

# LONGMONT ASTRONOMICAL SOCIETY

MARCH 2026

SH 2-181, CHILE DOG NEBULA  
BY M. J. POST

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## Next LAS Meeting on Thursday March 19 at 6 to 9 pm Member Presentations

The next LAS meeting is 7 pm next Thursday, March 19, at the First Evangelical Lutheran Church, 803 Third Avenue, Longmont, CO 80501.

The meeting this month is "open forum". LAS members are invited to give a 5 to 10 minute (or so) presentation on an astronomy related topic.

Tell us something about:

- An observing or imaging project that you are doing
- Good things and/or bad things about some equipment you have purchased
- Talk about an image you have taken - something about it, equipment used, how you processed it
- About anything astronomy related that interests you will probably interest others as well

Daniel Williams is going to do a show and tell about the SeeStar Telescope. Gary may do a "constellation of the month" talk like we used to do a quite while ago.

You may present in-person or via Zoom.

It would be helpful if you let me know that you are interested in presenting and the topic (email: [vern@raben.com](mailto:vern@raben.com)) before the meeting.

### Location

The meeting will be at 7pm in the First Evangelical Lutheran Church, 803 Third Avenue, Longmont, CO 80501. It will also be available to LAS members on Zoom.

## 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 Mike Hotka. 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.



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### LAS Officers

President: Vern Raben  
 Vice President: Gary Garzone  
 Secretary: Eileen Hall-McKim  
 Treasurer: Bruce Lamoreaux

### LAS Board of Directors

Mike Hotka  
 Brian Kimball  
 Tally O'Donnell  
 M. J. Post

### Appointed Positions

Webmaster: Mike Hotka  
 Library Telescope Coord.: Bruce Lamoreaux  
 Pubic Outreach Coord.: Aref Namdari  
 Newsletter: Vern Raben and Eileen Hall-McKim

## Front Cover: Sh 2-181, Chile Dog Nebula by M. J. Post



This is a crop of the upper left corner of a wider view that I'll post soon. 183 is top-most and 181 is below and to the right. SH2-183 has a tulip shape, in my mind's eye, but tipped at a different angle than its more famous counterpart.

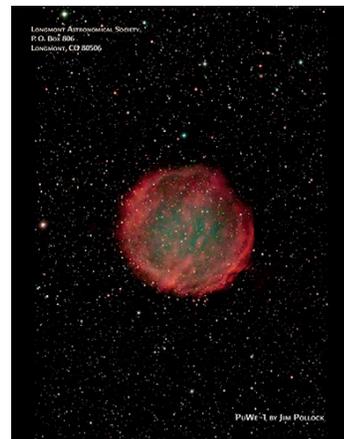
Beside both being H-alpha emitters as required

of Sharpless objects, they both have SII and OIII signals too. This (HS)OO rendition highlights the multiple layers of SH2-181 that undoubtedly gave it its nickname of the "Chili-Dog" nebula. Both are in Cassiopeia, so both are embedded in a myriad of Milky Way stars. Severe star reduction was therefore applied to help reveal nebular structures.

From DSNM, 3 hours each filter, RASA telescope, ASI 6200MM camera. FOV is about 66 x 44 arc minutes.

M.J. Post

## Back Cover: PuWe-1 by Jim Pollock



There are about 1500 known planetary nebulae in our Milky Way Galaxy. Out of those, the nearest to earth and 2nd largest of them all is PuWe-1 discovered by Austrian astronomers Alois Purgathofer and Ronald Weinberger. Hence the easier to manage name PuWe-1. (As best as I can tell, that was it. There's no PuWe-2). This planetary is 20' across, about 40% of the apparent size of the full moon,. So it's big!!

Despite it being very close to us (1500 ly), it is very old and has expanded so wide that its surface brightness is quite dim and virtually impossible to see visually. I have found it quite difficult to photograph locally from Longmont. But, with those Bortel 1 Skies of Texas, I finally picked up a good image this week.

This image is from 50 frames of 5-minutes each, or about 4 hours of exposure with my 9.25" EdgeHD at f/2 Hyperstar. Cropped pretty significantly. Imaged with the ZWO 2600mc Duo color camera with no moon and an L-Extreme filter to really get down on the Hydrogen reds!!

While this planetary will continue to expand, it won't appear to visually... it has already reached a size where the remains of the central star is not bright enough to "light up" more distant gases.

This information was mostly condensed from Astronomy Magazine and Wikipedia.

Keep skyward!!!

Jim

## Planets in March

### Mercury

Mercury is not visible this month.

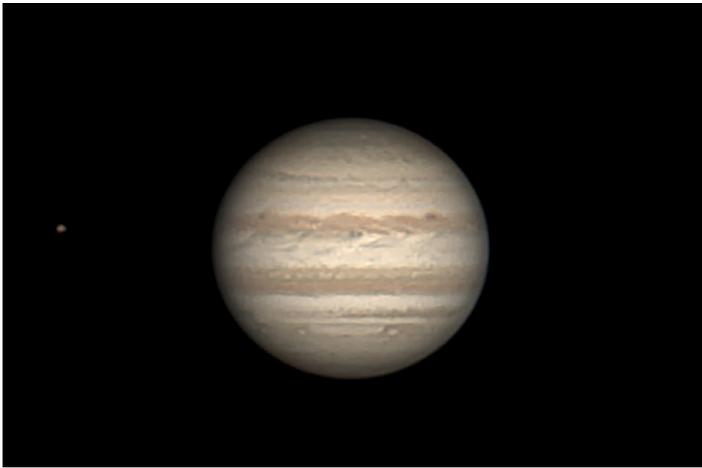
### Venus

Venus is visible in the evening sky in the west. It is magnitude -3.9 in brightness and its full disk is around 10 arc sec across.

### Mars

Mars is not visible until the end of May when it re-appears in the morning sky.

### Jupiter



Io and Jupiter at 9:55 pm on Feb 5 by Brian Kimball

Jupiter is in constellation Gemini. Best time to view Jupiter is between 8 and 9 pm. On the first it is -2.5 magnitude in brightness and the disk is 43 arc sec across. By the 31st it is 39 arc sec across and -2.3 magnitude. Some good times to view the Great Red Spot are listed in the table below.

Date	Time	Altitude	Date	Time	Altitude
Mar 2	10:03 pm	64°	Mar 17	12:38 am	36°
Mar 4	11:41 pm	45°	Mar 19	10:09 pm	62°
Mar 5	7:33 pm	73°	Mar 21	11:48 pm	42°
Mar 7	1:20 am	24°	Mar 22	7:39 pm	73°
Mar 7	9:12 pm	69°	Mar 24	1:27 am	22°
Mar 9	11:50 pm	51°	Mar 24	9:18 pm	67°
Mar 10	7:42 pm	69°	Mar 26	10:57 pm	48°
Mar 12	1:29 am	30°	Mar 29	12:36 am	28°
Mar 12	9:21 pm	73°	Mar 29	8:28 pm	71°
Mar 14	11:00 pm	56°	Mar 31	10:07 pm	54°

### Saturn

Saturn is visible in binoculars the first week of March but disappears into the evening twilight. It will re-appear in the morning sky around the first week of May.

### Uranus

Uranus is visible in the early evening in constellation Taurus. It is +5.8 magnitude in brightness and the disk is 3.5 arc sec across.

### Neptune

Neptune has disappeared into the bright evening twilight. It will re-appear in the morning sky about the first week of June.

