

Highlights of the January Sky . . .

1st
AM: Mercury is low in the southeast about 30 minutes before sunrise. It'll be 12° to the left of Antares.

Full Moon
9:24 pm EST

3rd
PM: Quadrantid meteor shower peaks, but bright Moonlight interferes.

4th
PM: The Moon is about 2° away from Regulus in Leo.

6th
DAWN: Mars and Jupiter are less than 1/3° apart, with Alpha Librae 2° to the upper right.

8th
Last Quarter Moon
5:25 pm EST

11th
DAWN: Jupiter and Mars, 2° apart, are joined by a waning crescent Moon.

15th
DAWN: A very thin crescent Moon forms a triangle with Mercury and Saturn.

16th
Last Quarter Moon
9:17 pm EST

24th
First Quarter Moon
5:20 pm EST

26th
PM: A nearly full Moon is near Aldebaran in Taurus. Watch the Moon move closer to the star throughout the night.

27th
PM: Asteroid 1 Ceres is at opposition and easily observable in binoculars.

31st
Full Moon (second of the month)
8:27 am EST

Prime Focus

A Publication of the Kalamazoo Astronomical Society

★ ★ ★ January 2018 ★ ★ ★

This Months Events

General Meeting: Friday, January 12 @ 7:00 pm
Kalamazoo Area Math & Science Center - See Page 8 for Details

Board Meeting: Sunday, January 14 @ 5:00 pm
Sunnyside Church - 2800 Gull Road - All Members Welcome

Full Moon Theater: Saturday, January 27 @ 7:00 pm
Kalamazoo Area Math & Science Center - See Page 4 for Details

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December Meeting Minutes

The KAS annual meeting, featuring our 19th Holiday Party, began at 6:30 pm EST on Friday, December 1, 2017. Approximately 40 members and guests were in attendance at the Kalamazoo Area Math & Science Center (KAMSC). Special thanks to Rich Mather, Jack Price, and Don Stilwell for assisting Richard Bell and Jean DeMott with setup.

Dinner was served at 6:40 pm. Our potluck hors d'oeuvre and dessert extravaganza was as good as always. These include tasty meatballs, chicken fajitas, pizza, and more desserts than one could possibly enjoy in a single evening. Our "hostess-with-the-mostess," Jean DeMott, supplied the soft drinks and hot wassail again and did another exceptional job with the table decorations. Thank you, Jean!

Once dinner was complete and everyone had a chance to relax and converse, we played four highly competitive rounds of BINGO. Here are the lucky winners:

- **Lydia Hoff** (tie) - *Pocket Sky Atlas* (Jumbo Edition)
– Donated by *Sky & Telescope*
- **Mike Patton** (tie) – Vintage Apollo 13 Drinking Glass
– Donated by *Jean DeMott*
- **Phyllis Lubbert** – *Observer's Handbook 2018*
– Donated by *Anonymous KAS Member*
- **Jack Price** – *Astro-Physics for People in a Hurry*
– Donated by *Anonymous KAS Member*
- **Mary Ann Comiskey** – *Aurora Borealis Drinking Mug*
– Donated by *Matt DePriest*

Remaining members and guests then reconvened in KAMSC's presentation center for the Annual Meeting. Everyone enjoyed the *2017 Year-in-Review Slide Show* painstakingly assembled by Richard Bell. Final nominations and elections for 2018 KAS board members were then held. All nominees ran unopposed, so members present at the



KAS members and guests enjoyed a good meal and good company at the 19th annual Holiday Party.

meeting unanimously voted to ignore Article 5 of the [KAS Bylaws](#) and forego voting by secret ballot. Please see page 7 for the list of 2018 KAS board members.

Richard gave another brief update on the Robotic Telescope Project during his President's Report (see the Board minutes on page 3 for details). Don Stilwell did a little observing with his family in North Carolina during Thanksgiving time. Matt & Dan DePriest have also done some viewing from their new house in Vicksburg. Matt intends to contact Vicksburg officials about installing light shields around offensive street lights in his neighborhood.

