MONTHLY OBSERVER'S CHALLENGE

Compiled by:

Roger Ivester, North Carolina

&

Fred Rayworth, Nevada

With

Sue French, New York, Special Advisor

Thanks to Robert Lambert, Alabama, for his dedicated work as LVAS Webmaster 2009 – 2019
RIP – You will be missed!

OCTOBER 2019

Report #129

NGC 7448 Galaxy in Pegasus

"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. 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 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 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.

NGC 7448 Galaxy in Pegasus

NGC 7448 is a spiral galaxy in Pegasus that lies about 80 million light-years away. It shines at an apparent mag. 11.4, or thereabouts, depending on the source. It was discovered by William Herschel on October 16, 1784.

The galaxy belongs to the 7448 galaxy group that includes galaxies NGC 7437, NGC 7454, NGC 7463, NGC 7464, and NGC 7465.

It's relatively easy to spot in moderate apertures, but quite a challenge in smaller instruments. However, in super clear skies, it's been spotted in smaller ones, especially in past decades when the skies were clearer.

Observations/Drawings/Photos

Jeff Schilling: Observer from Texas

I was able to grab just under an hours-worth of imaging on the October Observer's Challenge object, NGC 7448 until my mirrors dewed up. Attached is a quick stack and edit. Luminance filter only. My imaging train had some tilt, so all the stars are a bit elongated. The forecast is cloudy for the rest of the month. So...I was at least able to get something! My favorite part of this image is the numerous galaxies hiding in the background. North is toward the left, and west is up in this image.

Scope: 8-inch reflector.

Camera: ASI 1600 MM Pro

Luminance: 17 × 3 minutes.

Ed Fraini: Observer from Texas

We had the opportunity to observe NGC 7448 on the evening of Oct 23, 2019, soon after sunset from a dark sky site about 60 miles west of San Antonio. The location had a low glow of light-pollution from nearby small towns at the horizon, and gave us a sky that measured 19.4 SQM using the Apple App. Both transparency and seeing were above average, and the Milky Way and structure of the same were evident from horizon to horizon.

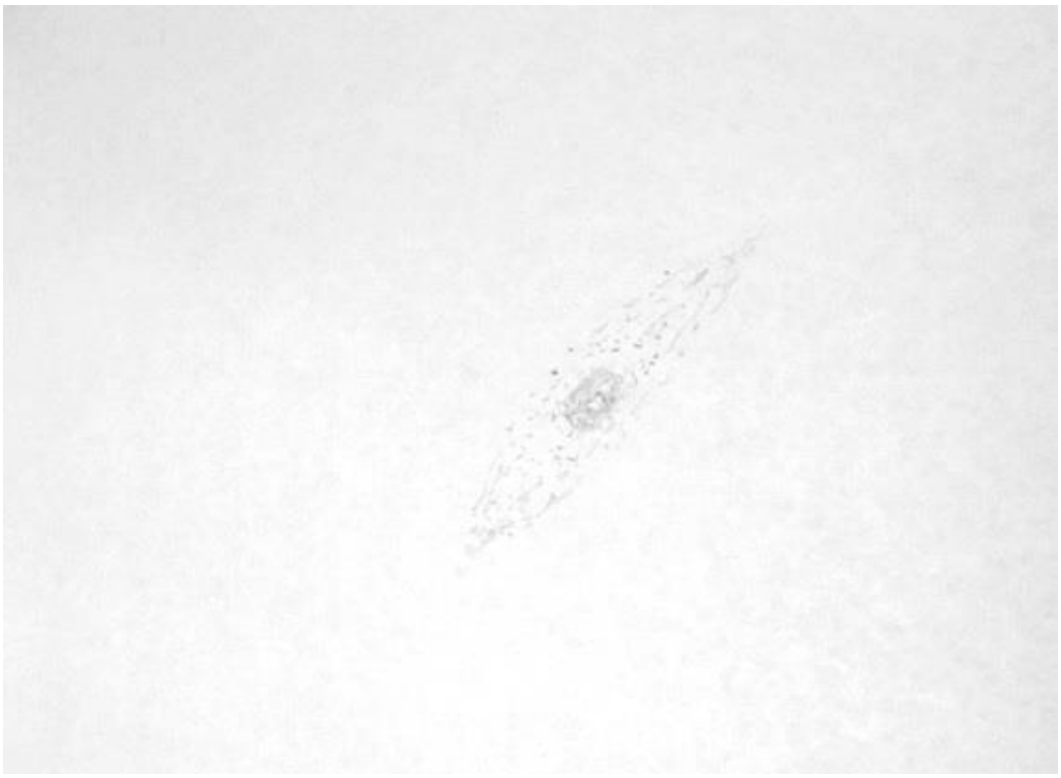
I easily located NGC 7448 1.3° from the southeast corner of Pegasus, which was marked by the star Markab. I first observed the field, at an elevation of about 60° above the horizon, at 74×, and the galaxy appeared as a slightly elongated brushstroke of even opacity with soft edges. It was aligned somewhat off the north-south axis and was readily visible in the 20-inch Dob we utilized. The target was situated between a pair of mag. 10 to 11 stars along a southwest-northeast line in an otherwise sparse field. Next, I bumped the power up to 142×, and now the galaxy elongation became wispier, and the ends much more pointed. It appeared almost translucent with no evidence of structure. The close pair of stars at mag. 14, centered between NGC 7448 and the northeast bracket star were now clearly separated.

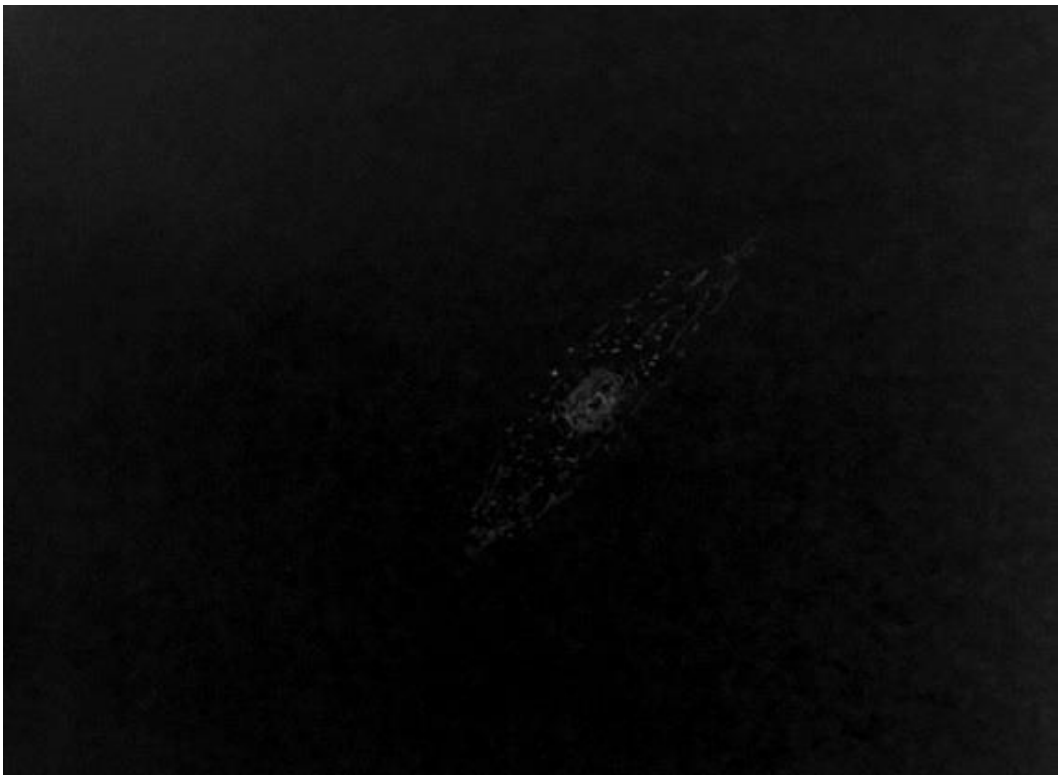
This target was the kick-off to a rewarding night of galaxy hunting and a great challenge object to add to our observing log.

