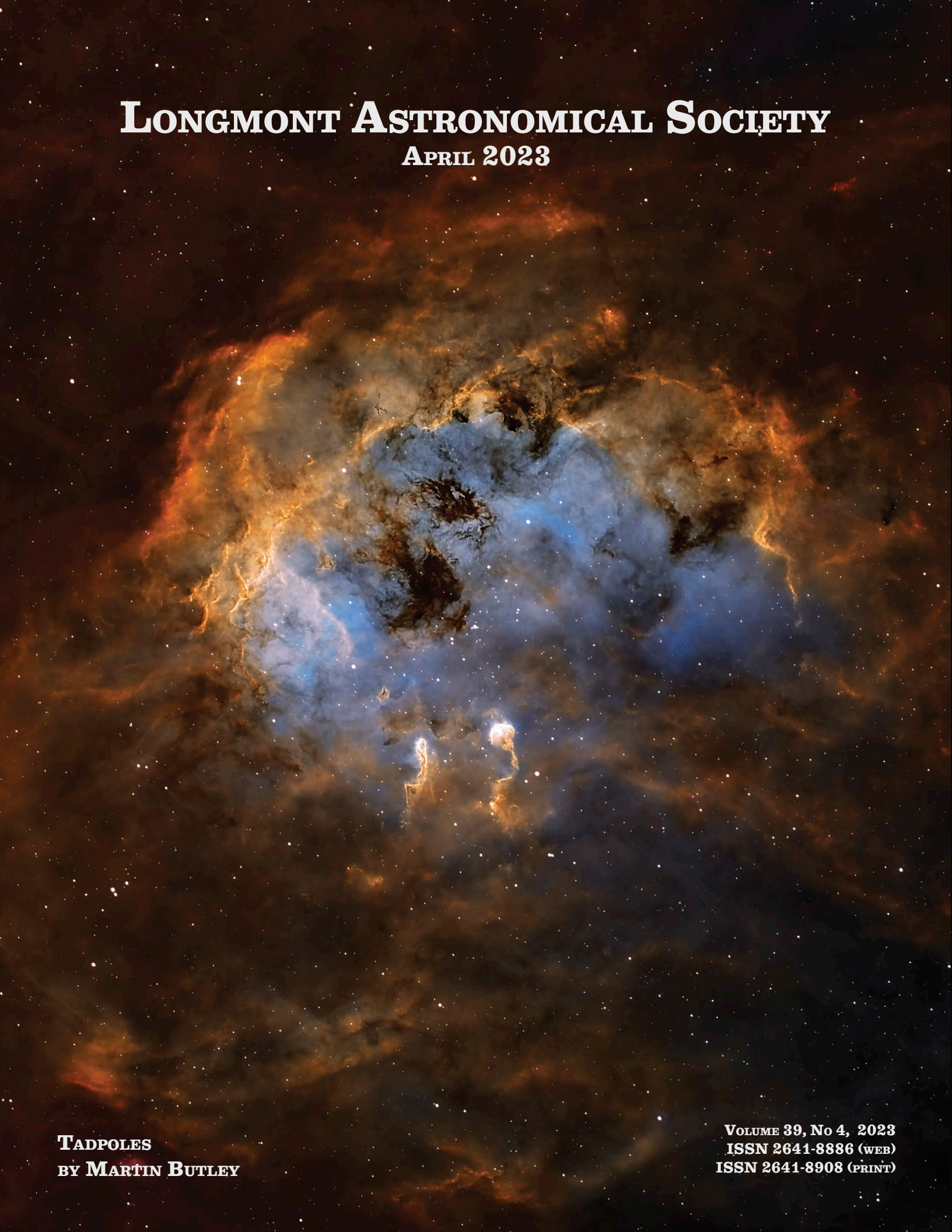
Longmont Astronomical Society

April 2023



Tadpoles
by Martin Butley

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LAS Meeting Thursday, April 20 at 7 pm
Presentation by Dr. Jeremy Darling on "Our Universe"

Our Universe: What is the Universe? What does it contain? What is its history? Its future?

This talk will explore the scale, age, and fate of the Universe. We will learn how we observe the Universe, how we know what we know, and what is still not known. We will also explore alternate Universes as a device for understanding our own.

The meeting will be in-person at the First Evangelical Lutheran Church, 805 3rd Ave in Longmont; it will also be availble on Zoom.

Bio:

Jeremy Darling is a Professor of Astrophysics at the University of Colorado, Boulder. He studies black holes, galaxy evolution, and cosmology. Mostly using telescopes, but sometimes just by thinking.

Front Cover "Tadpoles" by Martin Butley

Tadpoles – IC 410. The NGC 1893 central star cluster is about 4 million years old.

The region is 12,000 light years from Earth, and about 100 light years across. The tadpoles themselves are 10 light years long, and are sites of new star formation.

Marty took this a while ago - he's been playing with processing. Hubble Palette - SHO; All 10 minute subs: Ha x 41 about 7 hours; OIII x 25 about 4 hours; SII x 16 about 2.7 hours. Total integration about 14 hours. Taken with a Takahashi FSQ 130 on an Astrophysics Mach II mount with an ASI 6200 monochrome camera.

Back Cover: M51 by Eddie Hunnell

Image taken with C11 EdgeHD SCT and CGX mount with new ASI6200MC Pro. He started fairly early when it was low and captured a total of 51 subs of 10 min each. However he ended up throwing away most of the first 15 due to it being low in the sky and the associated noise. He stacked 31 subs so 5.17 hrs of signal. He utilized darks but not flats or bias images. Pixinsight and BlurXterminator and NoiseXterminator were used (but not StarXterminator). No filter was used and it was imaged from his back patio in Longmont.

About LAS

The Longmont Astronomical Society Newsletter ISSN 2641-8886 (web) and ISSN 2641-8908 (print) is published monthly by the Longmont Astronomical Society, P. O. Box 806, Longmont, Colorado. Newsletter Editor is Vern Raben. Our website URL is https://www.longmontastro.org and the webmaster is Sarah Detty. The Longmont Astronomical Society is a 501 c(3), non-profit corporation which was established in 1987.

The Longmont Astronomical Society is affiliated with the Astronomical League (https://www.astroleague.org). The Astronomical League is an umbrella organization of amateur astronomy societies in the United States.

Contents

LAS Officers and Board Members in 2023

- Vern Raben, President
- Hunter Morrison, Vice President
- Eileen Hall-McKim, Secretary
- Bruce Lamoreaux, Treasurer

Board Members:
David Elmore, Gary Garzone, Mike Hotka, Brian Kimball, and Tally O'Donnell

Appointed Positions 2023

Sarah Detty, Webmaster; Bruce Lamoreaux, Library Telescope Coordinator; Bill Tschumy, Public Outreach Coordinator; Vern Raben, Newsletter Editor

LAS Website is Moving

The Longmont Astronomical website is moving to a new web hosting provider, squarespace.com. The LAS webmaster, Sarah Detty, has completed work redesigning and moving content from the previous web host, Wild Apricot. This has been lots of work for Sarah. The new site is awesome. Wonderful job Sarah!!! Thank you for your dedication in accomplishing this.

The new website will be online April 3 or 4. It will remain https://www.longmontastro.org but will point to a server to the new web host. Changing a website address usually takes a few hours but sometimes it takes a day or so to propagate through the Internet; because of this we don't know the exact time it will be switched over.

You will need to sign up on the new website with your email address. Web hosting companies do not permit importing usernames and passwords as they must be encrypted for security reasons. You will soon receive a discount code by email which lets you register on the website. The discount code is necessary to keep your membership renewal date the same as it is now.

The Planets in April

Mercury

Mercury is visible due west after sunset until about the 19th. It dims from -1.1 to 1.8 magnitude and increases from 5.8 to 9.7 arc sec across.

Venus

Venus is visible after sunset in the west. It is about magnitude -4 in brightness and the waxing crescent disk is about 15 arc sec across.

Mars

Mars keeps getting smaller and dimmer. It is 6.4 arc sec across on the 1st but only 5.3 arc sec across by the 30th. It dims from 1.0 magnitude in apparent brightness to 1.4 magnitude by the end of the month.

Jupiter

Jupiter is not visible this month

Saturn

Saturn is low in the morning sky in constellation Aquarius. It is magnitude 1.0 in brightness and its disk is 16 arc sec across.

Uranus

Uranus is in constellation Aries. It is magnitude +5.8 in brightness and its disc is 3.5 arc sec across. It disappears into the evening twilight around the 19th this month.

Neptune

Neptune is not visible this month.

Meteor Showers

The Lyrids Meteor shower peaks at 9 pm the night of April 22. The radiant is at RA 18h 04m and Dec +34 ° in the constellation Lyra. The radiant is above the horizon after 10 pm. The Moon will be low in the northwest and is a thin crescent just 3 days old. It sets at 11 pm. Circumstances are quite good if you can get to a dark location. Expect to see 10 to 15 per hour in the early morning hours. Lyrids are typically fairly bright meteors and travel at medium speed.

Lunar Phases in April

- Full moon: April 5 at 10:36 pm
- Third quarter: April 13 at 3:13 am
- New moon: April 19 at 10:14 pm
- First quarter: April 27 at 3:21 pm

Bright Nebula in April

- M 1, Crab Nebula in Taurus, mag. 8.4
- NGC 1931Nebula in Auriga, mag. 10.1
- NGC 226 Hubble in Monoceros, mag. 9.2
- NGC 2264 Cone Nebula, mag. 3.9
- IC 410 in Auriga, mag. 10
- SH 2-261 Lower's Nebula in Orion, mag. 10

Galaxies in April

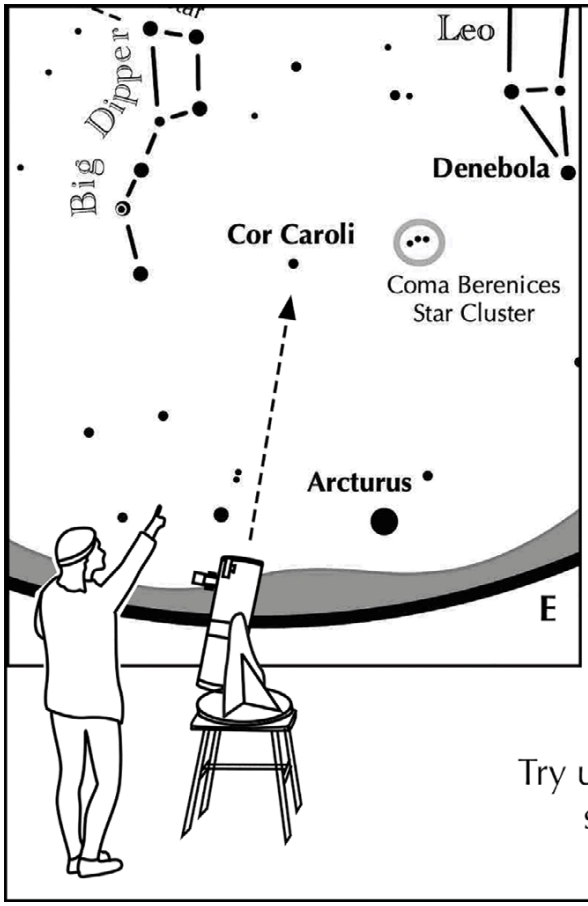
- M81, Bodes Galaxy, Spiral Galaxy in Ursa Major, mag. 6.8
- M101 Whirlpool Galaxy in Ursa Major, mag. 7.8
- M51 Whirlpool Galaxy in Canes Venatici, mag. 7.9
- M94 Spiral Galaxy in Canes Venatici, mag. 7.9
- M63, Sunflower Galaxy in Canes Venatici, mag. 85.

