Highlights of the August Sky. . .

- - - 2nd - - -

DUSK: A Waxing Crescent Moon is about 5° to the right of Mars.

- - - 3rd - - -

First Quarter Moon
8:50 pm EDT

DUSK: The Moon is almost directly between Mars and Saturn.

- - - 10th - - -

Full Moon
2:09 pm EDT

This is the largest Full Moon of the year.

- - - 11th - - -

PM: The Moon is about 4° to the upper left of Neptune.

- - - 12th → 13th - - -

PM: Perseid Meteor Shower peaks, but a Waning Gibbous Moon washes out all but the brightest of meteors.

- - - 17th - - -

Last Quarter Moon
8:26 am EDT

- - - 18th - - -

DAWN: Venus and Jupiter are within ½° of one another.

- - - 23rd - - -

DAWN: A Waning Crescent Moon forms a triangle with Venus and Jupiter.

- - - 23rd → 26th - - -

DUSK: Mars passes 3½° south of Saturn.

- - - 25th - - -

New Moon
10:13 am EDT

- - - 31st - - -

DUSK: The Moon forms a right-angled triangle with Mars and Saturn.

Prime Focus

A Publication of the Kalamazoo Astronomical Society

☆ ☆ ☆ August 2014 ☆ ☆ ☆

This Months KAS Events

Perseid Potluck Picnic: Saturday, August 16 @ 6:00 pm

Kalamazoo Nature Center - See Page 4 for Details

Observing Session: Saturday, August 16 @ 8:30 pm

Overwhelming Open Clusters - Kalamazoo Nature Center

Observing Session: Saturday, August 30 @ 8:30 pm

Deep Sky Objects Along the Milky Way - Kalamazoo Nature Center

Inside the Newsletter. . .

July Meeting Minutes

The general meeting of the Kalamazoo Astronomical Society was brought to order by President Richard Bell on Friday, July 11, 2014 at 7:09 pm EDT. Only 17 members and guests were in attendance in the amphitheater (located next to Owl Observatory) at the Kalamazoo Nature Center.

The theme of the July meeting, as it has been for the past several years, was Gadget Night. Gadget Night is one of the longest running traditions for the KAS; dating back to *at least* 1954. This year four KAS members brought a variety of gadgets, gizmos, and whatchamacallits to share.

Since Richard was already on the amphitheater stage he started things off by sharing his custom-made light box, used for producing flat field images for astrophotography. It provides an evenly distributed diffused light needed for successful flats every time. All telescopes and camera lenses produce vignetting to greater or lesser degree. Vignetting (or light fall-off) is the effect caused by more light reaching the center of an image than reaching the edges. Flat frames are used to remove this darkening of edges and also to remove blotches caused by dust on lenses and camera sensors. Richard's light box is made from black foam core board, LED light-strings, and plastic light diffusing material. The light box is custom made for Richard's 9.25" Schmidt-Cassegrain, but foam core adapters for his 8" Newtonian and 92mm refractor can be attached with Velcro.

Mike Dupuis shared not one, not two, but three gadgets in all! Mike used to live in a heavily populated suburban neighborhood in Western St. Louis County. If he wanted to observe he had to drive one to two hours outside of town for relatively dark skies. If this wasn't practical then he stayed home and observed from the top of his driveway. However, directly across from his driveway was a bright streetlight.

One of the three gadgets shared by Mike Dupuis was this luggage bag he uses as a case for his 8" LX90.

What would Gadget Night be without a modified light? Vice President Jack Price purchased this mini-LED lantern and installed red cellophane for use at star parties.

He needed to devise a "non-destructive" method for putting out the streetlight. Mike created an wooden adapter to attach an ordinary red laser pointer to a tripod. He pointed the laser at the streetlight's photocell and used a small bolt to hold the laser pointer switch on during his observing session. Mike explained that red laser pointers are capable of staying on for several hours without damaged.

Mike's next gadget was another custom built wood adapter. This one allowed him to attach the German equatorial mount from his 5" refractor, which came with an unstable tripod, to his steady LX90 tripod. The third gadget was a suitcase. He wanted a case for his 8" LX90, but didn't want to spend the money on a JMI case. Instead, he found a suitcase that fit his LX90 along with the original packing material and a blanket for additional padding. The suitcase has wheels for easy transport and room for a large star atlas in a front pouch.

