

# MONTHLY OBSERVER'S CHALLENGE

## *Las Vegas Astronomical Society*

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*&*

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*With special assistance from:*

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**OCTOBER 2014**

### **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-7640 Elongated Galaxy In Andromeda**

NGC-7640 is a highly-inclined spiral galaxy, discovered by William Herschel on 17 October, 1786, though he also described seeing it two years before. This mag. 11.6 object is about 26 million light-years away in the constellation of Andromeda. It's about 78,000 light-years across. Since Herschel discovered it, it's also known by the Herschel number H-600-2.

This makes a challenging object, especially for small scopes but has been spotted with objectives as small as 60mm (2.4-inches) when conditions were just right.

## Observations/Drawings/Photos (Contributors listed in alphabetical order)

**James Dire:** LVAS Friend from Hawaii



NGC-7640 is a mag. 11 spiral galaxy in the constellation Andromeda. William Herschel discovered the galaxy in 1786. The galaxy is located  $15^\circ$  due west of the Great Andromeda Galaxy, M31. Closer in, the galaxy is  $4^\circ$  southeast of the mag. 4 star Omicron Andromedae and  $4^\circ$  southwest of the mag. 4 star Iota Andromedae. It's approximately  $2^\circ$  south and slightly west of the popular Blue Snowball Nebula, NGC-7662.

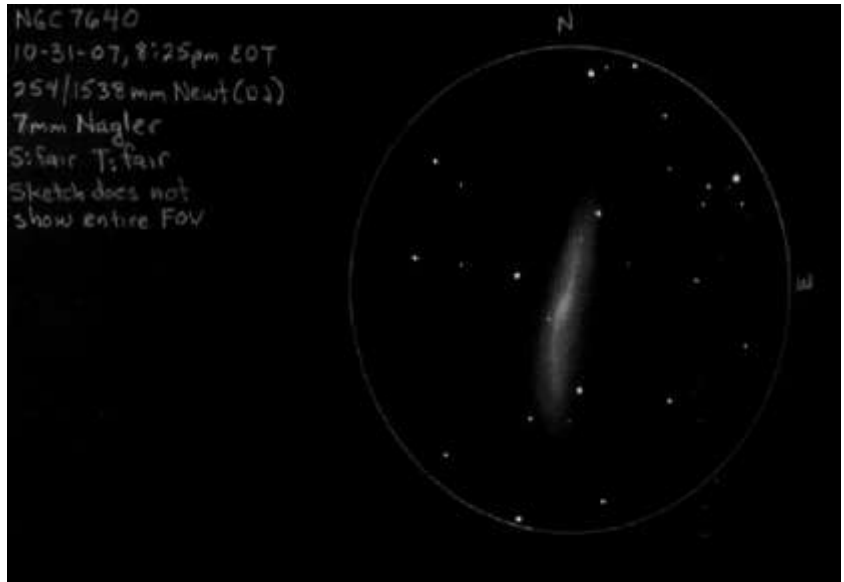
My image of NGC-7640 was taken recently with an 8-inch f/8 Ritchey-Chrétien cassegrain telescope. The camera was an SBIG ST-2000XCM CCD camera and the exposure was 2 hours. Based on this test exposure, I estimate 6-8 hours of total exposure will be needed to fully capture its spiral structure.

It's an Sc spiral galaxy measuring approximately  $10 \times 2$  arc-minutes in size. The galaxy is very slightly open from edge-on, revealing its spiral arms. The small galactic core has a dust lane in front of it, visible in long exposure images, such as below. The galaxy is 26 million light-years distant.

I provided two images of the galaxy. One has arrows pointing to four stars. The galaxy is surrounded by three mag. 11 stars (yellow arrows) forming a right triangle. All but the outermost edges of the spiral arms are contained within this triangle. A mag. 14 foreground star (orange arrow) lies just southeast of the galactic core. This is visible in a 10-inch telescope and possibly smaller scopes under ideal conditions.



