## Highlights of the February Sky. . .

- - - 1st - - -

DUSK: A waxing crescent Moon is 2° to the lower left of Venus.

- - - 5th - - -

First Quarter Moon @ 3:02 am EST

- - - 6th - - -

PM: The Moon is 1° above Jupiter.

- - - 9th - - -

DUSK: A waxing gibbous Moon, Mars, and Pollux, in Gemini, form a flat isosceles triangle.

- - - 12th - - -

Full Moon @ 8:53 am EST

PM: The Moon is 1½° to the upper left of Regulus when they rise in the east.

- - - 17th - - -

AM: A waning gibbous Moon is 1° to the right of Spica in Virgo.

- - - 20th - - -

Last Quarter Moon @ 12:33 pm EST

- - - 21st - - -

AM: A waning crescent Moon and Antares are separated by about 1° when they rise in the southeast.

- - - 24th - - -

DUSK: Mercury and Saturn are only 1½° apart low in the west-southwest.

- - - 27th - - -

New Moon @ 7:45 pm EST

- - - 28th - - -

DUSK: Use binoculars to spot an ultra-thin waxing crescent Moon about 3° below Mercury very low in the west-southwest.

# Prime Focus

A Publication of the Kalamazoo Astronomical Society

★ ★ ★ February 2025 ★ ★ ★

## This Month's KAS Events

**Member Observing: Saturday, February 1 @ 8:00 pm**

***February Freeze Out*** • ***Visit Schedule Page for Details***

**General Meeting: Friday, February 7 @ 7:00 pm**

***Kalamazoo Area Math & Science Center*** • ***See Page 14 for Details***

**Board Meeting: Sunday, February 9 @ 5:00 pm**

***Sunnyside Church*** • ***2800 Gull Road*** • ***All Members Welcome***

**Online Viewing: Saturday, February 22 @ 9:30 pm**

***Held on Zoom*** • ***Click to Register*** • ***Visit OVS Page for Details***

## Inside the Newsletter. . .



# Observations by Richard S. Bell

As if light pollution wasn't bad enough! There's another serious threat to the night sky that will also grow worse with time. However, unlike light pollution, there is no escape. It affects both amateur and professional astronomers anywhere in the world.

The threat in question are "megaconstellations" of satellites, with Starlink from SpaceX being the first and most notable. They are used for global internet and mobile phone coverage. The first batch was placed into orbit in May 2019. To date, nearly 7,000 of them are in low Earth orbit, below 373 miles (600 km). This number may balloon to 12,000 or even 42,000 in the years ahead.

Such large, low-altitude satellites appear visually bright to observers on the ground, and the initial Starlinks are naked-eye objects. Higher-orbit satellites such as the OneWeb constellation are fainter but have a larger impact on wide-field astronomical imaging. During winter, major observatories at lower latitudes will not illuminate the satellites for six hours in the middle of the night. However, at low elevations near twilight at intermediate latitudes, hundreds of naked-eye satellites may be visible at once to observers, and wide-field deep images may have of order one trail per exposure throughout the summer night.

For example, see the image from our friend Alan Dyer below. You may think this is a blend of images over several nights. Instead, he took this image over a period of just *30 minutes* in early June last year! It's a stack of 560 two-second exposures with a 15mm f/2 lens and Canon R6 camera at ISO 16,000.


All but one streak in the image is a satellite. The only streak from a natural object is a meteor just above center. Many of the parallel streaks heading generally horizontal west to east (right to left) may be from groups of Starlinks. Others traveling vertically north-south are more likely from Earth observation satellites.

The impact of satellite megaconstellations on astronomy and the environment will be the subject of our next general meeting on February 7th. Our guest speaker (via Zoom) will be Dr. Samantha Lawler from the University of Regina in Canada. Dr. Jonathan McDowell, from the Harvard–Smithsonian Center for Astrophysics, was originally planned to speak to us on this subject, but he had to cancel due to a personal emergency in the United Kingdom. Dr. Lawler graciously volunteered to take his place at the last minute. This is an important topic for anyone interested in astronomy and the night sky. That includes you! So please learn more about the presentation on page 14 and plan to join us at KAMSC or on Zoom.

Other activities this month include the February Freeze Out on February 1st and the final Online Viewing Session of the season on February 22nd (with a cloud date of March 1st). It's late January as I type this, and the Freeze Out will likely be canceled due to persistent Michigan winter cloud cover.

Aside from really bad seeing in November and minor technical glitches in December, the current season of online sessions has been pretty successful. We had full houses on Zoom in November and January, thanks in part to plugs in *Sky & Telescope's* Weekly Update. In addition to the United States and Canada, people from the United Kingdom, Germany, and South Africa joined us in January. So please attend on February 22nd, especially if you have yet to do so!

# January Meeting Minutes

KAS President Richard Bell brought the first general meeting of 2025 to order on Friday, January 10th, at 7:06 pm EST. For the second year in a row, hazardous winter weather forced us to hold the meeting exclusively on Zoom. At least 100 members and guests (Zoom's maximum capacity) attended safely from home.

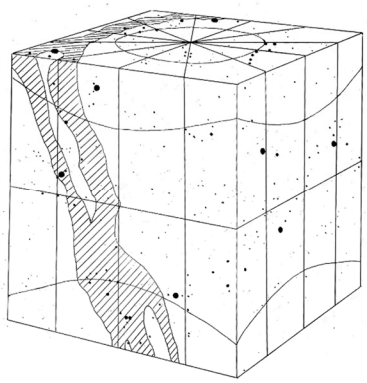
Our very special guest speaker for the evening was Emeritus Professor of Astrophysical Sciences at Princeton University, J. Richard Gott. The title of his presentation was *A Journey to the Cosmic Web and Return to Earth*.

Dr. Gott began his talk by discussing the five regular polyhedra (or Platonic solids), symmetrical three-dimensional objects all of whose sides are the same regular polygon. They include the cube, tetrahedron, octahedron, icosahedron, and dodecahedron. Knowledge of the five regular solids has been known since the time of the ancient Greeks.

