MONTHLY OBSERVER'S CHALLENGE

Compiled by:

Roger Ivester, North Carolina

&

Sue French, New York

November 2020

Report #142

NGC 278, Galaxy in Cassiopeia

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 278 is a nearly face-on galaxy shining at a visual V(V_T) magnitude of 10.8. It lies about 39 million light-years away from us. At that distance, the galaxy's angular size on the sky implies a true diameter of about 23 thousand light-years in visible light. The inner regions of NGC 278 show signs of intense star formation that may be the result of a merger with a smaller galaxy in its recent past. A darkling shroud enwraps NGC 278, perhaps dust from the cannibalized galaxy driven outward by stellar winds.

William Herschel discovered NGC 278 with his large 20-foot reflector (18.7-inch aperture) in 1786. His handwritten log of the discovery describes this galaxy as: very bright, round, very gradually much brighter in the middle, about 1½′ in diameter, about 1′ south of a pretty considerable star.

Uwe Glahn: Observer from Germany

Object: NGC 278

Telescope: 14″ f/3.8 Newton

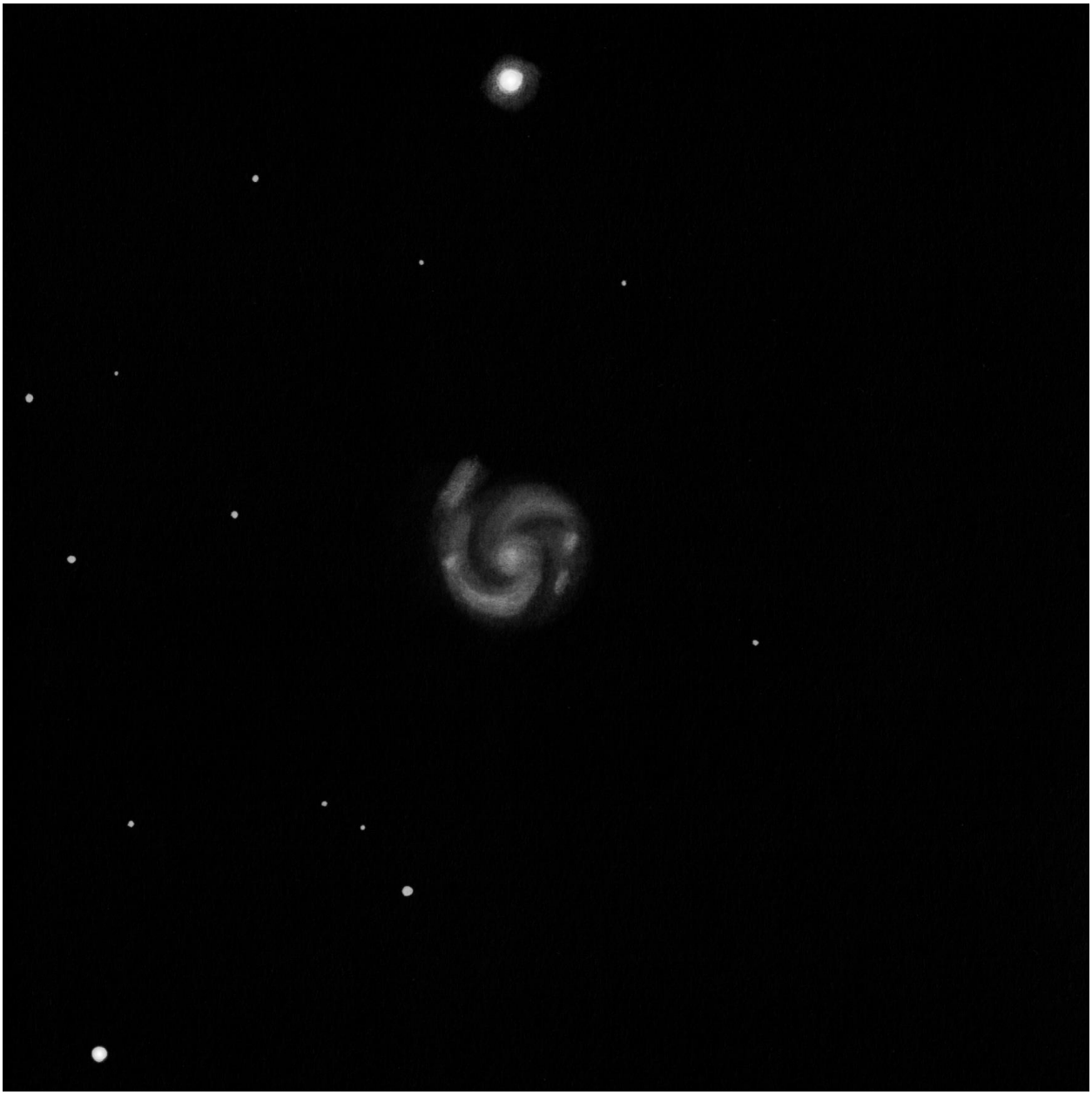
Magnification: 404×

NELM: 6.5+

Seeing: III

Location: Sudelfeld

Sketch on next page



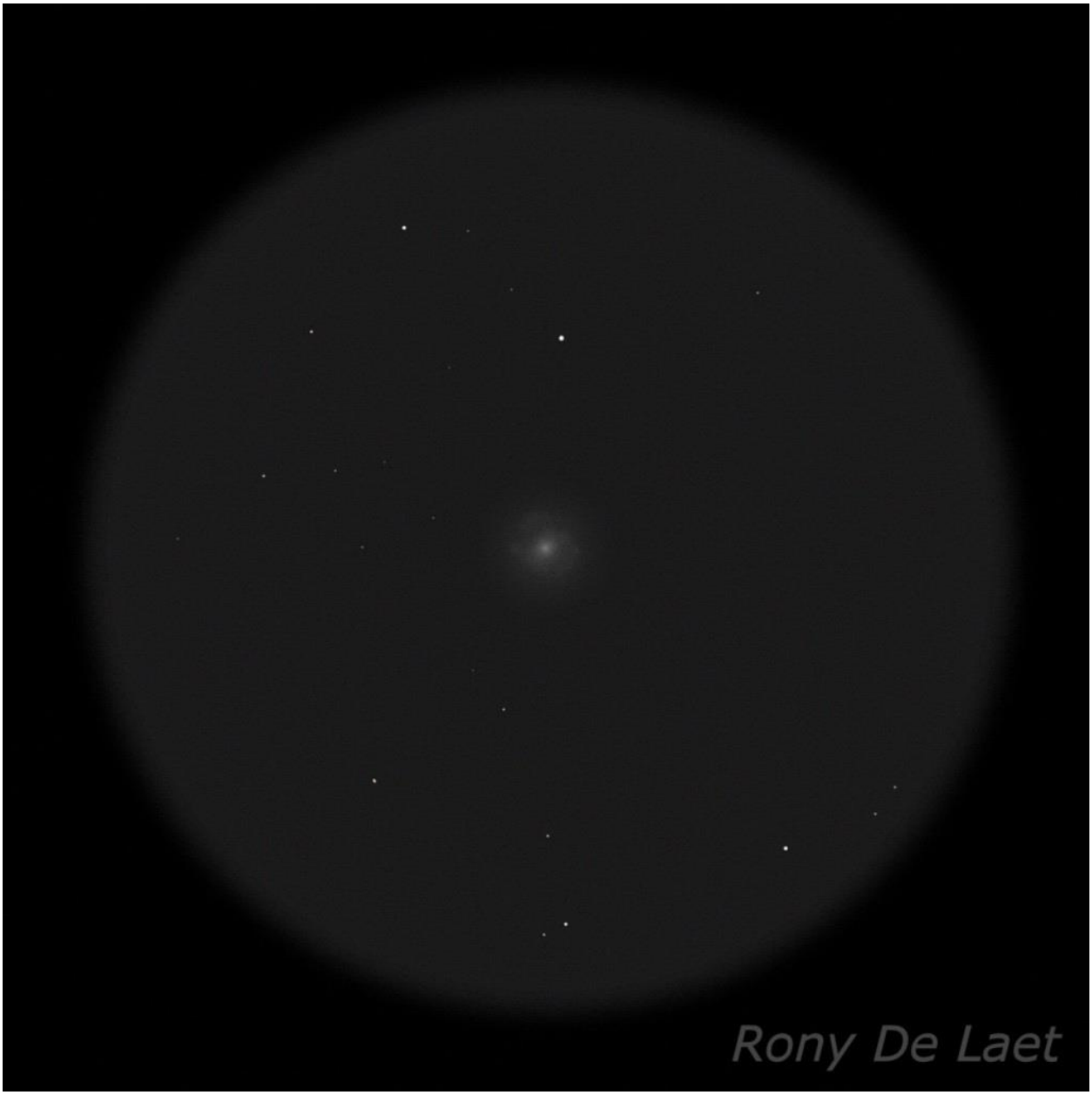
Rony De Laet: Observer from Belgium

NGC 278 is a conspicuous small patch at low power (60×). When I changed to medium power (200×), I realized that the galaxy's bright core could handle much more magnification. I found 400× the best choice for my sky's brightness. The nucleus is just short of being stellar in my scope. The galaxy's core remains bright but compact, even at 400×. The object's circular halo is the most interesting feature. I can detect an elongated 'gap' in the halo on each side of the galaxy's core. The one N of the core is the most obvious of the two. This gives the object a bar-shaped centre plus the appearance of some spiral structure outside the gaps. The contrast is too low to clearly see the orientation of the spirals. I'm convinced that a better night might do the trick.

Site : Bekkevoort, Belgium
Date : November 12, 2021
Time : around 2.45UT
Telescope: Taurus 16-inch
EP: 4.5mm (400×)
Filter : none

Seeing : 4/5
Transp. : 3/5
Sky brightness : 19.3 magnitudes per square arc second near zenith (SQM reading).
NELM: 5.3
Sketch Orientation: N up, W right.
Digital sketch made with Corel Paint Shop Pro, based on a raw pencil sketch.

Sketch on next page


Rony De Laet

Anas Sawallha: Observer from Jordan.

Finally I got myself a new telescope, it was lent to me by a fellow astronomer, Orion 10 inch, I decided not to go to the desert and observe from home.

The first night was a disaster, which after I prepared everything the sky became cloudy ☺.

However, the second night was perfect, with good seeing conditions, I was able to observe NGC 278.

At low power using the Aspheric 25mm eyepiece I could barely see it with averted vision, then I used the Plössl 12.4mm eyepiece and I could see it clearly. It appeared to me as an undefined round smudge much like what a globular cluster would look in my 5 inch reflector.

