

MONTHLY OBSERVER'S CHALLENGE

Las Vegas Astronomical Society

Compiled by:

Roger Ivester, Boiling Springs, North Carolina

&

Fred Rayworth, Las Vegas, Nevada

October 2009

NGC-253 (The Sculptor Galaxy)

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-253

NGC-253, known as the Sculptor Galaxy or in some circles as the Silver Coin Galaxy, is a bright and easy to see object in the southern skies. The further south one is, the better it appears. However, it has been seen at most latitudes within the continental U.S. At approximately mag. 7.1, it has been spotted with the naked eye in far southern locations when conditions are right. Discovered by Caroline Herschel in 1783, it has been a popular object ever since.

The galaxy is known as a starburst galaxy because it has many active star forming regions within it. Though these type galaxies are known for supernovae, only one has been discovered within this galaxy, and that was in 1940.

It's full of a surprising amount of detail, from the lumpy central bulge, to the dark lane and several foreground stars. It appears as a fat streak in smaller telescopes and in larger ones, the details emerge. In X-ray images, a central bar is evident. It's considered a great binocular object and is the most easily seen external galaxy next to the Andromeda galaxy.

Observations/Drawings/Photos

Roger Ivester: Observer from North Carolina



I first observed NGC-253 many years ago. It was the second object listed in one of my first deep-sky observing guides, *The Finest Deep-Sky Objects* by James Mullaney and Wallace McCall. My observation notes and sketch for this month will be from a very special observing session in October of 1995 using a 14.5-inch reflector. At 125X, this galaxy measured almost a full $1/2^\circ$ in length. The texture showed much mottling with little concentration especially in the outer halo extensions. With careful observation, there was a small and very subtle core which was difficult to see. The orientation was NE-SW. There were two mag. 9 stars situated just off the SSE part of the halo. I could see four faint stars superposed or embedded within the nebula.

Due to the galaxy's sky position which is low in the southern sky at -25° S latitude in North Carolina, a night of excellent transparency and seeing is required to see the true majesty of this incredible object.



Fred Rayworth: Observer from Nevada



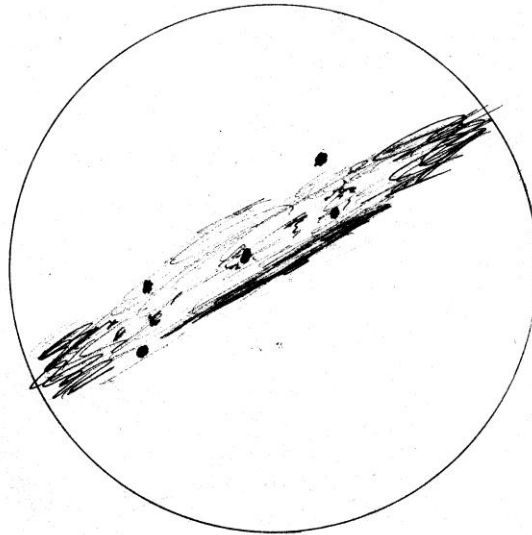
I've observed this galaxy many times over the years and never get tired of it. At Death Valley, I gave my most elaborate description of this showpiece.

The first time I tried for it, using a 16-inch f/4.5 Dobsonian, it was too low and just over the aircraft hangar next to where we'd set up. However an hour later, it was high enough in the sky for an attempt. Unfortunately, the stars were not very bright at that altitude and I had to hunt and peck before I finally found it. The one thing about this galaxy is that if you get in the general area, there's no doubt when the scope sweeps over it!

At 70X, it fit nicely into the field of view, but at 140X, it went beyond it. I swept both ways at 140X to see how far the halo extended and it cut off abruptly a little beyond the field. The galaxy was a fat elongated oval, with plenty of lumpiness in the core and several bright stars, plus some fainter ones, embedded within it.