The LIGO Observatory team [recently announced](#) another detection of gravitational waves resulting from the merger of two black holes. Jack Price mentioned that the first of three consecutive "supermoon's" occurs on December 3rd. The next two are both in January (see the star map on page 6 for details). Roger Williams mentioned that the St. Joseph County Historical Society (on 34 N. Main St. in Three Rivers) will have artifacts from the Apollo-Soyuz Test Project on display until February 23rd. From [their website](#), hours appear to be 10am - 4pm on Fridays only.

We then held the door prize drawings (donors are noted if known). Here are ALL the lucky winners (in order):

Maxwell Fiebelkorn (*Doctor Who: Extra Time* book); **Kathy Patton** (Solar Eclipse Drinking Mug, donated by Matt DePriest); **Gary Lubbert** (Meade 4.5-inch Newtonian telescope); **Jack Price** (Astronomy 2018 Calendar); **Don Stilwell** (*Sky Atlas 2000*); **Susan Severance** (*The Moon* book); **Frank Severance** (Mini Folding Knife); **Ruth Price** (Folding Hex Key Set); **Molly Williams** (TriLus Pen w/ LED light); **Karen Woodworth** (2017 Eclipse Photo, taken and donated by Kevin Jung); **Greg Sirna** (Night Sky card game, donated by Mike Sinclair); **Phyllis Lubbert** (Mystery Gift); **Lydia Hoff** (KAS Unhooded Sweatshirt, donated by the KAS); **Maevie Macfarlane** (2018 Moon Phase Calendar Poster, donated by Roger & Molly Williams); **Sue Sirna** (Apollo 13 Glass), **Roger Williams** (LED Portable Screwdriver Set); **Jim Kurtz** (Card USB Charger); **Zosha Kuiper** (KAS Hat, donated by the KAS); **Rich Mather** (*Voyages* astronomy textbook); **Scott Macfarlane** (*National Geographic Guide to the Night Sky*); **Sarve Cherukuri** (KAS Long-sleeve T-Shirt, donated by the KAS); **Tim Kurtz** (Total Eclipse of the Sun USPS Stamps, donated by Karen Woodworth); **Richard Bell** (Wish Upon a Star banner, donated by Beverly Byle); **Arthur Woodworth** (Apollo 13 Glass); **Kevin Jung** (Apollo 13 Glass); **Melody Woolf** (KAS Short-sleeve T-shirt, donated by the KAS); **Dan DePriest** (KAS Hat, donated by the KAS); **Dave Woolf** (Apollo 13 Glass); **Mike Sinclair** (Apollo 13 Glass); **Jean DeMott** (Total Eclipse of the Sun USPS Stamps, donated by Karen Woodworth); **Matt DePriest** (Apollo 13 Glass); **Mike Patton** (Apollo 13 Glass).

The meeting concluded at about 9:35 pm. Thanks to all the volunteers that helped with clean-up and putting all the tables and chairs away.

BOARD Meeting Minutes

The KAS Board assembled for the final regular meeting of 2017 at Sunnyside Church on December 12, 2017. President Richard Bell called the meeting to order at 5:10 pm. Board members present were Joe Comiskey, Scott Macfarlane, Rich Mather, Jack Price, Don Stilwell, and Roger Williams. Board member-elect Lydia Hoff was also present.

The Treasurer's Report was distributed by Rich, and it prompted no questions. Inflows of cash came mainly from dues payments, and outflows went to reimbursements for club expenses.

In the category of follow-up business, Richard reported that the Robotic Telescope group had met and had begun developing guidelines for use of the instrument by members. A contract had not yet been signed with Observatory Solutions. They wished to try operating the telescope before making a commitment, and they wanted Mike Patton to be present at the site for this trial. Progress will resume once the Pattons return to Arizona.

Richard reported that general meeting guest speaker are set through May. Other topics mentioned by Richard included the perihelic Mars opposition at the end of July, which should be the best since the vaunted 2003 opposition. The tentative dates are July 27th and 28th. Plans will be developed in future meetings. Finally, there was a reminder of the "quadruple conjunction" meeting of Southwest Michigan astronomy clubs to be hosted by the Muskegon Astronomical Society on September 8th. Jack pointed out that this conflicts with the Great Lakes Star Gaze, and Richard was asked to suggest an alternative date.

