MONTHLY OBSERVER'S CHALLENGE

Las Vegas Astronomical Society

Compiled by:

Roger Ivester, Boiling Springs, North Carolina

&

Fred Rayworth, Las Vegas, Nevada

With special assistance from:

Rob Lambert, Las Vegas, Nevada

JULY 2013

NGC-5981/5982/5985 Galaxy Trio In Draco

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-5981/5982/5985 Galaxy Trio In Draco

The trio of galaxies, NGC-5981, NGC-5982 and NGC-5985 in the constellation of Draco, provides the observer with a grab-bag of variety. Within this trio is a representation of three major classes of galaxies one is likely to observe.

NGC-5981, at mag. 13.9, is a classic edge-on, a very faint sliver seen at such an angle to us that we can only see a mere fraction of its surface.

NGC-5982 is an elliptical galaxy. This mag 12.0 galaxy is actually the brightest of the trio visually, with a surface brightness matching its' overall magnitude. It has an extremely bright core, surrounded by a diffuse halo. It is only slightly oval. Buried within or maybe even behind it is the quasar, 1537+595, a mag. 19 object.

NGC-5985 is a fine, though dim example of a spiral galaxy. It glows at a modest mag. 11.9 and with a relatively low surface brightness of mag. 13.7, relies on better sky conditions to eke out any significant details, even in larger backyard scopes. Yet even small scopes have been known to detect the spiral arms on the best of nights.

For those with the larger instruments, there is a fourth NGC galaxy that some might detect, NGC-5976. This mag. 15.8 galaxy is a very tiny oval that takes an extremely clear night, good eyes and skills to see.

The trio is a great challenge and shows a typical variety of galaxies available in our sky.

Observations/Drawings/Photos

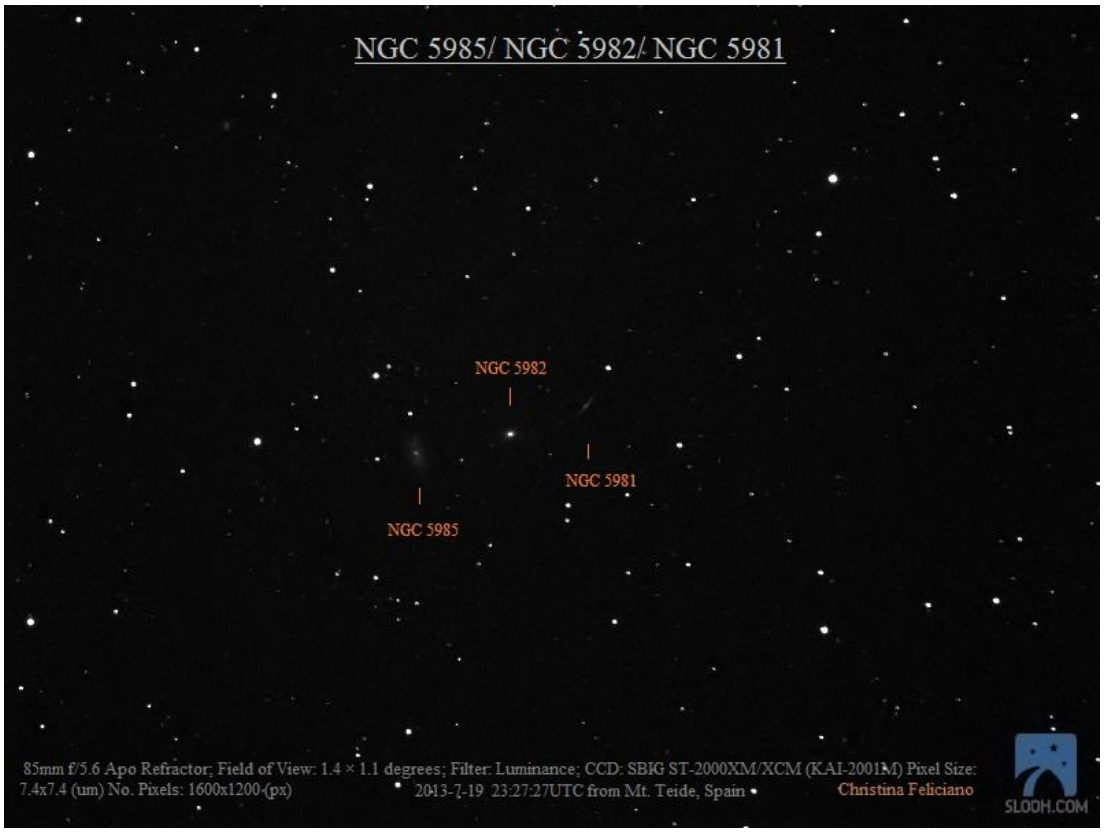
Christina Feliciano: Observer from Nevada

