

The High Desert Observer

July 2018



The Astronomical Society of Las Cruces (ASLC) is dedicated to expanding public awareness and understanding of the wonders of the universe. ASLC holds frequent observing sessions and star parties and provides opportunities to work on Society and public educational projects. Members receive the *High Desert Observer*, our monthly newsletter, plus membership to the Astronomical League, including their quarterly publication, *Reflector*, in digital or paper format.

Individual Dues are \$30.00 per year
Family Dues are \$36.00 per year
Student (full-time) Dues are \$24.00

Annual dues are payable in January. Prorated dues are available for new members. Dues are payable to ASLC with an application form or note to: Treasurer ASLC, PO Box 921, Las Cruces, NM 88004. Contact our Treasurer, Patricia Conley (treasurer@aslc-nm.org) for further information.

ASLC members receive electronic delivery of the HDO and are entitled to a \$5.00 (per year) Sky and Telescope magazine discount.



Table of Contents

- 2 *What's Up ASLC*, by Howard Brewington
- 3 *Outreach Events*, by Jerry McMahan
- 4 *Calendar of Events, Announcements*, by Charles Turner
- 7 *June Meeting Minutes*, by John McCullough
- 8 NASA Space Place Partner Article
- 10 *Object of the Month: Kent DeGross*
- 11 *Photos of the Month: E. Montes, A. Woronow, C. Sterling, RDee Sherrill*

ASLC Board of Directors, 2018

Board@aslc-nm.org

President: Howard Brewington; President@aslc-nm.org

Vice President: Rich Richins; VP@aslc-nm.org

Treasurer: Patricia Conley; Treasurer@aslc-nm.org

Secretary: John McCullough; Secretary@aslc-nm.org

Director-at-Large: Steve Barkes; Director1@aslc-nm.org

Director-at-Large: Ed Montes Director2@aslc-nm.org

Past President: Chuck Sterling; csterlin@zianet.com

Committee Chairs

ALCor: Patricia Conley; tconley00@hotmail.com

Apparel: Howard Brewington; comet_brewington@msn.com

Calendar: Chuck Sterling; csterlin@zianet.com

Education: Rich Richins; Education@aslc-nm.org

Grants: Sidney Webb; sidwebb@gmail.com

Loaner Telescope: Sidney Webb; sidwebb@gmail.com

Membership: Open

Observatories:

Leasburg Dam: David Doctor; astrodoc71@gmail.com

Tombaugh: Steve Shaffer; sshaffer@zianet.com

Outreach: Chuck Sterling; csterlin@zianet.com

Web-Site: Steve Barkes; steve.barkes@gmail.com

HDO Editor: Charles Turner; turner@milkywayimages.com

Masthead Image: February 10, 2017 From Las Cruces, Moon rising over the Organ Mts in Penumbral Eclipse.

July Meeting --

Our next meeting will be on **Friday, July 27**, at the Good Samaritan Society, Creative Arts Room at 7:00 p.m.

Howard Brewington will present "Let there be light: Man's quest for global illumination"

Member Info Changes

All members need to keep the Society informed of changes to their basic information, such as name, address, phone number, or email address. Please contact Treasurer@aslc-nm.org with any updates.

Events

ASLC hosts deep-sky viewing and imaging at our dark sky location in Upham. We also have public in-town observing sessions at both the International Delights Cafe (1245 El Paseo) and at Tombaugh Observatory (on the NMSU Campus). All sessions begin at dusk.

At our Leasburg Dam State Park Observatory, we hold monthly star parties. Located just 20 miles north of Las Cruces, our 16" Meade telescope is used to observe under rather dark skies. Please see *Calendar of Events* for specific dates and times.

What's Up ASLC?

July 2018

Anatomically modern humans arose from Africa about 200,000 years ago. From the very beginning, our ancestors feared the dark because they were easy prey for large nocturnal predators. To survive until morning twilight, early humans hunkered down in caves and built fires for protection. For more than 99.9% of man's existence, fire was the only anthropogenic light source on the planet, but humans eventually invented better ways to illuminate their nightlife. This new technology came with a multitude of unforeseen consequences, which included the brightening of Earth's night sky. With human population also factored in, the outcome proved disastrous.