Location: Irbid, Jordan

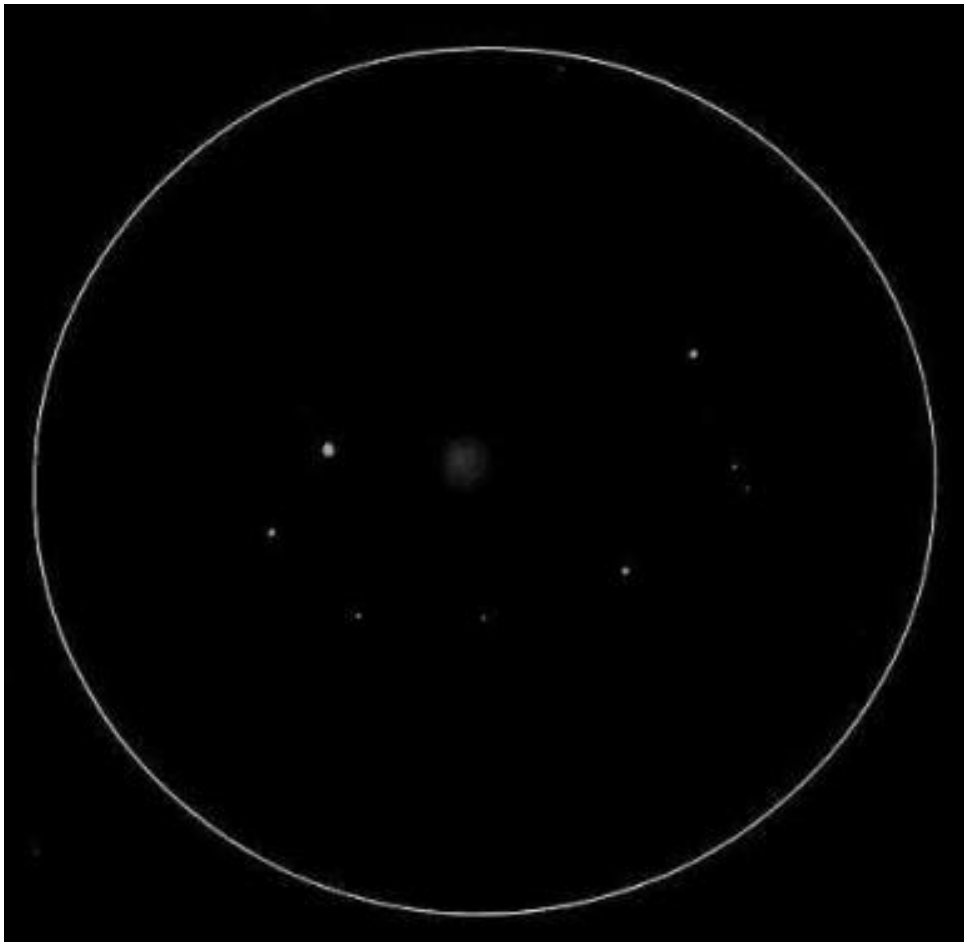
Time: 10:30 pm.

Seeing conditions: very good.

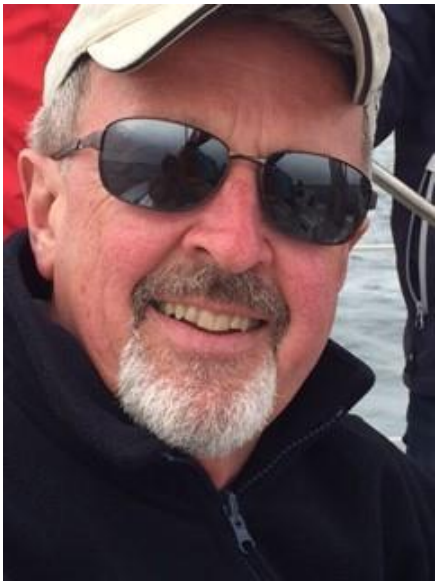
Telescope: Orion XT 10, 1200mm focal length.

Magnification: 97×.

Sketch on the next page.



John Bishop: Observer from Massachusetts



On 11/18/20, I observed face-on spiral galaxy NGC 278 from a suburban site outside Boston. The sky was clear, but transparency and seeing were only fair. This was the first really cold night of the season for me. Afternoon temperatures were in the low 30s, but fell to 19º by 9:00 pm.

I observed with an 8.25-inch f/11.5 Dall-Kirkham reflector, at powers ranging from 48× to 193×, and using an equatorial mount with a motor drive, without goto. I did not use any filters. I did attach the heater straps to my portable setup, recalling how dewed up things got while observing NGC 7332 in October.

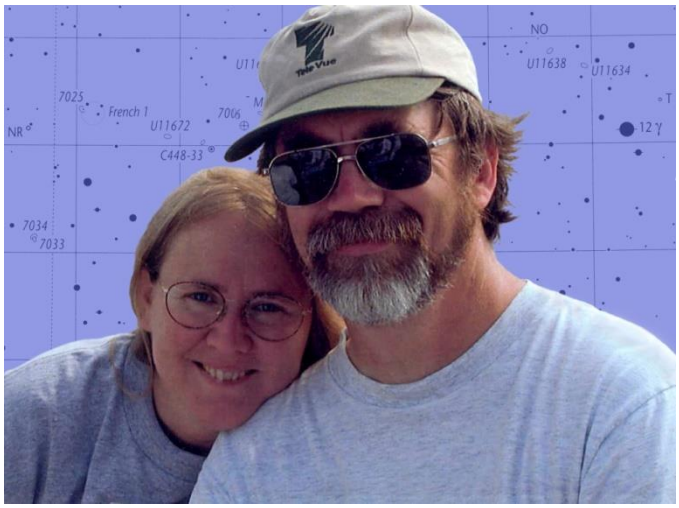
It took me longer than I expected to get to the NGC 278 field. I couldn't resist first taking a detour to peek at M31. From there, I thought I could easily star-hop my way up to NGC 278. The problem is that NGC 278 lies in a somewhat sparsely populated area of the sky, and sky glow on the eastern horizon made it hard to find landmarks for navigation.