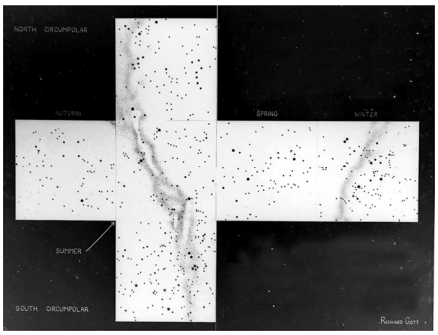
Casting shadows of the continents from a transparent globe allows one to create a map of Earth on a dodecahedron. The surfaces of spheres exhibit a constant positive curvature, whereas the vertices of a dodecahedron concentrate the curves.

Johannes Kepler discovered three new polyhedra. These are squares (four around a point), triangles (six around a point), and hexagons (three around a point). In this case, they each form an infinite flat plane as opposed to a three-dimensional object. These shapes were long known, of course, but Kepler was the first to identify them as regular polygons.

Dr. Gott then discussed that his eighth-grade science project was to project the celestial sphere onto the faces of a cube:



Unfolding the cube will create a flat map of the entire sky. It divides the sky into the six regions. You can place the northern circumpolar stars on the top square and the southern circumpolar stars on the bottom square. The four squares in the center separate them by season. Dr. Gott said he later discovered maps like this in a book from the 1800s in the Princeton library. The book made reference to other, similar maps from the 1600s.

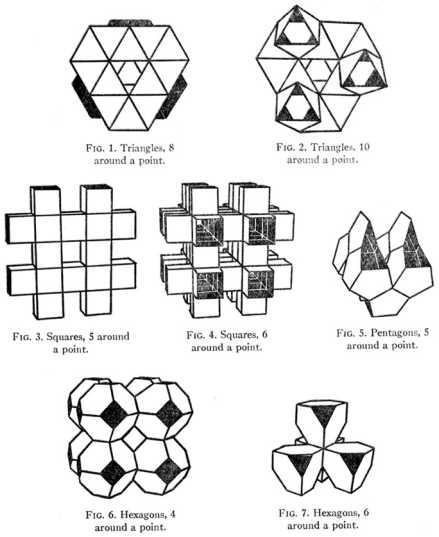



Dr. Gott then shared another science project he entered in the Westinghouse Science Talent Search (and placed second). He built a truncated octahedron, a solid shape that has 6 square faces and 8 hexagonal faces. He formed it by removing the 6 pyramids from the vertices of a regular octahedron. This is known as a semi-regular polyhedron since it uses two different shapes. Stacking a truncated octahedron as shown below is known as a body-centered cubic pattern. This is the structure of metallic sodium.

When he initially constructed this structure, he observed that four hexagons, arranged in a butterfly- or saddle-shaped pattern, surrounded some of the vertices. This made him think of the geometry of the universe, whether it be open (or saddle-shaped), closed (spherical), or flat.

Dr. Gott also noted the possibility of continuing this pattern. Removing the squares would reveal a sponge-like hexagon pattern, dividing the space into two

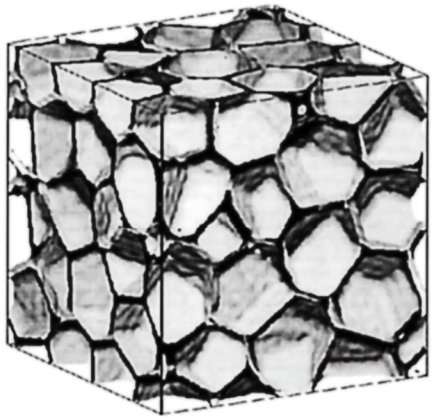
equal sections. This sponge-like network of hexagons forms a regular polyhedron. He discovered other regular solids that he called pseudopolyhedrons and entered this discovery into the National Science Fair International and won first place in mathematics. When he arrived at Harvard, his math mentor suggested he send this to the *American Mathematical Monthly Journal*.




The journal's referee noted that previous discoveries of three of the shapes occurred in 1927. John Flinders Petrie discovered figures 4 and 6, while Donald Coxeter found figure 7. The only reason they didn't discover the other four shapes was because they restricted their criteria by saying that the dihedral angle between these planes of hexagons at each edge had to be the same (all the edges had to have the same angle around them). There are now about two dozen of these structures that others have found over the years.

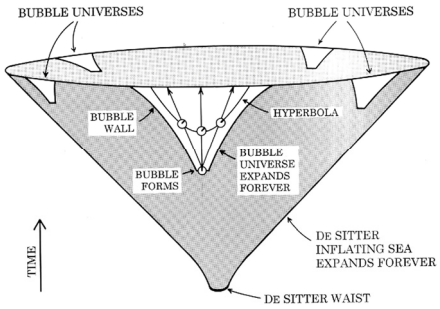
In the 1980s, there was a big debate about the large-scale structure of the universe. Astronomers knew that galaxies were grouped into clusters. Princeton astronomer P. James Peebles, using an idea from a paper written by Dr. Gott and James Gunn (also from Princeton), said that a cluster of galaxies would form when a slight over-density in the early universe slowed its expansion and collapsed back down to form the cluster. It would draw in additional galaxies from outside the cluster. So, in People's view, galaxies formed first, they clustered, and then pulled in materials from the low-density region outside. He referred to this as "meatball topology."

Yakov Zeldovich, a physicist in the Soviet Union, thought that the gas cloud would collapse into a flat disk. Shocks in the disk would cool the gas, and then galaxies would form out of "Zeldovich pancakes." In space, these pancakes would form a honeycomb pattern with an empty void, followed by plates of galaxies. We could refer to this version as a "Swiss cheese topology."



A.P. Roberts and E. J. Garboczi, *Facta Materialia*, Vol 49 (2) 189 (2001), Fig. 2 located at http://ciks.cbt.nist.gov/garbocz/closed cell/nodes.html

Around the same time these ideas were being presented, the inflationary universe theory was being developed to explain the observed geometry of the universe (flat), and the cosmic microwave background radiation seemed much more uniform than could be explained by the standard Big Bang theory.