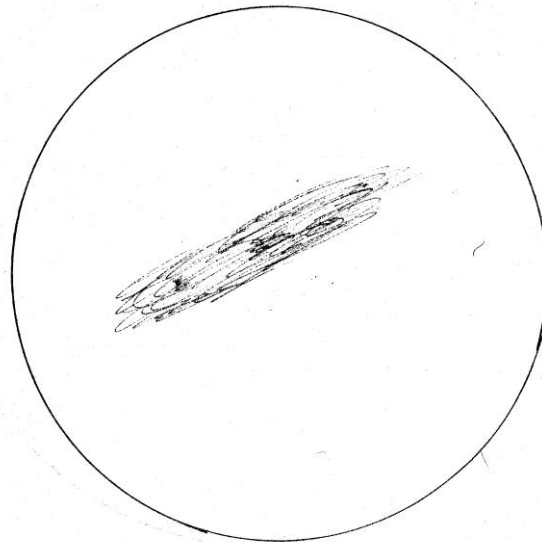
I noticed a dark lane, of sorts, with the main nebulosity above it. It wasn't quite like the Sombrero, but similar. There was a lot of lumpiness within the core which extended over 60% of the field. At 140X, a bit of spiral structure was just hinted at in the central area. I never saw the bar shape, though I saw hints of it with the dark and light shaded areas giving a vague impression of some shape. There were also several stars superimposed in front of it. The brighter ones combined to form a pseudo-W similar to Cassiopeia. I didn't realize the shape at the time, but saw Jonathan Kade's notes and the description just clicked. I give full credit for Jonathan pointing this out.

NGC-253
140 X



As a final experiment, and against what I usually tell newbies, I put on my O-III filter to see if I could suss out any knots (at 140X). What I got was 60% of the core which still extended almost to the edges of the field. However, the fuzz in the arms was gone as well as most of the foreground stars. As hard as I tried, I couldn't see any specific knots, though I saw a bit of lumpiness (especially in the center) that looked a bit different from the unfiltered view.

NGC-253
140 X
WITH
O-3 filter



Overall, this is one of my favorite objects and is sure to be on my list again the next time I go out. Maybe from Redstone Picnic Area at Lake Mead, it will be a bit higher in the sky.

Rob Lambert: Observer from Nevada



The Sculptor Galaxy is my favorite galaxy. I was completely enthralled the first time I observed it. Unfortunately, that was before I started keeping notes. This galaxy has more detail in its structure than you will see in most galaxies.

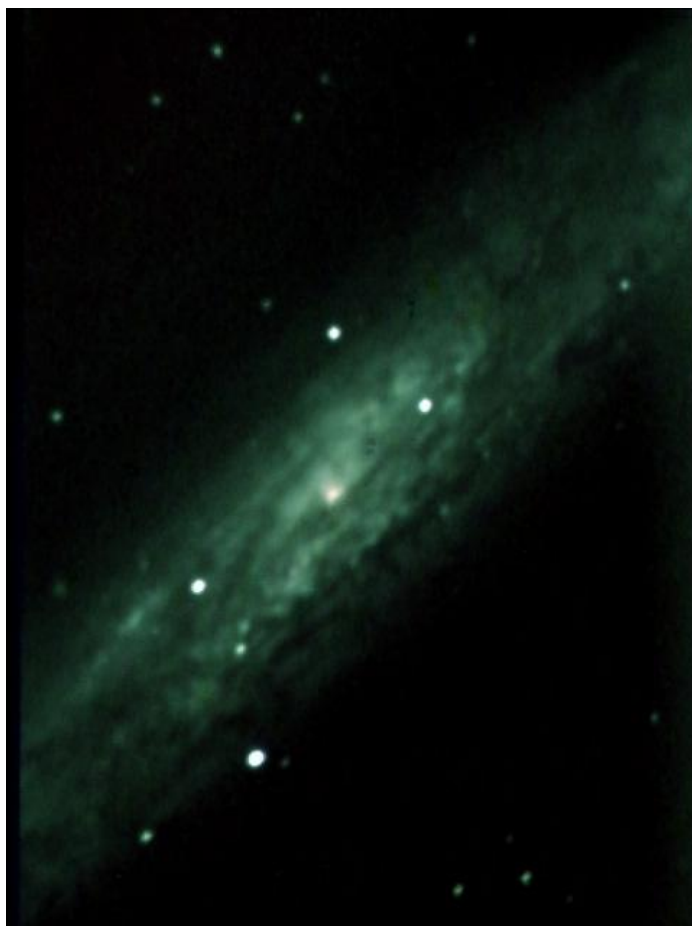
The first time I observed the Sculptor Galaxy was last winter in Rio Rancho, New Mexico. It was extremely cold that night, but I must have gazed at this treasure for at least 20 minutes. I could just imagine the churning gas and dust within its spiral arms. This first image (Nov 2008) was taken that night almost a year ago when the sky was so dark and steady on the outskirts of Albuquerque that I was able to capture it with only a 14-second integration. It's a single frame image with no post processing of any kind.



