

# **LONGMONT ASTRONOMICAL SOCIETY**

**JANUARY 2021**



**“MOON ON DEC. 29” BY BRIAN KIMBALL**

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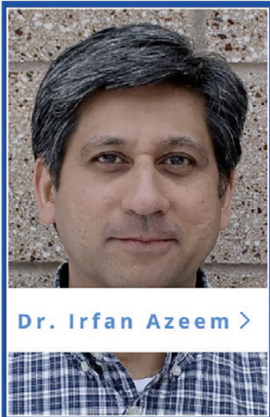
## LAS Meeting January 21 from 7 to 9 pm

### “The Super Soaker Sounding Rocket Experiment: How to Artificially Create Polar Mesospheric Clouds”

Irfan Azeem, Chief Scientist

**Atmospheric & Space Technology Research Associates (ASTRA), Louisville, CO**

In this presentation, I will discuss something that astronomers usually avoid: clouds. I will describe a recent NASA sounding rocket experiment that was designed to artificially create high altitude clouds, called polar mesospheric clouds (PMCs). The Earth's upper atmosphere (above 80 km altitude) is typically an extremely dry place, with water vapor mixing ratios measured in parts per million near 85 km altitude. The introduction of large quantities of water to the upper atmosphere, for example from rocket exhausts, can produce unexpected effects including the formation of PMCs. To better understand how concentrated water vapor parcels lead to PMC formation, NASA supported a rocket experiment called Supersoaker. Supersoaker was launched on 26 January 2018 from Poker Flat Research Range in Alaska and explosively released 200 kg of water vapor at 85 km altitude in a coordinated ground-based campaign to measure mesospheric clouds, temperature changes, and wind changes in response to the water vapor release. In this talk, I will present some highlights of the rocket experiment and the major advancement in our understanding of the generation of these PMCs.



Leveraging his decades of experience, Irfan leads a team of nearly 20 scientists working on cutting-edge space physics, including GPS receiver technology, ionospheric remote sensing techniques, data analytics, and remote sensing instrumentation. His expertise includes specialization in optical and radar remote sensing of the upper atmosphere, GPS signal processing, ionospheric physics, atmospheric dynamics, and advanced mathematical methods in scientific data analysis.

Prior to joining ASTRA, Irfan served as the Program Director, Space Weather Research, Division of Atmospheric and Geospace Sciences at the National Science Foundation (NSF).

About ASTRA:

ASTRA™ turns science into data, & data into knowledge.

Space affects us on Earth more than most realize. The complex systems of space weather dynamics interact with critical infrastructure both off and on Earth and impact the way we live, work, and play.

At ASTRA, we seek to better comprehend these systems through deep, fundamental knowledge of atmo-

spheric science and space weather dynamics. We provide the tools and data to understand and mitigate the influence space weather has on our daily lives. [Credits: text from [astraspace.net](http://astraspace.net), website for ASTRA, LLC]

## 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>. The Longmont Astronomical Society is a 501 c(3), non-profit corporation which was established in 1987. Our main goal is to promote local amateur astronomy. This is accomplished through regular monthly meetings, star parties and public observing sessions. Regular meetings are held every month (except December) on the third Thursday.

A broad spectrum of topics are covered at the meetings and include such things as deep sky observing, planetary imaging, narrow band imaging, equipment discussions and demonstrations just to name a few. These subjects are presented by both club members as well as special guests who are professional astronomers or experts in a particular field.



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.



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### **Nominations for 2021 LAS Officers and Board Members**

- Stephen Garretson, President
- M. J. Post, Vice President
- Sven Schmidt, Secretary
- Bruce Lamoreaux, Treasurer

Board Members:  
Mike Hotka, Gary Garzone,  
Brian Kimball, Vern Raben

### **Appointed Positions 2021**

Paul Kammermeier, Webmaster  
Vern Raben, Newsletter Editor

## Solar System Highlights for January 2021



Third Quarter: Jan 6 at 2:03 am

New Moon: Jan. 12 at 10:01 pm

First Quarter: Jan. 20 at 2:03 pm

Full Moon: Jan. 28 at 12:17 pm

Image Credit: Brian Kimball

### Mercury

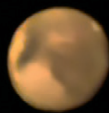
Mercury becomes visible very low in the evening sky after the 16th. It will be -0.9 magnitude on the 16th and fades to +1.5 at end of the month. During that time its apparent size increases from 5.9 arc sec to 9.1 arc sec.

### Venus

Venus is visible low in the southeastern morning sky until about the 18th. It is -3.9 magnitude in brightness and the disk is 11 arc sec across.

### Mars

Mars is visible high in the evening sky in constellation Pisces; it moves to Aries on the 5th. On the 1st it is magnitude -0.2 in brightness and 10 arc sec across. On the 31st it is +0.4 in brightness and 7.8 arc sec across.



Mars on Dec 1 by MJ Post

### Jupiter

Jupiter is very low in the west southwest; it disappears into the bright evening twilight around the 9th.