Globular Clusters in April

- M5 in Serpens, mag. 5.7
- M13 in Hercules, mag. 5.8
- M3 in Canes Venatici, mag. 6.2
- M92 in Hercules, mag. 6.4
- M53 in Coma Berenices, mag. 7.6

Planetary Nebula in April

- NGC 3242 Ghost of Jupiter mag 7.3
- NGC 6543 Cat's Eye Nebula, mag 8.1
- NGC 2392 Eskimo Nebula in Gemini, mag. 9.2
- M97 Owl Nebula in Ursa Major, mag. 9.8



Other Suns: Cor Caroli

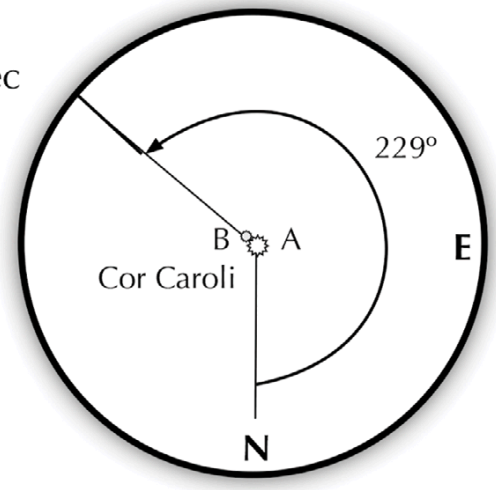
How to find Cor Caroli on an April evening

Look northeast toward the Big Dipper. A star, slightly dimmer than the handle stars, is placed near the center of the handle's curvature. That is Cor Caroli.

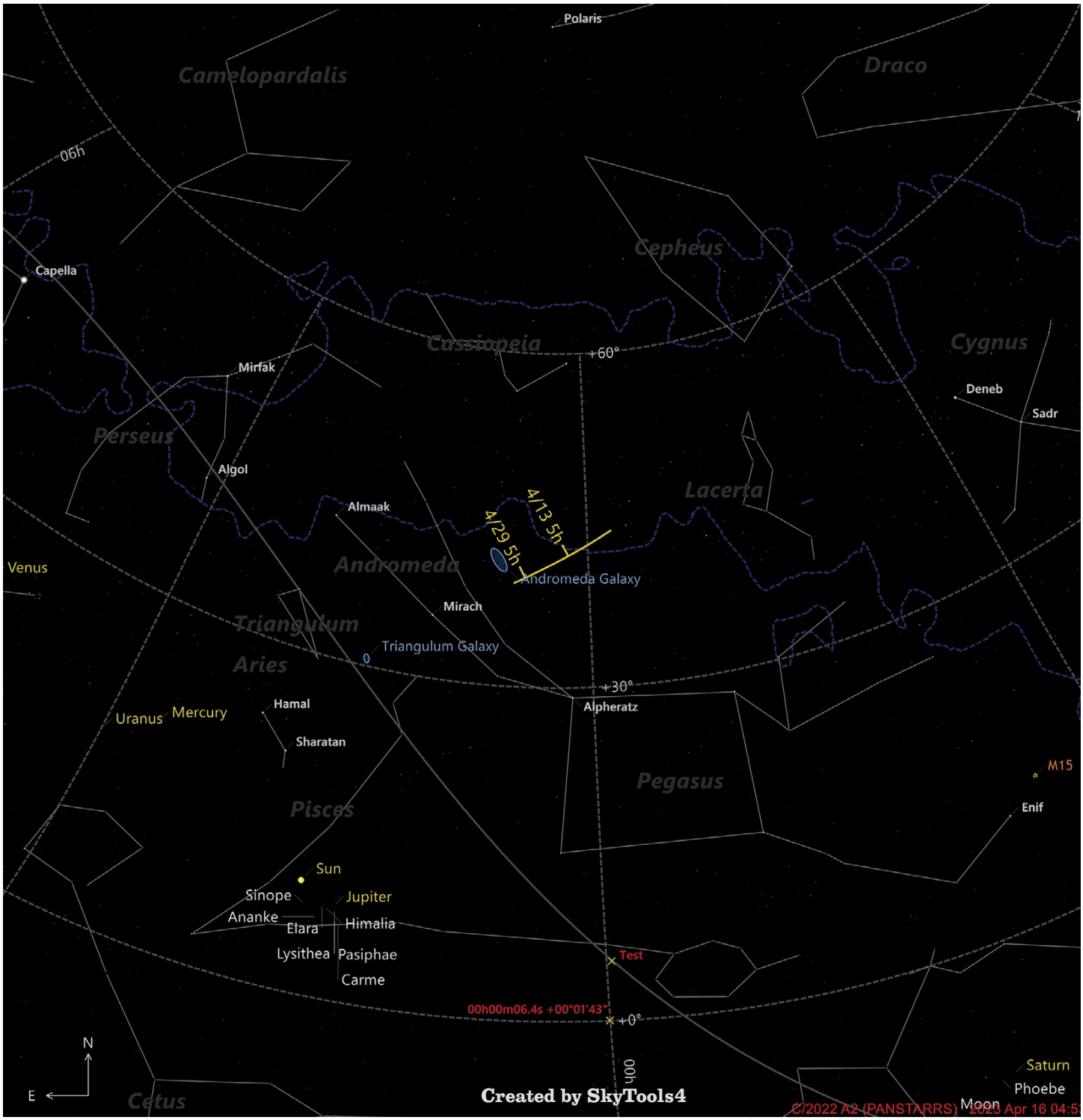
Suggested magnification: >20x
Suggested aperture: >2 inches

Cor Caroli
A-B separation: 19 sec
A magnitude: 2.9
B magnitude: 5.5
Position Angle: 229°
A color: white
B color: pale blue

Try using steadily held and sharply focused 10x50 binoculars.

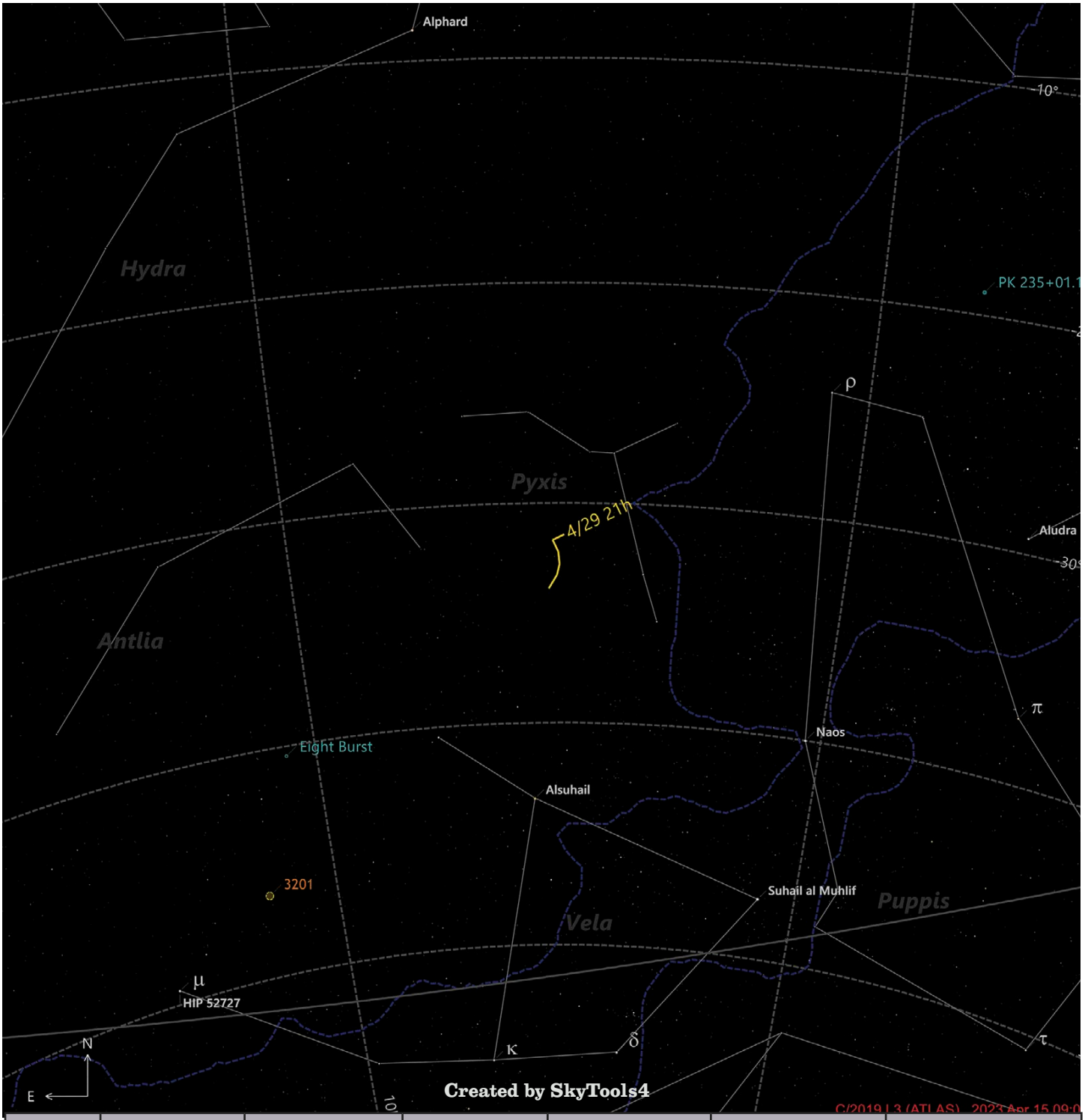


Comet C/2022 A2 (PANSTARRS)



Date	Optimal time	RA	Dec	Constellation	Magnitude	Size (arc min)
Apr 1	5:19 am	23h52m45.2s	+43°44’49”	Andromeda	10.6	1.7
Apr 7	5:09 am	00h02m55.8s	+42°44’02”	Andromeda	10.7	1.6
Apr 13	4:57 am	00h12m02.8s	+41°49’42”	Andromeda	10.9	1.6
Apr 19	4:46am	00h20m14.4s	+41°00’57”	Andromeda	11.0	1.6
Apr 25	4:36 am	00h27m36.1s	+40°16’59”	Andromeda	11.1	1.6
Apr 30	4:27am	00h33m08.7s	+39°43’22”	Andromeda	11.2	1.5

Comet C/2019 L3 (ATLAS)

