Highlights of the June Sky. . .

- - - 1st - - -

DAWN: A waning crescent Moon, Mars, and Saturn form a 35° long line above the east-southeastern horizon.

- - - 2nd - - -

AM: The waning crescent Moon is about 7° to the upper right of Mars when they rise in the east.

- - - 6th - - -

New Moon @ 8:38 am EDT

- - - 8th - - -

DUSK: A waxing crescent Moon forms an isosceles triangle with Castor and Pollux in Gemini.

- - - 11th - - -

DUSK: The Moon lies 3½° to the upper right of Regulus in Leo.

- - - 14th - - -

First Quarter Moon @ 1:18 am EDT

- - - 16th - - -

PM: A waxing gibbous Moon is 3½° to the left of Spica in Virgo.

- - - 19th - - -

PM: The nearly Full Moon is 3½° to the right of Antares in Scorpius.

- - - 20th - - -

SOLSTICE: Summer starts in the Northern Hemisphere at 4:51 pm EDT.

- - - 21st - - -

Full Moon @ 9:08 pm EDT

- - - 27th - - -

AM: A waning gibbous Moon and Saturn are separated by about 3½° in Aquarius.

- - - 28th - - -

Last Quarter Moon @ 5:53 pm EDT

Prime Focus

A Publication of the Kalamazoo Astronomical Society

★ ★ ★ June 2024 ★ ★ ★

This Month's KAS Events

General Meeting: Friday, June 7 @ 7:00 pm

WMU's Rood Hall (Room 1110) • See Page 24 for Details

Observing Session: Saturday, June 8 @ 9:30 pm

Kalamazoo Nature Center • Visit Observing Page for Details

Observing Session: Saturday, June 29 @ 9:30 pm

Kalamazoo Nature Center • Visit Observing Page for Details

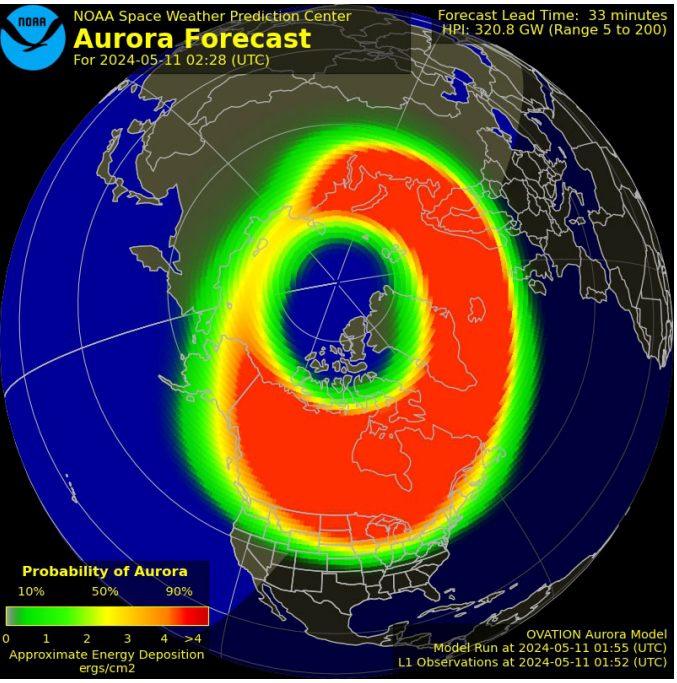
Inside the Newsletter. . .

Observations by Richard S. Bell

May brought us two very different types of storms, just days apart. A major tornado outbreak occurred across the Central and Southern United States from May 6th to 10th. Overall, 167 tornadoes have been confirmed. One of those tornadoes cut a path of destruction through Portage on May 7th. Here's a survey summary from the National Weather Service (NWS):

The tornado touched down near the intersection of South 10th Street and West R Avenue and traveled east/northeast for around 11 miles until it lifted north of East N Avenue just west of 31st Street. Along the path, many homes had roof and/or siding damage. Two mobile home parks were impacted with several homes destroyed in each park. A number of business[es] *has significant damage along the path. Multiple apartment complexes were also impacted with apartments on Timbercreek Court seeing the most significant damage. Hundreds of trees were snapped and uprooted along the path. A large section of the roof of an industrial warehouse collapsed near the Kalamazoo/Battle Creek International Airport.*

I assume the "industrial warehouse" the NWS is referring to is the relatively new FedEx distribution center on Centre Avenue. The NWS rated the Portage tornado as a high-end EF2, with peak winds of 135 mph and a maximum width of 300 yards. Fortunately, there were only three fatalities, and none were in Portage. Compare this to the five deaths caused by the F3 tornado that ravaged downtown Kalamazoo on May 13, 1980.



So far as I know, no KAS members suffered any injuries or damage on May 7th. If you did, you can bring us up-to-date during the next meeting on June 7th. Let's just hope it wasn't too severe.

Then, on May 10th (the 30th anniversary of the annular eclipse visible from southern Michigan), an extreme (G5) geomagnetic storm struck Earth. It was the strongest solar storm in nearly 21 years. The massive sunspot group 3664 was the culprit. Indeed, this sunspot was the largest in over 20 years and rivaled the group that triggered the Carrington Event in September 1859. It spat out six coronal mass ejections (CMEs) over a period of days. Some of the later CMEs caught up to the earlier ones, producing even more powerful "cannibal CMEs." They triggered an auroral outburst that was visible as far south as 18° latitude in the Northern Hemisphere. Researchers are saying that the low latitude of these sightings would seem to place this storm among the greatest aurora displays of the past 500 years.

It was pretty cloudy in west Michigan on the night of May 10th, but a brief "sucker hole" allowed us to see the aurora for an hour or so. From my house, the aurora was bright in the north and visible overhead as an auroral corona. By the time I arrived at Richland Township Park to capture the image on page 21, the auroral corona had vanished. Amanda Melwiki, daughter of KAS member Mike Melwiki, did manage to get a great shot of it overhead from Mattawan. I'm sure we'll talk a bit about the aurora outburst at the next meeting, but we still have a lot of eclipse reports to get through! I'm looking forward to it.

May Meeting Minutes

President Richard Bell called the Kalamazoo Astronomical Society's general meeting to order on Friday, May 3rd, at 7:07 pm EDT. About 40 members and guests were in attendance at the Kalamazoo Area Math & Science Center, while approximately 30 joined us virtually from home on Zoom.

At the top of his President's Report, Richard welcomed everyone back from our seven-week eclipse hiatus. Taking a quick poll, most members gave a thumbs up to witnessing the *Great North American Eclipse* on April 8th. A handful of others gave a thumb in the middle. It was surprising that no one voted negatively.

Richard said he's looking forward to a lighter KAS schedule going forward and hopes to do some observing and imaging this summer. To that end, he invited everyone to join him at Cherry Springs State Park near Coudersport, Pennsylvania, during the Fourth of July holiday week (if it's clear). Cherry Springs is a Bortle 2 site that appeals to amateur astronomers. They have an Overnight Astronomy Observation Field that allows for extended camping, as well as electricity and internet access.

Pretty Lake Camp, near Mattawan, is looking for someone to inspect their collection of telescopes and possibly train on their use. The teacher of a middle school student also reached out to us, seeking assistance with telescope repair. This summer, the Air Zoo is hosting a new Space Camp for middle schoolers. They are looking for someone to give a presentation on the Event Horizon telescope and black holes, the James Webb Space Telescope, or galaxies and supernovae. The camp runs from Monday, July 8th, to Friday, July 12th, from 9am to 12pm. Contact us if you'd like to volunteer for any of these outreach efforts.

Our feature presentation was Part 1 of the KAS membership's *Great North American Eclipse Stories*. Mike Dupuis (Muncie, Indiana), Joe Comiskey (Paoli, Indiana), Pete Mumbower (Grand Prairie, Texas), and Mike Patton (Uvalde, Texas) shared their stories from inside the Moon's shadow during the first half of the meeting.

Mike Sinclair provided refreshments during the break. We need a volunteer to provide snacks during the June meeting.

The following members presented their eclipse reports during the meeting's second half: Duane & Katie Weller (Uvalde, Texas), Dave Garten (Sulphur Springs, Texas), Karen Woodworth (Waco, Texas), and Don Stilwell (Portland, Indiana). Part 2 of *Great American Eclipse Stories* will be at the June General Meeting. All of those who shared reports at the meeting typed them up for everyone to enjoy. Please enjoy them, starting on page 4.

Anna Daly was then presented with a certificate and pin for completing the Astronomical League's Constellation Hunter Northern Skies Observing Program. She also received a certificate for the A.L.'s Solar Eclipse Observing Challenge. The meeting concluded at 9:37 pm.

Board Meeting Minutes

The KAS Board met on May 19th via Zoom. Richard Bell called the meeting to order at 5:04 pm EDT. Other board members in attendance were Anna Daly, Scott Macfarlane, Don Stilwell, Philip Wareham, and Dave Woolf. Richard noted that Dave Garten was not in attendance because he's recovering from a burst appendix. We hope he makes a speedy recovery. The board approved the meeting agenda, and Don then proceeded to give the treasurer's report.

The total account balance for February was $45,102.59, for March it was $44,799.62, and for April it was $45,005.32. The Advia 7-Month and 14-Month CD's are both doing well, earning above 5% interest. There was $3,042.97 in the Owl Maintenance Fund and $2,035.69 in the Remote Telescope Fund. Don said it looks like it is going to cost about $1,000.00 to fix the Takahashi FSQ-106, which will bring the Remote Telescope fund down to about $1,000. For the cash flow report, February was +$1,417.84, March was -$302.97, and April was +$205.70.

We then reviewed KAS activities up until the next board meeting in September. The general meeting on June 7th will feature more eclipse reports. Richard mentioned that if there are enough people who want to give an eclipse report but are not able to do so at the June meeting, we might have a special Zoom session if there's enough interest later in the month. We reviewed all the public sessions scheduled from June to September at the Nature Center. We've reserved a spot for the 30th annual Perseid Potluck Picnic at Texas Drive Park on August 3rd. We need to reimburse KAS member Arya Jayatilaka, a Texas Township resident who made the arrangements. Don said he would take care of that right away.

Land Sea & Sky (a.k.a. Takahashi America) has completed the Takahashi FSQ-106 collimation. They reported that it was pretty severely out of alignment. Jim Kurtz has constructed the Remote Telescope's new all-sky camera. If Jim travels to Arizona next month, he may install them.

When Mike Dupuis and Richard cleaned the observatory back in April, they noticed that the southwest corner had a small amount of water damage that requires repair. Richard proposed using the observatory's Sky-Watcher 8" Flextube Dobsonian Telescope as a loaner scope for club members if it continues to go unused during public sessions.

Chuck Allen, the Vice President of the Astronomical League, will present *Perspective on Distances* at the general meeting on September 6th. He will also be bringing a display with samples of all of the chemical elements. We still need a guest speaker for the November meeting.

Our Astronomical League membership is up for renewal. The cost would be approximately $1,800. A majority of board members approved the decision to renew our league membership. Richard was the only one to vote no.

At 5:51 pm, the meeting adjourned. The next board meeting will be in person on Sunday, September 8th, at Sunnyside Church.

Members of the Kalamazoo Astronomical Society stood in nearly every state along the path of totality on April 8th with hopes of witnessing the grandest phenomenon in all of nature—a total solar eclipse. Here are their stories...

