide 7188 ~1'¼' x ½'.



Glenn Chaple: Observer from Massachusetts



NGC 7184 Barred Spiral Galaxy in Aquarius (Magnitude 10.9; Size 6.0′ × 1.5″)

Visual astronomers are always advised to observe a sky object when it's as high above the horizon as possible. This month's Observer's Challenge, the barred spiral galaxy NGC 7184, makes this piece of advice difficult to follow. Located in the constellation Aquarius at a declination of nearly -21 degrees, it's never very high above the southern horizon for astronomers living in mid-northerly latitudes.

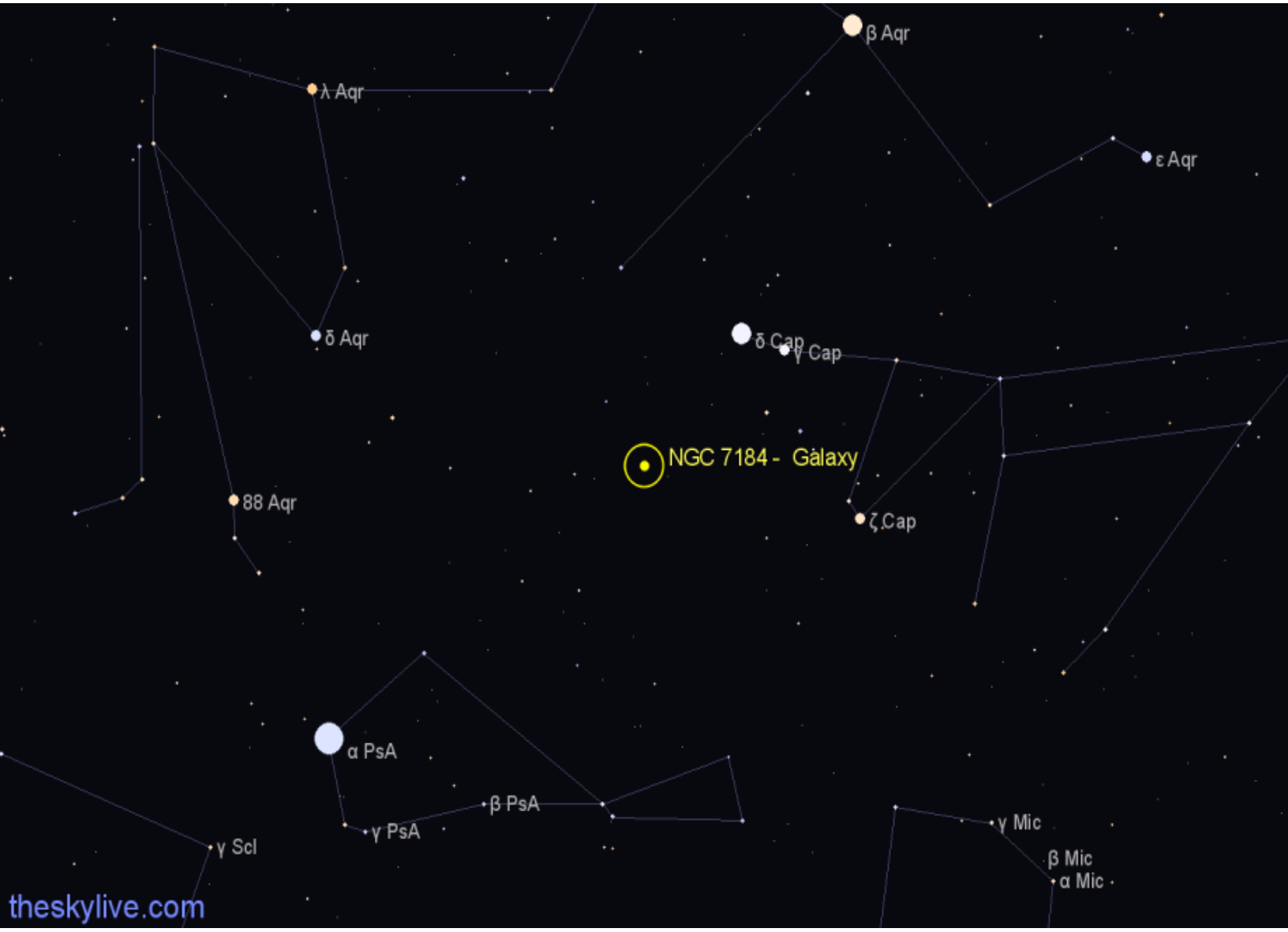
NGC 7184 is located at the 2000.0 coordinates RA $22^{h}02^{m}39.8^{s}$, Dec. $-20^{o}48'46''$. It can be found by star-hopping from the stars gamma (γ) and delta (δ) Capricorni (the stars that form the tail of the Sea-Goat). An alternate and more direct route can be had with a westerly star-hop from the 5^{th} magnitude star 41 Aquarii.