### Saturn

Saturn is not visible this month.

### Uranus

Uranus may be seen high in the evening sky in constellation Aries. It is magnitude +5.7 in brightness and its disk is 3.6 arc sec across.

### Neptune

Neptune is visible low in the southwest in the evening sky in constellation Aquarius. It is magnitude 7.9 in brightness and the disk is 2.2 arc sec across.

### Meteor Showers

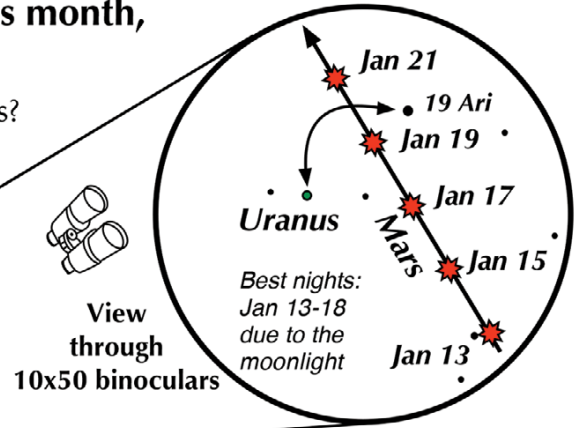
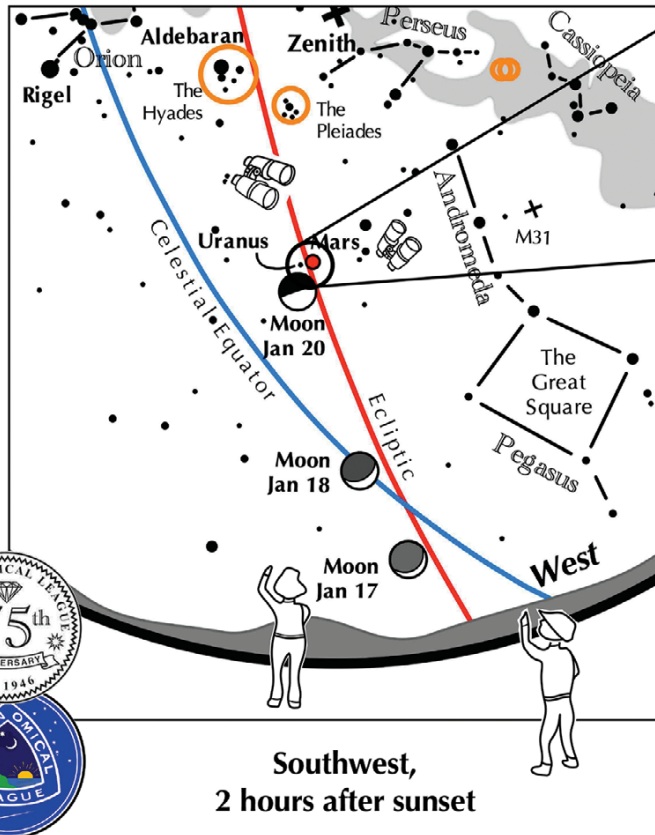
The Quadrantid meteor shower peaks on the night of January 3 - 4. Moon interferes though so only brightest ones will be visible.



Comet C/2020 M3 (ATLAS) on Dec. 7 by Gary Garzone

## If you can observe only one celestial event this month, consider this one:

Have you ever seen the dimmest of the six visible planets?  
Here is your chance to spot Uranus in binoculars.



### Mars meets Uranus

Look to the west 2 hours after sunset in mid January.

- In the west, shines Mars sporting an orange red tint.
- On the nights of January 13 through January 21, easy-to-spot Mars will move past faint Uranus.
- Use binoculars and the map to spot the planetary pair. The 5.7 magnitude star 19 Arietis is the same brightness as Uranus.
- On January 17, Uranus lies 1.8 billion miles from viewers on Earth, while Mars is only 99 million miles away.
- The passing and brightening moon makes viewing more difficult on the nights after January 18. The planets will be slightly more than 1 binocular field to the upper right of the first quarter moon on Jan. 20.

## Newsletter Archives

### 10 Years Ago - Jan. 2011



Pleiades by LAS member Brian Kimball



M31 by LAS member Jim Pollock  
Longmont Astronomy Society Newsletter  
January 2011

The annual banquet is at the Armadillo Restaurant 700 Ken Pratt Blvd. Bill Possel will talk about the MAVEN project. The past year was

a productive one for LAS: Allsky camera is installed and running on a NOAA tower on Niwot Ridge. Brian Simpson completed scanning 16 years of newsletters. Several LAS members were featured in fall issue of Longmont Magazine. Brian & Gary took great images.

### 20 Years Ago - Jan. 2001



Pleiades by LAS member Brian Kimball



M31 by LAS member Jim Pollock  
Longmont Astronomy Society Newsletter  
January 2011

The annual banquet meeting was at Anderson Farms in western Weld County. Matt Morgan of the Colorado Geological Survey gave a detailed description of meteorite

mineralogy. He showed us several large specimens of meteorites. Dr. Bob Stencil gave a short talk about getting some efficient lighting legislation enacted.

