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, Alabama

JUNE 2017

NGC-6015 Galaxy In Draco

Introduction

The purpose of the Observer's Challenge is to encourage the pursuit of visual observing. It's open to everyone that's interested, and if you're able to contribute notes, and/or drawings, we'll be happy to include them in our monthly summary. We also accept digital imaging. Visual astronomy depends on what's seen through the eyepiece. Not only does it satisfy an innate curiosity, but it allows the visual observer to discover the beauty and the wonderment of the night sky. Before photography, all observations depended on what the astronomer saw in the eyepiece, and how they recorded their observations. This was done through notes and drawings, and that's the tradition we're stressing in the Observers Challenge. We're not excluding those with an interest in astrophotography, either. Your images and notes are just as welcome. The hope is that you'll read through these reports and become inspired to take more time at the eyepiece, study each object, and look for those subtle details that you might never have noticed before.

NGC-6015 Galaxy In Draco

NGC-6015, also known as PGC-56219 was discovered by William Herschel on June 2, 1788 and given his designation, H-739-3. It lies in the constellation of Draco and is approximately 45 million light-years distant. With a diameter of approximately 79,000 light-years, it shines at a deceptively bright mag. 11.7, or thereabouts, but with a surface brightness closer to mag. 13.3, making it a relatively challenging object unless conditions are ideal.

Observations/Drawings/Photos

(Contributors are listed in Alphabetic Order.)

Gary Ahlers: LVAS Member from Pahrump, Nevada

NGC-6015 is a barred spiral galaxy in the constellation Draco. At a distance of 66 million light-years, the disk presents as a 3'5"x 1'5" angular size at 35° orientation. It has a bright core at mag. 11 but the disk surface brightness is quite dim at mag. 13.

It has a distinct bright core with tightly wound spiral arms. These arms are compact, knotty and bright for about 70% of the diameter. Highly visible dust lanes are on the inner side of each arm. There are lanes of luminous gas trailing the arms. I was unable to see any bar across the core.

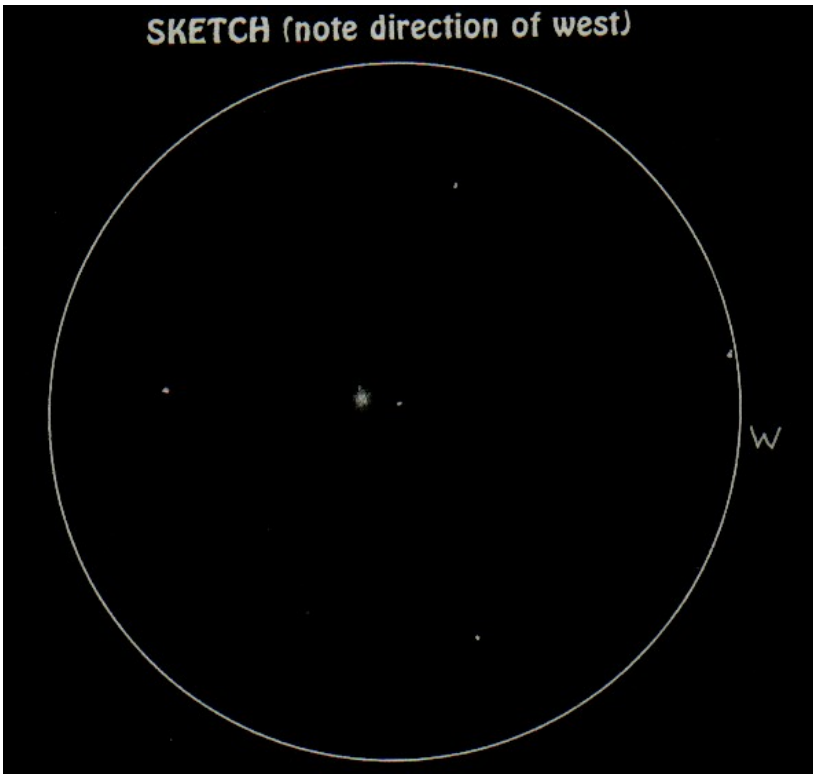
I was pleasantly surprised at the amount of detail at an apparent magnification of 100X, given the small angular size.

