

MONTHLY OBSERVER'S CHALLENGE

Las Vegas Astronomical Society

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NGC-3395/96 Interacting Galaxies In Leo Minor

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-3395/96 Interacting Galaxies In Leo Minor

The interacting pair of galaxies, NGC-3395/96 lie in the constellation of Leo Minor. They're also known as the group ARP-270. William Herschel discovered them on December 7, 1785 and gave them the designations H-116-1 & H-117-1. They shine at mags. 12.1 & 12.5, depending on the source.

Both galaxies are listed in the IRAS catalog as infrared sources, which indicates heavy star formation. They're approximately 85 million light-years away.

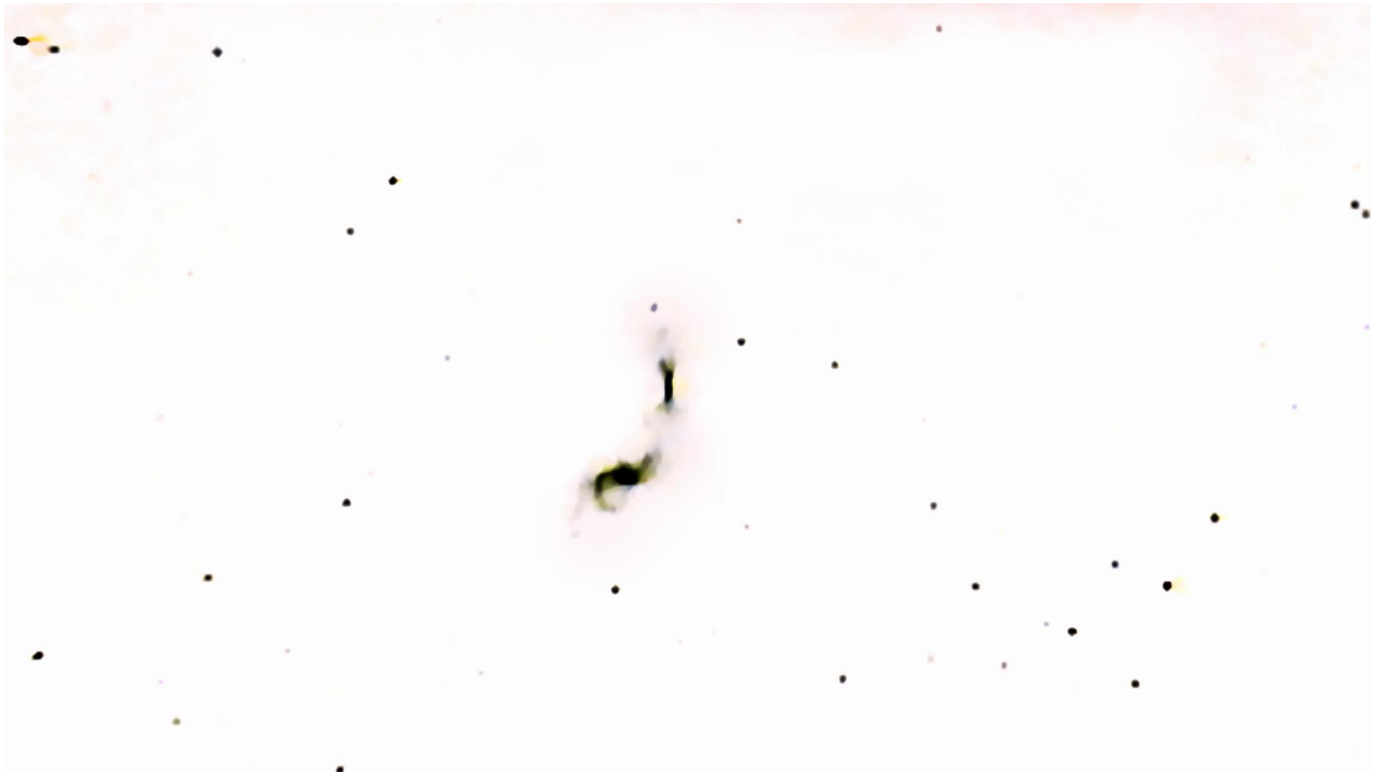
Observations/Drawings/Photos

Gary Ahlers: LVAS Member and Observer from Nevada



NGC-3395 and 3396, also designated as ARP 270, are two closely interacting galaxies in the constellation Leo Minor. Redshift calculations from Hubble data put these mag. 12.6 objects