### 30 Years Ago - Jan. 1991



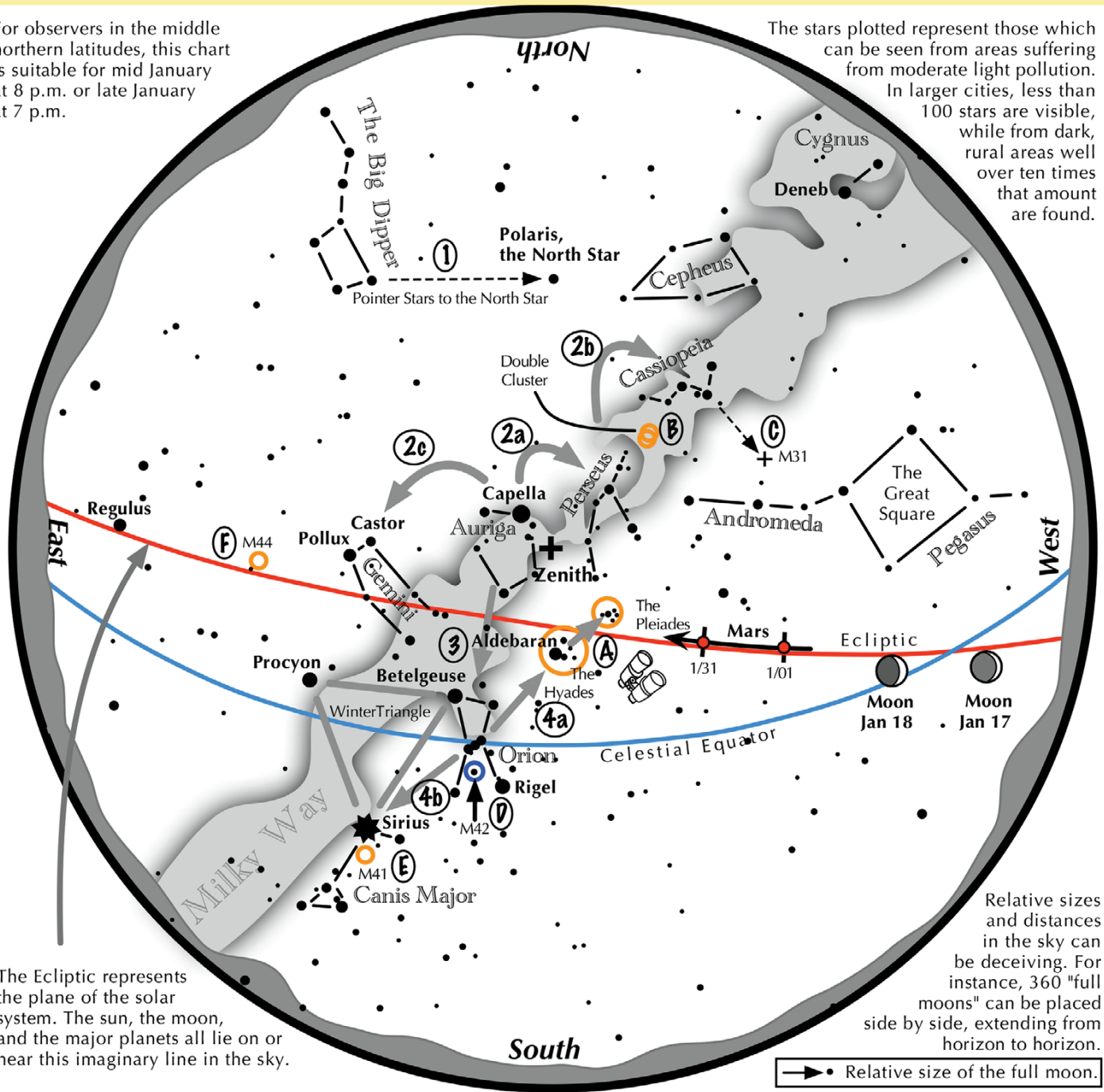
Dr. Bob Stencil from CU gave a presentation about what is going on in professional astron-

omy and an update on the valuable science the Hubble Space Telescope is doing. Ray Martin of Martin's Star Tracker gave a presentation on "What Astronomy Means to Me". He explored many dimensions amateurs can take and the significant contributions they can make. Brian Kimball was "rookie of the year" for photography. Steve Albers noted for grazing occultation calculations.

# Navigating the mid January Night Sky by John Goss

For observers in the middle northern latitudes, this chart is suitable for mid January at 8 p.m. or late January at 7 p.m.

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 winter night sky: Simply start with what you know or with what you can easily find.