Viadislav Mich: Observer from Massachusetts

Location: ATMOB clubhouse at Westford, Massachusetts. Conditions: Bortle 5. Telescope: 25-inch f/3 DOB with 8mm EP (~240×, FOV~20′) and a night-vision intensifier with a 2× Barlow (~150×, FOV~16′). Filter: Infrared long-pass 685nm used on the NV.

NGC 7448 was basically “an elongated smudge” with a bright core. I couldn’t see any structure or details, even with the “cheating device” – the night-vision (NV) intensifier. With the NV, it was still only a smudge, but brighter.





Michael Brown: Observer from Massachusetts

I observed NGC 7448 through my 8-inch SCT on October 19, 2019. I immediately spotted a faint glow at the galaxy's location. It appeared as a small, oval object, oriented roughly north/south, between two fairly dim stars to the east and west. After 5 or 10 minutes of observation, I found that some regions more distant from the center became more visible. I was not able to discern any detail or structure.

On October 22, I took the attached photograph with a Canon digital SLR through the 8-inch, with a total exposure of 28 minutes. While the photo is perhaps not much to look at, I'm pretty excited about this result. The bright central area is likely the part that was apparent with visual observation, but the photograph shows a much larger, fainter outer region, along with several gas clouds (HII regions). The galaxy is unusual in having the inner spiral arms in fragments, making it a "peculiar" galaxy.

Richard Nugent: Observer from Massachusetts

NGC 7448, also known as ARP 13, is a mag. 11.5 spiral galaxy in the constellation of Pegasus. It's apparent size is 2.1 × 0.8 arc-minutes, and has a surface brightness of mag. 12.6 (*Uranometria*). It lies at a distance of approximately 140 million light-years (*SkySafari 6 Pro*). The New General Catalog gives Dryer's description as: "pretty bright, large, extended @173°, very gradual brightening toward the middle."

My first opportunity to view this galaxy was with Roger Ivester while I visited him at his home in North Carolina. We used Roger's 10-inch equatorially mounted reflector. Sky conditions that evening were mediocre (clear, but hazy) with an NELM of a bit less than mag. five. The sky conditions certainly reduced contrast. I was impressed with how little of an impact a recently installed LED street light near Roger's house caused. However, he had to work with the city and Duke Energy to get it changed from a 4,000K, to a 3,000K-4000 with a shield (well done, Roger!).

We were going to use the equatorial mount and its setting circles to find the galaxy. However, we thought that star-hopping would be more efficient. We were able to locate the galaxy relatively quickly. At first, it was difficult to see, but after observing it for several minutes, its form began to appear. The object was an oval, diffuse, featureless glow. However, its slight NNW to SSE orientation was readily apparent.

Upon returning home to my observing site in Framingham, Massachusetts, and using my 10-inch reflector, I was able to see the galaxy with great difficulty. My skies typically run between a NELM of between 4.8 and 5.0, with considerable light-pollution always present. The galaxy was best seen using a eyepieces that gave exit pupils of 2 to 3mm. The best view came while using an 11mm eyepiece with a magnification of 108× and an exit pupil of 2.3mm.

I also had an opportunity to observe this galaxy on several nights through my 20-inch reflector. Of course the galaxy appeared brighter with more field stars visible, however it still appeared as a somewhat more extended, but a diffuse, featureless, glow. I've included a sketch (please don't judge!) made using an 8mm, 100° AFOV eyepiece. This gave 315×, a nearly 20′ true field of view, and an exit pupil of 1.6mm.

During the last week or so of October, the discussion about this galaxy seemed to turn toward the perceptibility of the field stars. It's bracketed by two attending stars. The easternmost star is BD +15 4742, and the westernmost star is TYC1711-0525-1. These stars are mags. 10.2 and 11.2 respectively. Between the galaxy and the mag. 11.2 star lies a faint pair of stars with mags. 13.7 and 14.2. As seen on images, near the 14.2 magnitude star there lies a fainter, third star at mag. 15.9. Also, near the TYC star there lies a mag. 14.9 star. In my 10-inch telescope, I could see only the mag. 13.7 star. Whereas, in the 20-inch scope, I was able to detect the pair and the mag. 14.9 star near the eastern, TYC star.

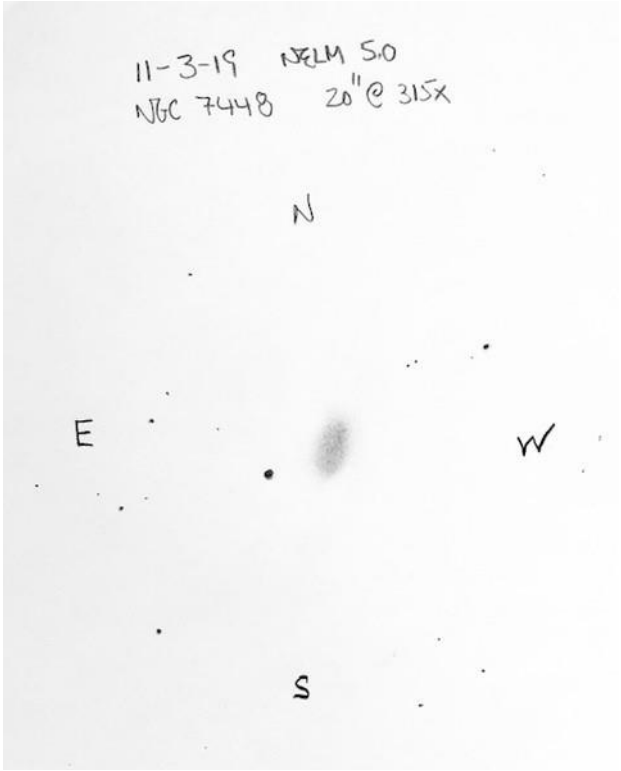
Using the 25-inch Dobsonian at the ATMoB clubhouse, we were able to observe the galaxy as well as its associated field stars. It looked brighter and somewhat more extended, however we could see no mottling. The glow appeared to be uniform without any sign of the fainter extensions seen in some images. As far as the field stars go, Chris Elledge was able to see the mag. 15.9 star intermittently, however, I could see it only fleetingly. Had I not known it to be there, there's no way I would've seen it. The skies at the ATM clubhouse have a variable NELM. We typically see a NELM of 5.0 to 5.2 overhead and to the north and west, the sky is brighter toward the south and very bright toward the east and southeast. There, the NELM is typically around mag. 4.