When William Herschel discovered this object on October 28, 1783, he described it as "Faint, considerably large, much extended, brighter in the middle, easily resolvable." Faint it is – especially if you live in an area cursed by a light-polluted southern horizon!

My initial attempt at NGC 7184 with a 10-inch f/5 reflector drew a blank – a bigger scope would be needed! A few night later, I teamed up with fellow ATMoB member Steve Clougherty to use the club's 25-inch f/3.5 Dobsonian-mounted reflector. I was able to aim the big scope at the desired location, but it was Steve's trained eye that picked out NGC 7184. The 25-inch failed to reveal the outer spiral arms, capturing only a circular smudge that proved to be the galaxy's core. Bright lights from a shopping center a few miles to our south proved to be our undoing.

Imagers or visual observers working with medium to large aperture scopes under dark sky conditions will make out the details Steve and I missed. Most notable is a bright inner ring formed by the spiral arms. Whether you capture this intricate detail or merely catch a fleeting glimpse of a hazy circular smudge, you're looking at light that left this galaxy some 115 million years ago.

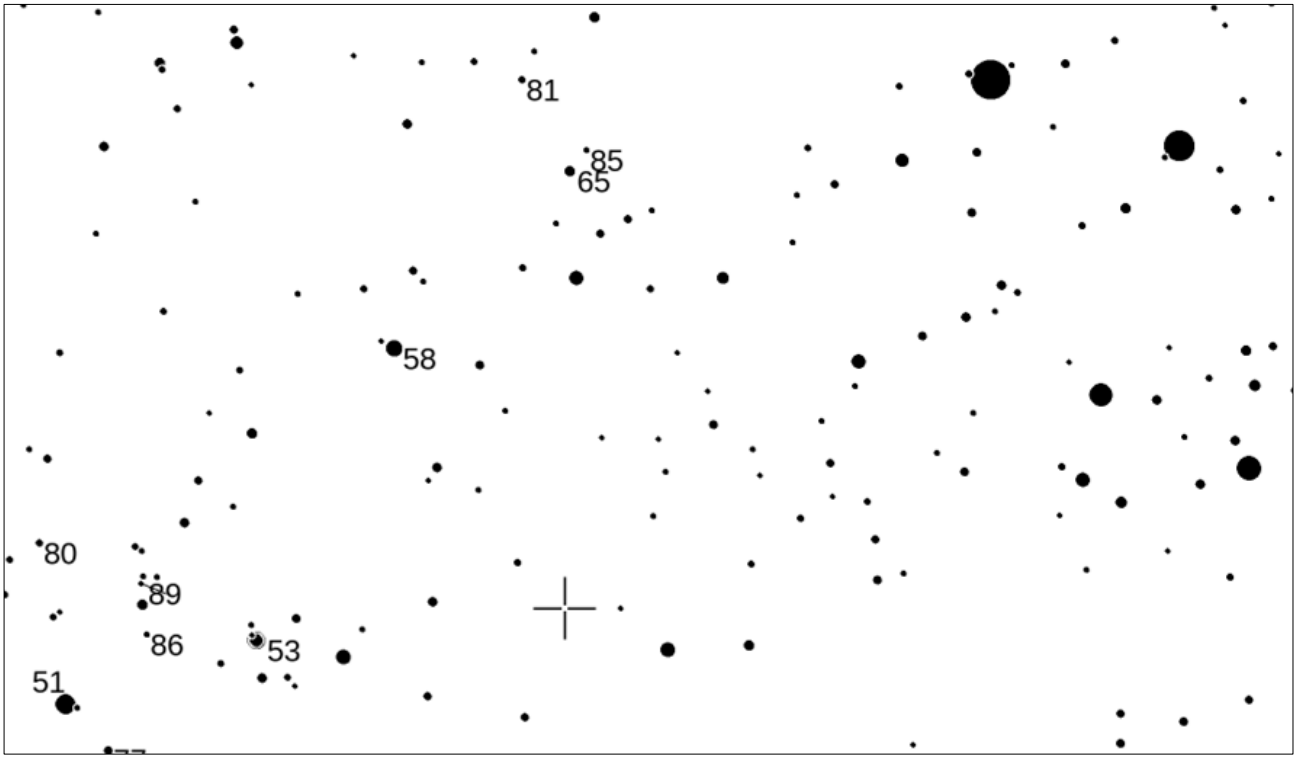
NGC 7184 Finder Chart A



Wide-field chart. Bright stars in upper right are the "tail" stars in Capricornus. γ and δ Cap. Magnitude 5.1 and 5.3 stars at lower left are 41 and 47 Aquarii, just west of the Helix Nebula. North is up; limiting magnitude is 9.0.

