MONTHLY OBSERVER'S CHALLENGE

Compiled by:

Roger Ivester, North Carolina

&

Sue French, New York

October 2020

Report #141

NGC 7332/39 Galaxy Pair 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. 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

NGC 7332 and its companion NGC 7339 form a relatively isolated binary pair, probably orbiting each other. We see the peculiar lenticular galaxy NGC 7332 edge-on to our line of sight. It has a brighter, boxy interior suggesting the existence of a bar. NGC 7339 is also nearly edge on, but shows traces of its spiral structure. The 2016 Cosmicflows-3 catalog gives the distance to NGC 7332 as 70 Mly. Its V (V_T) magnitude is 11.1, while that of its companion is 12.2.

William Herschel discovered these galaxies in 1784 and logged them on three occasions. The description in his 1786 *Catalogue of One Thousand new Nebulae and Clusters of Stars* reads: "Two. The preceding [western] pretty bright, a little extended nearly in the direction of the meridian. The following [eastern] faint, extended nearly in the direction of the parallel of declination. 1½′ long."

Uwe Glahn: Observer from Germany

16-inch, 257×, NELM 6m5+, SQM 21.3, Seeing III "very nice pair." NGC 7332 1:5 spindle with very bright core, extensions to both sides with bright surface brightness and sharp appearance, long SW edge a little better defined, no central dust lane visible; NGC 7339 has totally different characteristics, much lower surface brightness but visible with direct vision, similar elongation with 1:4 but without a dominant core, diffuse extensions, core area clearly mottled but difficult to hold individual structures.

Rony De Laet: Observer from Belgium

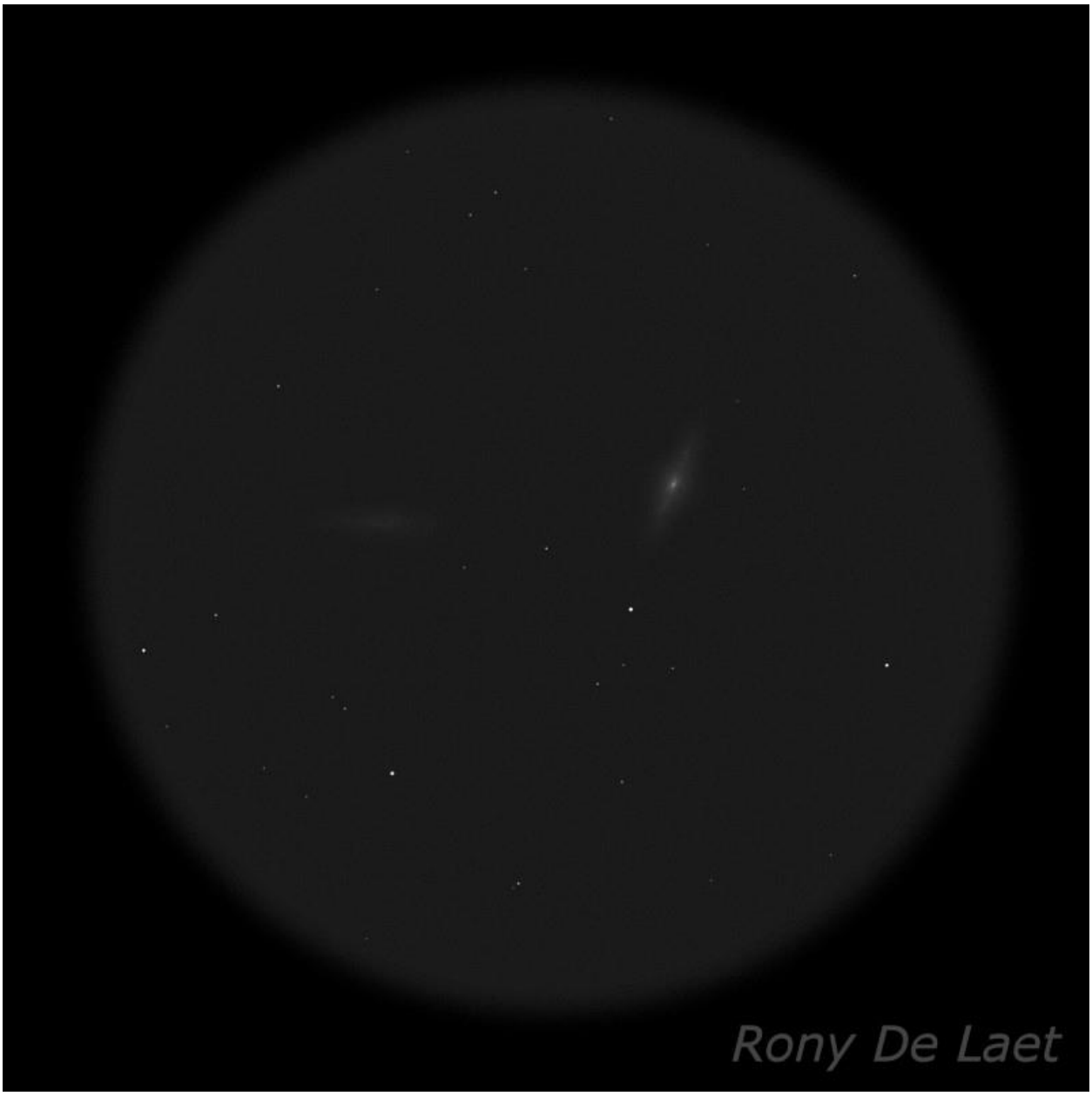
A nice galaxy pair in Pegasus. Under my light polluted sky, the 6.5mm (280×) eyepiece gives the best views.

NGC 7332 is a bright object in the 16″ Taurus. The galaxy is visible with direct vision. I see a spindle shaped galaxy with a prominent but condensed elongated core and a stellar nucleus. The spindle's major axis features a slightly brightened bar that seems to be disconnected from the core. This disconnection could be an optical illusion because the brilliant center of the galaxy overpowers its surroundings. The galaxy's halo shows a central 'bulge.' The halo is diffuse without any sharp boundaries.

