

Highlights of the February Sky . . .

1st

PM: The Moon, just past full, trails Regulus by about 4°.

2nd

AM: Jupiter rises in Libra a couple hours after midnight, followed by Mars near Beta Scorpii (Graffias).

7th

Last Quarter Moon
10:54 am EST

AM: Jupiter is about 6° below the Moon.

8th

DAWN: Antares, Mars, a waning crescent Moon, and Jupiter form an arc that straddles Scorpius and Libra.

11th

AM: Mars is about 5° to the upper left of Antares.

12th

DAWN: Low in the southeast, a sliver of a crescent Moon hangs 2° above Saturn, which in turn is some 3° above the Teapot in Sagittarius.

15th

New Moon
4:05 pm EST

23rd

First Quarter Moon
3:09 am EST

PM: The Moon is less than 5° from Aldebaran in Taurus.

28th

PM: A nearly full Moon begins the night by leading Regulus across the sky. Watch the gap decrease throughout the night. Then be less than ½° apart after midnight.

Prime Focus

A Publication of the Kalamazoo Astronomical Society

★ ★ ★ February 2018 ★ ★ ★

This Months Events

General Meeting: Friday, February 2 @ 7:00 pm

Kalamazoo Area Math & Science Center - See Page 8 for Details

Board Meeting: Sunday, February 11 @ 5:00 pm

Sunnyside Church - 2800 Gull Road - All Members Welcome

Observing: Saturday, February 17 @ 7:00 pm

February Freeze Out - Kalamazoo Nature Center

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JANUARY Meeting Minutes

The general meeting of the Kalamazoo Astronomical Society was brought to order by President Richard Bell on Friday, January 12, 2018 at 7:14 pm EDT. Approximately 26 members and guests were in attendance at the Kalamazoo Area Math & Science Center (KAMSC).

Richard gave a preview of 2018 KAS activities in his President's Report. Many members have grown accustomed to excellent general meeting guest speakers, and this year will be no exception. Among those is Professor Keith Riles from the University of Michigan. He'll give a presentation on gravitational waves on May 4th. For a quick list of other presenters, please see the [general meeting page](#).

Two major observing highlights will take place this summer. A perihelic opposition of Mars will occur on July 27th. Perihelic oppositions happen at intervals of 15 to 17 years. The last such opposition took place in 2003. That opposition was noteworthy, since Mars hadn't been closer to Earth in 60,000 years. However, Mars will only appear 1-arcsecond smaller this year than it did in 2003. Therefore, we're planning a two-day *Mars Watch* at the Kalamazoo Nature Center. In addition to observing, we'll have special presentations, displays, and more.

The famed Perseid meteor shower peaks on the night of August 11th/12th, which conveniently falls on a Saturday/Sunday. Our annual Perseid Potluck Picnic will be followed by a Perseid Meteor Shower Watch. Naturally, we just need the weather to cooperate.

Our feature presentation was the first-ever *Astronomy Open House*. Members were invited to give 10 -15 minute TED-style presentations. First up was Scott Macfarlane and Jack Price. They gave an overview of the Great Lakes Star Gaze, which is Michigan's premiere (only) star party. Don Stilwell gave a demonstration on how to collimate a Newtonian reflecting telescope. Mike Sinclair gave an oral essay on why he loves astronomy. Dr. Kirk Korista concluded with a primer on neutron stars.

The presentations went longer than planned, so we skipped observing reports and astronomical news (next time we'll limit the number of presenters to three and display a stopwatch). Richard gave a quick preview of upcoming KAS events. The meeting ended with a snack break and concluded at about 9:15 pm.



BOARD Meeting Minutes

The first meeting of the Kalamazoo Astronomical Society Board for year 2018 was held at Sunnyside Church on January 14th. The meeting was called to order by President Richard Bell at 5:10 pm. Members present were Joe Comiskey, Jean DeMott, Lydia Hoff, Scott Macfarlane, Jack Price, Don Stilwell, and Roger Williams. Gull Lake High School Student Autumn Cain was present as an invited guest.

No Treasurer's Report was presented, since Rich Mather could not be reached by Skype and no e-mailed report had been received. In Rich's absence, the checkbook and accumulated checks were given to Roger to enable deposits in the Advia account.

Richard gave a quick summary of planned January/February events, chiefly a Full Moon Theater presentation of *Arrival* on January 27th and the next general meeting on February 2nd featuring Joe Comiskey.

