

Highlights of the December Sky...

4th
New Moon
2:44 am EST

6th
DUSK: A waxing crescent Moon is 2½° below Venus.

7th
DUSK: The Moon is 2½° below Saturn.

8th
DUSK: The Moon, Jupiter, and Saturn form a triangle.

10th
First Quarter Moon
8:37 pm EST

14th
AM: Gemini meteor shower peaks, but is spoiled by the Moon until 3am.

18th
Full Moon
11:37 pm EST

21st
DAWN: A waning gibbous Moon is 3° from Pollux.

22nd
DAWN: The Moon is 3° to the upper right of the Beehive Cluster (M44).

26th
Last Quarter Moon
9:26 pm EST

28th
DAWN: A waning crescent Moon and Spica are 2½° apart.

29th
DUSK: Mercury and Venus are 4½° apart low on the southwestern horizon.

31st
DAWN: A slender Moon, Mars, and Antares form an equilateral triangle in the southeast.

Prime Focus

A Publication of the Kalamazoo Astronomical Society

★ ★ ★ December 2021 ★ ★ ★

This Months Events

Annual Meeting: Friday, December 3 @ 7:00 pm

Held on Zoom • [Click to Register](#) • See Page 12 for Details

Online Viewing: Saturday, December 4 @ 8:30 pm

Held on Zoom • [Click to Register](#) • See Page 11 for Details

Observing SIG: Saturday, December 11 @ 7:30 pm

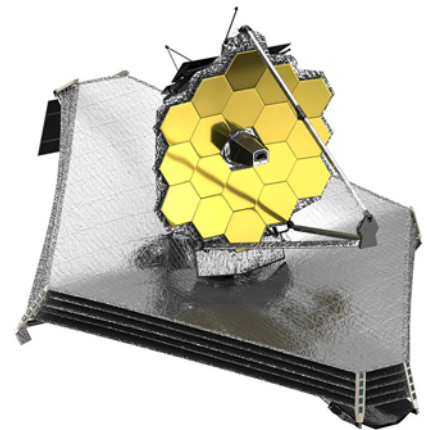
Richland Township Park • See Page 3 for Details

Astrophoto SIG: Friday, December 17 @ 8:00 pm

Held on Zoom • [Click to Register](#) • See Page 3 for Details

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★ ★ ★ www.kasonline.org ★ ★ ★

NOVEMBER Meeting Minutes

The general meeting of the Kalamazoo Astronomical Society was brought to order by President Richard Bell on Friday, November 5, 2021 at 7:06 pm EDT. About 45 members and guests attended from their homes via Zoom.

Before our feature presentation, Richard opted to start with his President's Report. Over 540 clubs in the U.S., Canada, and U.K. have been contacted about the upcoming *Introduction to Amateur Astronomy* series (see page 4). Over 80 registrations have been received thus far. Volunteers are needed to answer questions in the Q&A section of each installment. Contact Richard if you are interested.

Kevin Jung has decided to step aside as Facebook Manager, so another member is needed to update and maintain our Facebook pages. If you are fluent in this platform, please [contact us](#). Opening nominations for the 2022 KAS Board were then held. No nominations were made during the meeting. Open positions include Publicity Manager and Member-At-Large.

We then welcomed Sam Smartt, an Associate Professor of Film & Media at Calvin University in Grand Rapids. Mr. Smartt is an award-winning documentary filmmaker and film producer. His most recent work, *Luminous*, was our special feature presentation of the evening. Mr. Smartt followed Dr. Larry Molnar, Physics & Astronomy Professor, also at Calvin University, and his students for five years as they test an unprecedented prediction that brought them into the international spotlight. Dr. Molnar predicted that a close-contact binary star in Cygnus will merge and explode as early as 2022.

After introducing the film, members and guests were provided with a link to watch a 75-minute version of the documentary. The film was also a biographical piece on Dr. Molnar himself. In short, a typo in the initial data used to make the binary star merger prediction was discovered. Once the correction was made, any change of the stars merging and exploding went away. However, Dr. Molnar and his team discovered 7 other candidates for close-contact mergers, but none are expected to occur in our lifetime. Both Sam Smartt and Dr. Molnar were on hand to answer questions after the screening.

Thanks to typical cloudy mid-Fall weather, it's likely we missed a display of the Northern Lights on the night of November 3rd/4th. A geomagnetic storm was propelled toward Earth on November 2nd and aurora was spotted at a latitude of 39° in California. In other (or actual) observations, Joe Comiskey spotted a young crescent Moon. Aaron Roman was able to observe the Hubble Space Telescope (HST) low on the southern horizon. In other observing news, there will be a deep (97%) partial lunar eclipse during the early morning hours of November 19th. Members were encouraged to share observations and images for publication and use on social media.

In current events, Jack Price has been following the progress of the James Webb Space Telescope as it makes its journey to French Guiana for launch on December 18th. We then had a brief round table discussion about everything that could go wrong with its launch. Depending on the time of lift off, we may hold an impromptu launch party on Zoom. Mike Dupuis noted that some instruments on HST entered "safe mode" and it was uncertain when they'll be taken out of this control state. George Drake noted that astronomy books formally published by Willmann-Bell are now [available for purchase](#) on *Sky & Telescope's* website.

After covering upcoming events, the meeting concluded at 9:48 pm.

BOARD Meeting Minutes

KAS officers and at-large members gathered on Zoom for a board meeting on November 14th. President Richard Bell brought the meeting to order at 5:07 pm EST. Others present included Joe Comiskey, Kevin Jung, Scott Macfarlane, Pete Mumbower, Aaron Roman, and Don Stilwell.

With no recommended changes to the agenda, Don Stilwell presented the Treasurer's Report. Before the meeting, Don provided us with reports detailing finances through the end of October. The only notable change was that the total cash on hand was up \$413.88 since the last report due entirely to member renewals.