## Lunar Phases in March

Mar 3 at 4:39 am - Full Moon

Mar 11 at 3:49 am - Third Quarter Moon

Mar 18 at 7:25 pm - New Moon

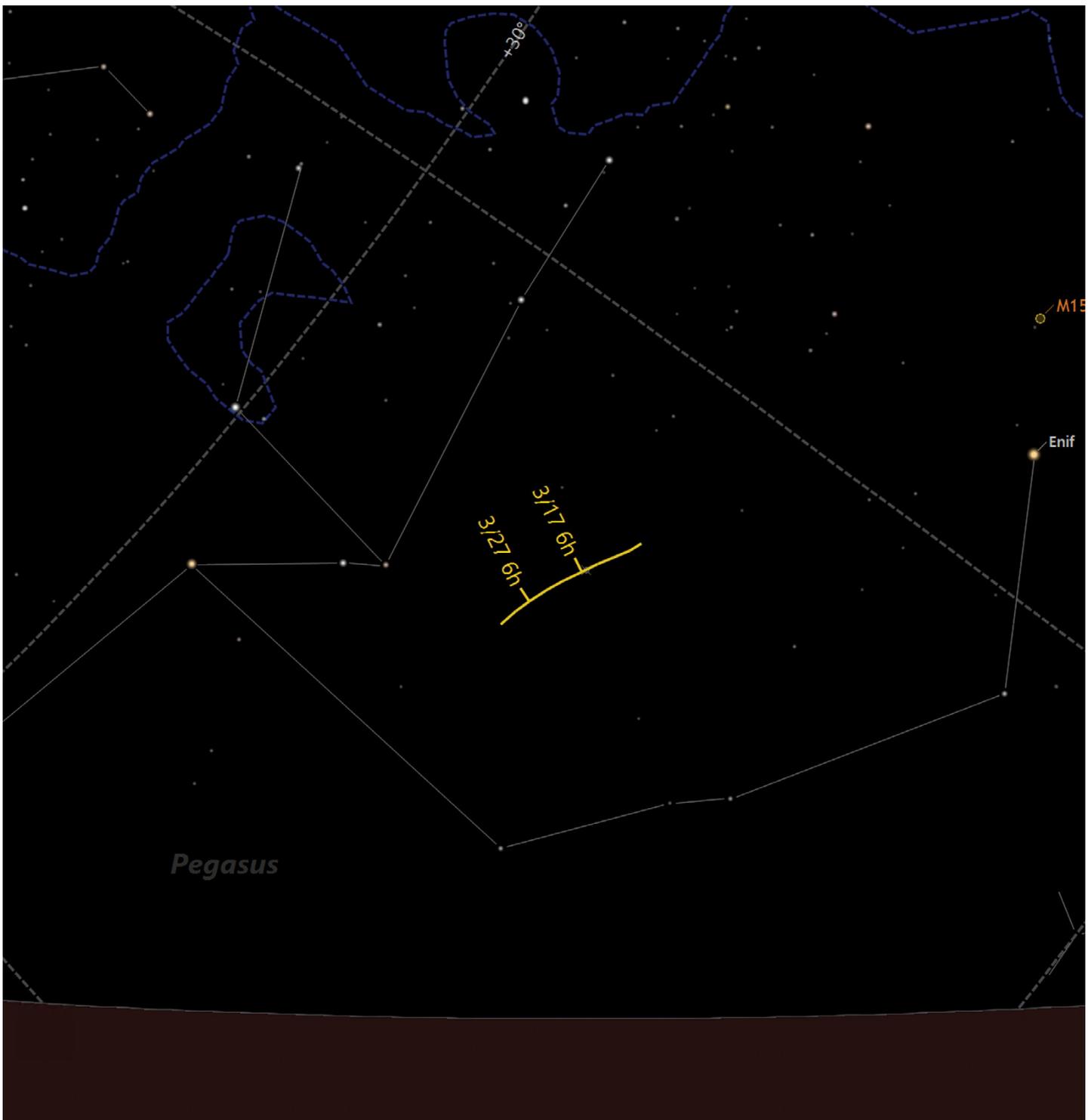
Mar 25 at 1:19 pm - First Quarter Moon



Third Quarter Moon on Mar 11 by NASA visualization Studio

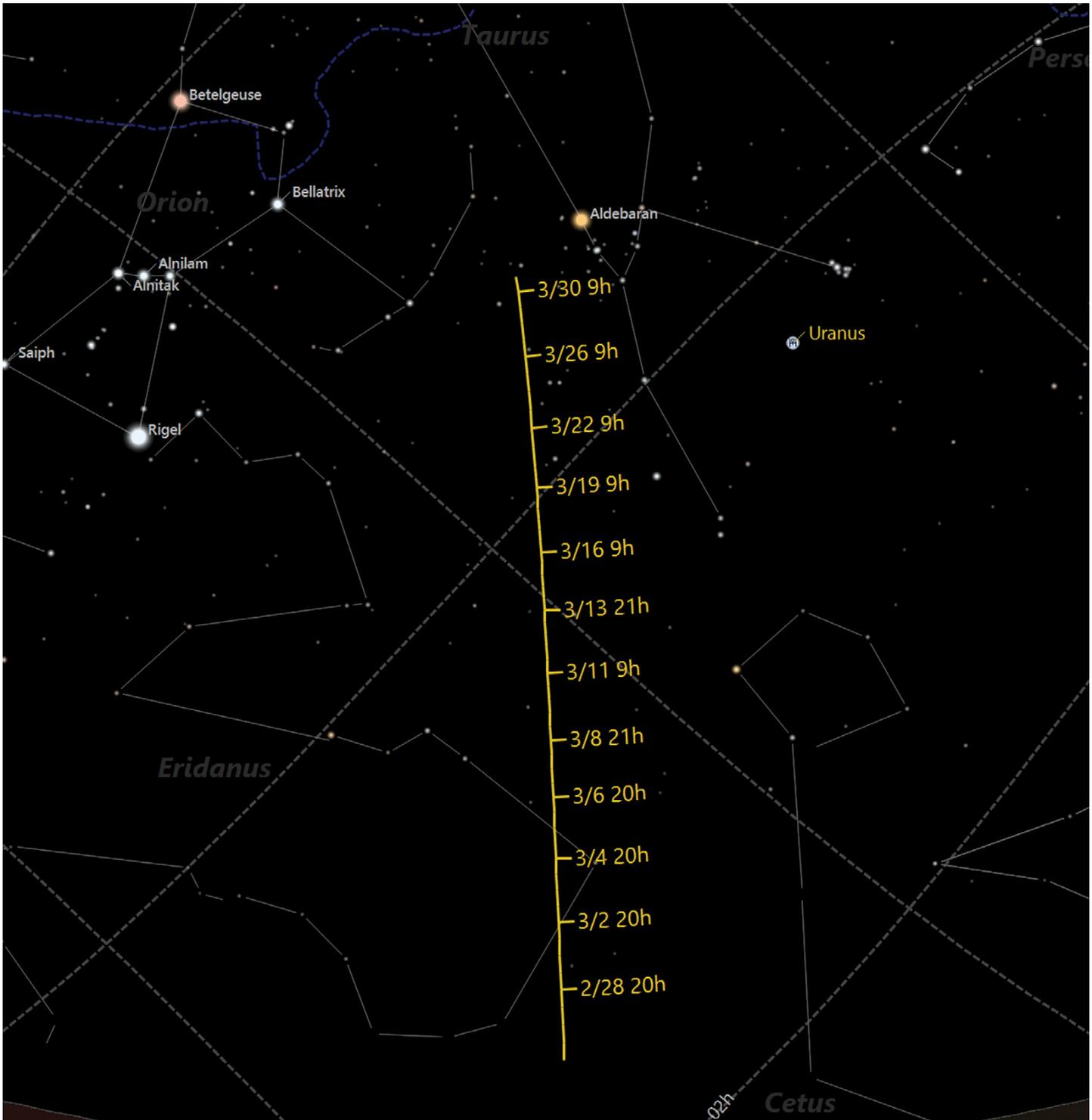
## Meteor Showers in March

There are no class 1 meteor showers in March.



Date	Optimal time	RA	Dec	Constellation	Magnitude	Size (arc min)
Mar 1	Not visible					
Mar 7	6:09 am	22h27m40.4	+18°21'30"	Pegasus	9.6	1.9
Mar 13	5:58 am	22h30m28.3s	+18°42'50"	Pegasus	8.5	2.0
Mar 19	5:48 am	22h33m50.1s	+19°06'44"	Pegasus	7.2	2.2
Mar 25	5:40 am	22h38m21.7s	+19°30'59"	Pegasus	6.7	2.4
Mar 31	5:32 am	22h45m26.8s	+19°51'14"	Pegasus	4.1	2.8

# Comet C/2024 E1 (Wierchchos)

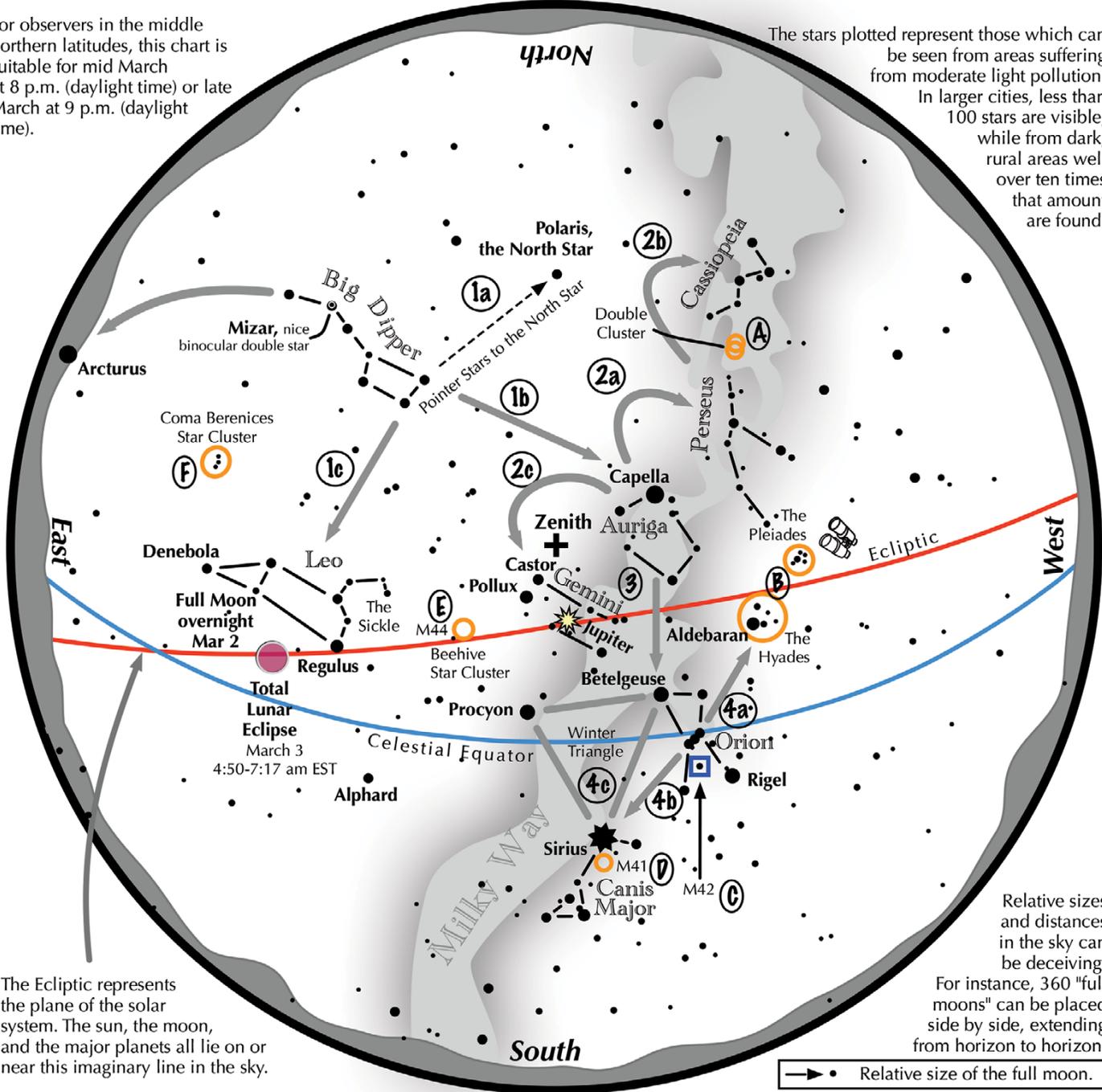


Date	Optimal time	RA	Dec	Constellation	Magnitude	Size (arc min)
Mar 1	7:13 pm	02h48m43.3s	-13°47'57"	Eridanus	8.9	3.1
Mar 7	7:22 pm	03h18m46.7s	-06°35'02"	Eridanus	9.5	2.9
Mar 13	8:30 pm	03h43m42.1s	-00°27'28"	Eridanus	10.1	2.6
Mar 19	8:38 pm	04h04m54.2s	+04°36'44"	Taurus	10.7	2.4
Mar 25	8:46 pm	04h23m23.3s	+08°46'22"	Taurus	11.2	2.2
Mar 31	8:51 pm	04h39m51.0s	12°11'23"	Taurus	11.7	2.0

# Navigating the mid March Night Sky

For observers in the middle northern latitudes, this chart is suitable for mid March at 8 p.m. (daylight time) or late March at 9 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 March 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. Its top bowl stars point west to Capella in Auriga, nearly overhead. Leo reclines below the Dipper's bowl.
- 2 From Capella jump northwestward along the Milky Way to Perseus, then to the "W" of Cassiopeia. Next jump southeastward from Capella to the twin stars of Castor and Pollux in 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 northwest to the red star Aldebaran and the Hyades star cluster, then to the Pleiades star cluster. Travel southeast from the Belt stars to the brightest star in the night sky, Sirius. It is a member of the Winter Triangle.