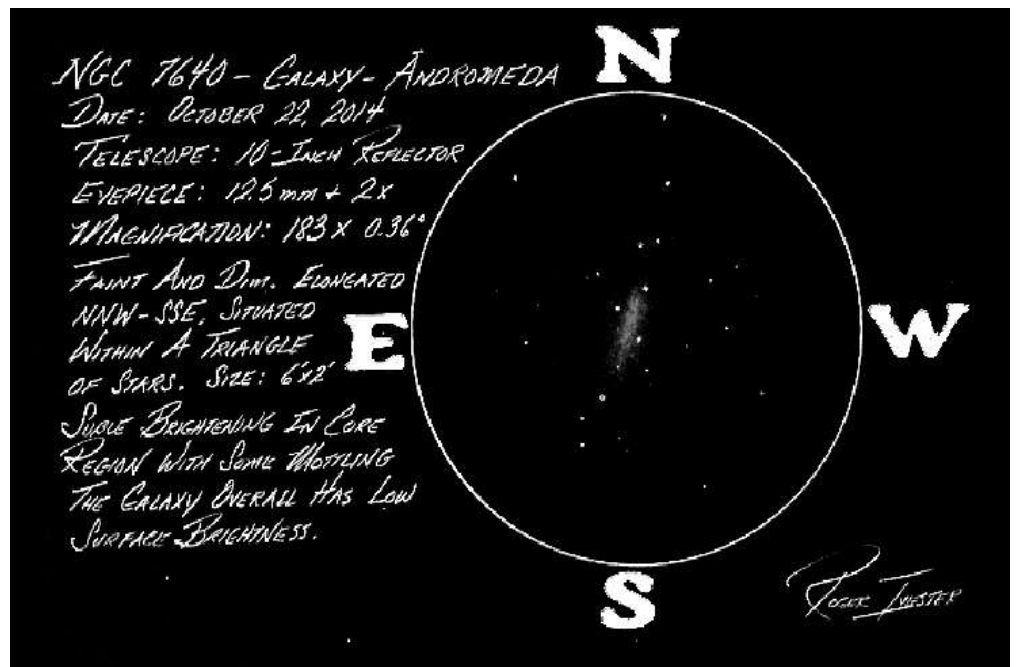
**Sue French:** LVAS Friend and Author From New York



**Roger Ivester:** LVAS Member from North Carolina



I observed NGC-7640 with a 10-inch reflector at 183X, from my moderately light-polluted backyard from the foothills of western North Carolina. The galaxy was faint and dim with overall low surface brightness, elongated NNW-SSE, and situated within a three star triangle. I estimated its dimensions at about 6' X 2' with a subtle brightening in the central region. With careful and patient observing, I noted a faint elongated halo.



**Gus Johnson:** LVAS Friend from Maryland



In November, 1994, I used an 8-inch reflector at 58X to view NGC-7640. The galaxy was faint and difficult, elongated N-S, and situated between a triangle of faint stars.

**Fred Rayworth:** LVAS Vice President and AL Coordinator from Las Vegas



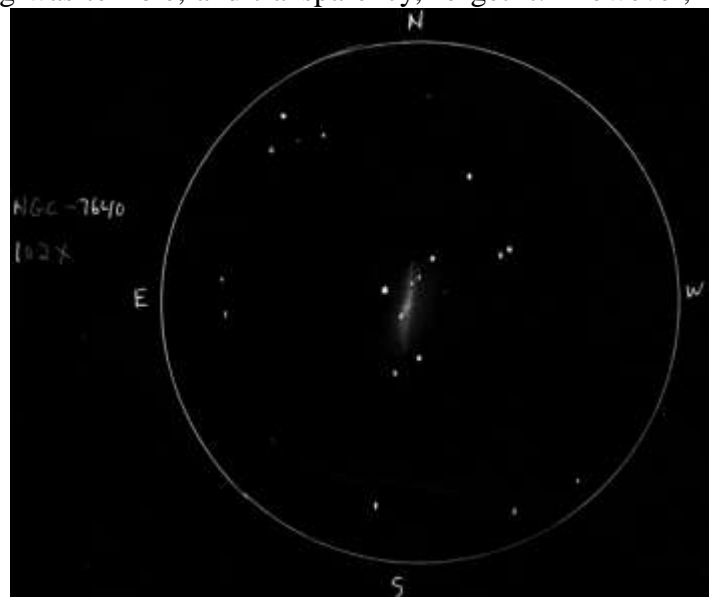
This is one object I've only seen twice. The first time was on August 26, 2006 from the Cold Creek Canyon gravel pit in the Toyabe National forest in the mountains near Indian Springs, about 30 miles north of Las Vegas, Nevada. At an elevation of 5,200 feet, this site was fairly dark. The weather was mild and the temp not too cold. There was a slight, intermittent breeze. A slight haze may or may not have affected viewing. As the night progressed, things calmed down and it was a killer night. Some crud did creep in about 22:45 and seemed to affect viewing in some areas of the sky.