- 1 Above the northeast horizon rises the Big Dipper. Draw a line from its two end bowl stars upwards to the North Star.
- 2 Face south. Overhead twinkles the bright star Capella in Auriga. Jump northwestward along the Milky Way first to Perseus, then to the "W" of Cassiopeia. Next Jump southeastward from Capella to the twin stars Castor and Pollux of Gemini.
- 3 Directly south of Capella stands the constellation of Orion with its three Belt Stars, its bright red star Betelgeuse, and its bright blue-white star, Rigel.
- 4 Use Orion's three Belt stars to point to the red star Aldebaran, then to the Hyades, and the Pleiades star clusters. Travel to the southeast from the Belt stars to the brightest star in the night sky, Sirius.

### Binocular Highlights

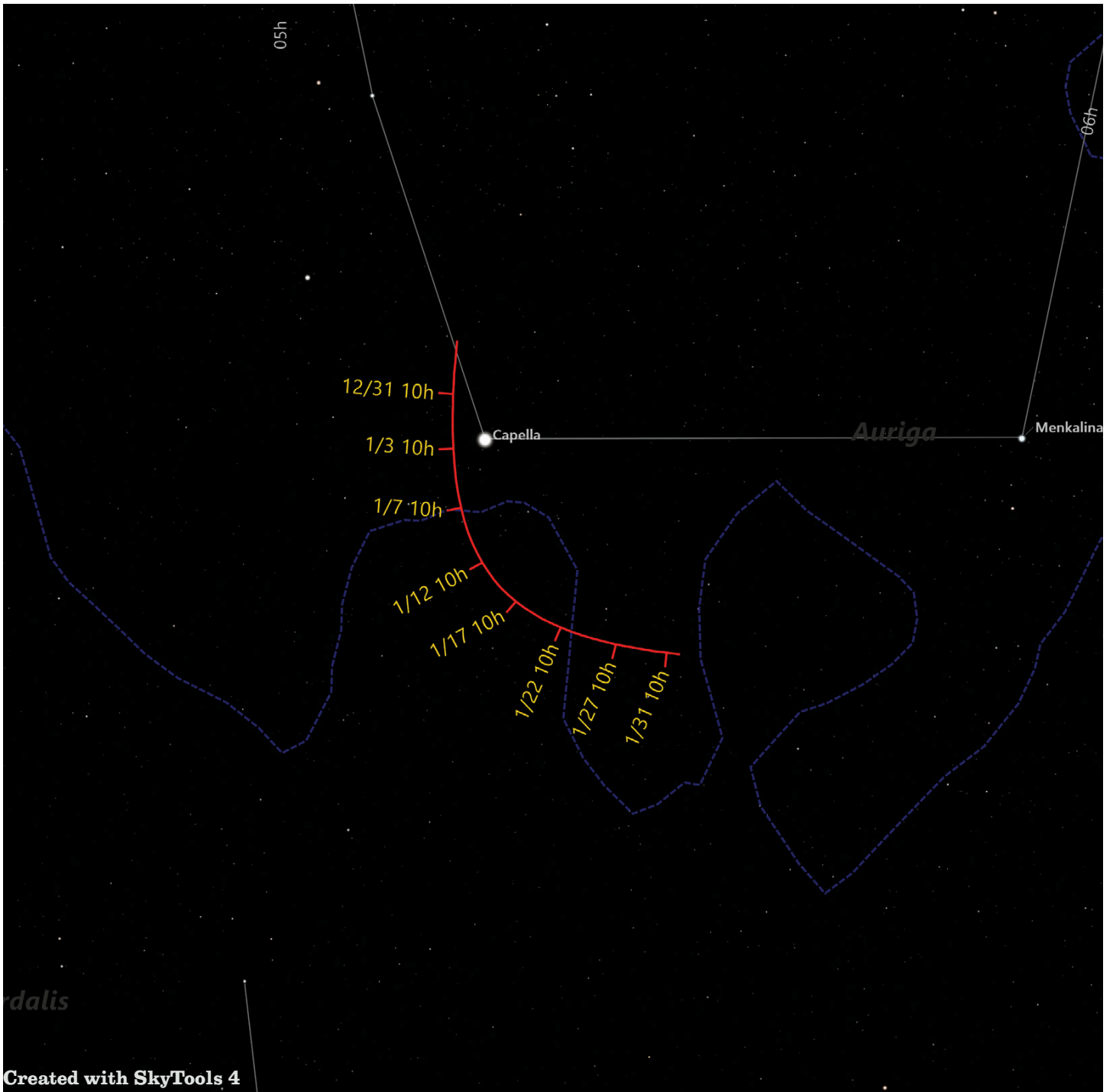
- A: Examine the stars of the Pleiades and Hyades, two naked eye star clusters.
- B: Between the "W" of Cassiopeia and Perseus lies the Double Cluster.
- C: The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval.
- D: M42 in Orion is a star forming nebula. E: Look south of Sirius for the star cluster M41. F: M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux.



Astronomical League [www.astroleague.org/outreach](http://www.astroleague.org/outreach); duplication is allowed and encouraged for all free distribution.

