MONTHLY OBSERVER'S CHALLENGE

Las Vegas Astronomical Society

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&

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November 2012

NGC-55 (Caldwell 72) Galaxy In The Sculptor Group

Introduction

The purpose of the observer's challenge is to encourage the pursuit of visual observing. It is open to everyone that is interested, and if you are able to contribute notes, drawings, or photographs, we will be happy to include them in our monthly summary. Observing is not only a pleasure, but an art. With the main focus of amateur astronomy on astrophotography, many times people tend to forget how it was in the days before cameras, clock drives, and GOTO. Astronomy depended on what was seen through the eyepiece. Not only did it satisfy an innate curiosity, but it allowed the first astronomers to discover the beauty and the wonderment of the night sky.

Before photography, all observations depended on what the astronomer saw in the eyepiece, and how they recorded their observations. This was done through notes and drawings and that is the tradition we are stressing in the observers challenge. By combining our visual observations with our drawings, and sometimes, astrophotography (from those with the equipment and talent to do so), we get a unique understanding of what it is like to look through an eyepiece, and to see what is really there. The hope is that you will read through these notes and become inspired to take more time at the eyepiece studying each object, and looking for those subtle details that you might never have noticed before. Each new discovery increases one's appreciation of the skies above us. It is our firm belief that careful observing can improve your visual acuity to a much higher level that just might allow you to add inches to your telescope. Please consider this at your next observing session, as you can learn to make details jump out. It is also a thrill to point out details a new observer wouldn't even know to look for in that very faint galaxy, star cluster, nebula, or planet.

NGC-55 (Caldwell 72) Galaxy In The Sculptor Group

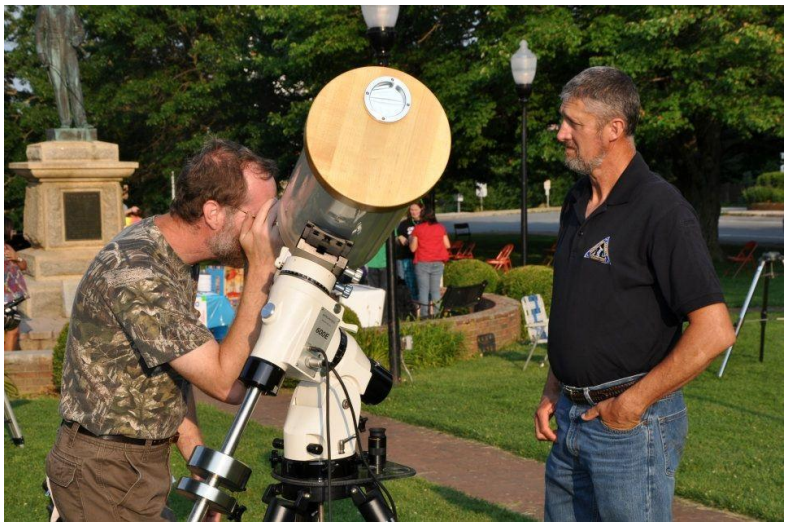
NGC-55, also known as Caldwell 72, is the brightest galaxy in the Sculptor Group of galaxies. Along with its neighbor, NGC-300, it's part of a neighboring group of galaxies that composes the Sculptor Group. They provide for some spectacular sites in modest to large telescopes. Our subject, NGC-55, shines at a relatively bright mag. 7.87 and is easy to spot if you have a good view of the far southern sky.

NGC-55 appears to be gravitationally bound to NGC-300. It's a barred irregular galaxy that lies about seven million light-years away. It appears to us almost edge-on, off-center with the bulge to one side, including several knots.

The big challenge is seeing it from the bulk of the United States as it sits low in the constellation of Sculptor and depending on the horizon, can become lost in haze, light pollution or turbulence, depending how far north you are. If you *do* manage to find it though, it's well worth it. The larger the telescope, the better the view, though even with small instruments, details can be eked out with surprising detail.

