Highlights of the November Sky. . .

- - - 4th - - -

Full Moon
1:23 am EDT

DAWN: Spica is 4° right of Venus very low in the ESE. Binoculars recommended. Mars is 16° above Spica.

- - - 5th - - -

PM: The Moon occults the bright star Aldebaran at about 8:03 pm EST. Aldebaran reappears at 8:56 pm.

- - - 10th - - -

Last Quarter Moon
3:36 pm EST

- - - 11th - - -

AM: Regulus is about 3° to the lower left of the Moon.

DAWN: Jupiter is 2° below Venus, barely above the ESE horizon about 45 minutes before sunrise.

- - - 16th - - -

DAWN: A very thin waning crescent Moon is about 6° above Jupiter and 17° below Mars. Venus is 3° to the lower left of Jupiter.

- - - 17th - - -

DAWN: A razor-thin Moon forms a loose trio with Jupiter and Venus, very low in the ESE. Binoculars needed.

- - - 18th - - -

New Moon
6:42 am EST

- - - 20th - - -

DUSK: Saturn is 2° to the lower left of a thin crescent Moon. Binoculars may reveal Mercury 7.5° below the pair.

- - - 26th - - -

First Quarter Moon
12:03 pm EST

- - - 28th - - -

DUSK: Mercury and Saturn are just 3° apart. Use binoculars and look low in the southwest.

Prime Focus

A Publication of the Kalamazoo Astronomical Society

★ ★ ★ November 2017 ★ ★ ★

This Months KAS Events

General Meeting: Friday, November 3 @ 7:00 pm

Kalamazoo Area Math & Science Center - See Page 18 for Details

Field Trip: Saturday, November 4 @ 5:00 pm

Abrams Planetarium - See Page 3 For Details

Board Meeting: Sunday, November 12 @ 5:00 pm

Sunnyside Church - 2800 Gull Road - All Members Welcome

Inside the Newsletter. . .

OCTOBER Meeting Minutes

The general meeting of the Kalamazoo Astronomical Society was brought to order by President Richard Bell on Friday, October 6, 2017 at 7:05 pm EDT. Approximately 45 members and guests were in attendance at the Kalamazoo Area Math & Science Center (KAMSC).

Richard quickly mentioned some upcoming volunteer opportunities during his President's Report. Members are needed to observe the Sun and pass out KAS literature at CraneFest, held at the Kiwanis Youth Conservation Area on October 14th and 15th. (Editor's Note: CraneFest was canceled this year due to the excessive rainfall we received on October 14th.) We will also conduct solar observing and offer a hands-on activity at Kingman Museum's Spooky Science Saturday on October 28th. (Editor's Note: Special thanks to Zosha Kuiper and Rich Mather for helping kids make planispheres from 11am - 3pm).

In lieu of the traditional Astrophotography Night, our feature presentation for the evening was Part 2 of *Great American Eclipse Stories* from the KAS membership. The following members shared their tales from the Moon's shadow during the first half of the meeting: Paul Asmus, pictured here, (Casper, Wyoming), Richard Bell (Jim Moss Arena, Wyoming), Joe Comiskey (Cortland, Nebraska), and Becky Csia (Hay Creek Ranch, Oregon).

Our snack break, courtesy of Jean DeMott, consisted of the traditional apple cider and donuts. Richard did squeeze in one piece of astronomical news before continuing with the eclipse reports. The Nobel Prize in physics for 2017 has been awarded to three researchers for their work helping to prove the existence of gravitational waves. Rainer Weiss (MIT), Kip Thorne (Caltech), and Barry Barish (Caltech) have been chosen by the Royal Swedish Academy of Sciences for the award thanks to their contributions in the development of the Laser Interferometer Gravitational-Wave Observatory (LIGO) and their observations of gravitational waves.

The following members presented their eclipse reports during the meeting's second half: Kevin Jung (Glendo, Wyoming), Mark Miller (Van Tassell, Wyoming), and Rich Mather (Hazard, Nebraska). All these members that shared reports at the meeting (and more), typed them up for everyone to enjoy. After all, no one can tell their story better than they can! Please enjoy them beginning on page 4. It was unanimously agreed that we'll do this again after the 2024 eclipse! The meeting concluded at 9:57 pm.

BOARD Meeting Minutes

The KAS Board met on October 8, 2017 at Sunnyside Church. President Richard Bell called the meeting to order at 5:08 pm. Board members present were Scott Macfarlane, Rich Mather, Jack Price, Don Stilwell, and Roger Williams.

As usual, the first agenda item was the Treasurer's report, presented by Rich. Income for this period was mostly from dues payments and donations, while expenses were for fees, postage, publicity, SkyShop inventory, and the book payment to Fred Espenak that was authorized last month.

In Follow-Up items from the previous meetings, Richard noted that the robotic telescope was still presenting problems in getting up to smooth running capability. He suggested that if we didn't have things going in about a month, we should hire Observatory Solutions to get the scope set up properly and to provide any necessary training. After some discussion of what would be the appropriate deadline and what Observatory Solutions should be asked to demonstrate, Jack moved (second by Rich) that the end of October be set as a deadline for us to have the system running satisfactorily before contracting with Observatory Solutions (motion carried). It was agreed that meanwhile Rich and Jim Kurtz would work on a list of items to be accomplished (with suggestions from other interested committee members) and would contact Observatory Solutions for information about capabilities and cost of their work.

In other Follow-Up topics, the proposed Owl Observatory upgrade was discussed again in very general terms, with agreement from the Board that we need to get the robotic scope running before considering details of the Owl upgrade. On the question of replacing the lost KAS banner, Richard showed 3 designs. After a motion by Rich, second by Don, and favorable vote, the Board agreed to let Richard choose between either design #1 or #3.

In New Business, a suggestion was made for preparing instructions for use of the loaner 8"-Schmidt-Cassegrain, since some who checked it out had problems with running it. A YouTube instructional video was also suggested. Richard suggested a field trip to Abrams Planetarium on Nov. 4th. Don moved that if *Planet 9* is playing on that date, KAS should sponsor a club field trip. After a second by Scott, the board voted in favor. The next item was a check of Richard's proposed calendar for 2018 General Meetings and Public Observing Sessions. The only suggested change was moving the April General Meeting from the 6th to the 13th. Jack brought up the subject of a new carpet for Owl Observatory. He had planned to salvage some of the carpet removed in renovation of Sunnyside Church, but it turned out to be too tightly glued for salvage. The carpet question will be revisited in the spring.

The next board meeting was set for November 12th. The meeting was adjourned at 6:35 pm.

Observations

by Richard S. Bell

Please promise you'll bare with me after you read the next sentence. Opening nominations for 2018 KAS officers and at -large board members will be held at the November General Meeting. Remember, I told you to please bare with me. You promised!

It's no shocking revelation that most KAS members have little interest in serving on the Board. Some of you are simply unable to make that sort of commitment, while some of you probably think it's not worth your precious free time.

I bring up this unpleasant and uninteresting topic for a couple of reasons. The past three years have seen nominees run unopposed, but I suppose we should be lucky to at least have members run for the positions at all. Secondly, the current board members have served multiple terms. Let's look at them one-by-one, shall we?

Yours truly is the senior member of the Board, having served continuously since 1996. I've now served TWELEVE terms as President (2002 - 2007, 2012 - 2017), two terms as Vice President (2010 - 2011), six terms in the now-defunct position of Editor/Secretary (1996 - 2001), and two terms as a Member-At-Large (2008 - 2009). I've also served in several volunteer positions for multiple years. These include Astronomy Day Coordinator (1997), KAS Online Webmaster (1997), and Newsletter Editor (2005).