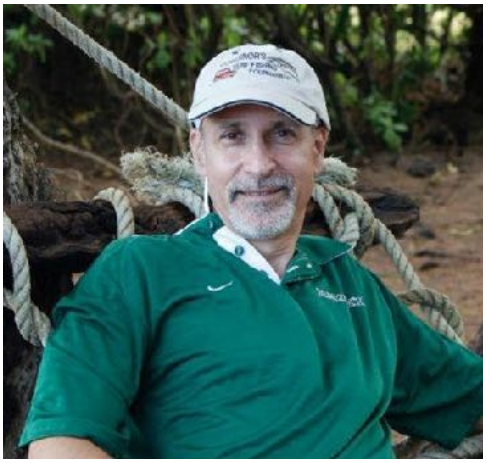
This image was acquired with an ACF-10 at F/7 using a QHYCCD8L cooled camera at 20 minute exposures. The image was cropped to show galaxy detail.

Glenn Chaple: LVAS Friend and Author from Massachusetts

I observed NGC-6015 with a 10-inch f/5 reflector and a 9mm EP @139X for a 0.6° FOV. Seeing was III on the Antoniadi Scale and the NELM was 5.

The galaxy was extremely faint. Seemed to have a concentrated nucleus. Uncertain as to shape.





Dr. James Dire: LVAS Friend From Hawaii

NGC-6015 is a mag. 11 spiral galaxy in the constellation Draco. The galaxy is 9° south and slightly east of the star Pherkad (second brightest star in the cup of the Little Dipper). It's also 4° west and 1/2° north of the star Eta Draconis. There is a mag. 5 star, HR5886, 1/2° west of the galaxy that helps pin down its location.

It's a type Sc spiral galaxy, which means it has a small core and galactic bulge compared to its disk diameter. The galaxy is 5.1 by 2.1 arc-minutes in size. Its small angular size makes this mag. 11 galaxy easier to see than a larger galaxy with the same dimensions. Distance estimates range from 28-60 million light-years.

My image of NGC-6015 was taken with a 10-inch f/6.9 Newtonian with an SBIG ST-2000XCM CCD camera. The exposure was 160 minutes. North is up and west to the right. The brightest star in the image is SAO16880, shining at mag. 9.5. SAO16880 is 8 arcminutes east of the galaxy's core. The image displays the tight spiral arm structure of the galaxy and its small core. Visually in my 14-inch Dob, the galaxy appeared oval shaped with no visible structure detail.

Chris Elledge: LVAS Friend from Massachusetts

Here are my observing notes on NGC-6015 from my Saturday night observing session at the clubhouse. I managed to get a few objects in-between astronomical twilight at 10:40pm and the clouds coming in at midnight. Unfortunately this Challenge proved to be a bit too "challenging" for our skies here.

On June 25, 2017 @10:50pm, EDT from the ATMoB (Amateur Telescope Maker's of Boston) Clubhouse, I observed NGC-6015. Sky conditions were: Bortle Scale: 6. NELM: 5. Transparency: Average. Seeing: Poor.

With a 10-inch, f/5 reflector, I located it with a 25mm (50X) eyepiece giving a 1.4˚FOV. It was easy to place the galaxy in the center of the view simply by putting the mag. 5 star HR5886 in Draco at the NW edge of the view. Even though I had successfully centered the galaxy, seeing it was something else entirely. It didn't even really show up as a fuzzy patch to me with averted vision. It was more of just a lighter portion of sky.