Joe & Ellen Comiskey

Paoli, Indiana

Memories of the 2017 eclipse were bittersweet at best. We had driven all the way to Nebraska, only to miss totality due to a stubbornly slow bank of thick clouds. Thus, expectations for the 2024 eclipse were not high. The cloud forecast models throughout the weekend did not ease our concerns.

Nevertheless, we traveled to Louisville, Kentucky, the weekend before the event, to visit our middle daughter, Jeannie. Viewing Monday's eclipse would be an added bonus if weather conditions cooperated. By Monday morning, the weather forecast for the path of totality had improved significantly. We set off for the small town of Paoli, Indiana, which was just shy of the three-minute totality line. Despite the 60-mile distance, it took us at least 90 minutes to get there due to some bottlenecks in traffic. Still, the trip was a pleasant one, and we arrived with time to spare before first contact.

We parked in the town square, which featured an impressive Greco-Roman-style county building. We set up our 4-inch Maksutov-Cassegrain telescope with a homemade solar filter. The scope tracked very well, despite making a rough estimate of true north. While waiting for first contact (at 1:49 pm), we took in the local flavor of the town, having lunch (and later dinner) at El Compadre. El Compadre was a Mexican restaurant located just across the street from where we had set up. They were very accommodating to their extra customers. The food was excellent too!

With several people nearby, we shared telescopic views of the decreasing sun. The crescent sun appeared shorter than in past partial eclipses because the Moon was a day away from perigee. As totality approached, one man enthusiastically kept us apprised of the time until totality, even counting down the last seconds.

When totality was minutes away, the lighting had noticeably changed. It appeared slightly dimmer, harsher, and surreal. We noticed a large flock of birds flying far overhead. The air had cooled to a more comfortable temperature. We observed a red solar prominence at the six o'clock position during totality, and we could clearly see Venus and Jupiter on either side of the eclipse. The sky looked like it was in deep twilight; streetlights were now on. Just after totality, we could see shadow bands on the street for several seconds. We stayed for the remaining partial phase of the eclipse until final contact at about 4:21 pm.

Lessons learned from this experience were as follows: First, when traveling a great distance to witness a solar eclipse, it's critical to have a secondary purpose for the trip that is equally, if not more, significant. In our case, we wanted to visit Jeannie. Second, it's understandable to feel a sense of disappointment once the eclipse ends. However, this is only due to the rarity of the event. There are many things in God's creation (whether in the sky or on Earth) that we can experience regularly that are just as spectacular. It behooves us (including the authors) to appreciate these

Ellen & Joe Comiskey safely view the partially eclipsed sun near the county building in Paoli, Indiana.

ordinary yet spectacular things as well. Third, despite the thrill of seeing totality, the authors probably do not aspire to being eclipse chasers in the future.

☼ ☼ ☼

George Drake
Wapakoneta, Ohio

My friend John Pacay and I left my home in Edwardsburg, Michigan, in mid-afternoon on Sunday, April 7th, for our eclipse adventure. We arrived at our hotel in Fort Wayne, Indiana, to have a nice Thai restaurant dinner, later watched some television, and retired about 10:30 pm.

The next morning, we arose at about 5:15 am, had breakfast at the hotel, then set out for Wapakoneta, Ohio. We arrived there about 8:30 am The traffic was light, and we noted that quite a few cars had parked at the Neil Armstrong Museum (Wapakoneta is Armstrong's birthplace). We decided to look for another area, learning later that the cost was $40.00 per car for the museum parking lot. We did find a better place at Walmart, where there were few people and the parking was free. We set up our camping chairs next to our car. We were fortunate to meet some friendly people parked nearby.

Walmart was selling some pins at their service desk for a donation: "Can't Work Today—I'm Watching the Eclipse." I purchased several and gave one to John, as well as to our "next-car neighbors" (saving one for myself). We sat comfortably, had a conversation, and snacked until first contact arrived.

First contact occurred at 1:54 pm, with only a few high cirrus clouds obscuring the view. John took pictures with his smartphone, using a Solar Snap filter, as the eclipse advanced. I reflected on the fact that we were watching that moon on which "Wapakoneta's own" had first walked, which was now taking an ever-larger bite out of the Sun.

Sky darkening, gradual at first, became eerily metallic

John Pacay, a friend of KAS member George Drake, holds a Solar Snap filter from American Paper Optics over his smartphone's camera lens.

in the moments just before Totality, when it was dark enough to spot Venus. Eclipse glasses worked better than the 6×30 Sunoculars I had purchased, at least for me. We did not see any shadow bands, but we did enjoy the "diamond ring" effect and the "360° sunset" on the horizon.

Totality occurred at 3:09 pm in Wapakoneta, as we were seeing it from the midline of the totality. It lasted about 3 minutes and 59 seconds. I used my 9×60 Oberwerk binoculars to view the corona—it was so hard to describe its beauty. There was a breath-taking filamentous translucency of rays emanating from the utter blackness of our satellite.

We decided to return home right after totality, so we missed seeing the mirror-image partial phases. We noted the sky lightening as we drove on, largely rewarding our decision to avoid traffic. After another good Thai meal in Fort Wayne, we arrived home in Edwardsburg at about 9:00 pm.

As the founder of Christian Science, Mary Baker Eddy, stated years ago, "Suns and planets teach grand lessons!"

☼ ☼ ☼

Mike Dupuis
Muncie, Indiana

My planning for the 2024 total solar eclipse started after the KAS September meeting. During that meeting, I saw that the path of totality would pass over Murfreesboro, Arkansas, and that the historical clear sky forecast was almost as good as south Texas and was 11 hours closer to Kalamazoo. Since my time in St. Louis, when I discovered the existence of the world's only publicly accessible diamond mine and the fact that visitors could keep any diamonds they found, I've wanted to visit Murfreesboro. I found a nice hotel at a reasonable price and set the plans aside. I found a nice hotel at a reasonable price and set the plans aside.

Fast forward to about 6 weeks before the eclipse, and my calendar had filled up with some appointments that I couldn't afford to miss, so I canceled the reservations in southwest Arkansas and pinned my hopes on Muncie, Indiana, instead. My rationale for Muncie was that it was only 3 hours away; it was outside of the Indianapolis bubble and was west of the I-94 and US-23 corridors with all the Metro Detroit travelers. It also had roads in and out of the city, so if I needed to dodge some clouds, there were options. Most importantly, it was close to the eclipse's centerline, and I was expecting about 3 minutes, 40 seconds of totality.

I didn't expect that many visitors, but I was surprised to see that Muncie was expecting over 100,000 people on Eclipse Day. As the day approached, the cloud forecast was as good for Muncie as it was for any place in the region, so I ventured forth. The drive was surprisingly easy; as we approached Indianapolis, traffic picked up, so we detoured onto state highways and had an easy drive into the downtown area with many free parking spaces still available.

After walking around and getting some lunch, there was no sign of the other 99,950 people, so we decided to go

Before viewing the eclipse, Mike Dupuis visited the Academy of Model Aeronautics in Muncie, Indiana. One of the many displays was a replica of "Big Guff," the first radio-controlled airplane built by twin brothers Bill & Walter Good, who were from Kalamazoo.

look at the campus of the Academy of Model Aeronautics (AMA) headquarters, about 10 minutes outside of the downtown area. There were about 200 people at the visitor's center, with lots of open space for flying (and viewing the eclipse), and the museum was open and free to enter. We saw more airplanes than I have ever seen in one place, as well as a nice display of Walt and Bill Good from Kalamazoo. In 1937, at the Kalamazoo airport, they made history by flying the first model airplane by radio control! Their flight was so significant to the field of aviation that their original airplane, Big Guff, and radio are in the Smithsonian Museum in Washington, D.C.

At last, the time had come to prepare for and observe the eclipse. I remembered the advice that many of our veteran eclipse chasers gave during their presentations to the KAS: just look and do not distract yourself by trying to take pictures. My equipment was modest—an Orion Short Tube 80 with a full-aperture solar filter and tripod, plus a few pairs of eclipse glasses. That's it.

The sky was partly cloudy with high, thin clouds, and temperatures were in the low 70's. The thin layer made it easier to see the Sun. The partial phases were very ordinary and stunning at the same time. I had seen a few annular eclipses, a few lunar eclipses, and many pictures of past solar eclipses, but this was the first total eclipse for me. We shared our views with about 20 other people gathered in the field around us, and as the eclipse progressed, the light began to take on some very interesting hues and tones. As totality neared, the breeze picked up a bit, the temperature started to fall, and the birds seemed to get very confused.

During totality, I took off the solar filter but looked with my eyes first. We saw the last of the diamond ring effect, and then there was the thing we were all there for: the solar corona and the feeling of being in the shadow. There were lots of "oohs," "ahhs," and "Oh my gosh." The landscape took on an eerie kind of greenish grayish glow, very much unlike the "golden hour" near sunset on nice evenings. I was able to take one cell phone shot of the Sun and look through the telescope to see two very bright, reddish pink prominences. Venus and Jupiter were plainly visible to the naked eye.

One of the biggest things that I realized (and remembered) is that the Sun only takes up about 0.5° of the sky, but it's so intensely bright that we think it's much bigger. That true-size perspective only comes during a total eclipse, when the Moon covers the Sun.

The 3 minutes and 40 seconds passed by more quickly than I could have anticipated, culminating in another breathtaking view of the diamond ring. Then, we had to turn away, replace our glasses, and replace the filter on the telescope. We watched the partial phase after totality for another half hour or so, then decided to pack up and get on the road.

Traffic was heavier on the way back, so we detoured again onto the state and county roads, zigzagging our way back to the north and west. We stopped in Warsaw, Indiana, for a nice dinner of Mexican food and were back in Kalamazoo by 9 pm.

I'm glad I took the time to travel and view the eclipse, and I'm also glad that I concentrated on the visual aspects of the eclipse rather than trying to capture it in pictures. Muncie was a good choice, providing more than enough to do and see in the time we were waiting for the eclipse to begin. I looked but couldn't find anything about how many people actually visited downtown Muncie for the eclipse. The AMA estimated that they had 1,000 visitors scattered around the 2,500-acre campus.

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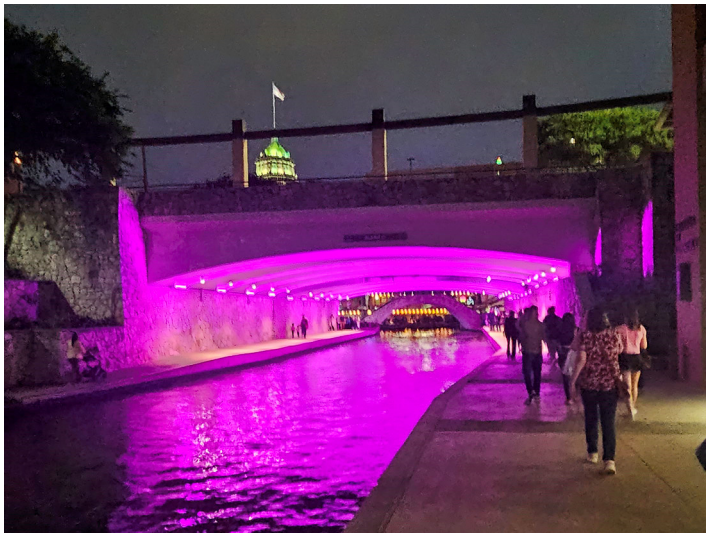
Dave & Bonnie Garten

Sulphur Springs, Texas

My eclipse adventure started with my wife (Bonnie) and me flying into San Antonio the Friday before the eclipse. We checked into our hotel room and tuned in to the local



Dave & Bonnie Garten enjoyed San Antonio's famous River Walk park before heading to Sulphur Springs to view the eclipse.

weather station. Our plan was to hook up with everybody at Uvalde, but it wasn't looking good. We hoped that things would improve over the next three days. Therefore, we ventured out and explored the surrounding area. San Antonio has a place called the River Walk. It was located right next to our hotel and is like a Mediterranean city under the city. So, off we went to check it out. I highly recommend it. They have bars, restaurants, and stores everywhere. There are beautiful little gardens along the sidewalks. Going over the bridges can easily lead you astray.