The next agenda item was an interview with Autumn, who had expressed an interest in some deeper involvement in KAS that would rekindle her interest in astronomy. Jean suggested that any project would be difficult until Autumn had graduated, since things get extremely hectic for graduates during this period. The calendar could also not be finalized until results were back from other applications that Autumn has pending.

Possible projects suggested by Richard included helping on a proposed upgrade of the observatory at KNC, help in writing grants, and work on making known to local schools the availability of the robotic telescope for school demonstrations. Jean also planned to research projects that could be carried out with the robotic telescope. Meanwhile, Autumn agreed to prepare a program for the September General Meeting.

Continuing with the regular agenda, Richard reported on the current state of robotic telescope functions. The Observatory Solutions company had logged on via the internet and confirmed Richard's finding that the system would not automatically choose a guide star and begin guiding. It appears that something still needs to be fixed. We had not yet received a written proposal for guaranteed performance and cost.

For the final general meeting topic, Richard and Jean suggested a presentation on light pollution by Professor Bill Davis of WMU. He is the photographer whose Art Hop exhibit had been brought to the attention of the KAS membership by an e-mail from Richard. Richard and Jean (and, separately, Molly & Roger Williams) had seen the exhibit and found it interesting.

On the topic of the favorable Mars opposition on July 27th and 28th, Richard questioned how much effort we wanted to

put into a special viewing opportunity. After some discussion, the consensus of the Board was that we should schedule viewing on both nights. A talk at 8pm (Richard taking one night and Dave DeBruyn from the Grand Rapids group the other) would be followed by viewing when darkness allowed. Richard agreed to ask Dave about his interest.

Finally, Richard reported asking the Muskegon Astronomical Society about a change in date for the "Triple Conjunction" meeting of four regional groups that had been proposed for September 8th. Jack had pointed out that this date interfered with the Great Lakes Star Gaze and asked if another date could be found. Richard said that the best compromise date that could be found was May 12th.

Regarding New Business, Jean reported the need for a new ladder to be used in our storage unit, which was authorized after a motion by Don and second by Joe. Richard raised the subject of more 2018 Public Observing Session Brochures. Following a motion by Joe and second by Jack, the Board voted to authorize the purchase of 1,000 brochures.

Richard reported further that due to the planned cessation of support for some of the software used, our web page would require major redesign. He invited ideas for a new look for KAS Online.

On the outreach front, Richard had received many invitations for KAS appearances. These included the Hastings Public Library (Family Science Night on February 21st and Barry County Builds on September 19th, both at 5 – 8 pm), Pierce Cedar Creek Institute (Science Festival, April 28th, 10am – 3pm and Family Science Night, June 20th, 5 – 8 pm), and the Rock & Mineral Show, May 5th (10am – 6pm) and May 6th (10am – 5pm).

The Rock & Mineral show assumes that we would skip their May 4th date, which conflicts with our general meeting. Jean, Richard, and Don expressed interest in the Hastings event on February 21st. Volunteers from the membership at large would be needed to cover some of the other events that are offered.

In Other Business, Jean made a strong case for more KAS group activities to encourage greater participation from the membership. In discussion, the Board showed considerable support for Apollo Rendezvous. However, so far no one had found hard evidence of when (or even whether) it will be offered this year. Assuming that Apollo Rendezvous is offered, the Board showed strong support to make this a club function in 2018.

On the subject of group activities, a weakness in our computer communications, particularly Facebook, was pointed out. For those who use Facebook, it needs to be updated more regularly, or else a different social medium might be considered.

There being no further business, the meeting was adjourned at 6:40 pm. The next meeting date was set for 5:00 pm on Sunday, February 11th at Sunnyside.

Respectfully submitted by Roger Williams



Observations

by **Richard S. Bell**

February isn't one of the more popular months of the year for stargazing. However, it can be a great time to *prepare* for another season of stargazing. Joe Comiskey presents *Trouble in Paradise: Astro Problem Solving 101* at the general meeting on February 2nd. Even seasoned stargazers run into problems in night, so I hope everyone can join us for another fun and informative talk by Joe. We will try to squeeze in some stargazing this month. Our annual February Freeze Out is scheduled for February 17th, but our success rate is pretty small. We've been holding Freeze Outs since 1996, but I'm pretty sure I can count the number of clear nights we've had on one hand!

My annual list of star parties appears on page 5. Scott Macfarlane and Jack Price are regular attendees of the Great Lakes Star Gaze, which is held near Gladwin, Michigan. Many of us have attended Starfest and even the Texas Star Party together. Take a look at page 5, check your calendar, and then visit their websites for more information.