Next, upcoming events for November through February were summarized. Most notable will be our annual meeting on December 3rd, where final nominations and elections for 2022 board members will be held. Other upcoming items include Astrophotography SIG Meetings (12/17 and 1/21) and Online Viewing Sessions (12/4 and 1/29). The *Introduction to Amateur Astronomy* lecture series will return starting on January 15th. Finally, for those interested in participating in in-person events, there are Observing SIG Sessions (12/11 and 1/8) at Richland Township Park and the February Freeze Out (2/5) at the Nature Center.

A few follow-up items from the previous meeting included purchase of the new autoguider for the Remote Telescope. It is currently on backorder. Richard contacted Dave Miller (Observatory Solutions) about an issue with the shutdown procedure. Dave has yet to reply, so Richard will try working with Bob Denny (creator of ACP) instead. Owl Observatory's new 8-inch Sky-Watcher Dobsonian is on order, but is also on indefinite backorder. Finally, there are three confirmed 2022 general meeting guest presenters thus far. These include Dr. David A. Williams (Psyche mission, 1/7), Dr. Jay Pasachoff (solar eclipses, 2/4), and Dr. Melissa Trainer (Dragonfly mission, 4/8).

The next board meeting is scheduled for Sunday, February 13th at 5pm. The meeting concluded at 5:33 pm.

Minutes submitted by Aaron Roman



Observations

by **Richard S. Bell**

Another season of giving is upon us once again! Obviously, the most important part of the holiday season is taking a break from our hectic schedules and spending time with friends and family. Receiving gifts is secondary, but it's become part of the seasonal tradition (and is good for the economy). I've been told by my family that I'm hard to shop for! Aside from my expensive hobbies of amateur astronomy and astrophotography, I'm not much of a materialistic person. If you've been told that you're difficult to find gifts for as well then don't despair. I'm here to help!

The topic of the November Astrophotography SIG meeting was *Great Gifts for the Astrophotographer*. Five members (Anna Daly, Pete Mumbower, Lloyd Simons, Jonathan Young, and I) shared 15 ideas for the current holiday season. You can see what we came up with in the meeting's recording on our [YouTube channel](#). Some of their selections are rather expensive for holiday gifts, but come from their collection of astrophotography gear. Most members are not sky shooters though, but I've got plenty of gift ideas for any astronomy enthusiast and/or KAS member!

From *KAS Online*, click on the Support Us menu and select [SkyShop](#). This is our online store. There's not much in there these days, but we do have KAS Lapel Pins, Miller Planispheres, and KAS Embroidered Caps in three colors. They are all reasonably priced and make great gifts for any hard-to-shop-for member. The planispheres are a great gift idea for anyone interested in stargazing. Also located under the Support Us menu is a link to our [clothing store](#) on Zazzle. There, we have many designs and colors of T-shirts, polo shirts, and sweatshirts (both hooded and unhooded) to choose from. There are also a few novelty items like a coffee mug, key chain, tote bag, and thermal tumbler with the KAS logo. Zazzle always seems to have items on sale, so keep an eye out for special holiday pricing.

One more link under the Support Us menu will take you to Orion Telescope & Binoculars' [website](#). Orion has a large selection of telescopes, binoculars, eyepieces, cameras, etc. for amateurs of all levels. (Their selection is even larger since acquiring Meade Instruments earlier this year.) The KAS receives a commission whenever you visit Orion's website through ours and make a purchase. A large portion of the KAS membership no doubt purchases items for themselves or others from Amazon. However, as noted on page 11, a 0.5% donation is made to the KAS on all eligible purchases through [Amazon Smile](#).

The final gift idea is [KAS membership](#) itself. This could be a new membership or a renewal. You've already been contacted by email if you need to renew this year, but if you've forgotten then check the membership list starting on page 7 to see your status. If you see **2021** in red with your listing, then it's time to renew! Memberships, purchases, commissions, and [even donations](#) all support KAS activities and facilities. Thank you in advance for your support!



Observing

Special Interest Group

The purpose of the Observing SIG is to help foster an observing culture in the KAS by aiding and encouraging its members to complete Astronomical League Observing Programs. One way to maintain enthusiasm for getting out under the stars is to have a long-range viewing plan or goal. Observing Programs do that by motivating and directing your viewing. Programs are available for unaided eye, binocular, and telescopic observers of all skill levels. This gathering will be canceled in the case of inclement weather.

Saturday, December 11th @ 7:30 pm

Richland Township Park • 6996 N. 32nd St.



ASTROPHOTOGRAPHY SIG Meeting Preview

All KAS members interested in astrophotography are encouraged to attend and participate during SIG meetings. Each meeting will feature a main topic presented by members or special guests. Members are encouraged to share their latest images during each meeting. We will also discuss and review the latest imaging equipment and software.

Main Topic for December Meeting:



Sequence Generator Pro is automation software for imaging that allows one to do hands-off collection of data all night long or if needed, night after night. But to be able to do this, SGP needs to be configured for YOUR setup properly. Pete will cover the areas needed for successful automation.

About the Speaker:

Pete is an avid amateur astronomer and IT professional residing in southwest Michigan. He holds a Bachelor of Computer Science degree from Davenport University and has worked in IT field for over 20 years in various positions at the local and global level. A lifelong interest in astronomy and astrophotography really took off in the early 1990s when he first joined the KAS. Most of his imaging efforts of the last few years are displayed on his [Astrobin page](#). Outside astronomy he is a competitive runner focusing on marathons and enjoys camping with his wife and four kids.

Friday, December 17th @ 8:00 pm

Held Online via Zoom • [Click Here to Register](#)



Introduction to Amateur Astronomy

Stargazing is easy, and astronomy is something anyone can do and enjoy. You just have to get started off on the right foot. Starting out wrong can lead to disappointment, frustration, and wasted money. Starting out right can lead to a lifetime of celestial exploration and enjoyment. Today, the hobby of astronomy - the biggest and most mind-boggling branch of amateur nature study - is attracting more people than ever. The **Kalamazoo Astronomical Society** is happy to present a five-part lecture series that will help you become a star-hopping skymaster!