NGC 7339 is a much fainter object. Averted vision is mandatory to confirm the galaxy's presence. At first an amorphous elongated streak reveals the galaxy's position. It takes time and patience to give this elusive galaxy a shape. There is no nucleus or core. The halo is weak but quite large. Some subtle mottling along the major axis can be discerned. This galaxy reminds me of a very distant sibling of Messier 82. I tried to represent the elusiveness of this object in the sketch.

Site: Bekkevoort, Belgium
Date: October 23th, 2012
Time: around 23.30 UT
Telescope: Taurus 16″
Magnification : 280×
FOV: 16′
Filters: none
Seeing: 4/5
Transp: 3/5
Sky brightness : 19.40 magnitudes per square arc second near zenith (SQM reading).
Sketch Orientation: N up, W right.

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



Mike McCabe: Observer from Massachusetts

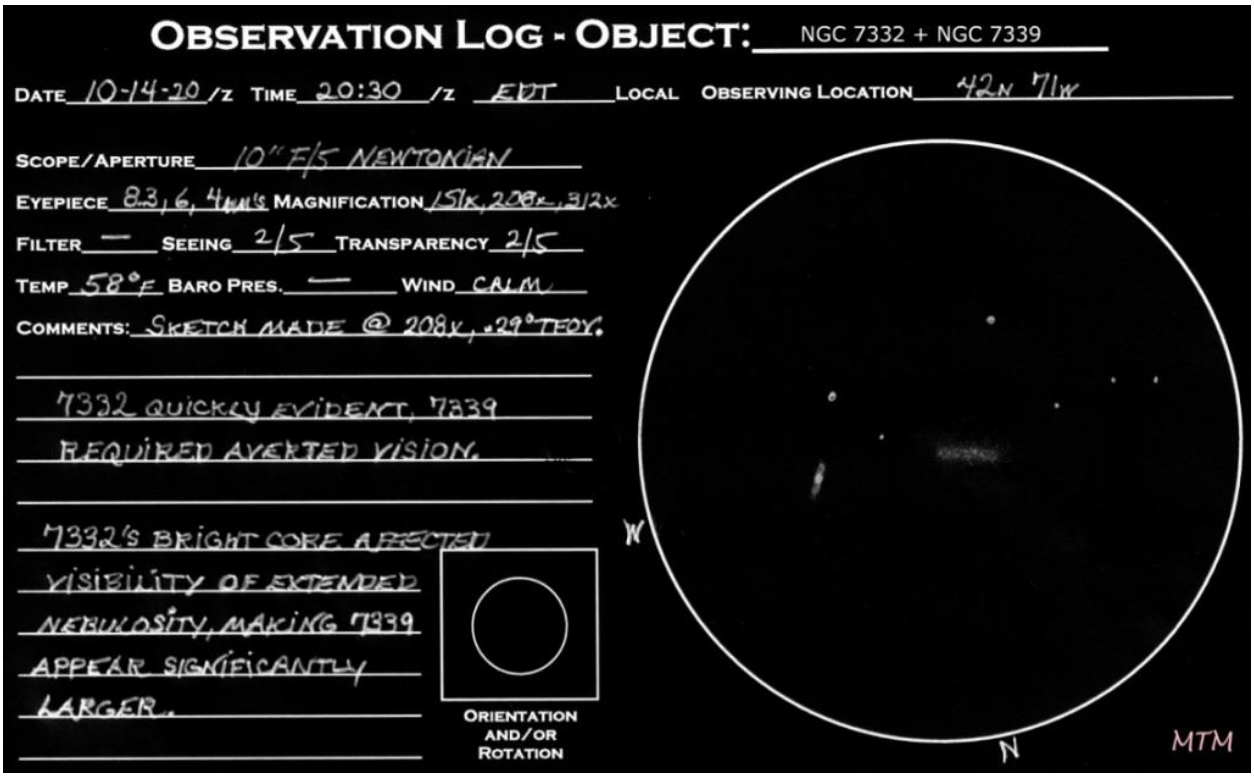
On October 14th, 2020 I got the chance to observe galaxies NGC 7332 and NGC 7339, which were the Observers Challenge objects for the month of October 2020. The night was comfortable with a temperature of 58°F and a calm wind. The sky quality was fair, with a transparency rating of 2/5 and a seeing rating of 2/5. My observing instrument was a 10″ F/5 Newtonian on a Dobsonian style mount. I observed the galaxies at a variety of powers, including 151×, 208×, and 312×. My sketch was done at 208×.

Steering to this close pair is a simple matter, with the naked-eye stars Scheat, Sadalbari and Lambda Pegasus guiding the way. The galaxies themselves are nearly centered between two magnitude 7 stars located just a short distance from Lambda Peg. Once I was on the area, the 12th magnitude NGC 7332 became readily apparent in the eyepiece, while 13.1 magnitude NGC 7339 did not. In fact it took a strong averted-vision effort to pry out 7339 from the background sky in the .29° true field of view.

An interesting effect took place during the observation wherein the dimmer of these two galaxies eventually came to appear significantly larger to me, even though from a specifications perspective 7339 is only 0.2′ larger in both length and width than its brighter neighbor, 7332. I eventually chalked this illusion up to the fact that the core of 7332 is so bright that it tends to overwhelm some of the extended nebulosity of its spiral arms when viewed with the human eye.

Applying the conventional theory of adding more magnification to make dimmer subjects easier to see didn't necessarily work with NGC 7339. I started observing this pair at a power of 208× and was able to discern 7339 with averted vision. I tried to improve 7339's visibility by stepping up to 312×, but it didn't help. What the higher power did do, though, was make 7332's core brightness become accentuated. Dropping down to 151× served to improve 7339's visibility in the eyepiece. This was one of those cases where more background sky had a tendency to improve the contrast and make dim nebulosity stand out a little better.