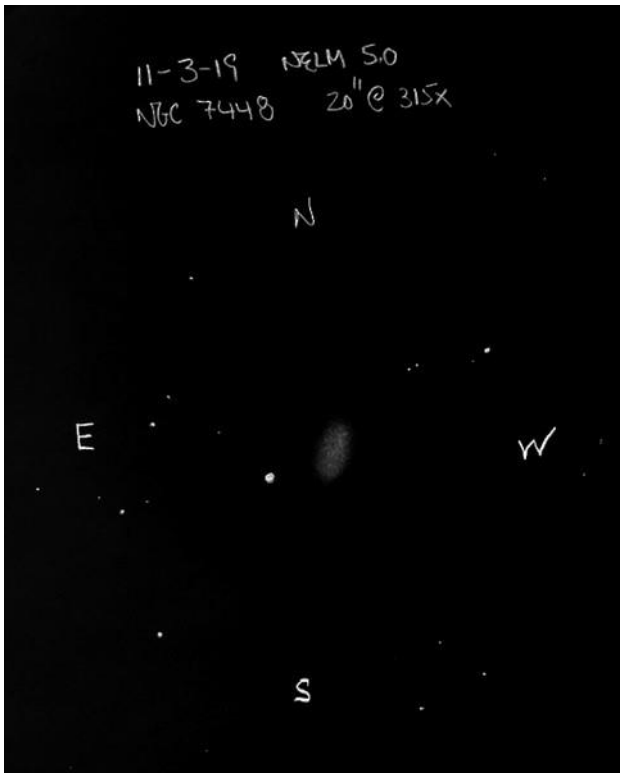
As far as observing galaxies goes, I have noted that when using backyard telescopes under light-polluted skies, we're only seeing the bright central regions and not their fainter spiral arms. Perhaps the best example of this is M81. Compare your own observations with images of the galaxy, noting the extent of the galaxy relative to the field stars visible through your telescope. When comparing actual observations with images, it's clear that only the central regions of the galaxy are visible to observers under moderately to severely light-polluted skies. Considering my own experiences, it's no wonder that NGC 7448 appears to me as a uniform glow.

As far as the limiting mag. of a telescope goes, many factors influence that value on any given night. When pushing observations to the limit of a telescope's theoretical faintest mag., it's important to remember that the star's image will likely be fleeting due to a number of causes. These include, but are probably not limited to, the seeing and transparency of the sky, the degree of light pollution, the optical quality of the telescope and it's eyepieces, the optical quality of the observer's eye, the observer's level of experience, the accuracy of the collimation of the telescope, the cleanliness of the optics, and the degree to which an eyepiece's exit pupil is matched to the observer's eye entrance pupil. I don't like to struggle when trying to observe

deep sky objects. Using a telescope near or at its theoretical limit can be frustrating to say the least. I consider my telescope's "practical" limiting mag. to be at least two mags. brighter than its theoretical limit.

I'm glad to have had the opportunity to observe NGC 7448. Despite the fact that my skies limit my ability to see faint, low surface brightness objects, I enjoyed this month's challenge object!




11-3-19 NELM 5.0
NGC 7448 20" @ 315x
N
E
W
S

Corey Mooney: Observer from Massachusetts

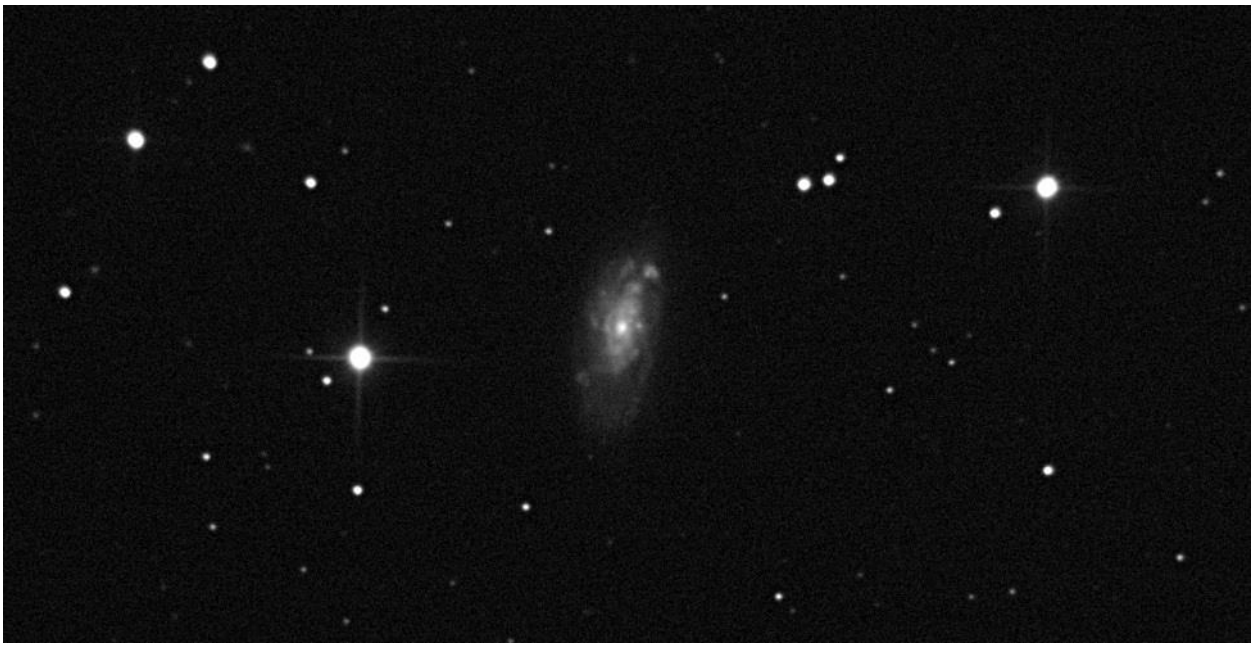
I live stacked NGC 7448 on October 11, 2019 from Maynard MA. It was the first light for my new-to-me 8-inch f/4 imaging Newtonian. I had initially planned to focal reduce it down to f/3, but that did not work out, so I had to run it at its native 812mm focal length. The resulting image scale of 0.74″/pixel with my IMX 290 Mono CMOS was overkill, but it should let me hit the atmospheric limit of 1″-3″ and extract as much detail as my sky will allow. The scope was significantly under-mounted on my lightweight Vixen Super Polaris GEM, but fortunately, the short 8-second exposures afforded by the low read noise CMOS and fast scope resulted no star trailing.

Once I had everything working, I slewed to the target area. The galaxy was clearly detectable amongst the noisy background during the short 2-second framing exposures. When I switched to 8-second exposures, the galaxy became much more apparent, and hints of a non-uniform brightness started to show. After watching a couple 8-second frames pass by, I started to live stack them, and the view rapidly improved. What was previously a non-uniform brightness resolved beautifully into detailed bright knots that I assume are intense star-forming regions. Playing with the histogram, I could stretch it to show the faint outer extension of the galaxy, or I could back off to show the mottled detailed core. I found the view of the core more interesting, so that's how I have it shown here.