With HR5886 in the eyepiece to the NW, a line of 3 stars in the W pointed toward the galaxy. There was a triangle of mag. 9 and 10 stars in the middle of the field surrounding it with points to the NW, SW, and E. A faint mag. 11 star sat immediately to the W of the galaxy. I had a lot of trouble determining the orientation, but it seemed that the long axis aligned with a pair of mag. 13 stars to its' SW that were only visible with averted vision.

I stepped up to a 10mm (127X) eyepiece which gave a 0.6˚ FOV. At this magnification, the triangle I mentioned before filled the view. The galaxy only showed up as a hint of brightness to the E of the mag. 11 star. It still appeared to have the long axis align with the pair of mag. 13 stars just to its SW.

I think a much darker sky is needed to enjoy visual observation of NGC-6015.

Sue French: LVAS Friend and Author from New York

NGC-6015 can be faintly seen in my 105mm (4.1-inch) refractor at 17X, but is much easier to catch at 47X. At 87X, it shows a 3' X 1¼' oval, tipped north-northeast that grows brighter toward the center. A mag. 11 star rests near the western side, and a pair of dim stars lie off the galaxy's south-southwestern tip. In my 10-inch scope at 170X, the galaxy covers about 3' x 1.2'. Its large bright core and inner halo look intriguingly patchy. A mag. 13 star nudges the galaxy's edge at PA 195° and makes an isosceles triangle with the star pair seen in the 105mm refractor.

Roger Ivester: LVAS Member from North Carolina

I observed NGC-6015 with a 10-inch f/4.5 reflector at 104X. The sky conditions were with a temperature of 59°, high humidity and a 16% moon. The NELM was between 4.5 and 4.8.

The galaxy was a low surface brightness, large, broad oval with a subtle brightening in the central region. A mag. 11 star lay 2 arc minutes to the west. A mag. 14 star was visible in the extreme SW halo when I used averted vision. A pair of mag. 13 stars were visible with direct vision, located just off the SW tip of the galaxy.

(See Roger's sketches on next page.)

NGC 6015 - GALAXY - DRACO - 7"/MAG 11.8
RA: 15h 51.m4 DEC. +62°19'
DATE: JUNE 2017
TELESCOPE: 10-INCH REFLECTOR
MAGNIFICATION: 104X - 0.79°
NELM: 4.5-4.8 - 16% MOON
LOW SURFACE BRIGHTNESS, OVAL SHAPE, OVERALL DIM, BRIGHTER WITH GREATER CONCENTRATION IN THE CENTRAL REGION. A FAINT STAR SUPERIMPOSED ON THE SW TIP, AND A PAIR OF ~13 MAG. STARS OFF THE SW TIP. DUE TO THE SKY BRIGHTNESS, AVERTED VISION REQUIRED. OTHER THAN THE SUBTLE CENTER BRIGHTNESS, FEATURELESS.

