



Reflections



Newsletter of the Popular Astronomy Club

SEPTEMBER 2018

President's Corner September 2018



Alan Sheidler

Well it's that time again when summer slowly migrates to fall. We have had a lot of opportunities to get together as a club for fellowship, observing and public outreach. This newsletter documents these activities which were both fun and productive. This fall promises to be busy as well. The Eastern Iowa Star Party kicks things off September 7-9th at the Menke Observatory, followed by Niabi Zoo on September 15th.

As I write this column, we don't yet have any details, but we have been invited to participate in a First Lego League "Into Orbit Challenge" for middle school students at the Putnam Museum on September 22nd. There will be more on this when we learn what the organizers want.

October will be very busy with events going on every weekend which you can see on the upcoming events calendar on page 18. Our annual club banquet will be on October 27th at the Butterworth Center at 5:30. Information about the banquet is on page 5. Be sure to send in your RSVP to Dale Hachtel by October 17th. This year's banquet speaker is Mr. Ray Wolf, Science and Operations Officer for the NOAA National Weather Service Office, Davenport, Iowa. This should be another great banquet and a enjoyable way to enjoy fellowship and celebrate the club's 82nd birthday.

(Continued in next column)

I would also like to thank everyone and particularly Mike Gacoch for what you have done so far in support of the NCRAL 2019 Annual Convention. See page 6 for an update about this wonderful opportunity for PAC to serve as host and to highlight the Quad Cities. The plans are coming together nicely, and with everyone's help, I am confident this will be a really nice event.

Sara and I decided to take a little vacation trip this summer and we just got back yesterday (as I am writing this). Whenever we go on vacation, we always try to work something astronomy related into the things we do. One of the places we visited was the St. Mary's Church near Rostock, Germany. This church has an incredible astronomical clock which was built in the year 1472 by clock maker Hans Düringer. This medieval clock is the oldest one of its kind still in working order, which is really amazing when you realize this clock was built almost 500 centuries ago! Every 130 years or so, a new "dial" has to be installed corresponding to the current epoch. They just replaced the fourth one, so the current version will be good until the year 2150. This clock was used to compute sunrise, length of the day, moon phase and when religious holidays such as Easter occur. This proves the computer age really started in the 15th Century. If you can figure this thing out, then you have my admiration!

Al Sheidler

NCRAL
2019
Astronomical Voyages of Discovery: Past, Present & Future!

Editors Note

I would like take a minute and thank everyone that contributed observations, photos and content for this issue. It really does help out a lot to have input when putting the issue together. I try to inform the members of current issues, events, and news while also giving some information for anyone that comes across our newsletter (from our website) on the internet that may not know a lot about Astronomy. With that in mind, once Dino uploads the current issue to the website, I will also put a link to it on Facebook. Maybe this will also generate visitors to our meetings and whatever.

Also this issue was done with a new version of MS Publisher and now the links will actually take you to the site or location.

Finally, I am finishing this issue on my laptop as I downloaded an bios update from Dell that fried my computer motherboard and it will be a while until they get parts to repair it. I don't think I was the only one as the parts are backordered. (sigh). Anyway it is not as easy to do this on a laptop as the screen is really tiny but will make due.

Thanks

Terry Dufek



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ANNOUNCEMENTS / INFO



EISP 2018

Event date:
Fri Sept 7, 2018 thru Sun
Sept 9, 2018

Location of event:
St Ambrose University Menke
Observatory Dixon, IA

Eastern Iowa Star Party presented by the
Quad Cities Astronomical Society (QCAS)
Davenport, Iowa

CONTACT: Jeff Struve (for information
and registration)



Event date:

Fri May 3, 2019 thru Sun May 5, 2019

Location of event:

Stoney Creek Hotel & Conference Center
101 18th St, Moline, IL 61265

North Central Region of the Astronomical
Leagues annual convention being presented
by the Popular Astronomy Club, Moline Illinois

**CLICK HERE for link
to NCRAL 2019**

CONTACT: 2019NCRALInfo@gmail.com

MEMBER LIST

If you are a member and want a current
member list, please contact Terry Dufek



**CLICK HERE for link
PAC on Facebook**

PAC Banquet



The 82nd annual Popular Astronomy Club
banquet is scheduled for Saturday October
27 at the Butterworth Center, Moline, Illinois.
The RSVP form will be included in the Sep-
tember newsletter. Please mark your calen-
dars and plan on attending this special event
as we celebrate another year of the PAC.

5:30 pm Social Time & Astro-photography
display
6:00 pm Buffet Dinner
7:00 pm Evening Speaker: Mr. Ray Wolf
8:00 pm Awards & Door Prizes
9:00 pm Adjourn

Mr. Wolf's program is titled Climate Change
in the Midwest

Here is a brief bio: Ray Wolf is the Science
and Operations Officer for the NOAA National
Weather Service office in Davenport, Iowa.
He is responsible for managing operations,
staff training, and local research. He re-
ceived an M.S. in Agricultural Climatology in
1985 and a B.S. in Meteorology in 1982 from
Iowa State University.

**Reservations and more information
on page 5**

YES! We have openings for..... NEWSPAPER ARTICLES



November, December 2018
(If you have need some ideas, we can help
– It isn't as hard as it looks)

Please contact Dino Milani
if Interested

ANNOUNCEMENTS / INFO

*A Thank You
From The
Family of
Lillian Nelson*

*The family of
Lillian H. Nelson
acknowledges with deep
appreciation your kind expression
of sympathy.*

*Thank you for the card and
lovely plant as a memorial to my
mom, Lillian.
Please continue your wonderful
programs and love of Astronomy,
and look through a telescope at
every opportunity. In this way the
lives of my parents will live on
in the Popular Astronomy Club!*

*Truly,
Love,
Bob + Alon*

ANNOUNCEMENTS / INFO



Popular Astronomy Club Banquet

- **October 27th, 2018**
- **Butterworth Center, 1105 8th Street, Moline, IL.**
- **Agenda**
 - **5:30 Social Hour & Entries for Astro-Photography Display**
 - **6:00 Buffet Dinner**
 - **7:00 Evening Speaker: Mr. Ray Wolf, Science and Operations Officer for NOAA National Weather Service Office, Davenport, IA**
 - **8:00 Awards and Door Prizes**
 - **9:00 Adjourn**



- Mr. Wolf's program is titled **"Climate Change in the Midwest"**
- bio: Ray Wolf is the Science and Operations Officer for the NOAA National Weather Service office in Davenport, Iowa. He is responsible for managing operations, staff training, and local research. He received an M.S. in Agricultural Climatology in 1985 and a B.S. in Meteorology in 1982 from Iowa State University.