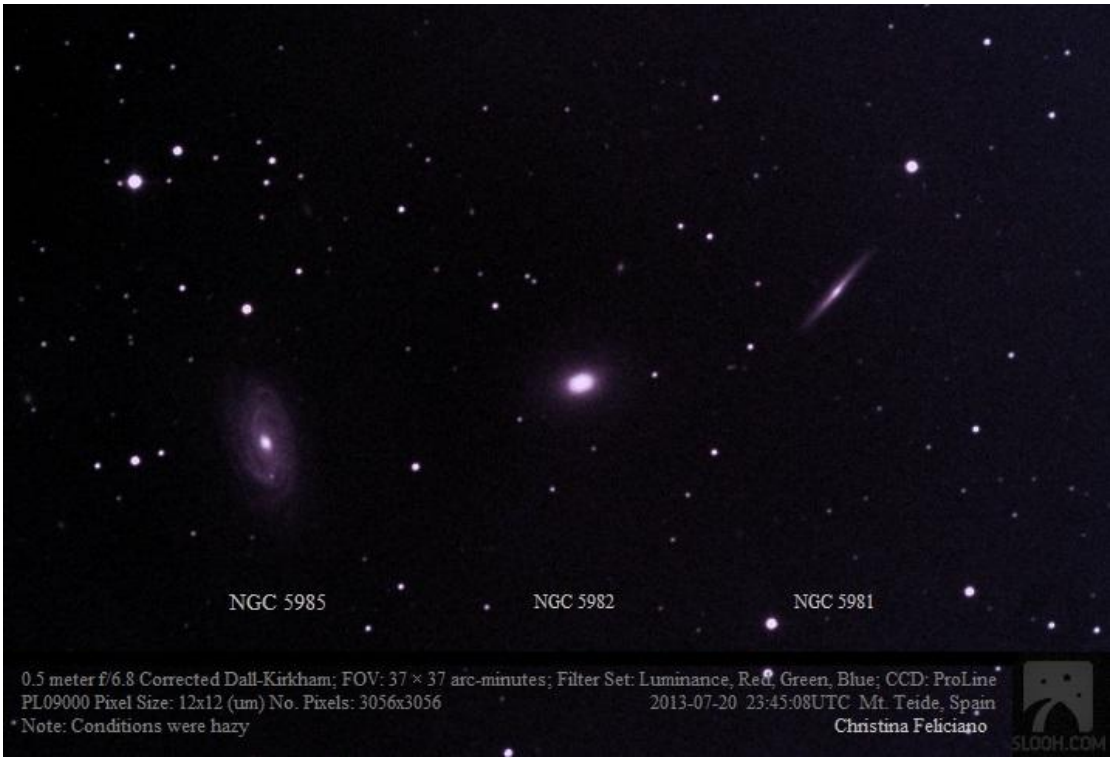
EDITOR'S NOTE: We'd like to introduce a new member to our Observer's Challenge. Christina Feliciano is a member of the LVAS and it is a real pleasure to have her input. Welcome aboard!

It was July 18, 2013, and there I stood in my backyard, in Pahrump NV. I could see a light, high haze covering the sky and could feel the wind creeping in from the northwest. I stood there for a minute, debating whether to take my 8-inch Newtonian out or not. After a minute of debate, I decided to give it a try even though I didn't think I'd get a clear enough view. As I was finishing setting up my scope, the sky cleared in the direction of the trio, and my excitement grew. My mount is broken, so finding the trio was a tedious task, as I had to move the whole tripod, centimeter-by-centimeter, but it paid off. As I scanned, I kept telling myself, "Look in the belly of the beast," and that's where I found the trio. I found the mag. 3.25 star Edasich, which is located in the lower abdomen area in most constellation charts for Draco, and I looked to the northeast of that star. At 9:30pm PST, I visually saw NGC-5982 at the center, and could barely make out a fuzzy patch for NGC-5985 with averted vision. I couldn't visually view NGC-5981 through my 8-inch. They were 65° over the northern horizon at that time.

I also viewed M-3 and NGC-5466, both globular clusters, that night also, with M-3 being the more pronounced of the two. I also tried to view C/2011 L4 (Panstarrs), that happened to be only 15° away from the trio, also in Draco, but she was too faint to pick out as the haze set back in.

A day later, on the 19th, I decided to take images of the trio using two robotic telescopes, provided by SLOOH, to supplement my viewing and to give me a closer look. These are the images taken with SLOOH's equipment. One image is from the 19th and the other from the 20th. The SLOOH observatory is located on Mt Teide, Spain, off the west coast of Africa and the observatory was experiencing a high level of dust blowing in from the Sahara's (called La Calima), at the time, causing the purple discoloration in one of the images.





0.5 meter f/6.8 Corrected Dall-Kirkham; FOV: 37 × 37 arc-minutes; Filter Set: Luminance, Red, Green, Blue; CCD: ProLine PL09000 Pixel Size: 12x12 (um) No. Pixels: 3056x3056 2013-07-20 23:45:08UTC Mt. Teide, Spain

* Note: Conditions were hazy

Christina Feliciano

Sue French: Observer from New York

The Draco Triplet, distance ~100 million light-years. NGC-5982, 15h 38m 39.8s +59º 21' 21", visual mag. 11.1, surface brightness (S.B.) 12.9, size 2.6' X 1.9'. NGC-5985, 15h 39m 37.1s +59º 19' 55", visual mag. 11.1, S.B. 14.0, size 5.5' X 3.0'. NGC-5981, 15h 37m 52.7s +59º 23' 38", visual mag. 13.0, S.B. 13.2, size 2.8' X 0.5'

William Herschel discovered NGC-5982 and NGC-5985 with his 18.7-inch reflector on May 25, 1788. He described the first as "pretty bright, small, irregularly round." He suspected a very faint and slightly extended object to its west. Shortly thereafter, Herschel swept up NGC-5985 and noted that it was "considerably large, pretty bright, resolvable, of an irregular figure."[1]

Although the "suspected" object west of NGC-5982 is most likely the third member of our trio, the discovery of NGC-5981 is generally credited to Lord Rosse. On May 6, 1850, the galaxy was spotted with the Leviathan, Rosse's 72-inch reflector, which was then the largest telescope in the world. It was simply described as a "very faint ray."[2]

The three galaxies are very roughly 100 million light years away, but current measurements seem to place them in a different order than one might expect on the basis of appearance. NGC-5985 is the most distant galaxy, and NGC-5981 is the closest.