Some sparse use of fire dates back to the time of Homo erectus, but early Homo sapiens did not enjoy widespread use and control of fire until about 125,000 BC. During this time, mankind's population is estimated to have been 200,000 to 300,000 individuals. By 70,000 BC, rudimentary oil lamps augmented man's ability to see in the dark, but human population crashed to an estimation of no more than 10,000 perhaps because of the Toba catastrophe. In 3000 BC, Egyptians lit their nights with beeswax candles, and Earth's population had recovered to about 14 million by then. Although no other lighting innovations were realized until the 18th century, the year of 1792 issued gas lamps to some of Earth's 900 million residents. Then, in the 1800s, fire was finally succeeded by florescent, arc, and incandescent lamps. The planet's population of 1.3 billion was now well equipped to defeat their innate fear of the dark.

The 20th century saw human population increase to 6 billion, and lighting such as mercury-vapor, metal-halide, sodium-vapor, neon, and LEDs was added to man's arsenal. Cost efficient LED technology was initially thought the savior of Earth's night skies; but ironically, those savings have only served to finance the installation of even more outdoor lighting. Data gathered from the Soumi National Partnership satellite, in fact, showed that nighttime Earth brightened by 9.1% during the years of 2012 to 2016. Most of this illumination occurred in developing countries such as Asia, Africa, and South America. But, the LED backlash did not end there. Some light-emitting diodes produce a spectrum that contains blue light. Those light waves, shorter than 500 nanometers, are scattered in Earth's atmosphere, which increase the size of a city's light dome.

For nearly all of man's 200,000-year existence, fire was the only anthropogenic light source on the planet. By the 19th century, however, darkness was ultimately defeated by human innovation. This new technology, unfortunately, brought with it many unanticipated consequences including the brightening of our planet's night sky. Public concern and intervention have been minimal, so nighttime Earth now brightens at an alarming rate. By the end of this century, as light pollution continues its inevitable climb and human population grows to the predicted 11.2 billion, I imagine the Milky Way will no longer be visible from most locations on Earth. A tragic outcome inadvertently caused by a species' fear of the dark.

You can learn more about light pollution at ASLC's next meeting on Friday 27 July. I hope to see you there!

Howard J. Brewington
ASLC President
July 2018

* * *

Outreach

Outreach is a very important part of ASLC. We are always looking for more volunteers to help us educate the public. Even if you do not have a portable telescope to bring to the events, please consider attending our public outreach programs to help answer questions, share knowledge and point out objects in the sky.

Outreach Events

June 2018 Report

by Jerry McMahan

Leasburg, Saturday, June 9

It was cloudy again. Chuck Sterling and his wife, Maria Elena, came, not intending to stay long due the the sky conditions. Chuck had to open the observatory anyway. There were a number of Astronomy students, from New Mexico State University, who had an assignment, for a grade, to come to the observing session. There was no observing, but they did show up and needed evidence, to show to their teacher, that they did attend. Some of them took selfies of them selves next to the 16 inch telescope. Others asked for Chuck, or myself, to sign a note indicating their presence.

Dave Doctor came to operate the observatory. For a while there a few blue sky spots in the East. There were just enough to give hope that the sky might clear. No such luck.

Moongaze, Saturday, June 23

We had two locations going again. Chuck Sterling, Mike Kopezewski and I set up at the International Delights. Chuck brought his 10 inch. I had the usual ETX 125. Mike had 15X70 binoculars. Dal and Nancy Jones came in from El Paso again. They brought their grandson to look though the scopes.

The seeing was good for the Moon and Jupiter, but a little breeze caused the image to jump around a little. We did not have a lot of viewers show up this time.

Steve Wood and Howard Brewington were at Pan Am Plaza with another successful event. Traffic from the parking lot noticed the scopes set up and stopped to view.

Leasburg Special Event, Saturday, June 30

Fifty Cub Scouts and other park visitors made for a very busy evening. The event was arranged for the scouts. It was a clear night this time.

Dave Doctor ran the observatory. Steve Wood had his 8 inch and I set up the donated C11, at which I explained Jupiter and the three visible large moons. Io was behind Jupiter at the time.

Rich Richins set up a six inch Dobsonian and showed the kids how to aim the scope at Jupiter. He did a great job organizing the kids, and is not well qualified to herd cats.

Chuck Sterling operated his 10 inch scope on the Orion mount. Howard Brewington was at his 8 inch Dobsonian.

Leasburg, Saturday, July 7

Chuck Sterling and I were there, but light rain and clouds meant another cancellation of observing.