# Comets in January

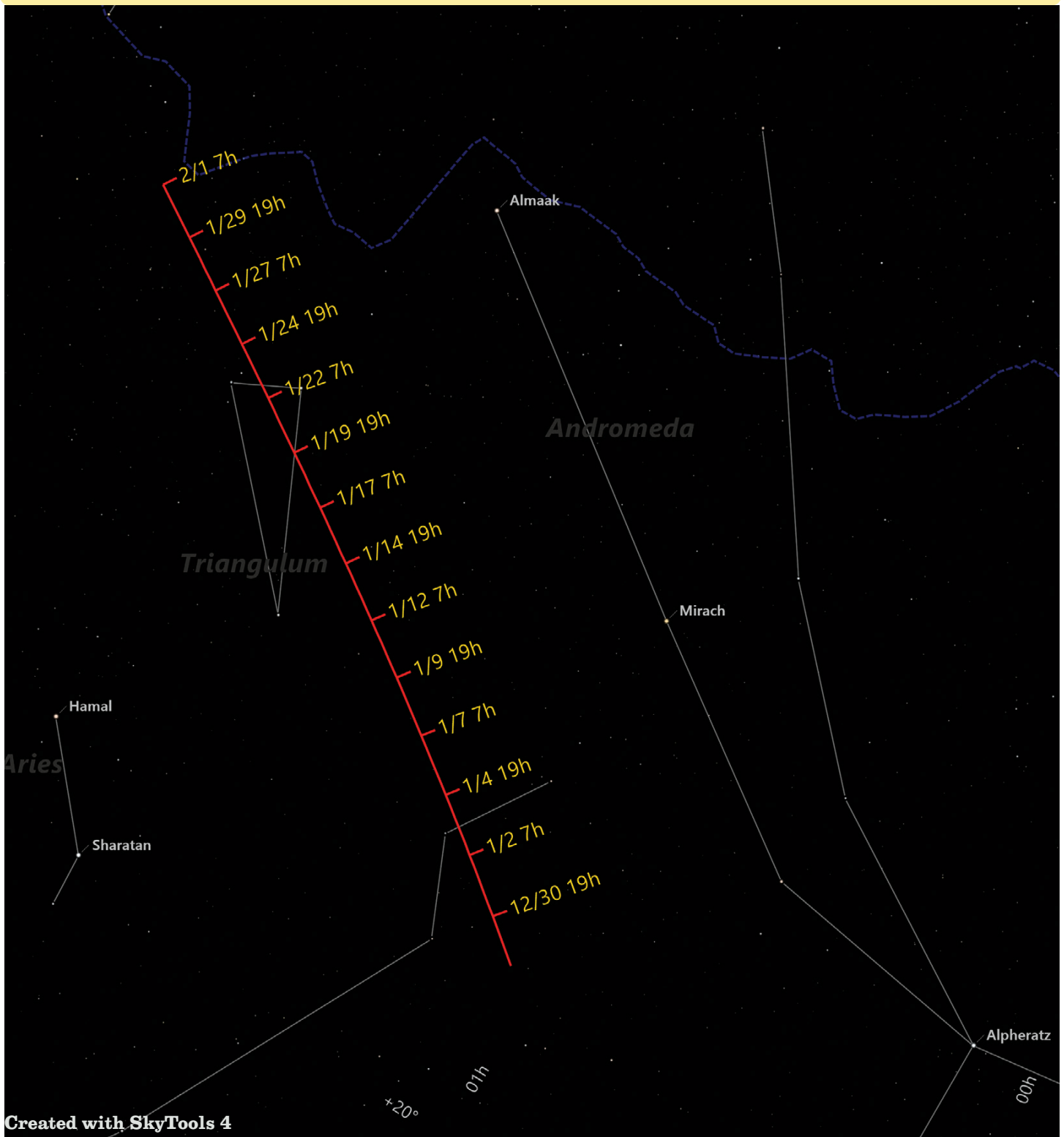
## C/2020 M3 (ATLAS)



Created with SkyTools 4

Date	Optimal time	RA	Dec	Brightness	Size (arc min)	Constellation
Jan. 1	07:28p	05h15m31.7s	+45°30'20"	10.6	4.6	Auriga
Jan. 8	09:59p	05h17m10.8s	+47°15'29"	11.1	4.0	Auriga
Jan. 15	09:35p	05h20m47.4s	+48°07'59"	11.5	3.6	Auriga
Jan. 22	08:53p	05h26m14.4s	+48°35'42"	11.9	3.2	Auriga
Jan. 29	06:40p	05h33m13.4s	+48°45'30"	12.3	3.1	Auriga