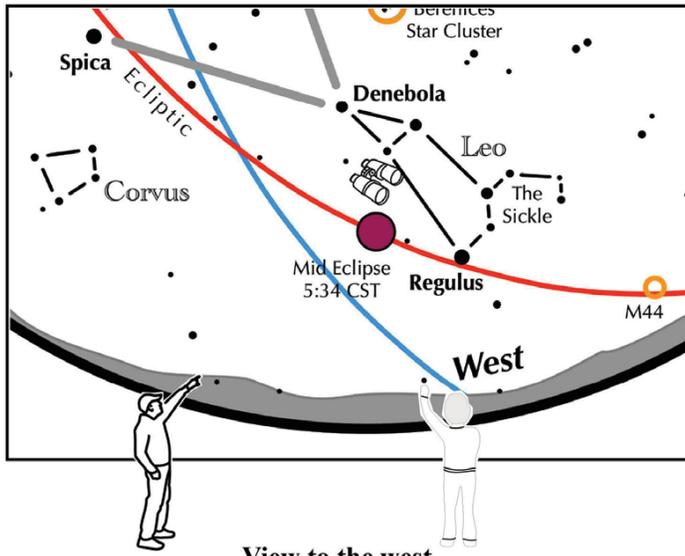
### Binocular Highlights

A: Between the "W" of Cassiopeia and Perseus lies the Double Cluster. B: Examine the stars of the Pleiades and Hyades two naked eye star clusters. C: M42 in Orion is a star forming nebula. D: Look south of Sirius for the star cluster M41. E: M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux. F: Look high in the east for the loose star cluster of Coma Berenices.



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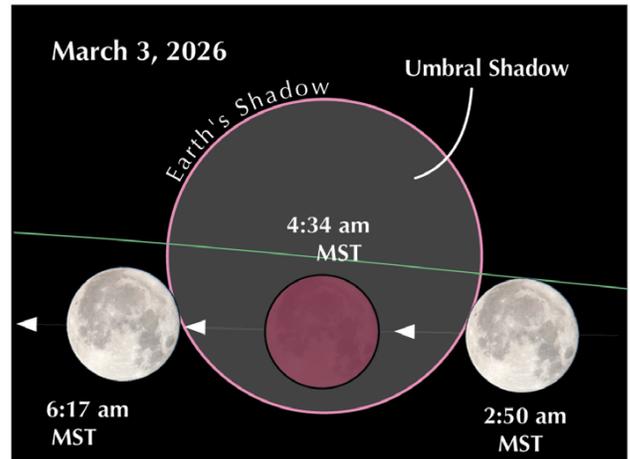
**If you can observe only one celestial event in the morning this March, see this one.**



**View to the west  
on March 3 at  
4 am MST**

**Eclipse times**

- Partial eclipse begins: 2:50 a.m. MST
- Total eclipse begins: 4:04
- Mid eclipse: 4:34
- Total eclipse ends: 5:03
- Partial eclipse ends: 6:17



**The Moon slides through a total eclipse**

In the hours before dawn on March 3, the brilliant full moon slides into Earth's shadow.

- Even though the partial umbral eclipse begins at 1:50 a.m. MST, darkening might not be noticed for another 5 minutes.
- When totality is reached, the full moon's brilliance is gone, allowing the stars to appear. Can you see that the moon lies east of Regulus and below Leo?
- At mid eclipse, what color is the moon? How red is it?
- During the partial phases, can you notice that the shadow's edge is not straight, but curved?

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# LAS Meeting Notes – Thursday, February 21st by Eileen Hall-McKim

## I. Introduction

Our first LAS monthly meeting of 2026 was held in-person and by zoom on February 21st at the Longmont Evangelical Lutheran Church, 803 Third Ave. President, Vern Raben began the meeting with self-introductions of those attending in person and on-line. 15 attended in person, 10 attended on-line.

## II. Main Presentation

Our featured presentation this evening explores the topic of setting up and using remote telescopes:

### **Starfront Observatories: Democratizing Astrophotography by Jim Pollock and Special Guest: Justin Gibson, Starfront Co-Founder**

Jim Pollock is a longtime member of LAS joining in 2008 and was born and raised in Oakridge, Tennessee. When he was 12 years old he saw a Criterion Dynascope 6” Reflector on the back of Sky and Telescope Magazine and made his first major purchase of \$199. ([Editor note: Eileen found advertisement for one, see page 19](#)). When he got his first view of Saturn, he decided he was going to be an astronomer, but over the next couple years he figured out that the romance of sitting on a cold mountain top, looking through an eyepiece and carrying on where Galileo left off maybe wasn't for him. Even so he has kept his love for astronomy alive as a hobby ever since.

In 1977 he headed off to Boston where he received an electrical engineer degree from MIT. He then went to work for Hewlett Packard as a system engineer, engineering manager, product manager, and head of product development for several companies in following years.

He began developing early stage technology start-up companies, and is now on his eighth one. He is currently CEO and Co-Founder of startup LumenAstra, a spin-out from the University of Colorado. They are developing the first of its kind, non-invasive sensor that measures brain temperatures in real time, applications include deep brain cooling for cardiac surgery and early warning of heat stress for military, fire fighters, and athletes. When he moved to Colorado twenty years ago, he looked at several astronomy clubs and decided LAS was the best for him.



“I started out getting into astrophotography basically with LAS members. Started out with 11” CBC 100, AL-TEX mount had a little DSLR camera on the back of it, didn't have to guide or learn software, do that for work, so avoided getting into all the geeky stuff of astrophotography.”

“A couple things changed that when I got ASI Air, that automated everything, put it on an equatorial mount, had an application on my iPad, took things to where instead of standing at my telescope, couple hours of exposure then going to bed at midnight I could sit inside with margarita and hit start and go to bed, that's what I call true astrophotography and astronomy”.



A few months ago several friends sent Jim an article that appeared in the New York Times titled “An Army of Robot Telescopes in Texas Makes the Stars Feel Closer Than Ever” about this thing called Starfront. Jim had heard about but first assumed it was probably too expensive, while working on start-up. He later looked into more and it seemed affordable and easy to do and recently shipped off his telescope down to Starfront Observatories in Nowhere, Texas.

## Starfront Observatories Rockwood, TX

- DARK! 220 clear nights/yr
- They roll off the roof
- I hit start!
- Margarita and Bed



Starfront Observatories, Rockwood, Texas (population 41)

- Is it DARK? Very close to Bortle 1
- They have 220-240 clear nights/year
- They roll off the roof
- I hit start!
- Have a margarita and go to bed
- Closest town is Rockwood, Texas
- Sweet dark spot in between Lubbock, Odessa and Austin (about 3 ½ hours NW)
- They started off with a couple buildings, ~50 telescopes in each, and then started adding on
- Been a year and a half, at this time have 11 buildings and 700 telescopes
- 3 more building getting ready to open up, will then house 1,000 telescopes
- Ship your scope down there and they take care of it for you
- Telescopes all cranking away all night long





Zoomed in on Jim's telescope, circled in yellow. Bunch of Seestar telescopes on shelf on end (by wall in lower right).



Here is telescope setup that Jim sent down there – 9.25" Celestron. It is set up with two configurations on front and back for two different imaging configurations (Hyperstar on front F/2 and on rear F/7).

All images acquired during the night from scope in Texas are synchronized to Jim's Mac mini at home the next morning. Notes sequence he want to shoot, starts at astronomical darkness, runs all night

- Next day all images synced together
- Some of the images taken in last month; Horsehead, M42, Iris Nebula, Omega Centauri, M81 & 82, Heart Nebula, Pleiades



Justin Gibson has joined us on-line from Texas, he is one of the 3 Co-Founders of Starfront, whose goal is to democratize astronomy to make it easy for everybody to access and enjoy

- Bachelor Degree in Applied Science from Tennessee State University
- Built observatories, some for the military
- Began studies for MS in Planetary Astronomy & Science – left to develop Starfront

What are the plans and how did this happen?

- Long time in the making; he has founded other companies, one was 'Our Sky'
- Starfront Co-Founders/Partners; Josh Kim, Bray Falls (well-known astrophotographer) and Nathan Hanks
- Built two observatories in backyard in Alabama as prototypes; ran for 1 ½ yrs, saw what needed to be strengthened; later built observatory in Mohave Desert at one of the clubs there. Let people use it; try it themselves; talk about space
- Went from there to build observatories in many countries, operating in 15 or so countries
- Felt like got to a point wanted to share this perspective more broadly
- Idea for Starfront kept coming up, how do we solve this problem of the under served community by bringing price down and experience up- it all came down to scale



The two prototype buildings built in Alabama

- Took a bunch of telescopes to Times Square to show people, got thrown out by security police for not getting permission; but got attention and got invited to do a Ted X talk in Nashville about Astronomy on things we were doing

Starfront location took about 7 months of searching

- Looking for space that checked all the boxes
- Other observatories have few service people on hand
- Made long list of requirements; dark, seeing, number of clear nights, internet
- Paid to have maps made that checked all the boxes



- Had to go test for Bortle 1; light pollution maps to generalized for specific area
- Found only 3 in U.S. that checked all the boxes, one was Rockwood, Texas
- Went to work on buildings, learned each day how to improve things

One of the coolest things is the supportive imaging community that has formed on Discord, a couple thousand people in there now, a really positive, supporting imaging group where everybody loves the same thing. Building on that it becomes a positive feedback loop. More people getting excited about getting involved, allows us to get more people, this helps us to keep driving costs down. For instance the biggest pier started at \$800 now down to \$399, lowest price now \$99 instead of \$199. The more success the company has, the more it allows us to add value, try new things and expand. We'll stop there and see if there are any questions."

## Questions?

### How did you find all that and fast internet?

One of main boxes needing to be checked and had been put into our search maps, and not sufficient internet would eliminate them from the search.

### Have done a number of star parties on tennis courts with people walking around under the scopes, how did you engineer the pads?



Isolated piers, double fiber concrete, floating floor, not touching the piers

The inside with 8' walls, later changed to 4' each system on isolated pier





Starfront has giant concrete pads specifically built to avoid vibration issues

**How thick are the pads now?**

I could be wrong but I think they are 8”

Lots of intricate details to attend to like all the light coming in at bottom of equipment, doesn't really effect the images, but still doesn't look good and needed to be adjusted. We have one service person that goes around and cleans up systems and tapes up power supply lights on systems that can't be put on night mode.