In doing a little research about our target galaxies, I found some interesting information on them in the professional realm. As it turns out this, pair was a subject of part of the AGES (Arecibo Galaxy Environment Survey) study wherein professional astronomers used the 1,000-ft Arecibo radio dish to study the area of NGC 7332 and NGC 7339 for the existence of dwarf companions and interacting elements. The Arecibo telescope is a 1,000-foot diameter spherical radio dish located in Arecibo, Puerto Rico. The dish is stationary and the telescope is 'steered' by moving the secondary component. Built in the early 1960's, the observatory has seen its share of ups and downs throughout the years, the latest of which happened on August 10, 2020 when a platform cable snapped, gouging a 100′-long gash in the dish.



Michael Brown: Observer from Massachusetts

NGC 7332 and 7339 are a pair of galaxies, gravitationally bound, that both appear in an edge-on orientation but perpendicular to each other. My photograph was taken as follows:

8" SCT, F/6.3, Canon Rebel T1i, ISO 1600, 47 30-second exposures (23.5 minutes total exposure), stacked and processed with Nebulosity software.

I first visually observed the pair on October 15. NGC 7332 was immediately apparent at 11th magnitude. It had the appearance of a star with two thin, fuzzy arms extending to the north and south. With averted vision, the outer regions became visible and the core was slightly extended rather than star-like. A relatively bright foreground star sits prominently off the end of the southern tip of the galaxy.

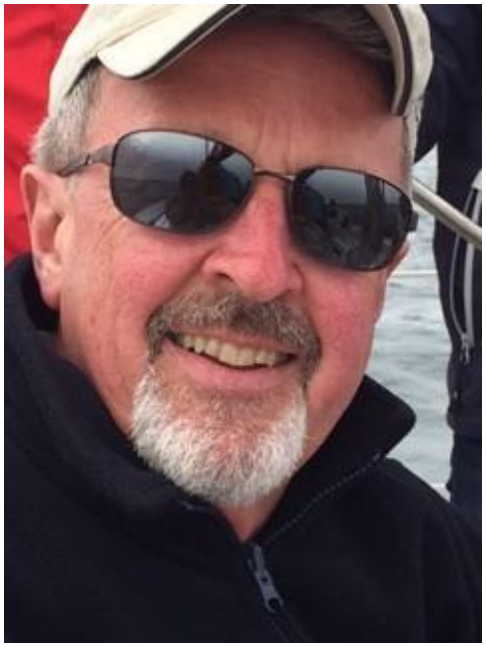
NGC 7339 is a much dimmer galaxy (around 12th magnitude) to the east of NGC 7332. I studied the field where NGC 7339 should be located, for about 10 minutes, and was not able to see it. Clouds then rolled into that area of the sky, but I was still able to get quick looks at a few other deep-sky objects and Mars before the entire sky became overcast.

I tried again on October 17. NGC 7332 was again easy to spot. After about 10 minutes of observation, I thought I saw a faint smudge with averted vision, east of NGC 7332. It was just at the limit of visibility. In order to convince myself that I had seen it, I made a rough sketch of 7332, the star south of 7332, a fainter star east of 7332 (the two stars made an isosceles triangle with the center of 7332), and the smudge farther to the east. I noted that the distance from the fainter star to the smudge was roughly 1.5 times the distance between the two stars.

Later, when I looked at my photo, I confirmed that I really had seen NGC 7339. Now that was really a challenge!

\

John Bishop: Observer from Massachusetts



On 10/14/20, I observed NGC 7332 and NGC 7339, a close galaxy pair in Pegasus. I observed from the ATMoB Clubhouse in Westford, MA. The sky was clear. Transparency and seeing were fair. The atmosphere was turbulent, giving Jupiter and Saturn a "swimmy" appearance in the eyepiece. Intermittent thin haze reduced contrast. At ground level, dew collected on my equipment after a few hours. I regretted not attaching the dew heater straps on my portable set up. Temperature dropped from the 50s ºF in the afternoon to low 40s ºF. by 11:00 pm.
This was my first time back to the Clubhouse after MIT closed it in March, due to pandemic concerns. It was recently reopened, restricted to the observing field only, with social distancing requirements, and limits on the number of persons allowed to observe at any one time.

I observed with an 8.25-inch f/11.5 Dall-Kirkham reflector, at powers ranging from 48× to 268×. Equatorial mount with motor drive, without goto. I did not use any filters.

I began the evening by looking for NGC 7332 during astronomical twilight, as an added challenge. NGC 7332 is the brighter of the two galaxies.

My 8th-magnitude charts don't show NGC 7339. Using Telrad and 7× finder, I located Lambda Pegasi. From there I followed three 7th-magnitude stars that form a right triangle just west of Lambda Pegasi. NGC 7332 is near the star marking the 90-degree corner of the triangle.

Centering the FOV just south of this field star, I spotted NGC 7332 fairly easily at 48× in my 2-inch 50mm eyepiece. It looked like a hazy star, even before twilight was over. As the sky got darker, and with increased magnification, the object became brighter and larger, although the image became less steady with higher power.

At higher powers (100×, 134×, and 193×), NGC 7332 was a small, elongated, relatively bright spindle, with a conspicuous bright core and faint nebulous extensions. The nebulosity was more extensive at higher power. I saw no other detail.

NGC 7339 was a more difficult target. Twilight had just ended; the object was still relatively low in the sky (approximately 45 degrees); contrast was limited; and the upper atmosphere was obviously churning. Sweeping slowly around the NGC 7332 field, I came to an area of brightening that I assumed was NGC 7339. Centering on this field, I spent a long time viewing it at higher powers, using direct and averted vision. I increased magnification to 268× using a fine old Clavé Barlow lens. I could see a brightening, but it would not resolve. By comparison, two fellow observers, using 18 inch and 10 inch reflectors, were able to see NGC 7339 at this time, although they reported it as "faint." I took a break, and moved on to other objects.