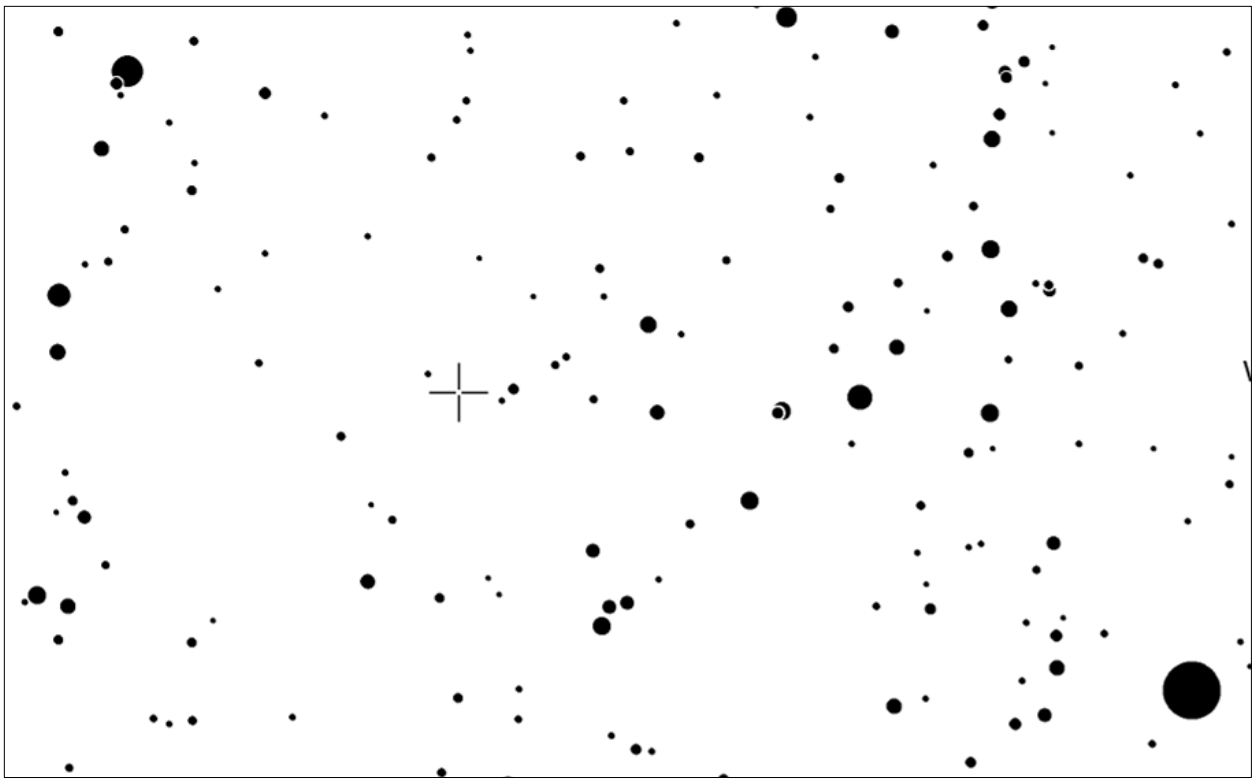
Finder Chart B

Bright stars in upper right are the "tail" stars in Capricornus. γ and δ Cap. Magnitude 5.1 and 5.3 stars at lower left are 41 and 47 Aquarii, just west of the Helix Nebula. North is up; limiting magnitude is 9.0.