Joe Comiskey recently went on vacation to Arizona. He didn't have room for a telescope, but at least wanted to bring a pair of binoculars. Joe also had room for a tripod, but needed a binocular tripod adapter so he purchased one from OPT made by Celestron. He discovered it's difficult to view objects near the zenith and discussed possible gadgets to build and share in the future. Last up was Jack Price, who is always on the look-out for red lights. Menards recently had a $4 rebate on a $5 mini-lantern. The lantern had white LED's, but he disassembled it and installed red cellophane.

Richard discussed coverage for KAS events during his absence in August (see page 3). Both observing reports and current events were few and far between this month. The meeting concluded at about 8:55 pm.

Observations

by Richard S. Bell

June and July were quiet months for the Kalamazoo Astronomical Society. We had an excellent guest speaker and healthy-sized crowd at the June meeting and a fun, but sparsely attended meeting in July. Unfortunately, all observing sessions in June and July were canceled due to poor weather. We started the season with a magnificent streak of four successful sessions and now have a streak of four cancellations. Last month was the worst July for observing in recent memory. Sure there have been some clear skies, but when it was clear it was very humid with LOTS of dew.

In a way this drought of KAS activities has been a welcome one. I got to admit to feeling a little burnt out lately. What I need is a vacation! As I have mentioned recently at general meetings and here in *Prime Focus*, I'll be attending the Saskatchewan Summer Star Party. This year's event runs from August 21st - 24th, but I'll be leaving on August 16th and returning (most likely) on the 30th. This means I'll miss an entire month of KAS activities. Since I normally organize and/or host most of our activities we'll need some extra coverage in my absence.

The twentieth annual Perseid Potluck Picnic will take place on Saturday, August 16th at the Kalamazoo Nature Center. As noted on page 4, the picnic will take place rain or shine. Mike Dupuis has agreed to purchase food this year, but don't forget to bring a dish or dessert to share. Jim Kurtz has tentatively agreed to do the grilling, but a back-up would be nice. Please let me know if you have a gas grill you can bring just in case. I'll be sending out the e-mail for food orders during the first week of August. Please do your best to respond as quickly as possible. I'll need to get orders to Mike a few days before I hit the road.

Public Observing Sessions will take place (weather permitting) on August 16th (after the picnic) and August 30th. The three signs we put out for sessions are currently in the observatory. Materials for the hand-out table are being stored in the middle bench of the observatory. Vice President Jack Price will be responsible for opening and closing the gates during my absence. As with the picnic, back-ups to open and close the gates may be necessary. Please let me know if you can help out. If an observing session needs to be canceled please visit the KAS Facebook page. It may be difficult to update the KAS website during my vacation.

As noted on page 7, we need volunteers for a special observing session on August 23rd at the Pierce Cedar Creek Institute near Hastings. Here's hoping for clear skies in Michigan and Saskatchewan. I'll have a full report (and hopefully lots of pictures) when I return.

How to Keep Mosquitoes Away

by Brian Ventrudo

Once I get going on a night's observations, not much can stop me. The cold doesn't bother me. I don't mind the fatigue, the eyestrain, or the strange noises in the night.

But I cannot stand mosquitoes.

My exasperation with mosquitoes comes from my younger days. As a kid in northern Ontario, I'd head out on a dark summer night to sweep the stars of Sagittarius or Scorpius. But in mosquito season, I never lasted long. The critters would attack every inch of exposed skin, flying up my nose and in my eyes and ears, and generally drive me as crazy as a lab rat. Some mornings I'd wake with a face swollen from the toxin of dozens of bug bites.

DEET is to go-to insect repellent, but how healthy can something with the real name N,N-Diethyl-meta-toluamide actually be for you? And for us astronomers, there's another problem with harsh chemical insect repellents…they're dreadfully bad for the anti-reflection coatings of your optics.

I have seen a few stargazers try screened bug jackets, hoods, and gloves. But these make it hard to handle eyepieces and filters in the dark. Not to mention trying to see fine detail with your telescope while wearing a screened hood on a warm summer night.