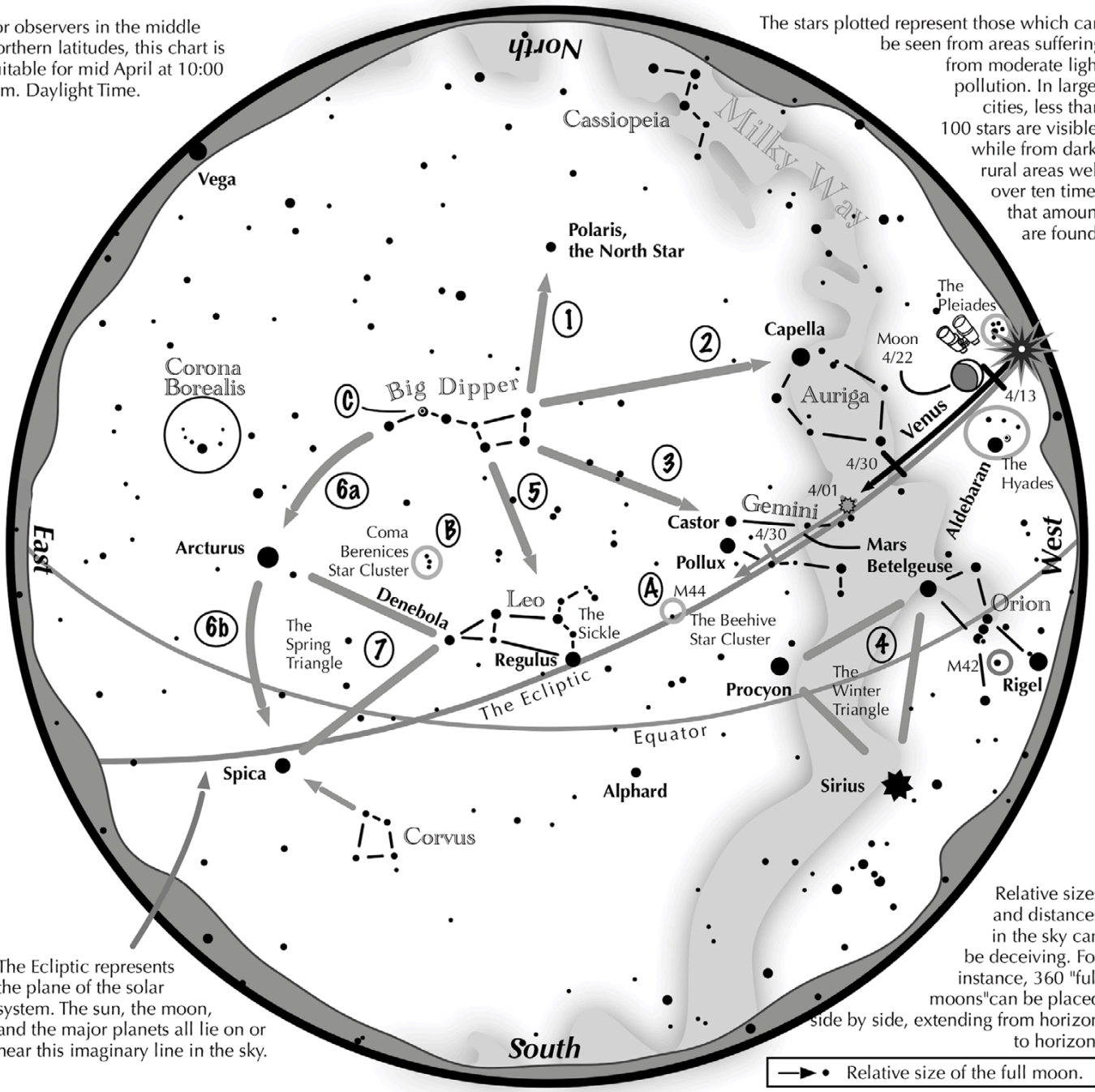


Date	Optimal time	RA	Dec	Constellation	Magnitude	Size (arc sec)
Apr 1	9:22pm	09h04m08.9s	-33°43'01"	Pyxis	11.9	58
Apr 7	9:08 pm	09h03m10.6s	-33°17'46"	Pyxis	11.9	57
Apr 13	9:08 pm	09h02m45.4s	-32°52'06"	Pyxis	12.0	56
Apr 19	9:11 pm	09h02m52.5s	-32°26'42"	Pyxis	12.1	55
Apr 25	9:17 pm	09h03m30.9s	-32°02'15"	Pyxis	12.1	54
Apr 30	9:20 pm	09h04m25.5s	-31°42'59"	Pyxis	12.2	53

Navigating the April Night Sky by John Goss

For observers in the middle northern latitudes, this chart is suitable for mid April at 10:00 p.m. Daylight Time.

The stars plotted represent those which can be seen from areas suffering from moderate light pollution. In larger cities, less than 100 stars are visible, while from dark, rural areas well over ten times that amount are found.



The Ecliptic represents the plane of the solar system. The sun, the moon, and the major planets all lie on or near this imaginary line in the sky.

Relative sizes and distances in the sky can be deceiving. For instance, 360 "full moons"can be placed side by side, extending from horizon to horizon.

—►• Relative size of the full moon.

Navigating the April night sky: Simply start with what you know or with what you can easily find.

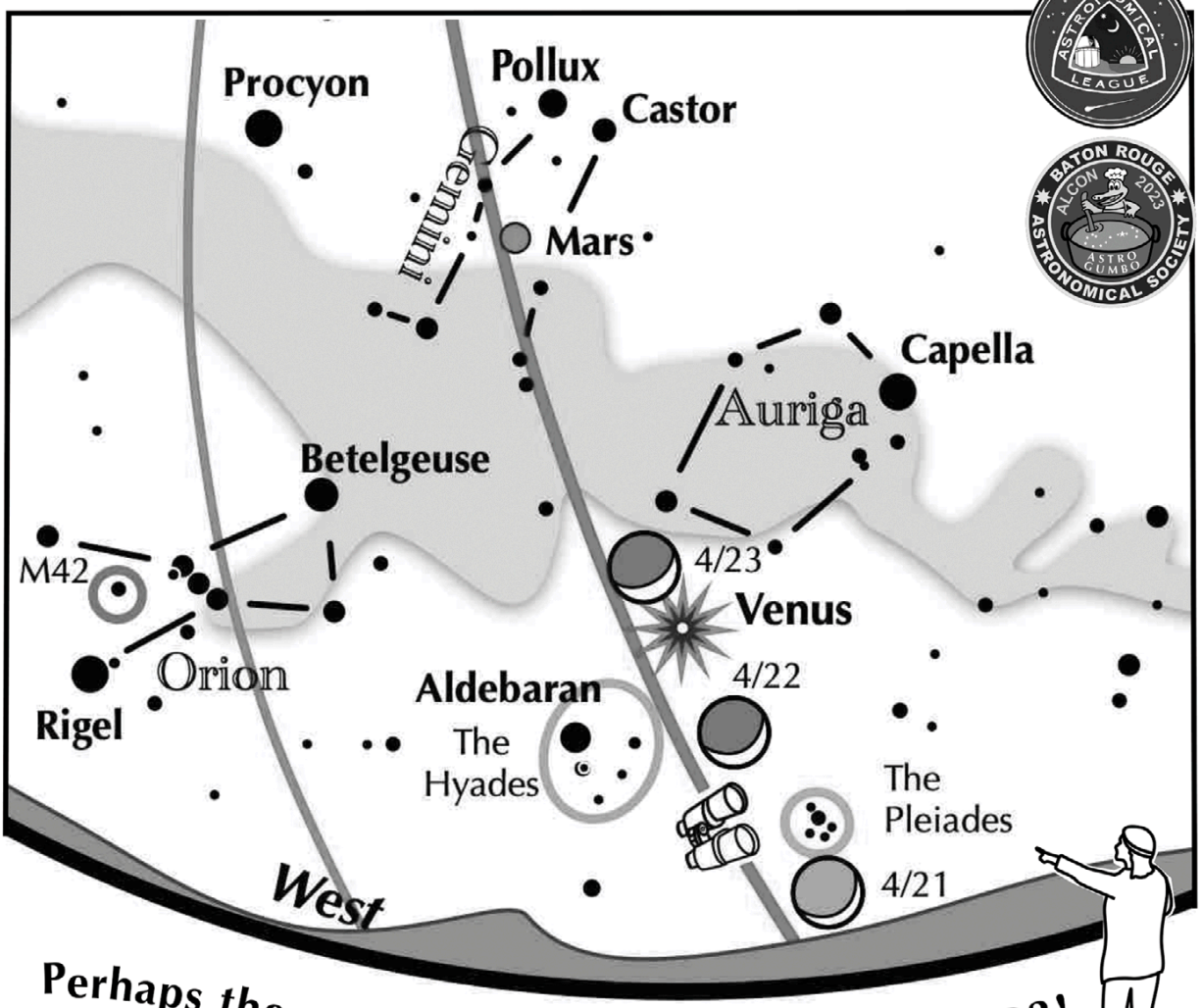
1. Extend an imaginary line north from the two stars at the tip of the Big Dipper's bowl. It passes Polaris, the North Star.
2. Draw another imaginary line west across the top two stars of the Dipper's bowl. It strikes Capella low in the northwest.
3. Through the two diagonal stars of the Dipper's bowl, draw a line pointing to the twin stars of Castor and Pollux in Gemini.
4. Look in the west-southwest for the bright Winter Triangle stars of Sirius, Procyon, and Betelgeuse.
5. Directly below the Dipper's bowl reclines the constellation Leo with its primary star, Regulus.
6. Follow the arc of the Dipper's handle. It first intersects Arcturus, then continues to Spica.
7. Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.

Binocular Highlights

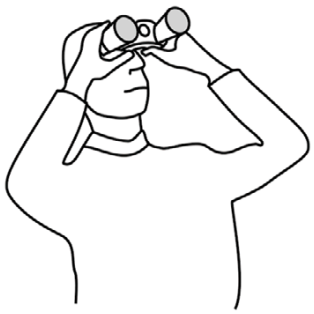
A: M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux.
B: Look nearly overhead for the loose star cluster of Coma Berenices.
C: In the Big Dipper's handle shines Mizar next to a dimmer star, Alcor.

Astronomical League
www.astroleague.org /outreach

If you can see only one celestial event this April, <u>see this one</u>.



Perhaps the most enchanting evenings of 2023!



Enhance the scene – use binoculars!

On April 21, 22, and 23, look low in the west-northwest 60 minutes after sunset.

- The crescent moon, glowing full with earthshine, floats just above the horizon in the bright twilight on April 21. Above it, lies the pretty Pleiades star cluster.
- On April 22, the slightly thicker, but more pronounced crescent moon moves between brilliant Venus and the Pleiades, and right of the Hyades star cluster.
- On the third night, the crescent moon stands commandingly above the scene.

Secretary Notes Thursday, March. 16, 2023
by Eileen Hall-McKim

I. Introduction

The March LAS In-person/Hybrid meeting was held on March 16th at the Longmont Lutheran Church. Vern Raben began the meeting with a self-introduction by all members attending in person. Seventeen members attended in-person, Five attended by zoom.

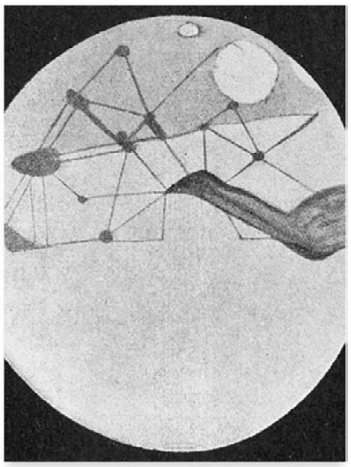
II. Main Presentation

Our March meeting was highlighted with a talk by LAS member, Martin Butley in which he presents the case for life on Mars with a review of the history of Mars exploration. From flybys to orbiters, landers to meteorites—what has the past 50 years taught us about life on Mars? Accounts of historical figures and pioneers of space exploration, past land rover missions, and details of what is known of the geology, atmosphere and hydrological cycle on Mars were presented as well as discussion of a series of lab experiments and discoveries during previous missions. Discussion follows on thoughts on the question of potential for existence of earlier life on Mars and the enigmatic questions that remain unanswered.