at a distance of 85 million light-years. NGC-3395 is a barred spiral galaxy with a very bright core, with two well-defined arms giving it a distinctive S shape and two attenuated or diffuse arms as well. NGC-3396 is a barred irregular galaxy with a bright core and irregular shape. There's a very evident bridge of material between the pair showing that they're in the early stages of merger into what will probably be an elliptical galaxy.

I imaged through a 10-inch SCT at F/6 using a Mallincam Xterminator II. Exposure was five average stacked frames @ 28 seconds using AGC4 gain.



Keith Caceres: LVAS Member and Observer from Nevada



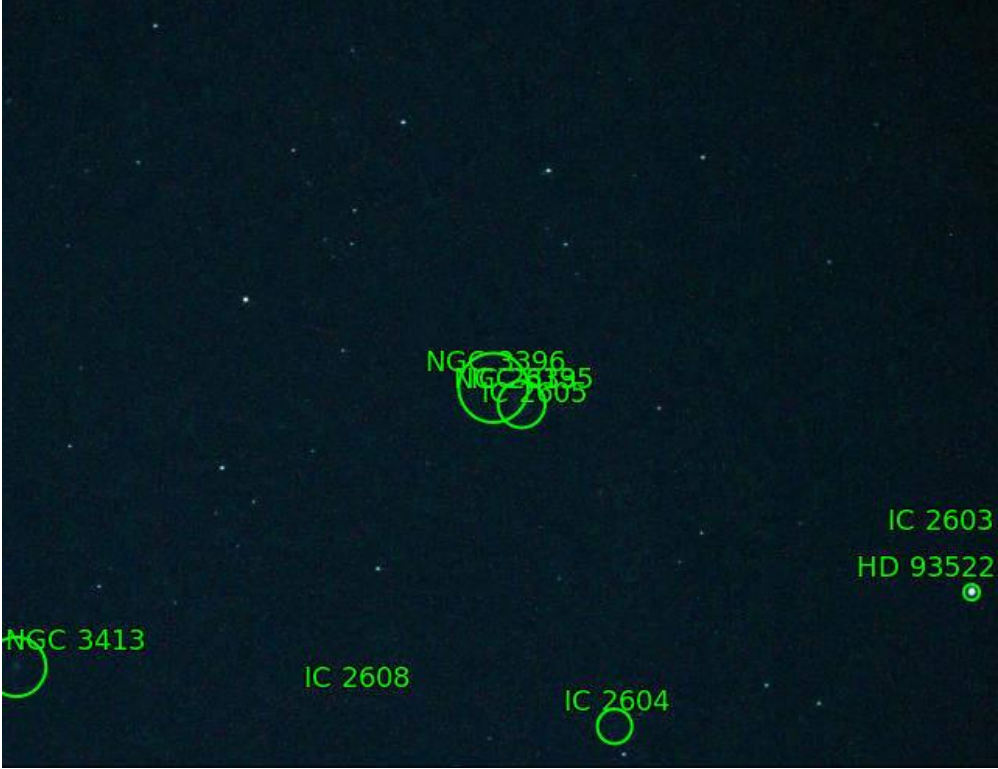
NGC-3395/3396 are a pair of interacting spiral galaxies approximately 85 million light-years away in the constellation Leo Minor. Professional astronomers believe they may be in the process of merging into an elliptical galaxy, much like the Milky Way and Andromeda galaxies are predicted to do in about five billion years.