NGC-5982 is an elliptical galaxy that exhibits multiple sharp-edged shells of material and a core whose rotational axis is severely tilted with respect to the spin axis of the galaxy's main body. These structures suggest NGC-5982 may have undergone a merger with a dwarf galaxy.[3]

NGC-5985 is ranked among the intrinsically brightest and most massive spiral galaxies. It displays a very small bar and three primary spiral arms that emanate from a nearly complete internal ring.

NGC-5981 is also a spiral galaxy, but our edge-on view conceals its distinguishing arms. On deep images, however, we see the galaxy's northeastern flank hemmed with the shadowy dust lane that delineates its equator. Seen face-on, NGC-5981 would present loosely wound spiral arms.

1. *The Herschel Archive, Royal Astronomical Society*, electronic scans.

2. *1861RSPT..151..681R*

3. *2007A&A...467.1011S*

With its three dramatically different galaxies, the Draco Triple is a popular target for astrophotographers – yet it is often overlooked as a visual treat. The trio fits nicely in a 20' field of view and makes a nice study in contrasts at moderate powers.

In a 4-inch scope at 75X to 100X, NGC-5982 is an oval glow, tipped east-southeast, with a bright core and a stellar nucleus. It marks the eastern corner of a 10', nearly square parallelogram that it forms with three mag. 11 stars.

NGC-5985 is a much larger oval but is more ghostly due to its lower surface brightness. It leans a bit east of north with a mag. 11.6 star guarding its northern end. The uniform haze of the halo enfolds a slightly brighter core.

NGC-5281 is the faintest member of the Draco Triplet. It can be coaxed into view with averted vision as a pallid streak elongated southeast-northwest and pointing almost toward the northern star of the parallelogram.

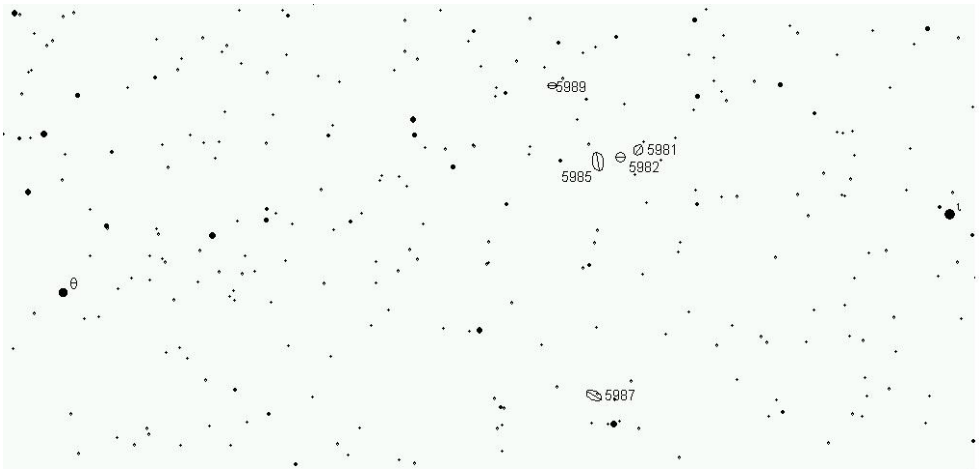
A 10-inch scope at 120X brings additional features to light. NGC-5982 brightens toward the center and covers 1½' X 1'. The galaxy's core appears approximately half the size of its halo.

NGC-5985 measures 3' X 2' with a gently mottled halo. The elongated core is about 0.4' long and a bit skewed with respect to the halo.

Although still faint, NGC-5981 is more readily visible. It spans about 1¾' and looks very thin.

Under dark skies, observers using high magnification with scopes 18-inches or more in aperture can enjoy the magnificent spectacle of NGC-5985's winding arms. The mottling seen in smaller instruments then becomes pronounced enough to resolve the complex spiral structure wrapping clockwise through the disk of this giant galaxy.

Above: From left to right – the spiral galaxy NGC-5985, the elliptical galaxy NGC-5982, and the edge-on spiral NGC-5981. Image: STScI POSS-II J.



Above: Chart showing the location of the Draco Triplet. The chart is 2.5º tall and shows stars to mag. 11.4. The mag. 3.3 yellow-orange star Iota (*I*) Draconis is near the right-hand side of the chart, and the mag. 4.0, yellow-white star Theta (*Θ*) Draconis is on the left-hand side.

I observed this galaxy trio on two separate mornings in January 2005, on the first occasion with my 4.1-inch (105mm) refractor and a few nights later with one of my 10-inch reflectors.

The refractor at 28X showed NGC-5982 as a small fuzzy spot, while at 47X, the galaxy gained a brighter core and stellar nucleus. It marked one corner of a nearly square parallelogram that it formed with three faint stars. At 87X I saw that NGC-5982 was tipped a little to the south of east. NGC-5985 was much larger, but had uniformly low surface brightness. It ran approximately north-northeast to south-southwest with a mag. 11½ star at its northern tip. NGC-5981 was a barely detectable, averted-vision streak pointing toward a mag. 11 star to its north-northwest. At 102, the three galaxies still shared a field of view, and they were evenly spaced along a shallow curve. This magnification gave the nicest view, with NGC-5981 now slightly easier to see.

Through the reflector at 70X, NGC-5985 was a fairly large, oval, uniform glow. NGC-5982 was a smaller, brighter oval that intensified toward the center and had a bright, stellar nucleus. At 118X, the galaxies shared the field of view. NGC-5985 was oval and tipped a little east of north. It measured about 3′ X 2′ and was slightly brighter toward the center. A mag. 11½ star sat off the northern end. NGC-5982 was about 1½′ X 1′ east-southeast to west-northwest, with its core about half that size. NGC-5981 was an elusive, averted-vision streak pointing approximately toward a mag. 11 star. NGC-5981 was easier at 171X, but it still seemed quite faint. Averted vision helped. The galaxy was about 1.7′ long and very thin. Later in the morning, when the trio was high in the sky, NGC-5981 was considerably easier at 118X. The galaxies were a nice sight, gathered into one field of view.