After two days of listening to the weatherman, Uvalde was basically a no-go. Our only hope was to find high clouds and head north. After reviewing the satellite imagery and my Astrospheric app, I discovered a city named Sulphur Springs, and to my surprise, it was right on the centerline. There was only one minor problem: it was 350 miles north. So Monday morning, Bonnie and I headed north. It was not too bad of a drive; they had signs all along the way saying no stopping on the highway to view the eclipse.

Once we finally got to Sulphur Springs, the only thing I could think of was to find a park. It was getting close to crunch time. It did not take too long to find one; they were only charging $50. Imagine that! At least it came with solar eclipse glasses. It was a very nice park, and there was no big crowd; there was plenty of room for everyone. I swiftly organized and prepared myself. My plan was to do a video of the eclipse this time, and I'm glad I did. All you need to do is start the video three minutes before the eclipse and remove the filter. I had no problem seeing the eclipse with the high clouds; they disappeared as they approached the Sun.

This was my third total eclipse and the first time I visually saw the diamond ring. For the other two, I was too busy with my telescope.

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Pete Mumbower

Grande Prairie, Texas

For the 2024 total solar eclipse, my family and I went to Texas. Despite the growing confidence in the forecast that clouds were going to be a major factor, many people I knew canceled their plans for Texas and instead went to Indiana, Ohio, and even Maine. My original plan was to go to Uvalde, Texas, with other KAS members. After pouring over weather models multiple times a day the week before the eclipse, I decided Uvalde wasn't going to work. With a few days to go, I felt the models gave the best chances for clear or partly cloudy skies around Dallas and to the northeast. So I booked a hotel in Grande Prairie, Texas, which sits between Dallas and Fort Worth. The reason for sticking with Texas in general was the planned family vacation for the rest of the week in Galveston, Texas.

With all these plans transitioning, I also decided to bring a small refractor and my DSLR camera to try and capture some pictures. In the best-case scenario, I would have pictures of the entire eclipse, before and after partial phases, and totality. In the worst-case scenario, I would return home with pictures of clouds. The main goal was still to have a visual experience with the family.

We flew into Houston and spent the night there on Saturday. The next day, we had a relaxing drive up to our hotel in Grand Prairie. Naturally, the previous day was bright and sunny. The forecast for the eclipse sounded promising: clouds early in the morning, slowly becoming partly cloudy, with a chance of full sun by eclipse time.

I spent that afternoon scoping out a spot to view and photograph the eclipse. The hotel was hosting a public eclipse event, and it seemed likely to be crowded. I observed that the hotel had a parking garage. As I made my way to the top deck, I noticed that it provided a stunning 360° view of the horizon, and it was devoid of any parked vehicles. Even better, I found power outlets that were live. So I decided to go up there the next morning, since everyone would likely be at the event elsewhere on the hotel grounds.

While checking out the viewing location, I realized the bright sun would make my laptop screen next to impossible to read. So, my daughter went down to the hotel front desk and asked if they had any empty boxes. She came back with a paper ream box that I constructed into a sunshade, which actually worked out great.

The morning of the eclipse began with cloudy conditions, a disappointing but anticipated occurrence. Accord-

Pete Mumbower and his wife, Bren, view the eclipse with their authentic KAS Eclipse Shades from the top of their hotel's parking garage.

Pete assembled this composite of the 2024 *Great North American Eclipse* from images taken with his Sharpstar 61EDPH11 refractor and Nikon D5100 DSLR camera on a heavy-duty Bogen tripod and geared tripod head. Pete took each image about 20 minutes apart.

ing to local forecasts and models, the clouds would gradually start to disappear throughout the mid-late morning. Worst case, it would be partly cloudy during totality; best case, mostly sunny. I went up to the spot to get the scope setup on the tripod, with the camera attached and connected to the laptop. For video, I simply put my iPhone on a "Basic Amazon Tripod" and an iPhone holder. This setup worked out very well.

With 15 minutes to go from first contact, the sky was about 50% cloudy. But the gaps between clouds were more than enough to get focused and wait. It was at this point that my family showed up with eclipse glasses ready. Around this time, I took a pre-eclipse photo every 20 minutes to use in my master photo montage of the entire event. I just needed the clouds to cooperate!

To time the eclipse, I used the "Solar Eclipse Timer" app, which I learned about during the KAS March meeting. To be safe, I used that app and TheSky software to make a timing list on a Word document that I printed out, just in case technology failed. I am so glad I did, because as the crowds grew, it became harder for me to hear the audio cues from the app.

At 12:22:30 pm, within seconds of the predicted first contact, I could see the edge of the Sun flattening out a bit and then becoming a dark, curved section. The Moon is here! It took me about 5 minutes to visually notice the Moon's arrival. The cloud situation remained the same.

Over the next hour, it was a cat-and-mouse game with the clouds. I would take a photo as close to the 20-minute interval I need for the montage as possible, but usually within a couple minutes. Visually, it was progressing like many partial eclipses that I have viewed, but I knew it would not be the same.

During this time, the parking structure slowly started to fill up. There was a car here and there, and gradually, the number of available parking spots decreased. With just 20 minutes remaining, cars were arriving, only to discover that there were no parking spots available, leading them to park in the middle lane instead. At the onset of totality, a car had already parked itself down the middle, spanning all three levels of the ramp.

It was not until 30 minutes to go that we really noticed the darkening of the sky. At first, it was the southwest horizon, but as totality got closer, it took on an eerie, shadowy darkness. I never really experienced that before. Additionally, due to the darkness, the parking lot lights turned on.

With fifteen minutes remaining, I am simply amazed by the state of the clouds. The clouds were just disappearing everywhere. It could not have been better scripted. I could only see low clouds on the horizon to the northeast, east, and southeast.

As the last rays of bright sunlight began to fade, the crowd buzzed with conversation and pointed at the Sun and Moon. At this point, my kids really took an interest and were focused on the events transpiring above. At 1:38 pm, I started the iPhone video set to a fairly wide angle to record all of totality and the sounds of the people around. At this time, I also removed the solar filter from the telescope.

Totality begins! The experience of that moment will be forever in my mind. I was gazing at a black hole in the sky, emanating bright rays in every direction. I began firing off a script of exposures with the camera, which I would repeat four times during totality. It was a good mix of hands-off photography and pure visual enjoyment.

Within a minute, I was pointing out Venus and Jupiter. It was ironic that I was seeing the two brightest points of light at sunset and sunrise at the same time. We're cheering, and the oohs and aahs are everywhere. I high-fived my family members and, maybe, complete strangers standing nearby.

The air temperature had noticeably dropped by at least

Here's a close-up of totality seen in the composite above. It's a high-dynamic range (HDR) image using exposures of $^1/_{1000}$, $^1/_{640}$, $^1/_{500}$, $^1/_{250}$, $^1/_{125}$, $^1/_{64}$, and $^1/_{25}$ second. It was assembled in Adobe Photoshop.

Pete discovered that the stories about post-eclipse traffic jams are true! His 4.5-hour trip from Grande Prairie to Galveston took about 8.5 hours.

10° F, maybe more. Even now, in the scorching Texas sun, I wish I were wearing a hoodie; however, that would have been completely absurd thirty minutes ago. There was a slight breeze that had picked up. It seemed plausible that the eclipse might have been the cause.

Towards the end of our conversation, my youngest daughter mentioned a red smudge that appeared to be coming from the bottom of the Sun. I honestly do not remember her saying that, but on the iPhone video, I can hear her say it a couple times. In fact, she was observing a significant prominence that I had overlooked. I believe my gaze remained fixed on the corona, capturing its full glory.

After 3 minutes and 37 seconds, the event came to an end. A bright spark, a combination of Baily's beads and the Sun, began to overwhelm the camera, and seconds later, our eyes caught up. It seemed as though a significant amount of time passed in an instant. The solar filters were back on the scope, and the glasses went over our eyes. Everyone nearby cheered and talked about the amazing experience.

No longer than five minutes after the Sun reemerged, there was talk of how everyone was going to get out of the parking ramp. For us, it was not a thought; the eclipse was still going on and had another hour and fifteen minutes to go. Slowly, the cars in the center aisle worked their way out, and then the cars in parking spots left a little here and there.

Minutes after totality, clouds began to appear again. We were so fortunate and blessed! The second partial phase was more challenging to photograph, with the clouds becoming thicker and the gaps in between getting smaller. With patience and a quick hand, I managed to capture the remaining 20-minute-ish spacing of frames for my montage. I wasn't certain if they were all free of clouds.

At 3:02 pm, the Moon finally leaves the disk of the Sun, and the eclipse is finally over. The temperature has increased and is higher than it was from the beginning, and we are the last ones on the parking garage roof. So, we packed up the Suburban rental to begin our journey to Galveston to finish off the week at a resort on the beach.

I had heard reports of lengthy traffic jams following the 2017 eclipse and was concerned about the same situation this time around. Driving up from Houston, it took roughly 2.5 hours. I was hoping that the cloud forecasts leading up to eclipse day, as well as the news that many people had cancelled their plans for Texas and instead traveled to the Ohio Valley or Maine, would prevent this from happening.

After a quick stop at a gas station for snacks and drinks, we set out on the drive back toward Houston. For 45 minutes, all was well, and I was convinced the traffic jam nightmare was not going to happen. Then I encountered a wall of vehicles, all of which had their red brake lights on. Sigh, I was wrong, and the traffic jam monster was real. It ended up taking us 8.5 hours to arrive at our resort. We only had fifteen minutes left to get our keys to the room before the front desk closed for the night. It was offseason for them because spring break was weeks before, and the summer crowd would not arrive for months.

For the following week, we enjoyed relaxing at the pool, on the beach, playing miniature golf, and looking at the pictures and videos we took. I started to go through all my pictures, and they turned out better than I expected. I was able to produce a nice high-dynamic range image of totality and, a couple weeks later at home, a montage of the entire event. Most importantly, I got to experience it with my family and share my excitement about astronomy with them.

☼ ☼ ☼

Mike Patton

Uvalde, Texas

In early 2023, my wife Kathy and I decided to attend the April 2024 total eclipse. The path of totality was going to be through Texas, and we figured we could catch it somewhere on our way home from Arizona.

Shortly after our decision, the KAS announced that they were considering Chalk Bluff River Resort and Park near Uvalde, Texas, which was located directly on the cen-

Mike Patton relaxes at Chalk Bluff, patiently waiting for the clouds to part (or thin) out and reveal the eclipse in progress. Credit: Duane Weller

Mike snapped this image of the bluff and river at Chalk Bluff River Resort and Park in Uvalde County, Texas.

terline of totality. This facility had everything that eclipse chasers were looking for, so we booked a small cabin. When booking, the weather conditions were favorable, and this was one of the few areas in the United States predicted to be cloud-free.