About an hour and a half later, I came back to NGC 7339.

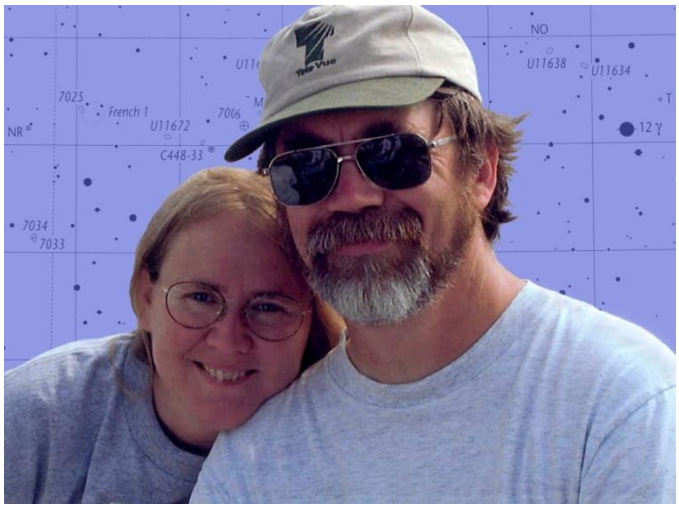
Transparency had improved, and the object was now near the zenith. In spite of dew and my awkward viewing position (looking directly overheard through a Cassegrain scope on a short tripod), I could see NGC 7339 starting to come into view. At 193×, the bright area I saw earlier took on a shape. Averted vision helped. The image was a nebulous, oblong brightening, obviously shimmering in the unstable atmosphere. Then, at times the image momentarily snapped into focus, showing a more-or-less defined edge-on galaxy.

In the moments of good focus, NGC 7339 was uniformly faint, elongated, with even surface brightness, and no obvious core. The ends of the galaxy were more "squared-off" than tapered. I saw no other detail. NGC 7339 lies approximately 5 arc minutes east of NGC 7332.

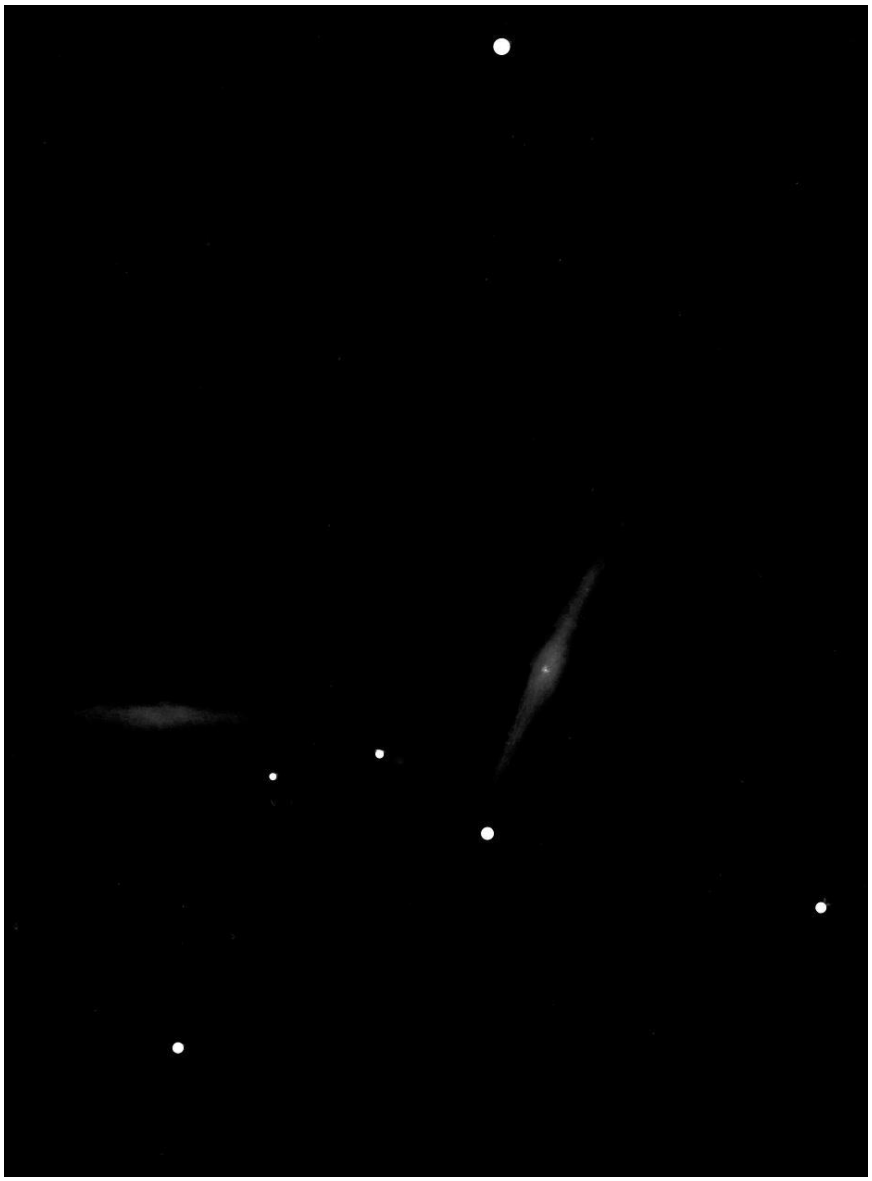
NGC 7339 points to NGC 7332 at an angle approximately 20º from perpendicular.

A good challenge. For me, galaxy pairs make some of the most interesting and dramatic astro targets.

Sue French: Observer from New York



N



W

The sketch above was made with a 10-inch reflector at 147×.