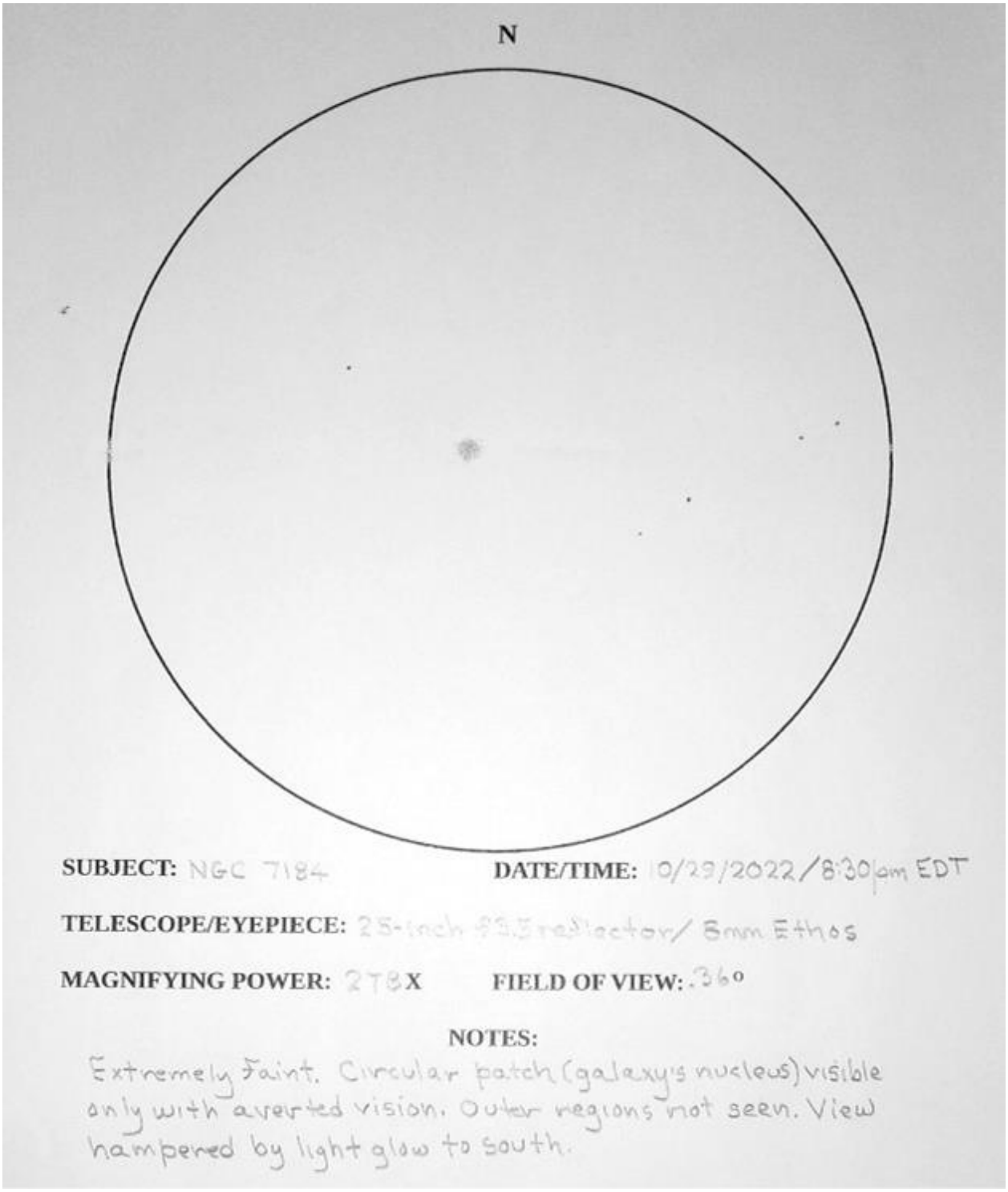
Finder Chart C

Stars to magnitude 13.5. Bright star at lower right is the star near the bottom center of Chart B.



NGC 7184 Sketch

Glenn Chaple (ATMoB)



25-inch f/3.5 Dobsonian-mounted reflector/8mm Ethos. Magnification:278×. FOV 0.36°