We had an uneventful wait until April 2024, but the weather forecast was constantly changing, predicting cloudy conditions at Chalk Bluff in late March. Upon our return home, we packed the car and faced limited flexibility to alter our destination. We decided to go to Chalk Bluff anyway, just to see what happened.

The day before the eclipse was beautiful. The Sun was out, and the sky was clear. The day of the eclipse was different.

Early on April 8th, it was a beautiful morning with no clouds, leading us to believe we might have luck, but we were mistaken.

At mid-morning, the clouds rolled in, and it started raining. We pointed our equipment towards the eclipse, knowing it would occur almost straight up, with no way to shield it from the rain.

About a half hour from totality, I made the decision to break down my equipment and get to drying it out. I had everything dismantled and was lying on the bed, thinking it would take a while to dry. Just as I did this, I heard my wife outside yelling that she could see it. She had been watching with a large pair of mounted binoculars, seeing brief and variable images as the clouds passed by.

Immediately, I reassembled my camera, went outside, and laid down on the picnic table. I shot every picture I could, regardless of what it looked like. I just wanted to get lucky with one or two images that would say I was there. That is exactly what happened. I managed to capture the total eclipse clearly in four of my shots, even through the clouds, but I had to delete about 40 pictures. Considering what we went through with the weather, I still felt successful.

The campground's cheers are the one thing I will remember most about this eclipse. Even though it was through the clouds, everyone was happy just to get a peek. The other thing that caught their attention was the increasing darkness. The combination of totality and clouds made it feel like nine or ten at night. This was way darker than I remember in 2017.

The next day was another beautiful and typical South Texas day. We stayed the day after the eclipse, thinking it would allow for traffic to clear as our route home was almost right up the path of totality. We used that day to visit the Alamo and the River Walk in San Antonio.

The next day, we decided to leave for home and ran into weather that was worse than heavy traffic. It rained so hard that we came to a stop, along with everyone else, on the expressway and lost about three hours the first day. The frustration was the same as traffic, but this also had a safety aspect that was exhausting.

Right now, we are not planning to travel any future eclipses, and we just hope to be around for the next one in North America.

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Don Stilwell

Portland, Indiana

On March 7, 1970, I witnessed my first total eclipse from the backyard of my boyhood home in Mayodan, North Carolina. That day, I felt glee and a sense of accomplishment. I had set up my Tasco 50mm with the solar projection plates hanging on the back of the telescope, balanced on a suspect German equatorial mount (GEM) on a shaky wooden tripod, but it worked. I produced an almost in-focus black-and-white image.

At my location, totality may have lasted for a few seconds, or perhaps it was just outside the path of totality, but it was sufficient to experience darkness, coolness, and the sound of birds roosting. The best part for me was having my dad come out during what I remember as totality to take in the experience. On this occasion, I didn't have the foresight to specifically notice the first contact, Baily's beads and diamond ring effect, or their second appearance as totality ended.

It was August 21, 2017, in Sparta, Illinois, where I saw my second total eclipse, but the first with my fellow Kalamazoo Astronomical Society friends and hundreds of other spellbound observers. A group of us were there to look at the very temporary solar blot out as the Moon crossed its face. This time I was in the path of totality, which lasted about 2 minutes and 30 seconds. My totality lasted about one minute while I fiddled with my telescope, causing me to miss the first diamond ring. I also did not pay enough attention to the Sun's corona.

It was wonderful anyway, because my dozen or so traveling partners had been looking forward to observing this eclipse for months. As our one-stop location, Jack Price had found this summer camping getaway location at the World Shooting & Recreational Complex, which featured concrete sweat boxes they referred to as outdoor bathrooms and showers. We all joined in the trek for the glory of KAS bragging rights and to satisfy our curiosity. We did a few

fun crescent projections, noticed the progression of features during the march to and through totality, took pictures (if we remembered), and enjoyed the experience.

Although it was 97° Fahrenheit, we all felt relief that the sky was clear. Our group, among others, mostly succeeded with our visual experiments and thoroughly enjoyed our experience in the Moon's shadow.

For the *Great North American Eclipse* of April 8, 2024, I have provided some detail about our eclipse travelers, but Mike Sinclair has the group photos. Count on him to feature those.

Thanks to the KAS, we received a well-tuned and thoughtful education on how to plan for, prepare for, and enjoy the 2024 total solar eclipse. This time, my goal was to witness first contact, the arrival and departure of Baily's beads and diamond ring, as well as final contact.

As a key to success, I planned to check my equipment ahead of time to ensure proper functioning at the critical time. I equipped my TMB 92mm f/5.4 apo refractor with my home-made Sun Funnel, which featured a rear projection image. The TMB, paired with my Orion SVP, a reliable GEM with clock drive sitting atop a sturdy steel-legged tripod, seemed to fit my needs perfectly. The plan for the photos was to take sequential shots of the eclipse projected on the Sun Funnel projection screen with my iPhone 5SE. On April 6th, I tested this setup in my backyard in Battle Creek.

The most important key to success was the perfect location, delivering both clear skies and maximum time in totality while fitting into a day and a half-time window. Due to time constraints, Texas was too far away for me, despite the high probability of a clear sky.

From about Thanksgiving 2023 on, the original planning group consisted of Jack Price, Mike Sinclair, and me. Jack planned our starting point again. We chose Fort Wayne, Indiana, for this eclipse and made hotel reservations months in advance. Considering our 7-year age advancement from 2017, comfort was a major consideration, climate-controlled bathrooms and all. Mike wanted a separate room for himself and his wife, Karen. Jack and I planned a room for us to share. We didn't decide on our observing spot yet, but we assumed it wouldn't be in the middle of a large crowd like in August 2017. Our eclipse travelers numbered four.

As the eclipse date drew closer, our planning group added KAS member Jim Bradshaw, for whom Jack was able to book a room at the same Best Western, at a higher rate, of course. In March 2024, I planned to include my grandson Conor in our group, while Jim expressed a desire to include his brother Pete. Jack had a separate room for Jim, so he and his brother shared it. Jack graciously offered Conor and me one of the queen beds in our room while he occupied the other, providing ample accommodation for everyone. Our eclipse travelers numbered seven.

Don Stilwell and his grandson Conor Grandstaff successfully viewed the eclipse with a small group of other KAS members from Portland, Indiana. Notice that Conor's arm is in a sling after breaking his arm during a basketball game. Credit: Mike Sinclair

The week before the eclipse, I received a call from a Kiwanis Club friend from Coldwater, as well as a KAS member, Terry Tomlinson, who wondered where I planned to go for the eclipse. I explained that our group planned to start in Fort Wayne. The idea was to head out Monday morning, April 8th, toward the area of Wapakoneta, Ohio, which would place us very near the path of totality. At that time, we aimed for approximately 4 minutes of totality and a 54% chance of clear skies. He asked if he and some family members could tag along with our group in Wapakoneta. I said yes, and I thought our eclipse travelers might number a dozen or more.

As it turned out, a day or two later, Terry called back to say he had found a place near Wapakoneta and I-75. He later told me his family enjoyed the solar experience of their lives in mostly clear skies there.

The plan was that in the early afternoon of Sunday, April 7th, Jack, Mike and Karen, Jim and Pete, Conor, and I would head south on I-69 to meet about check-in time at the Best Western in Fort Wayne. Oh, wait! I forgot to tell you that my grandson, Conor, while playing basketball on a paved court, fell and broke his right arm in the late afternoon on Friday, April 5th. His mother and I went to the emergency room with him.

Finally, just before midnight, Conor emerged from the emergency room with a cast covering his right arm from fingers to upper arm, well above the wrist, and a 90° bend at the elbow. Would he stay, or would he go? He said his arm really hurt, but with a day's rest and Tylenol, I was

hopeful. Also, one of his joys is quizzing me on solar system facts, and he was getting out of school on Eclipse Day, so I knew he had a vested interest in the trip.

Sunday afternoon came, and I drove over to Conor's mom's apartment. He walked out the front door with a backpack, proclaiming that his damaged right arm was feeling better. So, off we went down I-69 to see the *Great North American Eclipse*. The hour-and-a-half drive south to Fort Wayne was pleasant, but our weather prospects did not inspire confidence in Conor and me. We finally found the Best Western, tucked behind another hotel, hidden from roadside views, and checked into our rooms together. Conor declared he was hungry, which was no surprise since he is a growing 10-year-old.

While checking in, a friend of Mike's did the same and joined our group. We gathered in the lobby later to make some decisions on where to go to observe the eclipse. However, with inconclusive and disappointing weather information for all of our proposed destinations, we decided to wait until the next morning with current weather data to pick. Then, to Conor's delight, we went out for the highly anticipated dinner. Our eclipse travelers numbered eight.

On eclipse morning, we gathered in the lobby for breakfast and a confab to decide the best observing location. We wanted to decide and leave for the eclipse by 10 am. In the meantime, Greg Sirna found us in the lobby and joined our discussion. Our eclipse travelers numbered nine. The group of KAS and friends remains small.

After breakfast, our online search for weather prospects did not encourage us to have cloud-free skies. The choice of locations became even more muddled. The day before, Ohio locations in the path of totality east of Fort Wayne offered a 54% chance of clear skies, while Indiana choices south offered a 39% chance of cloud-free skies. Now, on Monday morning, east and south were both in the 39% range.

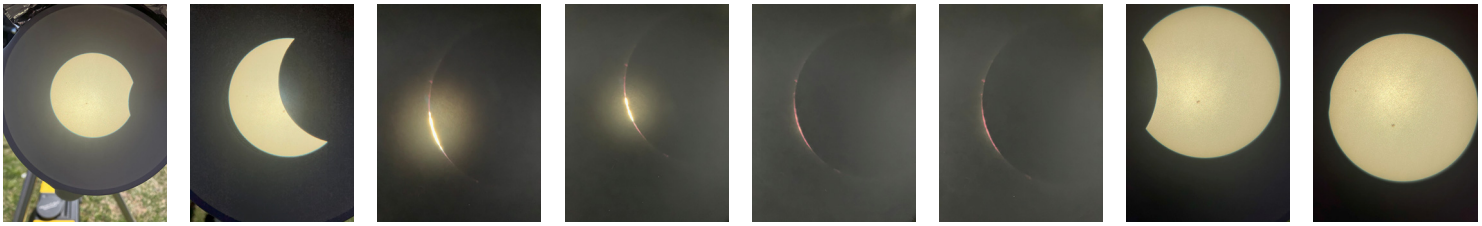
Mike was even thinking of returning to Kalamazoo, where the weather was excellent. In addition, students from the Kalamazoo Area Math & Science Center were launching research balloons. I was still advocating for locations near Wapakoneta. In deep thought mode, using printed maps and Google Earth, Jack spotted a location with an open area facing south. This was ideal for viewing an eclipse because it was near a food source and bathroom facilities. It sounded good for old men and a hungry grandson.

Nevertheless, we argued for this or that location until close to 9:30 am, when Jack said he was going to his choice at a Walmart Superstore with a south parking area. We could join him or not, but he would take his chances there in relative comfort. Mike decided to join Jack and take his chances of witnessing totality. The rest of us considered our options and finally decided to follow Jack's lead. We headed south out of Fort Wayne about 55 miles on U.S. Highway 27 to a small Indiana town east of Muncie, called Winchester, which fell very near the path of totality. If only the clouds would disappear, we would be well situated.