Using my home-built 16-inch f/6.4 at a magnification of 70X, NGC-7640 was a long narrow oval. It was easy to see. Seemed

to be another gray haze next to it but after checking Megastar, there was nothing there. It was just my imagination.

The next time I saw it was for this Observer's Challenge on October 25, 2014 from Furnace Creek Ranch in Death Valley at an altitude of -190 feet. The weather was extremely windy with high, thin clouds. The winds were supposed to die down at dusk, but they actually got worse. The clouds finally went away after dark but the winds brought in lots of turbulence and dust. Seeing was terrible, and transparency, forget it. However, I finally got a few fuzzies which amounted to two Herschels. That was it. Still, I enjoyed the night. The ironic thing was that when the winds finally died at midnight, the sky disappeared at the same time. Go figure.

Using my commercial 16-inch f/4.5 at a magnification of 102X, the galaxy was a very faint streak mostly between a triangle of stars. I could see some mottling in the fat streak, but it was really faint. No specific core but where the core probably was there was also a brighter foreground star. There was just the hint of more of a spread than shows in the drawing, but there were also three street lights shining directly into my eye from the south that didn't help, even when I cupped my eye with my hand.



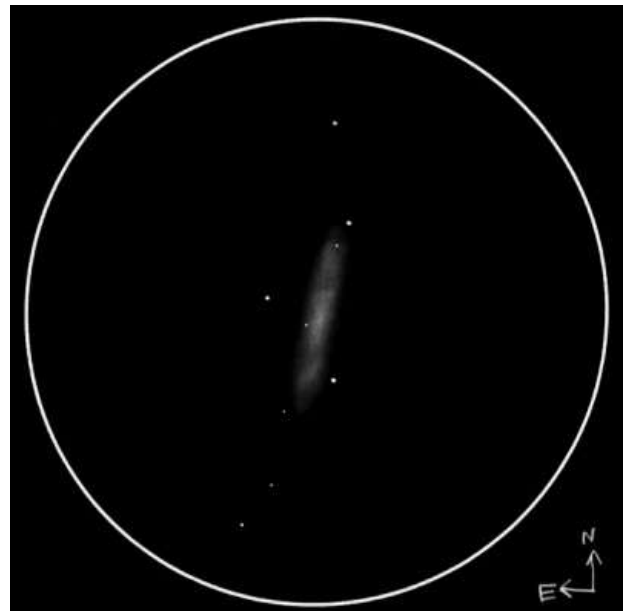
**Jaakko Saloranta:** LVAS Friend from Finland



**NOTE:** Jaakko noted my post on the LVAS Facebook page about the upcoming deadline, but he was a bit occupied: His daughter was born on the 11th of November at 4.35 am. They'd just got back from the hospital few hours before he sent his notes and drawing. The three of them are doing just fine. We'd like to congratulate Jaakko, his wife and new baby daughter!

I managed to write a short piece for you guys on NGC-7640 just now. As always, I wanted to re-sketch and re-observe the galaxy, but the weather here is what it is this time of the year: cloudy. November and December are the cloudiest months here, and also the darkest: less than 7.5 hours (sunrise 8:19 am, sunset 3.50 pm) and it's just getting darker every day. Here's my observation and drawing:

This was a faint, low surface-brightness edge-on galaxy inside a triangle of three mag. 11 stars. Despite the high (70°) altitude of the object, it was quite difficult to see even with averted vision. Some fluctuation in brightness was visible at both ends of the halo @ 150X (28"), but extremely difficult. There was a mag. 14 star visible SE of the brighter central region. I saw no definite nucleus. Size 7' x 1'. Observing conditions were decent on the night of October 29: naked eye limiting magnitude in Andromeda ~71 and SQM-L reading 21.41. Weather conditions were +45°F, humidity ~85%, SW wind 5 m/s. The sketch represents my impression of the galaxy through an 8-inch Newtonian @ 150X.



**Jay And Liz Thompson:** LVAS Members from Henderson, Nevada



We observed NGC-7640 from our backyard in Henderson, NV on December 26 and 28, 2013 with a 14-inch SCT. At 98X, we could see a faint glow in an elongated N-S triangle of stars with the long side N-S. When we upped the magnification to 279X, it revealed a vertical slash when using averted vision, to an extent roughly 1/3 of the field and equivalent to the length of the long side of the triangle.

With a 17.5-inch Newtonian under the dark skies of Meadview, AZ on January 3, 2014, it was framed nicely by three stars when viewed at 125X. This galaxy can be discerned at 63X if you know where to look. At 227X, it is somewhat dim but still nice, and reveals a faint stellar core.