First observatory Justin built, spent a lot of time so had a small bedroom





First building at Starfront, made of wood, didn't last long - was a mistake we had to correct for

### **Who is manning the observatory at night?**

Full automation with back-ups but still have multiple people on site at all times. Some live there and others who live within minutes nearby, someone is awake (one

in Japan) watching the sky and able to close the roofs when needed at all times.

### **Is it all just individuals with scopes or do you have institutions or scientists?**

Mostly individuals, meant to serve hobbyist, but do have people who do some science, satellite tracking, but rare, mostly those who want to take photos for own enjoyment and sharing.

### **Do you do any daytime observing?**

No, we don't at this time, we have talked about it quite a bit and think it is very interesting work but due to heat in Texas we cannot open roofs during day.

### **How about insulation?**

Some building are spray foamed, all have the white paint that NASA developed to block heat, keeps quite a lot cooler, expensive but significant decrease in heat that gets in, we keep building below 90° in summer daytime, mostly for the computers, have not had any issues yet with heat. Everyone can turn their system off/on remotely.

### **What if you want to look at something on the horizon, are other telescopes in the way?**

We make sure everyone can get to 30° at minimal. We have people shooting all the time down to 10° especially in the south. We have multiple pier heights; all far enough apart that they have no contact with anything in any orientation, that's why we have swing radius, that is how we do pricing, no one is ever blocked at any time.

### **Seestar phenomena, can you talk about them?**

Seestar is one of my favorite things, I know a lot of people don't like the smart telescopes but I love them because I think it opens the door to our hobby for people that otherwise would not make the leap into something so challenging. People send us theirs or you can just rent them from us. We started a Seestar bar where we can put 25 Seestars along the wall, they are very popular. This is a way to share with broader audiences, it's a great entry for many.

### **How many support messages do you get a day?**

A lot...the team is working on them actively all the time around the clock. We are trying to get to where we have live messaging, but not there yet. Most of the time we get through the tickets daily, larger projects that require several hours of dark may take up to a week.

### **Heard you are doing some crowd source imaging, can you talk about that?**

Having so many systems and the Discord community here, we can do this kind of thing. All take a picture of the same thing and combine all data. The first one we did Bray said, let's all image this spot, the very first image they

took was a new discovery of a nebula and is named after Starfront. Bray has dozens of discoveries, Falls objects are all Bray's. One just done of Helix Nebula on the Discord, many being done on Discord now, with that many scopes can do some pretty magical things.

Justin's telescope, Planewave L600 24" F3 system, had custom built in Italy, wanted something people could use, log-in for free, obviously logistical problems, but look at whole idea of how do we get community driven scope, can present research, push boundaries for new discoveries.



### **What kind of insurance do you have?**

Business has own insurance to insure business, buildings, but not allowed to insure individual scopes because we do not own them. But everyone can have their own insurance if they want it, just add to their own policy.

### **How far away is the next city?**

About 30 min. drive to Brady, Texas; Brownwood, Texas has Home Depot about 45 min. drive

### **Question about the use of your big Newtonian, with all the people, how do you manage that?**

This is where community is powerful, 2,000 people in Discord, put these questions out for ideas; apps to use for schedules, one of the challenges we face, now with Claude may be easier, community patient and committed so over time will work out.

### **For those who want to get into the hobby?...Will you expand how many scopes are available like this?**

This is not a Starfront scope, is my personal scope; very likely this will expand, maybe not this size. Stay tuned, see what's coming on-line. Join the Discord for free, you don't have to be a customer...2,000 people talking about astronomy and see the images, link is on the website under community tab.

### **I assume some people drop off their telescope but some people do not come to the observatory at all..Is that correct?**

No one is allowed to come into buildings for safety and security reasons, not allowed to install own equipment; all installation and maintenance is done by experts at Starfront.

- Prices start at \$99/month for Seestar and are based on swing diameter
- Build custom plate for your mount, they adapt to pier
- Service charges for work; adjustments needed @ \$50/hr

Justin Gibson: Thanks everyone for having me..Hope to see everyone in the Discord!

### III. Business Report by Treasurer, Bruce Lamoreaux



## Longmont Astronomical Society

P.O. Box 806  
Longmont, CO 80502-0806

### LAS Treasurer's Report - Bruce Lamoreaux

2/19/2026

#### Main Checking Account (xxx-1587)

Begin Balance:	\$ 6,270.00	1/5/2026
Deposits:	\$ 579.00	Membership
Expenses:	\$ (1,609.00)	Bank Charges, Meeting Room, Calendars
<b>Current Balance:</b>	<b>\$ 5,240.00</b>	<b>2/3/2026</b>

#### 2-Year Savings Account (xxx-1478) (matures 10/23/25)

Past Balance:	\$ 8,312.00	10/23/2025
Interest:	\$ 12.00	
<b>Balance:</b>	<b>\$ 8,324.00</b>	<b>12/31/2025</b>

#### Telescope Fund (xxx-0165)

Past Balance:	\$ 1,090.00	12/30/2025
Deposits:	\$ -	
Expenses:	\$ -	
<b>Balance</b>	<b>\$ 1,090.00</b>	<b>1/29/2026</b>

#### Petty Cash

Past Balance:	\$ 50.00
Deposits:	\$ -
Expenses:	\$ -
<b>Balance</b>	<b>\$ 50.00</b>

**Total Assets** **\$ 14,704.00** \$ (1,030.00) Down from January

<b>Active Membership:</b>	<b>110</b>
<b>Student Membership:</b>	<b>2</b>
<b>Total</b>	<b>112</b> Active

## IV. Announcements/Upcoming Events

- Bruce Lamoreaux, Treasurer: recently sent out email to watch for scam emails that appear to be coming from Astronomical League Officials, has been many recent reports

### LAS Digital Communications

Discussion of topic of using the LAS Discord, one has been set up for LAS, is a method of communication for a community to share information, images, discussion of topics other than the use of regular LAS email. Benefits: Some free email accounts can fill up quickly with images, easier to set up categories to be able to organize topics; images. Will need to be kept current, if interest is there to use. Some other local clubs tend to have a Facebook Page or X account, but more concern for security, shared personal information, hard to know which media to post to, so we have stayed with Google Groups. Steven Albers will set up some categories and has sent out email invite link, may need to be resent occasionally, let's give it a try. <https://discord.gg/HpgJW7vc>

- Email – LAS has used for 20+ Years; the last 10+ on Google Groups
  - Personal data is mostly transparent
  - Data used by Google for AI Training
- Facebook
  - Data used for AI Training
  - Aggressive data collection, personal data is least transparent
- X (Twitter)
  - Data used by X for AI Training
  - Personal data is mostly transparent
- Discord
  - Data not used for AI training
  - Personal data is the most transparent however recent TOS may change that

### Upcoming Events:

- February 21<sup>st</sup> – Dark Sky Association Public star party at Beech Shelter (north of Boulder) in cooperation with the City of Boulder Open Space at 5:30 pm
- March 19<sup>th</sup> – LAS Meeting at First Evangelical Church at 7:00 pm
- March 21<sup>st</sup> – Sandstone Ranch – more information will be announced
- March 27<sup>th</sup> Public star party at Rabbit Mountain with Boulder County Parks and Open Space at 7:20 pm
- We have received permit for all Rabbit Mountain Star Parties for the year
- Aref Nammari has presented the possibility of a LAS Group Star Party at Black Canyon, Colorado in late summer, early fall of this year. This is a very dark sky area and our group would be joining the Black Canyon Amateur Astronomy group. Members have expressed interest so Aref will be working on the logistics, lodging, etc.

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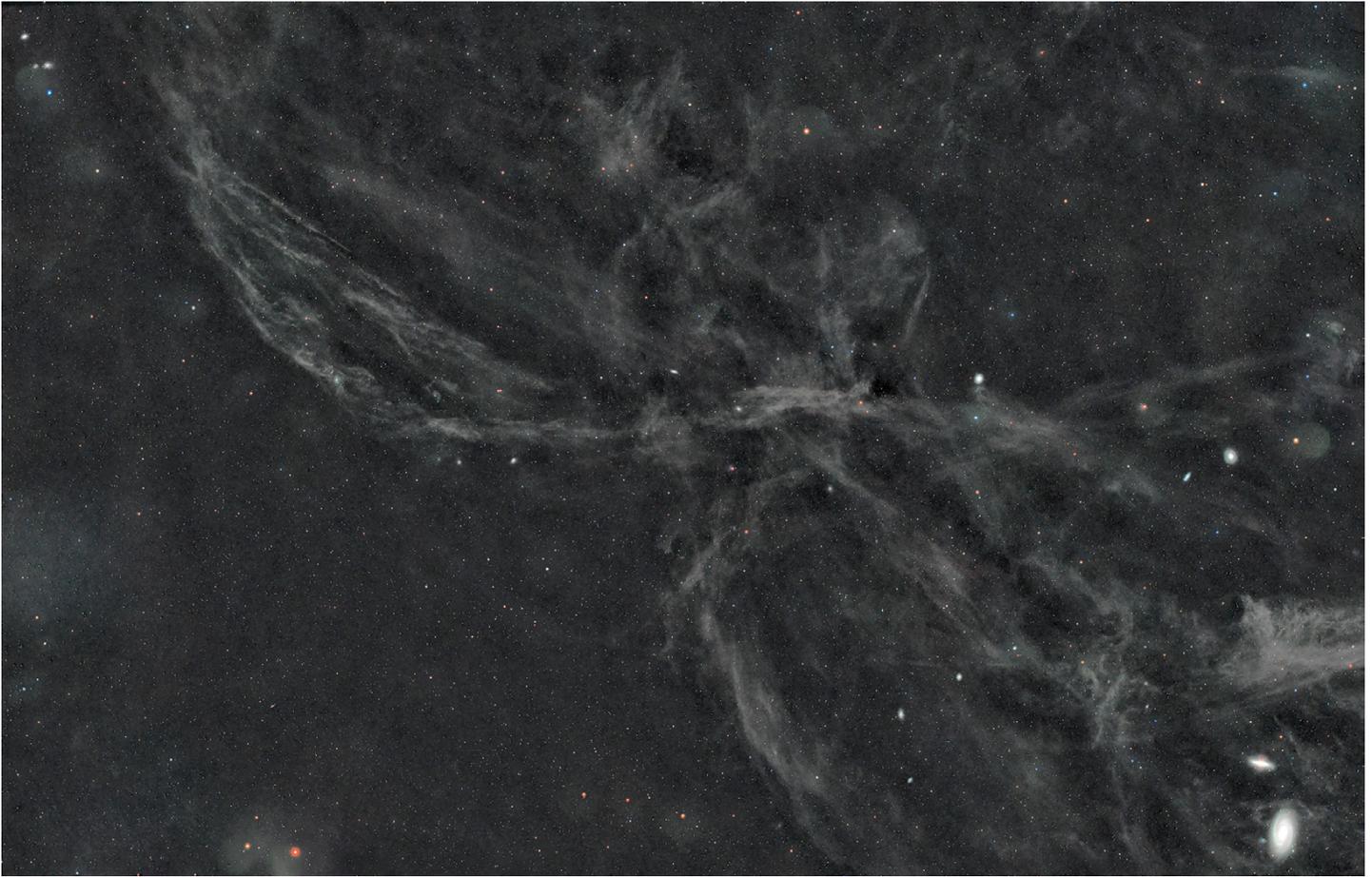
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The Criterion RV-6 Dynascope holds a legendary status in the history of amateur astronomy. Manufactured by Criterion Manufacturing Company in Hartford, Connecticut, from 1958 to the mid-1980s, this 6-inch Newtonian reflector became a gateway telescope for countless stargazers, setting the standard for beginner-friendly instruments. Its affordability, optical quality, and reliable design inspired generations of astronomy enthusiasts and cemented its place in the annals of amateur astronomy.