Under New Business, Richard mentioned the Rock & Mineral Show on May 4th - 6th. May 4th conflicts with a general meeting, but Richard agreed to check about May 5th and 6th. Since we would not be selling anything (as with Eclipse Shades last year), there would be no charge for setup space. Richard also reported on an e-mail from a Gull Lake high school student who is interested in doing an astronomy-related project in the year following her graduation. After discussion of some possibilities, the Board decided to ask for the additional CV information that was proffered in the letter and to invite the student to the January, 2018 board meeting.

In a final item of new business, Richard expressed interest in Events Calendar software that could be used for KAS Online. The price for a year's trial use would be \$49.90. After a motion by Don and second by Joe, the Board voted to acquire the software.

There being no further business, the meeting was adjourned at 6:00 pm. The next meeting date was set for Sunday, January 14th, 5 pm at Sunnyside.

Respectfully submitted by Roger Williams



Snowy Worlds Beyond Earth

by Linda Hermans-Killiam

There are many places on Earth where it snows, but did you know it snows on other worlds, too?

The north pole and south pole of Mars have ice caps that grow and shrink with the seasons. These ice caps are made mainly of water ice — the same kind of ice you'd find on Earth. However, the snow that falls there is made of carbon dioxide — the same ingredient used to make dry ice here on Earth. Carbon dioxide is in the Martian atmosphere and it freezes and falls to the surface of the planet as snow. In 2017, NASA's Mars Reconnaissance Orbiter took photos of the sand dunes around Mars' north pole. The slopes of these dunes were covered with carbon dioxide snow and ice.

There are dozens of moons that orbit Jupiter and one of them, called Io, has snowflakes made out of sulfur. In 2001, NASA's Galileo spacecraft detected these sulfur snowflakes just above Io's south pole. The sulfur shoots into space from a volcano on Io's surface. In space, the sulfur quickly freezes to form snowflakes that fall back down to the surface.

Saturn's moon, Enceladus, has geysers that shoot water vapor out into space. There it freezes and falls back to the surface as snow. Some of the ice also escapes Enceladus to become part of Saturn's rings. The water vapor comes from a heated ocean which lies beneath the moon's icy surface. (Jupiter's moon Europa is also an icy world with a liquid ocean below the frozen surface.) All of this ice and snow make Enceladus one of the brightest objects in our solar system.

Neptune's largest moon is Triton. It has the coldest surface known in our solar system. Triton's atmosphere is made up mainly of nitrogen. This nitrogen freezes onto its surface covering Triton with ice made of frozen nitrogen. Triton also has geysers like Enceladus, though they are smaller and made of nitrogen rather than water.

Farther out in our solar system lies the dwarf planet Pluto. In 2016, scientists on the New Horizons mission discovered a mountain chain on Pluto where the mountains were capped with methane snow and ice.

There might even be snow far outside our solar system! Kepler-13Ab is a hot, giant planet 1,730 light-years from Earth. It's nine times more massive than Jupiter and it orbits very close to its star. The Hubble Space Telescope detected evidence of titanium oxide — the mineral used in sunscreen — in this planet's upper atmosphere. On the cooler side of Kepler-13Ab that faces away from its host star, the planet's strong gravity might cause the titanium oxide to fall down as "snow."

Want to learn more about weather on other planets? Check out NASA Space Place:

<https://spaceplace.nasa.gov/planet-weather>



Kalamazoo Astronomical Society

presents

Full Moon Theater

Saturday, January 27 @ 7:00 pm

Kalamazoo Area Math & Science Center

When mysterious spacecraft touch down across the globe, an elite team led by expert translator Louise Banks (Amy Adams) - races against time to decipher their intent. As tensions mount between fearful governments, Banks discovers the aliens true purpose and to avert a global war, takes a chance that could threaten her life and quite possibly humanity. Jeremy Renner and Forest Whitaker co-star in this stunning, stellar masterpiece with a mind-blowing ending that you will want to see again and again.