* * *

Calendar of Events (Mountain Time - 24 hr. clock)

July	01	20:18	Sun Sets
	01	15:49	Jupiter Rises
	01	19:48	Saturn Rises
	06	01:51	Last Quarter Moon
	07	20:15	OUTREACH; Dark Sky Observing at Leesburg Dam State Park
	12	20:48	New Moon
	19	13:52	First Quarter Moon
	21	20:00	OUTREACH; MoonGaze, International Delights Café
	21	20:00	OUTREACH; MoonGaze, Pan Am Plaza on University Ave.
	26	20:16	Mars Opposition
	27	14:20	Full Moon
	27	19:00	ASLC Monthly Meeting; Good Samaritan Society, Creative Arts Room
Aug	01	20:05	Sun Sets
	01	13:50	Jupiter Rises
	01	17:38	Saturn Rises
	01	19:59	Mars Rises
	04	12:18	Last Quarter Moon
	04	19:30	OUTREACH; Dark Sky Observing at Leesburg Dam State Park
	09	15:00	Jupiter Double Shadow Transit, Europa + Io, Alt 18°
	11	03:58	New Moon
	16	17:00	Jupiter Double Shadow Transit, Europa + Io, Alt 38°
	18	01:49	First Quarter Moon
	18	20:00	OUTREACH; MoonGaze, International Delights Café
	18	20:00	OUTREACH; MoonGaze, Pan Am Plaza on University Ave
	16	19:30	Jupiter Double Shadow Transit, Europa + Io, Alt 40°
	24	19:00	ASLC Monthly Meeting; Good Samaritan Society, Creative Arts Room
	26	05:55	Full Moon
	30	21:30	Jupiter Double Shadow Transit, Europa + Io, Alt 15°

Note: For those using The Observer's Handbook 2018, or some other printed source, you may have noticed that they list more events than we have shown. We have only listed events, like eclipses and Jupiter shadow transits that are visible from Las Cruces, even if they occur during the day. Be sure to visit our web site for ASLC information: www.aslc-nm.org

* * *

Announcements

1. The program for the July meeting will be a presentation by Howard Brewington "Let there be light: Man's quest for global illumination" The topic of the presentation is light pollution, and Howard will talk about causes and solutions.
2. An ASLC member, Tony Levatino, has a 10x10-ft roll-roof observatory for sale for \$3500. For more info, pictures, etc. contact Tony. He can be reached at tonylev@gmail.com
3. The agreement to use the facilities at Good Sam for our meeting prohibits members from bringing in ANY food or beverages, except water in a container with a screw lid. Take note: no more Starbucks or Saturn Cookies!

4. The field trip to Safford, AZ to see the Pope's Telescope and the Large Binocular Telescope has been set for September 22nd. Unless the mountain catches on fire again or some other calamity occurs, Mike Nuss will be presenting information and details of the trip in the near future.

The Large Binocular Telescope Observatory is a marvel of design and engineering. For more information, check out their web site: <http://www.lbto.org> . It's capabilities are unique in the world of professional telescopes. It has two identical 8.4 meter telescopes with an interferometric baseline of 22.8 meters and an effective aperture of 11.8 meters. It also has a modern, advanced, and effective Adaptive Optics System.



The Large Binocular Telescope Observatory: Located on Mt Graham near Safford, AZ it is home to twin 8.4 meter telescopes.

5. Announcement!! Moongaze at Jerry McMahan's house. The image below shows Jerry and Chuck Sterling toasting First Light at Jerry's new observatory. Jerry is the one standing. Since Chuck is not in the image, we don't know if he is still vertical. It sure looks like a good time will be had by all in the future.



6. ASLC member, John Gilkison, has just published a new science fiction book called, "Tikopia IV."

From the back page of the book - A quarter million humans migrate from a dying Earth to a new planet Tikopia IV orbiting the star Tau Ceti. Their journey to Tikopia IV is aboard a giant rotating Torus Ark named Tikopia III. The namesake for their Ark and the new planet is an island in the Pacific Ocean of Earth called Tikopia which had once been inhabited sustainably for over three thousand years.

Our cautionary tale begins with our heroine, a journalist, Ida Tarbell. Her character is based on the journalist famous for taking down Standard Oil in 1905 CE. Ida interviews various experts aboard Torus Ark about what happened on the Earth to cause the biosphere to collapse leading to human extinction. Her work ultimately takes her to the surface of the new planet, Tikopia IV, as humans endeavor to explore and settle their new world.

Tikopia IV was published on July 2nd, 2018 and is now available on Amazon for \$12.99 for a paperback copy, and it is \$7.99 for a Kindle copy. Just search Amazon for Tikopia IV or John Gilkison.