RSVP

kindly respond on or before
October 17th, 2018

Cost per adult: \$25 Children: \$12.50

(include with RSVP, checks made out to the **Popular Astronomy Club**). Mail to Dale Hachtel, 1617 Elm Shore Drive, Port Byron, IL 61275 (dale_hachtel@msn.com)

	Name	Meat Choice	
		Roast Beef	Chicken
1			
2			
3			
4			
5			

Menu:
 Roast Beef or Garlic Herb Chicken
 Mashed Potatoes & Gravy
 Buttered Corn
 Salad
 Rolls & Butter
 dessert
 Coffee and soft drinks

ANNOUNCEMENTS / INFO



Update 1



NCRAL 2019 Annual Convention

Presented by the Popular Astronomy Club

Astronomical Voyages of Discovery: Past, Present & Future

New and improved . . . added Sunday morning: May 3 – 5, 2019

Convention Location: Stoney Creek Hotel & Conference Center, Moline, IL

Why are we giving you little details as plans progress? Because you need to plan for travel to the convention in advance! In order to maximize the bang for your buck, the current plan is to open registration at 1PM on Friday May 3rd with activities starting at 2 PM and finish by noon on Sunday May 5th.

Should you plan on arriving Thursday evening? If you have nothing else important going on, yes! Although some plans are still a bit fluid, there will be opportunities for pre-convention Riverboat ride, John Deere plant tour, Rock Island Arsenal Museum tour, Botanical Garden visit, Blackhawk State Historic Site visit, and more.

Is Moline a family destination? Pack up the whole family! Think Family Museum, Niabi Zoo, and climbing on John Deere Construction and Agricultural equipment.

How do you know there will be something at the convention that interests you? There are four cornerstones of amateur astronomy that are supported by the Astronomical League: *The Art of Observing*, *Joy of Outreach*, *Coolness of Equipment*, and *Science of Astronomy*. Our goal is to include something for you regardless of why you are into astronomy!

Do you need to wait for the next issue of Northern Lights to learn about updates for the NCRAL 2019 Convention? Absolutely not! Read below on how to be added to our mailing list. We'll let you know when the [NACRAL 2019 website](#) is updated!

To be the first to know as plans are finalized, please send your name, club affiliation, and email address to: 2019NCRALInfo@gmail.com

ANNOUNCEMENTS / INFO

Your ASTRONOMICAL LEAGUE



Join the Astronomical League to commemorate the 50th anniversary of the first moon landing!

ALCon 2019 **Kennedy Space Center and** **Southern Skies Cruise to the Bahamas** July 25 - 29, 2019

First, tour the **Kennedy Space Center**, the site of the Apollo 11 launch. Then, enjoy a **three-day cruise to the Bahamas** on a ship by Royal Caribbean and see the southern Milky Way of Sagittarius and Scorpius!

- Thursday July 25, after the KSC tour, stay on-shore at a hotel in Port Canaveral (to be arranged).
- You will need a passport valid through January 2020 or later. (Yes, at least six months after the cruise!)
- Royal Caribbean cruise ship leaves Port Canaveral Friday afternoon July 26 and returns Monday morning July 29.
- Cruise cabins are limited. Reservations are being accepted, with a \$100 initial down payment. Pricing (based on double occupancy) for the whole weekend cruise including meals is set at \$399 per person (PP) for inside cabins, \$579 PP for outside cabins, and \$589 PP for Balcony cabins. Singles, triples, and quad rates are available upon request with our agent.
- Members of the Astronomical League only: **To reserve your cabin with a \$100 deposit, and for additional cruise details, please contact Marsha at Lin-Mar Travel, 631-736-1049 or marsha@travelwithlin-mar.com.**

More details available shortly.

Contributions

(got something to share?)

How Large The Universe Is!

A light-year is the distance light travels in one year (at 186,000 miles per second).

One astronomical unit, or AU, (distance Earth is from the Sun) equals about 93 million miles (150 million km).

Quite by coincidence, the number of astronomical units in one light-year and the number of inches in one mile are virtually the same.

For general reference, there are 63,000 astronomical units in one light-year, and 63,000 inches (160,000 cm) in one mile (1.6 km).

This wonderful coincidence enables us to bring the light-year down to Earth. If we scale the *astronomical unit* – the Earth-sun distance – at one inch, then the light-year on this scale represents one mile (1.6 km).

The closest star to Earth, other than the sun, is [Alpha Centauri](#) at some 4.4 light-years away.

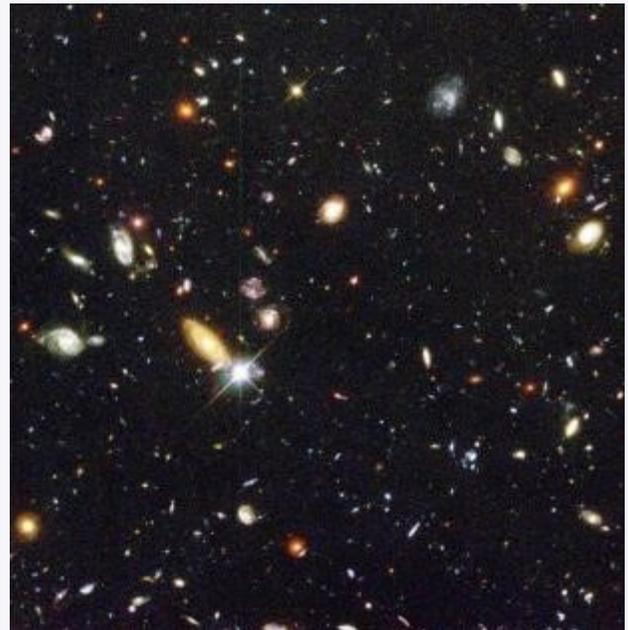
Scaling the Earth-sun distance at one inch places this star at 4.4 miles (7 km) distant.

Scaling the astronomical unit at one inch (2.5 cm), here are distances to various bright stars, star clusters and galaxies:

Alpha Centauri: 4 miles (6.4 km)
Sirius: 9 miles (14.5 km)
Vega: 25 miles (40 km)
Fomalhaut: 25 miles (40 km)
Arcturus: 37 miles (60 km)
Antares: 600 miles (966 km)
Pleiades open star cluster: 440 miles (708 km)
Hercules globular star cluster (M13): 24,000 miles (38,600 km)
Center of Milky Way galaxy: 27,000 miles (43,500 km)
Great Andromeda galaxy (M31): 2,300,000 miles (3,700,000 km)
Whirlpool galaxy (M51): 37,000,000 miles (60,000,000 km)
Sombrero galaxy (M104): 65,000,000 miles (105,000,000 km)

Fascinating!!!!