Bug zappers? They don't work well enough. Ultrasonics? Forget it. A bug fogger? Expensive and toxic. Citronella candles? The flame kills your night vision.

But last year, I read an article by Todd Carlson in *SkyNews* magazine. He mentioned a new device by a company called Thermacell that was effective in keeping the bugs away, even in the middle of a buggy Canadian summer. I've tried the Thermacell, and it works extremely well.

Which is strange because it doesn't seem to do much. It uses a little butane cartridge to generate a tiny flame that heats up a small blue pad soaked in a nearly odorless bug repellent derived from chrysanthemum flowers (yes, really). It's about the size of a telephone handset. You can hang it off your belt, or lay it on the ground. There are no moving parts, no noise, no batteries required. Yet it keeps an area about 15×15 feet square nearly bug free.

If bugs are keeping you away from stargazing (or otherwise enjoying the outdoors), then the Thermacell might be the answer for you. I'm not sure it's available everywhere in the world, but Google will help you find it.

Now if I can just find a "cloud repellent", I'll be ready to go.

The KAS Invites You to the Twentieth Annual

Perseid Potluck Picnic

Saturday, August 16th @ Kalamazoo Nature Center

Arrive at 6:00 pm • Dinner begins at 7:00 pm

Observing after sunset (weather permitting)

Mark your calendar. Hope for good weather. It's time for the big social event of the summer for the KAS. So get ready to party! Here are the details:

The KAS will provide the hot dogs, hamburgers, and veggie burgers (by order). You will be required to bring your own beverages, table service, lawn chairs, bug spray, and a dish to pass. Condiments will be provided by the KAS.

While dinner is cooking we will have solar observing available through KAS member telescopes (weather permitting). Feel free to bring any type of outdoor games or toys to pass the time while we wait for dinner.

After dinner, we'll hold a Public Observing Session - gates open at 8:30 pm. Stargazers should be prepared to observe the deep sky delights of the summer Milky Way, and perhaps some late meteors from the Perseids.

This gathering will take place rain or shine, so be prepared for whatever Mother Nature throws our way!

The Invisible Shield of Our Sun

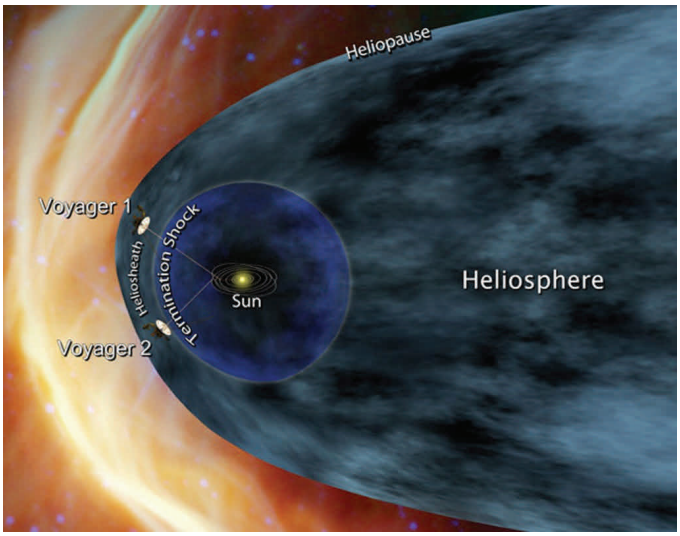
by Dr. Ethan Siegel

Whether you look at the planets within our solar system, the stars within our galaxy or the galaxies spread throughout the universe, it's striking how empty outer space truly is. Even though the largest concentrations of mass are separated by huge distances, interstellar space isn't empty: it's filled with dilute amounts of gas, dust, radiation and ionized plasma. Although we've long been able to detect these components remotely, it's only since 2012 that a manmade spacecraft -- *Voyager 1* -- successfully entered and gave our first direct measurements of the interstellar medium (ISM).