* * *

Presentation:

This month's presentation was by member Christopher Brownell on "Equatorial Mounts – History, Design, and Utilization". Chris began by describing the evolution of mounts and drives that culminated in the "German Equatorial Mount" or GEM. He then described several refinements and applications that various manufacturers have offered the modern observing public. Since Chris owned a commercial telescope business for several years, he had "hands-on" experience with the telescope/mount combinations he presented. An extended question-answer period followed his presentation.

The June meeting of the Astronomical Society of Las Cruces concluded at 8:35 pm. A social time followed at Pecan Grill.

-Respectfully submitted by John McCullough, ASLC Secretary

* * *

NASA Space Place Partner Article

July 2018

This article is distributed by NASA Space Place. With articles, activities and games NASA Space Place encourages everyone to get excited about science and technology. Visit spaceplace.nasa.gov to explore space and Earth science!



A Close-Up View of Mars

By Jane Houston Jones and Jessica Stoller-Conrad

In July 2018, skywatchers can get an up close view of Mars—even without a telescope! In fact, on July 31, Mars will be closer to Earth than it has been in 15 years.

Why is that?

Like all the planets in our solar system, Earth and Mars orbit the Sun. Earth is closer to the Sun, and therefore it races along its orbit more quickly. Earth makes two trips around the Sun in about the same amount of time that Mars takes to make one trip.

Sometimes the two planets are on opposite sides of the Sun and are very far apart. Other times, Earth catches up with its neighbor and passes relatively close to it. This is called Mars's closest approach to Earth, and it's happening this year on July 31. The Moon will be near Mars on that night, too!

Keep in mind that even during its closest approach, Mars is still more than 35 million miles away from Earth. That's really far. So, Mars won't appear as big as the Moon in the sky, but it will appear bigger than it usually does.

July and August will be a great time to check out Mars. Through a telescope, you should normally be able to make out some of the light and dark features of the Red Planet—and sometimes even polar ice. However, a huge Martian dust storm is obscuring these features right now, so less planetary detail is visible.

There is another important Mars date in July: Mars opposition. Mars opposition is when Mars, Earth and the Sun all line up, with Earth directly in the middle. This event is happening on July 27 this year.

Although you may see news focusing on one of these two dates, Mars will be visible for many months. For about three weeks before and three weeks after opposition and closest approach, the planet will appear the same size to a skywatcher.

From July 7 through September 7 Mars will be the third brightest object in the sky (after the Moon and Venus), shining even brighter than Jupiter. The best time to view Mars during this time is several hours after sunset, when Mars will appear higher in the sky.

Mars will still be visible after July and August, but each month it will shrink in size as it travels farther from Earth in its orbit around the Sun.

In other sky news, there will be a partial solar eclipse on July 13, but it will only be visible from Northern Antarctica and southern Australia. On July 27 (beginning at 20:21 UTC), a total lunar eclipse will be visible in Australia, Asia, Africa, Europe and South America. For those viewers, Mars will be right next to the eclipsing Moon!

If you're wanting to look ahead to next month, prepare for August's summer Perseid meteor shower. It's not too early to plan a dark sky getaway for the most popular meteor shower of the year!