The following night (October 12), I reshot the galaxy with my IMX224 color CMOS. The color chip has slightly larger pixels resulting in a more reasonable 0.95″/pixel image scale. I was curious to see the galaxy in color as most of the reference images I found online were monochrome. I was interested to know if the bright knots I saw in the monochrome image were reddish Ha regions or if they were bluish star forming regions. The color camera took a little

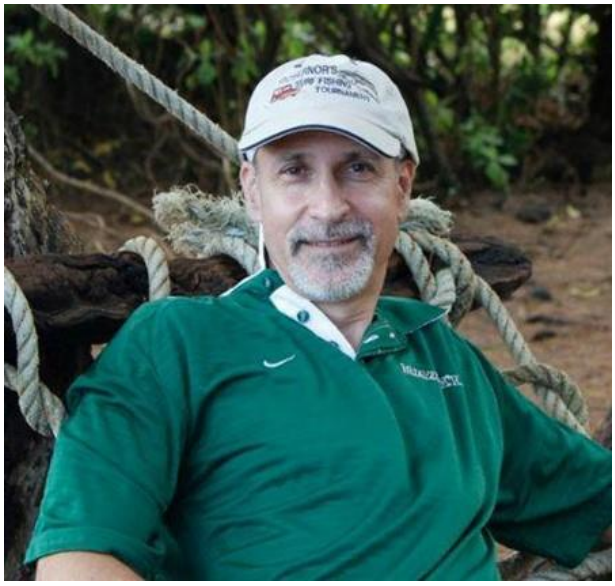
longer to reach a comparable noise level but the view was pleasing in the end. The image is still a little noisy so it's not decisive, but I think those brighter knots have a bluish hue.

NGC 7448 - 208mm (8-inch) f/3.9 Newt - IMX290 Mono CMOS – 8-seconds × 113 = 904 seconds.



NGC 7448 - 208mm (8-inch) f/3.9 Newt - IMX224 color CMOS – 8-seconds × 117 = 936 seconds.

James Dire: Observer from Illinois



Spiral galaxy NGC7 448 is really easy to find, but not so easy to see. The galaxy is located 1-1/3° northwest of the bright star Markab (Alpha Pegasi – located on the SW corner of the Great Square). However seeing the galaxy requires pretty good transparency, dark skies, and a large enough light bucket. I viewed the galaxy using a 190mm (7.5-inch) f/5.3 Maksutov-Newtonian on October 27, 2019, from Jubilee College State Park. I was about 25 miles northwest of downtown Peoria, IL, or about 12 miles west of my home. At my house, I can barely see the Milky Way on a clear night. However, in the state park, when the transparency is good, the Milky Way is a pretty sight (except when looking southeast). The transparency was excellent on October 27, and the seeing was around 2.5 arc-seconds.

NGC 7448 has two stars near it to help find it. To its east, about 2.5 arc-minutes away, is a mag. 10.4 star. To the west, and slightly north, about 4 arc-minutes away, is a mag. 11.2 star. The spiral galaxy is around the same mag. as the dimmer of the two stars, but its light is spread out over an ellipse measuring 2.6 by 1.2 arc-minutes. My 190mm (7.5-inch) Maksutov-Newtonian was on an equatorial mount, so I used the GOTO feature to center the galaxy. Right between the mag. 10.4 and 11.2 stars, I observed a faint elliptical glow oriented mostly N-S. At 120×, I could make out the shape of the galaxy much better using averted vision, but could discern no structure. The galaxy didn't have a bright core, and seemed pretty much uniform in brightness. This tiny galaxy might've been better to spy with my 14-inch Dobsonian. Perhaps another time…

NGC 7448 is a small spiral galaxy not quite edge-on. It presents itself at an angle similar to M31. The galaxy has Hubble Classification Sbc, and is located 80 million light-years away. The galaxy spans about 60,000 light years.

My image was taken with an 8-inch f/6 Ritchey–Chrétien Cassegrain telescope with an SBIG ST-2000 XCM CCD camera from the same location as my visual observation of the galaxy. The exposure was 60 minutes. North is up and east to the left. Some of the spiral structure is apparent. The bright blob on the northwest edge of the imaged region is a large star-forming region in one of the outer spiral arms. Images of the galaxy made with much larger telescopes do a much better job of resolving the galaxy's tightly wound spiral arms. The arcing trio of stars located to the upper right of the galaxy range in mag. from 13.2 to 15.7. The faintest stars in the image are near mag. 18.

Joseph Rothchild: Observer from Massachusetts

I observed galaxy NGC 7448 from dark skies on Cape Cod with my 10-inch reflector. At a magnification of 89×, I saw it easily, and it appeared as a faint oval within a grouping of three stars. The length was about 2× the diameter. As an added benefit, I observed two other faint galaxies nearby, NGC 7563 and NGC 7465, which both appeared as tiny faint smudges creating a triangle with star HD217602.

Gus Johnson: Observer from Maryland

I observed NGC 7448 in October, 1983 using an 8-inch reflector at 116×.

It was easy to locate. The galaxy had very soft edges, was elliptical shape, and had no nucleus. I could see a very faint double just to the NW of the galaxy. At first, it appeared as a single star.

Doug Paul: Observer from Massachusetts

I shot NGC 7448 late in August. Visibility was above average (NELM 4.6) and there were no clouds all night. Imaging this object finished just as the moon rose at 1:21 AM. There are 8 other galaxies visible in the full field-of-view (2.2 ×1.4° centering on NGC 7448). I included a full-scale image of NGC 7448 and a 1/4 scale image showing the nearby galaxies.

Technical details for the image of NGC 7448: Canon 80D, 600mm f/4.0 lens (150mm (6-inch) aperture), ISO 800, 68×30-seconds=34 minutes. FOV: 16′×17′ (full scale). Orientation: North is up, and west to the right. Standard processing: Regim (image calibration and stacking), my own stretcher, and cropping.

Supplemental Image: Technical details for the "nine-galaxy image" are the same except for: FOV 1.1° × 1.2° (1/4 scale).

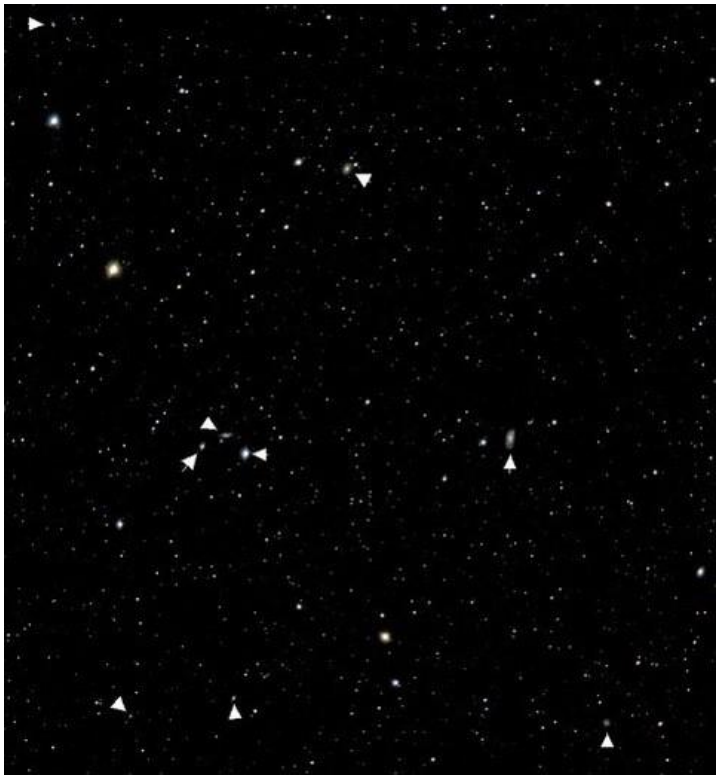
The marked galaxies are:

Upper left: NGC 7468

Upper center: NGC 7474

Middle Row: NGC 7465, 7464, and 7463 (tight group) and NGC 7448

Bottom Row: NGC 7467, 7461, 7442 (rows: Left to Right)



Keith Caceres: Observer from Nevada

I photographed NGC 7448 on the evening of Saturday October 26, 2019 at our Death Valley Star Party using an 8-inch SCT, a 0.7× focal reducer lens, and a Canon 70D DSLR camera. The skies were clear, but by this time, there seemed to be a fair amount of particulates in the atmosphere from California wildfires, greatly reducing transparency. This forced me to use an exposure of 90-seconds at ISO 5,000 to capture some detail. Since the exposure was unguided, star quality seems to have suffered due to tracking errors, and there's a decent amount of noise and hot pixels, including a red pixel immediately adjacent to the galaxy at its upper right.

NGC 7448 is a small spiral galaxy in the constellation Pegasus. Various sources place it at a distance of 80 million light-years away (*Celestial Atlas* by Courtney Seligman, via *Wikipedia*) and 137 million light-years (*SkySafari v5*). They place its diameter between 60,000 and 83,000 light-years across. Both sources give a visual mag. of about 11.5. It's described as having "an inner disk region of tightly wound spiral fragments with high surface brightness" and "at the edge of this region, the surface brightness decreases abruptly." Both of these features are easily visible in the photograph. There also seems to be a compact bright area at the bottom right edge of the disc that is likely a large star forming region. This region appears in a professional astronomer photo I reviewed of this galaxy, though there are no details on what it is.

The provided photo is a crop of the original photo so that more details of the galaxy can be seen. I also stretched the image histogram to darken noise in the background and removed a few bright hot pixels. Plate solving this crop on *astrometry.net* indicates a 19.9 × 15.1 arc-minute field of view (FOV) with an image scale of 0.601 arc-seconds/pixel. The up direction is 261° east of north. The original uncropped photo had a 54.8 × 36.5 arc-minute FOV.

Lightly Processed Cropped Photo:

Plate-Solved Cropped Photo (astrometry.net):

Sue French: Observer from New York

NGC 7448 is the brightest of five NGC galaxies that mark the corners of a nearly equilateral triangle with 28′-long sides. It sits at the triangle's western corner. I first logged NGC 7448 in 1988 for the Astronomical League's Herschel 400 observing program. Since then I've visited it a number of times, along with its buddies, through a few different scopes. My Observer's Challenge sketch was done with my 254/1494mm (10-inch f/5.8) reflector at magnifications of 187× to 299×.

NGC 7448 appears fairly bright and elongated at 68×, with a mag. 10 star in attendance 2½′ east by south of the galaxy. At 115×, NGC 7448 presents a moderate-size oval glow, twice as long as wide, that grows gently brighter toward the center. At 187×, the galaxy shows a south-by-east tilt. Its large, elongated core looks brighter in the north. At 213×, I estimate a size of about 1.7′ × 0.8′.

NGC 7465 shares the field of view with NGC 7448 at 68×, but it's dimmer and roundish, with a tiny, bright center. The galaxy sits 4′ east of a mag. 8 star, and is tucked inside the western corner of a ¼° trapezoid formed by that star and three others, mags. 9 and 7. At 115×, the small glow of the galaxy is easily viewed. Its core is tipped NNW and harbors a tiny bright nucleus. At magnifications of 187× to 299×, the core grows brighter toward a stellar nucleus and the faint halo is just a thin coating of fluff that slightly rounds out the galaxy's profile.

NGC 7463 emerges as an east-west glow at 115×, dwelling just 2½′ WNW of NGC 7465. At 213×, it shyly offers an elusive stellar nucleus and has a very elongated façade. At 299×, NGC 7463 maintains an almost uniform surface brightness.

NGC 7464 is a tiny little thing dangling south of the eastern half of NGC 7563. I was only able to spot it during one of my observing sessions. With averted vision at 299×, I could

catch repeated glimpses of the galaxy as a round dot. It was difficult to see, and I couldn't hold it steadily in view.

Together NGC 7463, NGC 7464, and NGC 7465 hold down the western corner of the galaxy-pinned triangle.

NGC 7454 is parked on the triangle's northern point and is visible even at 43× as a tiny smudge off the ESE side of a mag. 11½ star. A mag. 9 star lies 4½′ east by north. The galaxy is faint and somewhat oval at 68×, and 115× reveals a relatively large, bright, oval core. In addition to the mag. 11½ star near the galaxy's WNW side, the higher power captures a mag. 13½′ star a little farther away to the NNW. NGC 7454 grows gently brighter toward the center at 187×, and at 213×, I estimate the visible size as about 1′ × ⅔′.

I'd hoped all the galaxies would fit in my 187×, 32′ field of view, but that wasn't big enough, so I cheated and nudged the scope north to get NGC 7454. I also used higher magnifications to add some of the details. Sketching stars, I began with those near the galaxies and brighter field stars. For three nights, it kept clouded up before I could try to get the rest, so I decided leave the sketch as is. North is to the left and west is up.

Glenn Chaple: Observer from Massachusetts

NGC 7448 is a spiral Galaxy in Pegasus, has a mag of around 11.4, and is about 2.7′ × 1.2′.

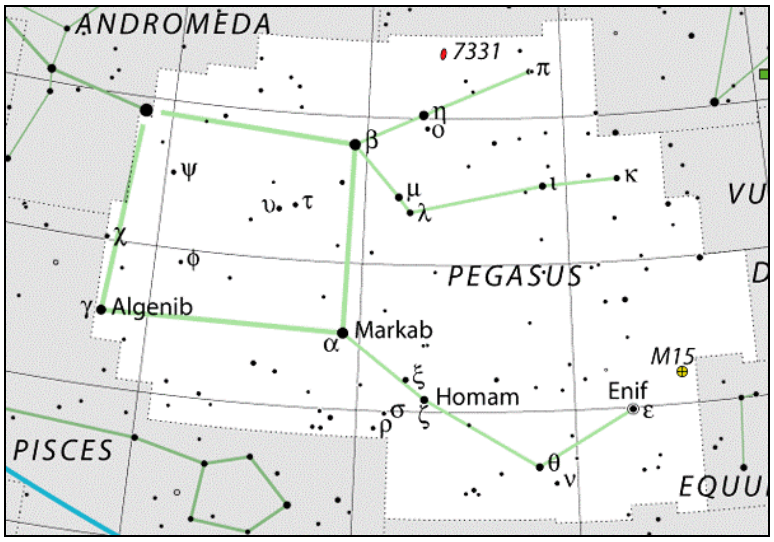
As promised last month, we leave the relatively easy Messier stuff behind and return to the realm of the faint fuzzies–in this case the spiral galaxy NGC 7448 in Pegasus. When William Herschel discovered it on October 16, 1784, he assigned it the Herschel Catalog designation H2512–his 251st Class II entry. The Class II category was reserved by Herschel for what he considered to be "Faint Nebulae." As such, it's a visual challenge for owners of modest-sized telescopes.