Directions to KAMSC

The Kalamazoo Area Mathematics & Science Center (KAMSC) is located on the fourth floor of Old Central High School, 600 West Vine Street, seven blocks south of Michigan Avenue on Westnedge Avenue. Parking is available in the main lot behind Old Central or along Dutton Street. Attendees must enter KAMSC on the Dutton Street side of the building. A KAS member will be posted at the entrance to guide your way. Elevator access is available. The Dutton Street doors will be unlocked at 6:45 pm. Please be sure to arrive by 7:10 pm otherwise you may get locked out.



Admission is FREE! The KAS will provide the popcorn and soft drinks. You just need to show up and have a great time! For more information and directions to KAMSC, please visit our website: www.kasonline.org

Observations

by **Richard S. Bell**

of

2017

There's A LOT about 2017 I think we'd all like to forget, but there are approximately 2 minutes from the past year many of us will remember for the rest of our lives. Of course, I'm referring to the *Great American Eclipse* on August 21, 2017. Much of the year was spent in anxious preparation and anticipation of briefly standing in the shadow of the Moon.

The year began with a "Great American Eclipse Seminar" at our general meeting on January 13th. Many KAS members in attendance shared their eclipse plans, while I covered events all along the path of totality and how to safely observe that momentous event. The entire reason I brought back the *Introduction to Amateur Astronomy* lecture series in the first few months of 2017 was to help build anticipation of the eclipse. Attendance for the five-part series was again strong, with 25 people receiving Certificates of Completion for attending every lecture.

Our biggest event leading up to the eclipse was Astronomy Day 2017 on April 29th. Jean DeMott and I did everything we could to make this event bigger and better than anything that came before. We had three excellent guest speakers; two of which are world-famous eclipse chasers. These include Jay Anderson, "Mr. Eclipse" Fred Espenak, and Dr. Tyler Nordgren. As documented in the [June 2017](#) issue of *Prime Focus*, Jean and I considered the event a failure do to lower than desired attendance. It certainly wasn't for lack of publicity, as blogs and articles were written and we received a great deal of television coverage. We even paid for publicity in some widely circulated publications. Perhaps KVCC's Texas Township Campus was just too isolated for an event of this magnitude (it wasn't our first choice) and there seemed to be a lack of interest from the membership. We're taking a break from Astronomy Day in 2018 and will retool our annual outreach event when it does return.

Our third ever Solar Filter Workshop was held at KAMSC



Richard prepares to observe the *Great American Eclipse* at the Jim Moss Arena in Wyoming on August 21, 2017.

on May 20th. Several members built custom solar filters for their telescopes, binoculars, and camera lenses. Thanks again to Don Stilwell for donating the solar filter material.

We took an extremely rare hiatus in August, since so many members (myself included) took extended vacations around eclipse time. I put together a [special issue](#) of *Prime Focus* to help build last minute excitement for the eclipse. Thanks to past guest speakers Michael Bakich and Alan Dyer for allowing me to republish eclipse-related articles they wrote in the newsletter. Special thanks goes to Jay Anderson. He wrote an *original* newsletter article on monitoring the weather in the days before August 21st.

Both the September and October General Meetings were dedicated to eclipse reports. Those meetings went longer than usual, but I enjoyed every minute of it and I hope you did as well. Fortunately, many KAS members wrote reports documenting their eclipse experiences. Both the [October](#) and [November](#) issues of *Prime Focus* are filled with tales of their adventures. Re-reading those reports is a great way to relive the *Great American Eclipse* and I plan to peruse them for many years to come.

One of the most memorable parts of 2017 for me was traveling all across southwest Michigan between May and early August talking about the eclipse. In all, I gave 26 presentations at schools and libraries. The last few lectures were heavily attended, since eclipse fever was building. One of the presentations was at the library in Benton Harbor. The librarian recalled from e-mail exchanges months before that the date we set would fall on my birthday, so she had the 40+ people in attendance sing "Happy Birthday!"

We did take advantage of all this outreach and education to sell Eclipse Shades. In all, we raised over \$5,700 in sales. My plan for the money raised is to install a new mount and telescope in Owl Observatory. 2018 is the ideal time for an upgrade, since it's the 20th anniversary of the observatory's completion and dedication. Hopefully we'll have news in the months ahead, but the Board thought it would be prudent to hold off on another fund raiser until we get the remote telescope fully operational.