# 156P (Russel)



Created with SkyTools 4

Date	Optimal time	RA	Dec	Brightness	Size (arc min)	Constellation
Jan. 1	06:37 pm	01h15m14.8s	+27°00'57"	10.5	4.2	Pisces
Jan. 8	06:39 pm	01h34m14.0s	+29°51'23"	10.7	3.9	Triangulum
Jan. 15	06:43 pm	01h54m09.8s	+32°18'56"	11.0	3.6	Triangulum
Jan. 22	06:47 pm	02h14m52.1s	+34°24'59"	11.2	3.4	Triangulum
Jan. 29	06:40 pm	02h36m08.9s	+36°10'45"	11.5	3.1	Triangulum



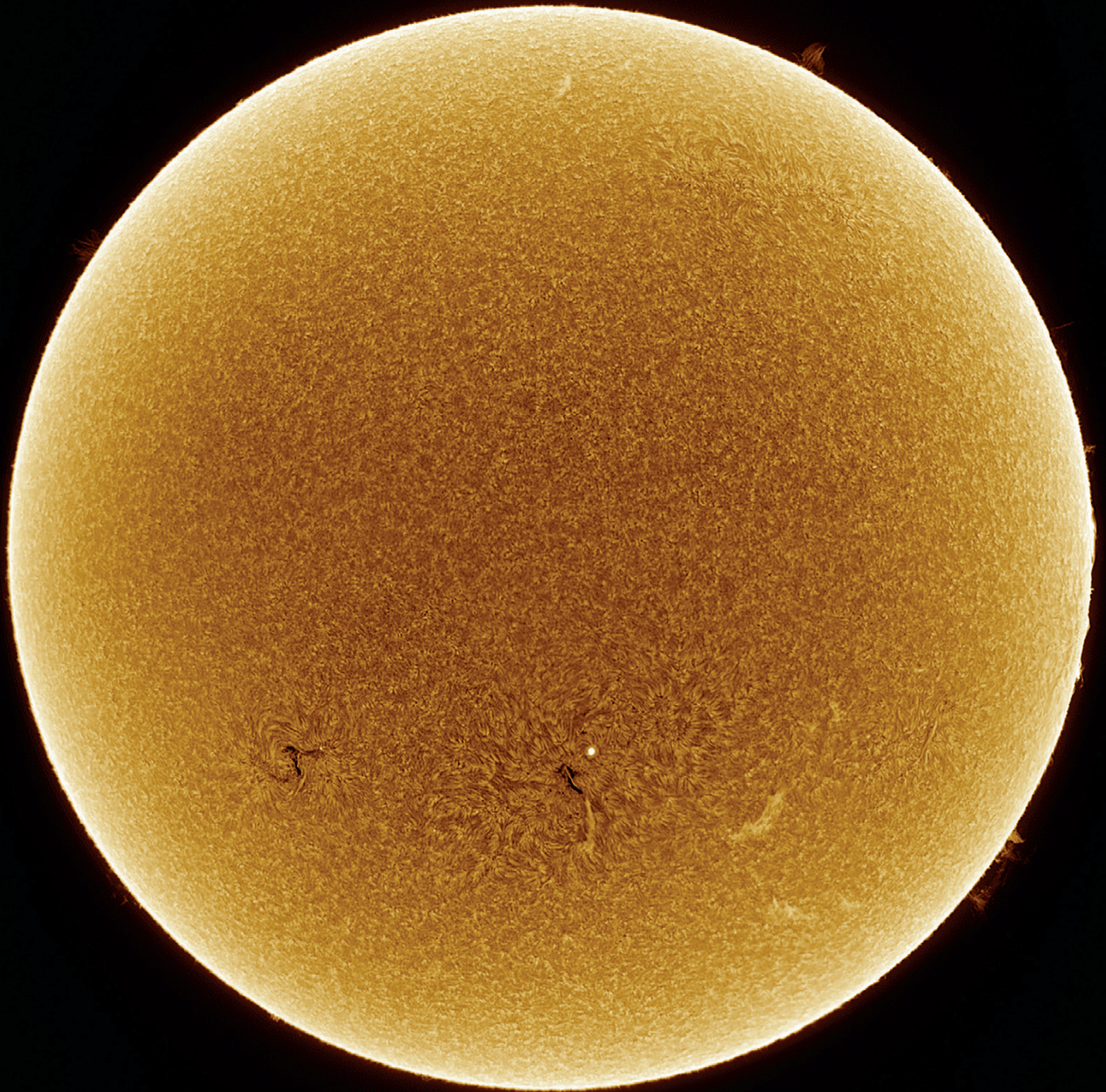
## Member Images from December 2020



About 50 people were watching the Jupiter-Saturn conjunction at Sandstone Ranch on Dec 21. Photo by John Warren

View of the Jupiter-Saturn conjunction through a 127 mm refractor with 2X barlow and Canon EOS camera by Brian Kimball