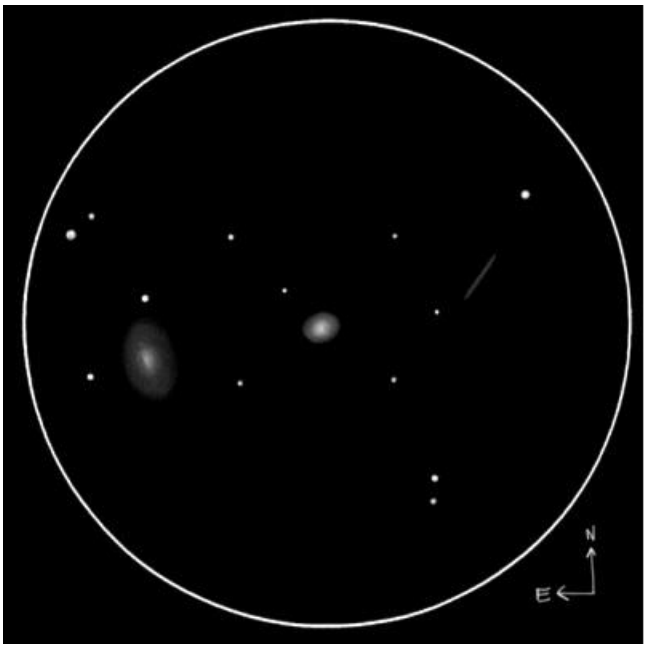
Jaakko Saloranta: Observer from Finland

NGC-5981, NGC-5982 and NGC-5985 form a great trio of galaxies in Draco. But the trio is actually a quartet! The faintest member is NGC-5976 which is pretty faint at mag. 14.8 (v). NGC-5976 is located 8' W of NGC-5981 – the westernmost galaxy of the trio. The three main galaxies are all wonderfully different: NGC-5985 is nearly face-on, NGC-5982 is an elliptical galaxy and NGC-5981 is seen edge-on. NGC-5985 and NGC-5981 are separated only by 14' and NGC-5985 and NGC-5976 by 22'. Two of the brightest galaxies are visible with a simple 3-inch (80 mm) refractor but NGC-5981 probably needs a little more aperture. The following description and sketch represent the trio as seen under dark skies with an 8-inch reflector using magnifications between 100X and 200X.

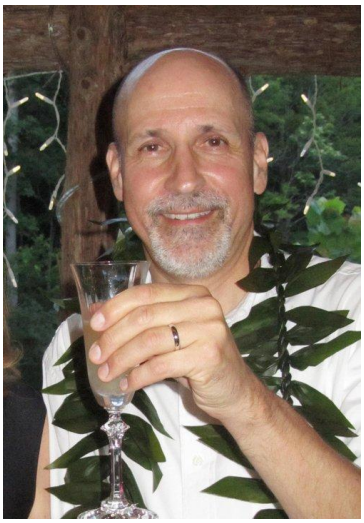
NGC 5981: Very faint, SE-NW elongated edge-on galaxy. 2' X 0.3' in size. Required averted vision. NGC-5976 remained invisible.

NGC-5982: The brightest galaxy in the group. Small, 1' X 0,5' E-W elongated halo surrounding a brighter core and a tiny, nearly stellar nucleus.

NGC-5985: Second brightest galaxy in the trio. NNE-SSW elongated nucleus surrounded by 3' X 1.5' NNE-SSW elongated halo of even brightness. Fairly low surface brightness. Mag. 11 star 2' N of the galaxy.


N
E

James Dire: Observer from Hawaii



NGC-5981, NGC-5982 and NGC-5985 are a trio of galaxies in Draco lying along a line spanning 14 arcminutes. This galaxy grouping is easy to find as it lies merely 1 3/4° east and slightly north of the mag. 3 star Iota Draconis.

The brightest galaxy in the group is in the center, NGC-5982. This galaxy is mag. 11.1 and measures 3.1 X 2.0 arc-minutes in size. It is an elliptical galaxy with a bright core and dimmer halo.