Jack Price has served on the Board almost continuously since 2000. He began as a Member-At-Large in 2000, and served in that position again in 2006. Jack was KAS President for four terms from 2008 - 2011. Most of Jack's time on the Board has been spent as Vice President, which he's currently served fifteen terms (2001 - 2004, 2007 - 2017).

Rich Mather was first elected to the Board in 2001 and served two terms as a Member-At-Large. He's now been the Treasurer continuously for 15 years! Roger Williams began his tenure the same time as Rich, also beginning as a Member-At-Large in 2001 and 2002. Roger has been the Secretary/ALCOR non-stop since 2003.

Joe Comiskey is still the newbie on the Board! He's served four terms as a Member-At-Large since 2014. Mike Cook is serving his fifth term as an At-Large member (2012 - 2013, 2015 - 2017). Scott Macfarlane is now up to seven terms as a Member-At-Large (2011 - 2017). Lastly, Don Stilwell has currently served eight terms as a Member-At-Large (2010 - 2017).

Joe Comiskey has expressed interested in running for the new Publicity Manager position, which has been vacant since March). That would leave an open position as a Member-At-Large. Interested? You're always welcomed and encouraged to run for another position. As laid out above, we've all been serving for quite some time. We could always use some fresh faces and new ideas.

Field Trip To East Lansing

On **November 4th**, KAS members will take another field trip to Abrams Planetarium, located on the campus of Michigan State University in East Lansing. We'll enjoy a show featuring their new state-of-the-art Digistar 6 projector. Our itinerary will include:

1. **Meet in State Systems Radio parking lot** for carpooling between 4:45 - 4:55 pm.

   State Systems Radio is located at 5066 Sprinkle Road, located just south of Kilgore Road on the west side of Sprinkle.

2. Depart for East Lansing at 5:00 pm.
3. Stop for dinner at Turkeyville at 6:00 pm.
4. Arrive at Abrams Planetarium at ~7:30 pm.
5. Abrams Planetarium show at 8:00 pm. *Admission paid by the KAS (members only).*

   Preview: ***Planet Nine: The Search is On***

   Follow Mike Brown and his team at CalTech as they uncover dwarf worlds like the remarkably bright Eris; Haumea, an egg-shaped object rotating incredibly fast; and Sedna, whose orbit takes it deep into the far reaches of the Solar System. Is there a new planet beyond these distant objects? We'll tag along on Mike Brown's first night searching for the ninth planet at the Subaru Telescope in Hawaii. Join us on the hunt!

5. Depart for Kalamazoo at ~9:30 pm
6. Arrive in Kalamazoo at ~11:00 pm.

For last minute details please attend the general meeting on November 3rd. If you are unable to attend the meeting but would like to go on the field trip then please contact us ASAP. If the weather is really bad (heavy rain or snow, severe thunderstorms, etc.) we will notify everyone that has signed up of a cancellation.

Members of the Kalamazoo Astronomical Society stood in nearly every state along the path of totality on August 21st with hopes of witnessing the grandest phenomenon in nature...a total solar eclipse. These are their stories...

Paul Asmus
Casper, Wyoming

Planning in earnest for the Great American Eclipse began for me in early 2015. A convergence of climate considerations, the Astrocon 2017 convention, a visit to my family in Fort Collins, CO, a wedding of a family friend and a high school class reunion (50th!) pointed to Casper, Wyoming as the place we were to be for this eclipse. My wife Alice and I arrived in Casper on August 11th and "camped" at the Holiday Inn and I got pumped up for the eclipse at the Astrocon convention while Alice shopped, relaxed and planned our pre and post eclipse parties.

Our observing party was composed of about 40 people: friends, friends of friends, family of friends including many kids (next generation of astronomers?). We observed the eclipse on the property of a friend's family - a 6,000-acre ranch/farm about 5 miles west of Casper on Poison Spider Road within 200 yards of the center line. The day of the eclipse dawned without a cloud in the sky and we set up to observe the "Eclipse of a lifetime" several hours before first contact. I planned to observe mostly with my naked eyes and 10×30 image stabilized binoculars. But I also wanted to see the details of the corona and prominences with my clock driven 90 mm Meade ETX at 31×. For a wider view I had my 80mm Orion refractor at 15× with approximately 1.5° field-of-view.

Paul & Alice Asmus (left) and friends celebrate after successfully observing the total solar eclipse.

The mildly interesting partial phases were observed with eclipse glasses and projection of the Sun's image through a colander. It really started becoming interesting about a minute before totality as the Moon's shadow began to build on the very thin stratus clouds that had moved into the area. It was moving at a half mile per second toward us, looking like a huge thunder storm without lightning. About 10 seconds before totality the lights really began to go out and then the most memorable and beautiful image I have of the eclipse was the diamond ring.

Then...Totality. The screaming from our group was so loud that the sound on the video we were making cut out for a few seconds. There we were standing in the shadow of the Moon! Sunset colors were on the horizon 360° around. Prominences were at 1:00, 3:00, 4:30. Through the telescope the details of their structure was magnificent: Delicate loops and curves. The corona was silky and you could actually "see" the magnetic field lines of the Sun.

All too soon (146 seconds) it was over after the 2nd magnificent diamond ring. The next thought was "When is the next one?" That was followed by the popping of the champagne corks as we all reveled in our experience of the *Great American Eclipse*.

Z Z Z

Richard Bell
Jim Moss Arena, Wyoming

In 1984, I asked my Dad to buy me an astronomy book that I needed for a class project at Milwood Junior High. He took me to the Waldenbooks located within the Kalamazoo Center and, after a little persuading, bought me a second (1983) edition copy of Peterson's *A Field Guide to the Stars and Planets* by Jay M. Pasachoff. He was hesitant to spend the


Teton Range Panorama by Richard Bell

money, because he didn't think I'd ever look at it again after completing my project. Boy, was he wrong! I *devoured* that book. *Stars and Planets* taught me the fundamentals of astronomy and for years it was the only serious book on the subject I owned.

Jay Pasachoff is a veteran eclipse chaser, so the section on eclipses was well covered. On page 409, there's a map that shows the paths of total eclipses of the Sun from 1979 – 2017. The date of the last total solar eclipse on the map was August 21, 2017 and it happened to cross the United States from coast to coast. At the time, I thought to myself: "Cool. I'll get to see that eclipse when I'm an old man!" That momentous date was in the back of my mind every time an eclipse took place, but otherwise I just went about my life. Once I started teaching astronomy in 2004, the August 21st eclipse became a regular highlight of one of my lectures.

I seriously started researching observing locations about five years ago. Most of my candidate sites were in Kentucky. Then, about two years ago, I learned that the Astronomical League Convention (ALCON) would be held in Casper, Wyoming from August 16th – 19th. The advantages of Wyoming became clear. The weather prospects were much better in the Northwest; plus, the increased elevation translated to better transparency and seeing conditions. Observing the eclipse from Casper was always the general plan, but then I discovered how much money some places were charging for camping. ALCON arranged a special viewing location for its attendees, but it wouldn't have room for my equipment. Jean DeMott, KAS member and my astronomical travel buddy, discovered affordable accommodations at the Jim Moss Arena, located about 11 miles northwest of Riverton, Wyoming and about 5 miles south of the eclipse path's centerline. From there, we would enjoy 2 minutes and 25.1 seconds of totality.