The second image (also a 14-second exposure), captured recently with my 4-inch refractor, provides the perspective that probably gives the Sculptor Galaxy its other nickname, the Silver Coin Galaxy. As one looks at the smaller image of the galaxy, one can almost imagine a coin being suspended in space.



I tried to capture a 56-second image while at Death Valley to show more detail in the galaxy's center, but the transparency wasn't very good for that much magnification.



There are obvious dark globs and streams of dust throughout entire length of the galaxy. Its core and nuclear bulge are tighter, more distinct, and less washed out than that of most galaxies. When I've seen IR or X-ray images of the Milky Way's center, I've imagined it looking something like NGC-253. The dust lanes on the north side remind me of the dust lanes visible in the much larger Andromeda Galaxy, as they spiral in toward the galaxy's center. As I looked to define the galaxy's spiral structure, I saw two large spiral arms that appeared to originate at opposite ends of a short bar stretching across the galaxy's center. If I orient the images correctly, the spiral arms give the galaxy the appearance of a clockwise rotation. What I would give to look directly down upon this galaxy and observe its full spiral structure! The brighter foreground stars that are superimposed on the galaxy appear to be riding the spiral waves as the galaxy revolves around its center. There are a number of areas of apparent star formation, but between the core and the bright star on the northeast periphery there's what seems to be an unusually bright area of star formation. According to published documentation, NGC-253 is a starburst galaxy similar to M-82.

I look forward to years of observing this galaxy and trying to see something new each time. NGC-253 will long be a fall and winter favorite of mine.

Jonathan Kade: Observer from Detroit, Michigan

Fantastic object for this month! I've never seen this amazing galaxy before - and somewhat surprisingly to me, neither have most of the people on the field at my club's star party this weekend, October 17, 2009. The general consensus was that NGC-253 had to be one of the best objects that they'd never seen before.

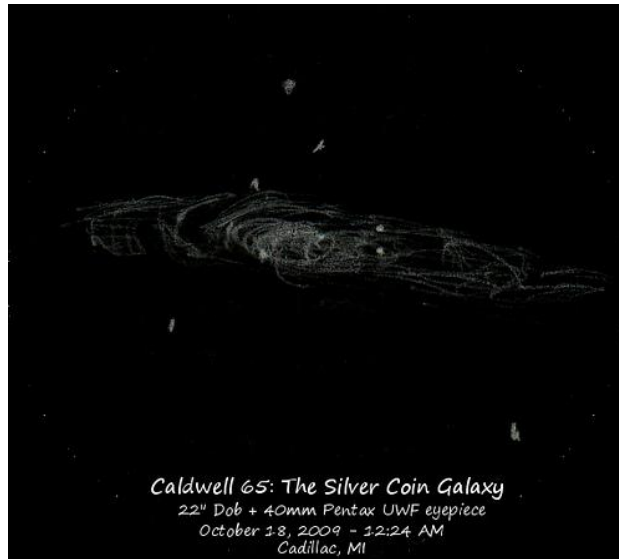
At only about 20° over the southern horizon, though, it's somewhat easy to excuse the omission. We're used to having the southern sky washed out to 30° at our observatory north of the Detroit metropolitan area. The watery constellations are a fairly star-poor area of the sky anyway, but even in black skies without optical aid, there is simply nothing there aside from a few scattered mag. 5 stars below Deneb Kaitos.