Several members did travel back to Arizona Sky Village in early March to install the Takahashi refractor and continue with setup. We did run into some additional technical issues, but plan to hire Observatory Solutions early this year to finish setup at long last. Our first Remote Viewing Sessions are scheduled for later this year.

Lastly, membership absolutely BOOMED in 2017. We finished the year with 179 memberships. The previous record was 151! Was the eclipse the factor? Probably so, but we'll continue our history of excellent programming and outreach so stick with us. Great stuff is yet to come!

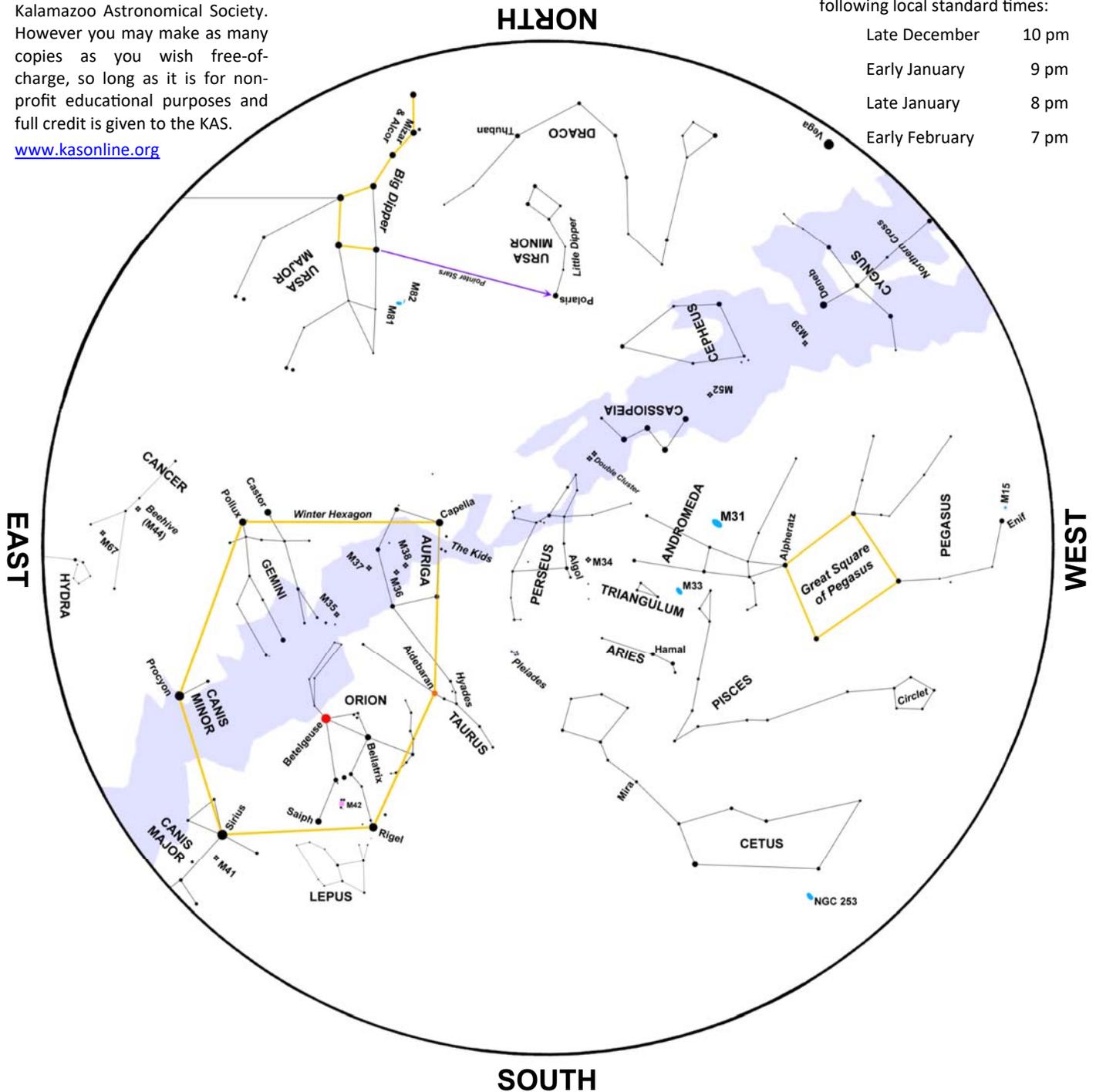
— January Night Sky —

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 December	10 pm
Early January	9 pm
Late January	8 pm
Early February	7 pm