The fat cumulous clouds from the west continued to discourage me as I traveled south on Hwy. 27 through Berne, Indianna. I commented to Conor, "We may be wasting our time." He was more optimistic and said, "I don't know. We'll see!" Somewhere in Portland, just north of our Walmart Superstore, the clouds started getting thinner and more transparent.

By the time we rolled into the Walmart parking lot, I was humming The New Vaudeville Band's 1966 song "Winchester Cathedral." Now I commented to Conor, "We're in the right place at the right time. This is going to work!" I felt good for Jim's brother, Pete, who said seeing a total eclipse was on his bucket list. It was about 1:00 pm. I had plenty of time to set up, use the facilities, and get Conor something to eat. Our eclipse traveler numbers were about to grow.

As our separated caravan of vehicles began to congregate along an access road at the far south end of the parking lot, which featured an almost flat grassy area a few feet east of the access road, I began to set up my tripod, mount, and scope. A small pond lay approximately forty feet downhill from our setup. With an open view to the south and west, I thought we'd struck gold, as Jack had foreseen. Our 39% chance of clear skies had turned to 100%. At this point, I observed that a significant number of other eclipse travelers had also taken advantage of this valuable observational opportunity. Our nearby eclipse travelers, who once counted in the dozens, now count too many.



Don used his homemade Sun Funnel, attached to a TMB-92SS refractor, to capture this sequence of eclipse images.

Even with this larger-than-planned viewing crowd, there were still far fewer people than in 2017. Also, the weather was mild (mid-70s) with a nice light breeze. Our viewing prospects were very good. The skies were mostly clear, with some wispy high clouds and a very slight haze. So now to test my setup. You know the one where I had a 92mm refractor on an Orion mount with a clock drive to eliminate the need for constant hour-axis adjustments to keep the Sun in my field of view?

With my refractor atop a sturdy steel-legged tripod and my Sun Funnel attached, I oriented my mount north and set it to 40° latitude. I located the Sun and adjusted the slow-motion knobs to position it in the middle of the projection

Katie & Duane Weller posed for a selfie before hitting the road on their great eclipse vacation.

screen. Then I turned on the clock drive, expecting to have the Sun in the middle of the screen for 10 minutes before needing a slight adjustment. To my confusion, in about one minute, the Sun's image was going off the edge of the screen. What the...heck!

I double-checked everything, ensuring the clutch was engaged to transfer the electric motor's RPMs to the clock's gears. These gears move the telescope to counterbalance Earth's rotation, maintaining the Sun's visibility on the projection screen with minimal adjustments. Simple, right? But again, "What the…heck!" Upon closer inspection, I found that the shaft connecting the clutch to the gears moving the scope had fractured in two. So, to keep the sun's aspect in the middle of the projection screen, I had to make minute adjustments to the mount's right ascension axis. On the good side, Greg Sirna offered to make me a new gear and shaft.

It was my responsibility to maintain a photogenic solar image on the Sun Funnel projection screen for our viewing group. In order to capture my sequential eclipse shots, I took pictures of that screen. With a fully charged battery and my iPhone 5 SE on the automatic setting, I managed the task well, so as not to worry about focus or ISO. Many of our group members used the same method to capture eclipse images. The pictures captured the basic stages of the eclipse: first contact, the Moon moving across the Sun's face, Baily's beads and diamond ring, the second coming of the beads and ring, the Moon retreating across the Sun's face, and last contact.

This time around, I noticed two eclipse phenomena: the shadow rushing towards us and the all-around sunset. During totality, which lasted about 4 minutes, I took a few minutes to take note of the Sun's corona. High cloud wisps lingered, creating a haze that muted the entire corona in size. This was the only slight drawback to an otherwise perfect experience. At Winchester's outdoor viewing cathedral, we all marveled at the splendiferous passage of the lunar orb in front of the Sun's face.

Being 74 years old, I am dubious about my viewing plans for the next North American eclipses: August 23, 2044, up north in Montana and North Dakota, then August 12, 2045, the one to covet, entering the U.S. from northern California and exiting over central Florida.

However, Conor has already stated that he particularly wants to see the 2045 eclipse. And I am sure you know of some up-and-coming stargazers and shadow chasers that you are proud of and want them to personally experience one of nature's best shows.

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Duane & Katie Weller

Uvalde, Texas

Katie and I work a lot and haven't taken a real, honest-to-goodness, pack your bags, and get out of town vacation since 2018. You could say that it took an alignment of the Sun, Moon, and Earth to finally get us out of the house.

From the beginning, we were involved in KAS 2024 eclipse planning. When the group chose Chalk Bluff in Texas, we decided that, along with the eclipse, we would take our long-awaited vacation. We eagerly attended all of the club's Eclipse Series programs and started planning our

Duane captured this image of the dark sky above Chalk Bluff on Saturday before the eclipse. It is a 5-minute exposure with a Canon 7D camera (set at ISO 1600) and an 18mm f/5.6 lens.

other trip activities.

Before we left for Texas, we took our gear out on a sunny day, tested it, and checked filters and glasses from our 2017 eclipse trip for any damage or wear. My setup included a 100mm f/7 Stellarvue refractor with a Celestron AVX mount, an unmodified Canon 70D, a MacBook Pro, and a copy of Xavier Jubier's Solar Eclipse Maestro program. As a backup, I took a second Canon 70D body with a Sigma 150-600mm lens and a Kase Wolverine 95mm magnetic filter. Katie originally planned to take her Celestron C8, but due to cloudy forecasts, she decided just before we left to stick with her Canon R6, tripod, and 100-400mm lens.

Prior to our test run, I realized that glare would be an issue with my laptop, so I picked up some corrugated plastic and black tape at the craft store and fashioned a sun shield. I was using a screen protector for the glare, but the shield kept the laptop cool.

was staying just a few doors down from us with his wife and a couple of friends. It was nice to see a familiar face and have someone with an astronomy background to share totality with!

When the Sun went down that night, the sky was clear and dark. There were so many stars that it was difficult to find even the easiest constellations. I took some pictures of the stars and the bluff, then turned in.

We were very excited about our prospects for Eclipse Day. Chalk Bluff was well situated, just west of Uvalde, Texas, almost exactly on the centerline of totality. The eclipse would begin at 12:12 pm local time, with totality running from 1:29 pm to 1:33 pm, for a total of 4 minutes and 26 seconds. This was almost twice as long as our view of totality from Hopkinsville, Kentucky, in 2017. FANTASTIC!

Monday morning dawned, and we woke to thick clouds covering the sky in all directions, as if someone had tossed

A big part of eclipse chasing is seeing the world (or, in this case, the country). Some of the many places Duane & Katie visited after the eclipse included Space Center Houston, the official visitor center of NASA's Johnson Space Center in Houston, Texas. They also did a little birding at the Anahuac National Wildlife Refuge.

We put in a full day of work on Thursday, packed the car, and started our estimated 23-hour, 1,450-mile trip. On the way, we saw the Gateway Arch in St. Louis, stopped at our first Buc-ee's, saw a movie (*Pitch Black*) at the Alamo Drafthouse, and toured the Lady Bird Johnson Wildflower Center gardens in Austin. We arrived at Chalk Bluff on Sunday afternoon and checked into our cabin, "Bashful," one of a string of five cabins named after Disney's seven dwarves. We are not sure what happened to the other two dwarves, and we didn't ask!

The Chalk Bluff "Resort" was, in a word, rustic. Picture a beautiful, spacious, modern resort in your mind. Now picture the opposite—that was Chalk Bluff Resort! We had no Wi-Fi and very spotty cell service, but our cabin was more or less clean. We found out the next day that Mike Patton

one of my mom's handmade quilts over the planet. There were a few breaks here and there in the cloud cover, so I set up my gear. I found that the breaks were large and frequent enough for me to catch the Sun, and once I adjusted the timing for Central Time, I was able to track the Sun through the occasional break in the clouds!

Everything was set to go. The telescope was tracking the Sun nicely, and the program was taking timed shots. All of the shots were full of clouds, but I remained optimistic. After all, I am from Michigan; I am used to this! At about 1:10 pm, it began to rain. We set up all our equipment in the field next to the cabin. We got busy breaking everything down and stowing it in the cabin, not bothering to bag it up. About 10 minutes later, when everything was safely out of the rain, the sky began to clear.

Ok. We'll do it a different way, then!

We both grabbed our cameras and zoom lenses and took them back outside. Katie used the table as support, while I positioned myself on the unbroken picnic table bench to take pictures. By this time, it was getting visibly dark, and we noticed a flock of vultures flying low and straight from east to west, just over the tops of the trees in front of us. Vultures typically wheel in large circles high in the sky, making this unusual behavior possible.

Katie used her iPhone 15 to take panoramic shots of the cabin and surrounding area before and during totality.

Despite the clouds, totality was a thrilling experience, and we both agreed afterward that the occasional clouds added an air of mystery to some of our photos of totality.

After totality, we joined Mike and his group to celebrate a successful eclipse experience, and then Katie and I drove into Uvalde to celebrate with a delicious Tex-Mex dinner.

On Tuesday morning, we packed up our things and left to explore Texas. We traveled the two-lane highways across to Houston and stayed the night at the Hilton hotel on NASA Parkway, just across the street from Johnson Space Center. A huge storm moved through that night, and the next day dawned bright and clear. We spent most of the day visiting Space Center Houston, the public/tourism arm of Johnson Space Center, and got in for free on our Grand Rapids Public Museum membership.

That evening, we drove up to Winnie, Texas, and spent Thursday birding and exploring the Anahuac National Wildlife Refuge. We started our long trip home that same evening, taking our time and arriving early Sunday morning.

Our trip was a success, our vacation was relaxing, and we have a new appreciation for the great state of Texas!

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Molly Williams
Perrysburg, Ohio

For the 2017 eclipse, my husband Roger's sister lived in northwest Nebraska, near the path of totality, so she hosted our clan for that event. Seven years later, in 2024, it was my own sister's home in Perrysburg, Ohio, just southwest of Toledo, Ohio, that served as our observation site.

Ellen's (also a KAS member) and her husband Guillermo's front yard was an ideal spot, with easy access to electrical power, food, and accommodations. The Sun was high enough to be well above the building and trees. There were high, thin clouds, but the eclipse itself was easily visible from start to finish, even though we may have lost some detail as light clouds passed by.

Our daughter Rebecca and her husband Fritz, from Oak Park, Illinois, joined us. The family included three teenagers (Anna, Jamie, and Will) plus a Japanese foreign exchange student named Kan. They'd all taken the day off from school and work to come into totality.

Our equipment was pretty low-tech. We emphasized watching the event with minimal fuss. Jamie, a KAS student member, received Roger's 4-inch Meade Schmidt-Cassegrain telescope, which he originally bought for a Halley's Comet trip to Australia. We didn't achieve good polar alignment, so tracking wasn't accurate. However, resetting the position every once in a while was easy enough to get a good view of the partial phases.

Molly Williams' grandchildren, Anna and Jamie, viewed the partial phases of the eclipse from Perrysburg, Ohio, using Roger's 4-inch Meade Schmidt-Cassegrain telescope.