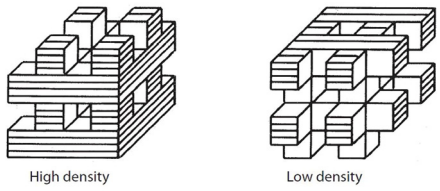

Alan Guth (from MIT) proposed that a high-density dark energy existed at the earliest stage of the universe. This would have been gravitationally repulsive, so the universe started rapidly accelerating in its expansion. This energy would then decay into normal particles with the standard Big Bang cosmology continuing from here.

Guth realized this model wouldn't be very uniform, and bubbles would form in this sea of dark energy (like bubbles in a boiling pot of water). Dr. Gott wrote a paper in 1982 that said we live in one of the many bubbles!

Steven Hawking wrote his own paper in which he said that the bubble model would lead to random quantum fluctuations with such a large amplitude that they could grow with the help of gravity in 13.7 billion years to create the groups and clusters of galaxies we see today.

It's important that these were random quantum fluctuations. Use a random number generator, but change the sign from positive to negative. This change would result in all regions that were initially slightly above the average density becoming just below it. This would interchange the high and low-density parts of the initial conditions. Since these fluctuations were random, those two parts had to have the same topology. This was inconsistent with the meatball topology or the Swiss cheese topology.

This change would result in all regions that were initially slightly above the average density becoming just below it. This topology would be required for inflation.




What this means is that if this structure were to grow due to gravity, it would create groups of galaxies linked by high-density filaments and low-density voids linked to other voids by tunnels.

Dr. Gott, along with Adrian Melott and Mark Dickinson, would use inflationary initial conditions to run different N-body simulations that would prove this big-picture structure of the universe.

To sum up, the clumping of matter started when quantum fluctuations at the subatomic level were pushed to enormous but very subtle changes in gravitational fields. These changes sped up the formation of galaxy walls, filaments, and clusters.

Astrophysicist Richard Bond of the University of Toronto coined the term "Cosmic Web" in 1996.

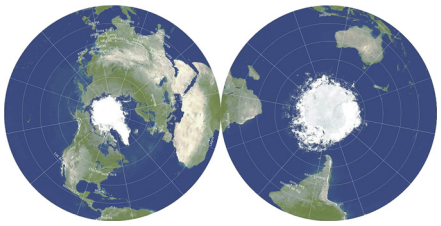
Dr. Gott then discussed a new type of polyhedra he recently wrote a paper

about, called envelope polyhedra. They are made of regular polygons, where the arrangement of polygons (creating a single surface) around each vertex is identical, but dihedral angles between faces need not be identical, and some of the dihedral angles are 0 degrees (i.e., some polygons are placed back to back). To learn more, read his paper online.

Dr. Gott's final topic was on maps. Cartographers have been looking for the most accurate flat map of Earth for years. The Mercator projection is the most famous type of map, and it illustrates the six errors he wrote about with David Goldberg in 2008. There are a lot of mistakes on this map, such as overly distorted areas near the poles, wrong measurements of distances between landmasses, skewed or uneven shapes, and possible boundary cuts (discontinuities) between countries that are shown on the edges.

They quantified these errors to give each type of map a score. The Mercator map received an 8.2, with a perfect score being 0. The most famous projection receiving the highest score, 4.56, was the Winkel Tripel projection. Cartographers wrote them about another projection they didn't review, Canters W09. Upon review, it received a score of 4.2.

Dr. Gott came up with an idea for a new type of map after examining a Guyou projection map. He realized you could fold this map in half, but instead of making it a circular shape, it was instead a square. Place the Northern Hemisphere on one side, with the Southern on the other, and the equator would be along the edge. This map has a very low error of 0.881!



Dr. Gott and Goldberg wondered if not being able to see the whole Earth at once was an error, but they realized you can't see both halves of a globe at once either! TIME magazine picked this as one of the best inventions of 2021.

Dr. Gott then showed examples of other planetary bodies using this new type of map projection. Instead of opposing hemispheres, a map of the Moon is divided by its near and far sides. Others shown include Jupiter, Saturn, Mars, and Enceladus.

Michael Blanton's review of Dr. Gott's book, The Cosmic Web, best captures the lesson of his story:

*Gott's journey shows how scientists can be so motivated by their earliest obsessions that they persist in pursuing them—and how unique obsessions can let them bring something new to the crowded table of ideas.*

Richard started off his President's Report by asking if anyone received any astronomical gifts this past holiday season. Dave Woolf got a copy of Volume 11 of *Annals of the Deep Sky*. Gregory Shanos got himself a ZWO Seestar S30 smart telescope. David Latimer purchased copies of *NightWatch* and *The Backyard Astronomer's Guide*. George Drake received a copy of *Merlin's Tour of the Universe* by Neil deGrasse Tyson.

Richard then introduced the 2025 KAS board members. He noted that this is his 20th term as KAS president! Members returning to the board include Matt Borton and Pete Mumbower. Pete last served on the board in 2021 and 2022 (and 1995 and 1996 before that). Matt Borton last served on the board way back in 2001.

The membership renewal process continues! Less than 100 people still need to renew. We plan to send a direct email, rather than an email blast, to all individuals whose membership has expired. We will send a follow-up snail mail letter in mid-February. We will then purge the roster on March 8th.

Our community outreach calendar is growing. Recently, we received invitations to two additional school events. The current list of outreach starts with STEM Night at Paramount Charter Academy on January 22nd, from 5:30 to 7 pm. (UPDATE: This was delayed to January 29th due to the extreme cold. Thanks to George Drake, Scott Macfarlane, and Jack Price for volunteering.)

The Hasting Public Library will host Family Science Night on Wednesday, February 19th, from 6 to 7:30 pm. We currently have sufficient volunteer coverage for that. Bloomingdale Public Schools will hold their own Family Science Night on Tuesday, March 25th from 5 to 7 pm. They plan to set aside an entire classroom for us, so we will need many volunteers for that. We plan to have a telescope display and offer a hands-on activity.

Finally, St. Michael Lutheran School will host STEAM Night on Friday, April 11th, from 6 to 8 pm. We will offer one hands-on activity, so only two or three volunteers are required.

Richard then inquired if we should add a ZWO Seestar S50 to our collection of equipment for loan.

For those unfamiliar with smart telescopes, they are an all-in-one unit that combines a telescope, tracking mount, camera, and computer into one compact and highly portable imaging system.