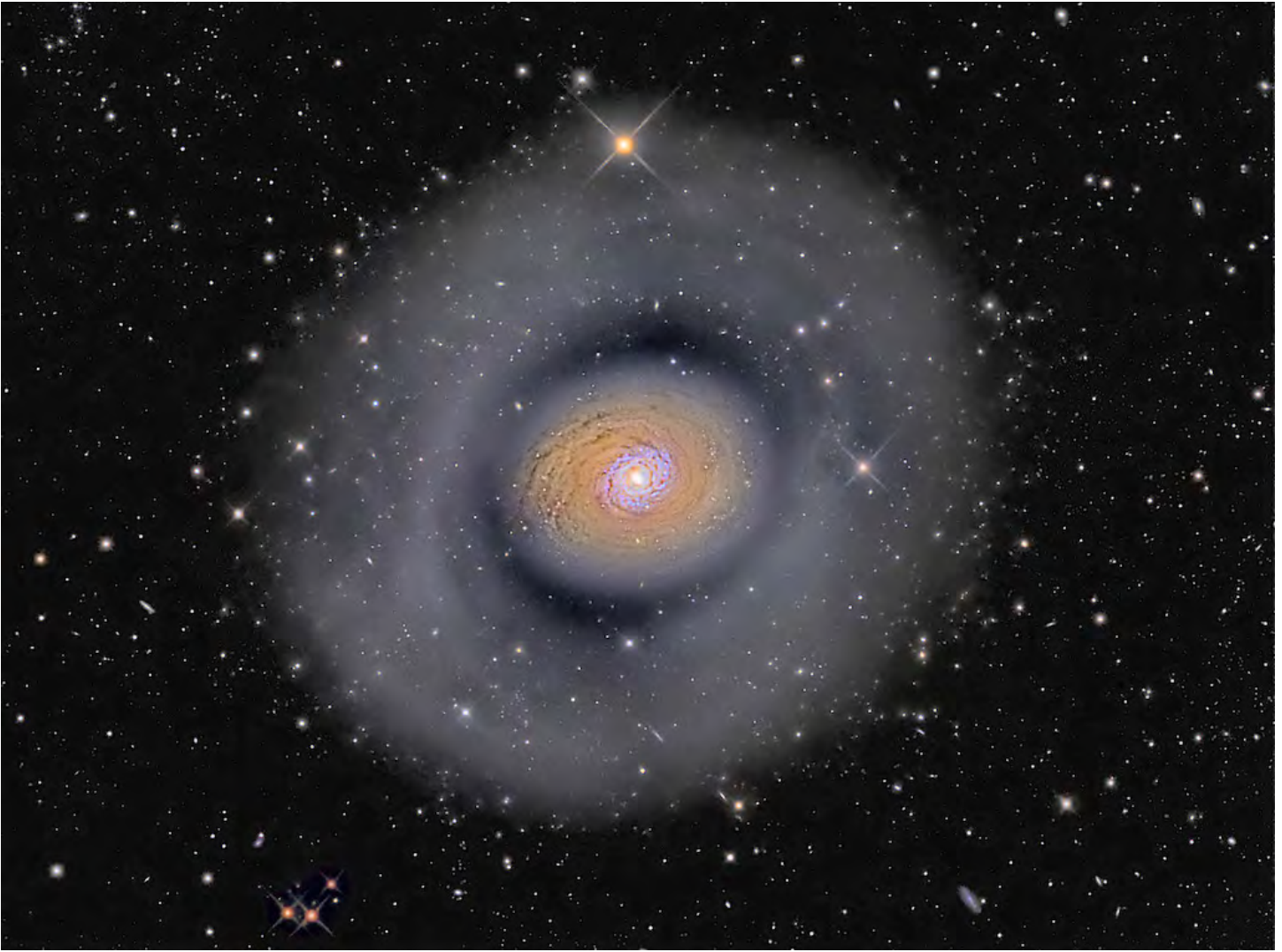
You can catch up on NASA's missions to Mars and all of NASA's missions at www.nasa.gov



Caption: In 2018, Mars will appear brightest from July 27 to July 30. Its closest approach to Earth is July 31. That is the point in Mars' orbit when it comes closest to Earth. Mars will be at a distance of 35.8 million miles (57.6 million kilometers). Credit: NASA/JPL-Caltech

* * *

Object of the Month



OBJECT M 94, NGC 4736 - Cat's Eye Galaxy

This is a class SA spiral galaxy in Canes Venatici. Unlike most SA galaxies, it is peculiar in appearance with two ring structures. The arms of the inner ring are well-defined while in the faint outer ring they are barely discernible. The inner ring is about 10 times brighter in optical wavelengths as measured on the raw images. There are numerous star-formation areas in both rings, with a complex spiral structure apparent in the outer ring on IR/UV images.

The outer ring contains about 23% of the stellar mass of the galaxy and contributes 10% to the total formation of new stars. The morphology of the two rings and, reportedly, little associated dark matter make this an unusual galaxy that does not fit into current galaxy models. A 2009 study concluded that the inner disk has an oval distortion that led to the creation of the outer disk but more study is needed to resolve discrepancies with the models.

M 94 lies in the M 94 Group of galaxies, a subset of the the Virgo Supercluster. Distance to the galaxy is about 16 million light years. The galaxy is about 30,000 light years across.

This image was taken in April 2018 at Whiskey Creek Observatory, Arenas Valley, NM.

Imaging details: 32x300s 1x1L + 21x90s 2x2 RGB; 4.24 hrs total integration time.

Instrumentation: 457mm(18in) F/4.2 Newtonian, SBIG ST-8300M, Baader filters, MPCC, OAG, Lodestar guider, AP 1200 GTO mount.

Acquisition: Sequence Generator Pro, PHD2 guiding Processing: PixInsight, GIMP.