Roy Gustafson



Contributions

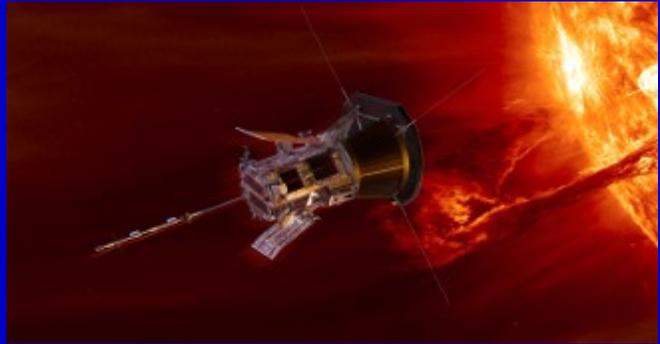
(got something to share?)

Take a look at the NASA Selfie app. Pretty neat. When Jan was teaching I used to take the kids pictures and then shrink them down and cut and past them into an astronaut suit. I would spend hours doing this! This app would have been fantastic!!

Roy Gustafson



NASA mission to sun honors pioneering U of Chicago physicist (contributed by Mike Mack)



[CLICK HERE for link to Article](#)



Jet Propulsion Laboratory
California Institute of Technology

DAY IN REVIEW



[15 Years in Space for NASA's Spitzer Space Telescope](#)

Initially scheduled for a minimum 2.5-year primary mission, NASA's Spitzer Space Telescope has gone far beyond its expected lifetime and is still going strong after 15 years.

[CLICK HERE FOR LINK TO SITE](#)



['NASA Selfies' and TRAPPIST-1 VR Apps Now Available](#)

The universe is at your fingertips with two new digital products from NASA.

[CLICK HERE FOR LINK TO SITE](#)

YERKES

**A Great History And
A Last Chance to visit?
By Mike Mack**

Here is one more picture from Yerkes in 1921. This was taken at the great 40" refracting telescope, the largest in the world. Can you pick out Albert Einstein? In 1919, the experimental astronomer Arthur S. Eddington led an expedition that measured the deflection of light from stars during the total eclipse that validated Einstein's Theory of Relativity, which overnight launched Einstein to fame worldwide.



The Yerkes Observatory is scheduled to close at the end of October 2018. If you want to see it this may be your last chance. If you are friends with Bill Gates, Jeff Bezos, or Elon Musk, maybe you can persuade them to buy Yerkes and keep it open.

The observatory is very important in the history of Astronomy and is often called the "birthplace of modern astrophysics." This is because it represented a shift in thinking about observatories from only housing telescopes and observers, to integrating equipment for physics and chemistry. A very good example is the use of refracting light to understand the chemistry of stars that was pioneered by the observatory founder, George Ellery Hale.

**George Ellery Hale
and the Chicago connection**

George Ellery Hale
was one of America's foremost men of science. His life work would expand our knowledge of solar and stellar evolution.

Hale was born in Chicago in 1868. In 1891, Hale's father built him the Kenwood Physical Observatory, attached to the Hale mansion near 45th Street and Drexel in Chicago. In it they installed a 12-inch refracting telescope.

Hale agreed to work for The University of Chicago in 1892 after being assured the University would build a large telescope and observatory.



Left: The Kenwood Physical Observatory, 45th Street and Drexel in Chicago.
Top: Hale's spectrohellograph on the 12-inch refractor at the Kenwood Physical Observatory.

Hale and Yerkes
At an astronomy meeting in New York that summer Hale learned about a pair of 40-inch lenses and a buyer. Hale helped persuade Charles Yerkes, prominent businessman in Chicago, to fund a telescope and an observatory for The University of Chicago.

The University of Chicago's Yerkes Observatory, Williams Bay, Wisconsin, was completed in 1897 at a cost of nearly half a million dollars, with Hale as first director. For eleven years the 40-inch refractor remained the largest telescope in the world.



Hale was a driven person and had one of the largest telescopes in the United States in his backyard (funded by his father) at 45th and Drexel in Chicago, just a few blocks from The University of Chicago. This was coincident with the time that William Harper the first President of the University of Chicago was using the great wealth of J. D. Rockefeller to build a powerhouse research university and coincident with Chicago's heyday sponsoring the Columbian Exhibition in 1893. The 40" refracting telescope was first on display at this exhibition before moving to its current location at Williams Bay, WI (near Lake Geneva).