Controlled with an app on a smartphone or tablet, smart telescopes automate many of the complex processes of Electronically Assisted Astronomy (EAA) and astrophotography, such as star alignment, focusing, and tracking. Simply choose the target you would like to view, and the telescope will automatically slew to and center it. Even more complex processes, like image stacking and processing, are all done for you.

The ZWO Seestar S50 is one of the most popular smart telescopes due to its affordability. Many members already have one, but this is for those who want to try it but may not buy one. We will decide on purchasing one at the board meeting on February 9th.

Finally, Richard encouraged anyone interested in organizing special KAS activities for 2025 to take the initiative. These could include field trips or workshops.

There were only sporadic observing reports from members in attendance on Zoom thanks to cloudy skies and frigid temperatures.

In astronomical news, the ESA's BepiColombo probe conducted its sixth flyby of Mercury on January 8th. They shared a few of the top images online.

NASA's Parker Solar Probe made a historic close pass to the Sun on December 24th. It zipped just 3.8 million miles above the Sun's surface.

The meeting ended at 8:46 pm after going over forthcoming KAS events.

# So, You Want To Be An Astrophotographer?

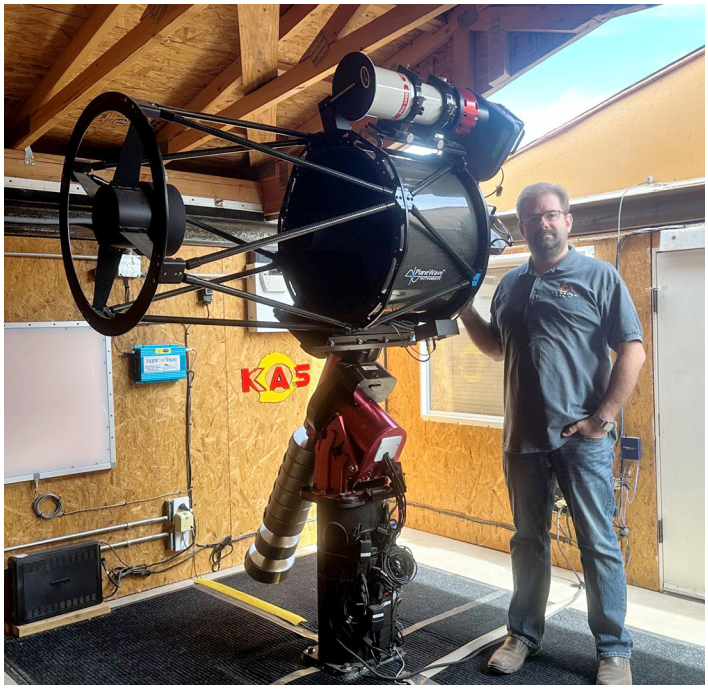
# Using the KAS Remote Telescope

by **Tim Kurtz**

Looking through a telescope is one of my favorite pastimes, and I can't get enough of seeing those faint fuzzies. One of my beloved memories is seeing Saturn through my dad's telescope on a frigid January night. We would set the telescope slewing to a target and then huddle in the garage out of the cold as his Celestron CG5 mount whined and moaned its way across the sky. We'd then race back out to the eyepiece, freezing ourselves as we gazed in wonder at the treasures the 8" SCT delivered. Despite the cold and biting winter wind, we enjoyed an absolutely tack-sharp view of the sixth planet. At that time, I thought, "I need to be able to share this view with everyone!" Since I failed spectacularly at getting people to attend public observing sessions, the next goal was astrophotography.

Well, it turns out putting my Canon 350D on my Meade 102ED refractor did not quite yield the images I expected. After a little research, I realized my goals were way beyond my current skills, so I did the obvious and shelved the project. Fast forward a few years, and the KAS moved forward with a remote telescope dedicated to astrophotography! EXCITEMENT = 110%

After completing some fundraising and installation work, we had a telescope in Portal, Arizona! I attended the inaugural training session, paid my dues, and then NEVER USED IT. I watched the Online Viewing Sessions and




Tim Kurtz with the KAS Remote Telescope.

Mike Patton's Piishii Observatory is home to the KAS Remote Telescope.

thought, "Gee, I should really get on that." In 2018, I traveled to Arizona to work on the Remote Telescope, and I returned in 2022 and 2023 to continue this work. Still, I did not use it. TIM, C'MON, WHAT IS WRONG WITH YOU!? 2024 came along, and I visited Arizona again on vacation, and finally:

"Richard, please help. I want to use the scope."

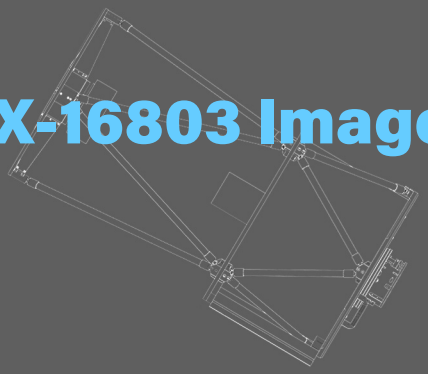
Good news, new users! Not only is there a comprehensive instructional video, but Richard (and likely other experienced users) will help you through your first night! Better yet, it is simple. As in, click here, type here, click here, and get images! Read that one more time: click, type, click, and boom—you too can be an astrophotographer. I was floored. Using the RT was this easy? Why did I wait? I had been collecting and building up my own telescope/mount/camera rig, costing 100 times more than the annual RT fee. And for what? There are nights of frustration, poor tracking, lost data, and typical computer gremlins to contend with. Using the KAS Remote Telescope is truly a painless experience, and for only $50 for the year, it is an absolute no-brainer.