Through my 105mm refractor at 87×, NGC 7332 appears as a highly elongated spindle tilted north-northwest. It harbors a brighter, elongated core and a starlike nucleus. An 11th-magnitude star sits off the galaxy's southern end. A faint star lies between the southern tip of NGC 7332 and its neighbor NGC 7339. At this magnification, NGC 7339 is just an east-west glow captured with averted vision.

At 122× NGC 7339 is visible with direct vision, has uniform surface brightness, and spans about 2¼′. NGC 7332 bridges 2¾′ and seems to extend farther south than north of its nucleus.

In my 14.5-inch Newtonian reflector at 63×, NGC 7339 shows slight brightening toward the center.

Glenn Chaple: Observer from Massachusetts

NGC 7332/7339 – Galaxies in Pegasus (NGC 7332, Mag: 11.1, Size: 4.1′ × 1.1′ NGC 7339, Mag: 12.1, Size: 3.2′ × 1.0′)

The deep sky aficionado who has spent time exploring galaxies in the constellation Pegasus is familiar with NGC 7331 and the nearby galaxy group Stephan's Quintet. For more Pegasus galaxies, look eleven degrees due south for the interesting edge-on galactic pair NGC 7332 and NGC 7339. Both were discovered by William Herschel on September 19, 1784 and entered in his *Catalogue of Nebulae and Clusters of Stars* as Class II (Faint Nebulae) objects.

Far be it for me to question Sir William's judgement, but I would humbly opine that NGC 7332 should have been catalogued as a Class I (Bright Nebulae) object. I had no trouble capturing the elongated form of this 11th-magnitude edge-on lenticular galaxy with a 4.5-inch reflecting telescope and magnification of 100×. NGC 7339 wasn't as accommodating. A magnitude fainter than NGC 7332 (and certainly deserving its Class II status), this edge-on spiral required a bigger scope (a 10-inch reflector), ample time to dark-adapt my eyes, and averted vision.

To find these galaxies with GoTo technology, use the coordinates for NGC 7332 (RA 22h 37.4m, dec. +23° 47.9′). If you're a star-hopper, train your finderscope on the wide pair mu (μ) and lambda (λ) Pegasi (magnitudes 3.5 and 3.9, respectively). After centering lambda in a low-power eyepiece field, nudge your scope 2 degrees westward until a pair of 7th-magnitude stars less than a degree apart and oriented N-S enters the field. Center the northernmost of the two in the eyepiece field and switch to a higher magnification. NGC 7332 should immediately be visible. NGC 7339, located 5 arc-minutes east of NGC 7332 will appear as a faint E-W-oriented streak.

NGC 7332 and NGC 7339 appear to form a gravitationally bound system. They lie some 67 million light years from earth.

OBSERVING LOG

NAME: Glenn Chaple

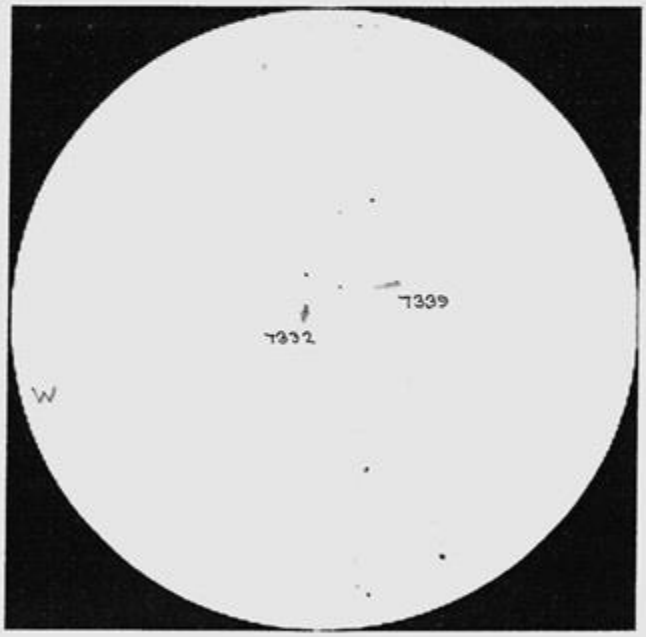
DATE (M/D/Y) 9 / 11 / 2020 TIME: 10 : 20 pm EDT

OBSERVING SITE: Townsend MA

SKY CONDITIONS: Seeing (Antoniadi Scale) _____ Limiting Magnitude 5.2

OBJECT: NGC 7332 NGC 7339 TYPE: Lenticular Gal Spiral Gal CONSTELLATION: Peg

SKETCH (note direction of west)



NOTES:

NGC 7332 - easily seen with low power. Stellar nucleus at 139 x. Elongated roughly N-S.

NGC 7339 - very faint at 139 x. Elongated E-W

OBSERVING EQUIPMENT

Binoculars ____X_____

Telescope: 10-inch f/5 reflector Eyepiece: 9mm Nagler

Mag: 139 X Field Diam: 0.6 ° Filter (if any): _____

Chris Elledge: Observer from Massachusetts

On October 9th @8:00pm EDT, I used a 10-inch f/5 refractor to observe NGC 7332 from the ATMoB Clubhouse. Sky conditions were: Bortle Scale 6; NELM 4.0 near NGC 7332; Transparency: Fair; Seeing: Fair.