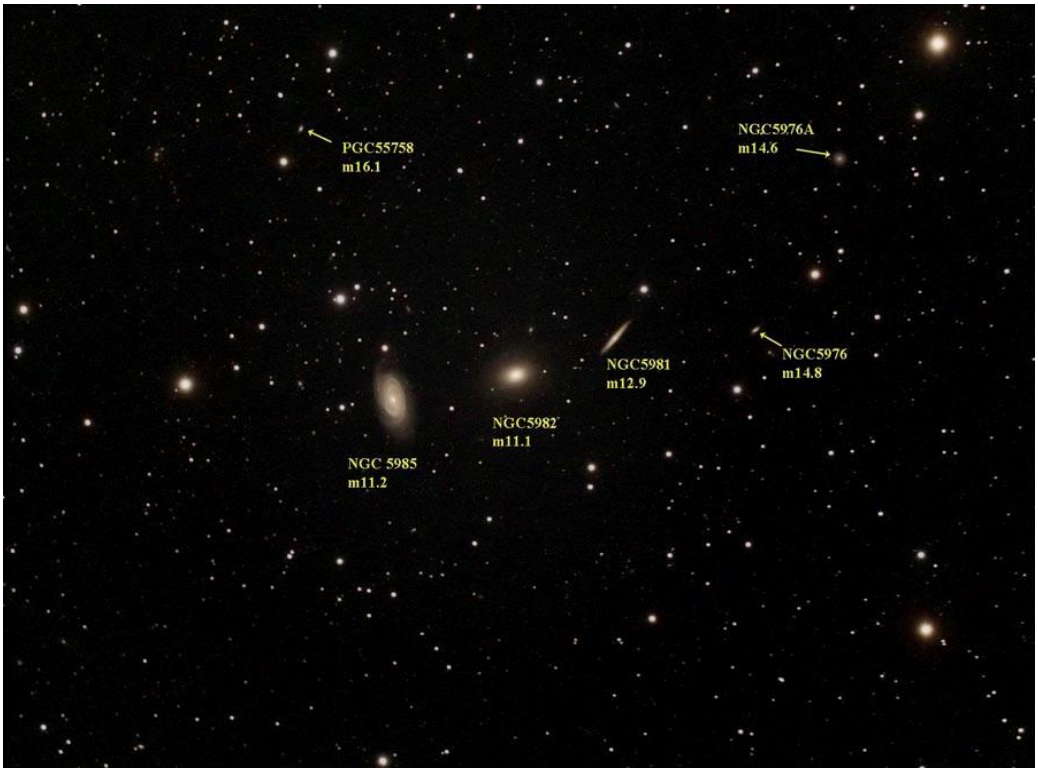
On the east side of the trio and just slightly dimmer than NGC-5982 is NGC-5985. NGC-5985 shines at mag. 11.2, and is 4.0 X 2.0 arc-minutes in size. It is a spiral galaxy, almost midway between face on and edge on.

The dimmest galaxy lies on the west end of the trio. Only mag. 12.9, NGC-5981 is a nearly edge-on spiral galaxy measuring 2.8 X 0.4 arc-minutes in size.

NGC-5982 and NGC-5985 were both discovered by William Hershel in the year 1788. NGC-5981 was discovered by William Parsons in 1850. The galaxies are all located about 100 million light-years away.

My image of this Draco trio was taken with a 102 mm f/6.3 apochromatic refractor using an SBIG ST-2000XCM CCD camera. The exposure was 2 hours. The brightest star in the image is mag. 8 SAO29585.

From the image, it is apparent the brightest region is the core of NGC-5982. The core may appear star-like in a six- to eight-inch telescope. NGC-5985 has tightly wound spiral arms with a galactic core that is considerably brighter. NGC-5981 is cigar shaped with a galactic bulge slightly brighter than its edge-on disk. There are numerous other fainter galaxies in the image labeled on the accompanying image.

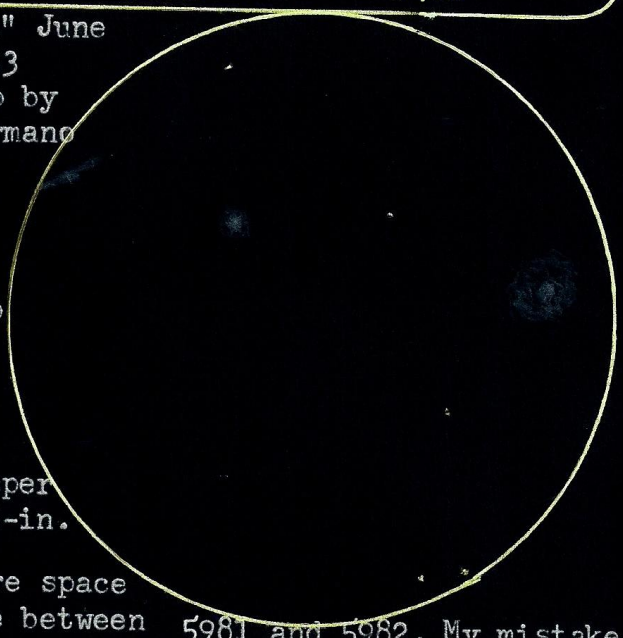

PGC55758
m16.1
NGC5976A
m14.6
NGC5981
m12.9
NGC5976
m14.8
NGC5982
m11.1
NGC 5985
m11.2

Gus Johnson: Observer from Maryland

May 20, 1992: NGC-5982 was clearly the brightest when using my 6-inch f/7.8 reflector, and NGC-5985 being second. NGC-5981 was very elusive even at 98X. At times, there was a mere suggestion of a dim streak at a 45º angle to the other two galaxies. NGC-5981 seemed to be considerably dimmer than galaxy NGC-5907, also in Draco. I could see NGC-5907 with my 60 mm refractor, but not NGC-5981.

I saw all three of the galaxies the following night, a somewhat less clear night, but I was using my 8-inch f/5.7 reflector. The dim edge-on (NGC-5981) was a bit easier to see with the larger telescope.

"Sky & Tel." June
1989 p.683
from photo by
Martin Germano
with C-8



Right:
from "Deep
Sky" #31
Summer
1990.
Sketch by
Dennis Casper
using a 13-in.
at 143x.
A bit more space
should be between 5981 and 5982. My mistake.
gj

From Webb Society Deep-Sky
Observer's Handbook,
Vol. 4 "Galaxies."
P. 190 Sketch
by E.S.Barker
using an 8½-in.
at 102x
(5981 not seen)