What we found was an amazing confirmation of the idea that our Sun creates a humongous "shield" around our solar system, the heliosphere, where the outward flux of the solar wind crashes against the ISM. Over 100 AU in radius, the heliosphere prevents the ionized plasma from the ISM from nearing the planets, asteroids and Kuiper belt objects contained within it. How? In addition to various wavelengths of light, the Sun is also a tremendous source of fast-moving, charged particles (mostly protons) that move between 300 and 800 km/s, or nearly 0.3% the speed of light. To achieve these speeds, these particles originate from the Sun's superheated corona, with temperatures in excess of 1,000,000 Kelvin!

When *Voyager 1* finally left the heliosphere, it found a 40-fold increase in the density of ionized plasma particles. In addition, traveling beyond the heliopause showed a tremendous rise in the flux of intermediate-to-high energy cosmic ray protons, proving that our Sun shields our solar system quite effectively. Finally, it showed that the outer edges of the heliosheath consist of two zones, where the solar wind slows and then stagnates, and disappears altogether when you pass beyond the heliopause.

Image credit: Hubble Heritage Team (AURA / STScI), C. R. O'Dell (Vanderbilt), and NASA, of the star LL Orionis and its heliosphere interacting with interstellar gas and plasma near the edge of the Orion Nebula (M42). Unlike our star, LL Orionis displays a bow shock, something our Sun will regain when the ISM next collides with us at a sufficiently large relative velocity.



Unprotected passage through interstellar space would be life-threatening, as young stars, nebulae, and other intense energy sources pass perilously close to our solar system on ten-to-hundred-million-year timescales. Yet those objects pose no major danger to terrestrial life, as our Sun's invisible shield protects us from all but the rarer, highest energy cosmic particles. Even if we pass through a region like the Orion Nebula, our heliosphere keeps the vast majority of those dangerous ionized particles from impacting us, shielding even the solar system's outer worlds quite effectively. NASA spacecraft like the Voyagers, IBEX and SOHO continue to teach us more about our great cosmic shield and the ISM's irregularities. We're not helpless as we hurtle through it; the heliosphere gives us all the protection we need!

Want to learn more about *Voyager 1's* trip into interstellar space? Check this out:

http://www.jpl.nasa.gov/news/news.php?release=2013-278

Kids can test their knowledge about the Sun at NASA's Space Place:

http://spaceplace.nasa.gov/solar-tricktionary/

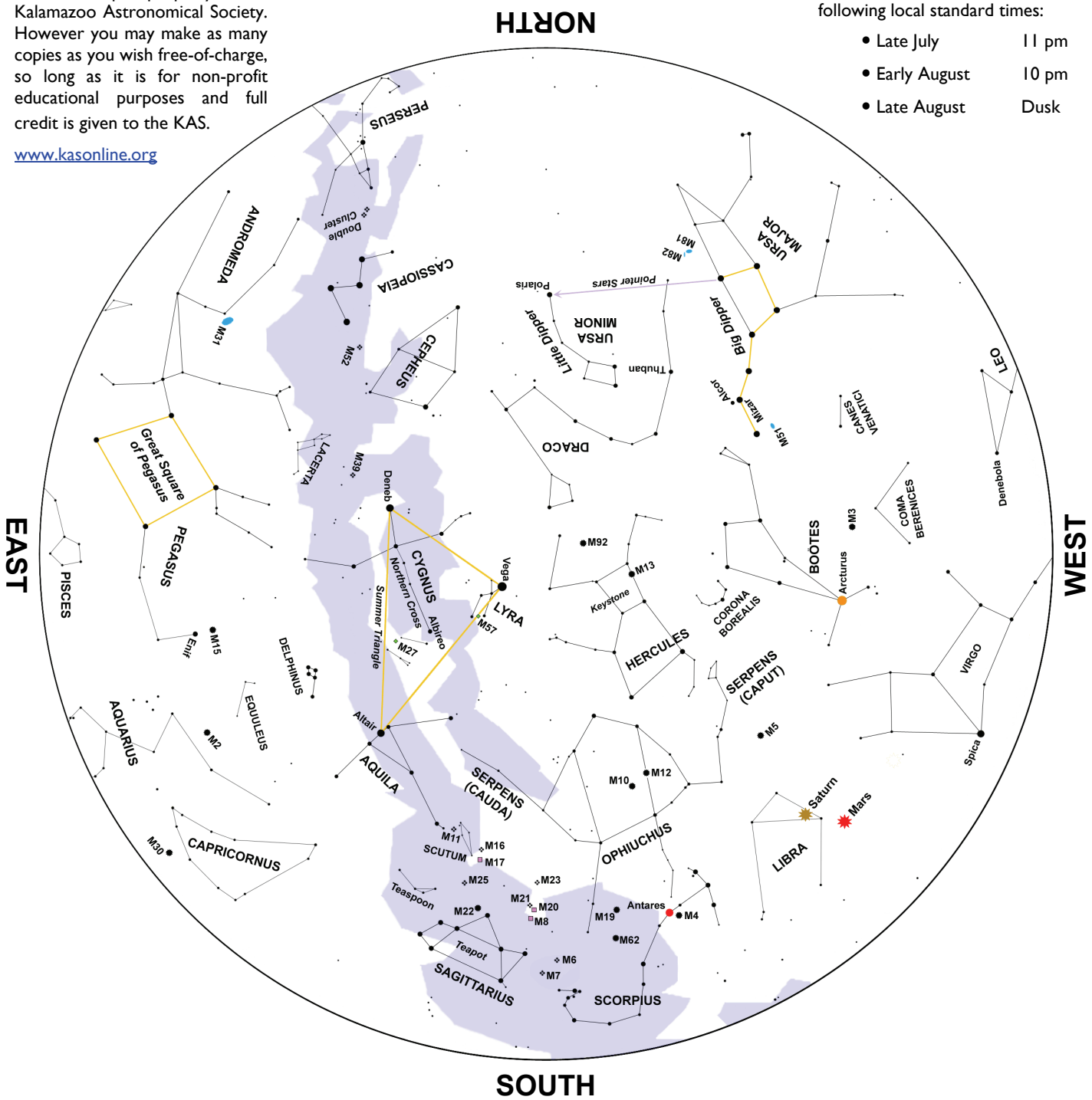
August Night Sky.....