Viewed with my 10-inch f/5 reflector under mag. 5 skies, NGC 7448 was a ghostly presence–a rather faint averted vision sight. I sensed an oval shape with a NW/SE orientation–an impression verified by descriptive notes in Volume 1 of Kepple and Sanner's *Night Sky Observer's Guide* and images sent by Doug Paul and Mario Motta.

Motta's image shows bright detached segments surrounding the inner disk. Because of these, Halton Arp included NGC 7448 in his *Atlas of Peculiar Galaxies* with the designation Arp 13.

The 2000.0 coordinates for NGC 7448 are 23h00m, +15°59'. Star-hoppers can work with the finder charts below, which show its location 1-½° WNW of Markab (alpha [α] Pegasi). The galaxy is approximately 80 million light-years from Earth, and is about 60,000 light years in diameter.

Finder charts for NGC 7448



www.constellation-guide.com (from IAU and *Sky & Telescope*)

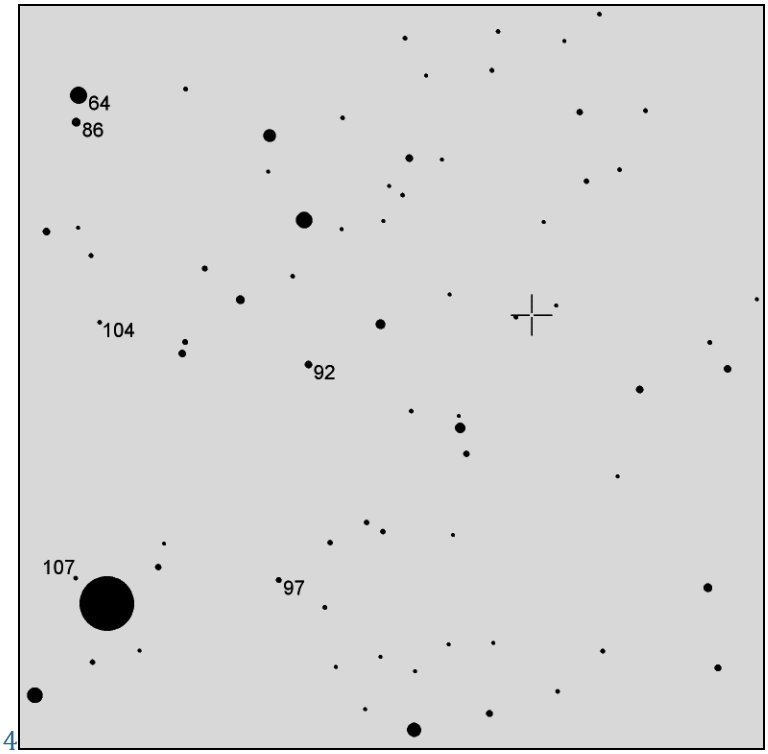


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Chart created using AAVSO's Variable Star Plotter (VSP). North is up on a 2° field. Limiting mag. 11. Numbers indicate mags. of field stars (decimals omitted). Bright star at lower left is Markab (alpha [α] Pegasi). The location of NGC 7448 is shown with a "+".

NGC 7448 (Image by Mario Motta, MD)

Taken with 32 inch scope SBIG STL 1001E camera, 5 min subs, 60 min total.

NGC 7448 (Image by Doug Paul)

Cannon 80D, 600mm f/4.0 lens (150mm (6-inch) aperture), iso 800,

71×30 seconds = 35.5 minutes, plate scale 1.3 arc-seconds/pixel, north up.

Chris Elledge: Observer from Massachusetts

On August 29, 2019, @10:10pm EDT, I used a 10-inch f/5 reflector to observe NGC 7448 from the ATMoB Clubhouse. Sky conditions were: Bortle Scale 6. NELM 5.0. Transparency above average. Seeing was average.

NGC 7448 fits in the 1.9° FOV with Markab at 35× in this telescope. Placing Markab in the ESE edge of the view, NGC 7448 is located on the WNW edge. It is located between mag. 10 BD +15 4742 to its east, and mag. 11 TYC 1711-0525-1 to its west. The eastern star is part of a right triangle of stars which contains fainter mag. 11 and mag. 12 stars to the star's SE and NE. I was unable to see the galaxy at this magnification.

At 115× (11mm 0.71° FOV), NGC 7448 just appeared as a tiny light spot between the two stars with averted vision.

At 270° (4.7mm 0.3° FOV), the galaxy simply looked like a diffuse light spot. It was just barely visible with averted vision. After spending quite some time looking at it, it seemed to have a north/south elongation.

I observed NGC 7448 again on October 19, 2019 at 8:00PM with the ATMoB 25-inch f/3.5 reflector. Transparency was average, and seeing was good. At 202×, I could easily see the galaxy to the west of the right triangle of stars. A few minutes of observing convinced me that the galaxy definitely had a north/south elongation. The galaxy was still visible at 473×, but the view was not as good as at 202×.

On November 3, 2019, @8:30pm, I made a follow-up with the 25-inch reflector. The sky transparency was good, but the seeing was poor. The mag. 13 and 14 star pair to the WNW of NGC 7448 were easily visible with direct vision at 253×. A mag. 15 star sat just to the ESE of

TYC 1711-0525-1, and was reliably visible with averted vision. The faint mag. 15.7 companion to the star pair was occasionally visible with averted vision. It blinked in and out with the seeing.

On November 4, 2019, @11:30pm, I made a follow-up with the 10-inch reflector. The sky transparency was average, and the seeing was good. The mag. 13 and 14 star pair were a challenging averted vision target at 270×. I would've never noticed them if I wasn't looking for them. The other 2 stars seen in the 25 inch were invisible.

Mario Motta: Observer from Massachusetts

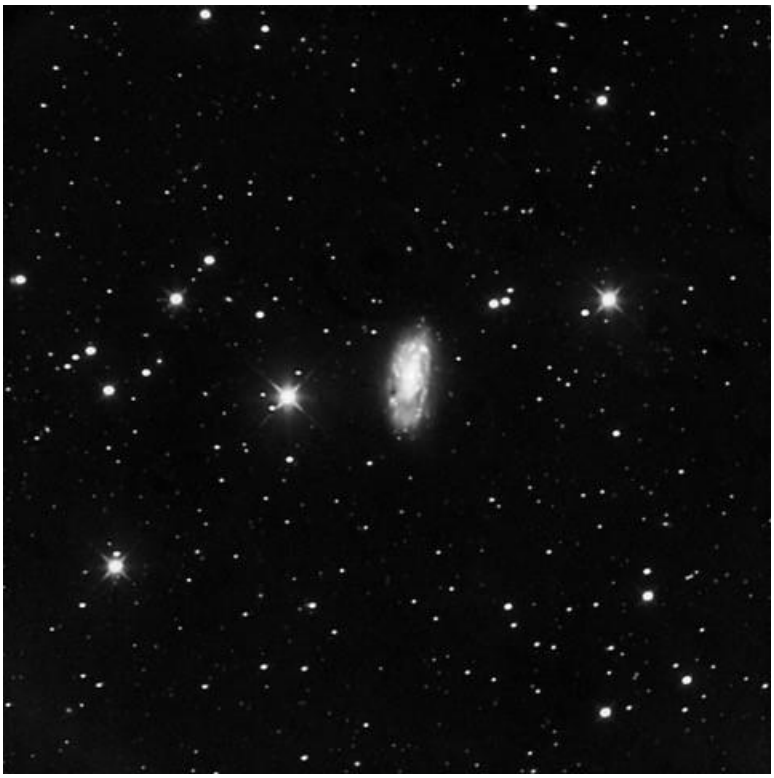
See attached, 90 mins exposure on NGC 7448. Wiki says it is 80 million LY away, about 60,000 LY across. It's notable for some "detached spiral arm segments," which I think you can easily see in my image. It's an interesting object.