These three
copied by
Gus Johnson,
free-hand.
7-18-2013

Rob Lambert: Observer from Nevada

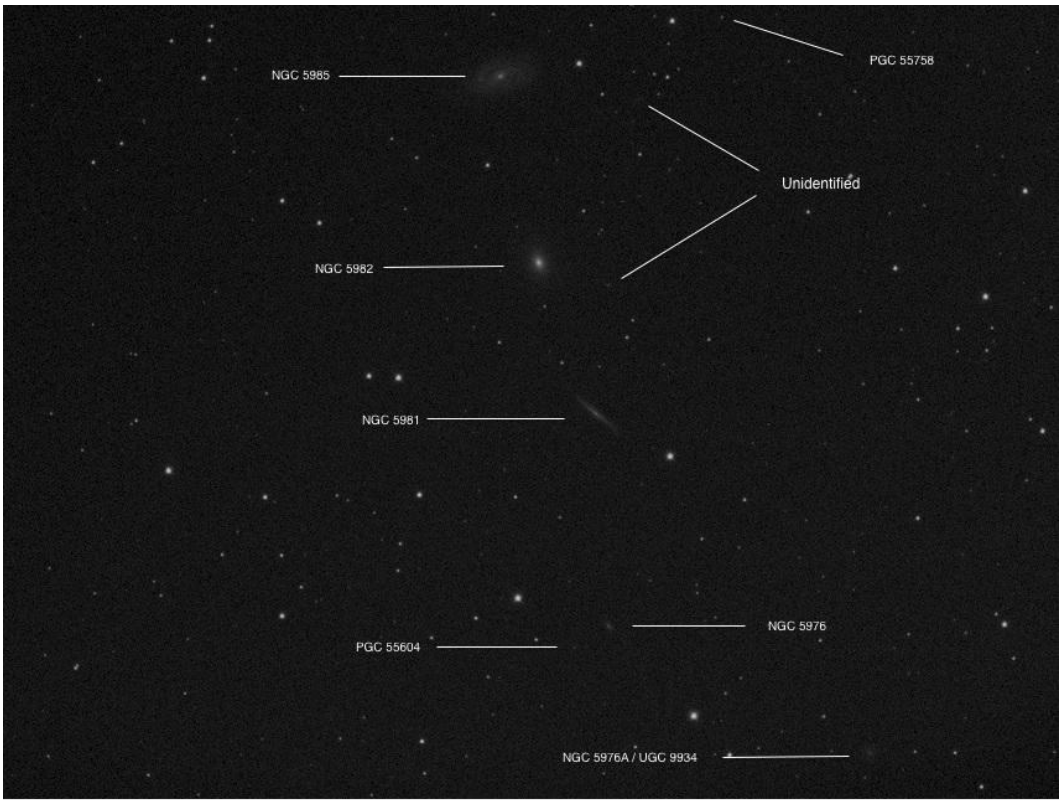
I had the opportunity to view NGC-5981 and its companions in the Draco Trio on August 10, 2013, while participating in the LVAS Astronomy In The Park in the Red Rock Canyon National Conservation Area just outside of Las Vegas. Considering the close proximity to Las Vegas, the observing conditions were actually near excellent. The sky was crystal-clear, without any moisture. The Milky Way was actually visible from the Teapot's spout in Sagittarius, up through the Summer Triangle and down into Cassiopeia. I knew we were in for a great viewing night, when only 45 minutes after Sunset, I was able to pull down the Hercules cluster with pinpoint stars well into the depth of the cluster.

In the images below, the three galaxies of the Draco Trio are distinctly visible, illustrating the face-on spiral of NGC-5985, the layered elliptical nature of NGC-5982, and the edge-on spiral of NGC-5981. The three galaxies are almost in a straight line, running east-to-west from NGC-5985 to NGC-5981, and are almost evenly spaced. Their distance from Earth is estimated to be somewhere around 100 to 140 million light-years.

What surprised me was picking up hints of other galaxies within the field of view. I was able to detect six other galaxies in my image of the Trio. Northeast of NGC-5985 is mag. 16 PGC-55758. Almost due west of NGC-5981 are two galaxies that caught my eye looking like two fuzzy out-of-focus stars. The larger more northern object is mag. 14.8 NGC-5976, and to the southwest is the small mag. 17.25 PGC-55604. Another, what appears to be a face-on spiral galaxy, is near the bottom (far northwest corner of the image), mag. 15.5 NGC-5976A. I used various sources to identify these small dim galaxies, but there were two other galaxies that I couldn't find documented anywhere. These are marked as "Unidentified" in the image and are located northwest of NGC-5985 and NGC-5982 respectively. I can only estimate that their

magnitudes are something less than 17.25. Rather than the Draco Trio, it is my opinion that this collection of galaxies should be hereafter referred to as the "Draco Group."

This region of Draco will be one of my future favorites to show at public star parties to illustrate some of the different types of galaxies - all in one field of view.



The image above was captured using a Mallincam VSS+ astro-video camera in a 127mm (5-inch) Triplet Apochromatic refractor mounted on an equatorial mount. A 0.5 focal reducer and light-pollution filter were inserted into the optical path to reduce the effective focal length of the telescope and to minimize the effect of the Las Vegas light pollution. The image is a single-frame shot with an integration of approximately 25 seconds. The effective magnification of this optical combination is approximately 120X. I'm not sure I would've seen the Draco Trio without the Mallincam. The camera effectively quadruples the diameter of the scope's objective. So rather than viewing these objects with a 5-inch refractor, my telescope was acting more like a 20-inch scope in its light-gathering capability. In the future, I'll take a shot at observing these galaxies with just the scope and an eyepiece.

Jim Gianoulakis: Observer from Nevada

The group of galaxies in Draco, NGC-5985, NGC-5982 and NGC-5981 are commonly known as the “Draco Trio”. The group consists of two barred spirals at different angles and a face-on elliptical. The fact that they all fit in the same field of view is relatively rare and make for a wonderful subject.