Observations/Drawings/Photos

Don Brooks: Observer from South Carolina



Don Brooks lives in Blacksburg, South Carolina. He has a private domed observatory located in the North Carolina Mountains, located approximately eight miles west of Little Switzerland. This area is considered to be an excellent location for deep-sky observing. It's also located only a few miles from "Deer-Lick Gap" which is the site where Tomm Lorenzin (author of *1000+ The Amateur Astronomer's Field Guide to Deep-Sky Observing* coined the name for the "Deer-Lick Galaxy Group" located in Pegasus.

Don has been an amateur for many years and is currently the president of the Cleveland County Astronomical Society, meeting at the Williams Observatory, in Boiling Springs, North Carolina.

His observation is as follows:

Thursday, December 13, 2012, North Carolina Mountains. Conditions, both seeing and transparency were excellent. Temperature during observation, low 30's, with calm winds. Scope: 10-inch SCT, eyepiece, 35 mm (73X), FOV 0.93º - 56'.

Bright, highly elongated, brighter off-set core, uneven texture with some mottling noted. WNW-ESE orientation. I estimated the FOV to be almost 1/3 of the eyepiece field, almost 30 arc minutes.

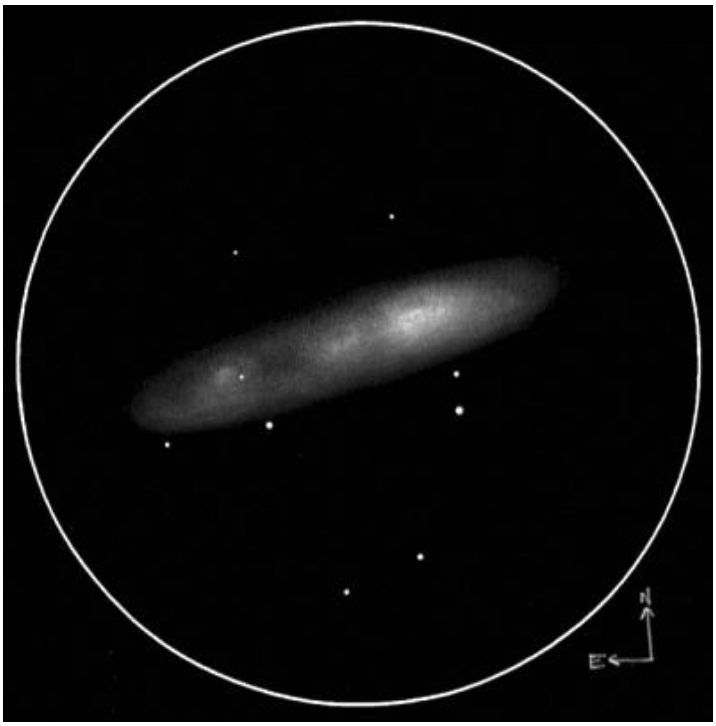
Jaakko Saloranta: Observer from Finland

Here's my late addition to the Challenge. I hope it gets there in time (Editors note 1: It did, just fine.). I'll let you decide if you want to use the picture of the caldera in the piece (Editors note 2: We thought it would add a bit of perspective to this observation.) As you can see from the photo, the clouds completely stop when they reach the caldera area of the mountain. It's quite fascinating, especially with the fact in mind that Finland's as flat as a pancake (fine, we have one 4,000 ft peak but that's above the arctic circle) and the clouds never stop like that here, I can tell you that! At least now, we finally have some snow with some manly temperatures around -10ºF, even here in the south. Anyway, here's my notes:

As can be suspected of the low declination, this object never rises above the horizon here in Finland. My latest observation of NGC-55 was made in November last year from the Canary Islands and specifically from the biggest island, Tenerife. I was observing within the Las Cañadas caldera at an altitude of 6,670 feet (2,034 meters) with fairly good observing conditions: naked eye limiting magnitude (NELM) near zenith of 7.1 with SQM-L measurements in the high 21.20s. What makes this observing site pretty good is the high altitude (above the clouds), low humidity and excellent seeing. They don't have observatories in here for nothing! My notes with the 4.7-inch refractor using several different magnifications read as follows:

A gorgeous sight. Huge, WNW-ESE elongated galaxy with a mottled appearance. NW part of the galaxy contained a bright, elongated nucleus with somewhat mottled appearance. Two brightenings visible within the halo. Larger and brighter knot appeared as slightly NW-SE elongated. The smaller and fainter knot appeared as a nearly stellar, roundish spot in the E side of the galaxy's halo with a faint mag. 14 star just W of it. A darker void seemed to separate these two possible H-II regions from each other. Several mag. 10-14 stars in vicinity, within the halo.

Size 20' X 4'. With low power, the galaxy was visible in the same field of view with pointy rock formations of Las Cañadas caldera.



Glenn Chaple: Observer from Massachusetts

NGC-55 was a scrub. At my latitude (43º North), it's barely above the treetops. I star-hopped with my 10-inch Dob to the precise location, but couldn't pick up anything. It wasn't the atmospheric extinction at that low elevation that did me in. Rather, it was the light glow from Worcester, Massachusetts, about 30 miles to the south. NC 55-definitely mandates an open and dark southern horizon!

NGC 457 (the ET Cluster) is a favorite of mine. I'll definitely have something positive to look forward to in the days ahead.

Jim Gianoualakis: Observer from Nevada

NGC-55, also known as Caldwell 72, is a barred spiral galaxy and is located in the constellation Sculptor. The galaxy is also known as "The String of Pearls" galaxy. It's located approximately 4.2 million light-years away. Its discovery is attributed to James Dunlop and was included in his 1827 catalog. In an observation by J. Herschel he remarked, "Bright, very large; much elongated in a long irregular train, the preceding end being much the brighter."

At a declination of -39º, this was a tough object due to its low altitude from my observing site. I'm sure others experienced this as well.

About the photo: This is a stack of 6X10 minute exposures taken through a luminous filter. Darks and flats applied. Very little post processing was possible due to the relative low signal strength captured. Many more exposures and a darker site would be required to pull much detail out. Another object to put the "challenge" in observer's challenge.

Dr. James Dire: Observer from Hawaii

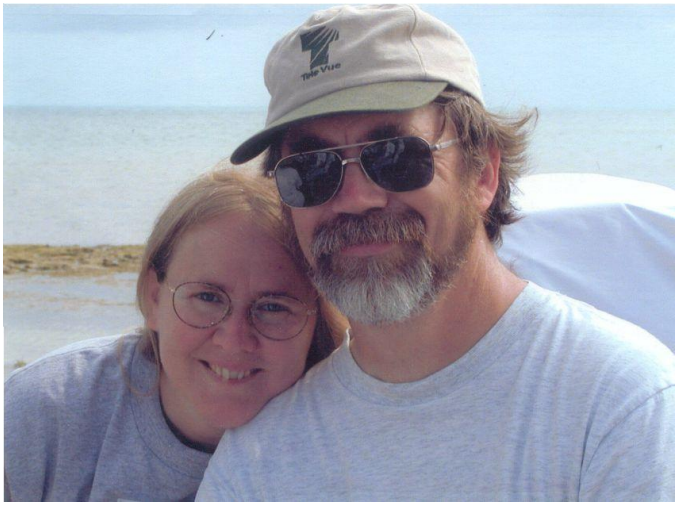
Slightly brighter than mag. 8, NGC-55 is the second largest galaxy in the constellation Sculptor, the brightest being mag. 7 NGC-253. Discovered in 1826 by James Dunlop, NGC-55 was originally thought to be a member of the Sculptor Group, which included NGC-253, NGC-300 and NGC-7793. Modern calculations have shown NGC-55 and NGC-300 are actually closer than originally thought and are members of the Local Group.