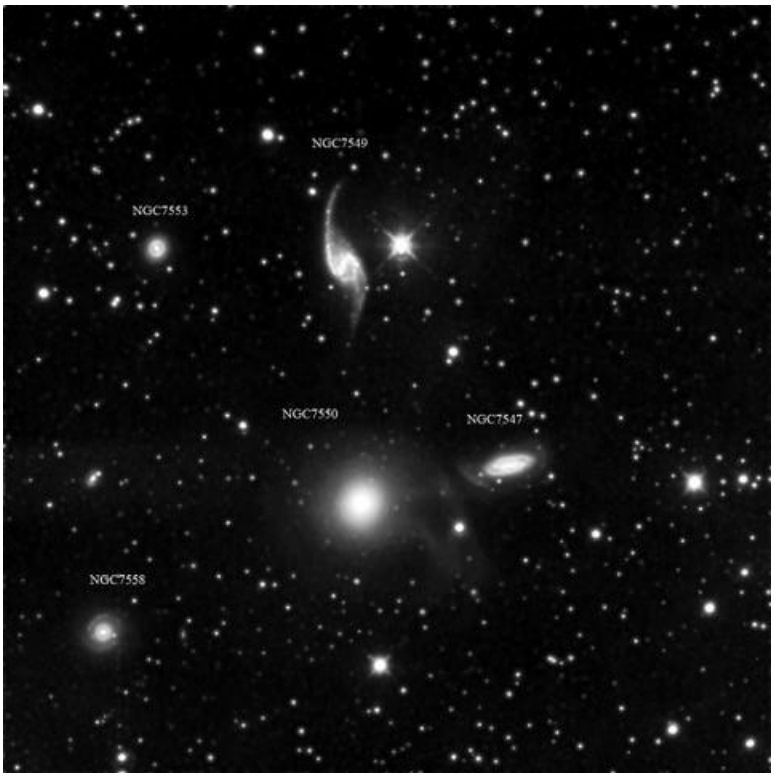
This was taken with a 32-inch scope, SBIG STL 1001E camera, 500 second subs, 90-minutes total exposure. Processed in pixinsight. The table is for stars 1, 2, and 3 in order of increasing distance from the galaxy from three different sources:

GSC 2.3	NOMAD	GAIA DR2

1) V = 13.60 ± 0.34	1) V = 13.54	1) G = 13.4561 ± 0.0005
2) V = 14.13 ± 0.34	2) V = 14.02	2) G = 14.0668 ± 0.0005
3) V = 15.89 ± 0.35	3) V = 15.63	3) G = 15.8040 ± 0.0009

Also, just for fun, nearby was "Abel 99", with 2 interacting galaxies, 5 galaxies total. Found this fascinating. The 7549 has unwound its arms in interaction with nearby 7550, an elliptical with material drawn out. This was just under 2 hours imaging, 230 Million LY away, larger intrinsic size. I labeled the 5 galaxies.




NGC7549
NGC7553
NGC7550
NGC7547
NGC7558

Roger Ivester: Observer from North Carolina

My first observation of galaxy NGC 7448, came on the night of October 24, 1994, using a 10-inch reflector. My notes are as follows:

"Can vaguely detect at 57× with direct vision, situated between two dim stars, which are oriented ESE-NW of the galaxy.

When increasing the magnification to 190×, the galaxy appeared elongated, still fairly difficult, but could be seen with direct vision. However, averted vision allowed a clear view of the elongated shape, oriented N-S, with a brighter stellar core."

It would be almost twenty five years before I would observe this galaxy again, on September 26, 2019.

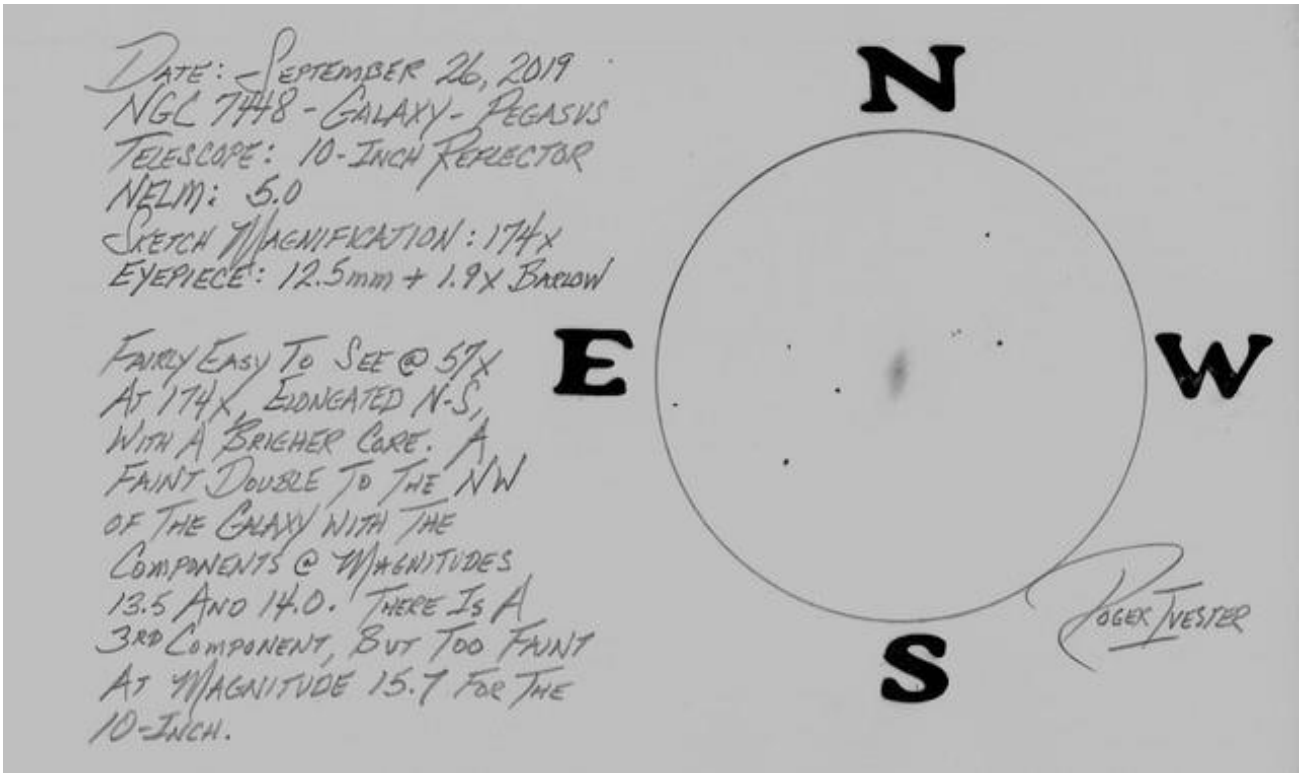
An astronomy friend, Richard Nugent from Massachusetts, visited both my wife Debbie and I, and we were fortunate to be able to observe the galaxy that night. We estimated the NELM at about 5.0, which is actually pretty good for my back yard this time of the year in the foothills of North Carolina.