**MW-2 by David Elmore**

The Angel Nebula serves as an illustrative example of an integrated flux nebula (IFN). IFN are molecular clouds situated slightly above the galactic plane, illuminated by the integrated flux of starlight emanating from the entire galaxy.

Bode's galaxies, M81 and M82, are located in the lower right corner of the image. Due to the vast field of view exceeding  $10^\circ$ , the galaxies show little detail. However, this aspect is not the primary focus of this discussion.

Collection of images of MW2 has been an on-going project. Integration, utilizing a one-shot color camera and the IDAS NGS1 filter, has spanned over nine hours. Additionally, three-second exposures were captured for the stars.

The equipment employed includes the William Optics Mini SpaceCat 51 F/3.5 refractor (178mm focal length), the NGS1 filter, and a ASI2400MC Pro camera. These observations were conducted from my small observatory located at Dark Sky New Mexico.

David



**Boogie Man, LDN 1622 by Stephen Garretson**

This is the Boogie Man Nebula in Orion, just off the edge of the top part of Barnard's Loop. It really should be done in LRGB, but, sadly, broadband is not really possible from my skies. I attempted to create a narrowband image, but while there was decent SII to accompany the H, OIII was essentially on vacation; the results were disappointing.

[20] 600s guided Ha subs

From the Beevo Dome

Total integration: 3 hours, 20 minutes

TheSkyX, SGP, PHD2

Capture:

PixInsight, MacOS Photo, Preview

dual scopes each having the following components:

William Optics FLT 132 APO Triplet, 0.8x reducer/flat- ...Stephen

tener, running at f/5.6

ZWO 2600MM Pro

ZWO EFW

Chroma 3nm Ha filter

Wanderer Astro Mini V2 Rotator

Bahtinov mask modified Wanderer Astro Eclipse

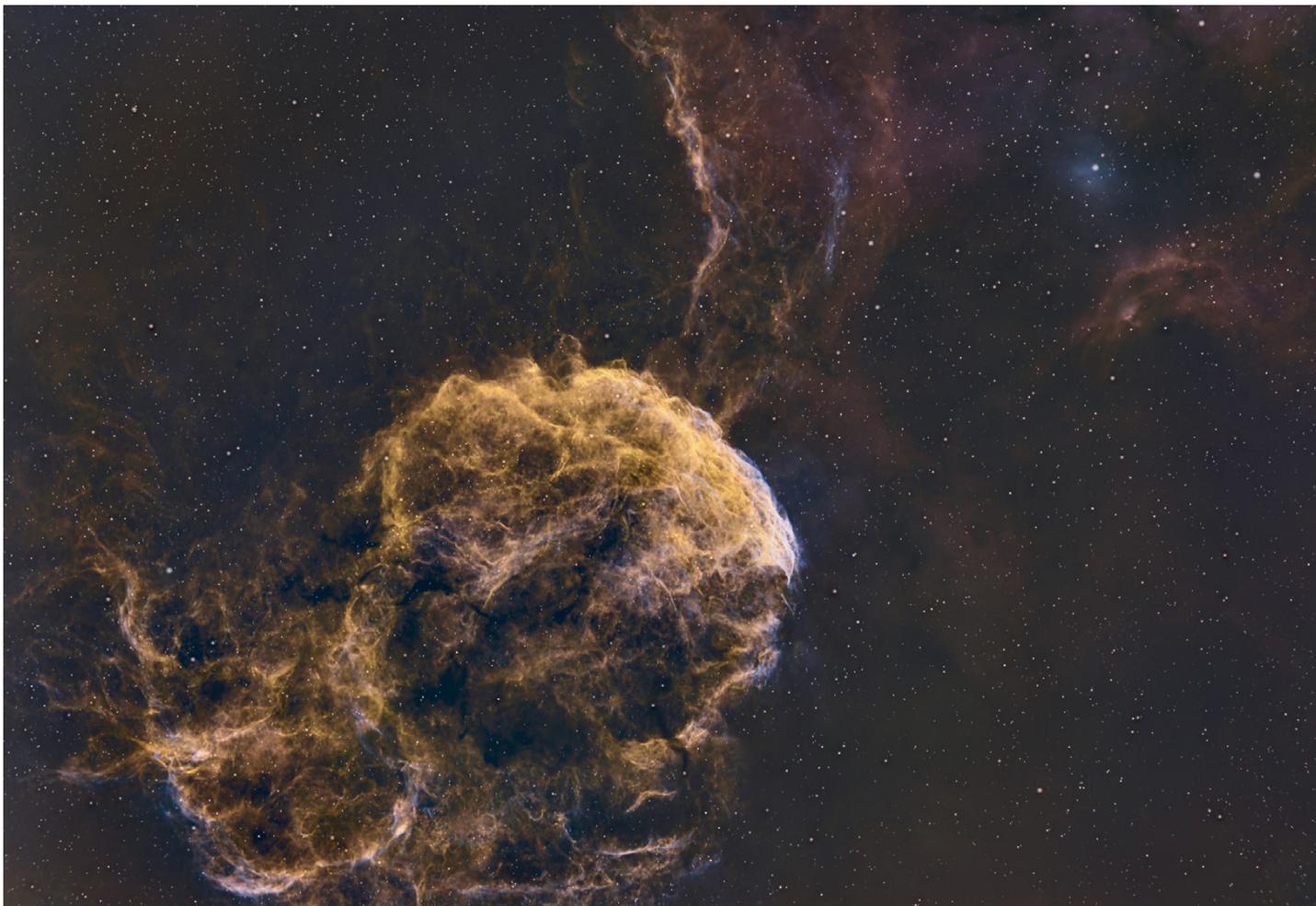
MicroTouch focus motors

Guiding:

William Optics WhiteCat f/4.9 Astrograph

ZWO 220 Mini

Paramount MX+



### IC 443, Jellyfish Nebula by Stephen Garretson

This is the Jellyfish Nebula, a target pretty high in the southwest now [mid-February], so relatively accessible for my setup as long as I carefully monitor the dome's shutter position. I used NBCM in Pixinsight to create two different versions, [a] Ha as red, OIII as teal, SII as yellow; and [b] Ha as more orange, OII as a lighter teal/blue, SII as deep red. I then tried different combinations of these two masters, looking to tone down the overwhelming dominance of the yellow SII signature. It's still strong; the SII master was by far the strongest of the three, but I hope it is balanced by the other two channels. I wanted to bring out the variety of colors in the surrounding gas clouds.

[18] 600s guided Ha subs  
[15] 600s guided OIII subs  
[6] 300s guided OIII subs  
[12] [ 600s guided SII subs  
[12] [ 300s guided SII subs

Total integration: 9 hours,

Capture:

dual scopes each having the following components:  
William Optics FLT 132 APO Triplet, 0.8x reducer/flat-tener, running at f/5.6  
ZWO 2600MM Pro  
ZWO EFW  
Chroma 3nm Ha, OIII, & SII filters

Wanderer Astro Mini V2 Rotator  
Bahtinov mask modified Wanderer Astro Eclipse  
MicroTouch focus motors

Guiding:  
William Optics WhiteCat f/4.9 Astrograph  
ZWO 220 Mini

Paramount MX+

From the Beevo Dome

TheSkyX, SGP, PHD2  
PixInsight, MacOS Photo, Preview

...Stephen



### Sh 2-261, Lower's Nebula by Stephen Garretson (2-23)

Sharpless 2-261, AKA Lower's Nebula, is found in Orion, basically north of Betelgeuse. It's in the same general neighborhood as the Jellyfish, the Monkey head, and not far from the Cone and the Rosette. Indeed a wide field shot would capture it and a neighbor or two depending on how you set up the FOV. An emission nebula, this HII region is so named because it was photographed by a father and son, Harold and Charles Lower; glass plate, 1939. Dad and son were amateur astronomers and telescope builders. They sought out diffuse nebulae using red sensitive film and a deep red filter. The nebula is energized by a runaway star, HD 41997. Depending on which distance estimate one accepts it's either part of the Gemini molecular cloud in the Perseus Arm, or part of the Orion Spur.

Data collected with a 40° clockwise rotation.