Part 1: Our Place Among the Infinities

January 15

For a long time, the stars were merely pinpoints of light on the black backdrop of the heavens. Before massive telescopes on mountaintops came along, all we could observe were the Sun, Moon, planets, their satellites, and the occasional comet. Today we know that those pinpoints of light are distant suns and that we live in a remote corner of one galaxy amongst billions. For our first presentation, we'll travel through our solar system, explore the star clusters and nebulae of our Milky Way Galaxy, and the countless other galaxies in this vast, infinite universe.

Part 2: Discovering the Night Sky

January 29

Is that a bright star or a planet? Where's the constellation Orion? Your first task as an amateur astronomer is to learn your way around the night sky. We'll show you how to find any star or constellation in the night sky with the use of a simple star map or planisphere. We'll also look at wealth of other celestial wonders you can observe with just your eyes alone.

Part 3: Binocular Basics

February 12

Every amateur astronomer, novice or advanced, should own at least one good pair of binoculars. They make an ideal first "telescope" because of their wide field of view, ease of use, portability, versatility, and low cost. Several types of binoculars are available, but which ones are best for astronomy? You'll be amazed at what you can see!

Part 4: Telescope Tutorial

February 26

Sooner or later, every amateur astronomer faces the decision of purchasing a first telescope. There are literally hundreds of choices today! What's the difference between a refractor and reflector? Which telescope is the right one for you? To make this daunting task easier, we'll compare several of the top telescopes available today and tell you which ones to avoid. We'll also look at the countless array of accessories available for your telescope.

Part 5: The Art of Astrophotography

March 12

Astrophotography is the art of photographing the night sky. Over the past two decades that art has undergone a revolution as digital cameras have overtaken their film counterparts. In some ways this has made the field more technical, but in many ways shooting the sky is easier than ever! We'll start with the basics like using a stationary photographic tripod and work our way up to imaging with sophisticated cooled CCD or CMOS cameras. Constellation patterns, the Milky Way, the night-to-night motion of the planets, bright comets, northern lights, and perhaps a meteor all await you.

Time: 1:00 pm → 3:00 pm EST

Admission: FREE

Location: Online via Zoom

Registration: www.kasonline.org





Take Back the Constellations!

A Review of Omegon's 2.1×42 Wide-Field Binoculars

by Joe Comiskey

As my family and I journeyed to Louisville for a graduation, an article in the June 2021 *Sky & Telescope* caught my eye. It was an extensive review of the 2.1×42 Wide-Field Binoculars by Omegon. I asked myself if such a low-power pair of binoculars would be of any use for stargazing. According to author Dennis di Cicco, these binoculars are designed for bringing out entire constellations with significantly greater clarity compared to the unaided eye. He reports at least a 1.5-magnitude boost in star visibility. This interested me to the extent that I eventually shelled out the \$150 to test them out myself.

Within five days, the package had arrived. As Ellen and I ate dinner at our patio table, I opened the box and gave the stubby new binoculars their first test on some backyard plants. I was disappointed. Not only was there little magnification, which was expected, but the field-of-view was slightly warped somewhere between the center of the field of view and the periphery. Later during evening twilight, I aimed them at the Moon, Venus, and Jupiter. Once again, I was disappointed. These objects actually appeared brighter without the binoculars. How would these binoculars help to see dim constellations if even these bright objects aren't enhanced?

When the sky finally darkened that same evening, I tested the binoculars a third time. This time they really came



through. Stars that I couldn't begin to see unaided suddenly came into view. Constellations that were difficult to see from my house could be seen. Examples include Ursa Minor, Sagitta, and Hercules. Even better, faint constellations I didn't know existed could be made out — all from my light-polluted suburban driveway! One such constellation, Lacerta (the Lizard) was home to one of the double stars (8 Lacerta) I needed to log for the Astronomical League's Double Star Observing Program. I was thus putting these binoculars to active use even on the first night. Other constellations that I have never seen, or only partially seen before, including Pisces and Equuleus, are now visible. This wide-field tool has become a workhorse, helping me locate stars for the Double Star and Constellation Hunter Observing Programs. I've taken these binoculars to Public Observing Sessions and one of our Observing SIGs, and those that have looked through them were impressed (Don Stilwell lamented that I had showed him another gadget that he must get!).

Note that Orion has a similar pair of binoculars at a comparable price. These are in a 2.0×50 configuration. The 50mm aperture almost tempted me to buy these instead. However, one drawback is that the minimum interpupillary distance is 60 mm, as opposed to 55 mm for the Omegon binoculars. This would limit their usefulness for younger folks. Another advantage Omegon's binoculars have over Orion's is that they come with a $\frac{1}{4} \times 20$ tripod socket, so these can be mounted. One other feature is that the objective cells are threaded to allow for 2-inch filters to be added, if desired.

In short, these binoculars have become a significant tool in my observing arsenal. I've used these extensively in the two months I've had them, and I can say that they are more than worth the \$150 I paid for them.



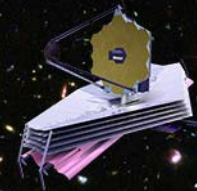
The author inspects his new Omegon 2.1×42 Wide-Field Binoculars fresh out of the box.



NASA Night Sky Notes...

The James Webb Space Telescope: Ready for Launch!