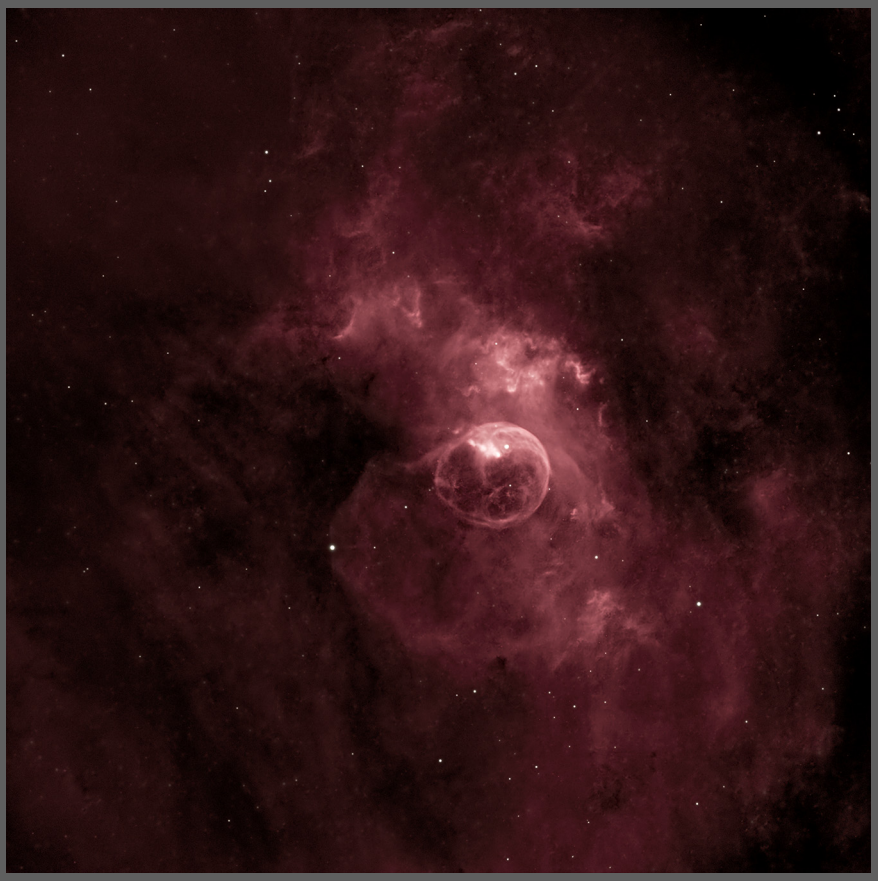
As a first-time user, I can confidently say this is accessible to everyone with a computer and the internet. I hope to see more people taking advantage of this opportunity. There are vast numbers of amateur astronomers out there salivating at the chance to use equipment like our very own Society possesses. I've included a couple of images I've taken with the PlaneWave CDK20 (Corrected Dall-Kirkham 20") and a photo of me standing next to the impressive setup, something you should be proud to show off to friends, family, and strangers alike.

*Tim Kurtz has been a member of the KAS since 2005.*

# PlaneWave CDK20 & SBIG STX-16803 Images

by Tim Kurtz



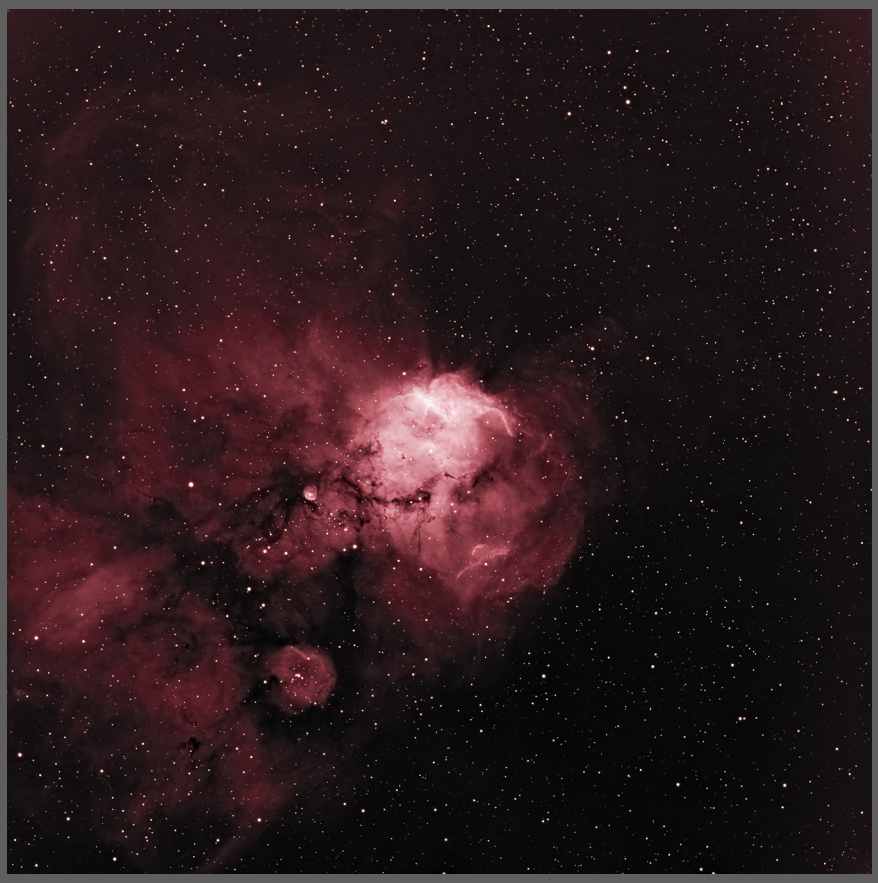


## Bubble Nebula

### — NGC 7635 —

This emission nebula is located at least 7,100 light-years away in the constellation Cassiopeia. The “bubble” is thought to be the result of a shock front from an O-type star's stellar wind meeting interstellar material at supersonic speeds. The bubble is about 7 light-years in diameter.

This exposure spans 3 hours and 45 minutes using the Astrodon 3nm Hydrogen-Alpha filters (45 × 5 minutes). Subframes were stacked in Siril. Background extraction was performed in GraXpert. Adobe Photoshop added false color and performed noise reduction using RC-Astro's NoiseXTerminator.



## Skull & Crossbones Nebula

### — NGC 2467 —

This star-forming region, also cataloged as Sharpless 311, is located at least 20,500 light-years away in the constellation Puppis. William Herschel used his 18.7-inch reflecting telescope to discover it on December 9, 1784.