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YERKES

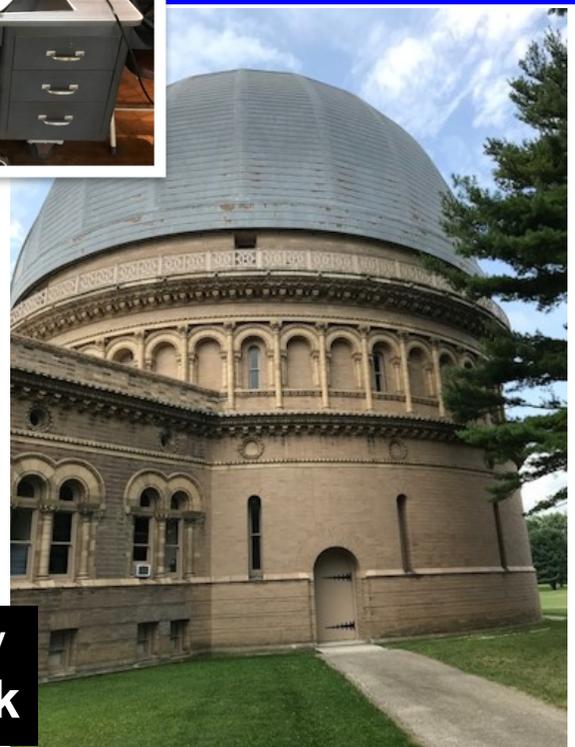
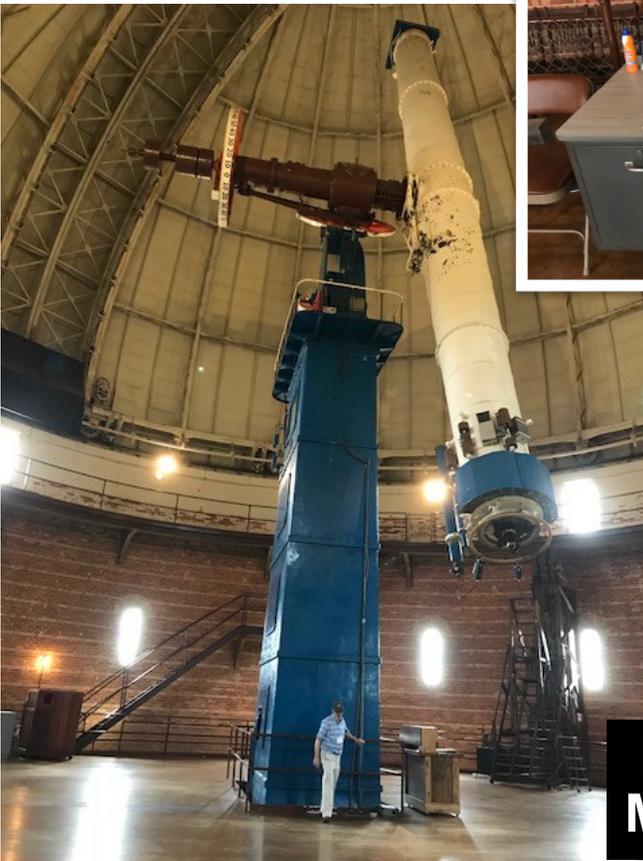
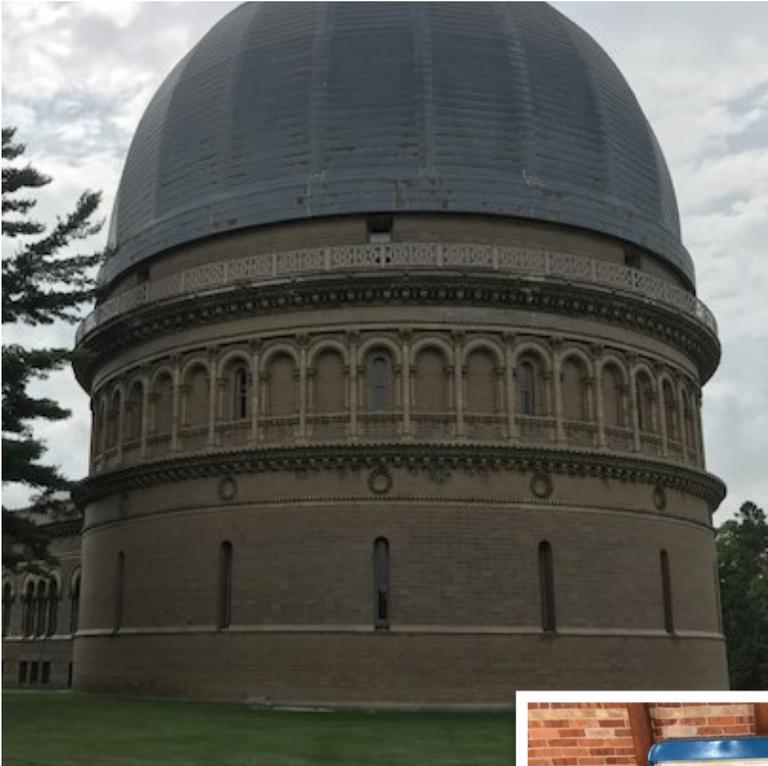
A Great History And A Last Chance to visit? (cont.)

(Continued from previous page)

Many Nobel prize winners and other notable astronomers who have conducted research at Yerkes include Edwin Hubble (who did his graduate work at Yerkes and for whom the Hubble Space Telescope was named), Subrahmanyam Chandrasekhar (for whom the Chandra Space Telescope was named), Russian-American astronomer Otto Struve,^[2] Dutch-American astronomer Gerard Kuiper, and the twentieth-century popularizer of astronomy Carl Sagan. The observatory provided the tools for Edwin Hubble to discover the expansion of the universe. Eugene Parker, the discoverer of solar winds (and namesake of the Parker Solar Probe) also did his research at the University of Chicago.

In addition to the history of the observatory's contributions to science and Astronomy, the building itself is beautiful and architecturally significant. Further, the grounds are grand and the landscape design was created by Frederick Law Olmsted, the father of American landscape architecture. You will recognize Olmsted as the designer of Central Park in New York City.