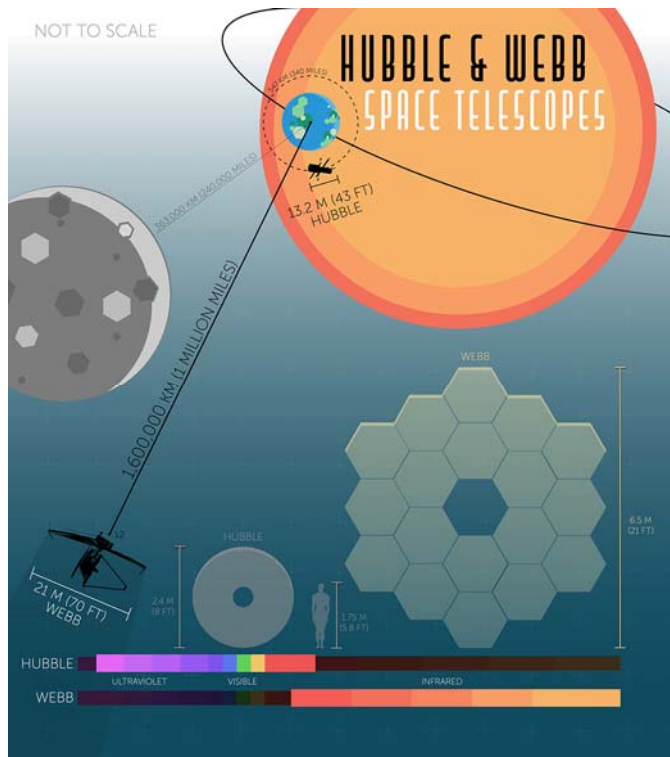
by David Prosper



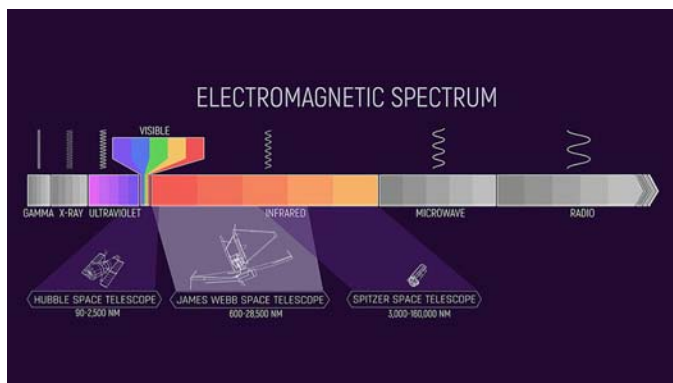
NASA's James Webb Space Telescope is ready for lift-off! As of this writing (November 15th), the much-anticipated next-generation space telescope is being carefully prepared for launch on December 18, 2021, and will begin its mission to investigate some of the deepest mysteries of our universe.

The development of the Webb began earlier than you might expect – the concept that would develop into Webb was proposed even before the launch of the Hubble in the late 1980s! Since then, its design underwent many refinements, and the telescope experienced a series of delays during construction and testing. While frustrating, the team needs to ensure that this extremely complex and advanced scientific instrument is successfully launched and deployed. The Webb team can't take any chances; unlike the Hubble, orbiting at an astronaut-serviceable 340 miles (347 km) above Earth, the Webb will orbit about one million miles away (or 1.6 million km), at Lagrange Point 2. Lagrange Points are special positions where the gravitational influence between two different bodies, like the Sun and Earth, "balance out," allowing objects like space telescopes to be placed into stable long-term orbits, requiring only minor adjustments - saving Webb a good deal of fuel.

Since this position is also several times further than the Moon, Webb's sunshield will safely cover the Moon, Earth, and Sun and block any potential interference from their own infrared radiation. Even the seemingly small amount of heat from the surfaces of the Earth and Moon would interfere with Webb's extraordinarily sensitive infrared observations of our universe if left unblocked. More detailed information about Webb's orbit can be [found here](#), and a video showing its movement [here](#).



Webb will follow up on many of Hubble's observations and continue its mission to study the most distant galaxies and stars it can - and as you can see in this comparison, its mirror and orbit are both huge in comparison, in order to continue these studies in an even deeper fashion! Credits: NASA, J. Olmsted (STScI)



Webb will observe a wide band of the infrared spectrum, including parts observed by the Hubble - which also observes in a bit of ultraviolet light as well as visible - and the recently retired Spitzer Space Telescope. Webb will even observe parts of the infrared spectrum not seen by either of these missions! Credits: NASA and J. Olmstead (STScI)

Once in its final position, its sunshield and mirror fully deployed and instruments checked out, Webb will begin observing! Webb's 21-foot segmented mirror will be trained on targets as fine and varied as planets, moons, and distant objects in our outer Solar System, active centers of galaxies, and some of the most distant stars and galaxies in our universe: objects that may be some of the first luminous objects formed after the Big Bang! Webb will join with other observatories to study black holes - including the one lurking in the center of our galaxy, and will study solar systems around other stars, including planetary atmospheres, to investigate their potential for hosting life.

Wondering how Webb's infrared observations can reveal what visible light cannot? The "Universe in a Different Light" Night Sky Network [activity](#) can help. Find the latest news from NASA and Webb team as it begins its mission by following #UnfoldTheUniverse on social media, and on the [web](#).