NGC-55 lies near declination 40° south, which means for observers at 35° north latitude, the galaxy never rises higher than 15º above the horizon. For this reason, very few U.S. astronomers have seen this galaxy in its entire splendor, if at all. Even here in Kauai, the galaxy only reaches 28° above the horizon when it transits, resulting in large atmospheric extinction when viewing it.

NGC-55 is a barred spiral galaxy oriented closer to edge on than face-on. It measures 32.4 by 5.6 arc minutes in size. The galaxy is filled with large hydrogen gas regions with very active star formation. These regions glow with the typical red color from hydrogen alpha emissions. These along with dark dust and dimmer molecular cloud regions scattered throughout the galactic disk make tracing the spiral arms very difficult, even in photographs. The galaxy also appears very asymmetrical, with more of the visible disk on the east side of the galactic core than on the west side. I have not come across any explanation of this phenomenon.

While I would have liked to have imaged this object for several hours this month near its maximum altitude, I only found time to collect light for 40 minutes. My image was taken with a 102mm (4-inch) apochromatic refractor at f/6.4 with a SBIG ST2000XCM CCD camera. Note the dark "eye" in the galactic core, with the dark lane angled 60º to the disk superimposed over this. Perhaps my shorter-than-desired exposure captures just the right amount of detail to compare with visual sightings of the galaxy with a 14-inch light bucket in the tropics. I will have to confirm this when I am out next with my 14-inch Dob!

Sue French: Observer from New York



November 30, 2005, Little Cayman Island. 10:10 PM EST. 113/450mm (4 ½-inch f/4) reflector. Seeing: good, transparency good, sky, very dark. Scope not collimated.

At 14X, easily visible, highly elongated, bright galaxy with brighter elongated core. Runs ESE-WNW. At 34X, very pretty. Large mottled core. Faint star south edge, west side. Galaxy extends farther east than west of core. About 28' X 2 1/2'. Star mentioned above plus three others cradled south side. At 64X, mottling much more evident. Many faint field stars visible. Skinny brighter triangle southwest.

October 2, 2010, 9:15 pm EDT, with a 130/819mm (5.1-inch f/6.3) apochromat. The seeing and transparency were fair. At 23X there was a bright glow around a fairly bright star. At 37X, the star was in the southern part of a 1¾ arcminute glow. A fainter, 1-arcminute glow continued south from the brighter one. UHC or O-III filter not helpful. At 63X, the southern part showed nicely, and there was a faint star in it. At 102X, the southern part was curved concave west so the whole thing looked like a fat comma in my mirror-reversed view.

October 6, 2010, PSSG. 10:30 PM EDT. 130/819mm (5.1-inch f/6.3) APO. Seeing fair-poor, transparency good. At 37X, although the sky was milky down there, this large galaxy was visible as ~26"ESE – WNW elongated galaxy. The western half was generally brighter. Mag. 10 star ~5' SE of eastern tip and mag. 12 star S X E of western tip. ~ 4' wide. At 63X, showed up nicely and was quite uneven in brightness. The bright western area broadly brighter toward the long axis. Eastern had a weaker brightening toward the east end. Three faint stars along south flank: The brightest one mentioned above, the second brightest was south of the middle of the western bright patch, the faintest star was on the galaxy's edge between the two bright patches. Another star hugged the south side of the west tip.

November 10, 2007, 8:15 pm EST with a 254/1494mm (10-inch f/5.9) Newtonian. The seeing and transparency were fair. At 43X, this bright nebula spanned about ¼° and was brightest around a mag. 7½ star in the center. At 68X, the bright central region of the nebula was elongated north-south, 3 arcminutes tall, with pinched sides and a faint star off the southeastern edge. At 213X, the pinch was prominent south of the mag. 7½ star, and the nebula section south of the pinch was fainter than the northern part.

November 2, 2010. 9:30 pm EDT

I'm afraid my description of that observation was just the sketch. The only details were: 254/1494mm (10-inch f/5.9) Newtonian, 67X. Seeing and transparency, fair.