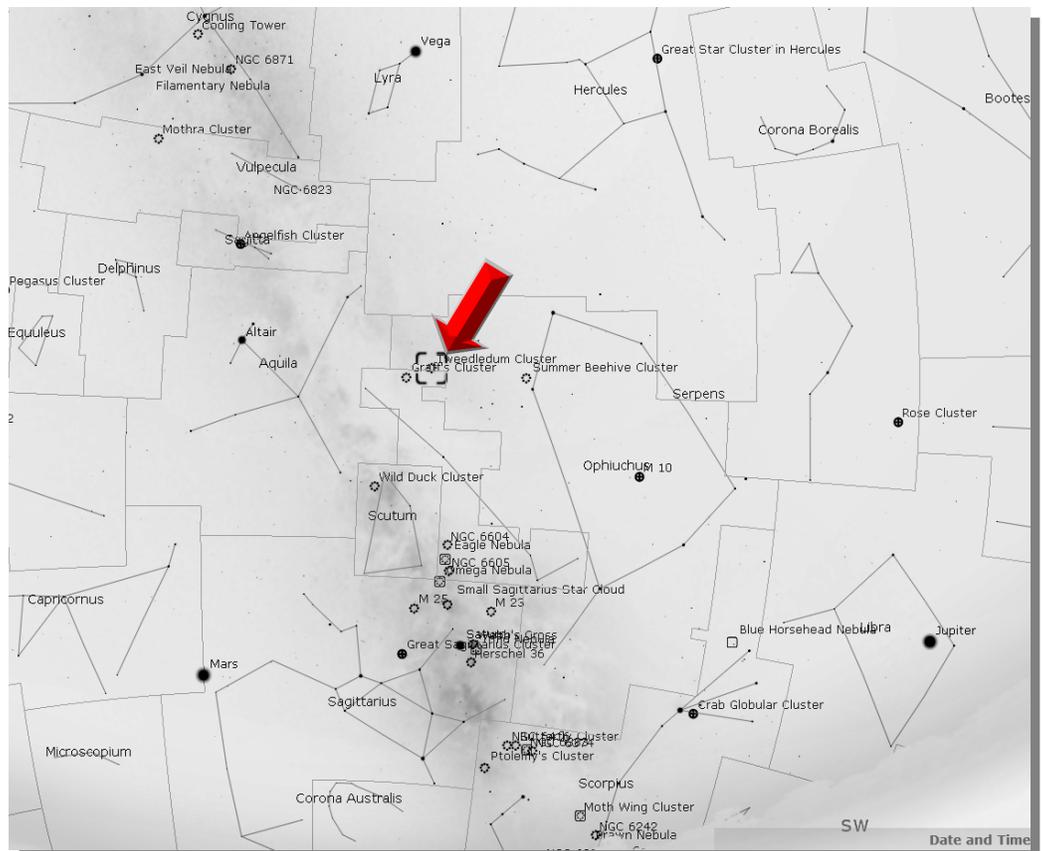
Mike Mack



**Photos by
Mike Mack**

NGC 6633 Tweedledum Cluster

- Located roughly 1,000 light-years from Earth
- NGC 6633 is about the same size as the full moon in the night sky (33'x22')
- home to approximately 30 young hot blue stars estimated about 600 million years old
- The star cluster is located in the large constellation Ophiuchus
- discovered in 1745-46 by Philippe Loys de Chéseaux
- independently rediscovered by Caroline Herschel, and been included in her brother's catalog
- shine at a total magnitude of 4.6; the brightest star is of mag 7.6
- Also known as the Captain Hook cluster or as the Wasp-Waist cluster
- Voyager 1 is traveling in the general direction of this cluster at a million miles per day
- NGC 6633 is in a very rich star field but very sparse cluster



PAC OUTREACH EVENTS



Silver Bell Hollow Alpaca Farm August 3rd 2018

An outreach was held at the Silver Bell Hollow Alpaca Farm in Illinois City, Illinois on the evening of August 3rd.. There was a crafts session followed by a presentation by Terry Dufek and an observing session with PAC members. Also, names were selected by votes cast, for a baby alpaca to be born in September. If its a boy it will be Alcor. If it's a girl it will be Delphini. The alpaca in the picture (right) is named Apollo, who was born this summer. Other members attending were Rusty Case, Mike and Jan Gustafson, Mike and Wanda Gacioch, Dale Hachtel, and Al and Eric Sheidler. The evening started out with hazy and slightly cloudy skies but cleared out quickly after sunset. We wrapped out about 10 p.m. after a nice showing up of the space station ended the evening for everyone.

We had a great time and fantastic views of Venus, Jupiter, Saturn, Mars and many other objects. There were approximately 50 visitors and we had 5 telescopes set up by PAC members and the PAC-MO. Thanks to everyone who participated in this great event. Thanks especially to Mike and Dana Wright for serving as hosts. Hope to do it again sometime.

Alan Sheidler



(above) Mike Wright , the owner of Silver Bell Hollow, escorted Apollo around to meet the guests.





(above) Terry Dufek gives a presentation on some of the objects to be seen tonight

(below) Rusty Case, Roy Gustafson and Mike Gacioch wait for the evening to darken. (Rusty and the PACMO did view the Sun earlier)



**UPDATE
August 20th**



You and 101 others · 13 Comments 5 Shares

Love Comment Share

CLICK HERE for Facebook link to event video



(above) Terry Dufek is explaining some details about the Solar System to some guests.



Niabi Zoo Outreach

August 18th 2018

We arrived at the zoo at about 7:20 p.m. and had to negotiate our spot with a large gathering of geese parked in our usual place. They grudgingly gave way and we set up before sunset. They did give us a very close fly by when dusk came.

A very nice public outreach was held at the Niabi Zoo along with a wonderful arrangement of celestial objects. It brought out over 60 plus visitors along with people that needed help setting up their telescope for the first time and even one lady brought out a 6 inch mirror in a holder, wondering what she could do with it.

PAC members attending were Wayland and Anne Bauer, Rusty Case, Terry Dufek, Mike Mack, Dale Hachtel, Dino and Mitchell Milani, and Eric Shiedler.

A wide selection of solar system objects were on display across the sky. A 1/2 full Venus, big Jupiter, beautiful Saturn and a Mars which is finally starting to show some markings and a polar ice cap. We even had views of Neptune later on in the evening and at about 10:07 pm, Io popped out of Jupiter's shadow,

(Continued in next column)

We had views of double stars like Albireo and various Messier objects such as the Ring Nebula, The Dumbbell nebula and Messier 13 globular cluster.

Live feed viewing was not very clear as we had a 1st quarter moon along with a hazy sky with the smoke from the forest fires. Visitors did see some of the brighter deep sky objects and we tuned into a new object which really was a surprising little planetary. NGC 40 (the Bow Tie nebula) in Cepheus has a bright center star surrounded by what looks like red parenthesis. I am sure it is similar to the Ring Nebula but we are only seeing part of it. Rusty's camera showed it completely surrounded by a red haze. Wayland said it was a gas shell heated to 50,000 degrees.

As mentioned, the 1st quarter moon gave views of craters with really deep walls and great shadows. If nothing else, the haze seemed to cut down on the glare and brightness of the Moon.

We wrapped up around 11:30 p.m. just as the moon was setting having had a nice event this evening.

Editors note: sorry no pictures turned out because I evidently don't know how to use a camera at night. My apologies.



ASTRONOMY IN PRINT

M Dwarf stars are cool neighbors

Astronomers key in to their dim low-temp status

By KATIE MELBOURNE

Since the discovery of the first exoplanet, or planet orbiting another star, more than two decades ago, astronomers have been scouring the sky for Earth 2.0.

While it may seem that the best place to look for potentially habitable exoplanets is other stellar systems similar to ours, we are still a ways off from detecting an Earth-sized exoplanet orbiting a star like the Sun. Instead, astronomers have turned to observing M Dwarfs, the coolest and dimmest type of star.

M Dwarfs are the most abundant stars in our region of the Milky Way, making up about 75 percent of the stars surrounding our solar system. These stars also harbor large populations of terrestrial (rocky) planets, an important prerequisite to life. Because of the lower stellar temperature, the habitable zone around M Dwarfs, or the range of orbits in which liquid water could exist on the surface of a planet, is closest to the star. This makes it easier to find planets around M Dwarfs with the two most common methods of detecting exoplanets.

All stars give off electromagnetic radiation through light of different wavelengths, including the visible light that surrounds us during the day and the ultraviolet (UV) rays that can leave us with sunburns. Luckily, our ozone layer protects us from the majority of this harmful UV radiation. But M Dwarfs are more active than our sun, meaning they emit radiation more frequently and at higher intensities.

This radiation could affect the atmospheres of the exoplanets in an M Dwarf system, making their habitability uncertain. Therefore for astronomers to analyze the atmospheres of exoplanets

(Continued in next column)

surrounding M Dwarfs, they must also understand the unique UV emission profile of the star in the system.