Feel like you're being left out on all the observing fun because you don't have a telescope? Don't forget, we currently have three telescopes you can borrow from the KAS. These include an Orion ShortTube 80mm refractor, a Coronado PST for H-alpha solar observing, and an 8-inch Schmidt-Cassegrain. Information on how to borrow these 'scopes can be found on the [Telescopes for Loan page](#).



New Additions to the KAS Library

by **Karen Woodworth, Ph.D.**

We have added the book *Sun Moon Earth: The History of Solar Eclipses from Omens of Doom to Einstein and Exoplanets* by Tyler Nordgren to the KAS library. The book was published in 2016 and was autographed by the author at our 2017 Astronomy Day. I enjoyed reading this book in the weeks prior to the *Great American Eclipse* and I was excited to see that it has now joined our collection. If you haven't had a chance to read it yet, I hope you will consider borrowing it. It will be processed and available for checkout at the February General Meeting.

I'm the other new addition to the KAS library! I've taken over as librarian from Bob Havira, who served in the position for more than ten years, beginning at least as early as 2005. He catalogued the library so that its contents could be online - you can find the listings on the [KAS Library page](#) (or just go to the KAS website and look for "KAS Library" under the "Resources" tab at the top). Many thanks to Bob for his years of dedication and work on the library.



Sixty Years of Observing Our Earth

by Tegan Wall



Satellites are a part of our everyday life. We use global positioning system (GPS) satellites to help us find directions. Satellite television and telephones bring us entertainment, and they connect people all over the world. Weather satellites help us create forecasts, and if there's a disaster — such as a hurricane or a large fire — they can help track what's happening. Then, communication satellites can help us warn people in harm's way.

There are many different types of satellites. Some are smaller than a shoebox, while others are bigger than a school bus. In all, there are more than 1,000 satellites orbiting Earth. With that many always around, it can be easy to take them for granted. However, we haven't always had these helpful eyes in the sky.

The United States launched its first satellite on Jan. 31, 1958. It was called Explorer 1, and it weighed in at only about 30 pounds. This little satellite carried America's first scientific



The launch of Explorer 1 from Cape Canaveral, Florida, on January 31, 1958.

instruments into space: temperature sensors, a microphone, radiation detectors and more.

Explorer 1 sent back data for four months, but remained in orbit for more than 10 years. This small, relatively simple satellite kicked off the American space age. Now, just 60 years later, we depend on satellites every day. Through these satellites, scientists have learned all sorts of things about our planet.

For example, we can now use satellites to measure the height of the land and sea with instruments called altimeters. Altimeters bounce a microwave or laser pulse off Earth and measure how long it takes to come back. Since the speed of light is known very accurately, scientists can use that measurement to calculate the height of a mountain, for example, or the changing levels of Earth's seas.

Satellites also help us to study Earth's atmosphere. The atmosphere is made up of layers of gases that surround Earth. Before satellites, we had very little information about these layers. However, with satellites' view from space, NASA scientists can study how the atmosphere's layers interact with light. This tells us which gases are in the air and how much of each gas can be found in the atmosphere. Satellites also help us learn about the clouds and small particles in the atmosphere, too.

When there's an earthquake, we can use radar in satellites to figure out how much Earth has moved during a quake. In fact, satellites allow NASA scientists to observe all kinds of changes in Earth over months, years or even decades.

Satellites have also allowed us — for the first time in civilization — to have pictures of our home planet from space. Earth is big, so to take a picture of the whole thing, you need to be far away. Apollo 17 astronauts took the first photo of the whole Earth in 1972. Today, we're able to capture new pictures of our planet many times every day.

Today, many satellites are buzzing around Earth, and each one plays an important part in how we understand our planet and live life here. These satellite explorers are possible because of what we learned from our first voyage into space with Explorer 1 — and the decades of hard work and scientific advances since then.

To learn more about satellites, including where they go when they die, check out NASA Space Place:

<https://spaceplace.nasa.gov/spacecraft-graveyard>

This article is provided by NASA Space Place. With articles, activities, crafts, games, and lesson plans, NASA Space Place encourages everyone to get excited about science and technology. Visit spaceplace.nasa.gov to explore space and Earth science!



Star Parties in 2018

Pack your bags, collimate your 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 2018. Registration 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. Plus, if you do attend any star parties this year, please consider writing a report for *Prime Focus*. Clear Skies!