Information sources: Mostly Wikipedia, Astrophysical Journal

Kent DeGross was a member of the Silver City Astronomy Club and an active imager from his observatory near Silver City. More info and images can be found at: www.flickr.com/photos/whiskey_creek_observatory

Editor Note: I really like this image because it reveals different information about the object than most of the other images of M94. For comparison, go to the wikipedia article on Messier 94 or just do an internet search for images of Messier 94.

The point that I want to make is that how an image is processed makes a world of difference. Most of the other images of M94 obscure the structure of the outer ring, perhaps in an effort to emphasize the spiral structure. Much of the outer ring is “processed out” like noise, and we get a very different galaxy.

Photo of the Month



Southern Milky Way from Africa, by Ed Montes

The Southern Cross is in the bottom center (on its side) with the Coal Sack quite prominent. Above it, close to the center of the shot is the duo of Alpha and Beta Centauri (Beta is over 100 times farther away, therefore more than 10,000 times brighter). Jupiter makes an appearance in the upper right corner.

-- Ed Montes

Photo of the Month



OBJECT: Markarian Chain (including M 84 & M 86 and M 87 visible too)

OTA: RH-305 (12" f/3.5)

Camera: SBIG STX-16803

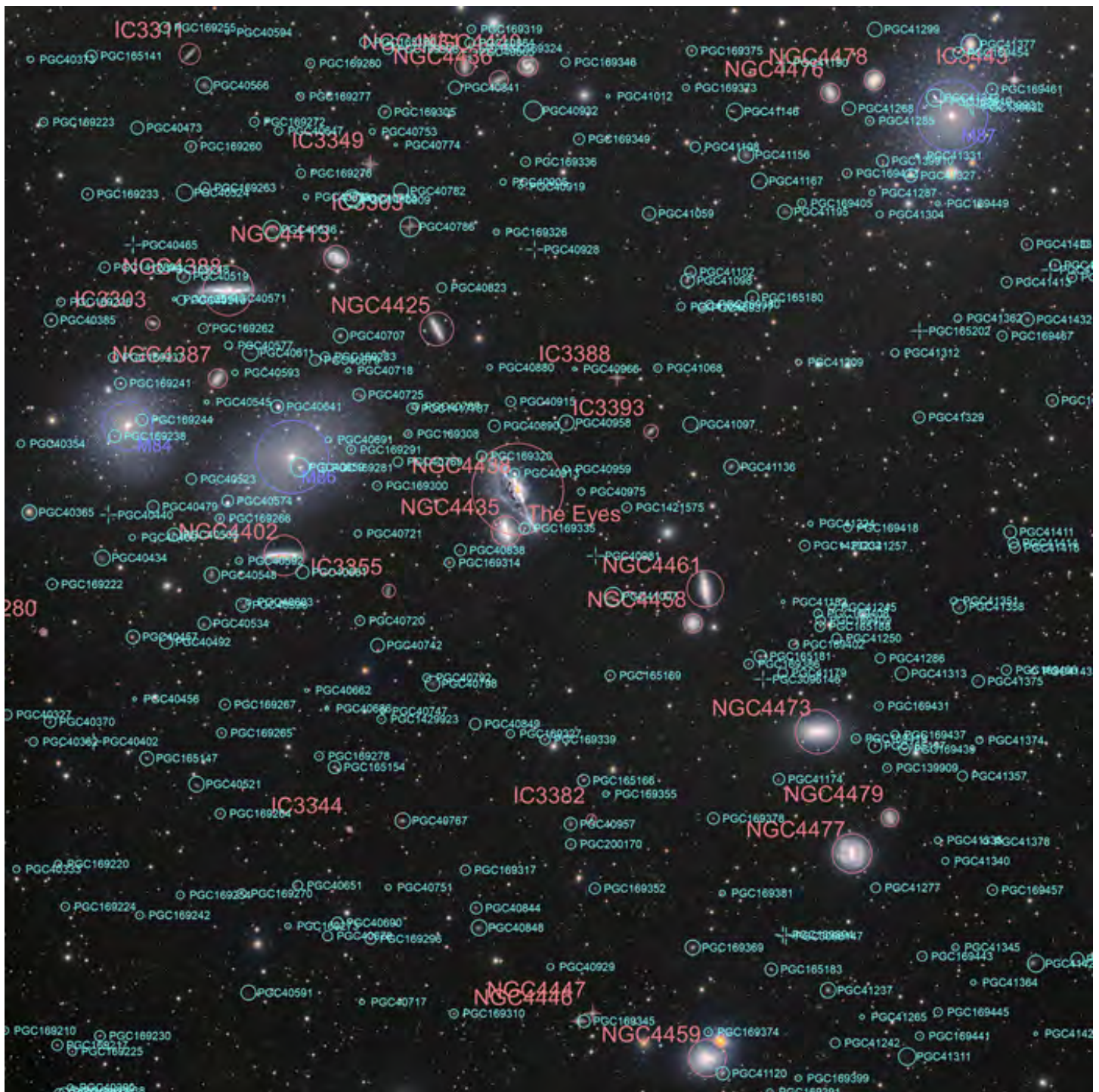
EXPOSURES: Red: 21 x 600 seconds Blue: 16 x 600 Green: 14 x 600 Lum.: 16 x 600