However UV observations are challenging to obtain. Because our ozone layer absorbs light in the ultraviolet range, we cannot accurately measure UV emission from ground-based telescopes. While space-based telescopes, such as the Hubble, can observe UV light from these M Dwarfs, time on space telescopes is limited and competitive.

A number of instruments that will observe these targets are in the works, including the James Webb Space Telescope, but in the meantime, finding a way to characterize the ultraviolet spectrum of stars through other methods is essential.

This is where the work of the MUSCLES Treasury Survey comes in. MUSCLES stands for "Measuring Ultraviolet Spectral Characteristics of Low-mass Stars with Exoplanetary Systems" and is a collaboration between many universities and research organizations across the world.

MUSCLES seeks to identify a mathematical relationship between a star's emission in visible and ultraviolet wavelengths. To achieve this, the collaboration looks at one M Dwarf target at a time, measuring the flux of different ultraviolet spectral lines, each line corresponding to a different element present in the star.

We then compare this information to measurements of several spectral lines in the visible wavelength range, fitting a model to the data.

As methods of detecting exoplanets improve, astronomers will shift toward studying the planets orbiting stars more similar to our own. But now, in our ongoing search for stellar systems compatible with life as we know it on Earth, we cannot forget about our coolest stellar neighbors, the M Dwarfs.

UPCOMING EVENTS



PAC Meeting

September 10th, 7:00PM
Location is at the Butterworth Center
Business Meeting

Constellation Report: Wayland Bauer

Presentations: Smorgasbord of Short Presentations (let Dino know if you have a presentation)



- **September 7– 9th, 2018** Eastern Iowa Star Party (QCAS at Menke Observatory) Contact Jeff Struve for Information
- **September 10th, 2018** PAC (business) meeting at Butterworth center at 7:00 p.m. Constellation report: Wayland Bauer ; Presentation: Smorgasbord of Short Presentations
- **September 15th, 2018** Niabi Zoo Outreach. Featuring Venus, Jupiter, Saturn, Mars, Neptune and 1st quarter Moon. Sagittarius and Scorpio high in the south.
- **October 6th, 2018** Rock Island 30/31 Branch Library - 7:30 pm - 9:00 pm
- **October 13, 2018** Eldridge Library 6:30 p.m.. "Constellations & Cocoa". Star Lab, Indoor Planetarium Shows, Night Sky Presentation, and Viewing.
- **October 20th, 2018** Niabi Observing Night. Featuring 3/4 Moon, Mars, Saturn, Uranus, Neptune
- **October 27th, 2018** Annual Club Banquet - Butterworth Center - This is the meeting for October! Speaker is Roy Wolfe,
- **November 12th, 2018** PAC regular meeting at Butterworth center at 7:00 p.m. Constellation Report: Roberta Wright; Presentation: Al Sheidler
- **November 16th, 2018** Family Fun Night at the Putnam. Starts at 5:00 to 8:00 p.m. .
- **November 17th, 2018** Niabi Observing Night. Featuring 1st quarter Moon
- **December 10th, 2018** PAC (business) meeting at the Butterworth center at 7:00 p.m. Constellation Report: Jan Gustafson; Presentation: Roy Gustafson
- **January 14th, 2019** PAC regular meeting at Butterworth center at 7:00 p.m.
- **February 11th, 2018** PAC regular meeting at Butterworth center at 7:00 p.m.
- **March 11th, 2018** PAC regular meeting at Butterworth center at 7:00 p.m.
- **March 16th, 2019** WQPT Imagination Station WIU-QC Campus
- **May 3rd-5th, 2019** NCRAL conference – Moline Illinois

(Continued in next column)

Mark your calendars and watch upcoming

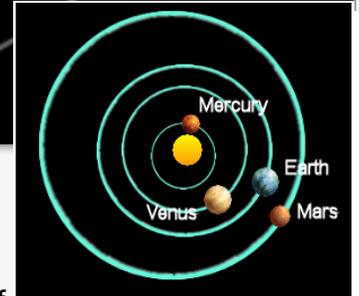
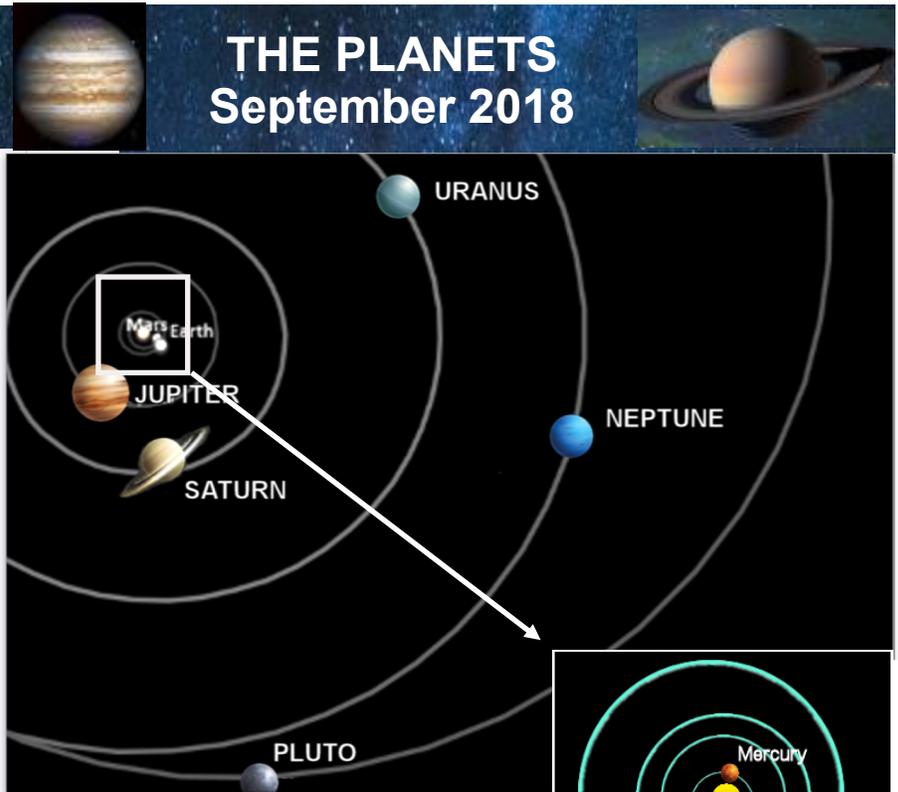