I used Canon 15×45 image stabilizer binoculars. They provided an easy way to watch the eclipse. Sunspots were clearly visible during the partial phases.

We also used an unsilvered 3-inch mirror with a 5-foot focal length to project an image onto a whiteboard.

The observing tools included a home-made cardboard pinhole box viewer, a kitchen colander, and enough eclipse shades for everyone.

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Karen Woodworth
Waco, Texas

My story begins in 2017, at Saluki Stadium at Southern Illinois University in Carbondale. My sons Daniel and Arthur, as well as myself, had just witnessed totality, and it was a fantastic experience. Because Carbondale was the "Eclipse Crossroads," I wanted to return in 2024. But I had some doubts. My biggest worry was the weather. You may remember that clouds covered the Sun for the first part of totality in Saluki Stadium, so we only saw the glorious end. When I thought about April in Illinois, I wasn't sure we'd have clear skies. So I decided to look in Texas for an event similar to what we experienced at SIU.

While on her way to Texas for the 2024 eclipse, Karen stopped at Southern Illinois University in Carbondale, where she viewed the 2017 eclipse. She participated in their "Run from the Sun 5K" event. Here she is at the start/finish line.

I found the event I was looking for at Baylor University. The university, NASA, Lowell Observatory, and the Discovery Channel co-sponsored Eclipse Over Texas, which would take place at McLane Stadium. It would include science talks and activity booths, as well as food trucks. So I made hotel reservations in Waco and started planning the trip!

I decided that my husband, Klay, and I would drive to Waco. It would be his first time witnessing a total eclipse. Arthur and Daniel would fly into Dallas, and we would pick them up on the way. Although I had never driven to Texas before, I had heard from those who had that it takes a significant amount of time. So I decided to split the trip up into three days going down and two days coming back.

After looking at a map of cities in the path of totality from greatamericaneclipse.com, I realized that we would follow the path of totality for a good part of the trip. I was a little sad to abandon Carbondale, so I decided that Klay and I would stop there for some of their eclipse events. This ensured that, even in the event of cloud cover in Waco, I could still relish the experience of an eclipse.

All good expeditions start with reference material and gear, right? I packed some books for the trip. They included my autographed copy of Tyler Nordgren's *Sun, Moon, Earth* from 2017's Astronomy Day; Mark Littman and Fred Espenak's *Totality*; *American Eclipse* by David Baron; a bound edition of the KAS special "Great North American Eclipse" of *Prime Focus*; a bound edition of *Celebrating the Wonder of Science in the Shadow*, which was the Bulletin of the American Astronomical Eclipse special; and "The Great 2024 Eclipse" issue of *Sky & Telescope* magazine. At this point, I'm sure you can tell I'm a librarian. But I forgot one great reference book: my copy of the *Field Guide to the 2023 and 2024 Solar Eclipses*, autographed by Michael Zeiler when he spoke at our meeting this year. The good news is that before we left home, I studied it quite a bit.

I also packed plenty of observation gear, including a Solar Snap kit for my cell phone; Mini-Sunoculars; 3D-printed NASA pinhole projectors in the shapes of Illinois, Texas, and the United States; a SafeShot filter for my cell phone; plastic Eclipser glasses; full-size Sunoculars; KAS eclipse glasses; and eventually a viewer card and a few other assorted eclipse glasses I picked up along the way. When I'm in the path of totality, people tend to give me eclipse shades.

The first leg of our journey was 442 miles from Kalamazoo to Carbondale. We left Friday morning. Although Klay had come home on Thursday with a severe respiratory virus, his COVID tests were negative. So I bundled him into the car and drove him to Carbondale.

Southern Illinois University had planned four days of eclipse activities, and we had time to attend three events. The first one was a concert on Friday night. While Klay slept in the hotel, I drove to Shryock Auditorium on the SIU campus.

At this point, it becomes relevant that I'm a musicologist. I was thrilled to see that twelve choirs and bands for students from upper elementary through high school had gotten together to perform a concert of music composed since the 2017 eclipse. The program included three world premieres and one Illinois premiere. In other words, nobody had heard three of the pieces before, and nobody in Illinois had heard the fourth one. The choir piece *A Solar Eclipse* by Thomas Willhoit and the band piece *Into the Darkness* by Caroline Ahn were specifically about the eclipse. I enjoyed the concert so much that I bought their t-shirt to help support them.

The second event was the Chalk-Eclipse, a chalk art competition for regional junior high and high school students. This is an annual event, but the eclipse was a special theme this year. The students had covered the plaza between the auditorium and the student center with chalk drawings inspired by the eclipse. Although it was dark after the concert, the lights along the plaza made viewing the drawings a special experience.

Klay was still sick the next morning, so I ate breakfast

Baylor University, in Waco, Texas, provided busies to their Eclipse Over Texas event.

by myself. After realizing that the other two women in the breakfast room had been at the concert last night, I introduced myself and found out that one of them was composer Amanda S. Her choir composition, *The Jelly-Fish*, had received its premiere at the concert. We had a good conversation. She and her mother planned to return home to Indiana for the eclipse, since their hometown was in the path of totality.

My third Carbondale event was Saturday morning. Klay and I were registered to walk the "Run from the Sun 5K." Proceeds from the 5K will be used to promote the professional development of future Air and Space Force officer candidates at SIUC. Klay had to stay in the hotel room and sleep, so I went by myself. The Weather Channel covered the event. Their reporter even ran in the 5K! A large contingent from Chicago was there, and I watched the reporter interview an astronomer from Adler Planetarium. I finished the walk in 47 minutes and 29 seconds. The route was a loop around campus, and the finish line was chalked on the parking lot pavement.

My final stop at SIU was the Student Center, where EclipseCon was in progress. Although we enjoyed EclipseCon in 2017, this year I didn't have the time to attend. **MY** goal was to visit the campus Starbucks.

Did you know that Buckminster Fuller, famous for the Geodesic Dome, taught at SIU? The student center Starbucks is decorated in his honor. But the real reason I was there was because I hoped to revive my husband with *The Total Eclipse*, a Caffé Vanilla Frappuccino with Mocha Drizzle with Coffee, unlike *The Eclipse*, which was a Vanilla Bean Frappuccino with Mocha Drizzle but no coffee. (Except for the coffee implied by the term "frappuccino.") Since I'm not a coffee drinker, I had the very beautiful and delicious Iced Lavender Cream Oat Milk Matcha. After a quick lunch at Culver's (where they had a special eclipse-themed t-shirt for sale), we said goodbye to Carbondale and headed down the road.

Our destination was Texarkana, Texas, 468 miles away. They were planning a weekend "Solarbration." I loved their logo so much that I really wanted to figure out a way to attend an event! However, we completed everything by 7:00 pm and arrived at the venue after 9:00 pm. By that time, we just wanted to sleep.

Sunday morning, we got up early to drive the 193 miles to Dallas. I applied the last of my glow-in-the-dark eclipse tattoos from greatamericaneclipse.com to my hand, put on my glow-in-the-dark eclipse t-shirt, and we hit the road, ready to pick up Daniel and Arthur. Klay was beginning to feel better, but I still did all the driving.

The Woodworth Family at Eclipse Over Texas in Waco. From left to right: Karen, Daniel, Arthur, and Klay.

While in Dallas, we had a mini-family reunion at the home of a relative to celebrate my father's birthday. He had just turned 84 on Saturday, and he had flown to Dallas to watch the eclipse from there.

By 3:00 pm, we were back in the car and ready to drive the last 99 miles to Waco. We had tickets to a special concert that evening!

In January, I received an email at the library from David Baron. His book, *American Eclipse*, was being republished in a new 2024 edition, and he had sent a link to a free book club kit. I went to the website and discovered that the

book was being turned into a Broadway musical. The night before the eclipse, Baylor University was going to host a preview concert of the musical! Since we were going to be there, I bought tickets to the evening show.

The performance we attended, the second one of the day, featured six Broadway musical actors. Vocal music students from Baylor University sang the chorus parts. Between the nine musical selections, director Bill Rauch interviewed both David Baron and Michael John LaChiusa (who's writing the libretto and music) about their approach to the story of the 1878 *American Eclipse*. It was fantastic! If the show ever goes into full production, I highly recommend it.

David Baron was nice enough to sign my copy of *American Eclipse* when I tracked him down in the lobby after the concert. And it was a great surprise over breakfast in the hotel the next morning when he came in and offered everyone NASA eclipse glasses! We had more of a chance to chat at breakfast the day after the eclipse before heading home.

When we woke up on eclipse morning, the sky was completely overcast. We took a shuttle bus to McLane Stadium. The festival was actually in Touchdown Alley, which is a grassy area alongside the Brazos River next to the stadium. I made sure to wear a lot of sunscreen.

After we listened to the first science talk, we wandered around the STEAM Zone activity booths. NASA's tents were very popular! There were 14,000 of us at Eclipse Over Texas, but there was plenty of room.

Now that's what we like to see! At the Eclipse Over Texas event at McLane Stadium, the entire Woodworth family used their genuine KAS Eclipse Shades.

The sky was still cloudy at 11:59 am. We were a little worried. Arthur and I went to get lunch for everyone right around the time of first contact, which happened at 12:20 pm in Waco. By 12:30 pm, the clouds had started to clear. One astronomer had his telescope set up right in the middle of the lunch activity to share with people!

I accidentally took a photo of the Sun without a filter 24 minutes before totality. By then, things were so bright that I couldn't really see what I was doing on my cell phone. Even though I practiced with my Solar Snap kit ahead of time, I didn't do very well on Eclipse Day. During the partial phases, I took several photos, including one around the time when the clouds cleared and I could see a little bite out of the Sun (it's not visible in the photo). I also took one when the Sun was just a tiny crescent, but clearly too much light came in because that's not what the photo shows. (If only I had had time to attend the astrophotography SIG meetings or watch them online! Sigh.)

With Arthur's help, I took some pinhole projector photos. The sky began to lose some of its color, and that's reflected in some of my other photos.

The photos I took during totality were all accidental. After our 2017 experience in Carbondale, I wished that I would have had an audio recording of the crowd's reaction to totality in Saluki Stadium (when we could finally see it). So I decided that this time I would get an audio recording by wearing my cell phone around my neck, starting a video recording before totality without worrying about aiming the camera, and letting it run all the way through, maybe trying to get the eclipse in the frame at some point. Unfortunately, 25 seconds into totality, I accidentally hit the photo button instead of video. So I didn't get the audio I had planned for. But I did get an accidental video of totality happening when my cell phone camera was tilted at an angle to catch the Sun. Of course, totality didn't really look like what the video shows; the camera had too much light coming in to let us see the black disk in front of the Sun. But I like the video anyway because there is a clear change in the Sun's appearance when it's fully covered by the Moon. And the crowd reaction at the beginning of totality was exactly what I hoped to record! The part that's missing is the part where Arthur and I talk through what we're seeing in actual time and the crowd's reaction when totality ends.

A few minutes after totality was over, I asked my family to share their thoughts about seeing the eclipse, and then I recorded mine so that I wouldn't forget any details. Here are some quotations from the video.

Arthur: "It was worth the hassle because the clouds let us see the Sun. … [The prominences] looked like one until a thinner cloud came over and filtered out a little bit more, and you could see there were actually two separate dots."

Daniel: "I saw the planets."

Klay: "Pretty amazing. Indescribable. Words cannot say what I want to say. I'm glad I saw it."