Membership of the Kalamazoo Astronomical Society

Thomas Abraham
Kalamazoo, MI
Senior | 2022

Amy Alexander
New Braunfels, TX
Regular | 2021

Jan Andersen
Kalamazoo, MI
Senior | 2022

Darren Anthony
Paw Paw, MI
Family | 2022

Harry Armitage
Portage, MI
Senior | 2022

Paul Asmus
Kalamazoo, MI
Senior | 2021

Robert Baldyga
Portland, MI
Senior Family | 2021

Ginny Baldwin
Battle Creek, MI
Senior | 2023

Jeffrey Baldwin
Griffin, GA
Supporting | 2021

Harold Ballen
Kalamazoo, MI
Senior | 2022

Alton Bates
Manchester, MI
Senior Family | 2022

Jack & JoAnne Beertema
Plainwell, MI
Senior Family | 2022

Richard Bell
Kalamazoo, MI
Lifetime | n/a

Svetla Ben-Itzhak
Manhattan, KS
Regular | 2022

Jeff Berson
Crawfordville, FL
Supporting | 2023

Karen & Peter Berzins
Kalamazoo, MI
Senior Family | 2022

Luke Bessler
Portage, MI
Student | 2021

Charles Bibart
Vicksburg, MI
Senior Family | 2022

Betty Bledsoe
Portage, MI
Senior | 2021

Jack & Lorrie Bley
Paw Paw, MI
Senior Family | 2023

Rebecca Bodnar
Allegan, MI
Senior Family | 2021

Rich Bogdanovich
Denver, CO
Senior | 2022

Matthew Borton
Paw Paw, MI
Regular | 2021

Craig Brockmeier
Bartlesville, OK
Senior | 2022

Tommy & Betsy Brown
Portage, MI
Family | 2021

Phyllis Buskirk
Kalamazoo, MI
Lifetime | n/a

Michael Bussey
Kalamazoo, MI
Senior | 2021

Beverly Byle
Kalamazoo, MI
Senior | 2022

Dale A. Campbell
Otsego, MI
Family | 2022

David Carpenter
Kalamazoo, MI
Family | 2021

Craig Carrel
Marshall, MI
Regular | 2021

Mike Chaffee
Battle Creek, MI
Senior Family | 2022

Cori Charles
Buckeye, AZ
Regular | 2021

Janine Chesak-Black
Kalamazoo, MI
Senior Family | 2022

Michael Clapp
Kalamazoo, MI
Family | 2023

Barry Collins
Marshall, MI
Family | 2021

Joe & Ellen Comiskey
Portage, MI
Family | 2023

Roark Consolatti
Paw Paw, MI
Senior | 2023

Michael Cook
Kalamazoo, MI
Family | 2021

Amiel Cooper
Jamaica Plain, MA
Senior | 2021

Harry Cotterill
Kalamazoo, MI
Senior Family | 2022

Steve Crawford
Kalamazoo, MI
Regular | 2021

John Dillworth & Dorilee Crown
Portage, MI
Family | 2021

Kalman & Becky Csia
Kalamazoo, MI
Senior Family | 2022

Christine Currie
Fennville, MI
Family | 2022

Simon Dale
Battle Creek, MI
Family | 2021

George Dalecki
Paw Paw, MI
Regular | 2022

Anna Daly
Mattawan, MI
Regular | 2022

Jeff DeHaven
Mattawan, MI
Family | 2022

Sue DeNise
South Haven, MI
Regular | 2021

Matthew DePriest
Vicksburg, MI
Family | 2022

Jeff Dickerman
Lowell, MI
Honorary | 2021

Scott Dickson
Neeah, WI
Senior | 2022

Richard Dirrenberger
Portage, MI
Senior | 2021

Dave Doan
Kalamazoo, MI
Senior | 2021

Lynne Dorsey-Smith
Wildwood, GA
Regular | 2022

George Drake
Edwardsburg, MI
Senior | 2021

Alicia Dunifin
Kalamazoo, MI
Regular | 2022

Michael & Rachel Dupuis
Mattawan, MI
Family | 2022

Kristi & Steve Durbin
Kalamazoo, MI
Family | 2021

Fred E. Dutton
Kalamazoo, MI
Senior | 2022

James Dyer
Kalamazoo, MI
Senior Family | 2022

Janet Dykens
Portage, MI
Regular | 2021

Clifton E. Ealy Jr.
Kalamazoo, MI
Regular | 2022

Matt Eash
Battle Creek, MI
Regular | 2021

Allen Edwards
Sun City, AZ
Supporting | 2021

David Erhart
Kalamazoo, MI
Regular | 2022

Fred Espenak
Portal, AZ
Honorary | n/a

Eric Fischer
Kalamazoo, MI
Regular | 2022

Thomas Foor
Kalamazoo, MI
Senior | 2022

Tom Fota
San Diego, CA
Senior | 2021

Tom Fowle
Martin, MI
Senior Family | 2021

William Fowler
Mattawan, MI
Family | 2021

Richard Frantz
Battle Creek, MI
Senior Family | 2021

Justin Freese
Three Rivers, MI
Family | 2021

Joseph Frick
Portage, MI
Family | 2021

Cathy Friday
Kalamazoo, MI
Regular | 2022

Saul Frommer
Murrieta, CA
Supporting | 2021

Paul Gallagher
Portage, MI
Family | 2021

Dave & Bonnie Garten
Portage, MI
Family | 2022

Matt Garten
Kalamazoo, MI
Regular | 2022

Brendan & Dee Gauthier
Kalamazoo, MI
Senior Family | 2021

Dzintars "Z" Gendrikovs
Kalamazoo, MI
Senior | 2022

Tom George
Kalamazoo, MI
Regular | 2021

Jennifer Gessler
Kalamazoo, MI
Family | 2021

Sandra Geyer
Sturgis, MI
Regular | 2021