I took this photo of the galaxy pair on April 29, 2017 at our International Astronomy Day event at Red Rock Canyon Visitor Center, during my near-real-time astrophotography presentation. I was using the following equipment: 8-inch SCT, f/6.3 focal reducer, broadband light pollution filter, Canon 70D. The photo is a cropped single 30-second exposure at ISO 3200. I also took a shorter exposure and two longer exposures, but I like this one best because the longer exposures are overwhelmed with noise artifacts.



Unfortunately, due to the wide field that the f/6.3 focal reducer gives, we can't see a lot of details in these two distant galaxies. However, we can make out that they're vaguely spiral (especially for NGC-3395, on the right) and that they're very close together.

Also included below is a version of the exposure annotated by astrometry.net. Their plate solving indicates a field of view of 40.3 x 31.1 arc-minutes with a scale of 1 arc-sec/pixel.



NGC 3396
NGC 25395
IC 2605

IC 2603
HD 93522

NGC 3413

IC 2608

IC 2604

Dr. James Dire: Observer From Hawaii



NGC-3395 and 3396 are a pair of interacting galaxies in the constellation Leo Minor. The galaxies are thought to be in the early stages of merging. They were discovered by William Herschel in 1785 using an 18.7-inch reflector.

NGC-3395, the brighter of the two, is mag. 12 and is roughly 1.6 X 0.9 arc minutes in size. Its core is south-west of NGC-3396. NGC-3395 is a Hubble type Sc spiral galaxy.

NGC-3396 is slightly dimmer and slightly larger than NGC-3395. It shines at mag. 12.4 and is 3.1 X 1.3 arc minutes in size. It's a barred spiral galaxy.

My image was taken with a 10-inch f/6.9 Newtonian with a SBIG ST-2000XCM CCD camera. The exposure was 150 minutes. West is to the right and north is up. Several smaller fainter galaxies can be seen scattered throughout the image. The brightest star in the frame, located near the left (east) edge, shines at mag. 10.3. NGC-3396 is on the left, NGC-3395 on the right.

Sometimes NGC-3395 is measured to be larger than the size I reported above. That's because the galaxy lies along the line of sight of a slightly larger and slightly dimmer background galaxy. This galaxy is PGC-4534783, a mag. 13.2 galaxy. PGC-4534783 is 2.3 X 1 arc minutes in size and the position angle is nearly identical to NGC-3395.

The bright emission nebula IC-2605 lies in the southern edge of NGC-3395. The nebula can be seen in the accompanying image near the edge of the visible galaxy. This nebula was discovered April 11, 1899 by Guillaume Bigourdan. He estimated the mag. to be 15 and size 0.4 X 0.2 arc minutes.

I viewed the pair with a 6-inch refractor under clear dark skies. The galaxies appeared as elongated glows close to one another, but the interacting portions of the galaxies were not bright enough to see.



Joseph Rothchild: Observer from Massachusetts

I observed NGC-3395-6 under dark skies with a 10-inch reflector at 81X. I saw it easily, appearing most like an asymmetric butterfly with close interaction of the galaxy pair.

Mike McCabe: Observer from Massachusetts



The Las Vegas Astronomical Society Observer's Challenge for the month of April was to observe the interacting galaxy pair of NGC-3395 and NGC-3396 in Leo Minor. This would be no small-scope challenge. At mags. 12.1 and 12.5 respectively, I'd need all the light-gathering horsepower that my arsenal of weapons could deliver. Of course, a dark and transparent sky wouldn't hurt matters, but that's all relevant because I don't live in New Mexico and I'd almost certainly be making the observation from my driveway in southeastern Massachusetts. It is what it is – we make do.

All told, I observed this handsome pair on three occasions in the past month. The first, and best, was back on March 20th, and the subsequent observations were made on March 23 and April 14, 2017.

The galaxies were easily located just a wee bit to the southwest of Praecipua, one of the stars that makes up the Leo Minor asterism, and no I can't pronounce it. Also known as 46LMi, it shines at mag. 3.8 and makes getting the finder scope in range quite easy. The view in the finder scope was then easily matched to a chart that I produced in Stellarium, and just like that, the galaxies were in the eyepiece.