This exposure spans 5 hours and 40 minutes using the Astrodon 3nm Hydrogen-Alpha filters (68 × 5 minutes). Subframes were stacked in Siril. Background extraction was performed in GraXpert. Adobe Photoshop added false color and performed noise reduction using RC-Astro's NoiseXTerminator.

# How Can You Help Curb Light Pollution?

by **Dave Prosper** | updated by **Kat Troche**

Light pollution has long troubled astronomers, who generally shy away from deep sky observing under full Moon skies. The natural light from a bright Moon floods the sky and hides views of the Milky Way, dim galaxies and nebula, and shooting stars. In recent years, human-made light pollution has dramatically surpassed the interference of even a bright full Moon, and its effects are now noticeable to a great many people outside of the astronomical community. Harsh, bright white LED streetlights, while often more efficient and long-lasting, often create unexpected problems for communities replacing their older streetlamps. Some notable concerns are increased glare and light trespass, less restful sleep, and disturbed nocturnal wildlife patterns. There is increasing awareness of just how much light is too much light at night. You don't need to give in to despair over encroaching light pollution; you can join efforts to measure it, educate others, and even help stop or reduce the effects of light pollution in your community.

Amateur astronomers and potential citizen scientists around the globe are invited to participate in the Globe at Night (GaN) program to measure light pollution. Measurements are taken by volunteers on a few scheduled days every month and submitted to their database to help create a comprehensive map of light pollution and its change over time. GaN volunteers can take and submit measurements using multiple methods ranging from low-tech naked-eye observations to high-tech sensors and smartphone apps.

Globe at Night citizen scientists can use the following methods to measure light pollution and submit their results:

- Their own smartphone camera and dedicated app
- Manually measure light pollution using their own eyes and detailed charts of the constellations
- A dedicated light pollution measurement device called a Sky Quality Meter (SQM).

Before and after pictures of replacement lighting at the 6th Street Bridge over the Los Angeles River. The second picture shows improvements in some aspects of light pollution, as light is not directed to the sides and upwards from the upgraded fixtures, reducing skyglow. However, it also shows the use of brighter, whiter LEDs, which is not generally ideal, along with increased light bounce back from the road. Image Credit: **The City of Los Angeles**

Light pollution has been visible from space for a long time, but new LED lights are bright enough that they stand out from older streetlights, even from orbit. Astronaut Samantha Cristoforetti took the above photo from the ISS cupola in 2015. The newly installed white LED lights in the center of the city of Milan are noticeably brighter than the lights in the surrounding neighborhoods. Image Credit: NASA/ESA

- The free GaN web app from any internet-connected device (which can also be used to submit their measurements from an SQM or printed-out star charts)

Night Sky Network members joined a telecon with Connie Walker of Globe at Night in 2014 and had a lively discussion about the program's history and how they can participate. The audio of the telecon, transcript, and links to additional resources can be found on their dedicated resource page.

The International Dark-Sky Association (IDA) has long been a champion in the fight against light pollution and a proponent of smart lighting design and policy. Their website provides many resources for amateur astronomers and other like-minded people to help communities understand the negative impacts of light pollution and how smart lighting policies can not only help bring the stars back to their night skies but also make their streets safer by using smarter lighting with less glare. Communities and individuals find that their nighttime lighting choices can help save considerable sums of money when they decide to light their streets and homes "smarter, not brighter" with shielded, directional lighting, motion detectors, timers, and even choosing the proper "temperature" of new LED light replacements to avoid the harsh "pure white" glare that many new streetlamps possess. Their pages on community advocacy and on how to choose dark-sky-friendly lighting are extremely helpful and full of great information. There are even local chapters of the IDA in many communities made up of passionate advocates of dark skies.

The IDA has notably helped usher in "Dark Sky Places", areas around the world that are protected from light pollution. "Dark Sky Parks", in particular, provide visitors with incredible views of the Milky Way and are perfect places to spot the wonders of a meteor shower. These parks also perform a very important function, showing the public the wonders of a truly dark sky to many people who may have never before even seen a handful of stars in the sky, let alone the full glorious spread of the Milky Way.

More research into the negative effects of light pollution on the health of humans and the environment is being conducted than ever before. Watching the nighttime light slowly increase in your neighborhood, combined with reading so much bad news, can indeed be disheartening! However, as awareness of light pollution and its negative effects increases, more people are becoming aware of the problem and want to be part of the solution. There is even an episode of PBS Kid's SciGirls where the main characters help mitigate light pollution in their neighborhood!

Astronomy clubs are uniquely situated to help spread awareness of good lighting practices in their local communities to help mitigate light pollution. Take inspiration from Tucson, Arizona, and other dark sky-friendly communities that have adopted good lighting practices. Tucson even reduced its skyglow by 7% (as of 2018) after its own citywide lighting conversion, proof that communities can bring the stars back with smart lighting choices.

*This article is distributed by the Night Sky Network. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!*

# Star Parties in 2025

**Pack your bags, collimate that scope, and clean those eyepieces! It's time to hit the road and attend a star party (or two). Listed below are some of the major star parties that have already announced their dates for 2025. Registration procedures and deadlines for each star party may be different (or even passed), so please visit their websites for the latest information.**

**If you plan to attend any of the events listed (or not listed) here, then let us know. Maybe other KAS members would like to attend as well. Plus, if you do attend any star parties this year, please consider writing a report for *Prime Focus*. Clear Skies!**