[18] 600s guided Ha subs

[12] 600s guided OIII subs

[18] [ 600s guided SII subs

Total integration: 8 hours,

Capture:

dual scopes each having the following components:

William Optics FLT 132 APO Triplet, 0.8x reducer/flattener, running at f/5.6

ZWO 2600MM Pro

ZWO EFW

Chroma 3nm Ha, OIII, & SII filters

Wanderer Astro Mini V2 Rotator

Bahtinov mask modified Wanderer Astro Eclipse

MicroTouch focus motors

Guiding:

William Optics WhiteCat f/4.9 Astrograph

ZWO 220 Mini

Paramount MX+

From the Beevo Dome

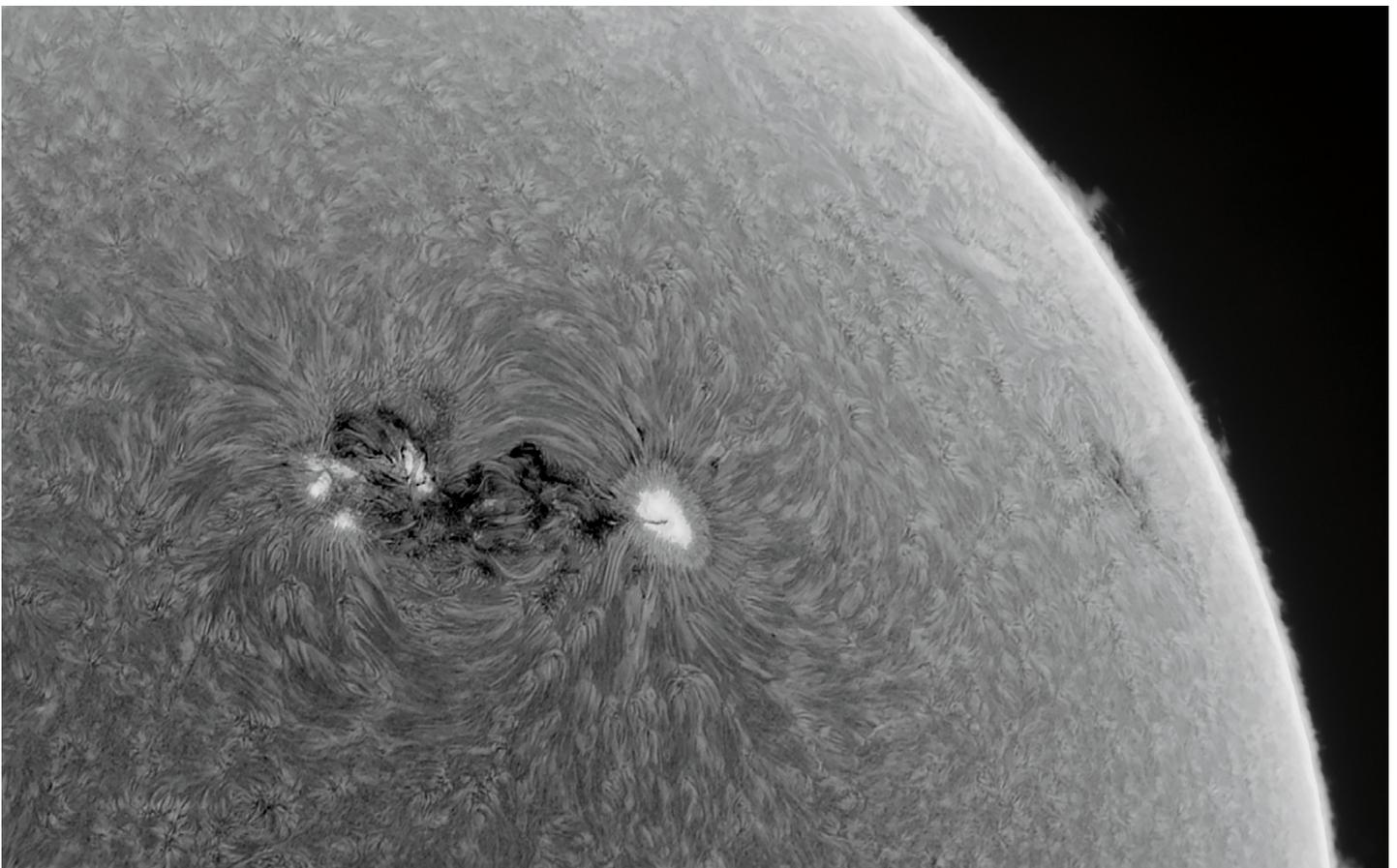
TheSkyX, SGP, PHD2

PixInsight, MacOS Photo, Preview

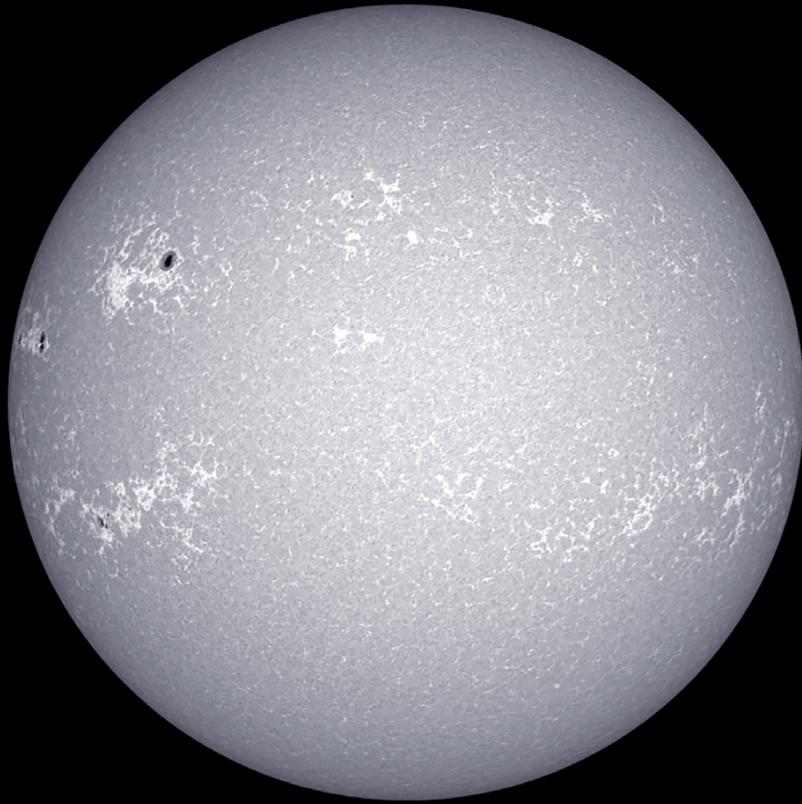
...Stephen



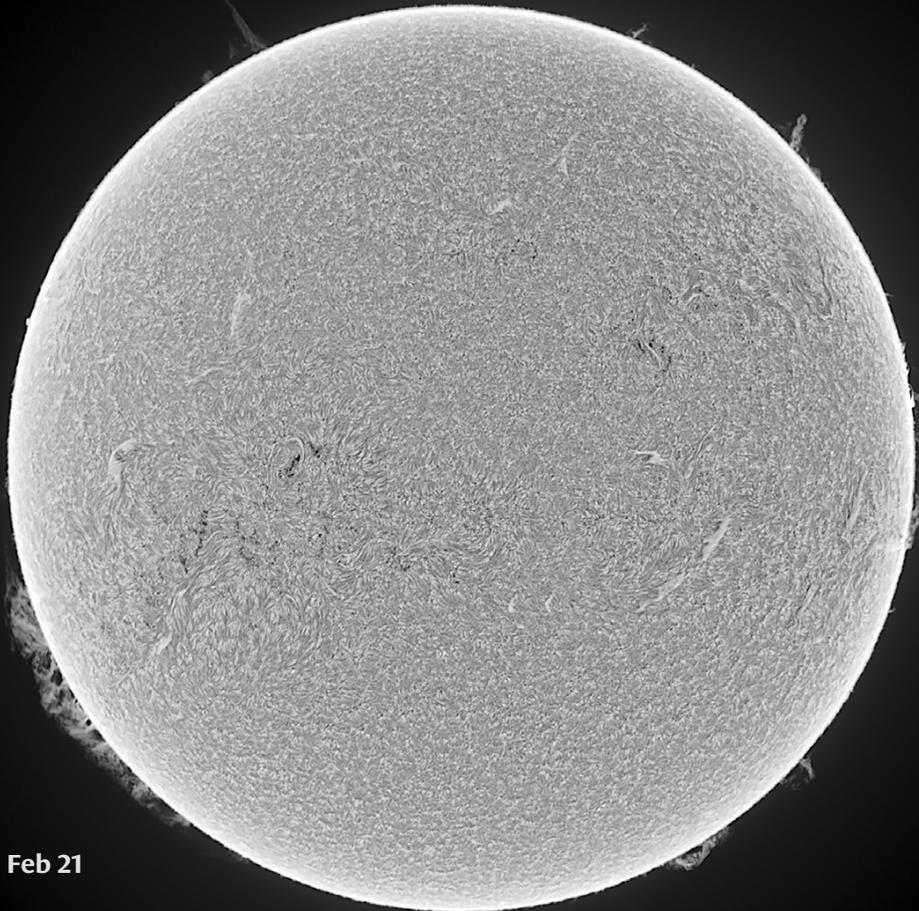
**Solar region AR 4366 in H-Alpha on Feb 21 by Brian Kimball**



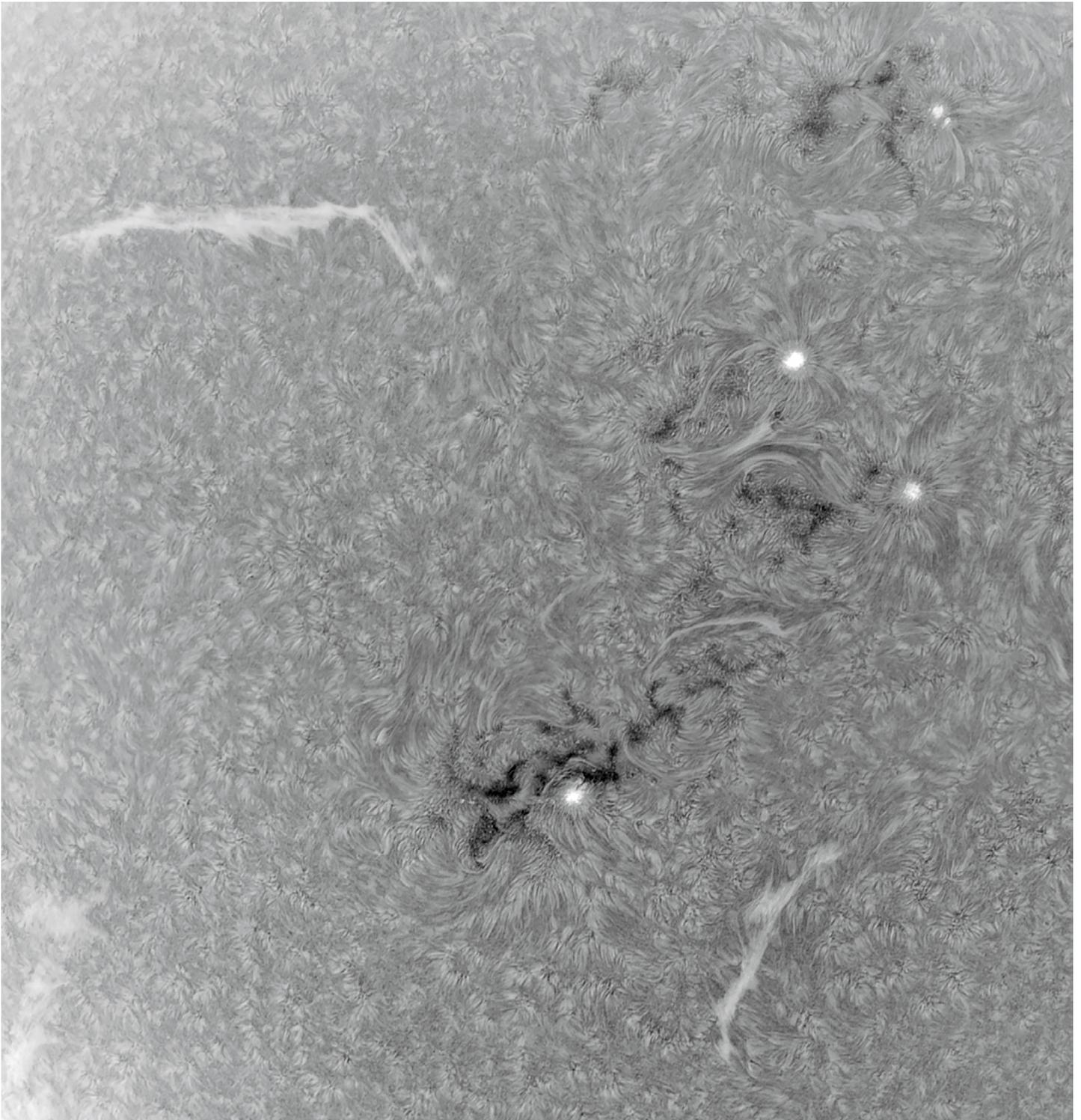
**Solar region AR 4366 in H-Alpha on Feb 6 by Brian Kimball**