Rob Lambert: Observer from Nevada

First of all, I must disagree that NGC-55 is either the brightest or largest galaxy of the Sculptor Group. Even though conditions were not ideal when I last of observed it on the night of October 13, 2012, it was nowhere close to the brightness of NGC-253, the great Sculptor Galaxy. NGC-55 is estimated at only mag. 8.1, where the Great Sculptor Galaxy is estimated at mag. 7.6. Although that's only a difference of mag. 0.5, NGC-253 is 1.6 times brighter than NGC-55 (that's 2.512 raised to the 0.5 power). Visually, NGC-253 is a much more spectacular object.

Okay, enough about NGC-253 and back to my observation of NGC-55. This galaxy is quite elongated, similar to the Sculptor Galaxy. Also similar, it has several knots of brightness. There are two knots of special note near the center of the galaxy, with two dimmer but larger knots east and west of those in the center. The knot on the western side is larger and brighter than the one on the east end. The rest of the galaxy fades into faint fuzz.

In my 4.75-inch refractor at approximately 35X, the galaxy appeared to be not much more than an oval smear with a definite brighter center. In my 10-inch SCT at approximately 105X, the details of the brighter areas were more obvious, but the rest of the hazy oval wasn't any more apparent.

As I mentioned earlier, conditions weren't great at Death Valley on the night of observation, and I haven't had a chance to get back out under any better conditions since that night.

In keeping with Roger's desire to observe with smaller scopes, I've traded my SCT/refractor telescope combination for a 127mm apochromatic refractor and a 90mm guide scope. I'm looking forward to observing and recording our future objects with my Mallincams through this new combination of scopes.

NGC-55 at 35X

NGC-55 at 105X

Gus Johnson: Observer from Maryland.

This month, Gus didn't have any notes for NGC-55. Though he's seen it before, he's never written anything down that we could use for the challenge.

Buddy Barbee: Observer from North Carolina

This observation was made from our club field near Pilot Mountain, NC at 11:15pm EDT on Friday, November 18, 2011. I am using last year's observation because this fall the only clear nights have been when that big light in the sky (the Moon) was up making it impossible to observe almost anything faint in the sky. I was using my 10-inch Dob with a 24mm eyepiece for a magnification of 50X and a true field-of-view of 1º and 22 minutes.

NGC-55 was about an hour or two from reaching the meridian, so it was still low in the sky, but I thought I would give it a try anyway. Boy was I surprised. To be so low in the sky, I thought it was very bright. After looking at the galaxy for a couple of minutes, I began to realize that the galaxy was about twice as large as it had seemed at first, the western half was much brighter than the eastern half. The western half almost looked mottled and had a faintly brighter core region. This is a galaxy that I wish I could see from a much further south location where it would be higher in the sky. It must be wonderful for you guys in the southern hemisphere.

DEEP-SKY OBSERVATION FORM

CONSTELLATION: Sculptor

OBJECT: NGC 55

Day & Date: Fri. Nov. 18, 2011
Time (local): 11:15 PM EST
Time (UT):
Observer: BLB
Location: Club Field Near Pilot Mt, NC.

Seeing (1-5): 3
Transparency (1-7): 4
NELM: 5.6±
Temp: 34°F Wind: 1-2mph
Humidity: 54%

INSTRUMENT
Telescope: 10" Dob
Aperture: 254 mm
Focal Length/Ratio:
Eyepiece: 24mm
Magnification: 50x
Field-of-View: 01° 22'
Filter: None

OBJECT
RA: 00 hr. 14.9 min.
Dec: -39 d. 12.1 min.
Type: Galaxy
Listed Magnitude: 8.2
Listed Size: 32' x 7'
Altitude of object: 12°±

NOTES

At first seeing of this galaxy, I only saw the bright western half. I was supprised by how bright it was. After looking a couple of minutes, I started to realize that the fainter eastern half was also visible. Wow! This is a large galaxy