Jean and I decided to spend three weeks on the road and departed from Kalamazoo on August 4th. We briefly stopped in Rapid City, South Dakota to rent a camper. Staying in hotels may have actually been cheaper, but we didn't want to commit to any one location in case we had to flee for clearer skies. Our first major destination was Yellowstone National Park. Entry into the park was quite memorable, since we were stuck in a traffic jam for nearly 4 hours. A herd of stubborn buffalo blocked our path ahead! We spent the next three days touring geysers (such as Old Faithful), hot springs (like those at Mammoth Hot Springs), waterfalls (such as the one at the Grand Canyon of Yellowstone), and much more.

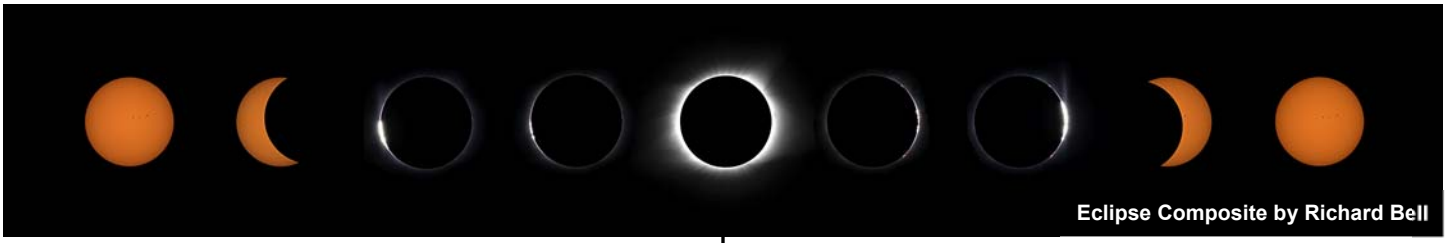
Two days were then spent at Grand Teton National Park. We were actually at Grand Teton during the 45th anniversary of the Great Daylight Fireball, which occurred on August 10, 1972. It was captured on video from Grand Teton (and shown during an episode of *Cosmos* by Carl Sagan). The Tetons were difficult to see during the first day because of clouds and smoke. The smoky conditions were apparent as soon as we arrived in Rapid City and were a growing concern for the eclipse.

The next few days were spent digging for fish fossils near Kemmerer and touring places like Flaming Gorge, Fossil Butte, and the Wyoming Dinosaur Center near Thermopolis. We at last arrived in Casper on the night of August 15th. Our arrival was also memorable, since we ran out of gas just outside of town! There were no gas stations between Thermopolis and Casper. I thought half-a-tank would be plenty, but I neglected to factor in the smaller gas tank on my new Jeep and the extra weight of the camper. Fortunately, we were only 1,400 feet from a gas station and even ran into a tow truck driver. He let us use a gas can and we paid him in eclipse glasses!

We enjoyed many excellent presentations at ALCON and spent more than enough time (and money) in the vendor's room. We had hoped to collect our Astronomy Day Award in person during the Gala Award Banquet. We notified both the award's coordinator and Astronomical League President that we would be in attendance. However, they simply announced the KAS as the winner, briefly mentioned representatives were in attendance, but never called us up to accept an award certificate or check. It was disheartening to say the least, considering how hard we all worked. I eventually received the certificate and check by regular mail...as usual.

It was time for the main event! Jean and I arrived at the Jim Moss Arena on August 20th and quickly began preparing for the big day. A small crowd of eclipse chasers gathered around me once my telescope was setup. It turned out I was the only person with a serious setup, so word spread that I was "the expert." Many of our neighbors asked if they could view the Sun and stars through my telescope and I relented.


The Lower Falls at the Grand Canyon of the Yellowstone.



Eclipse Composite by Richard Bell

It did adversely affect some of my plans, so perhaps I should have politely explained that I came a long way to photograph the eclipse and that I still have preparations to make. Basically, if you see someone setting up lots of gear the day before an eclipse then LEAVE HIM ALONE!

My main setup consisted of an Astro-Physics Mach1GTO German Equatorial mount, which carried a Stellarvue 130mm refractor (with a focal reducer/field flattener) and Astro-Tech 65mm refractor. The Stellarvue took still images of eclipse using a Canon 6D and controlled via Eclipse Orchestrator from Moonglow Technology. The Astro-Tech recorded video of the eclipse using a Canon 550D (T2i). I also setup an Akaso Action Camera EK700. This small GoPro-type camera boasted a 170° field-of-view, so I thought it would be ideal to capture the Moon's approaching and receding shadow. Finally, I pointed a standard digital camcorder at a white board in an effort to capture shadow bands. It was inspired by a YouTube video posted after the 2016 eclipse in Indonesia.

Fortunately, despite the interruptions, I was able to get my Mach1GTO polar aligned. I had planned on doing a drift alignment, but decided it wasn't necessary. Simply placing Polaris in the proper position of my Right-Angle Polar Alignment Scope was enough to keep a star centered for 5-minutes. I then shared some views of Saturn and deep sky objects with the people waiting for me to complete polar alignment. Once that was done I switched the tracking of my mount to "solar rate" and headed to bed.

We awoke before sunrise on August 21st and it was much cloudier than forecast. Forecasts the night before called for clear skies up until 3pm, when the eclipse would have been long over. The internet was painfully slow, but I managed to see that a minor line of clouds was working its way through our area. It would eventually pass us by, but it was a matter of when as they were moving quite slow. Fearful of the clouds, many people left the Jim Moss Arena and headed north. All my gear made relocation impossible. I was committed to where I was.

First contact for our location took place at 10:19:26.9 MDT. Due to clouds, my first few pictures showed nothing. Jean was the first to spot the Moon with the aid of her Lunt Solar Systems 6×30 Sunoculars. The clouds were a hinderance until about 25-minutes before totality. While it may have affected my images, the partially-eclipsed Sun was still fairly easy to see visually. Shadows grew sharper as the Sun was reduced to a narrow crescent.

Naturally, the sky darkened as the eclipse progressed but, about a minute before totality, the landscape took on an eerie grayish-blue hue. Colors became very subdued as well. Someone screamed "here comes the shadow," so I turned my gaze toward the northwest and spotted it. It was as if a giant blanket was being draped over the entire sky. Eclipse Orchestrator reminded me to remove solar filters about 20-seconds before totality. (I even wore an earbud, so I wouldn't miss it in all the excitement!) Seconds before totality, which occurred at 11:38:45.7 MDT, Jean screamed "DIAMOND RING, BAILY'S BEADS!" I simply gasped and said "OH, WOW! OH MY GOD, IT'S AWESOME!" Quickly the spectacular, awe-inspiring corona made its glorious appearance in the form of three magnificent streamers that extended several degrees from the Sun. My first thought was that it looked like the NASA "meatball" logo!

I took just a few seconds to glance around the sky. Venus was easy to spot, but it never grew dark enough for stars to appear. This wasn't too surprising, since the Sun was about 55° above the horizon. I could see a 360° twilight-like glow

Richard poses with his eclipse imaging setup at the Jim Moss Arena in western Wyoming.

Jean DeMott observed the eclipse through her Celestron 15×70 binoculars on an Orion parallelogram mount.

Richard created this high dynamic range (HDR) image of the total solar eclipse by combining exposures between 1/4000 and 1/4 second. It brings out the full extent of the Sun's corona.

along the entire horizon. I brought some Celestron 20×80 binoculars to view the corona, but forgot during all the excitement! Jean did view the corona through her 15×70 binoculars on a parallelogram mount.