Sun in CaK on Feb 28 by Brian Kimball



Sun in H-Alpha on Feb 21  
by Brian Kimball



**Solar regions AR 4367, 4368, 4369, 4370, and 4371 in H-Alpha on Feb 6 by Brian Kimball**



**M81/M82 Galaxy Pair by Jim Pollock**

Well this was a surprise. One of my favorite targets is the M81/M82 Bode Galaxy Pair. And it's a favorite because of the massive red ejections spewing top and bottom from M82. Anytime I shoot it, I'm trying to see how much of the red I can get. It generally takes a very dark sky to get much.

Well, for kicks, I had my L-Extreme filter on my Texas 9.25 and thought I'd do a run and see what happens. Boom! Very cool. Got pretty nice ejection columns on M82, but what further surprised me are all the Hydrogen new-growth-star clusters on M81!! Cool!! And this was on a nearly full moon night!!!!

This image is 37 frames of 3-minutes for 1.9 hours on my Texas 9.25" EdgeHD at f/2 Hyperstar with an L-Extreme f/2 filter. ZWO 2600mc Duo color cam.

Hmm. Didn't expect this!

Jim



**Sh 2-261, Lower's Nebula by Jim Pollock**

For a long time, I thought the name of this object was Lowe's Nebula... found near aisle 15 in the tools section. But, alas, it is named after Howard Lower and his son Charles, amateur astronomers that discovered Lower's Nebula (Sh2-261) in 1939. The father/son team built a homemade 8" f/1 Schmidt camera. Such a fast system coupled with a red filter enabled them to photograph many faint emission nebula. Rich red hydrogen in this emission nebula with some nice dark nebula for contrast.

There's not much info on this nebula and it is not imaged very often. I tried once 3 or 4 years ago and got nothing impressive. I like this one a lot better!!

This image is 50 frames of 3 minutes for 2.5 hours on my 9.25" EdgeHD at f/2 Hyperstar with L-Extreme filter into a 2600mc Duo color camera.

Some people prefer to call this The Big Brain Nebula... which is understandable!!



**Sh-2-274, Medusa Nebula by Jim Pollock**

Yikes! Snakes!!! Yes, the head of the appropriately named Medusa Nebula is covered in snakes!! Albeit writhing threads of hydrogen gas! Yikes again!

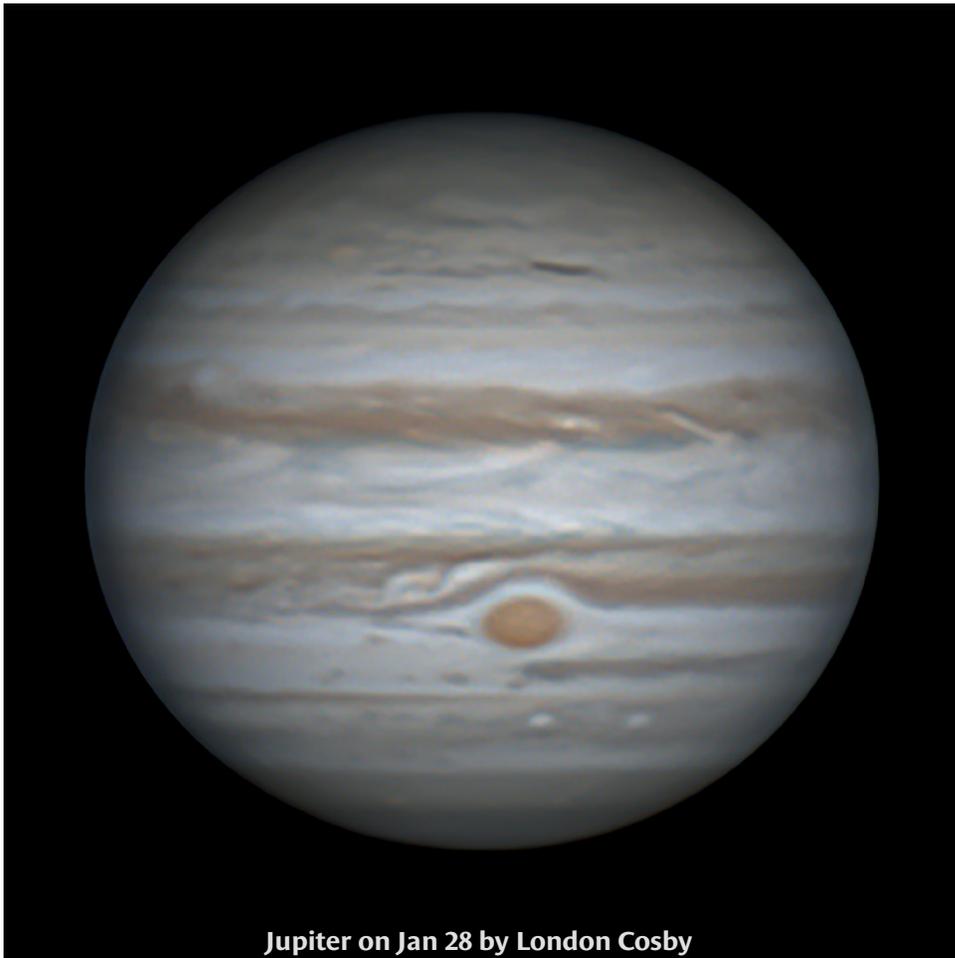
This is my birthday nebula, having been discovered by Dr George Abell (author of the Abell catalog of galaxy clusters) in 1955. Originally thought to be a supernova remnant, Russian astronomers discovered the greenish-tiel gas ejections that are markets of planetary nebula. So rather than a massive explosion, Medussa was created by the fluffing off of multiple shells of matter until the parent star became a white dwarf.

As planetary nebulae form, it is not uncommon for the mass ejections to be intermittent and repetitive, hence the interesting multiple arcs of hydrogen (red) and double-ionized oxygen (greenish-tiel). Look closely at this one to follow the trail of arc fluffs up and to the left. There is also some faint hydrogen nebulosity beyond the oxygen puffs.

This is another very dim nebula at magnitude 16. Pretty tough to see visually unless you have at least an 8" scope in super dark skies.

This image is 100 frames of 3-minutes each for a totally of 5 hours of exposure with my 9.25" EdgeHD in Texas at  $f/2$  Hyperstar into a ZWO 2600mc Duo color camera with no moon and an L-Extreme filter to emphasize the hydrogen and ionized oxygen.

Jim



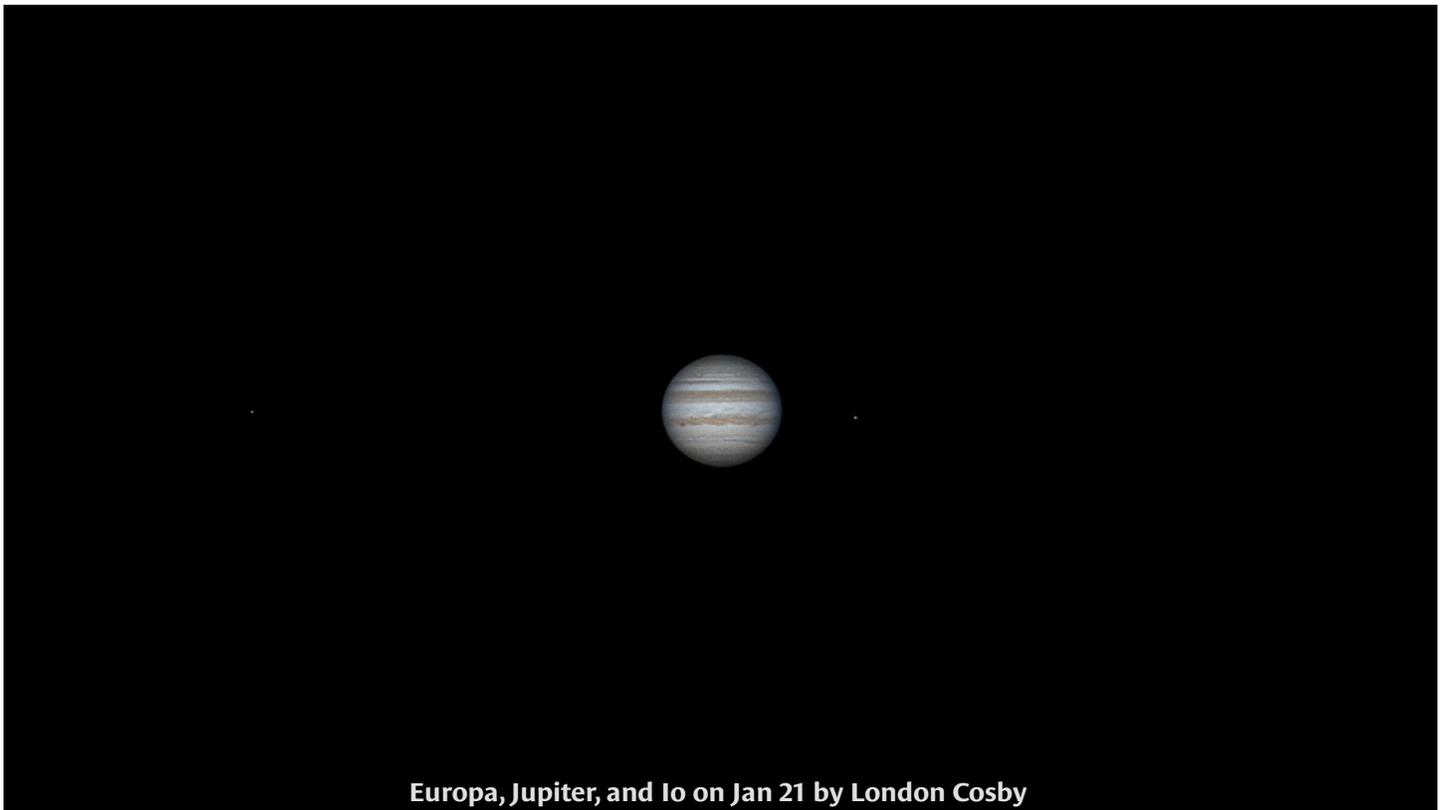
**Jupiter on Jan 28 by London Cosby**

As I was about to start imaging for the night my QHY533C died. I didn't have anything else that would pair well pixel size wise for the scope so I grabbed the other OSC planetary camera to just do some testing.