James Gianoulakis
Las Vegas, NV
Senior | 2021

Adam Gigandet
Sparta, MI
Regular | 2023

Dick & Jackie Gillespie
Port St. Lucie, FL
Senior Family | 2022

Steven Glista
Kalamazoo, MI
Family | 2022

Tonia Gonzalez
Kalamazoo, MI
Family | 2022

Linda & Charlie Grdina
Mattawan, MI
Family | 2021

Roy & Dana Grubbe
Bexley, OH
Supporting | 2025

Tony Gurczynski
Kalamazoo, MI
Senior | 2021

Rick Gustafson
Eureka, CA
Senior Family | 2021

Membership of the Kalamazoo Astronomical Society

Deb Hamilton
Portage, MI
Regular | 2021

Alexander Hanchar
Portage, MI
Senior | 2021

Robert & Barbara Havira
Portage, MI
Senior Family | 2022

Daniel Heaton
Kalamazoo, MI
Regular | 2021

Keegen Henschel
Kalamazoo, MI
Regular | 2022

Geoffrey Hickok
Gobles, MI
Senior | 2022

Lydia Hoff
Oshtemo, MI
Regular | 2021

Ryan Horak
Grand Rapids, MI
Regular | 2021

Dave Horton
Springfield, OR
Regular | 2021

Jerry Horton
Mount Pleasant, WI
Regular | 2021

Brian & Kylie Horvitz
Kalamazoo, MI
Family | 2021

Rachel Humphrey
Waite Park, MN
Supporting | 2025

Arya Jayatilaka
Kalamazoo, MI
Family | 2023

Michael Jensen
Charlotte, FL
Senior | 2022

Chip Johnson
Plainwell, MI
Senior | 2023

Dean Johnson
Kalamazoo, MI
Senior | 2021

Phillip Johnson
Portage, MI
Family | 2023

Stephanie & Levi Johnson
Gobles, MI
Family | 2021

Dorothy Jones
Battle Creek, MI
Family | 2021

Kevin Jung
Grand Rapids, MI
Regular | 2021

Ahsanuddin & Maliha Ali Khan
Kalamazoo, MI
Senior Family | 2021

Terry Kimmey
Richland, MI
Family | 2022

Rodney & Marlene Kinne
Battle Creek, MI
Family | 2023

Mark Kinsey
Kalamazoo, MI
Regular | 2021

Kellie Kloosterman
Kalamazoo, MI
Regular | 2021

Tanner Klute
Kalamazoo, MI
Student | 2021

Bob Koditek
Norwell, MA
Regular | 2021

Katherine Koons
Glen Mills, PA
Senior Family | 2022

Kirk & Angela Korista
Portage, MI
Family | 2021

Srinivasa Kota
Saint Joseph, MI
Family | 2022

Tyler Krasavage
Kalamazoo, MI
Student | 2021

Rebekah Kreckman
Portage, MI
Family | 2021

Bob Kren
Flushing, MI
Senior | 2021

Zosha Kuiper
Okemos, MI
Student | 2021

Jim Kurtz
Kalamazoo, MI
Regular | 2022

Tim Kurtz
Kalamazoo, MI
Regular | 2022

Cheryl Kuta
Kalamazoo, MI
Senior | 2022

Cal Lamoreaux
Middletown, MI
Senior | 2021

Robert Lando
Kalamazoo, MI
Senior Family | 2022

Hayden Lane-Davies
Kalamazoo, MI
Student | 2021

Christopher Larson
Jackson, CA
Supporting | 2021

John Lee
Kalamazoo, MI
Senior Family | 2022

J. Scott Levene
Kalamazoo, MI
Senior Family | 2022

Nancy Wood & Dale Lighthizer
Plainwell, MI
Senior Family | 2022

Janice Livesay
Portage, MI
Senior | 2021

Keith Longjohn
Kalamazoo, MI
Senior | 2021

Andrew Loveless
Lawton, MI
Family | 2022

Gary & Phyllis Lubbert
Kalamazoo, MI
Family | 2021

Chuck Lund
Paw Paw, MI
Senior | 2022

L. Carlton Lyles
Sterling Hts., MI
Senior | 2022

Scott Macfarlane
Schoolcraft, MI
Family | 2021

John Maile
Galesburg, MI
Regular | 2022

Dale E. Mais
Marcellus, MI
Senior | 2022

Joseph Mallek
Evanston, IL
Senior | 2023

Cary Mannaberg
Kalamazoo, MI
Regular | 2021

Phillip & Linda Marshall
Lawrence, MI
Senior Family | 2022

Jennifer Martin
Kalamazoo, MI
Family | 2022

Jon Towne & Bobbi Martindale
Bangor, MI
Family | 2021

Richard Mather
Richland, MI
Regular | 2022

Randy & Michelle Matson
Delton, MI
Senior Family | 2022

Mark McClure
Cooper Twp., MI
Senior Family | 2022

Sandi McGuire
Kalamazoo, MI
Senior Family | 2022

Joe McJilton
Battle Creek, MI
Regular | 2023

Paul McKinley
Carson City, MI
Senior | 2021

Cathy & Mike McMinn
Delton, MI
Family | 2022

Michael J. Melwiki
Plainwell, MI
Regular | 2021

Chris Miller
Lowell, MI
Regular | 2022

John Miller
Plainwell, MI
Regular | 2023

Mark & Ninah Miller
Kalamazoo, MI
Senior Family | 2022

Scott Millin
Portage, MI
Family | 2021

Dave & Carol Mitchell
Portage, MI
Senior Family | 2021

Gordie Moeller
Grand Rapids, MI
Senior | 2022

Michele Momotiuk
Kalamazoo, MI
Family | 2021

Anne Mount
Kalamazoo, MI
Regular | 2021

Pete Mumbower
Vicksburg, MI
Regular | 2022

Peggy Napier
Kalamazoo, MI