**“Sun in H-Alpha on Dec. 6” by Brian Kimball**



**“Heart and Soul in HOO” by David Elmore**



**“California Nebula” by Eddie Hunnell**



**“M101, the Pinwheel Galaxy” by Eddie Hunnell**



**“Jupiter and Saturn conjunction on Dec. 20” by Gary Garzone**

**Christmas Star**



**"Sharpless 2-240, the Spaghetti Nebula" by Stephen Garretson**





**"Tadpoles" by Marty Butley**





**“Thor’s Helmet” by Marty Butley**



**“B33, Horsehead Nebula” by M. J. Post**



**“Orion’s Belt” by Stephen Garretson**



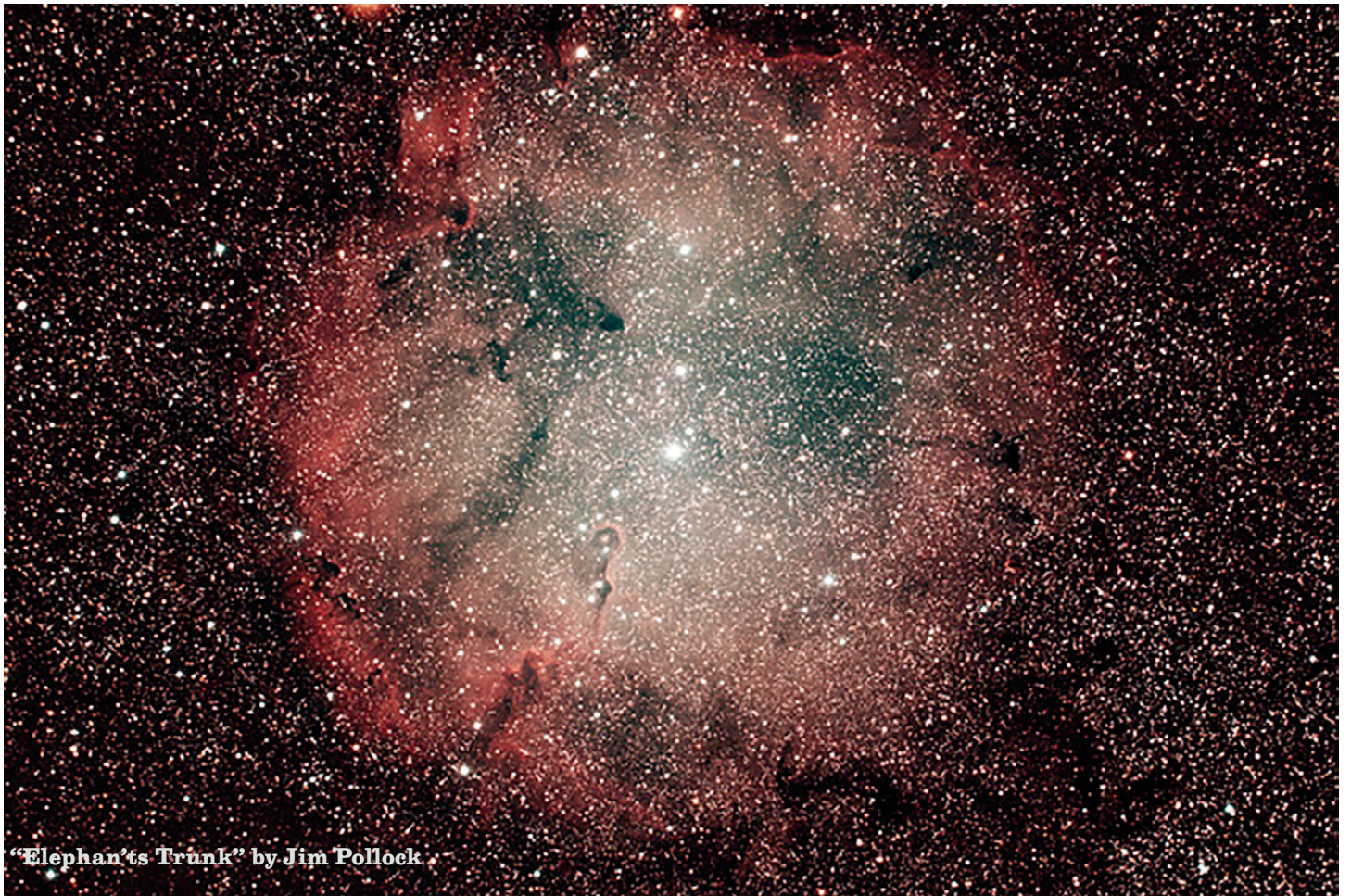
**“M101, the Pinwheel Galaxy” by M. J. Post**



**“Heart” by Tally O’Donnell**



**“Soul by Tally O’Donnell**



**“Elephant’s Trunk” by Jim Pollock**



**“Soul Nebula” by Jim Pollock**

# Summary of Dec. 17, 2020 Meeting

## Presentation on “How to do Virtual Star Parties” by Dr. Brian Otum

Format of Brian Otum’s presentation was mainly a question and answer session. LAS members have expressed interest in hosting some “virtual” star parties for the public. It seems likely that we will not be able to host “in-person” star parties until sometime this summer or perhaps next fall.