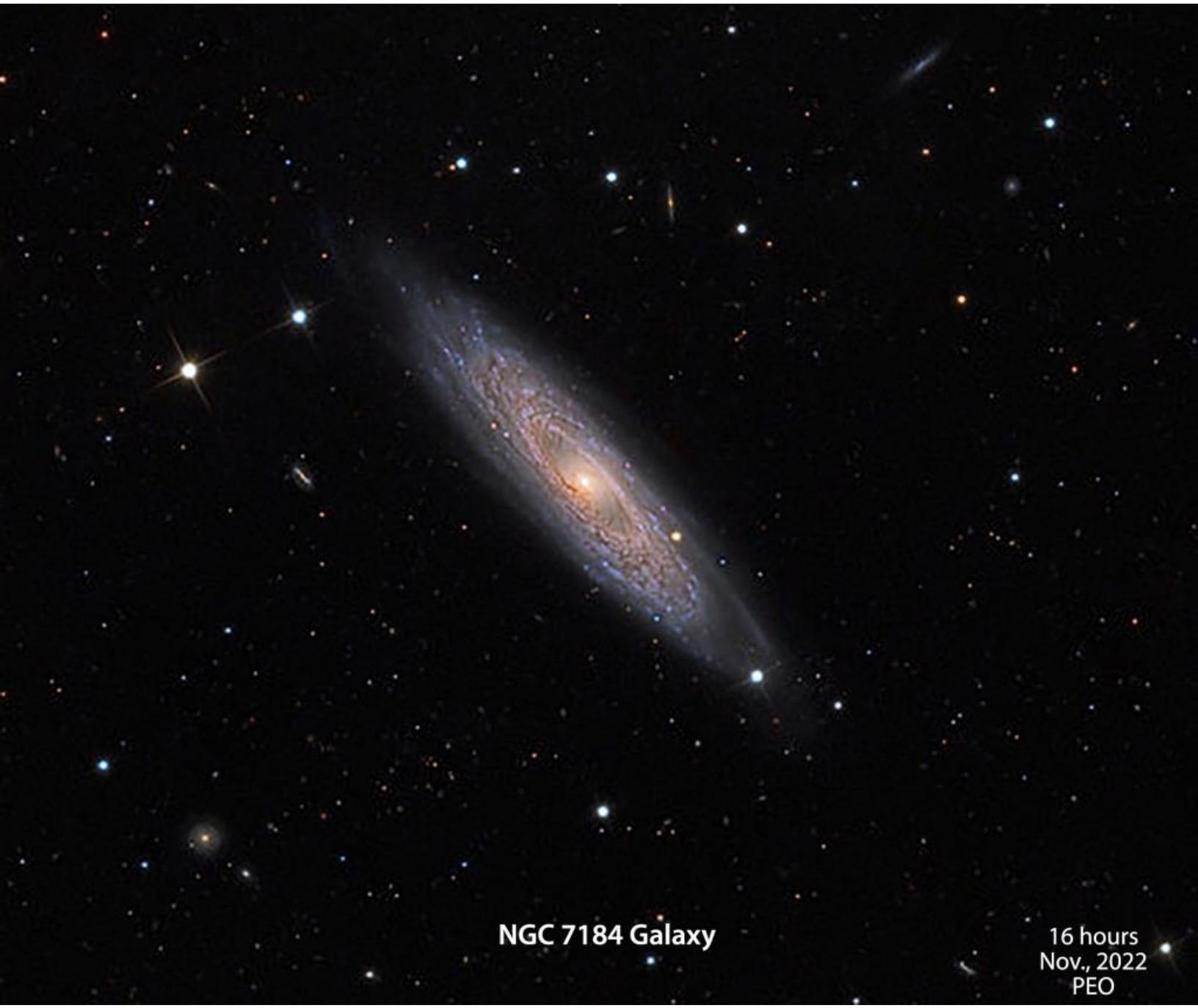
Extremely faint. Circular patch (galaxy nucleus) visible only with averted vision. Outer regions not seen. View hampered by light glow to the south.

Mario Motta: Observer from Massachusetts

Taken with my 32-inch f/6.5, one hour Luminance, then one hour Blue, 30 mins. green, and 45 mins. red filters. I tried H alpha, but the signal was poor in that filter, so was not included in processing.

Taken with ZWO ASI6200 camera.

Phil Orbanes: Observer from Massachusetts



This barred spiral galaxy is at least 100 million light-years in distance, therefore it is twice as far as the galaxies in the Virgo Cluster, such a M84 and M86. It is only 6.0″ × 1.5″ in size. However, it is thought to be 175,000 light-years in size, making it larger than the Andromeda Galaxy.

My photo, which is enlarged from the original, includes 16 hours of imaging with my 14-inch Planewave Reflector and FLI 16803 CCD camera. This includes five hours each via R, G, B, filters and 1 hour of H II. (I stopped the H II run when I realized I was not collecting any unique data.)