It was dark enough during totality to notice that my Canon 550D stopped recording. This is a common occurrence with this camera, bit it's all I had to use. I missed about a minute of totality, but did managed to record rest. My results have been uploaded to YouTube, so please enjoy.

All too quickly, Baily's beads and then the diamond-ring effect reappeared from the behind the opposite side of the New Moon, bringing totality to an end. Our neighbor, Bob Milstead, setup a white sheet and reported seeing shadow bands. I was able to see them visually as well and was successful in my effort to capture them on video. I also captured the Moon's shadow racing across the sky with the Akaso camera. That pesky long, but narrow cloud really helped highlight the shadow's movement. The sky was clear for the remainder of our stay at the Jim Moss Arena and Eclipse Orchestrator dutifully photographed the eclipse until it ended at 13:05:00.5 MDT.

We spent the next two days at Devil's Tower National Monument. We were lucky enough to get the last RV spot at the Devil's Tower KOA. This was our second visit to Devil's Tower and we'd gladly visit it again and again. It is a sight to behold. However, since we stayed overnight, I got to photograph the Milky Way next to the tower. We returned to Kalamazoo on August 25th with a great feeling of accomplishment. After waiting 33 years, I got to witness the *Great American Eclipse*. I hope to again be in the Moon's shadow on April 8, 2024 if not sooner.

Z Z Z

Joe Comiskey
Cortland, Nebraska

Ellen and I drove from our home to Davenport, IA on Saturday (August 19th), a distance of about 300 miles. On Sunday we pressed on to Lincoln, NE, which was an additional 350 miles. We arrived there in the late afternoon and started thinking about where we should view the eclipse. Bev Byle and a friend were also coming to Lincoln, and I wanted to suggest a good place for viewing the *Great American Eclipse* when they arrived later that day. Unfortunately, the unpredictable cloud cover over eastern Nebraska, and the menacing possibility of apocalyptic traffic jams rendered no easy answers. Bev later suggested the parking lot of St. James Church in Cortland, 23 miles south of Lincoln. She had heard that they were hosting an eclipse viewing. This seemed a good place since it was not too far, was in a very small town, and was closer toward the middle of totality than Lincoln.

Nevertheless, I was later bedeviled with second thoughts, which didn't help an already poor night's sleep. After

breakfast the morning of the eclipse, Ellen and I decided to drive to Cortland, second guessing all the way due to encroaching clouds. Meanwhile, Bev and her friend decided to scrap the Cortland idea and head west in search of better sky conditions. Traffic was not light but we made it to the church without a problem. People were setting up in the parking lot. Two chartered buses pulled into the parking lot near us, bringing many school kids. The weather cleared up around 10:30 am (CDT) and I was able to set up my 4" Mak-Cass telescope to observe the Sun (w/ filter of course). Despite not knowing true north, I used the Sun's right ascension and declination coordinates, and the local sidereal time, in hopes of setting the scope so it would track properly. It worked without any trouble!

Ellen saw first contact, and we were able to take a few photos through the telescope eyepiece. We also viewed the eclipsing sun with our eclipse shades. We interacted with the others, including two nice ladies (Barb and Lin), a family with a puppy, and the two bus drivers. The two bus drivers hung out with us the most.

A little after high noon, a terrible thick bank of gray clouds approached the Sun from the south and slowly swallowed it up. We could no longer see the Sun at all. Worse yet, the cloud bank seemed to stop moving. A half hour passed, and our hopes of seeing totality were rapidly fading. Ellen and I eventually made our way into the church and prayed for the clouds to part. When we came back out, it had started to sprinkle briefly.

A few minutes before totality, we decided to go behind the church and into a field, which was a quieter place. The clouds were totally blocking the Sun, but there were some clear patches of sky to the north and to the west. We noted how those areas were becoming a deeper blue, and the clouds in the foreground were becoming darker. Crickets were singing, mourning doves were cooing, and butterflies were grounding themselves. Then it got eerily dark, like the deeper stages of twilight. The open parts of the sky became a deep blue. I tried briefly to find stars using 10×50 binoculars, but found none. One could also see orange sunset-like colors low on the horizon where the sky was clear. The darkness seemed to last for at least 2 minutes. Then everything

Even a pre-eclipse prayer in the local church didn't bring Joe Comiskey clear skies in Nebraska.

Joe & Ellen may have missed out on totality, but the eclipse still created beautiful scenes around them.

gradually brightened up and within a few minutes it was typical (cloudy!) daytime again.

We were not able to see the Sun at all around the time of totality. The Sun did come back out on our way back to the hotel. After parking the van in the parking garage, we watched the remainder of the eclipse, a few minutes before last contact. At that point, Ellen was more into viewing the eclipse than I was. Still, those last few moments of the eclipse were a special time for us to be together.

It was a good experience but both of us were incredibly disappointed in missing the Sun during totality. In the aftermath, we found out that we would have seen totality if we had just stayed in Lincoln and walked two blocks to the University of Nebraska's campus.

Was it worth driving 650 miles — no, 1,300 miles for? The jury is still out. Fortunately, the next total solar eclipse will be much closer!

Z Z Z

Becky & Kalman Csia

Hay Creek Ranch, Oregon

Forget about missing the last flight in, about family members having to reluctantly cancel, and about having to check into the Emergency Room on the night before The Eclipse.

We had a spectacular view of the *Great American Eclipse* of 2017 on a private hilltop with clear 360-degree views of surrounding mountains. The location was Hay Creek Ranch, 20 miles east of Madras, Oregon. First Contact came at 9:06 am PDT on Monday, August 21, 2017. Totality began at 10:19 am. Third contact was at 10:21 am. The end came into view at 11:41 am. While it may have seemed like eight seconds, totality lasted for two minutes and two seconds.

We selected Central Oregon because it is in the rain shadow of the Cascade Mountain Range. And it was touted as a promising site by meteorologist Jay Anderson, a speaker at Kalamazoo Astronomy Day.

In an effort to avoid the massive traffic jams predicted for Eclipse Day, the Csia's chartered helicopter rides to their private viewing site at Hay Creek Ranch.

Not that he would remember, but 15 years earlier, we had met Jay at a Southern Skies Star Party on the shores of Lake Titicaca in Bolivia where the hotel staff got a chuckle out of mispronouncing his name as "Che." The one reservation Che had about Madras was the potential for smoke from forest fires. And that proved to be provident.

The alignment of our heavenly bodies looked anything but promising in the months, weeks and especially the night leading up to The Eclipse.

We had been planning this event for what seemed like an eternity. A little more than a year out, we were finally able to secure reservations for 14 family members and one lucky dog.

The only pet-friendly lodging we could find close to our preferred destination of Madras, Oregon was at Brasada Ranch near Bend, Oregon. Although the ranch was outside the path of the total eclipse, we thought it was close enough that we could catch up with totality on the morning of The Eclipse by simply driving a caravan of vehicles down country roads.

"Not so much" was the message we got from the Kalamazoo Astronomical Society meeting in January. Predictions of coast-to-coast traffic jams along the Moon's shadow were exacerbated for Madras, a community of 6,000, by plans to host the Oregon Solarfest for 100,000 plus celebrants. We were told to expect rock bands, pot parties, highway closures, stress on the sanitation systems - as well as food and gasoline shortages. Not exactly the atmosphere we were looking for in a family gathering. Nor were the local roads going to lead us to any guaranty of success.

But wait - Solarfest was going to offer helicopter rides! That was the answer to the question we didn't even know we had. We found Big Mountain Heli Tours on the Web. They had all-inclusive packages for private hilltop viewing sites with sun tents, solar glasses, picnic lunches and Dom Perignon Champagne with which to toast totality.