The Angry Red Planet
by Martin Butley

Historical Observations (18th-19th century)

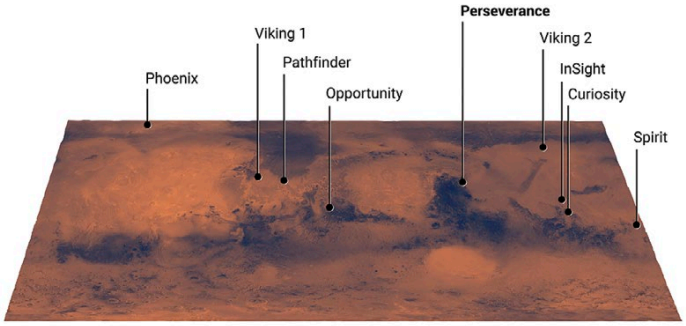
- 1719 Giacomo Maraldi, during the opposition of 1719, observed both polar caps and the temporal variability in their extent
- 1784 William Herschel was first to deduce the low density of the Martian atmosphere when Mars appeared to pass close by two faint stars with no effect on their brightness
- 1809 Honore Flaugergues discovery of the "yellow clouds" on the surface of Mars is the first known observation of Martian dust storms



- 1877 Giovanni Schiaparelli, during the opposition of 1877, observes canali, or channels on Mars
- 1892 W.H. Pickering during the favorable opposition of 1892 observed numerous small circular black spots occurring at every intersection or starting-point of the "canals"
- 1906 Percival Lowell publishes Mars and its Canals
- 1909 Alexander Graham Bell cites Lowell's work and writes "there is no escape from the conviction that Mars is inhabited by highly civilized and intelligent race of beings"

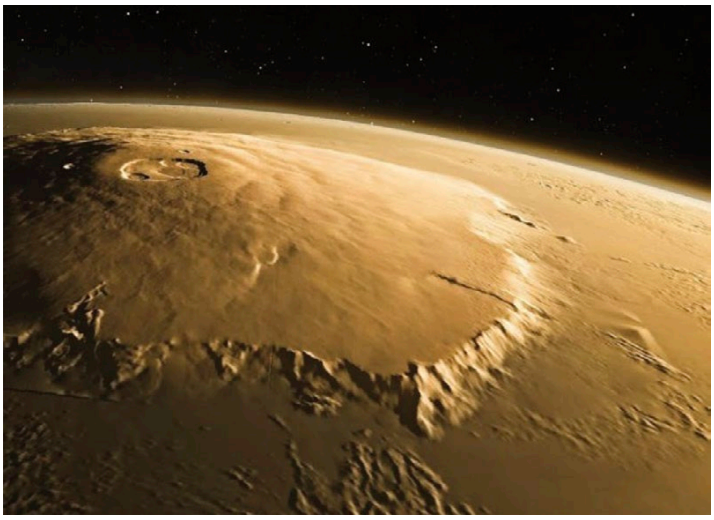
Exploratory Missions (1960s – present)

- Mariner IV launched 1964, performed the first successful flyby on the planet Mars, returning the first close-up pictures of the Martian surface. Discussion of canals on Mars came to an end when the photographs from Mariner IV showed no trace of anything like canals. Several more exploratory missions followed, and today nine Rovers have landed on the surface.



What have we learned?

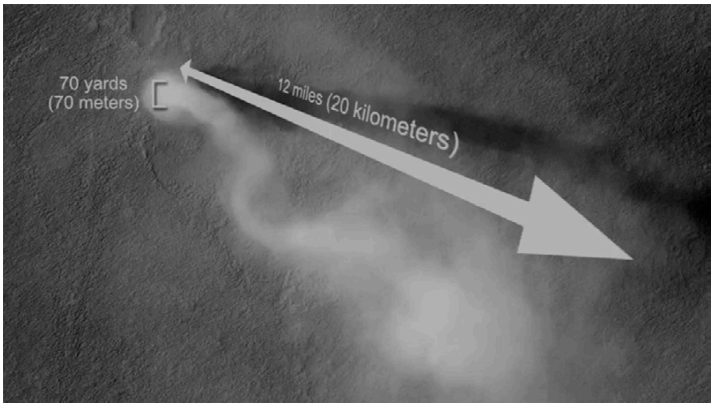
Is Mars Geologically Active?



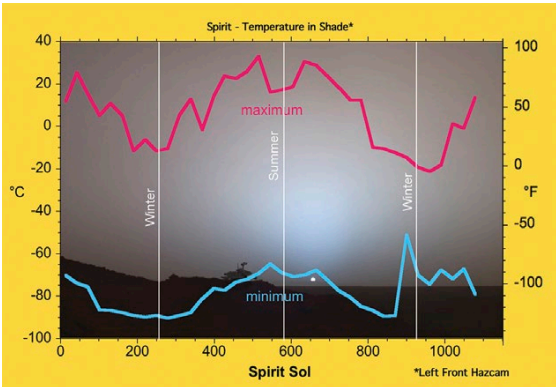
The relative ages of the surface in various parts of Mars can be estimated from the number of impact craters present in a given area, with young regions having fewer craters than old regions. Only two craters are visible indicating that Olympus Mons is young.

What about the atmosphere?

- Mars has an atmosphere and experiences weather such as dust storms and tornadoes



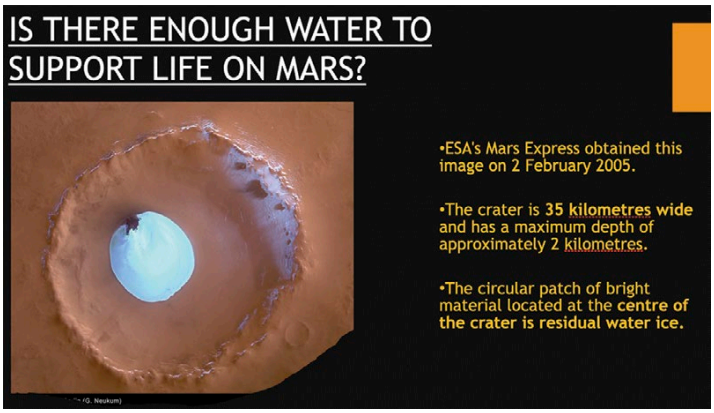
- Ice clouds were imaged moving over Phoenix landing site August 29, 2008
- What is the temperature range? Temperatures recorded by Mars rovers have indicated midday highs of about 35°C (95°F) nighttime lows -90°C (-140°F)



- Relative humidity is very high at night with levels reaching 80-100%

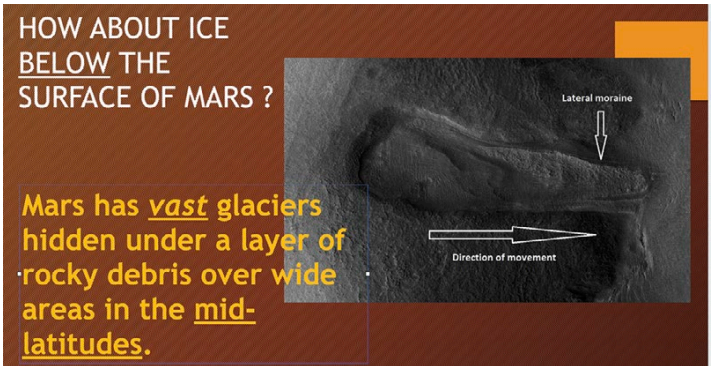
Is there enough water support life on Mars?

We have known about ice at the poles for some time, but what about other water? Water ice has now been identified in various craters.

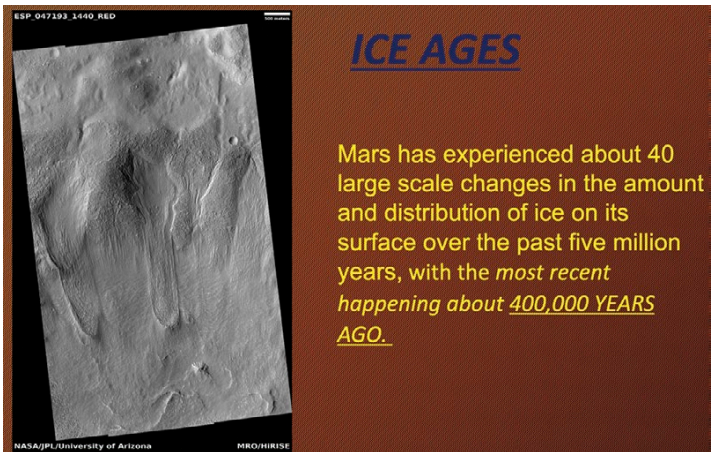


What about glaciers and ice below the surface?

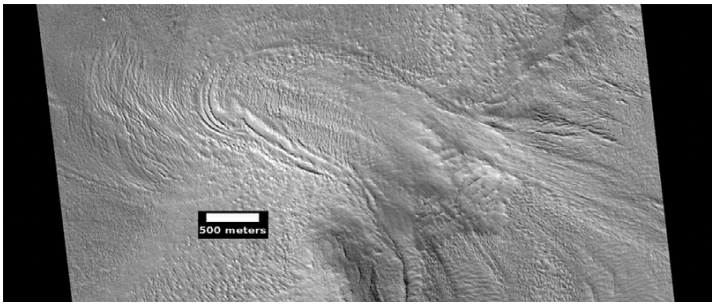
- Geological evidence shows that glaciers have existed on Mars and the planet has experienced ice ages



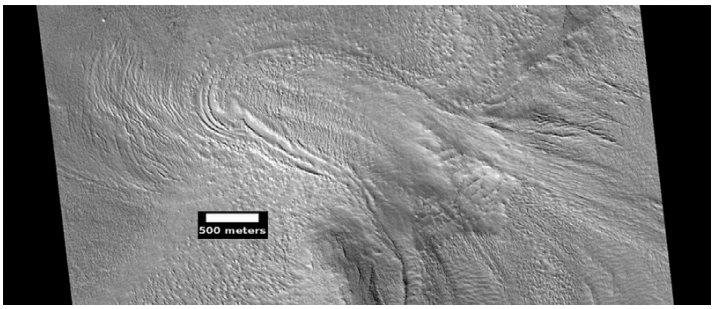
- About 40 distinct large scale changes in the amount and distribution of ice on its surface have occurred over the past 5 million yrs, the most recent about 400,000 yrs ago
- The most popular model for the origin of these ice ages is climate change caused by large changes in the tilt (or obliquity) of the planet's rotational axis



- Today, Mars is tilted 25°, a few million years ago, the tilt of the axis was 45° at times, the tilt has been more than 80°
- Large changes in tilt explains the many ice-rich features on Mars
- At 45° ice is no longer stable at the poles; solid carbon dioxide sublimates (evaporates), increasing atmospheric pressure, allowing more dust to be held in the atmosphere
- Moisture in the atmosphere will fall as snow or ice frozen onto dust grains

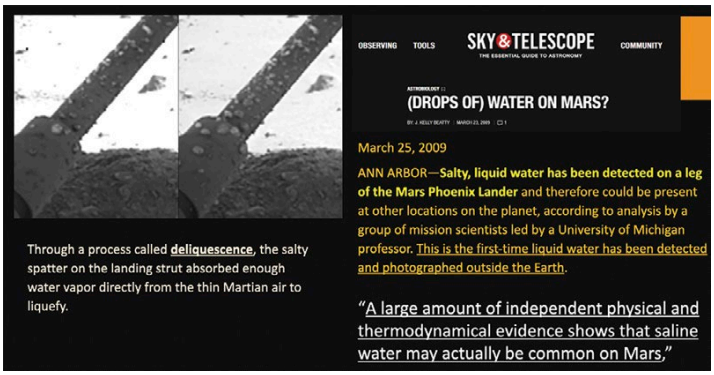


- The total volume of water removed is enough to cover the entire surface of the planet under 1 meter of water, this in representative of an active hydrological cycle on Mars.