The view on the first night was surprisingly good. Through my 12.5-inch scope, I was impressed with the visibility of these virtual twins in the eyepiece and how easily I was able to discern their orientation to each other. I spent all my time at 102X while drafting a pencil sketch of the field, and I didn't bother to push up the magnification to see what would be revealed. It would be a decision I would come to regret.

That first night had its issues with clouds coming and going, and I figured I'd get another chance to observe this pair and perhaps under even better conditions. That wouldn't be the case.

Even though I did get to go back to see them twice more, in both of those instances, the transparency was worse than on the first occasion and I only got poorer views, not better. The conditions during the subsequent observations didn't support increasing the magnification, so I didn't observe no brighter cores, which I've heard can be seen under good conditions.



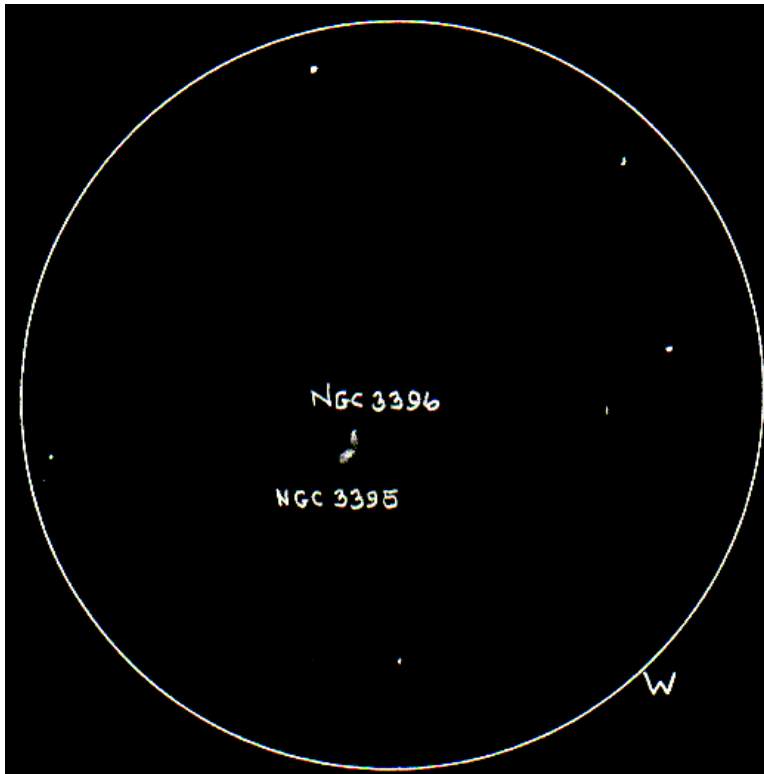
Glenn Chaple: Observer from Massachusetts



“I observed and sketched these interacting galaxies with a 13.1-inch f/4.5 Dobsonian reflector and 9mm eyepiece (166X, 0.5° field). The galaxies were relatively easy to find by star-hopping from a trio of stars that included 46 LMi and 46 UMa to a wide double star 1° south and slightly west, then shifting one-half. I had previously viewed these galaxies with fellow ATMoB members Steve Clougherty and Rich Nugent, using Steve’s 18-inch Dob. They were barely perceptible, but skies were rapidly hazing up. These galaxies definitely need clear skies!”

You’ll like this. On the same night that we viewed NGC-3395/6, Steve and Rich also turned the 18-inch on your (Roger’s) Virgo Diamond. I’m not sure which of them had the finder chart, but they did this on their own - no prodding from me!

Editor’s note: This was out Spring 2009 Supplemental Challenge object.



Jay Thompson: LVAS member and observer from Nevada



I observed the galaxy pair from the dark skies of Meadview, AZ with a 17-inch reflector in 2014 while working through the BE list of deep-sky objects (search on belist.txt). At 125X, NGC-3395 was evident with fainter NGC-3396 close by.