We arranged to be picked up outside our lodging by five Robinson R44 helicopters and whisked to our viewing site.

Not so fast.

Because of the influx of private fixed-wing aircraft into the area, Bend was one of only four airports in the USA where in the days leading up to The Eclipse, the FAA took over aircraft operations by sending in their own controllers.

No longer assured of timely takeoffs by the local Bend controllers, Heli Tours had us pack up the kids before dawn and caravan to the Redmond Airport. That was only one of a dozen details ironed out in the months and minutes leading up to rotors turning.

We had flown to Portland, Oregon on the Tuesday before The Eclipse. The rest of the family was scheduled to arrive in Redmond on Saturday.

Never assured of seeing a total eclipse because of weather and other unknowns, we decided to nail down some sightseeing. And we were blessed with perfect weather in the Columbia River Gorge.

We found a wonderful motel on a bluff overlooking dozens of kite-boarders surfing the wind-swept waves of the Columbia River. Westcliff Lodge was not only pet-friendly, but included one of the most scenic dog runs ever.

We hiked part of Historic US 30 that had been turned into a pedestrian trail, including the Mosier Twin Tunnels. Originally opened in 1921, after two years of back-breaking labor, the tunnels could easily accommodate Model T's. But as automobiles became larger, accidents became more common. The tunnels were closed and filled in during the 1950s - but reopened as part of a hiking and bicycling path in 1995.

We took advantage of Historic Columbia River Highway having been designed to provide motorists with stunning views of waterfalls at Multnomah Creek, Bridal Veil and Shepperd's Dell. But because of an outdated guidebook, we slipped along life-threatening, muddy drop-offs just to earn the right to gaze at Elowah Falls.

And then - after 11 years - we returned to Punchbowl Falls - a place we call Heaven on Earth. It is the reward for a challenging but doable hike along Eagle Creek Trail.

Look for the American Dipper, North America's only truly aquatic songbird, to pop out of Eagle Creek among the rocks near the trailhead. Unbelievably the Dipper catches minnows for its young by walking or swimming under the fast flowing currents. We caught glimpses of the chunky little ball of feathers in almost the very same spot this year as on our first visit in 2006.

We have also seen the Dipper in...

...Alaska: in a salmon stream frequented by grizzly bears;

...Yellowstone N.P.: downstream from the frozen waters of Fairy Falls;

...Peru: in a mountain rivulet flowing into the Urubamba River; and...

...the Carpathian Mountains of Central Europe.

From the Columbia River Gorge, we took a route that circled us through the Painted Hills Unit of John Day National Monument on our way to Central Oregon. We met with rangers and tourists discussing plans to deal with what was expected to be record attendance at the Monument during The Eclipse. What we heard reported afterwards was the strange behavior of some celebrants who shed their clothing to greet the extinguishing of the Sun.

As we approached Bend, Oregon, smoke from five named wildfires darkened the sky. We were told there was a chance that the helicopters wouldn't be allowed to fly on the day of The Eclipse because of impaired visibility. And we were starting to have trepidations whether our family would see the syzygy of Sun, Moon and Earth.

As we said, we had made reservations for 14. But two members of our family reluctantly dropped out the week before because of a medical situation. Three more members of Team Eclipse missed the last connecting flight into Redmond on Saturday. With no transportation options available for arriving until after The Eclipse, they were mulling returning to Maryland.

That's when our nephew stepped up to save the day. He was able to charter an airplane in the face of seemingly impossible scarcity to facilitate his sister and family reaching the ranch in time for dessert that evening.

More ominously, Kalman checked into the Emergency Room at the Redmond hospital at 11:30 at night on Sunday, August 20th. Our participation in The Eclipse was thrown in doubt. We were to spend a sleepless night waiting for Kalman, who was on a heavy-duty blood thinner, to be treated for a nosebleed that would not stop. With 45 minutes left before making a go/no-go decision on catching a helicopter and being isolated on a mountain top for five hours, the doctor gave us a green light.

Before dawn, our dog "Miss Katherine" was the focus of attention for dozens of eclipse chasers from around the world waiting to board their helicopters. In the gathering beside tables piled with breakfast goodies, a gentleman from

Big Mountain Heli Tours ferried Becky, Kalman, and the rest of the family on Robinson R44 helicopters to their site in central Oregon.

The private hill-top at Hay Creek Ranch, east of Madras, Oregon, offered 360-degree views, sun tents, picnic lunches, and champagne with which to toast totality!

Sydney stepped forward to ask permission to take her picture. He wanted to show friends in Australia that dogs were indeed allowed to fly commercially in the U.S.

We had six kids in the party, ranging in age from 9 to 15. For most, this was their first helicopter ride; and for all, this was their first total solar eclipse. Becky handed out pinhole eclipse viewers copied from the ones used by KAS on Astronomy Day. The kids punched their cards and projected images of crescent Suns through their names. As the sky darkened, one of the boys stumbled on a rock while running to catch a football.

The Moon's shadow crossed Oregon in just 9 minutes and 3 seconds, covering a distance of 336 miles at an average ground speed of 2,246 MPH (about three times the speed of sound.) During totality at our site, the Sun was about 41° above the eastern horizon.

Nighthawks were fooled by the darkness. Reacting to the stimulus, the birds began to awaken and swoop around our hilltop looking for insects of the evening.

Forewarned by Heli Tours about invasive Cheatgrass at our observing site, we were prepared to protect our dog from having the plants' barbed seed pods catch in her paws, eyes and nostrils. That meant that Miss Katherine wore a fashionable (for hunting dogs) black mesh mask around her head and orange booties on her feet.

Fortunately, the winds shifted before the day of The Eclipse and blew the wildfire smoke away from our observing site. It turned out to be an amazing adventure that just grows more awesome with each remembrance - probably the more so because of us almost having missed it in its entirety.

Tragically the week after we returned from Oregon, teenagers threw smoke bombs into Eagle Creek Canyon setting the trail, the woods, the waterfall sites and the interstate highway on fire in the Columbia River Gorge. They were seen laughing while recording their crimes on a smart phone. The smoldering area, including a key railroad artery as well as I-84, closed for weeks. About 100 hikers

Becky enjoyed the eclipse with Miss Katherine, who had to wear a black mesh mask and orange booties to avoid being injured on the invasive Cheatgrass.

were trapped along Eagle Creek, forcing them to climb into the mountains to find shelter before being evacuated the next day.

Z Z Z

Bob & Barbara Havira

St. Genevieve, Missouri

We planned to view the eclipse in St. Genevieve, MO, which had 2 minutes 40 seconds of totality. We found that our nephew's house was in totality for some 30 seconds less but had the advantage of driveway parking, restrooms, a very nice picnic lunch with cold drinks and a cooling awning in the yard (104° F).

We supplied eclipse shades for everyone and nervously watched some very large clouds pass over the Sun. Some took as long as five minutes to pass. As the Moon approached it cleared and we had excellent views of the partial stages. As totality approached we SAW IT ALL. The diamond-ring was so exquisitely bright one could almost hear it crackle! Baily's beads, the corona, the eerie twilight and finally total darkness as we stood in the shadow of the Moon! The temperature dropped, insects set up an absolute din! We cheered; somewhere people set off fireworks. Then all too soon the second diamond-ring and back on with the shades. Hurrah for an unclouded eclipse 2017 from our nephew's backyard in Arnold, MO, thirty miles south of St. Louis.