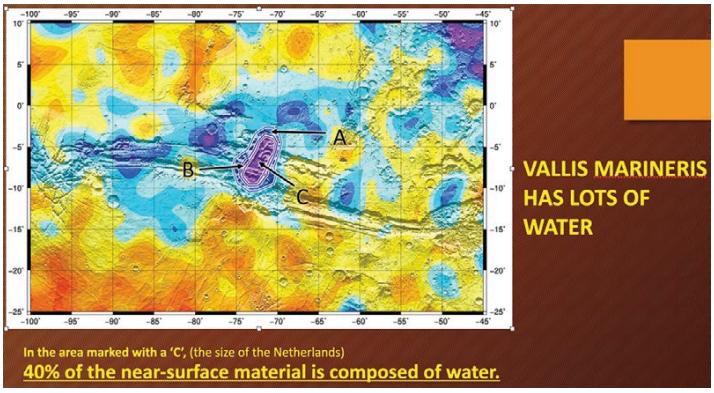
Can liquid water exist on Mars?

Through a process called deliquescence, by which a substance absorbs enough water vapor from the air to liquefy; salty, liquid water was detected on a landing strut of the Mars Phoenix lander. This was the first time water has been found and photographed outside of the earth.

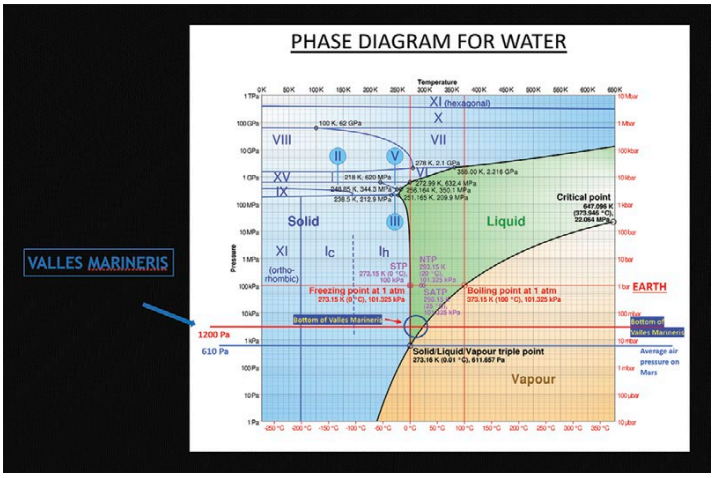


- Recurring slope lineae in equatorial regions of Mars are narrow, dark marking on steep slopes that appear and incrementally lengthen during warm seasons on low-albedo surfaces
- The lineae fade in cooler seasons and recur over multiple Mars years
- Although the origin of the recurring slope lineae remains an open question, observations are consistent with the intermittent flow of briny water; such an origin suggests surprisingly abundant liquid water in some near-surface equatorial regions
- Extensive activity of recurring slope lineae can be seen particularly in deep canyons of Valles Marineris, where at the valleys eastern end, there is unmistakable evidence for massive floods
- In other places the valley floor is piled deep with sedimentary deposits, whose origins and nature remain a mystery

- Valles Marineris has lots of water but will it sublimate? (change phase from ice directly to vapor) with no liquid phase



- The depth of Valles Marineris extends into a phase stage where at the bottom of the canyon, it is possible water remains in liquid phase



1976 Vikings 1 & 2 Experiment

NASA conducted experiments with Viking 1 & 2 Landers to test soil samples for organic carbon.

The Miller-Urey experiment LR (Labeled Release Experiment) was designed to look for life by detecting metabolism. Soil samples were collected after Viking 1 landing and upon nutrient injection, the LR response was immediate and strongly active. A critical 160° control was also performed on duplicate sample of same soil. Taken together, the results are consistent with a life response. Soil samples from the second lander Viking Lander 2 -- 4,000 miles away also duplicated the results of Viking Lander 1.

- In addition to the LR experiment each Viking Lander used volatilization-gas chromatography-mass spectrometry (GC-MS) to test soil samples for organic carbon
- Martian soils were found to contain less carbon than lifeless lunar soils
- The GC-MS did not detect organic material
- It is hard to explain the LR results as biologic if there are no organic compounds in Martian soil
- Some carbon compounds were detected, but were believed to be contaminates, a theory that was later called into question
- At this time, the results of the LR experiments were discounted and NASA concluded that there was not organic material in the soil at either Viking landing site
- It was not until the 30 years later when the Phoenix Rover landed on Mars, May 25, 2008 that errors in the interpretation of the results were discovered, as they did not account for the strong oxidation effects of perchlorate, a chemical compound salt, now known to be widespread on the surface of Mars
- The presence of perchlorate in the martian soil explains why no organic compounds could be detected by the early landers. Even if they had been present, they would have been combusted before reaching the mass spectrometer.
- A reinterpretation of the result show that the Viking samples did indeed contain organic compounds. The presence of organic compound

Where do Perchlorates come from?

On Earth perchlorates are rare, but they are abundant on Mars. Electricity on Martian dust storms helps to form perchlorates.

- Researchers simulated how colliding dust particles of a dust storm on Mars may emit tiny violet flickers of electricity known as triboelectrification, or static charge
- These static charges generate chlorate/perchlorate at rates 1,000 times greater than the yield generated by photochemistry in the laboratory
- Dust storms explain the unique, high concentration of perchlorates in Martian soils
- It is a popular misconception that perchlorates are lethal

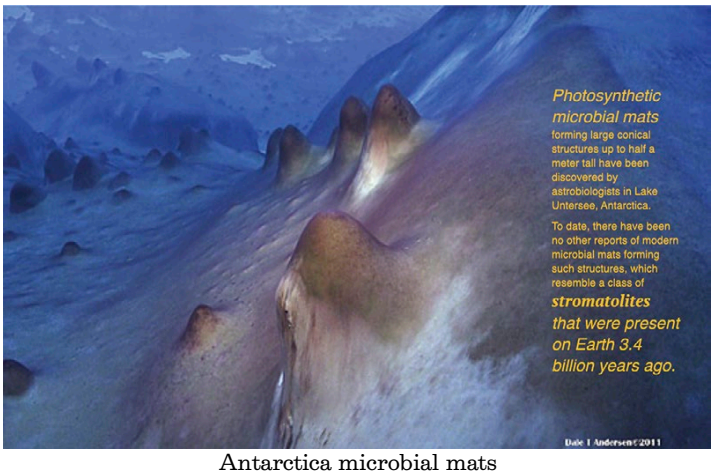
to microbial life
- In reality, some microbes are able to use perchlorates as an energy source
- Dust storms might be a vital part of the Martian biosphere, replenishing an essential source of nutrients

Other evidence for life on Mars

NASA's Curiosity has repeatedly detected methane at Gale Crater.
The detection of methane in a seasonal cycle that peaks in late summer/early autumn. What drive this seasonal cycle is an interesting question.
- Methanogenic Archaea can produce methane in deliquescence-driven Mars analog environments. Deliquescence refers to the property of a substance to absorb water from the air to dissolve itself and form an aqueous solution

How did life begin?

- First evidence of Life on earth 4 billion years ago, shown by earliest fossils
- Photosynthetic microbial mats have been discovered by astrobiologists in Lake Untersee, Antarctica that resemble a class of stromatolites that were present on Earth 3.4 billion years ago



Antarctica microbial mats

What was Mars like 3.4 billion years ago?

The geological history of Mars is divided into 3 main periods

Nochian (4.1-3.7 billion yrs ago)
- Many of the valley networks on Mars date from this period
- Lakes formed in many basins and craters
- A shallow ocean covered at least part of the northern lowlands
- Rocks analyzed by rovers confirm chemical alteration caused by prolonged exposure to non-acidic ground water
- Sustained fluvial (river) deposition recorded in the Noachian stratigraphic record demonstrates that river deposition was already well established >3.7 Ga.
- Such conditions would require an environment capable of maintaining large volumes of water for extensive time-periods, necessitating a precipitation-driven hydrological cycle

Hesperian (3.7-2.9 billion yrs ago)
- In this next period a lot of volcanic activity
- Sulfur dioxide and water emitted by erupting volcanoes reacted to make sulfuric acid which the rained onto the surface.
- The rovers discovered extensive sulphate deposits and evidence of chemical alteration of the rocks by acidic ground water
- There is also evidence of massive flash floods surging across vast stretches of the surface equivalent to thousands of Mississippi Rivers

Could life survive during this period?

Acidithiobacillus ferrooxidans lives in acid mine drainage and mine tailings
- Thrives at extremely low pH (pH 1-2)
- Fixes both carbon and nitrogen from the atmosphere
- Solubilized copper and other metals from rocks
- Plays an important role in nutrient and metal biogeochemical cycling in acid environments
- Same could have existed on Mars

Amazonian 2.9 billion years ago to present (dating very uncertain)
- The planet's surface has been relative dry, but has been punctuated by short-lived returns to warmer, wetter conditions
- Extensive evidence of glaciation and ice-related surface processes
- Late-stage volcanism included eruptions on Olympus Mons
- Outflow activity around Chryse Planitia area

Discussion and questions from members followed, Martin has presented compelling evidence, gathered by various exploratory missions to Mars, and analyzed by countless scientists, for the possibility of early life on Mars with close analogies to beginnings of early life on Earth. Whether early life developed on Mars or any other planets, is still a story that continues to unfold as investigation and discov-

ery continues, and as our understanding evolves of how and under what circumstances life develops, but at this time remains an open question.

III. Business Report

Vern's note -- I intended to present the treasurer report as Bruce was out of town but I had difficulty with that PowerPoint and wasn't able to show it. Here are the numbers:

Main Checking Account	$10,135.00	
2-Year Savings Account	$8,135.00	
Telescope Fund	$1,100.00	
Petty Cash	$50.00	
Total Assets	$19,420.00	(up $ 850.00
from last report)		
Active Membership:	114	
Student Membership:	4	
Total	11	
(16 Renewals Overdue)		

IV. Old/New Business

Hunter Morrison will lead a April 15 presentation at the Sandstone Ranch and Visitor's Center, Longmont
"The Life Cycle of Stars; star birth, life cycle, stellar nucleus synthesis, star death".