Fortunately for me we had some of the best seeing I've had here, and I was able to make some adjustments on the camera to produce a decent image. In fact this is probably my best Jupiter ever. Now to send the QHY533C for repair!

Edge 9.25, 2x focal extender, ADC, QHY 715C

London



**Europa, Jupiter, and Io on Jan 21 by London Cosby**



**NGC 2437 and M 46 by M. J. Post**

### **An Unusual Combination**

When we observe open cluster M 46, we always get NGC 2438 as a bonus; it is a planetary nebula. This composition used a wide band color camera on my CDK 14 scope (full frame) and a monochrome camera plus H-alpha and OIII filters on my RASA scope (quarter frame).

These two objects do not co-mingle in space. Instead, NGC 2438 is 1400 l.y. away and 8500 years old while M 46 is 5000 l.y. distant and about 250 million years old. Scientists estimate about 600 stars comprise M 46. Both lie in constellation Puppis, well south of the celestial equator.

From DSNM, 2 hours integration on CDK 14 image, 1 hour each integration on OIII and H-alpha images. NGC 2438 is depicted in HOO format.

M. J. Post



**M65 and M66 by M. J. Post**

### **M66 and M65**

This photogenic pair is located in Leo. Their apparent separation is only 20 arc minutes but in reality they lie nearly 10 M. l.y. apart. M66 is left, larger, and closer (31 M.l.y. from us).

Five supernovae have been observed in M66 (a.k.a. NGC 3627) since 1973 but only one in M65 (a.k.a. NGC 3623) in 2013. A third similarly-sized but edge-on galaxy, NGC 3628, forms the Leo Triplet, a nice composition for wider field telescopes.

From DSNM, CDK14 scope, 3 hours time on target with ASI 6200 color camera and luminance filter.

M.J. Post



**Abell 31 Planetary Nebula by M. J. Post**

### **Abell 31 - His Largest Planetary**

This PN is large and charismatic - one bound to please imagers but perhaps too dim for visual observations except when using large Dobson telescopes. It lies in Cancer, about 2000 light years away and is about 9 light years in diameter.

It is the largest in angular extent of all 86 objects listed in the Abell Catalog of Planetary Nebulae (1966). Only 79 are now considered true PNs; others are mis-identified or plate defects. George Abell's partners in compiling this catalog from Palomar plates were Albert Wilson, Robert Harrington, and Rudolph Minowski.

FOV here is about 1.5 x 1 degrees. HOO rendition. 2 hours through each filter (H-alpha and OIII) using 11" RASA scope at DSNM.

M.J. Post

## 30 Years Ago – 1996

For the March meeting on the 23<sup>rd</sup>, it was decided to have a Geek Night, aka Show and Tell, to which all are invited to bring instruments, gadgets, curiosities and such. Goals include getting better acquainted with the diverse talents of other club members, and sharing ideas on how to enhance our astronomy using ingenuity and stuff.

- We were reminded of the big annual FRASC meeting (Front Range Astronomical Super-Cluster) at 1pm on Saturday April 27 at the Denver University campus
- Andrew Planck spoke of a planned outing with school children to Canyon lands National Park in Utah
- Club Tee Shirts are available from Harry Albert (Secretary) for \$10 each
- Dave Street, the ALCOR representative (Astronomical League) told of the Annual Meeting for 1997 to be at Copper Mountain here in Colorado, in July
- Bob Ross would like help getting a mount for some 20 X 120 binoculars, which weigh 45 lbs
- Andrew Planck brought and distributed copies of the latest revision of his double star lists

## Call for Hale-Bopp Images

FRASC would like to help provide the local print and broadcast media with locally generated HB images during the coming 12 months. Once HB emerges from solar glare later this year, if you have any especially nice images that you be willing to share, please contact Dr. Bob Stencel to arrange getting these into print/on the air as part of a local “HB Watch” effort to raise awareness of astronomy, light pollution and other good things.

Wanna be a Scientist? Here's a opportunity: Dr. Joseph Pesce of the Space Telescope Institute is coordinating a world-wide monitoring campaign for selected quasar-like objects. He needs visual data to put the satellite observations in context. If you can help, please consider participating in the campaign.

## 20 Years Ago – 2006

February Meeting Notes: President Gary Garzone:

- Welcome Dr. John Weiss CICLOPS Cassini Imaging Central Laboratory for Operations from Boulder.
- Vice President report Michelle Lavers. Astronomy day May 6th, by Victoria Secret's in the mall again this year. We are looking for volunteers, nice to get new blood. We are also trying to get more posters for the kids. Julie mentioned school is doing different Astronomy day previous weekend April 24th? Twice the fun!
- Suzanne wanted to mention we have training sessions for Sommers Bosch observatory to run the scopes, in March. Refer to the Fiske Planetarium schedule.
- Webmaster report from Steve Albers: Mike Hotka added “Membership Award Page” for AL awards. It is sorted by category or recipient.
- Short topic from Dick Mallot: Constellation of the Month: Cancer. We want to encourage members to get out observing, that's why Mike added the awards list to the website. Fiske planetarium on April 29th, but that is also Sterling star party weekend! We have been invited back out there.
- Dave talked about celestial navigation. Three methods you can use to navigate, beginning with star hopping. Second way is to use the alt-azimuth system. Cardinal points of compass, 360 degrees. It is used to find Iridium flares or satellites. 270 degrees directly west, for example. It is time-sensitive, so only good for 10-15 minutes, as it precesses across the sky. Star charts, showing Declination, celestial equator crosses Orion's belt more or less, 40 degrees to 50 degrees above the horizon. Right ascension, in 24 hours, divided by minutes and seconds. Goto scope can take RA-DEC coordinates to find objects not in the database.
- FRCC star night in Westminster was very good, with clear skies and excellent views of Mercury and Saturn. Clara Wente is the teacher at FRCC who puts on the hands on astronomy star party for kids there. Thanks to LAS and BASS volunteers, large crowds and weather was good, not so cold. We lucked out again, doing pretty good for urban skies.
- We did a star party night for Boulder County Day school in Gunbarrel also. It was a pretty good night once again. We seem to be building quite the reputation for throwing star parties for schools. The giving of our time and

sharing the skies with kids, must be good for our Karma, you know how hard it is to predict before hand a good night for these. Nature has been good to us.

- The lucky dozen of us, went to Crow Valley campground by Briggsdale, Colorado in the Pawnee National grasslands for some Dark skies for new moon star party we try to do every month. Not only was it clear and no winds but we even had some close to excellent seeing going on most of the night. I thought last month was cold out there on the high plains but we beat that record with low of 3 degrees. I stayed up till 3:30 am, pretty well frosted over by then. Dan L slept outside in bed of his truck again; heck if he survived 8 degree lows last month, 3 degrees might work too? Big turnout of dark sky marines again!

## 10 Year Ago – 2016

LAS February 19th meeting at IHop The meeting began at 7 pm with announcement of the agenda for the evening and upcoming star parties.

- The guest speaker was Dr. John Bally from the Department of Astrophysical and Planetary Sciences at the University of Colorado at Boulder. He talked about recent results of his research concerning the Orion region. Specifically, ALMA and laser-guide-star adaptive optics imaging of the explosion that occurred ~ 500 years ago behind the Orion Nebula, and a search for similar events in nearby galaxies using the Spitzer Space Telescope.
- We talked about the star party on the previous night at Erie High School for the St Vrain Valley School District. It was mostly cloudy and only maybe 100 folks came out to the scopes so it was a bit disappointing. We had 16 scopes outside and a table with brochures and information about LAS indoors. Nineteen volunteers supported the event – the most ever. Thanks to all who helped out!
- We then discussed expanding the library telescope program this year. The Louisville Library and Boulder library are to be contacted to see if they would be interested in participating.
- Next LAS Meeting March 17: “Pluto the Pugnacious Planet” Dr. Fran Bagenal, Laboratory for Atmospheric and Space Physics, University of Colorado. Fran Bagenal is professor of astrophysical and planetary sciences at the University of Colorado, Boulder and is a co-investigator on the New Horizons mission. Her main area of expertise is the study of charged particles trapped in planetary magnetic fields. She is interested in finding out if the solar wind interaction with Pluto’s escaping atmosphere acts like a comet.



It’s March! Our days are getting longer and our night time hours are shrinking rapidly. As March begins there are 9 hours and 42 minutes of astronomical darkness. At the end of the month that shrinks to 8 hours and 16 minutes. The Big Dipper is now high up to the northeast. Following the arc of the Big Dipper’s handle we can find the fourth brightest star that can be seen from Earth – Arcturus. Our winter time favorites are still visible high in the southwest. Sirius, the brightest star visible from Earth, twinkles brightly in early evenings. Above and to the west the 3 bright stars forming Orion’s belt are easily found. Capella, the sixth brightest star in our night sky, is nearly overhead. Procyon, the 8th brightest star, is about midway up in the sky straight to the south. Procyon (pronounced pro-see-on) is one of our nearest neighboring suns at only 11.46 light years away.



LONGMONT ASTRONOMICAL SOCIETY  
P. O. Box 806  
LONGMONT, CO 80506



PUWE-1 BY JIM POLLOCK