In January, 2017, I viewed the pair again while again viewing the BE list, this time with a 24-inch f/4. Since I was not aware of the substitution of this pair for the previously listed NGC-3245, I didn't spend much time on them (as I recall, the pair were nearly overhead and I was getting tired of climbing up and down the ladder). My goal that night was to essentially complete viewing the BE list with the 24-inch. At 116X, the pair appeared close together with NGC-3395 brighter than NGC-3396. Then on to the next object!

In total, I saw 262 deep-sky objects that night which brought my total of BE list objects viewed with the 24-inch to 831 out of 867 possible from my latitude.

Addendum from last-minute observations on April 25, 2017

I observed NGC-3395 from my backyard in Henderson, NV with a 16-inch SCT. NGC-3395 was overhead just west of the meridian. It was visible at 102X as a faint smudge against the background sky glow. At 156X, it stood out a little better.

In a 20mm eyepiece, giving 203X, NGC-3395 was visible as a fuzzy glow around a fairly bright nucleus. Following NGC-3395, just outside its halo, was the nucleus of NGC-3396. Both galaxies were visible with direct vision. With a 15mm eyepiece (271X), both galaxies were still visible with direct vision. With averted vision, there was a definite halo around the nucleus of NGC-3395 and a fuzzy glow around the nucleus of NGC-3396. NGC-3396 appeared dimmer and smaller than NGC-3395. The connection of the halos was not evident. In the 10mm

eyepiece (406x), the two cores of the galaxies were separated but just barely visible with direct vision. With averted vision, the halos were less evident than at lower power. The best view was through the 20mm eyepiece, followed closely by the 15mm eyepiece.

In summary, this interacting galaxy pair showed up unexpectedly well from my moderately light-polluted location at the edge of the Las Vegas Valley. The quality of the view was dependent on the magnification used.

Sue French: Observer from New York



In my 130mm refractor at 48X, NGC-3430 shares the field with the colliding galaxies NGC-3395 and NGC-3396. Their combined glow appears a little smaller and fainter than the lone galaxy. At 117X, these entangled galaxies each harbor a brighter center, with NGC-3395 boasting the more obvious one. NGC-3396 is elongated approximately east-west, with NGC-3395 south of its western end, where their halos blend together. Seen through my 10-inch scope at 166X, NGC-3396 hosts an elongated core with a star-like nucleus.

NGC-3395 and NGC-3396 have undergone at least one close encounter in the past and are now thought to be in the early stages of a merger, a show we are watching from a distance of 85 million light-years.

Mario Motta: Observer from Massachusetts



See attached image of about 1 hour with my 32-inch f/6 telescope.

6 exposures, 10 minute each stacked~one hour.



Roger Ivester: LVAS Observer from North Carolina



I observed NGC-3395/96 on March 18, 2017 from my moderately light-polluted backyard with a 10-inch reflector using a 16mm EP and a 1.9X Barlow for a magnification of 135X.

The pair were almost connected. Both galaxies were elongated, with brighter middles with NGC-3396 having a distinctive stellar nucleus when using averted vision, but I could intermittently see it directly. I could glimpse the galaxies using a low magnification of 57X, but the best views came at 200X, and 135X, respectively, which would indicate that both galaxies are fairly well concentrated. Joseph Rothchild from Massachusetts, using a 10-inch reflector, provided an excellent description of this beautiful interacting pair: “Easily seen, appearing most like an asymmetric butterfly....”

Another galaxy, NGC-3340, only $1/2^\circ$ to the east of the NGC-3395-96 pair, had low surface brightness. Elongated NE-SW, it had an oval shape and a very subtle brightening or greater concentration in the central region. Despite the low surface brightness, I found that a higher magnification of 191X worked best.

NGC 3395-6
GALAXIES IN LEO MINOR

MARCH 18, 2017

TELESCOPE: 10-INCH SELECTOR
EYEPIECE: 16mm + 1.9X BARLOW
MAGNIFICATION: 135X

95 - DIM WITH BRIGHT
ALMOST STELLAR NUCLEUS
ELONGATED. THE GALAXIES
95-96 APPEAR SOMEWHAT
SIMILAR. ALMOST IN CONTACT.