Karen: "Here's what I remember about totality. I remember that it was amazing to take off my glasses and see the Moon just over the Sun. The corona at first looked really even around me, and then I could see, when Arthur pointed it out, that there were streamers coming out of it. I think they were in maybe the 7:00 position, the 10:00 or 11:00 position, and the 5:30 position. I did see a red dot down at the bottom, which I assume was a prominence, but it was really red. And it looked like a little red ruby down there, sort of in the 5:30 position.

"And I could see two planets: one to the right that was brighter and bigger, and one to the left, almost where the clouds were, that was a little smaller. I did look around and see the 360° sunset, and it was just amazing. And the temperature went down and the wind picked up, and then we saw the diamond ring, and we put our glasses back on, and the Sun was this tiny, tiny little sliver."

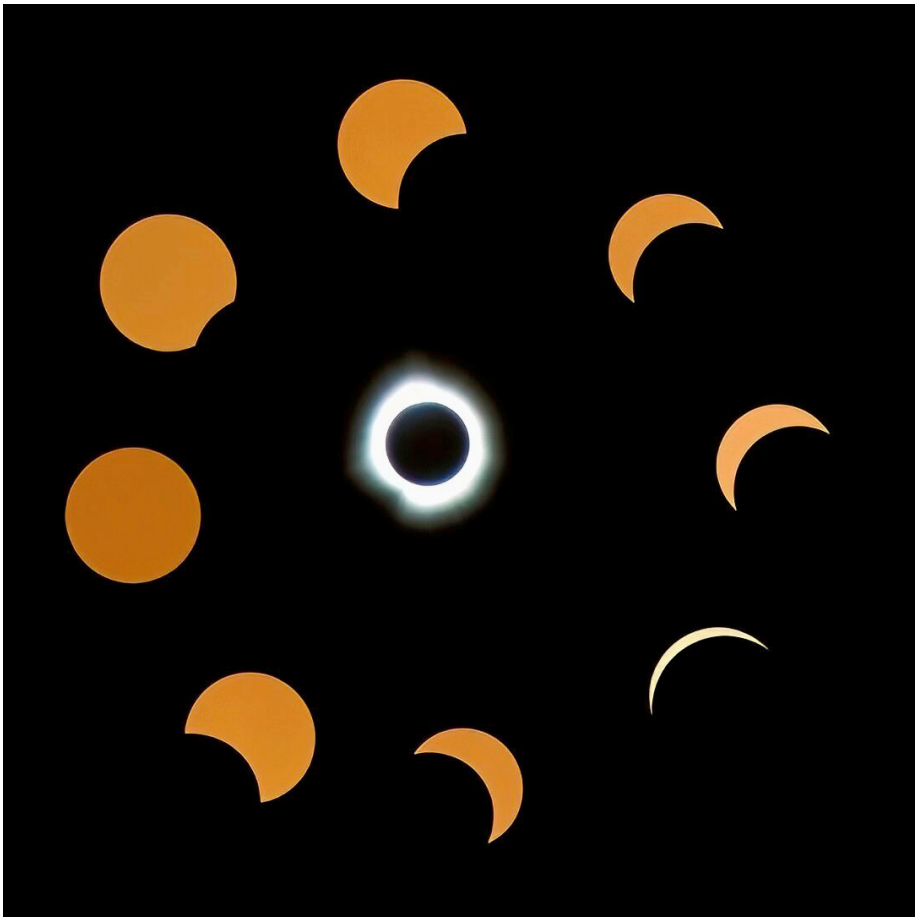
In closing, my Epic Eclipse Expedition was everything I hoped it would be. Driving 1,202 miles down to Waco paid off; we had a glorious view of totality for 4 minutes and 13 seconds.

☼ ☼ ☼

Mohammed Zafar
Newcastle, Indiana

I have to admit that the 'eclipse bug' bit me after a successful viewing of the annular eclipse of October 14, 2023, at Bryce Canyon, Utah. In the months that followed, the anticipation of the total solar eclipse gained momentum, reaching a feverish pitch as April 2024 drew nearer and nearer.

I made plans to travel to Texas and selected Burnet, Texas, which is northwest of Austin, due to its favorable weather forecast for clear skies in April. Then, I watched the weather forecasts like a hawk. Finally, about a week before the big event, when weather predictions began to paint a gloomy picture for this location, I decided to quash my Texas plans and drive instead to Indiana. I scouted a few locations near the centerline of the totality path before setting my sights on Summit Lake State Park in Newcastle, Indiana.



Mohammed assembled this composite from images he took with his Nikon Coolpix P1000 camera and 180mm f/8 lens in Newcastle, Indiana.

Other than a better weather forecast, the main reasons for choosing this location were that it was almost on the centerline, away from the heavy crowds and traffic congestion that would follow the event; easily accessible restroom facilities; a serene, natural landscape; and wide, open spaces free of tall buildings or other obstructions.

When I called the park office, they informed me that they still expected crowds and only had 425 parking spaces available. Furthermore, they informed me that the gates will close once the spaces fill up. So, I decided to find a hotel to stay at the previous night in nearby Muncie. As I headed out to the park before dawn, the excitement in the air was palpable. There was a long line of cars already ahead of me, meandering all the way to the park entrance. A friendly Park Ranger assured me that I would make it, chuckling to add that a few had already lined up the night before.

A beautiful sunrise and splendidly bright skies that remained clear for the rest of the day filled me with immense joy. And I felt confident that I stood a far better chance of experiencing the event in all its glory. Apart from my time-tested, user-friendly Nikon P1000, I set up two additional back-up cameras with the necessary zoom lenses and solar filters.

I reminded myself that even if I did not acquire any stellar images, I was there to savor the whole experience and cross off viewing a total solar eclipse off my bucket list.

As the Moon began to move gradually in front of the Sun and the midday skies slowly darkened, the anticipation gave way to a sense of amazement and reverence as the 'totality' set in. Fellow viewers' "oohs and aahs" charged the atmosphere with excitement and awe. A kid in a tent nearby shouted out in excitement, "It is getting darker and colder." The birds were chirping nervously; the stars twinkled brightly; and Venus was visible.

Time seemed to stand still as I marveled at the breathtaking sight. I felt privileged to experience 4 minutes of totality, cherishing each moment as a reminder of the vastness and beauty of the universe. I stayed a while longer with several other eclipse enthusiasts, sharing our captures and taking in the natural beauty of the landscape.

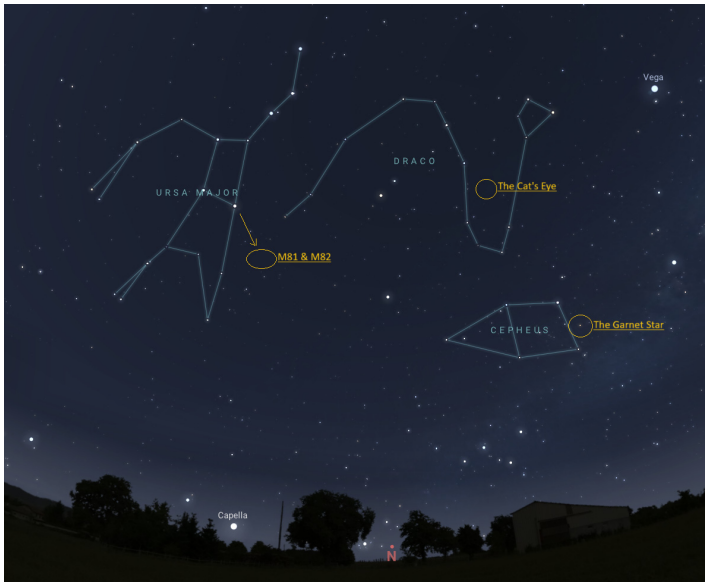
As I reflected on the eclipse and shared my stories and images with family and friends, I felt a sense of fulfillment and satisfaction. A solar eclipse is a reminder of the wonders of nature, a surreal cosmic phenomenon that I will never forget.

CONSTANT COMPANIONS

Circumpolar Constellations, Part III

by **Kat Troche**

In our final installment of the stars around the North Star, we look ahead to the summer months, where depending on your latitude, the items in these circumpolar constellations are nice and high. Today, we'll discuss **Cepheus**, **Draco**, and **Ursa Major**. These objects can all be spotted with a medium to large-sized telescope under dark skies.

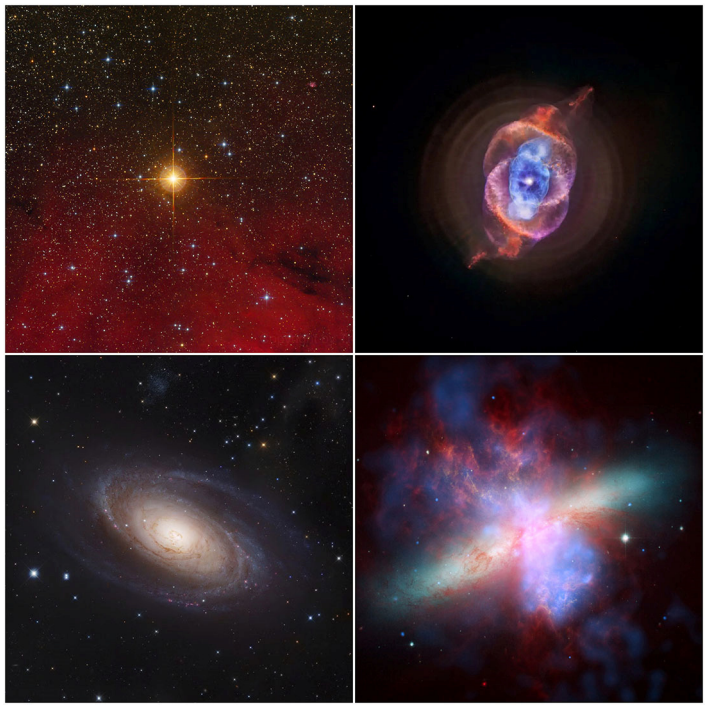


From left to right: Ursa Major, Draco, and Cepheus. Credit: Stellarium Web.

Herschel's Garnet Star: Mu Cephei is a deep-red hypergiant known as The Garnet Star, or Erakis. While the star is not part of the constellation pattern, it sits within the constellation boundary of Cepheus, and is more than 1,000 times the size of our Sun. Like its neighbor Delta Cephei, this star is variable, but is not a reliable Cepheid variable. Rather, its brightness can vary anywhere between 3.4 to 5.1 in visible magnitude, over the course of 2-12 years.

The Cat's Eye Nebula (NGC 6543 and Caldwell 6): Labeled a planetary nebula, there are no planets to be found at the center of this object. Observations taken with NASA's Chandra X-ray Observatory and Hubble Space Telescopes give astronomers a better understanding of this complex, potential binary star, and how its core ejected enough mass to produce the rings of dust. When searching for this object, look towards the 'belly' of Draco with a medium-sized telescope.

Bode's Galaxy and the Cigar Galaxy (M81 & M82): Using the arrow on the star map, look diagonal from the star Dubhe in Ursa Major. There you will find Bode's Galaxy (Messier 81) and the Cigar Galaxy (Messier 82). Sometimes referred to as Bode's Nebula, these two galaxies can be spotted with a small to medium-sized telescope. Bode's Galaxy is a classic spiral shape, similar to our own Milky Way galaxy and our neighbor, Andromeda. The Cigar Galaxy, however, is known as a starburst galaxy type, known to have a high star formation rate and incredible shapes. This image composite from 2006 combines the power of three great observatories: the Hubble Space Telescope imaged hydrogen in orange, and visible light in yellow green; Chandra X-Ray Observatory portrayed X-ray in blue; Spitzer Space Telescope captured infrared light in red.