Light pollution is a serious problem in Michigan so Brian toured the southwest about seven years ago researching different telescope farms so that he could operate his equipment remotely. These facilities provide basics such as a pier to mount your equipment, shelter (usually a building with a roll-off roof), electric power, internet, and security. They provide varying levels of support. Some are for do it your-selves and don’t do much more than turning power on/off or moving something. Others provide extensive services to get you running and support your operation. Prices vary from about \$500 per month to \$1500 or so.

To control your telescope and cameras you connect to your PC at the dark site facility using remote desktop

software such as “AnyDesk” <https://www.anydesk.com> or “TeamViewer” <https://www.teamviewer.com/en>

Brian Otum moved his telescope equipment from Ann Arbor, MI to Dark Sky New Mexico near Lordsburg, NM. Dark Sky New Mexico is mostly a “do-it-yourself” facility.

Getting the mount aligned and everything working can be time consuming and difficult. Several long trips to the dark site facility are necessary to get everything running correctly.

To do public star party presentations Brian recommends that we broadcast them on YouTube Live. He recommends that we use OBS Studio software see <https://obsproject.com>. This software allows anything appearing on your desktop to be broadcast on Youtube or Facebook Live. You may overlay video of a remote telescope, the speaker, static images, etc. With some practice the presentation can have a professional appearance.

The telescope can be local; it does not need to be at a dark site. Not having a dark site means you will need a “fast” scope such a Celestron RASA or Fastar, or a short tube refractor.

You may also “live stack” using software such as SharpCap <https://www.sharpcap.co.uk>

His Recommendations:

Do not twiddle with a cameras settings in front of the public; they will hate it. It is best to rehearse in advance on a particular object so that you know exactly what settings you will need to use.

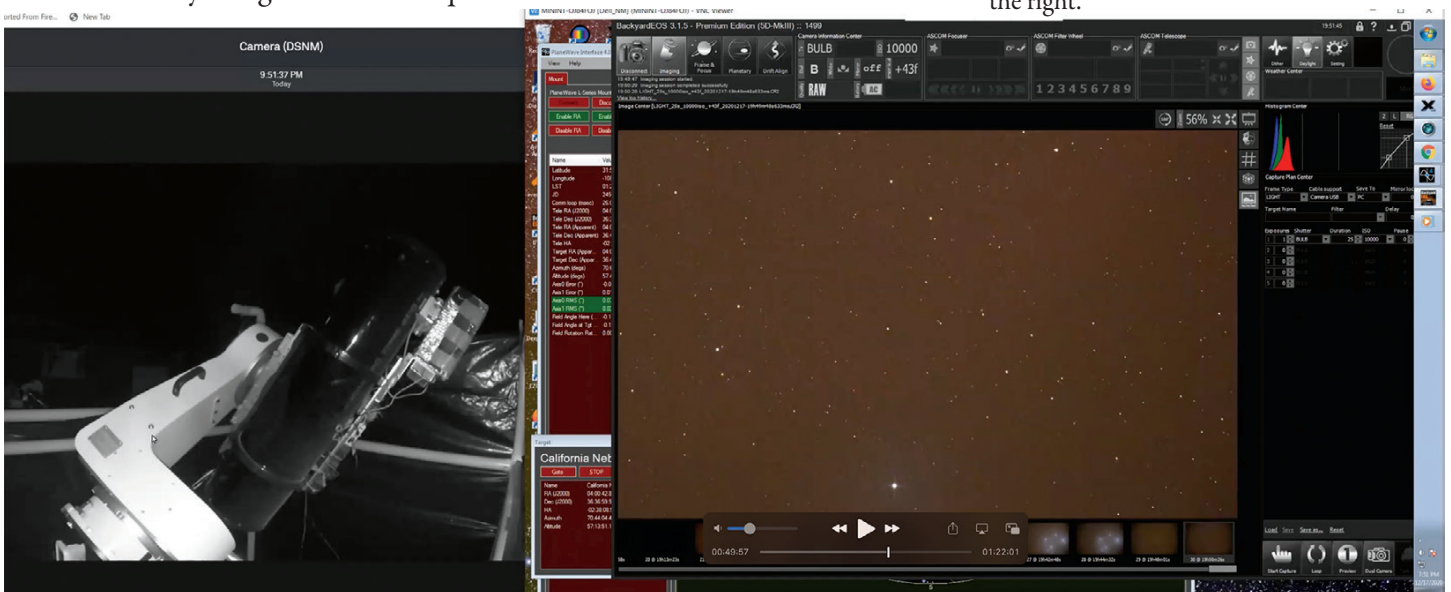
During the presentation you need to talk while some operation or exposure is in progress.

You should encourage the public to text you questions. Once you get this started they will become interested and your presentation will go well.

Ideally two people should do the presentation. One person should talk about the science and the other operate the equipment.

Zoom is not recommended for public presentations as there is no way you can prevent obscene or other bad behaviour.

Below: Brian’s typical screen setup. Live video of the scope on the left; middle image from scope’s camera. Scope & camera controls on the right.



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