The face on spiral is NGC-5985. The proper designation for the elliptical galaxy is NGC-5982 but is also known by Herschel H764-2 as well. The catalog number for the edge-on is NGC-5981.

The photo is a stack of 9 X 10 minute exposures. They were registered and calibrated with darks and flats utilizing CCD Stack and an initial stretch performed in Photoshop. These were taken with an 8-inch RC at a focal length of 1625 mm and focal ratio of F/8.

Jay and Liz Thompson: Observers from Nevada

On the night of June 07-08, 2013, Jay observed from the dark skies of Meadview, AZ with a 17.5-inch f/4.5 Newtonian. The core of NGC-5982 (elliptical galaxy in the middle) was the most visible (brightest) at the initial look, followed by the center of NGC-5985, and lastly the streak of NGC-5981. I saw all three in the FOV of an 8.8mm wide field eyepiece giving 227X. Each galaxy was visible using direct vision, but I saw more using averted vision. This was a nice triplet of galaxies in a row. NGC-5981 was edge-on, NGC-5982 was a condensed elliptical, and NGC-5985 was a spiral (no spiral structure visible for sure, though I could see the bright core surrounded by a softer glow). I could just make out nearby NGC-5976 as a very soft glow for a fourth galaxy.

Both of us attempted to observe the galaxy trio on July 30, 2013, from our back yard in Henderson, NV using a 14-inch SCT. Due to the moderate light pollution, we had low expectations. We were able to make out the core of NGC-5982 but were unable to definitely see either NGC-5985 or NGC-5981.

Both of us successfully saw the trio through the 17.5-inch" at the Redstone Picnic Area in Lake Mead Recreational Area on August 3, 2013. Eyepiece impressions were similar to those noted on June 07-08, 2013.

Roger Ivester: Observer from North Carolina

On June 11, 2013, I observed the galaxy trio from my moderately light-polluted backyard in western North Carolina. The conditions were very good, with a NELM of 5.2.

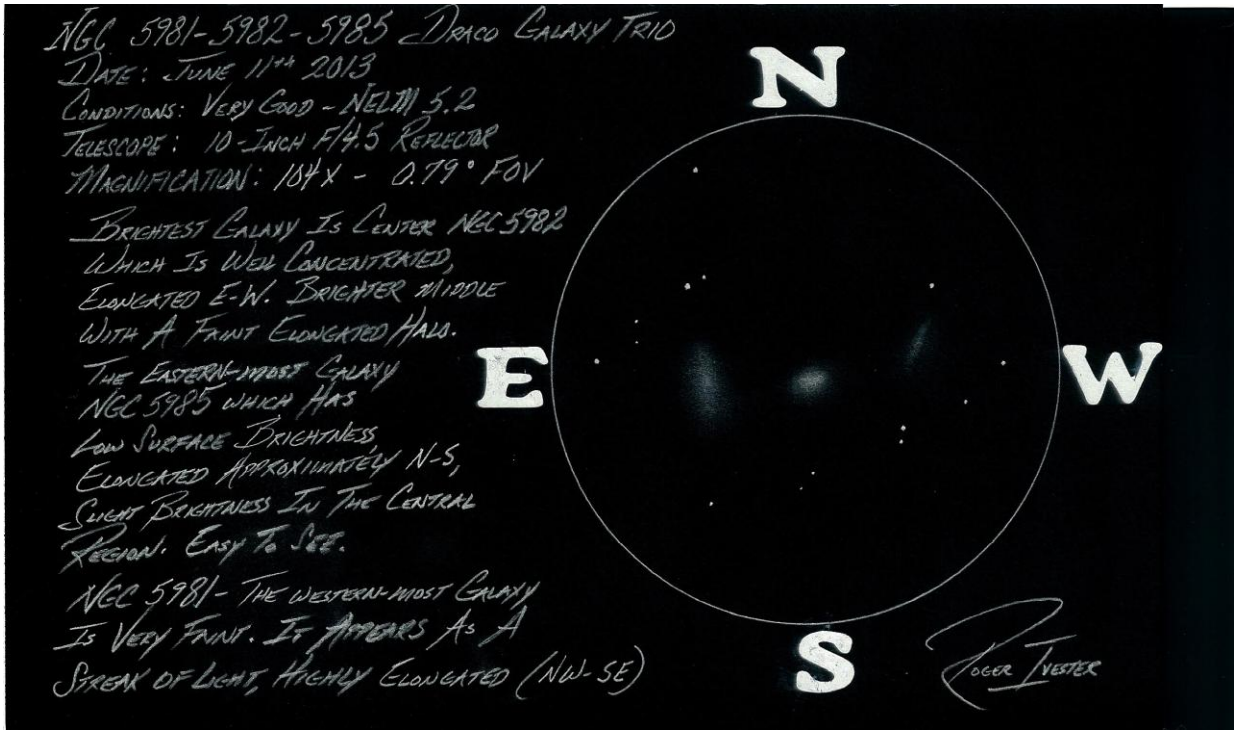
Using a 10-inch Newtonian reflector, I saw the following:

NGC-5981: This is the faintest individual of the galaxy group, often referred to as the Draco trio. The surface brightness of this galaxy was very low, requiring a minimum magnification of 104X and averted vision (my backyard has several unshielded streetlights nearby). It appeared as a very faint streak of light, elongated NW-SE, and I noted no center brightness or concentration. A fairly bright star was located very close to the NW tip.

NGC-5982: This is the brightest of the group, and was very easy to see with the 10-inch. The galaxy was well-concentrated with a much brighter middle, and elongated mostly E-W with a faint halo.

NGC-5985: This galaxy was faint with fairly LSB and elongated mostly E-S. The largest of the group, it appeared very extended and diffuse with a faint brightness in the central region.