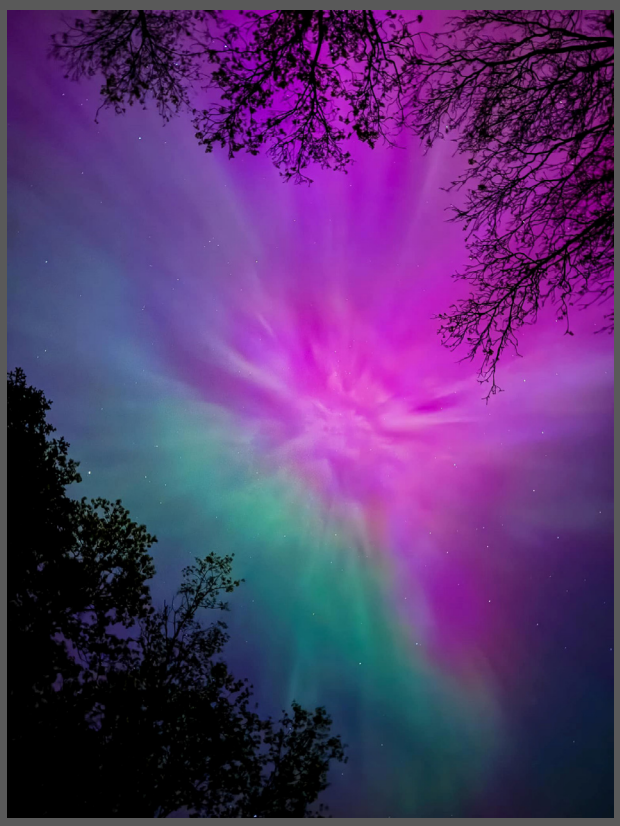
From left to right: The Garnet Star (Mu Cephei) in Cepheus, the Cat's Eye Nebula (NGC 6543) in Draco, Bode's Galaxy (M81) in Ursa Major, and the Cigar Galaxy (M82) in Ursa Major.

Up next, we celebrate the solstice with our upcoming mid-month article on the Night Sky Network page through NASA's website!

KAS Members Capture May 10th Aurora Outbreak

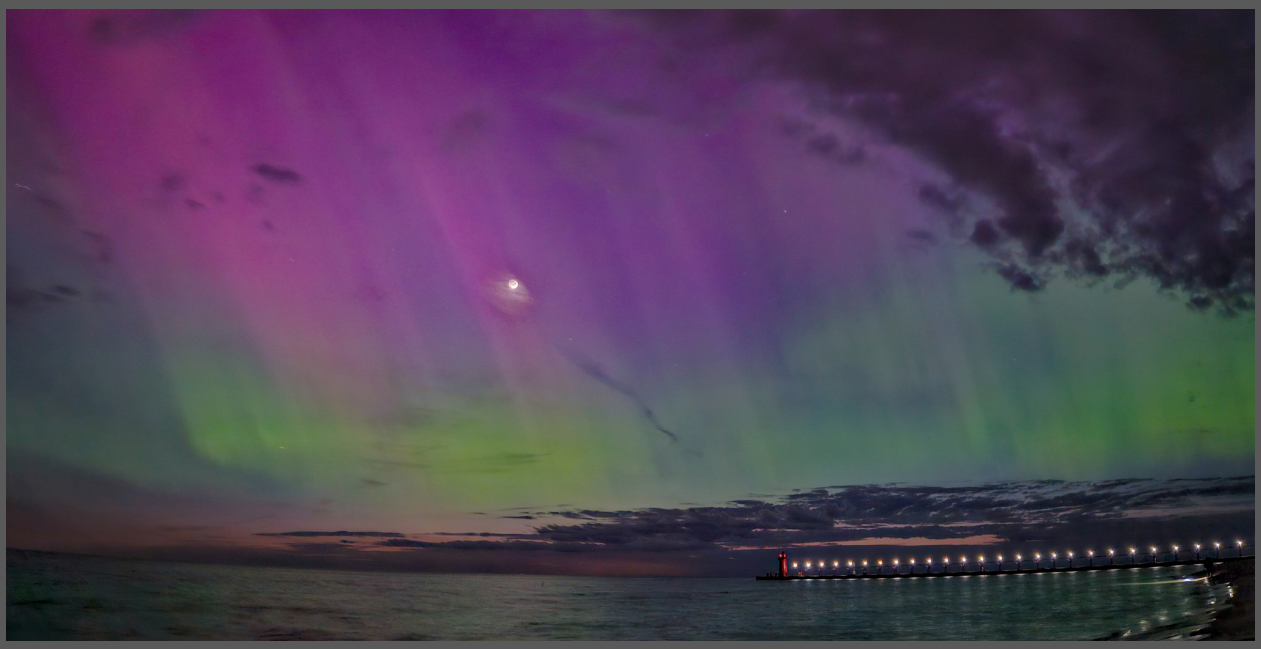
↑ Richard Bell

Richland · Canon 6D · 16mm f/2.8 · 10 seconds · ISO 1600



Amanda Melwiki ↑

Mattawan · iPhone 15 · 24mm f/1.78 · 1 second · ISO 3200



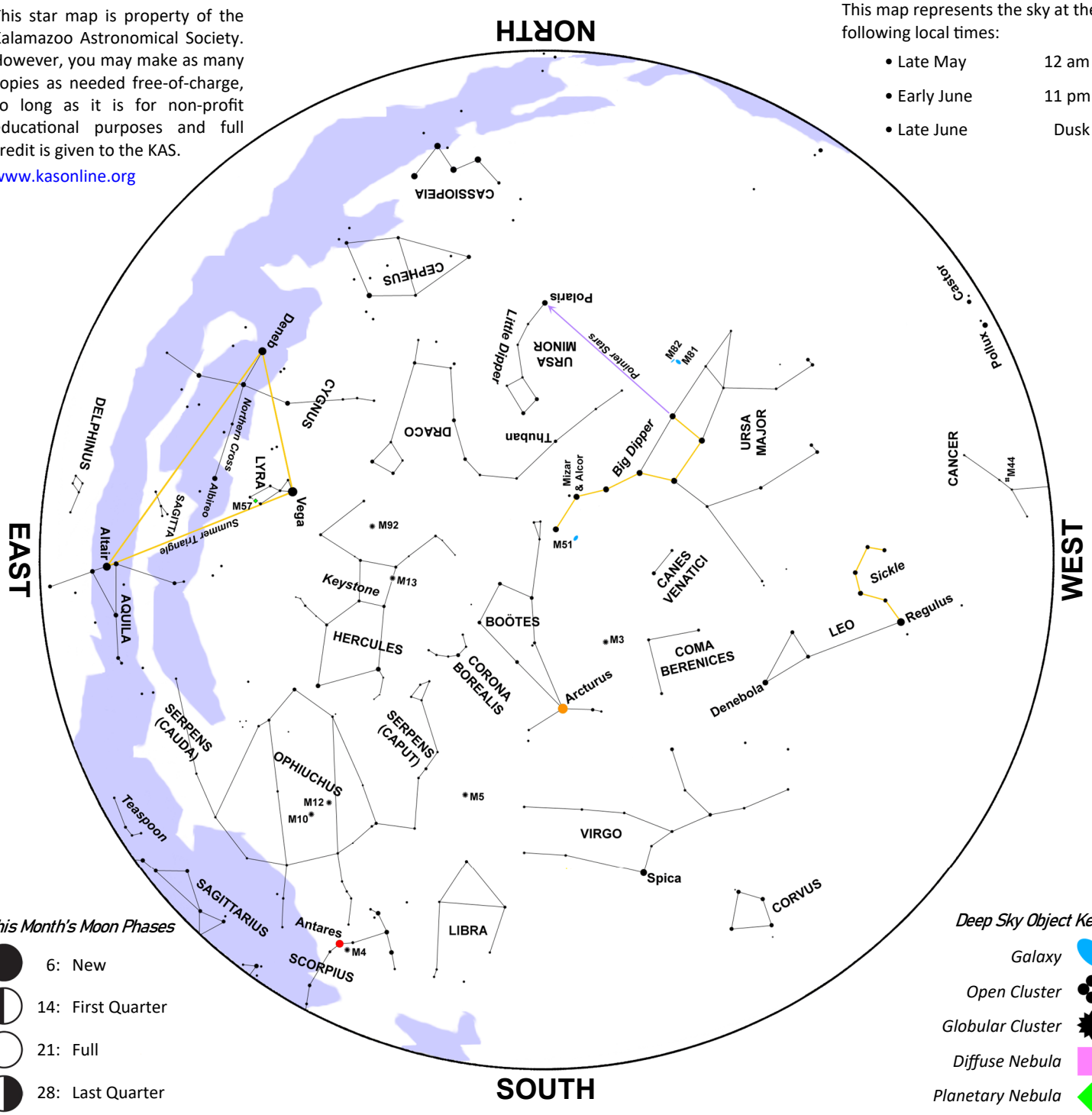
↑ Eric Schreur

South Haven South Pier · Samsung S23 Smartphone · 23mm f/1.8 · 1/5 second · ISO 2000

June Night Sky

This map represents the sky at the following local times:

- Late May 12 am
- Early June 11 pm
- Late June Dusk



This Month's Moon Phases

- 6: New
- 14: First Quarter
- 21: Full
- 28: Last Quarter

Deep Sky Object Key

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

A waning crescent Moon leads the red planet Mars by about 6½° when they rise in the east on the morning of June 2nd.

On June 8th, look west-northwest at dusk for the "twin" stars of Gemini, Castor and Pollux. You will find that they form a neat isosceles triangle with a waxing crescent Moon. Catch them before they disappear below the horizon.

At dusk on June 11th, the Moon hangs about 3° to the upper right of Regulus, the heart of Leo, the lion. Use a pair of 7×50 or 10×50 binoculars for an enhanced view.

The Moon, now in a waxing gibbous phase, visits another spring star, Spica, in Virgo, on the evening of June 16th. The two start the night separated by about 3½° and slowly drift apart over the course of the night.

Turn your gaze toward the south on the evening of June 19th to see the nearly full Moon 3½° to the right of Antares, the red-orange supergiant representing the heart of Scorpius, the Scorpion.

The early morning hours of June 27th will see a waning gibbous Moon and Saturn separated by 3°. Binoculars will help cut through the Moon's glare.

General Meeting Preview

On April 8, 2024, the Moon's shadow traced out a 115-mile-wide, 4,400-mile -long path from Mexico, the United States (from Texas to Maine), and Canada. Members of the Kalamazoo Astronomical Society stood at multiple locations along the path and, weather permitting, got to witness the grandest phenomenon in nature—a total solar eclipse. We encourage members who successfully witnessed the *Great North American Eclipse* to share their experiences through photos and videos during the June General Meeting. Join us and relive that historic day.

Friday, June 7th @ 7:00 pm EDT

Western Michigan University • Rood Hall

Free Parking in Lot 61 • Meet in Room 1110

Also held on Zoom • Click to Register