Regular | 2022

Bill Nigg
Deming, NM
Lifetime | n/a

Andrew Northam
Portage, MI
Family | 2022

Mark Ohrstrom
Kalamazoo, MI
Regular | 2021

Jim & Christene Oorbeck
Kalamazoo, MI
Family | 2022

Charles Overberger
Kalamazoo, MI
Regular | 2021

David Parks
Battle Creek, MI
Family | 2021

Robert Parrish
Edwardsburg, MI
Senior | 2021

Ryan Pate
Kalamazoo, MI
Regular | 2022

Sheetal Patel
Portage, MI
Family | 2022

Mike Patton
Plainwell, MI
Senior | 2022

Thom Peters
Vicksburg, MI
Senior | 2021

Louis Petik
Delton, MI
Family | 2022

George Piner
Brighton, MI
Senior | 2021

Henry Polderman
Mattawan, MI
Student | 2021

Lance Poloms
Portage, MI
Senior Family | 2022

Jeremiah Poole
Mattawan, MI
Family | 2022

Jack & Ruth Price
Kalamazoo, MI
Family | 2021

Alison Pruitt
Augusta, MI
Regular | 2021

Dominic Pullo
Kalamazoo, MI
Family | 2021

Membership of the Kalamazoo Astronomical Society

David Puzycki
Stevensville, MI
Regular | 2023

Sam & Tina Qualls
Portage, MI
Family | 2022

Michael Quinn
Portage, MI
Senior Family | 2021

Jay Raycraft
Kalamazoo, MI
Senior | 2022

Jonathan Reck
Plainwell, MI
Senior Family | 2022

James Reiss
Louisville, KY
Supporting | 2022

Lynn Risser
Fayetteville, AR
Regular | 2022

Kate Roberts
Kalamazoo, MI
Student | 2021

Andrew C. Robins
Kalamazoo, MI
Regular | 2021

Florence Roe
Kalamazoo, MI
Senior | 2021

Aaron & McKenzie Roman
Kalamazoo, MI
Family | 2021

Bill Rose
Kalamazoo, MI
Senior Family | 2022

Brent Sanford
Portage, MI
Regular | 2021

Jason Schettner
Kalamazoo, MI
Student | 2021

Matthew Schie
Auburn Hills, MI
Regular | 2021

Paul Schlegelmann
Corvallis, OR
Regular | 2022

Lela Schneider
Boise, ID
Family | 2022

Eric Schreur
Kalamazoo, MI
Senior | 2022

Frank & Susan Severance
Kalamazoo, MI
Senior Family | 2022

Kayley Schanz
Kalamazoo, MI
Regular | 2021

Diane Schear
Kalamazoo, MI
Regular | 2021

Luis Silva
Pullman, MI
Student | 2021

Lloyd Simons
Mattawan, MI
Family | 2023

Michael & Karen Sinclair
Kalamazoo, MI
Senior Family | 2022

Greg Sirna
Centreville, MI
Regular | 2021

Richard Smith
Reading, MI
Senior | 2023

William Squiers
Scotts, MI
Senior Family | 2023

Annie Stephens
Riverdale, UT
Senior | 2023

Mark Stewart
Hersey, MI
Senior | 2021

Don Stilwell
Battle Creek, MI
Senior Family | 2023

Stephanie Stratton
Paw Paw, MI
Regular | 2022

Brian & Terri Swisher
Kalamazoo, MI
Family | 2022

Renée Szostek
Scotts, MI
Regular | 2021

David Taylor
Constantine, MI
Regular | 2021

Josh Taylor-Lehman
Portage, MI
Regular | 2021

Gary & Karen Theisen
Hickory Corners, MI
Family | 2022

Eric Therkildsen
Kalamazoo, MI
Family | 2021

Scott Thomas
Portage, MI
Family | 2021

Sam Tidwell
Caledonia, MI
Senior | 2022

Terry Tomlinson
Coldwater, MI
Senior Family | 2021

Henry & Martha Upjohn
Kalamazoo, MI
Family | 2021

Deb Ulmer
Chatham, NY
Supporting | 2022

Elaine VanBelleghem
Kalamazoo, MI
Senior | 2022

Michael & Debbie Vandever
Lawton, MI
Senior Family | 2021

Marie Viglas
De Pere, WI
Regular | 2021

Patricia Villalobos
Kalamazoo, MI
Family | 2022

Alvaro Villamizar
Carlsbad, CA
Supporting | 2021

Gary & Christina Vincent
Portage, MI
Senior Family | 2022

John Vollmer
Lake Linden, MI
Regular | 2022

Jim Vukelich
Bloomington, MI
Senior | 2021

Robert Wade
Salem, NH
Supporting | 2021

Brian Walesh
Kalamazoo, MI
Family | 2021

Princess-Dominiquecole Walker
Kalamazoo, MI
Family | 2023

William Walkowiak
Portage, MI
Regular | 2023

Brrasie Walmer
Richland, MI
Family | 2022

Lynn Ward
Green Bay, WI
Supporting | 2022

Philip Wareham
Portage, MI
Regular | 2022

Sharyl Weber
Kalamazoo, MI
Family | 2021

Caroline & John Webber
Kalamazoo, MI
Senior Family | 2022

Katie & Duane Weller
Grand Rapids, MI
Family | 2021

Bob White
Plainwell, MI
Senior | 2021

Jacob White
Kalamazoo, MI
Regular | 2022

Reid Williams
Kalamazoo, MI
Family | 2021

Roger & Molly Williams
Kalamazoo, MI
Senior Family | 2022

John Wing
Portage, MI
Family | 2024

Klay & Karen Woodworth
Kalamazoo, MI
Family | 2021

David Woolf
Kalamazoo, MI