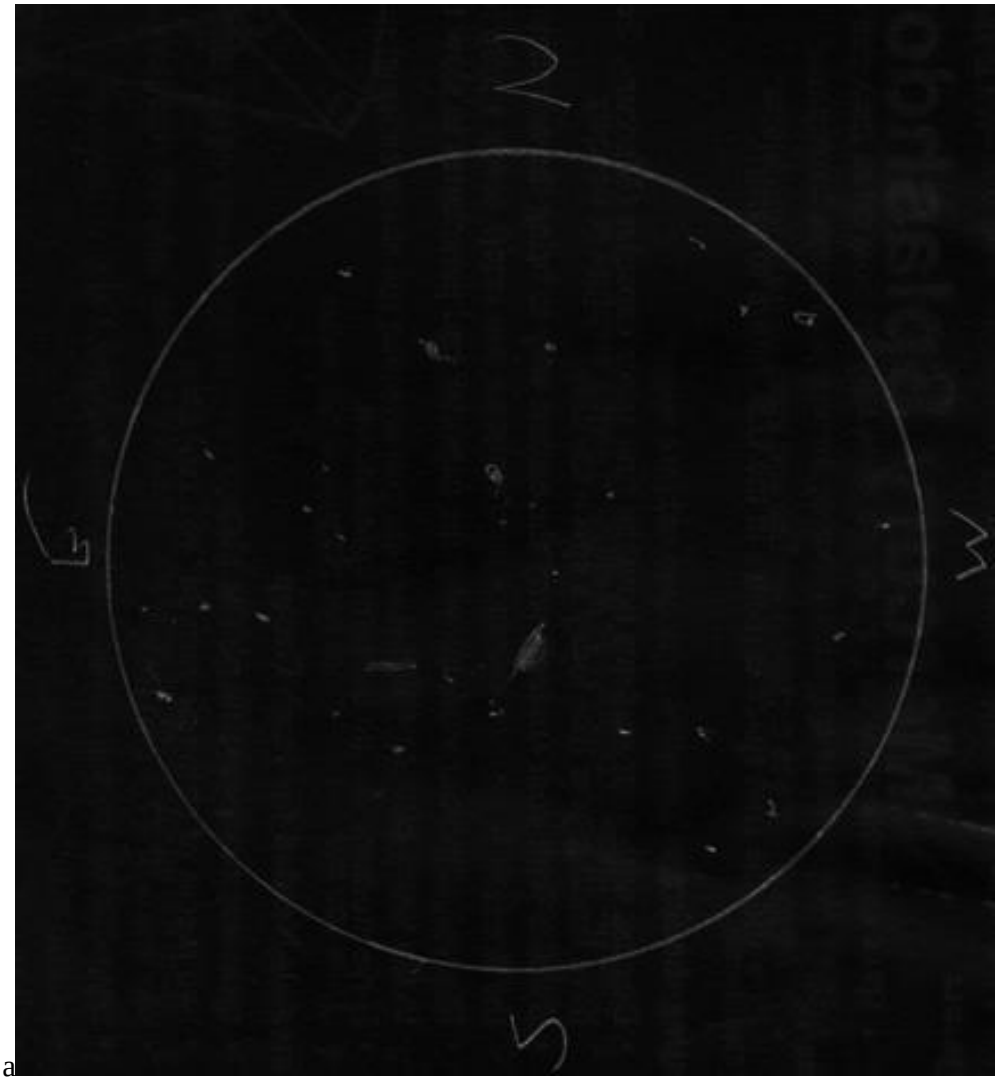
Lambda Pegasi was barely naked eye visible. I star hopped from it to HD 214930 and then to HD 214398. Two mag. 10 stars join HD 214930 to form a triangle that points South towards the mag. 7 star HD 214350. At 36× (35mm eyepiece) a small light patch and a faint star appear adjacent to each other with averted vision about 9′ South of the triangle heading towards HD 214350. The faint mag. 11 star (TYC 2220-0831-1) is slightly further from the triangle than the galaxy which appears as a light patch.

At 115× (11mm, 0.7˚ FoV) the triangle of stars and HD 214350 both just fit in the view of the eyepiece. The core of NGC 7332 is visible with direct vision along with the nearby mag. 11 star. With averted vision the outer portions of the galaxy are smudge-like with a NNW to SSE elongation, which almost orients itself with the mag. 11 star. A faint mag. 13 star is visible to the East of the galaxy and star pair. Slightly further East from that star I sometimes get a hint of a lighter area that I think is NGC 7339.

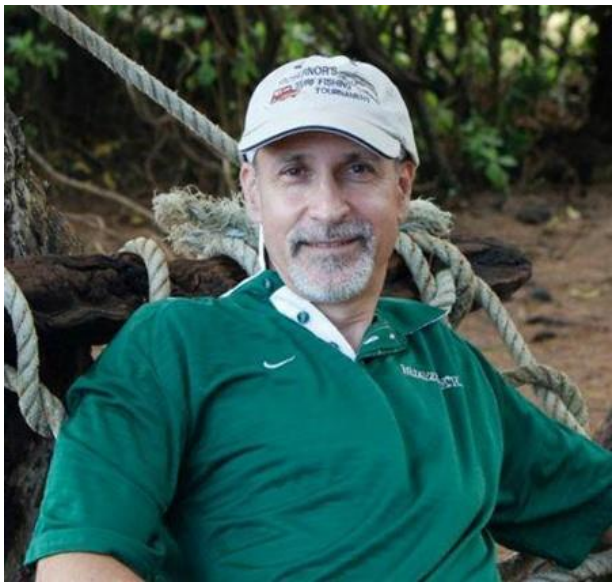
Increasing the power to 270× (4.7mm) darkened the background enough that 7332 was much easier to see with averted vision. The core was easily visible with direct vision. The core of 7339 was visible with averted vision as a very faint smudge.

Joseph Dechene: Observer from New Hampshire

My sketch of NGC 7332 and NGC 7339 was made on October 8, 2020 with a14.5-inch scope at f/4.37 using a multi-purpose coma corrector and a 13.8mm super wide angle eyepiece.



James Dire: Observer from Illinois



NGC 7332 and NGC 7339 comprise a pair of nearly edge-on spiral galaxies in the constellation Pegasus. The pair lies two degrees west of the 4th-magnitude star Lambda Pegasi. William Herschel discovered both in 1784 using his 18.7-inch Newtonian telescope.