**Winter Star Party**
*Scout Key, Florida*
January 27 – February 2
https://www.scas.org/winter-star-party/

**Death Valley Dark Sky Festival**
*Death Valley National Park, California*
February 21 – 23
https://shorturl.at/yoHb9

**Staunton River Star Party**
*Staunton River State Park, Virginia*
March 24 – 30
http://chaosastro.org/starparty-home/

**Northeast Astronomy Forum**
*Suffern, New York*
April 5 – 6
https://www.neafexpo.com/

**Texas Star Party**
Fort Davis, Texas
April 20 – 27
https://texasstarparty.org/

**Mid-South Stargaze**
*French Camp, Mississippi*
April 23 – 26
https://rainwaterobservatory.org/events

**Grand Canyon Star Party**
*Grand Canyon, Arizona*
June 21 – 28
https://is.gd/GrandCanyonStarParty

**Cherry Springs Star Party**
*Cherry Springs State Park, Pennsylvania*
June 19 – 22
http://www.cherrysprings.org/

**Oregon Star Party**
*Indian Trail Spring, Oregon*
June 24 – 29
https://oregonstarparty.org/

**Bryce Canyon Astro Festival**
*Bryce Canyon National Park, Utah*
June 25 – 28
https://is.gd/brca_astrofest

**Green Bank Star Quest**
*Green Bank, West Virginia*
June 25 – 28
http://www.greenbankstarquest.org/

**Rocky Mountain Star Stare**
*Gardner, Colorado*
June 25 – 29
http://www.rmss.org/

**Nebraska Star Party**
*Merritt Reservoir, Nebraska*
July 20 – 25
https://www.nebraskastarparty.org/

**Stellafane**
*Springfield, Vermont*
July 24 – 27
https://stellafane.org/

**Starfest**
*Ayton, Ontario*
August 21 – 24
https://www.nyaa.ca/

**Almost Heaven Star Party**
*Circleville, West Virginia*
August 22 – 26
https://www.ahsp.org/

**Illinois Dark Skies Star Party**
*Cass County, Illinois*
September 18 – 20
https://sas-sky.org/

**Connecticut Star Party**
*Goshen, Connecticut*
September 19 – 21
https://asnh.org/

**Okie-Tex Star Party**
*Kenton, Oklahoma*
September 19 – 27
http://www.okie-tex.com/

**Great Lakes Star Gaze**
*Gladwin, Michigan*
September 25 – 28
http://www.greatlakesstargaze.com/

**Black Forest Star Party**
*Cherry Springs State Park, Pennsylvania*
October 2 – 5
https://bfsp.org/

**Peach State Star Gaze**
*Deerlick Astronomy Village, Georgia*
October 19 – 26
https://atlantaastronomy.org/pssg/

**Eldorado Star Party**
*Eldorado, Texas*
October 20 – 25
http://www.eldoradostarparty.org/

**Michiana Star Party**
*Vandalia, Michigan*
October 23 – 26
http://www.michiana-astro.org/

# FAAC Astronomy Conference & Swap Meet

*Saturday, April 5, 2025 9:00 am - 3:00 pm*

### General Astronomy

9:30 am: **Touching the Sun** – Liam Finn
10:45 am: **Astronomy: What Can Go Rong?** – Ed Halash
12 N **Which Eyepiece?** – Gordon Hansen
1:30 pm: **Astronomy vs Pretty Pictures–** Adrian Bradley

### Technical Talks

9:30 am: **Telescope Making** – Clay Kessler
10:45 am: **Nightscape Photography** – Jason Guensel
12 N: **Seestar S50 & S30** – Sean Pickard
1:30 pm: **Space-Time** – Tim Campbell

### Planetarium Shows

10:45am, Noon & 1:30pm FAAC Members

### Swap Meet

All Day…Earn Cash by Selling Those Items Sitting Around Collecting Dust!
Telescopes, Eyepieces, Cameras, Binoculars, Mounts, Software, Books, and Accessories, etc.

**Admission: $7.00** (children 15 and younger – Free / must be accompanied by an adult)

**Sales Table:** $20 in advance, or $25 at the door as available, (one admission ticket included).

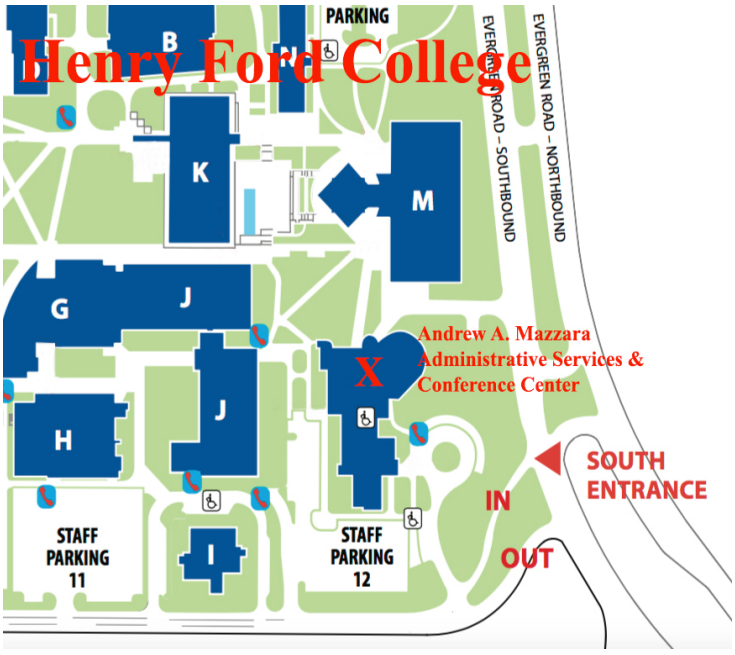
**Advanced Table Registration ends Mar 15, 2025**

**Doors Open:** 8:00am for setup.

**Make Checks Payable:** to **FAAC** for advance table registration.

**Send payment to: Ford Amateur Astronomy Club, P.O. Box 7527, Dearborn, MI 48121-7527**

**Location: Henry Ford College,** 5101 Evergreen Rd, Dearborn, MI 48128 (Andrew A. Mazzara Admin. & Conference Center… See **X** on map, Staff Parking Lots 11 & 12 will be open)