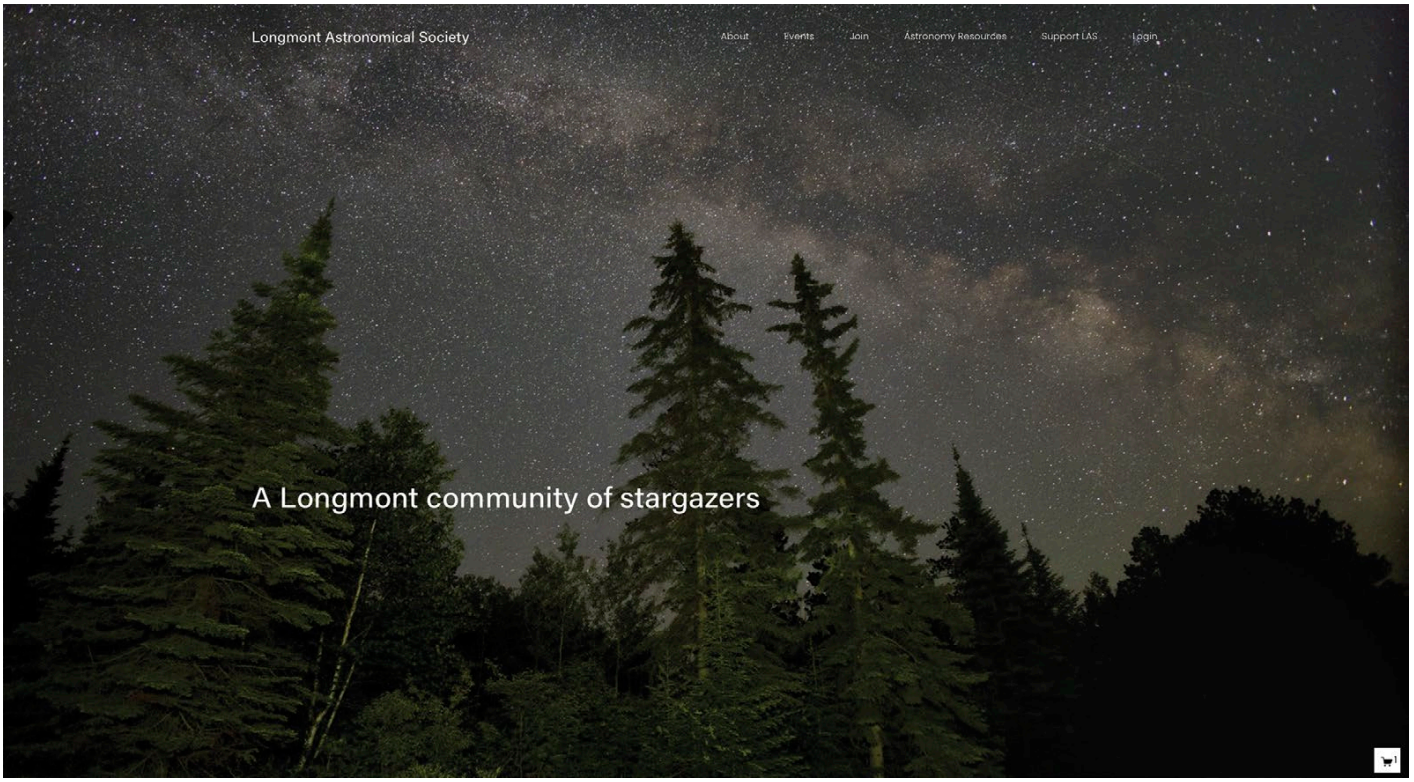
More updates coming for member telescope volunteers and instructions and set-up for star party viewing (Scopes and volunteers needed) .

Bill Tschumy, Outreach coordinator, is working on coordination with various schools for potential future star parties More updates to follow on outreach to schools, and the RMNP program.

Star party at Rabbit Mountain April 21

- Boulder County Open Space program at Rabbit Mountain (east of Lyons off US 66)
  - The BPOS planned program will be Astronomy: Wish Upon a Star, a program about meteors, meteor shower and where they come from
  - Weather permitting, should be a great night for viewing with a very young crescent moon!
  - After public viewing, members are permitted to remain at Rabbit Mountain until 2:00am (Scopes and volunteers needed); further announcement to come and can sign up for telescope volunteer

- The next LAS Meeting will be on April 20. It will be at the First Evangelical Lutheran Church, 805 3rd Street, Longmont, CO; it will also be available on Zoom.
- Sarah Detty, LAS Webmaster has been continuing work on new website; she is starting to work on the member area and now connected to PayPal
- Planning on early April 2023 change over to SquareSpace. Vern previewed new first page of LAS new website homepage (snapshot below).



M65 by Gary Garzone on Mar 6. Taken with C14 at F7, Zwo ASI6200mc for an hour. PixInsight processing.

M66 by Gary Garzone on Mar 1. Taken with C14 at F7, Zwo ASI 6200 mc for an hour. Quick processing in CCD Stack only.

NGC 3628, Hamburger Galaxy by Gary Garzone on Mar 1. Taken with C14 at F7, Zwo ASI6200mc for an hour. Quick processing in CCD Stack only.

M42 by Gary Garzone on Mar 6. Taken with C14 at F7, Zwo ASI6200mc for an hour. PixInsight processing.

IC434, Horsehead Nebula by Jim Elkins on Mar 1. 385 exposures of 10 seconds each with Vaonis Vespera smart scope on February 28th. The scope temperature was 4.9° C and 43% relative humidity, yielding moderate frost from the dew. The scope has a heater to protect the optics from the dew/frost affecting the image.

NGC 2359, Thor's Helmet Nebula by Jim Elkins on Mar 6, Located in the constellation of Canis Major. This was taken with Vaonis Vespera (50 mm f/4) smart telescope using a Vaonis Vespera Dual Band (nebula) filter. It represents 399 images of 10 seconds each with a scope temperature of 3.0° C and relative humidity of 66%. A total exposure time of about 67 minutes. The dew that created a frost layer on the outside of the scope, but the heaters turned on and kept the lens dry. The image was processed first in Affinity Photo 2 with StarXTerminator to brighten the nebula versus the stars, sharpen with Topaz Photo AI, and brighten the nebula/stars and darken the background sky with MacOS Photos app.

NGC 2174, Monkey Head Nebula by Jim Elkins on Mar 15. (183 x 10 seconds exp, 30 ½ minutes, 1.0°, 47% rh) with open cluster, NGC 2175 with a Vaonis Vespera smart scope (50 mm, f/4, APO refractor) in Orion on February 24th. It came out well. Post processing with Affinity Photo 2, Topaz Photo AI, and MacOS Photos app.

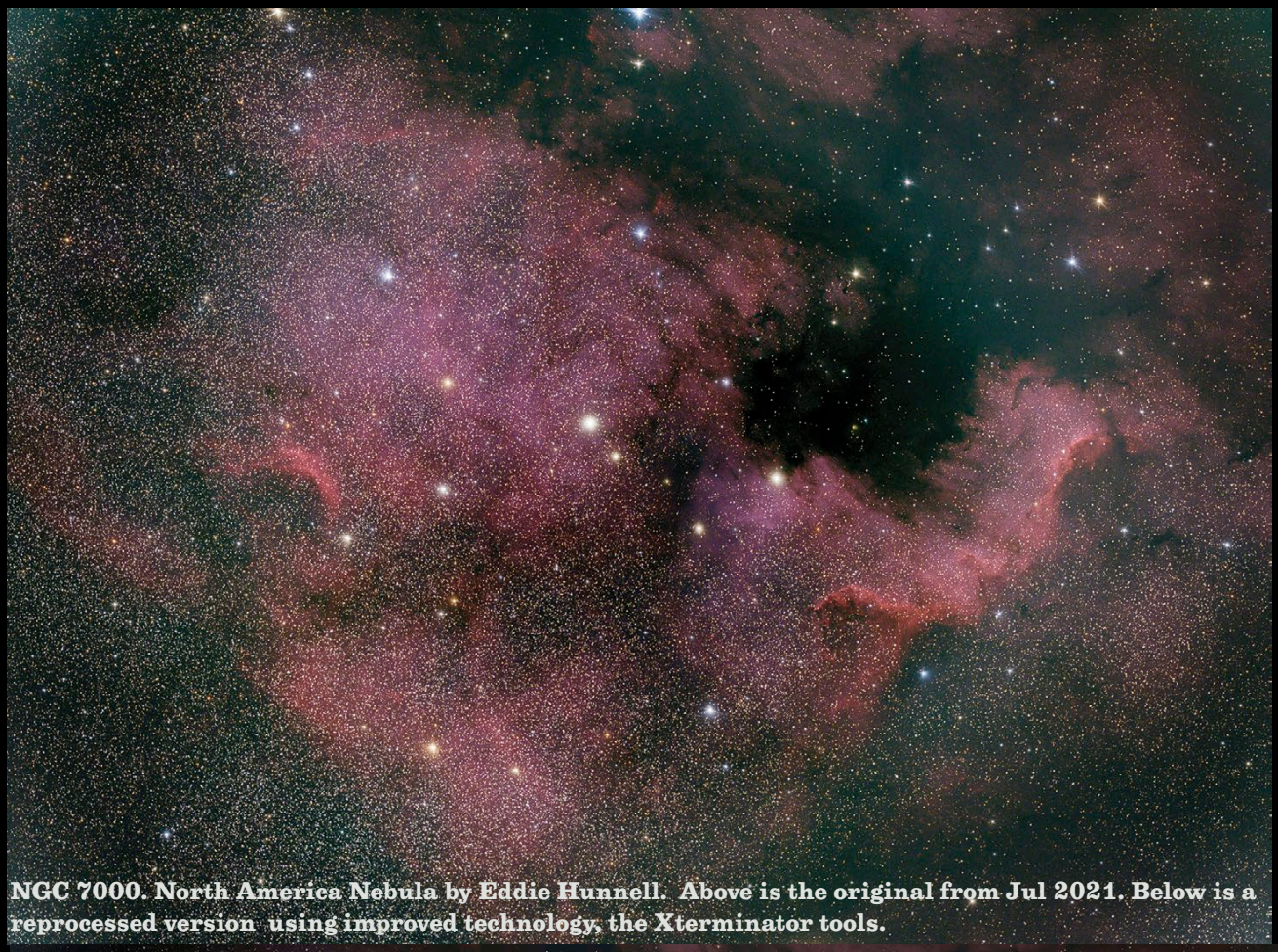
M42 by Jim Elkins on Mar 19. It was taken with a Vaonis Vespera smart telescope (50 mm, f/4, APO refractor). Exposure is 30.8 minutes with 191 exposures at 10 seconds each at temperature of 3.1° C and 41% rh. The final stacked image was processed with Affinity Photo 2, Topaz Photo AI, and MacOS Photos App.