Addendum

In addition to enjoying the eclipse themselves, Robert and Barbara were "missionaries" for Eclipse 2017. They advertised the event to over fifty people via email, sending each a one page info sheet and lots of "links". They distributed 80 pair of KAS eclipse glasses to family and friends near and far. Using Richard's PowerPoint materials, they made a presentation to the Parchment Garden Club in August.

Recipients of KAS glasses included about one hundred people associated with the society of women religious who taught Barbara in grade school, high school, and college in St. Louis, Missouri.

Thirty pair of KAS eclipse glasses went to sisters in St. Louis, and twenty more to the retirement center outside Bardstown, Kentucky. In St. Louis, twenty five sisters held an eclipse picnic, used KAS glasses, and signed a thank you card. The Kentucky group shared KAS glasses with retirees, infirmary residents, and employees, and sent a photo with 48 thank you signatures.

Z Z Z

Kevin Jung

Glendo, Wyoming

On August 21, 2017, a Total Solar Eclipse crossed the continental United States. This was the first time since 1918 that a total eclipse crossed the country, and the first time since 1776 that it was exclusively over one country. Millions of people from all over the United States - and the world - traveled to a 70-mile-wide swath from Oregon to South Carolina to witness one of nature's greatest spectacles.

Months of planning, and many equipment checks, went into this adventure, and finally it was August 19th: departure day. We left around 8:00 am, arriving at our hotel in Lincoln, Nebraska about 12 hours later. The next day we made a trial run to the airfield to check out the site, which looked nearly perfect. It was going to be a great place to view this historical event, at what turned out to be an historical venue. Turns out the WWII bomber squadrons at this airfield were picked by Col. Paul Tibbetts to be part of the group that would eventually drop the atomic bombs that helped end World War II.

Back at the hotel that night, our group gathered with Ellen Bacca, one of the meteorologists from WOOD-TV, to get a

Ellen Bacca, a meteorologist from WOOD-TV 8 (center), gave a final weather briefing to members of the Grand Rapids Amateur Astronomical Association.

"final weather briefing." The airfield location was looking iffy, so the group split - with some people leaving right away for the west in hopes of guaranteed clear skies. We decided to get a few hours sleep, and then leave in the middle the night to join the westward-bound.

We got up around 3.30 am, and headed west on I-80, hoping to get in the clear skies before the eclipse started. The rest areas were full of parked cars full of sleeping people, and just before dawn a dense fog slowed us down dramatically. Sporadic communications with those who left the night before told us that most were headed for Glendo, Wyoming, so we headed there as well. However, due to the fog and ever -increasing traffic, we arrived on the highway outside of Glendo State Park a short time after First Contact had happened - but could not get in because of the traffic. Instead we drove about a half mile past and pulled over onto the side of the road just past the entrance to the park, got out and started getting our equipment ready.

The original plan was to get the observing site about three hours before the eclipse started, so we would have the time to polar align the mount, get it perfectly balanced, and be ready even before the eclipse started. Now, I had to set up and align the mount in a hurry, because the Sun is already over a quarter covered by the Moon.

Using the compass in my phone, I did a quick alignment to the north and set the mount down, levelled it and mounted my gear and the counterweights. I get the Sun in the center viewfinder - pausing for a bare second to witness a "bite" taken out of our planet's star, and then return my attention to finishing focusing and set-up. I took a couple of quick images to check exposure time, focus, and everything is ready. This gives me time to set up my other camera to get some wide-field photos during totality. Behind me, my brother has set up his DSLR on one tripod, while another holds his iPhone to shoot 4K video of the event. The whirring sounds of propellers tell me he's launched his drone which will hover overhead and catch the changing of the light and the crowd.

Now I think we're ready. Bring on Totality!

Totality nears, as the Moon covers up more and more of the Sun. There's a definite difference in the quality of the light

Heavy traffic blocked Kevin's entry into Glendo State Park, so he and his brother found a suitable site on the side of the road.

Kevin captured this beautiful wide-angle view of totality with a Canon 40D. It's 1/6-second exposure with a 11-16mm zoom lens set at 11mm. A small dark spot in sunlit area near the horizon is a hot air balloon, two of which floated by during the eclipse.

as we look around. It becomes eerie, and very contrasty, and shadows become very crisp like you would see at twilight. An app on the iPad counts off the seconds until each event - shadow bands, preparation for filter removal, and then the countdown tells us how long until shadow bands arrive, and then tells us to be prepared to take our filters off the lenses.

As it gets darker, we can see Venus in the sky to the west and low on the horizon, a pair of hot air balloons - their burners bright stars of their own against the deepening twilight. Before we know it, the iPad app tells us to prepare for filter removal. The friendly countdown-voice was almost eclipsed itself by the sound of the thousands of fellow travelers below us in the park cheering the emergence of the Diamond Ring, and finally - what all this planning, travel and work has prepared us for - **totality**.

The soft glow of the corona around this dark center is mesmerizing. I can hear my brother's camera clicking away as I look in the viewfinder and see nothing! The Sun is gone! Oh my God, it's not tracking! Then I look up and realize that

The Diamond Ring Effect as captured by Kevin Jung. It was taken with a Canon 7D and 70-200mm lens with a 2× teleconverter, giving a 400mm focal length. (It has been cropped from the original.) Tracking was provided by an iOptron SkyGuider Pro.

I didn't take the filter off the front of the lens - I missed Baily's Beads and the Diamond Ring! Quickly I remove the filter and now the viewfinder shows the Sun, right in the center, with the corona shining a glorious halo around the Moon. I immediately start taking images, changing settings to get the results I want. As we get closer to the midpoint of totality, I get ready to fire my other camera and my phone. My brother yells out that the star Regulus is visible in the darkness just to the east of the Sun. I let my gaze wander around the entire area during this brief moment while I'm still taking photos - seeing the twilight glow all around us as we are underneath the shadow of the Moon. In the valley of the park I can see thousands of little points of light, as people are using flashlights to look at their cameras to adjust settings or take pictures, and you can just barely make out people staring up in the air at the wonderful view above them. And it's not silent, oh no. There has been cheering going on for quite a while, and at the moment of totality - screams of joy!

Now totality is halfway through. I press the remote shutter for my other camera a couple times to get my wide-field image, then drop that and grab my phone and do a panorama of totality. I move my phone across the sky and put it back in my pocket because I have to keep looking and shooting. The app is telling us the third contact is approaching. I don't want to miss this opportunity, so I look down into the viewfinder of the camera to make sure that I press the shutter button at the right time to get the pictures of Baily's Beads and the Diamond Ring that I missed at the beginning of totality. The app calls out the warning for the Diamond Ring and to put glasses and filters is back on. I press the shutter button while looking up to see that beautiful diamond in the sky as the first part of the Sun crashes through a valley on the Moon, beginning to illuminate the ground again. When I gets too bright for me to safely look, I put the filter back on and resume taking pictures of the now partial phases. Totality is over. At that moment there are yells and screams and cheers of joy from the surrounding valley and the hills behind us - and from us as well. After all this time and labor - we've witnessed one of the rarest astronomical events of our lives… us and thousands of like-minded strangers across valley below and across the country.

A few minutes after totality was over, my brother lands his drone and starts packing up his equipment. I still wanted to get a few images of the partial phases, so I kept shooting but I packed up my other camera to get ready to leave. Looking across the valley into the park we could see people tearing down and walking to their cars - pretty soon the traffic jams that we were all warned about we're going to happen. After about another half an hour, I was done shooting, so I quickly packed up and we headed out. We could see traffic was already lined up for a couple miles heading back the way we came, so we had the idea to go further north into Wyoming and then turn east to hopefully go around most of the traffic. This worked for a while and then we got stuck in traffic for about two hours. At times we did not even move, so we grabbed our laptops and started downloading the images from our cameras. That's when I found my second mistake I made: I forgot to press the shutter button when taking the panorama with my phone.