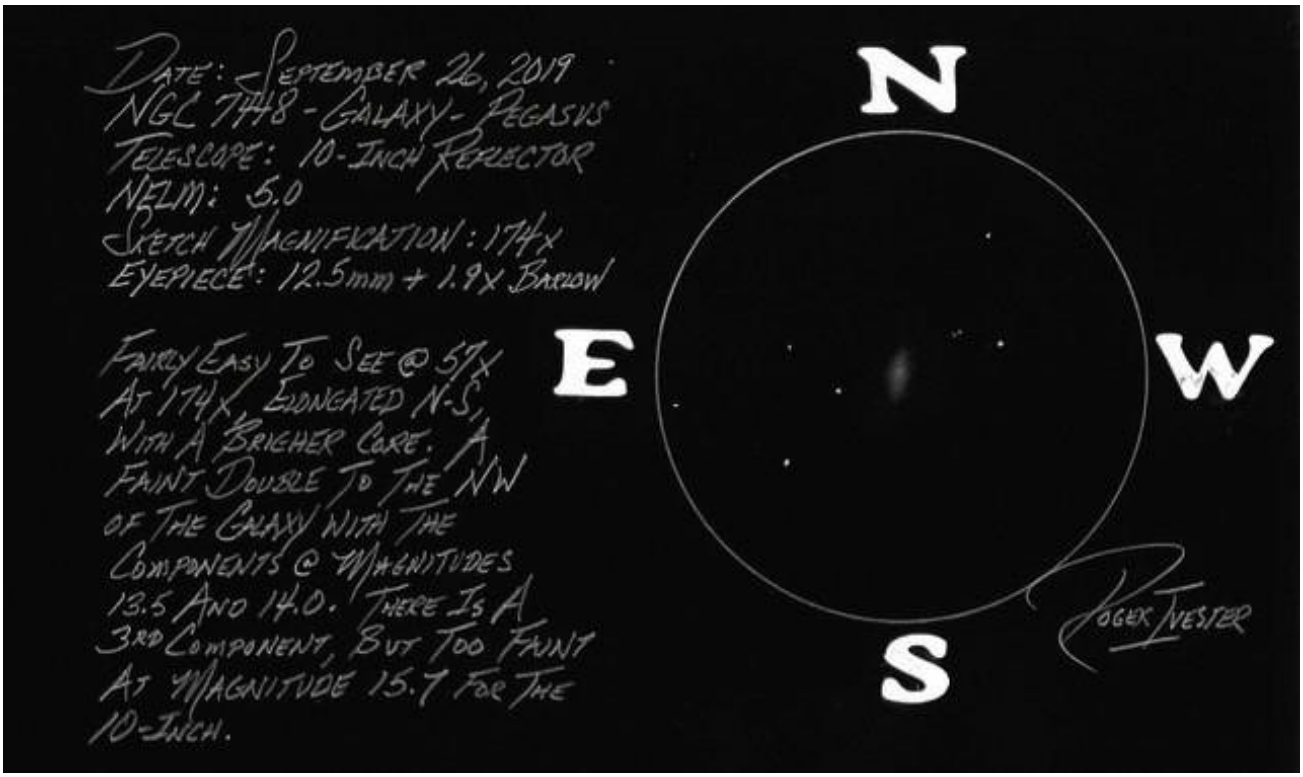
Using a 10-inch reflector, the galaxy was fairly easy to see with direct vision, at 114×. When I increased the magnification to 174×, using a 12.5 mm eyepiece and a 1.9× Barlow, the galaxy appeared elongated and oriented N-S with a brighter core.

However, for a faint galaxy such as this, and using a 10-inch reflector, in a moderate-plus light polluted location….just being able to recognize and see a few minor details can be an accomplishment or considered a success.

I was pleased to be able to see the very faint double star, mags. 13.5 and 14.0, located to the NW of the galaxy. (Mags. from NOMAD, and provided by special advisor to the Observer's Challenge, Sue French).

The double is actually a triple, but the third component is very faint at mag. 15.7, which is a bit too faint for my 10-inch reflector. I'm hoping that others using much larger telescopes were able to see this third star.




DATE: SEPTEMBER 26, 2019
NGC 7448 - GALAXY - PEGASUS
TELESCOPE: 10-INCH REFLECTOR
NELM: 5.0
SKETCH MAGNIFICATION: 174x
EYEPIECE: 12.5mm + 1.9x BARLOW
FAIRLY EASY TO SEE @ 57x
AT 174x, ELONGATED N-S,
WITH A BRIGHER CORE. A
FAINT DOUBLE TO THE NW
OF THE GALAXY WITH THE
COMPONENTS @ MAGNITUDES
13.5 AND 14.0. THERE IS A
3RD COMPONENT, BUT TOO FAINT
AT MAGNITUDE 15.7 FOR THE
10-INCH.
N
E
W
S
ROGER IVESTER

Fred Rayworth: LVAS AL Coordinator and Observer from Nevada

I've actually logged this moderately dim galaxy ten times since 1987, but for the purposes of the Challenge, I'm sticking with my observations from Furnace Creek in Death Valley on October 25 & 26, 2019, even though I purposely observed it for the Challenge at my "undisclosed location" at Lake Mead last month as well.

On October 25, 2019, it was cool, calm and clear. The seeing was terrible, but all I cared about was transparency, which was pretty good most of the night, except in patches. I had to switch areas multiple times to find darker spots. Overall, it was pretty decent and I stayed out until about 2 Saturday morning.

NGC 7448 was a small, medium-bright oval between two bright stars. One star was slightly brighter than the other. There was a tiny double almost between the galaxy and one of the other stars. At the time I didn't know it was a triple or I might've spent more time looking for the third, much fainter companion. The galaxy was oval, and slightly mottled with a slightly concentrated core. The edges flaked a bit as well, giving just the hint of a spiral shape, though due to the small size, it was a hint at best.

On October 26, 2019, it was once again cool, clear and calm, with a line of low clouds on the northern horizon. They sky wasn't quite as good as the 26th, but still not too bad until right after midnight on the 28th, when smoke from the fires up north started blowing in.

I gave the galaxy another try, but conditions were about the same. This time, I also did it to help a friend locate it and verify he was looking at the correct object, which he was. My laser finder helped that, plus his visual look through my eyepiece. Once again, I verified the double between the galaxy and the dimmer of the two bright stars the galaxy sits between. I also spotted

and re-confirmed the mottling and edge flaking I saw the night before. The core seemed a bit more concentrated tonight.