Total exposure ~11 hours Image Width: ~2 deg

Observatory: Deep Sky West Processed by Alex Woronow using PixInsight in 2018

The Markarian Chain is a fortuitous arrangement of several members of the Virgo Galaxy Cluster. The Chain is named after Benjamin Markarian, an American astrophysicist who first identified the common motion of the Chain's members.

M 84 inhabits the densely populated central region of the Virgo Cluster. It has a very low rate of star formation.



M 86 is an elliptical galaxy with streamers of ionized gas and dust reaching toward the highly distorted galaxy NGC 4438. M 84 is the most highly blue-shifted of all Messier galaxies, as it falls from the far side of the Virgo cluster toward the cluster's center and toward us.

M 87 is a supergiant elliptical galaxy in the constellation Virgo Group. One of the most massive galaxies in the local Universe, it hosts a large population of globular clusters—about 12,000 compared to the 150–200 orbiting the Milky Way.

The Virgo Cluster, is part of the Virgo Supercluster (of which our Milky Way is a member). The Virgo Cluster has a mixture of spiral and elliptical galaxies, numbering about 2000 in all. The annotated image shows the amazing density of galaxies (objects with “PGC”, “IC”, and “M” designations).

(Source: largely Wikipedia)

Photo of the Month



Moon

From my back yard 6/17, shot at 1/125 sec at ISO100, a composite of 20 subframes. Canon 60Da, 8" f/4 Newtonian.

Chuck Sterling



OBJECT NGC 4535:

From my back yard 6/17, shot at 90 sec at ISO1600, about 30 subframes. Canon 60Da 8" f/4 Newtonian.

NGC 4535 is a barred spiral galaxy located some 54 million light years from Earth in the constellation Virgo. It is a member of the Virgo Cluster of galaxies and is located 4.3 degrees from Messier 87. The galactic plane of NGC 4535 is inclined by an angle of 43 degrees to the line of sight from the Earth. The morphological classification of NGC 4535 in the De Vaucouleurs system is SAB(s)c, which indicates a bar structure across the core (SAB), no ring (s), and loosely wound spiral arms (c). The inner part of the galaxy has two spiral arms, which branch into multiple arms further away. The small nucleus is of type HII, meaning the spectrum resembles that of an H II region.