Lunatics rejoice! The New Year begins with a Full Moon. This New Years Day Full Moon is also the largest our nearest celestial neighbor will appear to Earthbound observers in 2018, since it takes place within 4 hours of perigee. Astronomers refer to this common occurrence as a Perigee Moon, but the media has come to inaccurately

refer to it as a “supermoon.” Another Full Moon occurs on January 31st. In addition to being another “supermoon,” it is also a “Blue Moon,” another inaccurate but widely used term for the second Full Moon in one calendar month. As a result, for the first time since 1999, there will be no Full Moon in February. This won’t happen again until 2037.

Mars and Saturn shine within $\frac{1}{3}^\circ$ of one another before dawn on January 6th. The star Zubenelgenubi (Alpha Librae) can be found just 2° to the pair’s upper right.

Mercury and Saturn will be $\frac{1}{2}^\circ$ apart in the southeast before sunrise on January 13th. The Moon is about 6° to the upper right of Saturn.

KAS BOARD

PRESIDENT

Richard S. Bell

VICE PRESIDENT

Jack Price

TREASURER

Rich Mather

SECRETARY/ALCOR

Roger Williams

PUBLICITY MANAGER

Joe Comiskey

MEMBERS-AT-LARGE

Jean DeMott

Lydia Hoff

Scott Macfarlane

Don Stilwell

[E-MAIL a BOARD MEMBER](#)



January 2018

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— Volunteer Opportunity —



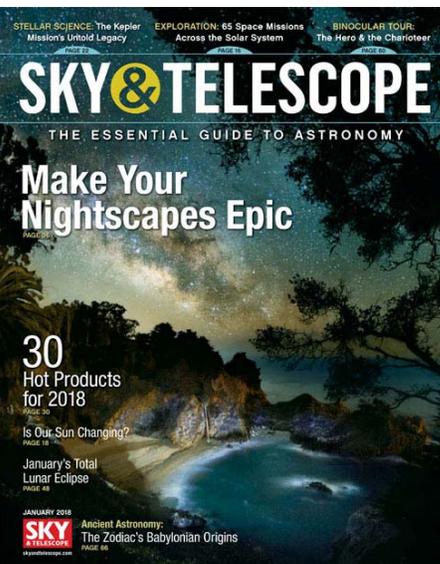
The students at Dix Street Elementary in Otsego are having a campout on Friday, January 19th. They would like some KAS members to be on hand and share views of the winter night sky. The chances of clear skies are low, but if you're interested in participating then please [contact us](#) and we'll keep you updated.

Friday, January 19th @ 8:00 pm
Dix Street Elementary • 503 Dix St, Otsego, MI

Moving? New E-mail?

Have you recently moved and/or changed your e-mail address? If so please [let us know](#) ASAP.

If you are moving out of town before your membership expires please contact us anyway. You paid for a years worth (or more) of newsletters and that's what you'll get!



S & T Subscription Discount

One of the many benefits of KAS membership is a **\$10 discount** on a one year subscription to the premiere astronomical magazine, *Sky & Telescope*. A regular one year subscription costs \$42.95; you pay only **\$32.95**. It's like receiving two free issues!

To take advantage, bring a check (made payable to [Sky Publishing](#)) to the next general meeting or [contact](#) KAS Treasurer **Rich Mather** for more information. First-time subscribers must pay through the KAS to receive the discount.

General Meeting Preview

Astronomy Open House

Infinite Possibilities



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 15 minute astronomically-themed presentations on topics of their chosen. What will they be? Please join us and find out.

Friday, January 12 @ 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