Winter Star Party

February 12 – 18

<http://scas.org/winter-star-party/>

Staunton River Star Party

March 14 – 18

<http://www.chaosastro.com/starparty/>

Northeast Astronomy Forum & Telescope Show

April 21 – 22

<http://www.rocklandastronomy.com/neaf.html>

Texas Star Party

May 6 – 13

<http://www.texasstarparty.org/>

Michiana Star Party

May 18 – 20

<http://www.michiana-astro.org/>

RTMC Astronomy Expo

May 24 – 28

<http://www.rtmcastronomyexpo.org/>

Bootleg Spring Star Party

June 7 – 10

<http://www.bootlegastronomy.com/>

Grand Canyon Star Party

June 9 – 16

<http://tucsonastronomy.org/>

Rocky Mountain Star Stare

June 13 – 17

<http://www.rmss.org/>

Cherry Springs Star Party

June 14 – 17

<http://www.cherrysprings.org/>

Golden State Star Party

July 11 – 15

<http://www.goldenstatestarparty.org/>

Nebraska Star Party

August 5 – 10

<http://www.nebraskastarparty.org/>

Table Mountain Star Party

August 7 – 11

<http://www.tmspa.com/>

Oregon Star Party

August 7 – 12

<http://www.oregonstarparty.org/>

Saskatchewan Summer Star Party

August 8 – 13

<https://sssp.saskatoon.rasc.ca/>

Starfest

August 9 – 12

<http://www.nyaa.ca/>

Stellafane

August 9 – 12

<http://stellafane.org/>

Great Lakes Star Gaze

September 6 – 9

<http://www.greatlakesstargaze.com/>

Almost Heaven Star Party

September 7 – 11

<http://www.ahsp.org/>

Black Forest Star Party

September 7 – 9

<http://www.bfsp.org/>

Connecticut Star Party

September 7 – 9

<http://asnh.org/>

Illinois Dark-Sky Star Party

October 5 – 6

<http://sas-sky.org/>

Okie-Tex Star Party

October 6 – 14

<http://www.okie-tex.com/>

Eldorado Star Party

November 5 – 10

<http://www.eldoradostarparty.org/>

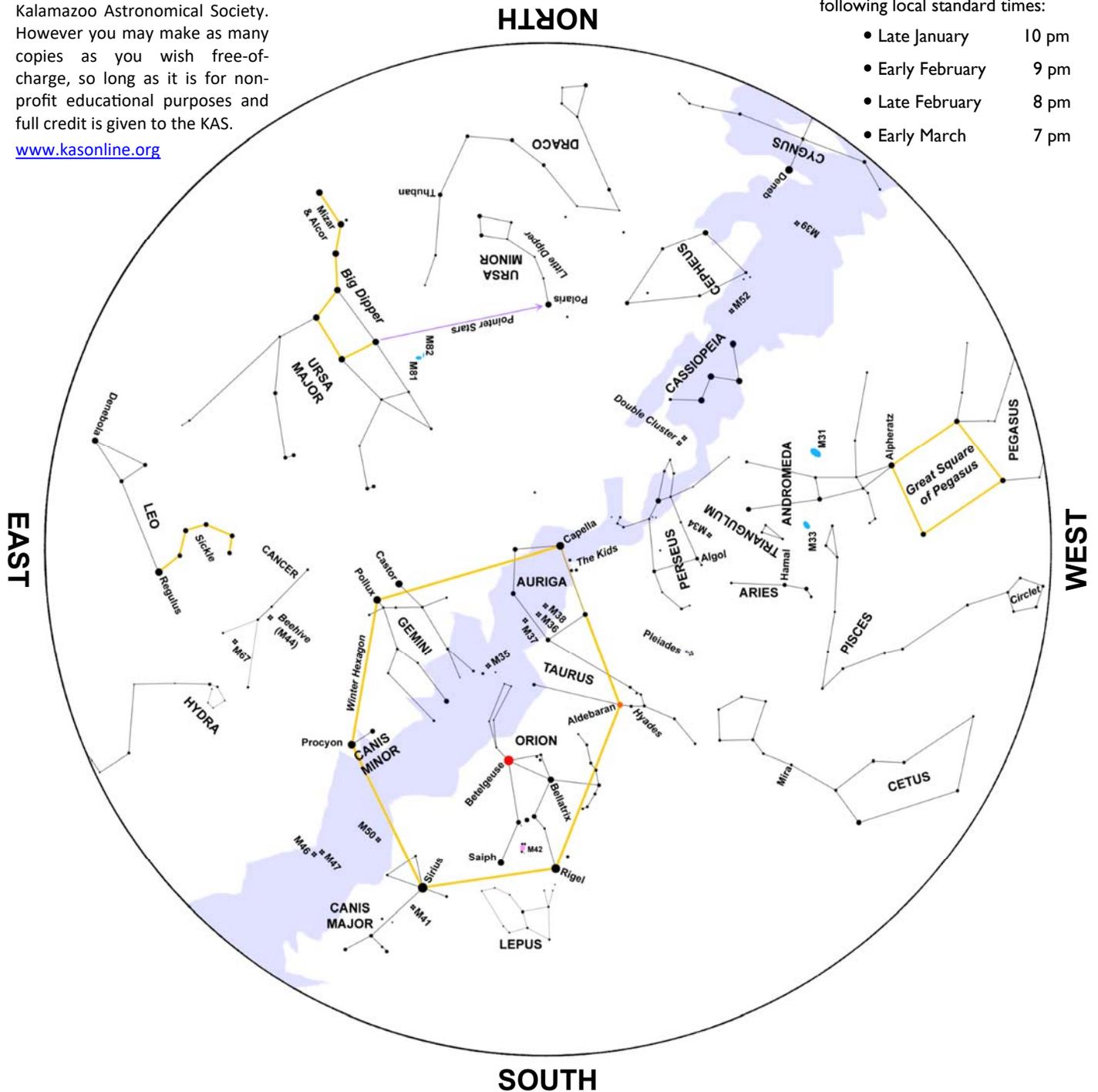
— February Night Sky —

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:

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



February begins with Jupiter rising in Libra in the southeast a couple of hours after midnight. Mars soon follows in Scorpius. Mars will be near Beta Scorpis (Graffias) on February 2nd.

Look low in the southeast before dawn on February 8th for Antares, along with its rival, Mars, a waning crescent Moon, and

brilliant Jupiter. They'll form a celestial arc that straddles the constellations Scorpius and Libra.

A sliver of a waning crescent Moon hangs 2° above Saturn shortly before dawn on February 12th. Saturn itself is some 3° above the famous Teapot asterism in Scorpius.

Find the First Quarter Moon in Taurus on the night of February 23rd. It'll be less than 5° below Aldebaran.

Watch the nearly full Moon on the night of February 28th as it leads Regulus, in Leo, across the sky. Watch the gap between them decrease throughout the night.