Roger Ivester: Observer from North Carolina

Date: October 14th 2022

Telescope: 10-inch f/4.5 EQ Newtonian

Sketch Magnification: 104x

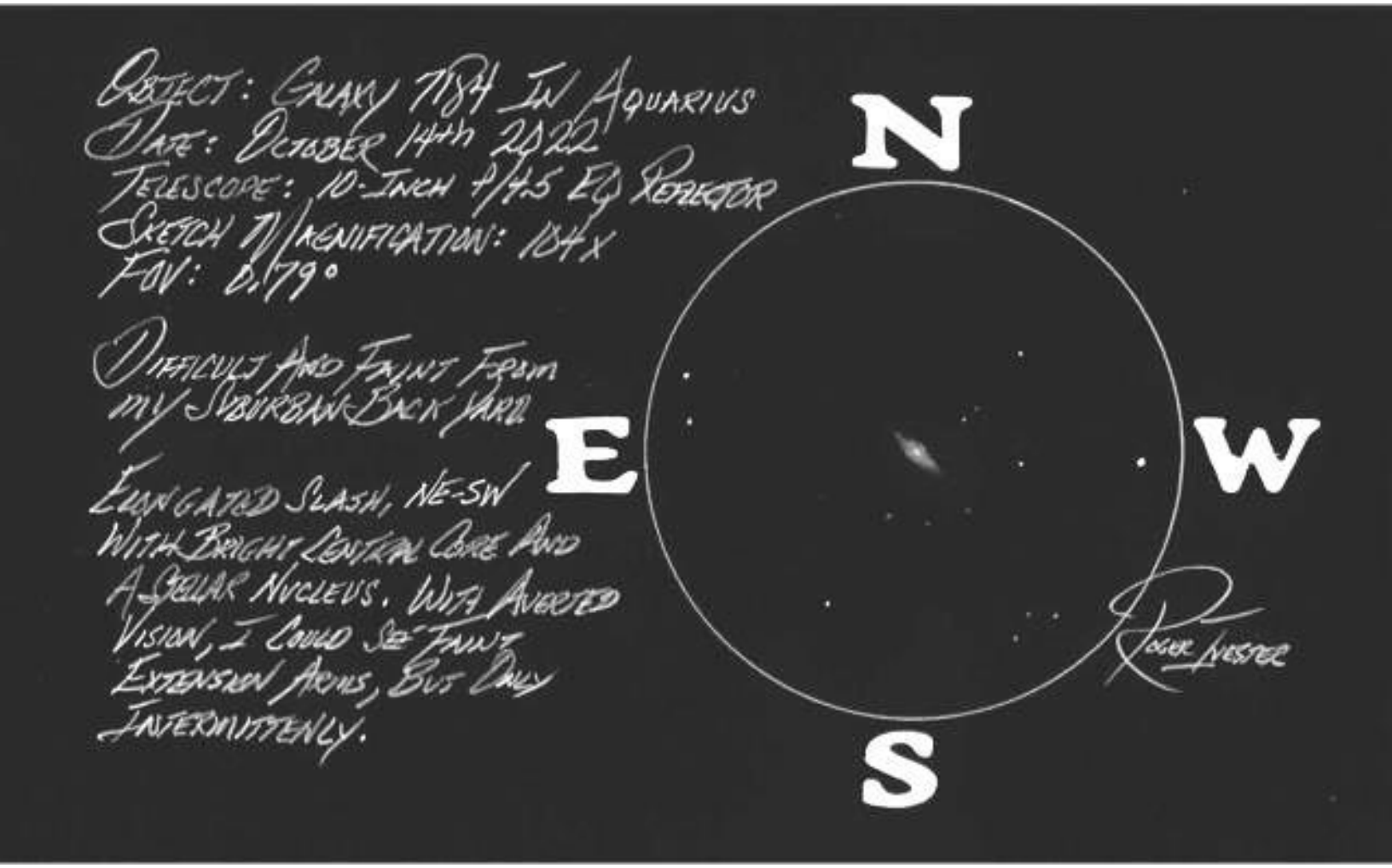
Field-of-View: 0.79º

Difficult and faint due to observing from my suburban back yard, over-looking the city of Boiling Springs. I was using a light block curtain, to shield a pesky LED streetlight, to the east, about 1/4 mile away. The curtain eliminated that problem, but still looking over a light dome, due to its southerly position.

Description: Elongated slash, oriented NE-SW with a brighter central core, and a stellar nucleus. With averted vision, I could see faint extensions arms, but only intermittently.

Pencil Sketch as following:

“Keeping the ancient art of pencil sketching alive, for now and in the future of amateur astronomy.”



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

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