Eventually I realized that I already knew the field I should be looking for, having previously observed nearby NGC 185 and NGC 147. A useful landmark in this region is a distinctive line of 3 stars, running north-south. Omicron Cassiopeiae, at magnitude 4.5, is one end of this line, and Pi Cassiopeiae, magnitude 4.9, is the other. A 5.5-magnitude third star lies in line between them, closer to Omicron. On this night, only Omicron Cas was visible to the naked eye (barely, with averted vision). Using the Telrad to get to the general area, I soon spotted the telltale 3 star alignment in the 7×50 finder. NGC 278 lies east of Omicron Cas. From Omicron Cas, hop to the 5.5-mag line star, then turn 90 degrees, to the east, and proceed to a 6th-magnitude star about one degree away. NGC 278 lies just east of this star.

At 48× NGC 278 was a small hazy patch that could have been taken for a planetary nebula. At higher magnification, the galaxy was unevenly round, nebulous, and faint, with an increasingly bright core. At 193×, the face-on image of the galaxy was unsteady, with uneven surface brightness. Possibly this was an indication of some structure. No other detail was seen.

While in the neighborhood, I also observed NGC 185, but was unable to see companion NGC 147. NGC 147 is very tough. Locating it last year was an observational high point for me. It is likely the faintest object I have detected with this scope from suburban Boston.

Sue French: Observer from New York



Through my 10-inch reflector at 43×, NGC 278 appears very small but easy to see, while at 68× it's enclosed in a faint, round fringe. My sketch was made when viewing the galaxy at 166×. It spanned about 1.2′, hosted a very small nucleus, and offered a suggestion of spiral arms within the brighter region.

Glenn Chaple: Observer from Massachusetts

The mere mention of the constellation Cassiopeia to a deep sky enthusiast conjures up visions of open star clusters like M52, M103, and the "ET Cluster" NGC 457. But if you move southward towards Cassiopeia's border with Andromeda, you'll come across a handful of galaxies that includes NGC 278 – this month's Observer's Challenge.

This nearly face-on spiral was discovered by William Herschel on the evening of December 11, 1786. It bears the Herschel Catalog designation H159[1] (his 159th Class I [Bright Nebulae] object). Its calculated distance of 38 million light-years translates to a true diameter of 26,000 light years.

I observed NGC 278 on the evening of September 20, 2020, using a 10-inch f/5 reflector. At 39×, it showed itself as a hazy "star." A boost to 208× revealed a ghostly circular patch with no discernible concentration. NGC 278 was faintly visible in my 4.5-inch f/7.9 reflector. At 90×, it looked more like a planetary nebula than a galaxy.

The coordinates for NGC 278 are RA 0h 52m 04.3s, Dec +47° 33′ 02″. Star-hoppers can find it by tracing a path from 4th-magnitude omicron (o) Cassiopeiae.

My sketch of NGC 273 as seen with a 10-inch f/5 reflector at 208× is on the following page.