KAS BOARD

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February 2018

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February Freeze Out



Winter nights can be ideal for observing. When it's actually clear during a winter night in Michigan, the sky can be unbelievably transparent. So why don't amateur astronomers turn out in droves to winter observing sessions? It's because it gets **REALLY, REALLY COLD** on a clear winter night! Now comes the time of year when the hardcore members of the KAS brave the frigid temperatures to enjoy the deep sky delights that most people probably miss because of the frigid conditions.

Saturday, February 17 @ 7:00 pm

Kalamazoo Nature Center



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Did you know that you could purchase products from [Orion Telescopes & Binoculars](#) in the KAS's online store, the SkyShop?

Purchasing Orion products through the SkyShop gives the KAS a commission. Don't see an item listed that you want to buy? Please [contact us](#) and we'll add it to the webpage or send you a link ASAP.

— skyshop.kasonline.org —



Volunteers Needed @ Science Night



The KAS has been invited to participate in the second annual Family Science Night at Hastings Public Library (located at 227 East State St.). Members are needed to help setup and take down a display, help with a hands-on activity, pass out KAS literature, and answer questions from students and parents. A member is also needed to setup a telescope outside if skies are clear. Please [contact us](#) if you'd like to lend a helping hand.

Wednesday, February 21st, 5 - 8 pm | Hastings Public Library

General Meeting Preview



TROUBLE in PARADISE

Astro Problem Solving 101

presented by

Joe Comiskey

Observing the night sky can be inspiring, educational, and just plain fun. It can also be fraught with unexpected "challenges". Ever been exasperated operating a telescope or found something specific about it that isn't quite right? Is it really possible to observe at home with all the light pollution or is it necessary to find a dark site? How do you find anything in the night sky anyway? This presentation will cover many common problems that we amateur astronomers grapple with and offer some fixes for them. The intent is to promote a can-do attitude to overcome these obstacles and get us confidently out under the night sky.

Friday, February 2 @ 7:00 pm

Kalamazoo Area Math & Science Center

600 West Vine, Suite 400 • Use Dutton St. Entrance

– *Dutton Entrance Locked by 7:10 pm* –

Kalamazoo Astronomical Society
c/o KAMSC
600 West Vine, Suite 400
Kalamazoo, MI 49008

STAMP