With lots of scintillation near the horizon, Sculptor didn't seem like a promising region of the sky on Saturday night. However, once transit time neared for NGC-253, I decided to have a look with binoculars. I got out my Pocket Sky Atlas and looked at the various maps of Sculptor for some context. I noted that "To be honest, it took a little guesswork to pick out Beta Ceti, as Cetus is almost always awful near home." Fomalhaut helped me get my bearings, though, and I was off.

I turned my wife's 15X70 binoculars to Beta Ceti (after melting the frost off the objectives), and scanned down toward the horizon. Right away, there it was. The lumpiness and asymmetry reminded me a lot of M-106 - but that was through an 8-inch reflector! I was very excited now to see it with my telescope. The 2-inch 25mm eyepiece showed off the extent of the galaxy marvelously. I hadn't realized before just how large or how bright this object really was. With the Webster Astronomical Society's 22-inch Dob on the field and between targets (after giving up again on the Bubble Nebula), I had to see it with more aperture.

With a 40mm eyepiece providing a FOV just large enough to hold the whole galaxy, the object looked almost three-dimensional enough to touch. The arms were still somewhat tough to identify, but I did have some impression of two arms with a bar. The dust lanes and patches, though, really stood out, and helped greatly with identifying the orientation and "sense" of the galaxy. Then I started asking others if they were familiar with this galaxy. Many were not, and pretty soon almost everyone who wasn't actively imaging was standing around the big scope. This object was the defining one of the star party.

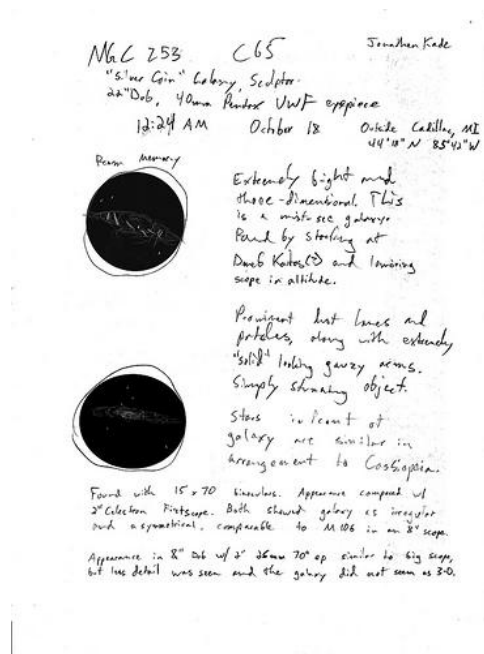
While others were observing, I ran inside and got out the sketching pad. (It was 20° Fahrenheit, so I'd been somewhat neglectful of my note taking.) I wrote my initial impressions along with a sketch from visual memory. Then I went out to spend some more time with the object.



Viewing the galaxy again after returning outside, I noticed the foreground stars much more keenly. The pseudo-Cassiopeia asterism was amusing, and made me think of the galaxy's similarities to (and differences from) M31 a bit. The triangle of stars overlaid on the bulge was an interesting sight as well.

I wish I'd spent more time on the nucleus at high powers, but eventually we had to move onto other objects with the big scope. The Silver Coin will definitely be a staple of fall star parties for many years to come, though!

My final thought was "Thanks very much for choosing this amazing galaxy. This is one southern object that northern observers shouldn't be missing!"



Tony Labude: Observer from Oklahoma



Several of me and my friends got to a fairly dark site October 16-17, 2009 with a list of 25 objects including NGC-253. I bagged NGC-6717 (not even on my star maps), M-33 and NGC-604 while waiting for NGC-253 to clear the trees. Unfortunately, the 75% humidity brought heavy dew. I was still able to find NGC-288 first, then just nudged the scope northwest to the galaxy. In the 8-inch at 55X and terrible transparency, the galaxy had an elongated shape with a bright knot resembling a star in the middle and about 4 foreground stars scattered across the galaxy. The 25-inch was set up but not collimated but I took a peek with a 17mm eyepiece and was able to make out some dark areas and knots of something. I finally had to give up because of the dew on the eyepiece. The next night was wetter than the first. I along with my friends were able to get an image with the FLI 8300C thru an 80mm (3-inch) refractor.