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OBSERVING LOG

NAME: Glenn Chaple

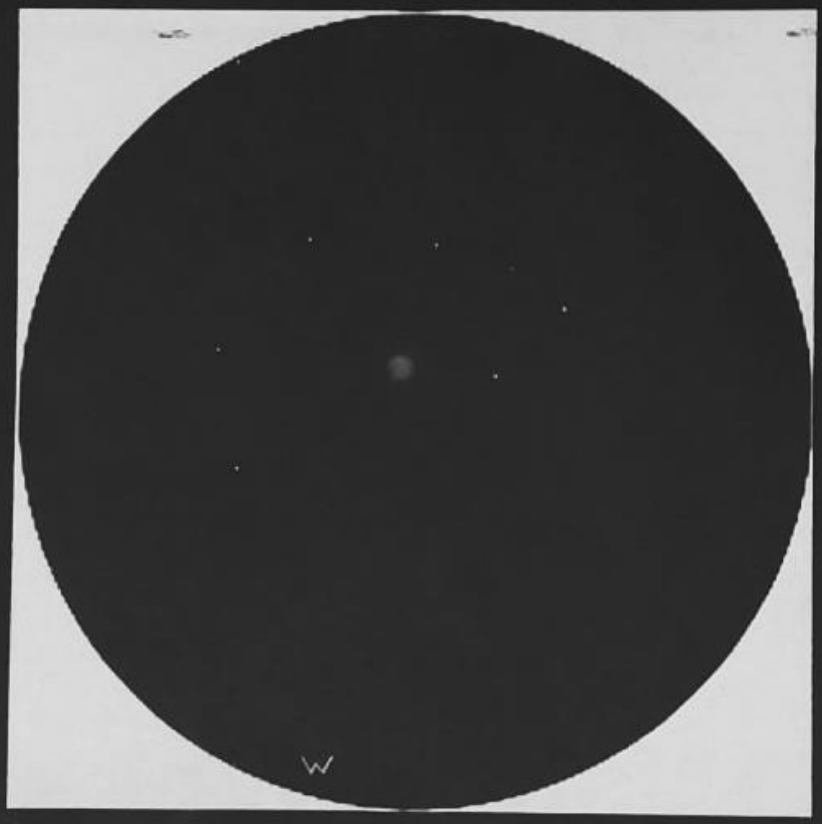
DATE (M/D/Y) 9 / 20 / 2020 TIME: 9 : 25 pm EDT

OBSERVING SITE: Townsend MA

SKY CONDITIONS: Seeing (Antoniadi Scale) III Limiting Magnitude

OBJECT: NGC 278 TYPE: Spiral Galaxy CONSTELLATION: Cas

SKETCH (note direction of west)



NOTES:

In 10-inch at 39X, v
as hazy "star." At
appears as ghostl
circular patch-no
visticeable concen

Also seen in 4½-inch
reflector at 90X.
Looks like a planeta
nebula

OBSERVING EQUIPMENT

Binoculars ____X____

Telescope: 10-inch f/5 reflector Eyepiece: 6mm Tele Vue Radian

Mag: 208X Field Diam: 0.3 ° Filter (if any): ____

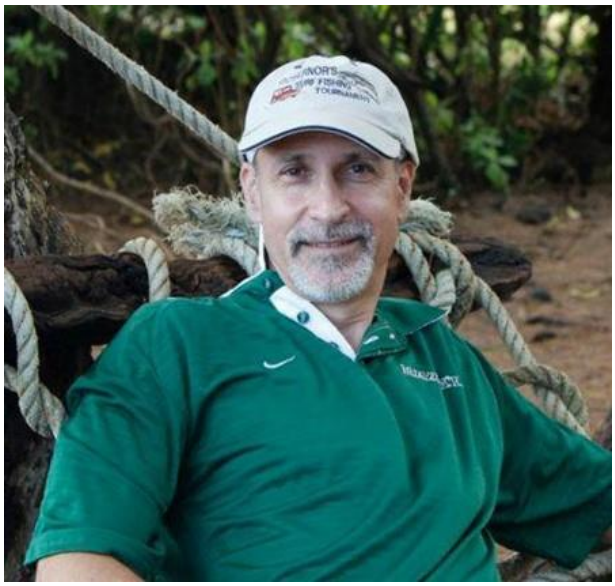
Richard Nugent: Observer from Massachusetts

NGC 278 is a bright, relatively easy to find galaxy located near M31 but is in the constellation of Cassiopeia. Its estimated distance is 38 Mly and it subtends 2.4 × 2.3 arcminutes. It has a visual magnitude of 10.8 and despite its reported surface brightness of 12.8 the galaxy is an easy find. While your path may vary, I start at Pi and Omicron Cas. Shining at magnitude 5.0 and 4.5, respectively, these stars can be seen in most finder scopes. I next move to the magnitude 6.7 star HD 4701. The galaxy lies 28 arcminutes away at a position angle of 117º (just south of east) and is attended by the 8.8-magnitude star, HD 4950. The galaxy appears nearly face-on and has a bright, condensed nucleus with flocculent arms containing many young, high-luminosity, blue stars that ring the nucleus. The outer region of the galaxy's disk is extremely faint. Many observers suggest the galaxy looks like a planetary nebula.