From Wikipedia, the free encyclopedia

Chuck Sterling

Photo of the Month



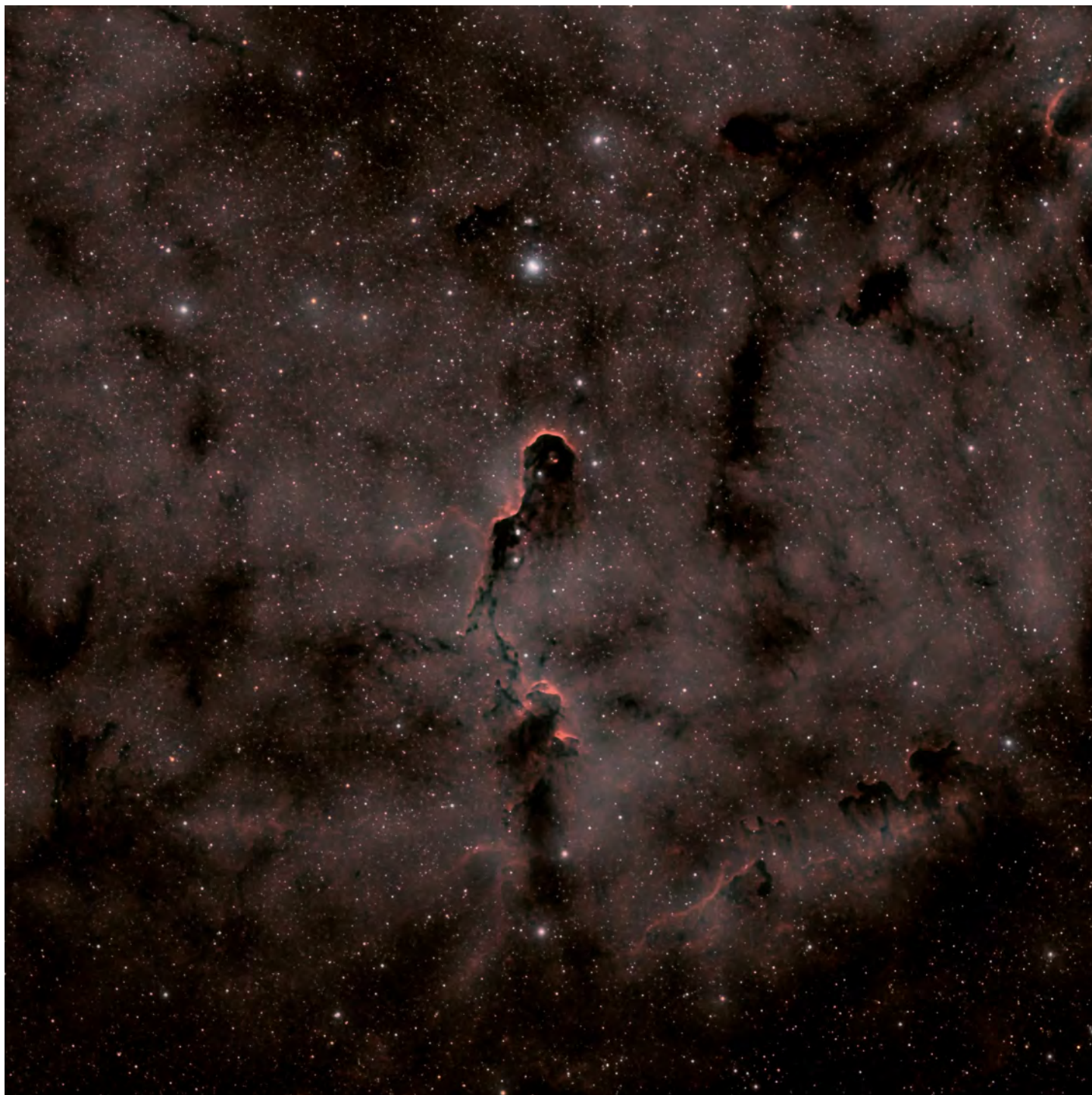
OBJECT Messier 104 The Sombrero Galaxy NGC4594

The Sombrero Galaxy is a spiral galaxy in the constellation Virgo at a distance of about 30 M Light years. It has a bright nucleus, an unusually large central bulge, and a prominent dust lane in its inclined disk. The dark dust lane and the bulge give this galaxy the appearance of a sombrero. Astronomers initially thought that the halo was small and light, indicative of a spiral galaxy, but the Spitzer space telescope found that the halo around the Sombrero Galaxy is larger and more massive than previously thought, indicative of a giant elliptical galaxy.

L: 17 x 600 sec R: 21 x 600 sec G: 14 x 600 sec B: 18 x 600 sec
Total exposure: 11.67 hours Data was collected during Jan 2018.

PixInsight was used for all calibrations, stacking, and processing. By RDee Sherrill

Photo of the Month



OBJECT Dark Nebula LDN 1150

OTA: RH-305 (12" f/3.5) Camera: SBIG STX-16803 Image Width: ~1.5 deg

EXPOSURES: Hydrogen: 5 x 1800 sec Sulfur: 4 x 1800 Oxygen: 3 x 1800 Total exposure ~6 hrs

Observatory: Deep Sky West Processed by Alex Woronow using PixInsight and ON1 in 2018

LDN 1150 is part of the very large nebula IC 1369. The area is thought to be a region of very active star formation. The two fairly young stars in the 'cavity' of the nebula (just a bit above the image center) may have blown away the dust and gas from that cavity. The red region outlining the cloud is the result of winds from young stars and massive stars highly compressing the gas.

In this rendition, Red = $0.35 * \text{Ha} + 0.65 * \text{S}$ Green = $0.3 * \text{Ha} + 0.3 * \text{S} + 0.4 * \text{Ox}$ Blue = Ox .

(Source: largely Wikipedia)