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

www.kasonline.org

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

- Late July 11 pm
- Early August 10 pm
- Late August Dusk



A First Quarter Moon will be between Mars and Saturn after sunset on August 3rd. The Moon will be closer to Saturn, which is slightly dimmer than Mars.

The largest Full Moon of the year occurs on August 10th. The Moon will be at perigee (closest to Earth) at 1:43 pm EDT and exactly Full at 2:09 pm. West Michigan sky watchers won't see the Moon at its absolute biggest and brightest, but it doesn't matter. It'll look like a Full Moon on any other month.

The Perseid Meteor Shower peaks on the night of August 12th-13th, but the brilliance of the Waning Gibbous Moon will spoil the show.

The two brightest planets in the sky, Venus and Jupiter, will be within ½° of each other before sunrise on August 18th. This is their closest approach in 14 years.

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Volunteers Needed!

The KAS has been invited to setup telescopes and share the wonders of the universe with patrons at the Pierce Cedar Creek Institute, located 9 miles south of Hastings. Please contact us ASAP if you'd like to volunteer your time and telescope.

Saturday, August 23rd @ 8:30 pm

Pierce Cedar Creek Institute • 701 West Cloverdale Rd, Hastings, MI 49058

BUY ORION® TELESCOPES & BINOCULARS *in the* SkySHOP

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

Purchasing Orion products through the SkyShop gives the KAS a commission. Don't see an item that you want to buy? Please contact us and let us know and we'll add it or send you a special link ASAP.

— skyshop.kasonline.org —

Public Observing Sessions

Saturday, August 16th
Feature: Overwhelming Open Clusters

Saturday, August 30th
Feature: Milky Way Deep Sky Objects

Gates Open: 8:30 pm • Observing Begins: 9:00 pm

Kalamazoo Nature Center • 7000 N. Westnedge Ave.

Robotic Telescope *Fundraiser*

The time is now! Contribute to the Robotic Telescope Project today. *Every* donation brings us closer to our goal.

Learn more about this exciting project on our website, KAS Online.

Donations can be made in one of two ways:

- **Via PayPal (send money to kas@kasonline.org)**
- **Check or Money Order (made payable to the KAS - use return address shown below)**

Please remember that the KAS is a non-profit organization. All contributions are federally recognized as tax deductible per section 501(c)(3) of the IRS code.

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