The following sketch was made using a No. 2 pencil, and a blank 5 X 8 note card, with the colors inverted via my scanner.


NGC 5981-5982-5985 Draco Galaxy Trio
Date: June 11th 2013
Conditions: Very Good - NELM 5.2
Telescope: 10-Inch F/4.5 Reflector
Magnification: 184x - 0.79° FOV
Brightest Galaxy Is Center NGC 5982 Which Is Well Concentrated, Elongated E-W. Brighter Middle With A Faint Elongated Halo.
The Eastern-most Galaxy NGC 5985 which Has Low Surface Brightness, Elongated Approximately N-S, Slight Brightness In The Central Region. Easy To See.
NGC 5981 - The Western-most Galaxy Is Very Faint. It Appears As A Streak of Light, Highly Elongated (NW-SE)
N
E
W
S
Roger Ivester

Debbie Ivester: Observer from North Carolina

On June 11, 2013, I observed the galaxy trio from my moderately light-polluted backyard in western North Carolina. The conditions were very good, with a NELM of 5.2.

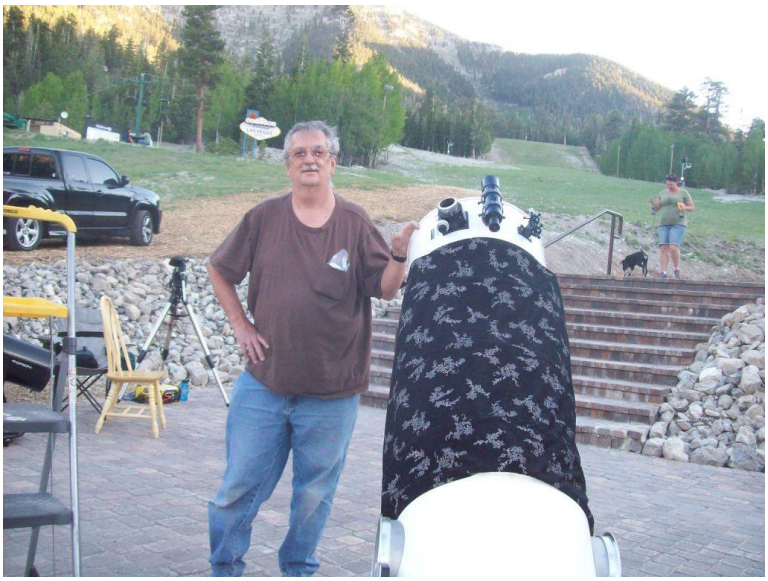
Using a 10-inch Newtonian reflector, I saw the following:

NGC-5981: This galaxy was very difficult, and I had to use averted vision with the 10-inch. It appeared as a faint elongated glow, and I couldn't hold it constantly.

NGC-5982: Very easy and bright, with an elongated shape, and with a much brighter middle.

NGC-5985: Very faint, but much easier to see than NGC-5981. This galaxy appeared to me as little more than a faint glow. With careful observing, I could see an elongated shape.

Fred Rayworth: Observer from Nevada



I've seen this galaxy trio multiple times, however, one time I only saw NGC-5982 and NGC-5985. On September 20, 2003, we went to a one-time observing site up in Lovell Canyon near Las Vegas at 5,000 feet next to a shooting range. Sandwiched in a steep valley with restricted views to the east and west, we had pretty decent views of straight above and to the south and north. I caught the brighter of these two galaxies that evening with my home-made 16-inch f/6.4 at 70X. Part of the problem for not catching NGC-5981 probably stemmed from the low magnification. NGC-5982 was a small sharp oval, medium-bright. NGC-5985 was a broad faint ball with a halo. Two vague descriptions, at best.

I had a much more decent observation, which included all three galaxies and even a bonus fourth member on June 8, 2013 from the Lee Canyon Ski Lodge, near Las Vegas, at 8,665 feet. It was clear, calm and warmer than I expected. In the afternoon, clouds formed over the mountains but they dissipated, at least visibly as dusk approached. However, the sky never really gave up the junk, and seeing and transparency were never great the whole night. Everything blurred in and out of focus over and over again, especially the planets and stars. This night I was also going for Porrima and it gave a poor showing, for example. I saw down to mag. 15.8 one time, as I'll talk about in a minute, but couldn't find a mag. 12 galaxy another time, though the sky seemed quite dark and clear. The problem became quite evident the next morning when high thin clouds moved in from the west. We must've been getting the leading edge and just couldn't see it in the dark. Still a good night and it wasn't very cold despite the altitude.

My notes show that NGC-5981 was a big wow! At 102X, it was a nice streak at one end of a trio of three types of galaxies, in a fairly straight line. This one is quite a contrast to the other two. NGC-5982 is almost round with a very dense core and a significant halo, which

indicates to me it's an elliptical. It is small but looks a nice contrast to the others. Magnification wouldn't do this one any good. NGC-5985 is a large soft, fuzzy oval. Despite being fuzzy, it is more distinct, clearly defined and quite different from the other two. Seems to have a slightly brighter core and just the hint of something going on in the halo around the core that might be spiral arms. NGC-5976 is just the hint of a tiny oval disturbance in the black background off the end of the trio of galaxies. It lies to the west of NGC-5981. So faint I could just tell something was there and detect a shape with averted vision after staring around the spot for a while.

I tried the trio at 229X but the magnification didn't help much. By then, some of that junk must have moved in because the galaxies dimmed considerably and when I went back to 102X, I couldn't see them like I did before. I didn't try again that night.

Once again, I tried the trio at Redstone on August, 3, 2013 but the sky conditions were very poor and I could barely see them at all. I gave up and went for Collinder open clusters instead.