I had two opportunities to view this object. Through my 10-inch scope, the galaxy was easy to see at all magnifications. Appearing as a nearly circular, diffuse, even glow. I could not see the nucleus, nor did I see any of the brighter regions of star formation seen in images. The 20-inch scope gave a better view with the small nucleus easily visible, but I did not see any detail in the disk. I will return to this galaxy and I'm hopeful that with extended observations and careful scrutiny, I'll be able to see structure.

While we often overlook NGC objects, this galaxy is well worth visiting and adding to your observing list. Enjoy!

James Dire: Observer from Illinois



The constellation Cassiopeia spans 38 degrees of declination from 39°N to 77°N. Most famous in the constellation is the W asterism located in the Milky Way, which cuts through the center of the constellation from east to west. Consequently, most of the deep space objects in the constellation are star clusters, followed by nebulae. Away from the plane of our home galaxy, a few distant galaxies can be spied.

The southernmost deep space object in the constellation is NGC 278, a tiny faint spiral galaxy. NGC 278 is located 10.25 degrees due south of the magnitude 3.45 star Achird. Achird is located just south of the midpoint between two stars forming the W asterism – Navi and Shadar. The closest naked eye star to NGC 278 is Omicron Cassiopeiae, magnitude 4.48. NGC278 is approximately 1.5 degrees southeast of Omicron. Omicron is about 7 degrees due north of M31, the Great Andromeda Galaxy.

NGC 278 is a tightly wound spiral galaxy measuring 2.4 × 2.3 arc minutes in size. It appears face on, but is actually tilted 30 degrees to our line of sight. The galaxy has classification SABb, which means it is intermediate between a normal spiral galaxy and a barred spiral galaxy. The galaxy is located 39 million light years away.

NGC 278 shines at magnitude 10.8. Because of its small size, it has more apparent brightness than visually larger galaxies of the same magnitude telescopically. It appears as an unresolved small circular smudge with a faint star-like core.

My image of NGC 278 was taken with a 10-inch f/6.9 Newtonian using an SBIG ST-2000XCM CCD camera. The exposure was 70 minutes under less than average seeing conditions (3 arc sec) from the west side of the island of Kauai. In the image, north is up and east to the left.

The galaxy has two main spiral arms emanating from the core near position angles 45° and 225°. These main arms are resolved in my image, but the myriad arms branching off the main spiral arms are not resolved. The galaxy has a photographically noticeable circular (or spherical?) halo extending beyond the edges of the spiral arms. The brightest star in the image, above the galaxy, is HD 4950, magnitude 8.82. The faintest stars are magnitude 18.

Mario Motta: Observer from Massachusetts

This image was captured through the 32-inch with ASI6200 camera, a small object (2 arc minutes). 90 minutes total integration time, taken October 15.

Venu Venugopal: Observer from Massachusetts

I was able to observe NGC 278 on Nov 21st after a couple of attempts within a mostly cloudy month.

This image shows a spiral galaxy named NGC 278 which lies 38 million light-years away in the northern constellation of Cassiopeia (The Seated Queen). NGC 278 is undergoing start formation within an inner region of 6500 Ly and is anything but serene. NGC 278's star formation is said to be somewhat unusual as it does not extend to the galaxy's outer edges, The galaxy's centre is bright, its edges are much darker. This configuration is said to have been caused by a merger with a smaller, gas-rich galaxy with a turbulent event igniting the centre of NGC 278, the dusty remains of the small meal then dispersed into the galaxy's outer regions.