96 - FAINT, ELONGATED WITH
BRIGHT STELLAR NUCLEUS.



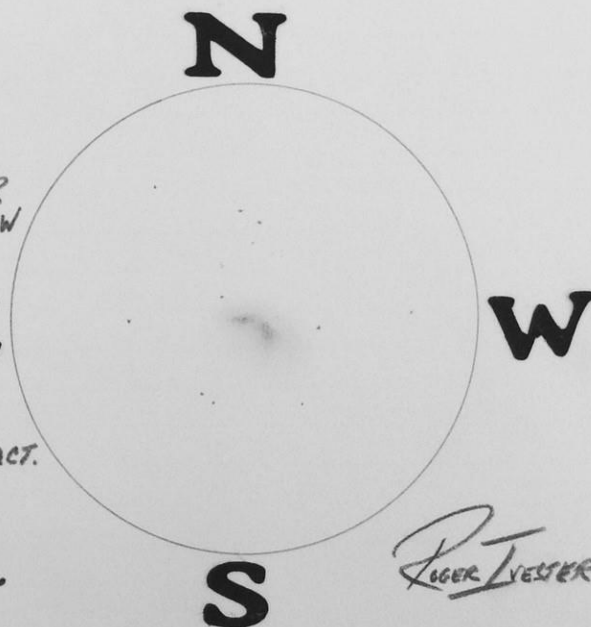
NGC 3395-6
GALAXIES IN LEO MINOR

MARCH 18, 2017

TELESCOPE: 10-INCH SELECTOR
EYEPIECE: 16mm + 1.9X BARLOW
MAGNIFICATION: 135X

95 - DIM WITH BRIGHT
ALMOST STELLAR NUCLEUS
ELONGATED. THE GALAXIES
95-96 APPEAR SOMEWHAT
SIMILAR. ALMOST IN CONTACT.

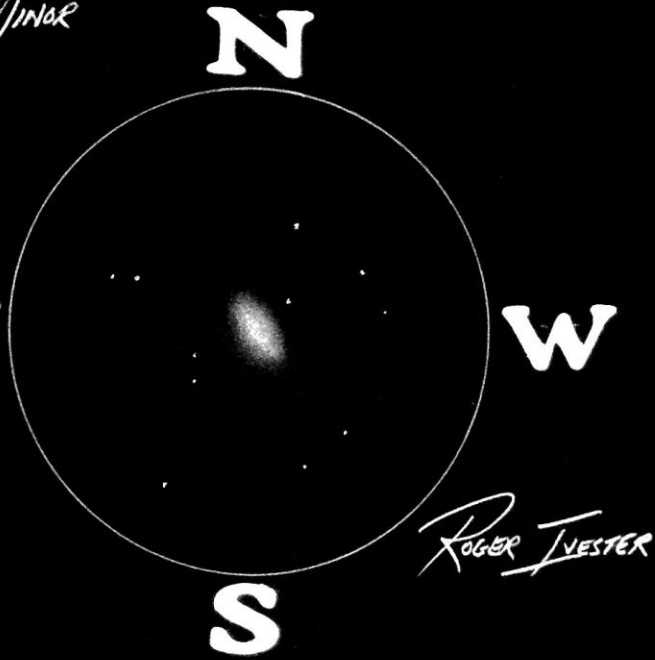
96 - FAINT, ELONGATED WITH
BRIGHT STELLAR NUCLEUS.