ASTRONOMICAL CALENDAR OF EVENTS

THE PLANETS September 2018

adjusted for Daylight Savings Time

Date	Time	Event
Sep 02	05:00	Mercury at Perihelion
Sep 02	20:34	Aldebaran 1.2°S of Moon
Sep 02	21:37	LAST QUARTER MOON
Sep 06	17:42	Moon at Ascending Node
Sep 06	21:13	Beehive 1.4°N of Moon
Sep 07	12:00	Neptune at Opposition
Sep 07	20:21	Moon at Perigee: 361355 km
Sep 09	13:01	NEW MOON
Sep 13	21:21	Jupiter 4.4°S of Moon
Sep 16	07:00	Mars at Perihelion
Sep 16	18:15	FIRST QUARTER MOON
Sep 17	11:46	Saturn 2.1°S of Moon
Sep 19	19:54	Moon at Apogee: 404875 km
Sep 20	01:38	Mars 4.8°S of Moon
Sep 20	04:30	Moon at Descending Node
Sep 20	21:00	Mercury at Superior Conjunction
Sep 22	20:54	Autumnal Equinox
Sep 24	21:52	FULL MOON
Sep 30	02:06	Aldebaran 1.4°S of Moon
Oct 02	04:45	LAST QUARTER MOON
Oct 03	22:10	Moon at Ascending Node
Oct 04	04:51	Beehive 1.3°N of Moon
Oct 05	16:58	Regulus 1.8°S of Moon
Oct 05	17:29	Moon at Perigee: 366396 km
Oct 09	21:47	NEW MOON
Oct 11	16:21	Jupiter 4.1°S of Moon
Oct 14	22:01	Saturn 1.8°S of Moon
Oct 15	22:00	Mercury 6.2° of Venus
Oct 16	13:02	FIRST QUARTER MOON
Oct 17	07:03	Moon at Descending Node
Oct 17	14:16	Moon at Apogee: 404227 km
Oct 18	08:01	Mars 1.9°S of Moon
Oct 21	12:00	Orionid Meteor Shower
Oct 23	20:00	Uranus at Opposition
Oct 24	11:45	FULL MOON
Oct 26	27 08	Venus at Inferior Conjunction
Oct 27	08:04	Aldebaran 1.6°S of Moon
Oct 29	01:00	Mercury 3.1° of Jupiter
Oct 30	22:46	Moon at Ascending Node
Oct 31	10:24	Beehive 1.0°N of Moon
Oct 31	11:40	LAST QUARTER MOON
Oct 31	15:05	Moon at Perigee: 370201 km



Sun is in Leo on Sept 1st

Mercury (in Leo) starts off Sept 1st in the morning sky. It is about 16° off the eastern horizon at sunrise. It is 66% illuminated. It is mag. -.87 with a disk of 6.3". By the 30th, it has swung back to evening sky, less than 4° off the western horizon at sunset.

Venus (in Virgo) on Sept 1st, is about 15° off the SW horizon at sunset. It is 1° from Virgo. It is mag.-4.62 with a disk of 29.6"; illuminated: 39.7%. By the 30th, it is less than 7° off the SW horizon at sunset but brightens to -4.76 with a disk of 46.2° and an illumination of only 17.3%. This is a good opportunity to see a crescent Venus if you have a clear western horizon.

Mars (in Capricorn) on Sept 1st is on the meridian at 10:26 p.m. It is beginning to go retrograde. With a mag.-2.08 with a disk of 20.7", it is really starting to pull away from the Earth because by the 30th, it is mag.-1.31 with a disk of 15.8". Probably last good month for viewing.

Jupiter (in Libra) on Sept. 1st, is high in the SW at sunset. 20° NE of Venus, it is mag.-1.92 with a disk of 34.7". By the 30th, it is about 12° from Venus at sunset, 18° off the SW horizon.

Saturn (in Sagittarius) on Sept 1st, is 25° off the southern meridian at 8:29 p.m. It is mag. .37 with a disk of 17.3" (with rings, 40.2")

Uranus (in Aries) on Sept 1st, is on the southern meridian at 4:21 a.m.. It is mag. 5.73 and a disk of 3.7"

Neptune (in Aquarius) on Sept. 1st. It is on the southern meridian at 1:28 a.m. It is mag. 7.82 and has a 2.4" disk.

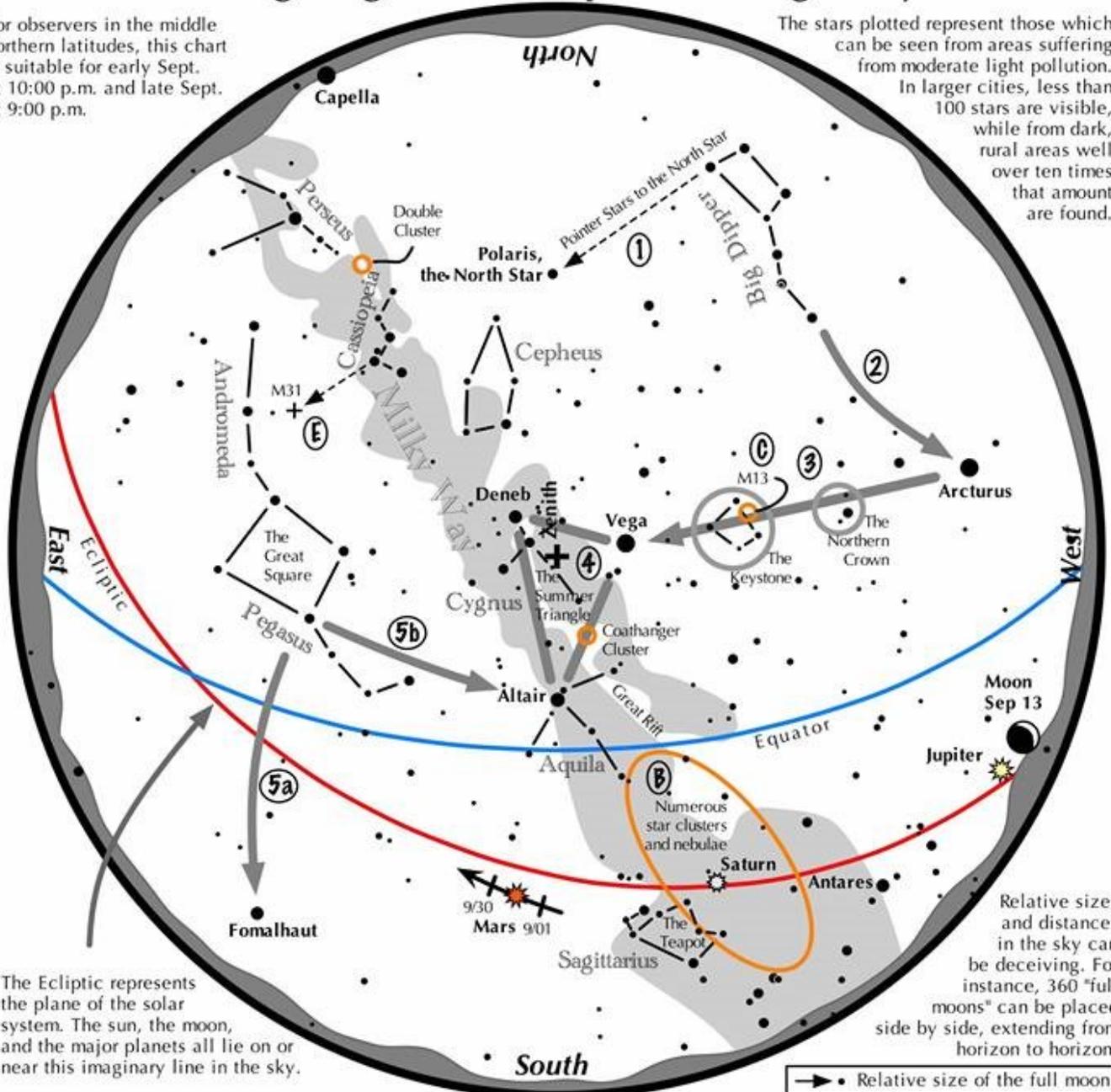
Pluto (in Sagittarius) on Sept. 1st. It is about 12° west of Mars. It is mag. 14.22