ROGER IVESTER

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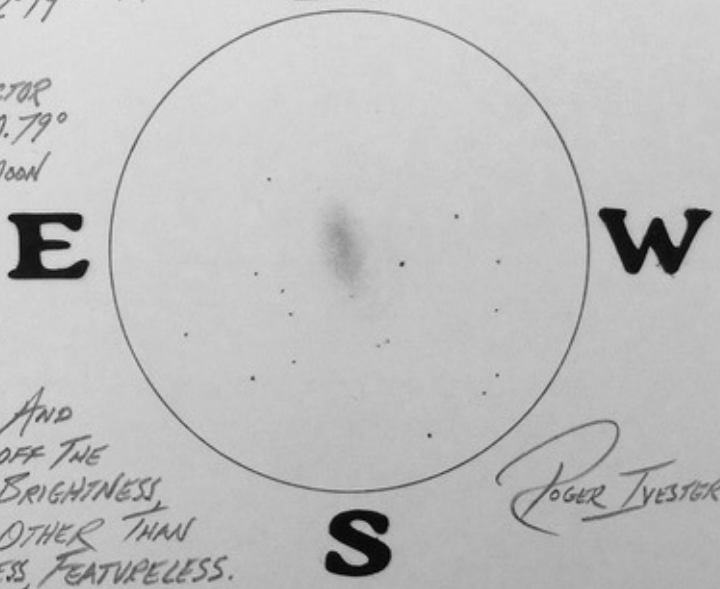
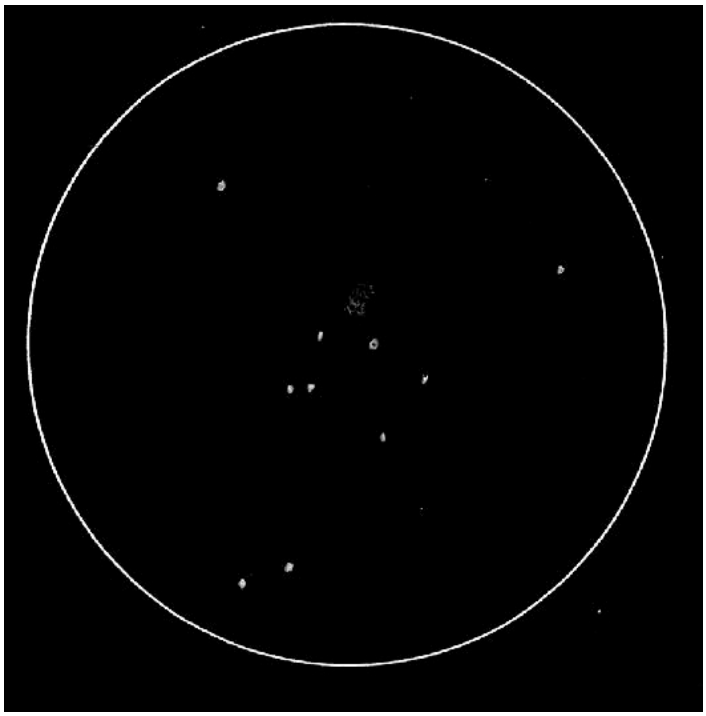


ROGER IVESTER

Mike McCabe: LVAS Friend from Massachusetts

Wow! I didn't think the weather was going to let me get to this one but we finally got a break and luckily the moon was in a good place for it, too. NGC-6015 is a grand spiral galaxy in the constellation Draco, and it lies about 44 million light years distant from us. At mag. 11.7, it doesn't sound like it'd be all that dim, but it's small and it suffers from a low surface brightness as well. It's located less than 2° to the east of a mag. star, HIP77277, so you'd think finding it would be a snap. However, I found that I needed every star on my chart to locate the galaxy. Fortunately, there was a trapezoid of mag. 9 to 11 stars nearby that I was able to use to home in on it. I was surprised at how dim it was.



I spent time at magnifications ranging from 60X to 130X and didn't see much difference in the galaxy itself. It was never much more than a fuzzy patch, and I didn't discern any brightening toward the center of the patch, nor could I discern a distinct shape either. This was a true faint-fuzzy from my location and with the equipment I was using.

Mario Motta: LVAS Friend from Massachusetts

Done with a 32-inch reflector.

Richard Nugent: LVAS Friend from Massachusetts

I recently observed NGC-6015 from the ATMoB (Amateur Telescope Makers of Boston) observing site in Westford, MA. The NELM was about 5.5 and I was using my 10-inch reflector. The area of interest in Draco was easy to locate, but seeing this galaxy was not. I swept past it several times without seeing it. Thanks go out to Chris Elledge (current ATMoB membership secretary) for pointing it out to me. With a surface brightness of mag. 13.9 (*Deep Sky Field Guide to Uranometria 2000*) I'd certainly consider this a low surface brightness object. At first, I could barely see the galaxy, but after a few minutes, it was easier to view. Knowing where to look will make future observations easier. Although smaller, it compared in detectability to M110 (also with a surface brightness of mag. 13.9). To me, NGC-6015 appeared as a faint, oval-shaped patch of light. Increasing magnification did little to improve the view. I couldn't make out any detail.