Roger Ivester and Debbie Ivester: Observers from North Carolina

On November 9, 2012, when looking at my deep-sky observing list, I was surprised that NGC-55 was not included. My backyard has a very poor southern view, due to light pollution, so I loaded up my 10-inch in search of a better location. I had been spying a grassy field only a couple miles from my house for quite a few years which appeared to be a pretty good site. I could easily see my starting location star, Alpha Phoenix, just above the tree line. After a quick polar alignment, I centered my scope on the location of NGC-55, but couldn't see anything. I tried low power to start, but to no avail, then moved up to medium, but again, no galaxy. I did this for almost two hours, and never once saw it, apparently due to the sky glow of Boiling Springs. I don't think that the conditions were that bad. However, this would suggest that a very dark sky is needed. If you're planning to observe this galaxy, make sure you have a good southern sky, devoid of any light pollution.

For our second attempt, on December 13, 2012, my wife Debbie agreed to go with me to a better site. We started to drive to a true dark site. However, we got a late start and decided to stay a bit closer to home. I picked another grassy field that had an excellent view of the southern sky. Due to being sore from a recent bicycle accident, I decided to take a 4-inch refractor, which is much easier to set up than a 10-inch equatorial reflector. The sky and conditions were excellent, with a NELM of 6.0 or maybe a bit better. We started out with low power, and then medium…still no galaxy. Everything seemed to be perfect, but there was a faint light glow, just above the tree tops that seemed to obscure the view. We attempted a variety of eyepieces, but after more than an hour of searching, we decided to give up.

Fred Rayworth: Observer from Nevada

The first time I tried to observe this galaxy was on October 4, 1997 during an Okie-Tex star party at Lake Murray, Oklahoma. Unfortunately, what I saw was a blurry pinwheel very low to the horizon. I'm not sure which galaxy I saw, but I can scratch that one off!

The next crack I had was not until October 21-22, 2011 from Furnace Creek in Death Valley. This time, I nailed the correct galaxy. The first night, on a Friday, I only saw a large fat streak, very blurry with no detail because it was so low to the horizon and the humidity and sky conditions were pretty bad. However, the next night turned out to be much better. On October 22, 2011, my notes were as follows: "Wow! Despite the low altitude, filled field. Gray fat streak extended almost edge to edge, though that was likely an illusion because the galaxy is not that large in reality. Some darkness and blotchiness in the middle and a slight mottling. Hard to see with the atmosphere, but seemed to be lumpier to one side. Seemed to favor one side over the other."

For this challenge, I tried again on October 12, 2012 and spent a bit more time at the eyepiece. The humidity was thick enough to cut with a knife after some major flooding that closed many roads in the valley. Despite that, the viewing wasn't too bad. Though very low on the horizon and having to look through a lot of sludge, I saw that uneven fat streak. I spotted several stars lining one side, almost in a line, sort of a jagged line. I noticed lots of mottling within it, especially at the fat end, though I detected a bit trailing off at the lighter end. At times the streak seemed to fill the eyepiece field but that was an illusion, as I noted the last time. When I took time to study the streak, it was smaller than first impressions, though it still filled a good bit of the 82º field. A fine object in a constellation that is rich with spectacular galaxies. Well worth the trouble to seek out.

NGC-55

102X

Jay and Liz Thompson: Observers from Nevada

Jay and Liz Thompson observed NGC-55 from Cathedral Gorge State Park, NV on September 14, 2012 with a 10-inch f/6.3 SCT and on September 15 2012 with 3-inch f/4 and 17.5-inch f/5 Newtonians. Through the 10-inch with a 30mm eyepiece, NGC-55 appeared as a mottled long streak, nice but not as impressive as nearby NGC-253. Mottling was more apparent through the 17.5-inch using a 32mm eyepiece. NGC-55 was visible as an elongated streak in the 3-inch using an 18mm eyepiece.