The traffic finally moved and we were headed eastward to Lincoln. Around Scottsbluff, Nebraska we saw the best sign the entire trip. As we stopped to take some photos, a van with Colorado license plates was pulling out as we are pulling in and on the back window was written "Totality or Bust!" and on the side window was written "because 97% just won't do!" We tried to flag them down so we could take a picture but we could not get their attention.

(Important side note: You know we had to listen to ***"Eclipse"*** from ***"Dark Side of the Moon"*** at least once. I mean, you just *have* to, right?)

Eleven hours after we'd left Glendo, we arrived back at our hotel. We get to our room, but before bed we downloaded some video and images to post to social media. Then it was time for a few hours of sleep before getting back on the road by 8.00 am. The return home was uneventful, and about 12 hours later, we pulled in my driveway.

A lovely sunset on a historic day. Taken by Kevin on August 21st somewhere in Nebraska while en route to their hotel.

The total numbers were 2,559 miles travelled over 4 days with over 1,000 miles racked up on Eclipse Day alone! Our eclipse adventure was officially over.

This was my first total solar eclipse that I had witnessed, and I don't think I'm ever going to stop talking about it. I'm already making plans for the next one that crosses the country in April 2024. I hope my cousins in Texas will be ready for us, when again, "everything under the Sun is in tune, but the Sun is Eclipsed by the Moon."

(For the unedited version of my Eclipse Adventure, head over to http://www.astronomyguru.com/gae.html)

Z Z Z

Rich Mather
Hazard, Nebraska

In December, when my family and I decided to see the eclipse, I looked on AirBNB for housing. I found a cabin located near Burwell, Nebraska, a bit northwest of Grand Island, with five bedrooms each with two twin beds, a kitchen, dining room, a large living room, and washing machine and dryer and internet access for a very reasonable price. It was available for that weekend and Monday night, so we booked it. We had our daughter, Kristie, and her two children Gavin and Muriel, from Chapel Hill, NC.; our son, Phil and his wife Natalia and their son Rafa, from Phoenix, AZ; my brother Dave with his son Max, from Lansing; and my second brother Tim and his partner Linda, from Oklahoma City; and my wife Donna and me. Kristie and her children had decided to spend the week before the eclipse camping in South Dakota with a high school friend and his family, from Washington, DC area, and they came along to see the eclipse also. When we arrived at the cabin, it turned out to be the staff cabin for a church camp. They set up their tent outside, and we had quite a group, 11 adults and five kids, to view the eclipse.

My plan was to choose potential sites before we got there. This was aided greatly by the wonderful website

A common theme in KAS Eclipse Reports has been family reunions. The Mather's also took advantage of the eclipse to meet-up with their extended family.

The Mather's generous host checks to make sure everything is okay leading up to the *Great American Eclipse*.

Eclipsewise.com set up by Fred Espenak. (This is a fabulous resource for many eclipses in the future.) I had several spots picked out to check on Saturday and Sunday.

I found a field that appeared unplanted, at the top of a west facing ridge. I went to the nearest farmhouse to inquire about the possibilities. I parked behind his house and walked toward their fenced in and nicely shaded backyard, where there were four people enjoying the nice day. I introduced myself as I approached the gate, and the farmer responded "Well, come in and have a seat". So, I did, and explained what I was looking for. It turned out that the four people were the farmer, his wife, his nephew and his nephew's son, who were also there to see the eclipse. They invited us to view from the site they had picked out, which was at the top of the next ridge west of the one I had located, and the view was even better than the spot I had found. We talked for a while. It turned out (as I had suspected) that his nephew was quite knowledgeable about the eclipse. Our viewing site was near the town of Hazard, NE.

I went back to the cabin and enjoyed the rest of the time with family. During this time, the weather prediction for eclipse day was turning from clear to partly cloudy to mostly cloudy. On Saturday afternoon we had mammatus clouds, not a sign of good weather, and there was quite a storm Saturday night. On Sunday, the weather for Monday was difficult to predict. When we got up on Monday morning, it was completely cloudy and foggy. We checked the forecast for our selected location and it looked bad. So we looked around for a spot with better weather. Alliance, NE seemed possible, but it was nearly 200 miles west, possible to reach before the eclipse, but not leaving much time for setup. Fortunately, we had to go south to get to a good road west, and before we got to that decision point, the clouds seemed to be breaking up. So, we pulled over and hemmed and hawed for a while (as Mathers are prone to do) and decided to go to our original location. The clouds continued to break up, and when we got there, the sky was nearly completely clear. So, we set up on an unmaintained county road (complete with a sign stating that it was unmaintained) along the west side of the hayfield that had been pointed out to us. We had a small

stand of trees nearby, in case some birds would decide to spend the short night there.

We had plenty of eclipse glasses, cameras, and 16 pairs of eager eyes. This was Donna's and my third total eclipse, but the first for everyone else. We got everything ready, and eventually a bite was taken out of the Sun. The eclipse had begun. We saw the many images of the partial eclipse from the natural pinhole cameras formed by the leaves of the nearby trees. Totality turned out to be much brighter than either of the previous two we had seen, and the onrushing shadow was so subtle that I didn't notice it.

Some of us saw the shadow bands. Venus was the only star-like object I could see. No confused birds came to the trees near us. Totality ended far too soon. We started packing things up shortly after totality ended, and stopped by the farmer's house to give him the fifth of single malt scotch we had picked up for him. (He was delighted with it.) We went back to our cabin and did family things. The next day we all headed home. Phil and his family had flown to Omaha and rented a car there. Donna and I went back with him, and had enough time to see the zoo there. Omaha has a magnificent zoo, which I highly recommend. Then, two days back to Richland with wonderful memories. This had been a highly satisfying family reunion thanks to the eclipse.

Rich Mather's grandchildren, Gavin and Muriel Trump, enjoy their first eclipse on a farm in Hazard, Nebraska.

Mark & Ninah Miller (right) reunited with their 2001 African "eclipse buddies" - including Bill Nigg (center) - in the days leading up to the *Great American Eclipse*.

Z Z Z

Mark Miller

Van Tassell, Wyoming

Unlike many of us, I procrastinated until two weeks out to make plans for the eclipse. I eventually picked Fort Robinson, a state park in northwest Nebraska, and former home of the "Buffalo Soldiers" during the 1880s. On our way, we stopped off in Grand Island to visit Bill Nigg and family, and Mike and Judy, our eclipse buddies from the 2001 southern Africa eclipse.

I thought we might end up camping on the open prairie in overflow, but actually we were not crowded at all, and had a nice campsite by the river. Over the weekend, we visited Agate Fossil Beds, Chimney Rock, and Carhenge.

Eclipse morning had some worrying cloud banks just to our north, so we decided to make a quick dash to the west just over the Wyoming border. Turns out we could have stayed in our area just as well, but we would have missed the scattering of folks spread out along a state highway I got to show sunspots to during the partial phase.