Family | 2022

Doug Wussler
Tallahassee, FL
Supporting | 2026

Jonathan Young
Saline, MI
Family | 2022

Mohammed Zafar
Kalamazoo, MI
Regular | 2023

SUMMARY TOTAL MEMBERSHIPS: 261 SINGLE MEMBERSHIPS: 148 FAMILY MEMBERSHIPS: 113 TOTAL INDIVIDUAL MEMBERS: ~374



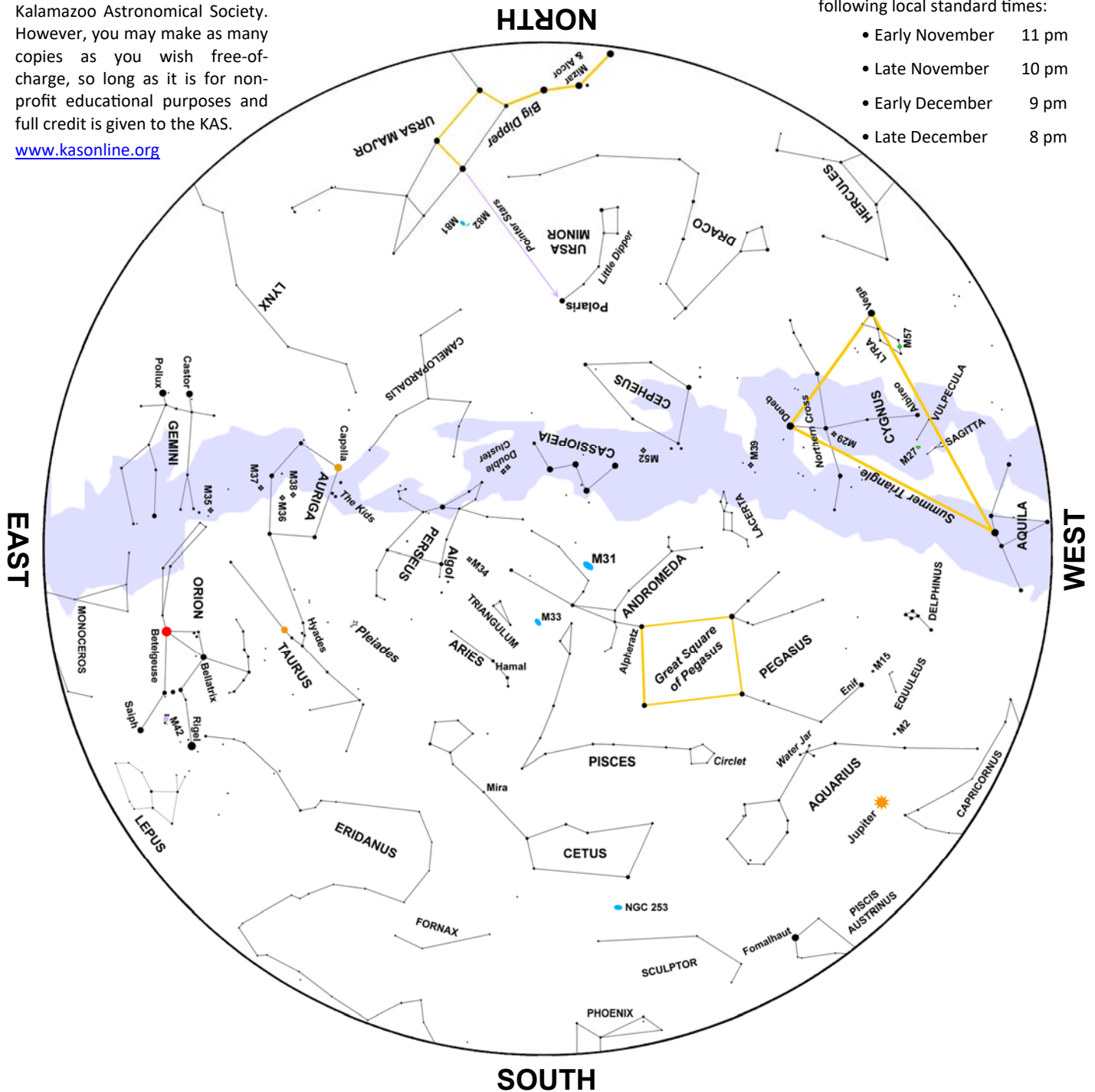
— December Night Sky —

This star map is property of the Kalamazoo Astronomical Society. However, you may make as many copies as you wish free-of-charge, so long as it is for non-profit educational purposes and full credit is given to the KAS.

www.kasonline.org

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

- Early November 11 pm
- Late November 10 pm
- Early December 9 pm
- Late December 8 pm



Look low on the southwestern horizon after sunset on December 6th and you'll spot a two-day old crescent Moon suspended 2½° below Venus. That's close enough to fit in the field of 15×70 binoculars. Venus' stint as the Evening Star will soon end, so this will be your last chance for a while to enjoy a Moon-Venus conjunction in the evening sky.

On the following evening (Dec. 7th), the waxing crescent Moon can be found 5½° below Saturn. Notice that Venus, Saturn, and Jupiter are in a straight line. They'll be in this configuration throughout the entire month.

The Geminid meteor shower is predicted to peak at 2am EST on December 14th.

From a dark, rural location up to 150 meteors/hour can be spotted. However, a waning gibbous Moon spoils the show until it sets at 3:38 am.

Early morning risers should look toward the southeastern horizon before dawn on December 31st. A crescent Moon, Mars, and Antares form an equilateral triangle.

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December 2021

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ONLINE VIEWING SESSION



Enjoy the wonders of the universe as seen through the “eyes” of the KAS Remote Telescope, located under the dark skies of southeastern Arizona.

Attendees will view images of deep-sky objects captured with the system’s CCD cameras in Arizona, transmitted to participant’s computer, tablet, and smart phone screens in southwest Michigan and around the world.

Images acquired during each session will be made available for download.

Saturday, December 4th (5th) @ 8:30 pm

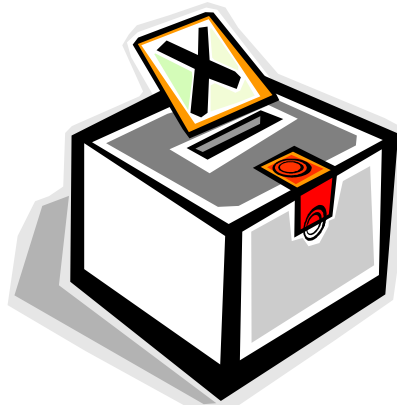
Held on Zoom • [Click Here to Register](#)



Help the KAS when you make purchases on Amazon. Visit the website listed below and search for “Kalamazoo Astronomical Society.” You only need to do this once, but all purchases must be made using the Smile address so update your bookmark. Amazon will donate 0.5% of eligible purchases. There are no fees or extra costs to you. All products, prices, and services are the same as on the regular Amazon website.

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The KAS Needs You!



Final nominations and elections for 2022 KAS Officers and At-Large Board Members will take place at the Annual Meeting on **December 3rd**. If you are interested in running for a position but cannot attend the meeting then please [contact us](#) by December 2nd. Ask not what the KAS can do for you, but what you can do for the KAS!



Astronomy Open House

Astronomy is a subject rich beyond measure. Topics in the science of astronomy can range from microscopic specks of interstellar dust to walls and filaments of superclusters of galaxies. Then there's the hobby of astronomy. Topics there include basic night sky observation to advanced astrophotography and image processing techniques. And don't forget the rich and fascinating history of astronomy or space exploration. This month, KAS members will give 10 to 20 minute astronomically-themed presentations on topics of their choosing.

Presenters & Topic Previews...



Richard Bell
Hertzsprung-Russell Diagram



Pete Mumbower
Mauna Kea Vacation



David Parks
Electronically Assisted Astronomy

Friday, December 3rd @ 7:00 pm

Held on Zoom • [Click Here to Register](#)