Lagoon and Trifid Nebula by David Elmore

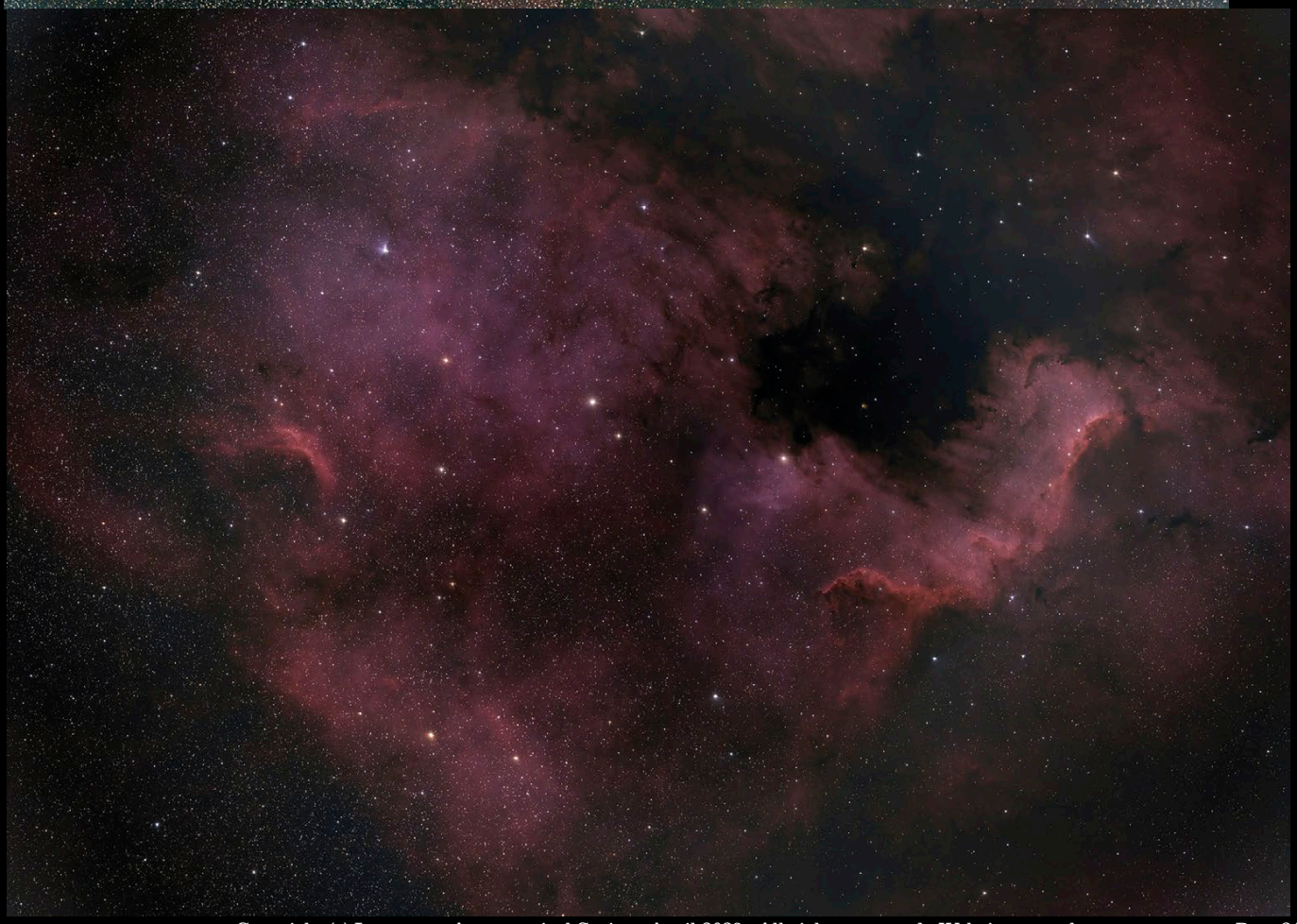
The Lagoon Nebula (M8, Sh2-25, LBN-25), Trifid Nebula (M20, SH2-30), and many others in the constellation Sagittarius in the Milky Way.

There is a lot going on in this field. New stars are being formed in the Lagoon and Trifid. Visible in the Lagoon are small dark protostars named Bok Globules. Dark molecular clouds obscure the background field of Milky Way stars.

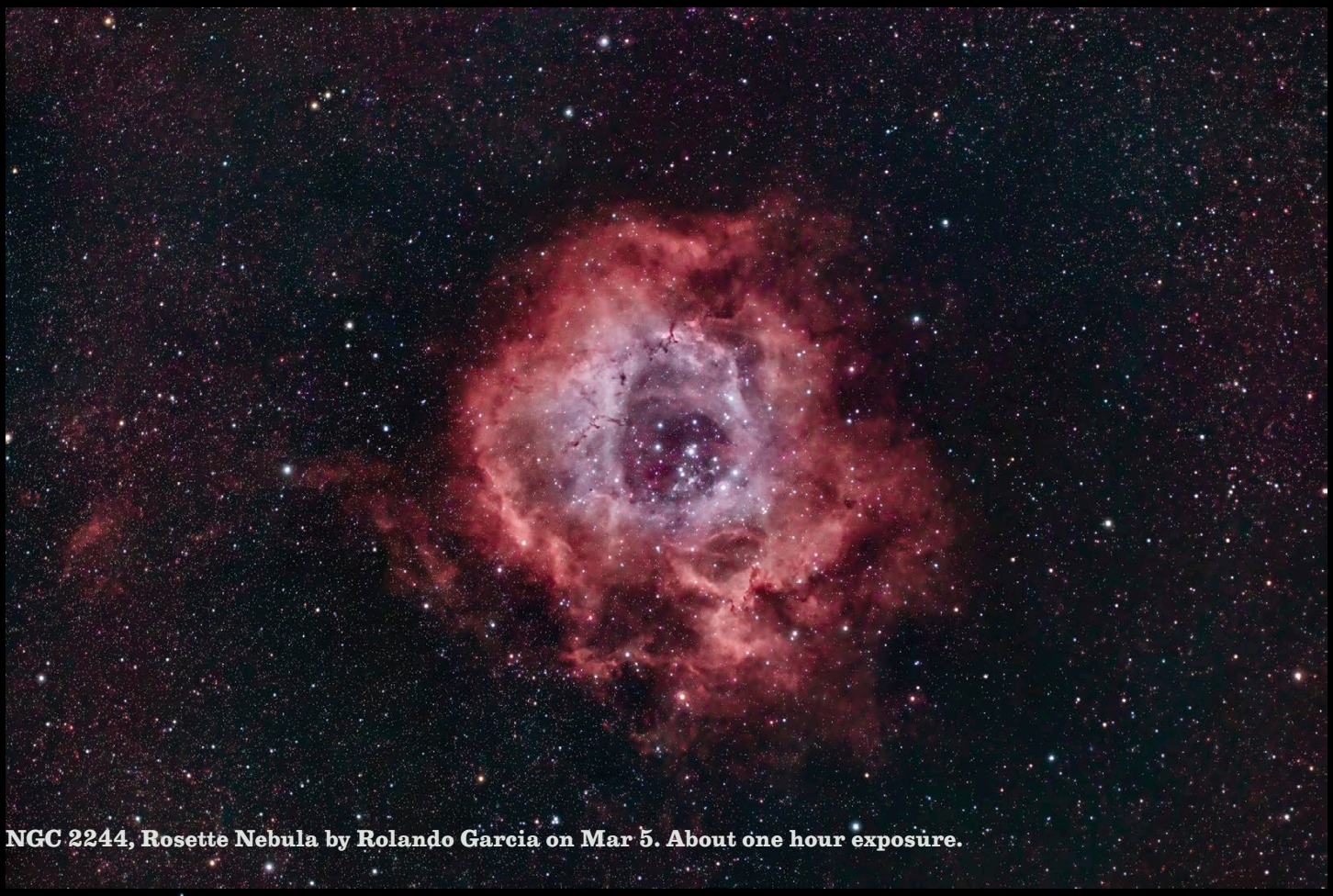
This image was recorded last summer from remote observatory at Dark Sky New Mexico. Borg107FL sextuplet F/3.9 refractor, ASI6200MM Pro camera, Chroma 3nm H-alpha, Oxygen III, and Sulfur II filters for fast optics. Six Ha, three OIII, and three SII exposures of 10-minutes each (a mere two hours). This is a re-processed image utilizing Russell Croman's Blur and Noise XTerminator tools in PixInsight. Rendering is HOO, Hydrogen-alpha as red and Oxygen III as teal, with Sulfur II added as yellow. Often in rendering, even false color images such as this one, green and magenta are removed to create a more 'pleasing' palette. Here green due to a mixture of SII and OIII, and magenta from OIII and H-alpha are retained in an effort to better differentiate emission from the three atomic species and reveal their mixtures. Note especially Sh2-26 below and left of the Trifid.



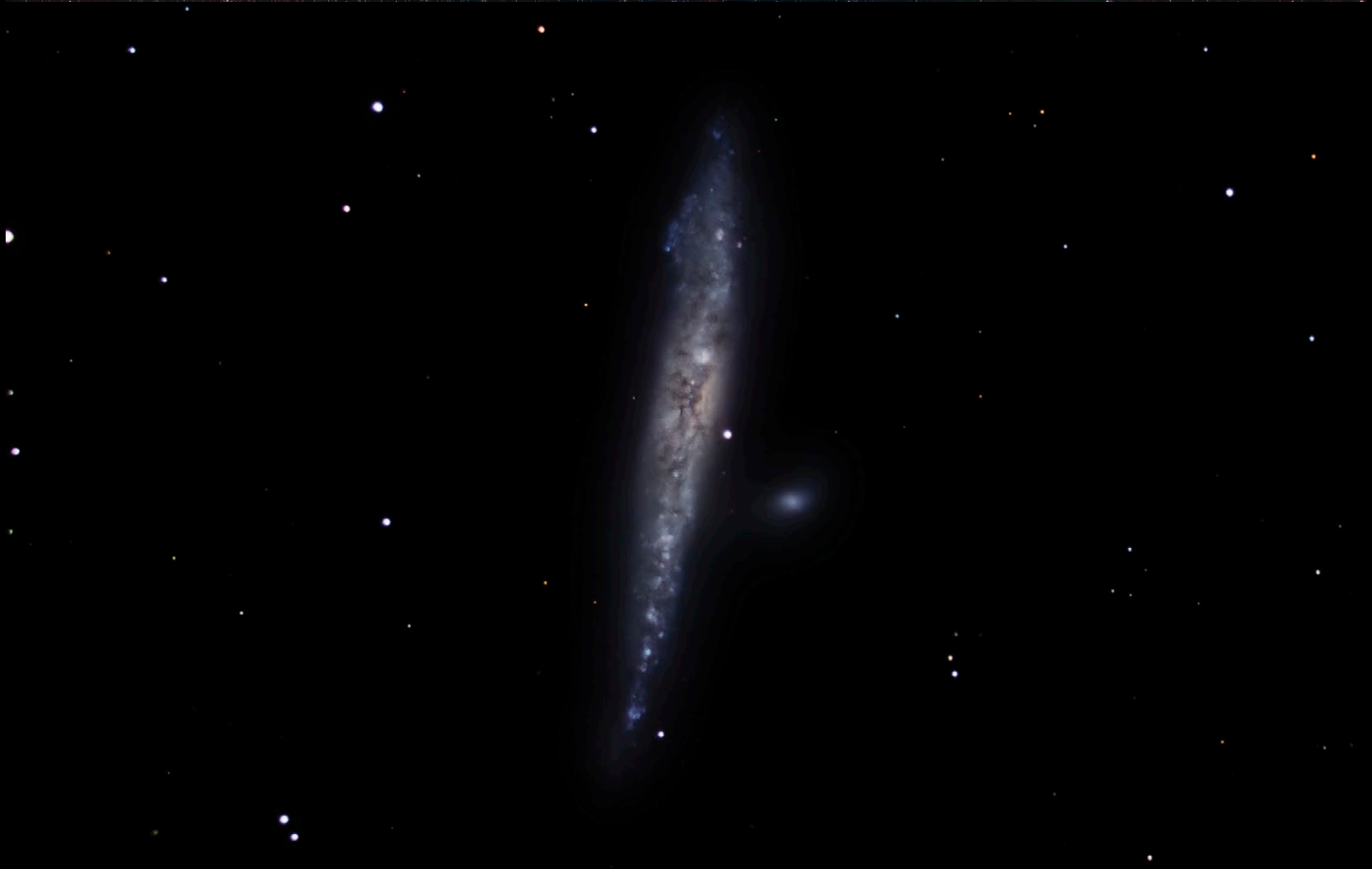
NGC 7000. North America Nebula by Eddie Hunnell. Above is the original from Jul 2021. Below is a reprocessed version using improved technology, the Xterminator tools.