Optics: Sky-Watcher 72 ED @ f/5.8; Mount: iOptron / GEM 45

Camera: Zwo 533MC Pro; CCD Temperature: -20 degrees Celsius

Exposure Length: 25 min bin 1×1

Calibration: Darks, Flats

Software – Sharpcap, Photoshop

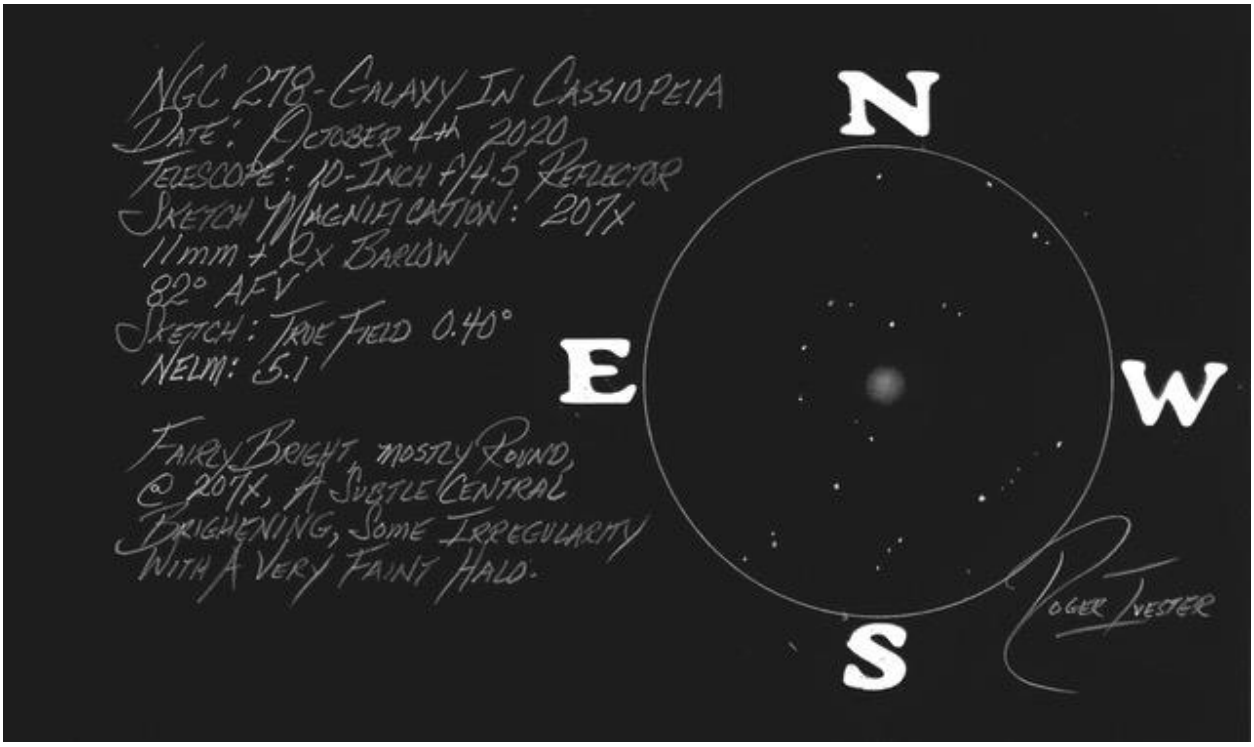
Joseph Rothchild: Observer from Massachusetts

I observed NGC 278 on October 24 under the dark skies of Cape Cod. I observed again with my 10-inch reflector. The galaxy was fairly easy to find, forming a triangle with two stars as seen in the finder. The best view came with a 14mm eyepiece @ 89×.

The galaxy appeared round, diffuse with a central condensation which was slightly eccentric. The galaxy was reminiscent of the Owl Nebula, although fainter.

Roger Ivester: Observer from North Carolina

Galaxy NGC 278 in Cassiopeia when using a 10-inch reflector at a magnification of 104× is presented as small, mostly round, and fairly bright. When increasing the magnification to 207×, a very subtle brightening was noted in the central region, with some irregularity, and a very faint halo.



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