I've always been intrigued by the visibility of galaxies. I know there are different types of galaxies with different sizes, orientations, at different distances and each of these characteristics plays into a galaxy's visibility. While some "nearby" spirals have low surface brightness (M33 and M101 come to mind), many are "bright." Consider M31 at 2.5 million light-years and M81 at about 12 million light-years. Some of the NGC galaxies are surprisingly bright. Check out the UFO galaxy, NGC-2683 in Lynx or the Cocoon galaxy, NGC-4490 in Canes Venatici. These galaxies are about 25 million light years away.

Now, back to this month's challenge, NGC-6015. Its distance is about 44 million light-years, about the same distance as May's observing challenge, M98. Remember how faint that one was? I'm always impressed how dim these vast collections of stars become at relatively nearby distances. Galaxies get pretty faint out past a mere 50 million light-years!

How far can you see? It depends on your sky quality, telescope aperture, magnification, and, perhaps most importantly, your experience level. Challenges like NGC-6015 make us better observers. On your next observing night throw in one or two challenge objects just to see how far you can go. Remember…have fun!

Fred Rayworth: LVAS AL Coordinator from Las Vegas, Nevada

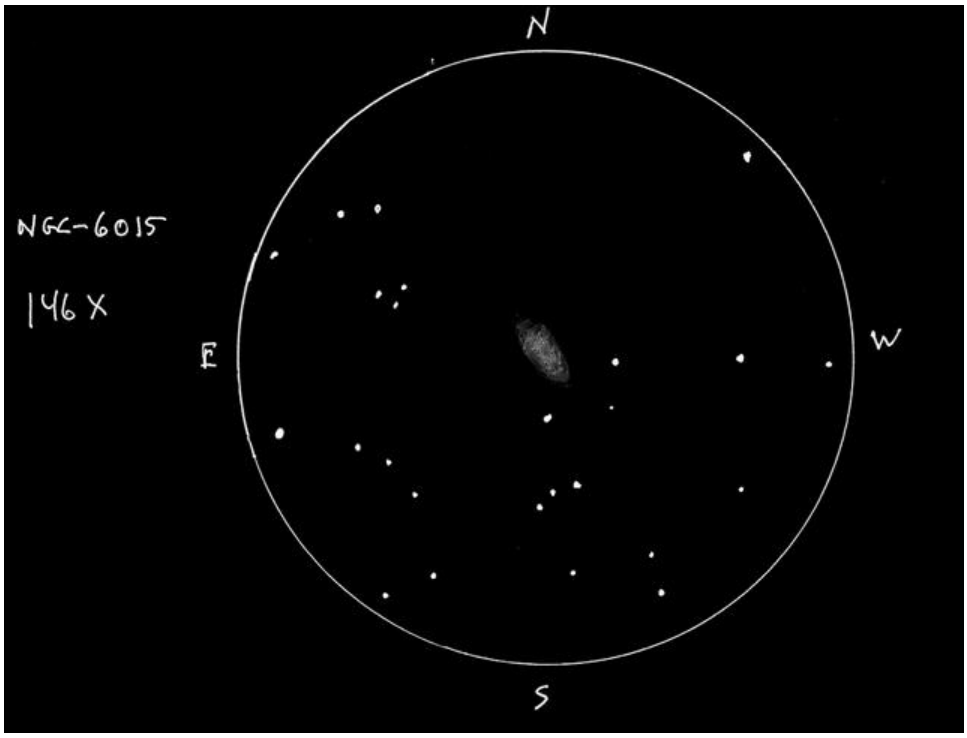
I've only observed this object three times, total, and all in Nevada. The first time was back on September 20, 2003 from Lovell Canyon, southwest of Las Vegas, Nevada. At 5,000 feet, there was a slight gentle breeze. We had no east or west view because it was blocked by the mountains. A shooter group was there camping. We were worried about a lot of light pollution from them but that didn't turn out to be an issue. At most, we had a slight haze of black powder until it got too dark for them to continue shooting their muzzle loaders. As far as the actual weather, it became cool due to the altitude but never super cold. The sky was very clear at the zenith, however, there was a slight brownish haze near the horizons all around.