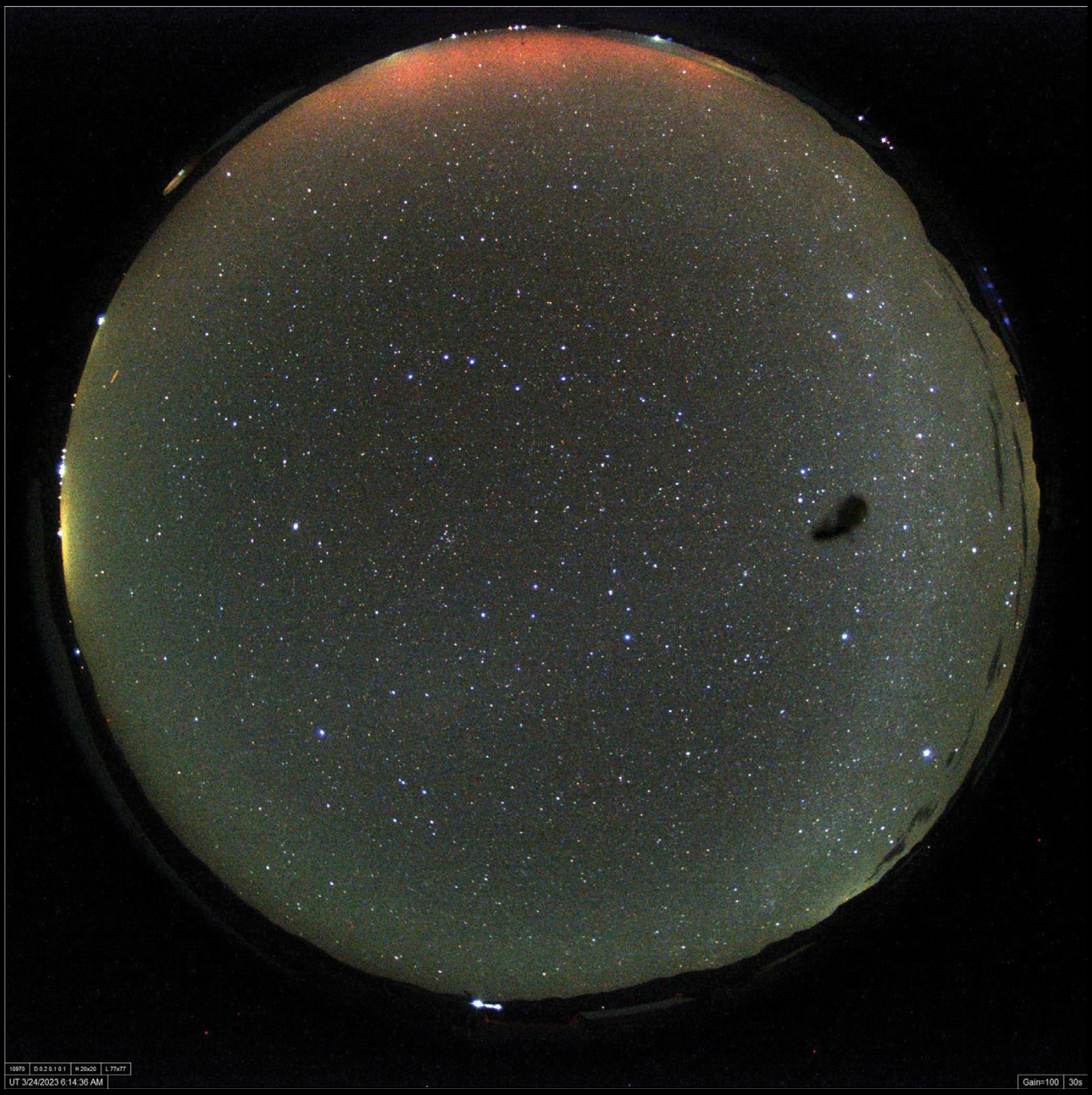
LDN 1228, LBN 552, 550 & 555 by David Elmore on Mar 12. From compressed molecular clouds new stars are can be formed. Here perhaps on the nose of the parrot or buried in Beverly Lynds Dark Nebula 1228 in the center. This is a wide field region far north in Cepheus. Below is the starless version.
Processing in PixInsight included use of Russell Croman's Star, Blur, and Noise XTerminator processes.
Vixen VSD100 F/3.8 quintuplet refractor. ASI6200MM Pro camera. Baader R, G, and B filters. 6 hours 40 minutes of 10-minute exposures from my remote observatory at Dark Sky New Mexico.



NGC 2244, Rosette Nebula by Rolando Garcia on Mar 5. About one hour exposure.



NGC 4631, Whale Galxy by Gary Garzone on Mar 29



Aurora from New Mexico by M. J. Post. On March 23 a severe magnetic storm caused aurora to be visible as far south as Florida and New Mexico. Image is from MJ & Tally's allsky camera at their observatory in Dark Sky New Mexico which is at 32 degrees south latitude.

NGC 4314 and NGC 4274 by M. J. Post on Mar 26.

There are two picturesque galaxies near one another in Coma Berenices. The upper left is NGC 4314, a face-on barred spiral 53 million l.y. away. There are better images showing its miniature "spiral galaxy within a galaxy" at the bar's center, but there's a hint of it here. This feature is thought to arise from a "nuclear starburst ring" of new star formation caused by dust and gas being sucked into the center after an encounter with a smaller galaxy.

In the lower right corner is NGC 4274, a mere 45 million l.y. distant. Its most interesting features are inward-spiraling dust lanes. A type II supernova (collapse of a massive star) occurred here in 1999 and was extensively studied. Actually, it occurred 45 million years before that!

This image is from DSNM using a PlaneWave CDK14 scope, a one-shot color camera, and 1.75 hours exposure time. Field of view is about 50 x 33 arc minutes.

PGC 29653 by M. J. Post on Mar 26.

NGC 3189 by M. J. Post on Mar 26.

NGC 4676 by M. J. Post on Mar 29

NGC 4151 by M. J. Post on Mar 26.

IC 443, NGC 2174, M33, Sh2-247 by Stephen Garretson on Mar 27

[40] 180s guided Ha
[40] 180s guided OIII [37]
180s guided SII Dual Borg 55
F3.6 Petzval Astrographs
Dual ASI 2600 MM Pro
Cameras

Filters:
Baader 3.5 nm Ha
Chroma 3 nm Ha
Chroma 3 nm OII
Chroma 3nm SII
Baader 8nm SII filters

April Newsletter 1993

From the president, Bob Spohn:
This month's 3rd quarter star party will be at the Crow Valley campground at the Pawnee Grasslands this Saturday, the 17th. You are encouraged to come early and bring friends and family and a dish to pass, as we will have a covered dish dinner starting at 5:30. This should give you enough energy to 'hang 10' while dissecting the "Realm of the Galaxies" for this month's Messiers!

Saturday, the 24th is Astronomy Day- probably our biggest day of the year. We will be setting up at Twin Peaks Mall at 9:00 and tear down at 5:00. This will be followed by public observing at Dawson park starting at dusk.

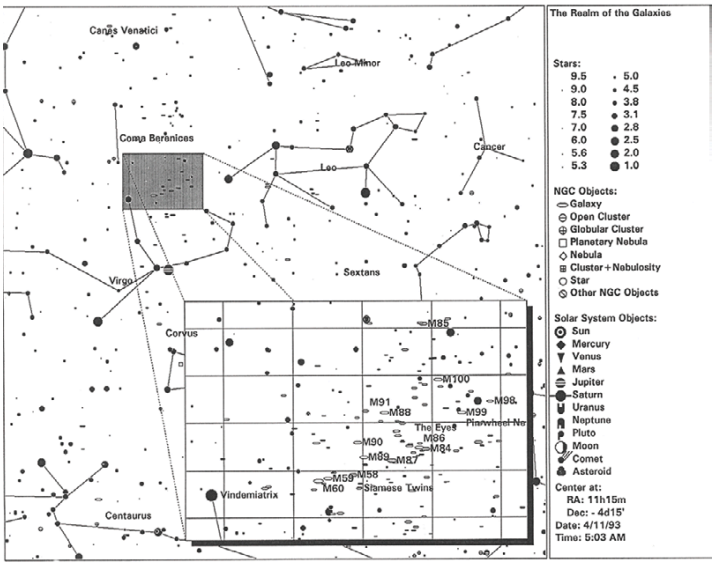
Congratulations to Steve Albers, who celebrated first light with his new 16' this month!

The LAS/NCAS will be conducting another Grazing Lunar Occultation Expedition coming up
early Sunday morning of May 16th. The graze will take place in the Ft. Collins vicinity, near the town of Alt. This graze happened during morning twilight, the star being occulted (19 Pisciem) is 4.8 mag. The star will play hide and seek on the dark northern limb of the 23% sunlit waning crescent . The moon will be 24° above the east-southeast horizon. Morning twilight will be getting fairly bright with a solar depression angle of 6.8°. The star should remain easily visible.
Details and more information on graze plans, contact Steve Albers.

The April Messier observing list is contained in an area of 10° declination and 1 hour of R.A. and is known as "the Realm of the Galaxies". Constellations involved this month include Coma Berenices and Virgo, also known as the "Coma-Virgo" area.

Map of "realm of the galaxies", pg. 11 ??
Insert Table "APRIL MESSIER OBJECTS " pg. 8 ??

May will bring warm weather, 11 globulars, and 2 open clusters found glowing in Hercules, Ophiuchus, and Scorpius.



APRIL MESSIER OBJECTS

M	NGC	R.A. 2000	DEC.	CONSTELLATION	TYPE
58	4579	12 37.7	+11 49	VIRGO	GALAXY
59	4621	12 42.0	+11 39	VIRGO	GALAXY
60	4649	12 43.7	+11 33	VIRGO	GALAXY
84	4374	12 25.1	+12 53	VIRGO	GALAXY
85	4382	12 25.4	+18 11	COMA BERENICES	GALAXY
86	4406	12 26.2	+12 57	VIRGO	GALAXY
87	4486	12 30.8	+12 23	VIRGO	GALAXY
88	4501	12 32.0	+14 25	COMA BERENICES	GALAXY
89	4552	12 35.7	+12 33	VIRGO	GALAXY
90	4569	12 36.8	+13 10	VIRGO	GALAXY
91	4548	12 35.4	+14 30	COMA BERENICES	GALAXY
98	4192	12 13.8	+14 54	COMA BERENICES	GALAXY
99	4254	13 18.8	+14 25	COMA BERENICES	GALAXY
100	4321	12 22.9	+15 49	COMA BERENICES	GALAXY

April Newsletter 2003

No newsletter was published

April Newsletter 2013

From the President, Bill Tschumy:
This is always a challenging time of year for astronomy in Colorado. Just as the weather warms, the clear skies seems to vanish, giving night after night of clouds. Let's hope the pattern breaks soon - after we get a bit more rain. Until then we will have to rely on spontaneous observing sessions on those few clear days. By next month the Pawnee Grassland should have dried out and we can more easily get out to darker skies.

Longmont Astronomical Society
PO Box 806, Longmont, CO
https://www.longmontastro.org

"M51" by Eddie Hunnell