NGC 3430 - GALAXY IN LEO MINOR
DATE: MARCH 18, 2017

TELESCOPE: 10-INCH REFLECTOR
MAGNIFICATION: 191X

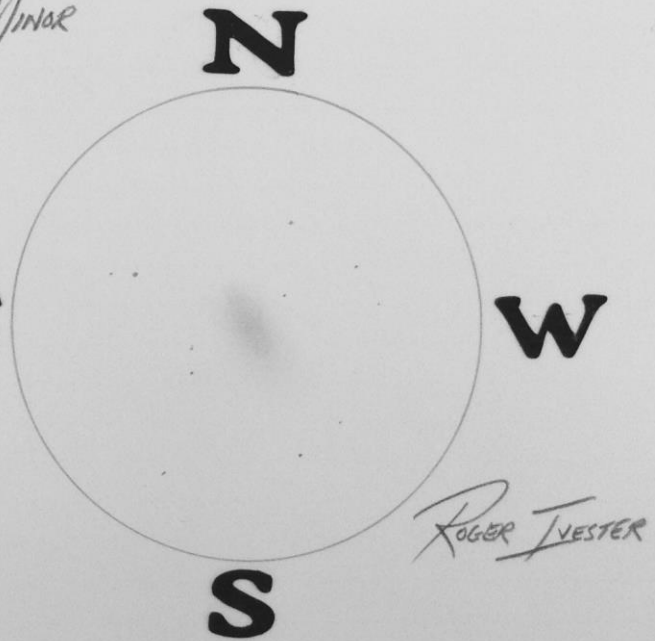
ELONGATED NE-SW OVAL.
LOW SURFACE BRIGHTNESS.
GREATER CONCENTRATION
IN THE CENTRAL REGION,
BUT VERY SUBTLE.



NGC 3430 - GALAXY IN LEO MINOR
DATE: MARCH 18, 2017

TELESCOPE: 10-INCH REFLECTOR
MAGNIFICATION: 191X

ELONGATED NE-SW OVAL.
LOW SURFACE BRIGHTNESS.
GREATER CONCENTRATION
IN THE CENTRAL REGION.



Fred Rayworth: LVAS AL Coordinator and Observer from Nevada



I've seen this pair before, but I wanted a fresh observation. Luckily, I was able to go out on April 29, 2017, cutting it pretty close to the wire. As it turned out, despite a sliver of moon and a day full of high winds, to use an old cliché, the stars came together and everything worked out. The winds cleaned the junk out of the air making for transparent skies and though the moon was at first, an annoying beacon in the western sky, it was buried in the skyglow of Las Vegas and was never really an issue all evening. Not only that, with the lack of dust to scatter light, it never affected anything as far as dimming the background.

Though there were the occasional annoying gusts here and there, the night was clear and cool but rather pleasant. Outside of ruffled pages with my log book, it didn't even bob my scope around or make my eyes water. The seeing wasn't bad either and the stars didn't excessively twinkle. I'd previously viewed Jupiter and the bands and moons were relatively sharp.

The thing about viewing NGC-3395 and 96 is that if you have enough aperture and a wide-field eyepiece, there's so much more to see. In the past, I've spotted five galaxies with relative ease. This night, I was finally able to grab that elusive sixth companion, the very faint mag. 14.7 IC-2604. There's also a much fainter IC-2608 at mag. 15.6 but that one is extremely tough and I've yet to even get a hint of it in the eyepiece. Also, right next to 3395 & 96 is the marked but unknown IC-2605 which is listed as probably a mistake in the IC catalog or an anomaly (turns out it's a real nebula as Jim Dire mentions in his writeup above. It's also possible to spot it in a scope my size). Since it's right next to a well-imaged pair, with nothing to show for it, it has to be a mistake and is probably just wrong coordinates (wrong again!).

Using my 82 degree EP at 102X, I was able to squeeze NGC-3395, NGC-3396, IC-2604, NGC-3430, NGC-3424 & 3413 into the same field. Groups like this are not uncommon in this galaxy-rich region of the sky.

NGC-3395 and 96 were a touching pair, 95 distorted and twisted, while 96 seemed to be touching it. They looked connected. Both had dense cores. 96 was more oval shaped. They appeared almost as one blob but upon careful examination with averted vision, I could tell they were two distinct bodies, but just barely.

NGC-3430 was a small and soft, faint oval just off from two medium-bright stars, one mag. 7+ and the other mag. 8+. NGC-3424 followed it in a line south and was a flattened oval with a slightly stellar core. NGC-3413 was another one in line even further south and was a tiny distinct oval with a concentrated core. Finally, IC-2604 was an extremely faint smudge next to a dim mag. 12.3 star. Barely visible.