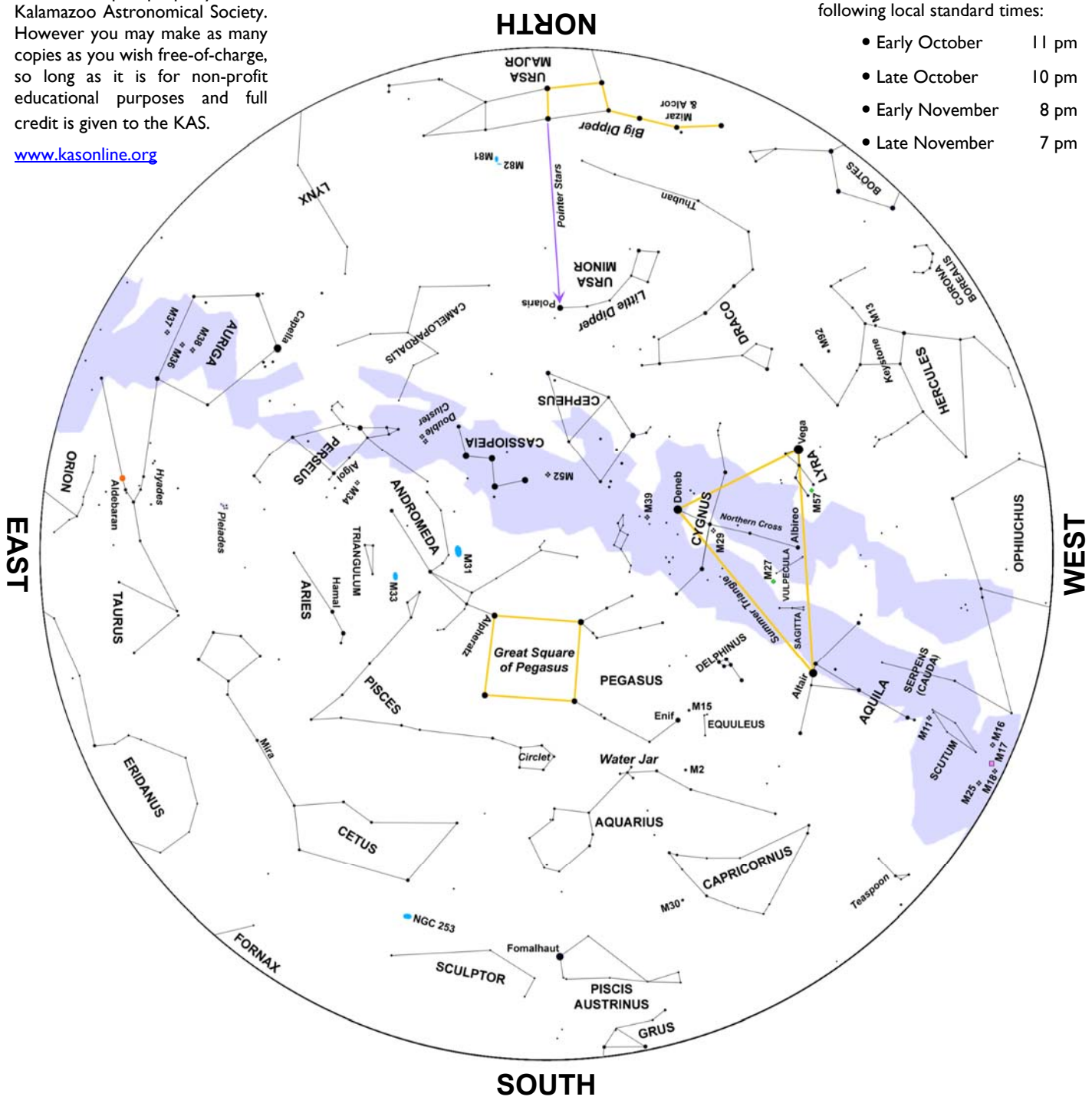
My main activity during totality was just looking at the prominences and corona through the telescope and naked eye. I was about to look through the scope again when I heard Ninah saying, "Would you like to look?" to a complete stranger. So, I stared at the back of his head for about 30 seconds of totality. My wife is a very generous person!

I did not have the best vantage point for videoing the approach of totality across the prairie, or its departure. That goes on my list for the next eclipse. What I do have strong memories of is how the shape of prominences and corona markedly differs in the four eclipses I've seen so far. As always, there was the feeling of numinous awe at the approach of totality. We live in a very special place in the universe!

November Night Sky.....

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

- Early October 11 pm
- Late October 10 pm
- Early November 8 pm
- Late November 7 pm



Aldebaran, the orange-red eye of Taurus the Bull, will be occulted by the Moon on November 5th. The cosmic cover-up begins at about 8:03 pm EST. The star will dramatically reappear at 8:56 pm. The Moon will be in a waxing gibbous phase, so you'll need binoculars or a telescope to observe the occultation.

Jupiter will be 2° below brilliant Venus on the morning of November 11th. You'll need an unobstructed view of the east-southeast horizon about 45 minutes before sunrise. Binoculars will help

A very slim waning crescent Moon, one day from new, forms a loose trio with Jupiter and Venus just before dawn on November 16th. You'll again need to point your binoculars low on the east-southeastern horizon.

Find a waxing crescent Moon 2° to the upper right of Saturn on the evening of November 20th. Use binoculars to hunt for Mercury about 7.5° below the Moon about 30 minutes after sunset.

KAS BOARD

PRESIDENT
Richard S. Bell

VICE PRESIDENT
Jack Price

TREASURER
Rich Mather

SECRETARY/ALCOR
Roger Williams

PUBLICITY MANAGER
VACANT

MEMBERS-AT-LARGE
Joe Comiskey
Mike Cook
Scott Macfarlane
Don Stilwell

E-MAIL a BOARD MEMBER

THE MILLER PLANISPHERE

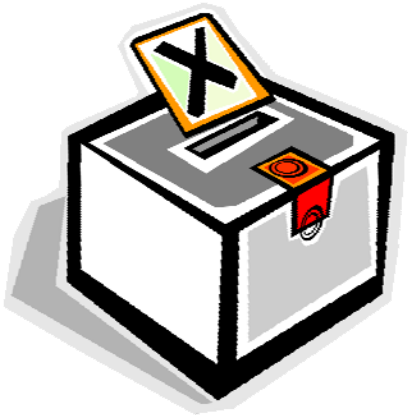
The Miller Planisphere is made with heavy duty plastic and includes a durable plastic case. All planispheres sold by the KAS are 10.5" in diameter and set at 40° latitude. Just dial the date and time and you'll see what's in the sky for that moment. Available for purchase at most meetings and observing sessions. Also available online at:

skyshop.kasonline.org

Only $13.00

The KAS Needs You!

Opening nominations for 2018 KAS Officers and At-Large Board Members will take place at the November General Meeting. Please send us your nominations if you are unable to attend the meeting. Ask not what the KAS can do for you, but what you can do for the KAS!



Follow the KAS on twitter

Read about the latest news and activities of the Kalamazoo Astronomical Society. Stay informed about upcoming events in the night sky.

All this and more in 140 characters or less!

– http://twitter.com/kzooastro/ –

General Meeting Preview

THE FARTHEST
VOYAGER IN SPACE

Launched in 1977, NASA's epic Voyager mission revolutionized our understanding of Jupiter, Saturn, Uranus, Neptune and their spectacular moons and rings. In 2012, *Voyager 1* pierced the bubble of our solar system and ushered humanity into the interstellar age. *Voyager 2* is expected to join it in interstellar space within the next few years. Both *Voyager 1* and *Voyager 2* continue to function, and send daily updates back to Earth from almost 13 billion miles and almost 11 billion miles away, respectively. THE FARTHEST features more than 20 original and current Voyager team members, providing never-before-seen insights into one of the greatest feats of exploration our species has ever undertaken.

Friday, November 3 @ 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