At magnitude 11, NGC 7332 is the brighter of the pair. It has a bright central bulge and a fainter, flatter disk. The galaxy measures 3.0 x 0.7 arc minutes in size. Although many have cataloged NGC 7332 as a spiral galaxy, it appears more like a lenticular galaxy in photographs. The major axis of the galaxy is at a position angle of 154°.

NGC 7339 is a magnitude fainter than its companion. The galaxy measures 3.2 × 0.9 arc minutes in size and is oriented east-west. Being slightly larger, but fainter, NGC 7339 is more difficult to see than NGC 7332. In my 190mm Mak-Newt, I could see NGC7332 readily, but had to concentrate more to see NGC7339.

NGC 7339 is classified as a SABc galaxy. This means it's part way between a regular spiral galaxy and a barred spiral galaxy, with a very small core. It is tilted just enough away from being perfectly edge on that some spiral arm structure can be seen in photographs.

Both NGC 7332 and NGC 7339 are located 67 million light-years away. The two galaxies are gravitationally bound. They have a slight red shift, which means they are slowly receding away from the Local Group. The cores of the two galaxies are separated by 5 arc minutes.

My image of the pair was taken with a 132mm f/5.6 apochromatic refractor with an SBIG ST-2000XCM CCD camera. The exposure was 50 minutes. In the image, north is up and east to the left. Even with this small telescope, the NGC 7339 shows some spiral structure in the image and the lenticular nature of NGC 7332 is apparent.

The two bright stars in the image are both 7th magnitude and are separated by one-half degree. Centering them in a finder scope of a 6-8 inch telescope guarantees you'll have the two galaxies in the eyepiece.

Mario Motta: Observer from Massachusetts

I took this Friday night Sept 11, and tried for color, got 1 hour Lum, and 45 min each RGB, but.. getting color on small galaxies is rarely very rewarding. Barely a reddish tint is all I see. Taken with ASI6200 camera though the 32-inch scope.

It's a good thing I took this image last Friday! The past few days we have had a dense plume of smoke (Due to the California wildfires) up high at 25,000 feet dimming the sky, below 30 degrees you can very safely stare at the sun. Certainly we are much better off than the poor people out west with the fires, but that smoke and dust is now in the upper atmosphere and covering New England skies.

I estimated a 3 mag loss in the sky last night. Tonight I made visual estimates I normally have a 5.5-mag sky on a good moonless night from my observatory deck.

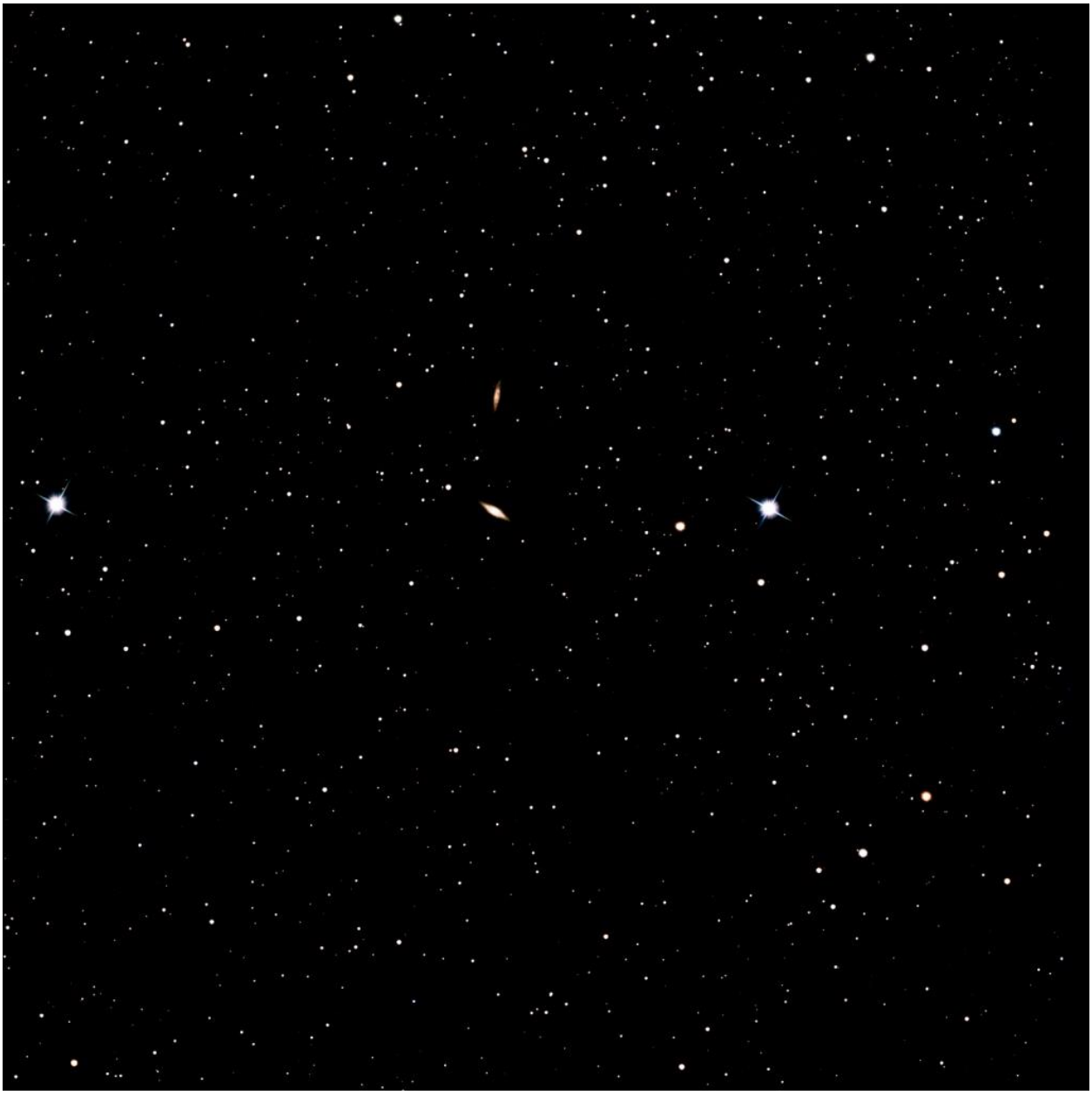
I will be quantitative now: straight up looking at Cygnus, only the brightest stars are seen, Albireo (mag 3) barely seen, so a loss of 2.5 mags. Don't forget magnitude is logarithmic so this amounts to filtering of 80% of the starlight out.