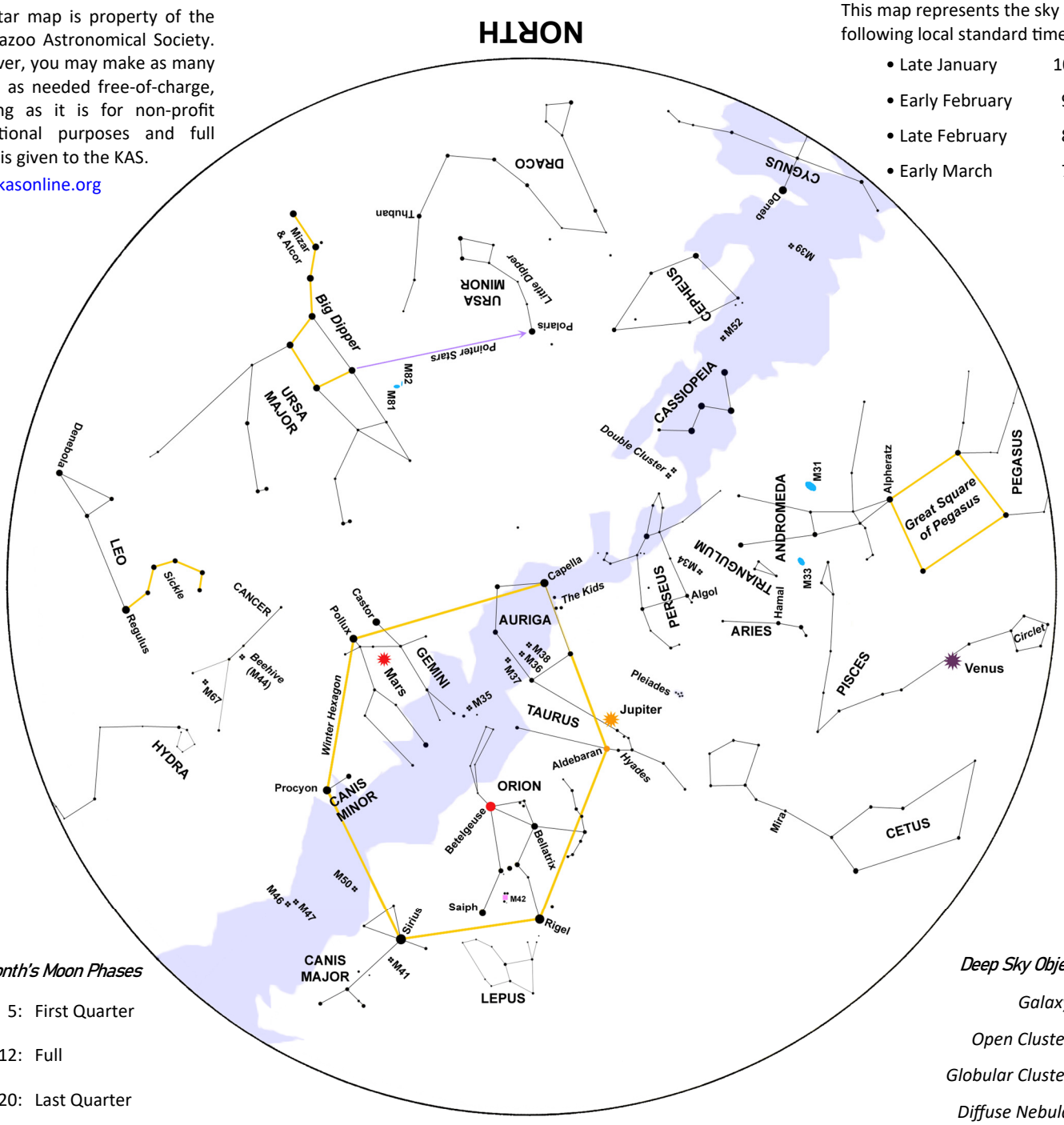

**For More Information:** Contact Jim via email: w8tu@comcast.net or call (734) 751-6280

# February Night Sky



This map represents the sky at the following local standard times:

- Late January 10 pm
- Early February 9 pm
- Late February 8 pm
- Early March 7 pm




*This Month's Moon Phases*

- 5: First Quarter
- 12: Full
- 20: Last Quarter
- 27: New

*Deep Sky Object Key*

- *Galaxy*
- *Open Cluster*
- *Globular Cluster*
- *Diffuse Nebula*
- *Planetary Nebula*

Grab your binoculars and point them to the west-southwest at dusk on February 1st. There, you'll find a waxing crescent Moon about 2½° to the lower left of Venus. Earthshine on the young Moon will make for a dramatic view.

The Moon, one day past first quarter, appears about 5° above Jupiter on the evening of February 6th.

Only 1½° of sky will be between the Full Moon and Regulus, the heart of Leo the Lion, when they rise in the east on the evening of February 12th.

A waning gibbous Moon appears 1° to the right of Spica, in Virgo, during the early morning hours of February 17th.

Mercury and Saturn will be less than 1½° apart at dusk on February 24th. Look low in the west-southwest.

On February 28th, at dusk, a razor-thin waxing crescent Moon, one day past new, will be situated 3° below Mercury. Using binoculars, start from Venus and slowly work your way toward the horizon. You'll need an unobstructed view of west-southwest. The lakeshore would be ideal.

**General Meeting Preview**

# Astronomy and the Billionaire Space Race

*presented via Zoom by*

## Dr. Samantha Lawler

**In February 2024, hundreds of pounds of potentially lethal debris from a SpaceX Crew Dragon trunk from a private astronaut mission fell on farmland near Regina, Saskatchewan. Dr. Samantha Lawler of the University of Regina has been studying the degradation of the night sky due to thousands of new commercial satellites over the past six years and was stunned to learn that space debris fell so close to her home.**

**This talk begins with the story of SpaceX employees driving a rented U-Haul truck to an isolated grain farm to be greeted by an astronomer and a dozen of Saskatchewan's finest local journalists. By the end of the talk, we'll cover international space law, atmospheric pollution due to launches and reentries, and how thousands of new commercial satellites are already changing casual stargazing, astrophotography, and astronomy research alike.**

**— About the Speaker —**

*Dr. Samantha Lawler is an Associate Professor of Astronomy at Campion College and the Department of Physics at the University of Regina in Saskatchewan, Canada. Her discoveries in the Kuiper Belt and predictions for satellite pollution have been featured by CBC, CNN, NPR, Scientific American, The New York Times, The Los Angeles Times, Wired Magazine, Nature, and many other international news outlets. She lives on a farm outside Regina and deeply appreciates the beautiful prairie skies.*

## Friday, February 7th @ 7:00 pm EST

***Kalamazoo Area Math & Science Center***

***Use Dutton St. Entrance • Locked by 7:10 pm***

***Also held on Zoom • Click to Register***