Using my home-built 16-inch f/6.4, at 84X, I saw a faint, broad oval. It was slightly tilted. I didn't give it much more description than that at the time, probably because of the low magnification and the brown haze that evening.

The second time was my first attempt to get the Challenge early on May 20, 2017 from Cathedral Gorge State Park in east-central Nevada. At 4,800 feet, the sky was not near as good as the previous evening. It was

warmer and calm, with occasional air movement. Puffy clouds moved through like the night before and we hoped, they'd stay away. Unfortunately, though conditions were similar to the night before at first, by 11PM, the clouds moved in in waves and never left. Packed up for the evening instead of chasing holes. In the morning, I woke up to basically overcast skies, so it was a good call to not wait it out the night before.

As for NGC-6015, I saw a spiral-shaped face-on. I detected a messy sort of reverse-spiral. I could just detect arms and lumpy appearance at 102X.



The final observation, which happened to be in June, the actual month of the Challenge, was on June 17, 2017 from Redstone Picnic Area on the North Shore Road at Lake Mead, Nevada. At 2,100 feet, it was warm with some air movement. The sky was very clear with slight cirrus on the northwest and northeast horizons. There were lots of nasty horseflies that finally disappeared a bit after dark, replaced with other flying nasties that occasionally made their presence known. The humidity was a bit higher than expected and most of the night, looking just at the edge of the Las Vegas light dome to the west was making for not the most ideal transparency. Skyglow was an issue at times, but otherwise it was a pretty decent, but short night. I only got a little over two solid hours of observing.

NGC-6015 was a faint, but distinct, grainy spiral with a quadruplet of stars at one end. No stellar but a distinct and concentrated core. A slight hint of spiral activity in the arms but only with averted vision, and I couldn't hold it constant. Some of this detail showed up better at 146X. Came back and revisited it later in the evening when it was darker and didn't get much improvement except the spiral activity was a bit more definite and it was more grainy and looked counterclockwise. I based my drawing on the 146X magnification this time.

Joseph Rothchild: LVAS Friend from Massachusetts

After a long stretch of bad weather, I was able to observe NGC-6015 last night with a 10-inch reflector at 86X under dark skies on Cape Cod. I observed it near mag. 5 star HR5886. The galaxy appeared as a compact featureless smudge. It was initially difficult to see, but then I readily saw it with dark adaption.

Craig Sandler: LVAS Friend from Massachusetts

On June 20, 2017, I observed NGC-6015 from Petersham, MA using an 8-inch SCT with a zoom EP at 20mm, giving a magnification of 101X.

The skies were clear and the wind calm. The Bortle scale was a 6, the seeing excellent and the transparency good.

After a brief GOTO excursion to NGC-6105 (which I couldn't see at all!), I was pleased that as the sky darkened around 9:15 pm, on this shortest night of the year, even in a navy sky, I could just barely discern the puff of this galaxy. I wasn't sure, but I thought so. Later, around 10:30PM, I came back out and spotted NGC-6015 fairly easily, though it's not the easiest object, that's for sure!

Description:

Longish dim bulge with knifelike arms in a pretty field. Best observed in one quadrant of the FOV - centering made it harder. Perhaps the off-center view aids averted vision?

Jay and Liz Thompson: LVAS members from Henderson, Nevada

From an observing sight near Lake Mead, we saw NGC-6015 as an elongated smudge in a 17-inch at 227X. We didn't see much other detail.

In the 24-inch at Cathedral Gorge, at 116X, it showed a faint stellar core with an extended brightness around it. It was definitely elongated. At 277X, we could still see the faint core and surrounding elongated glow. We noted a little texture in the body of the galaxy.