At an altitude of 30 degrees up…nearly all stars are gone, Mars and Jupiter appear as a first or second magnitude star, which is a magnitude-4 loss, much dimmer than they should be. This smoke is really thick up there. And just at new Moon with "clear" skies, very unfortunate. No more imaging until the skies clear…

Venu Venugopal: Observer from Massachusetts

NGC 7332 is an edge-on lenticular galaxy located at about 67 million light-years away, both NGC 7332 and 7339 were discovered by William Herschel in 1784. NGC 7332 and NGC 7339 form a binary system in the constellation Pegasus and are likely orbiting each other. NGC 7332 is the brighter of the two galaxies. Receding from us at over eight hundred miles per second, they are orbiting each other at about sixty miles per second.

Telescope: 72mm ED f/5 refractor, GEM 45Camera: ZWO 533 Exposure time: 57 minutes / 10 second subs / flats / darks Real time stacked on SharpCapPost Processing software: Adobe Photoshop



Joseph Rothchild: Observer from Massachusetts

I observed NGC 7332/7339 on Cape Cod, October 14 with my 10-inch reflector. Transparency was fair.

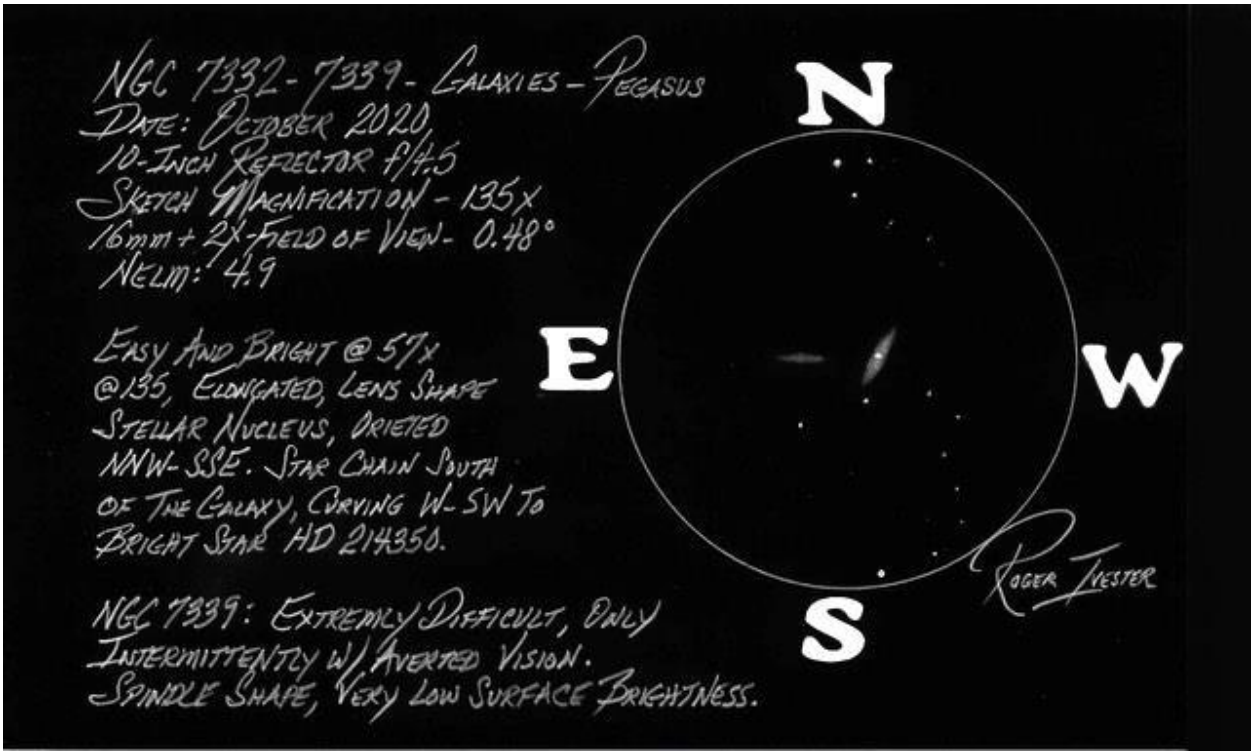
The galaxies were fairly easily found near lambda Pegasi. NGC 7332 was initially seen with a 14mm eyepiece (88×), but not at lower power with a 27mm. The galaxies are at near right angles to each other, reminiscent of M81/82.

NGC 7332 was relatively bright, elongated, with a central condensation. NGC 7339 was faint and barely visible, though better with averted vision. It was uniform in brightness and wider and slightly longer than its companion galaxy.

Roger Ivester: Observer from North Carolina

NGC 7332 was very easy to locate and see with my 10-inch f/4.5 reflector at 57×. When increasing the magnification to 135×, a stellar nucleus becomes obvious with direct vision. Elongated with a lens shape, oriented NNW-SSE. The NELM while observing this galaxy was poor at ~4.9 due to high humidity, and reflecting ambient lighting. A very interesting star chain crosses the southern part of galaxy, extends toward the west and then curving south to bright star, HD 214350.

NGC 7339 at 135× was extremely faint and could only be seen intermittently with averted vision. A very thin spindle shape, with very low surface brightness. An extremely difficult galaxy from my back yard.



The following is the complete listing of all Observer's Challenge reports to-date.
https://rogerivester.com/category/observers-challenge-reports-complete/