Vesta (in Ophiuchus) on Sept. 1st. It is about 7° SW of Saturn. It is mag. 6.99

Navigating the mid September Night Sky

For observers in the middle northern latitudes, this chart is suitable for early Sept. at 10:00 p.m. and late Sept. at 9:00 p.m.

The stars plotted represent those which can be seen from areas suffering from moderate light pollution. In larger cities, less than 100 stars are visible, while from dark, rural areas well over ten times that amount are found.



The Ecliptic represents the plane of the solar system. The sun, the moon, and the major planets all lie on or near this imaginary line in the sky.

Relative sizes and distances in the sky can be deceiving. For instance, 360 "full moons" can be placed side by side, extending from horizon to horizon.

→ • Relative size of the full moon.

Navigating the mid September night sky: Simply start with what you know or with what you can easily find.

- 1 Extend a line north from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
- 2 Follow the arc of the Dipper's handle. It intersects Arcturus, the brightest star in the September evening sky.
- 3 Nearly overhead shines a star of similar brightness as Arcturus, Vega. Draw a line from Arcturus to Vega. It first meets "The Northern Crown," then the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.
- 4 The stars of the summer triangle, Vega, Altair, and Deneb, shine overhead.
- 5 The westernmost two stars of the Great Square, which lies high in the east, point south to Fomalhaut. The southernmost two stars point west to Altair.

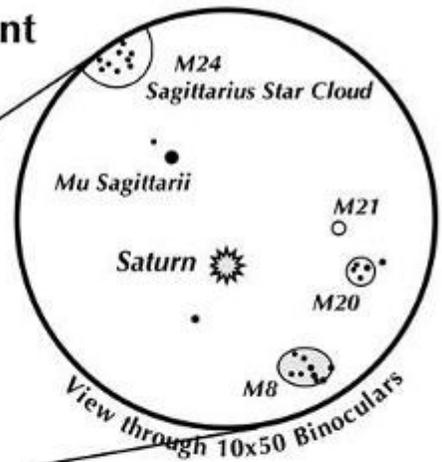
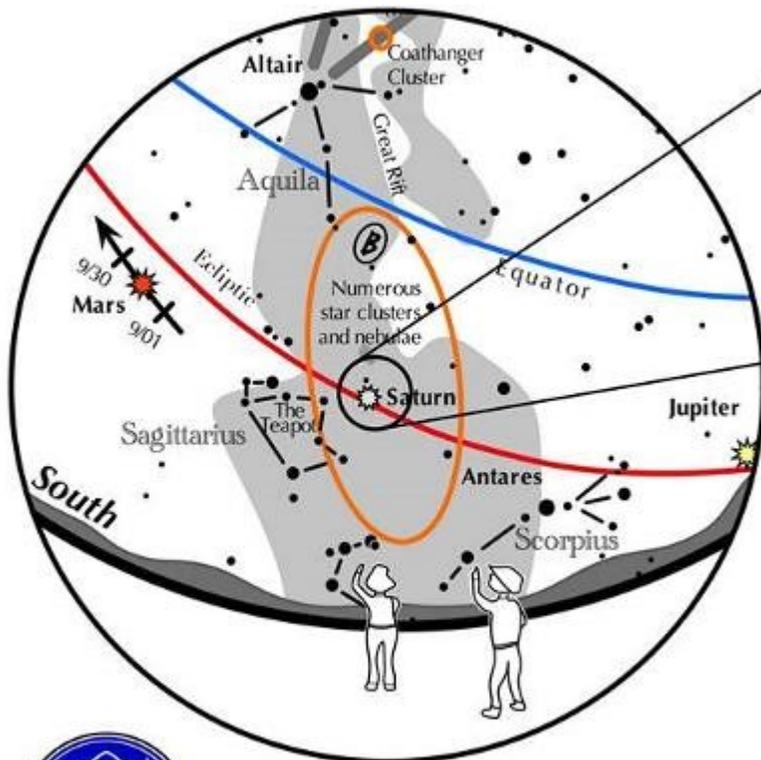
Binocular Highlights

- A: On the western side of the Keystone glows the Great Hercules Cluster.
- B: Between the bright stars Antares and Altair, hides an area containing many star clusters and nebulae.
- C: 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars outlining a coathanger.
- D: Sweep along the Milky Way for an astounding number of faint glows and dark bays, including the Great Rift.
- E: The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval.



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If you can observe only one evening celestial event this month, consider this one:



Saturn reveals celestial treasures

Look to the south-southwest 75-90 minutes after sunset.

- Before the moon brightens significantly after September 13, look for Saturn low in the south-southwest. It will be the brightest star-like object in the area, and will lie about 40% between bright red Mars in the southeast and Jupiter low in the southwest.
- Use binoculars to view Saturn. In the lower right of the field will be a nebulous star forming nebula and cluster, M8, nicknamed "the Lagoon Nebula" (4100 L-Y distant). On the field's right side will dimly glow another star forming nebula and cluster, M20, also called "the Trifid Nebula" (5200 L-Y distant). Just above M20 twinkles the star cluster M21.
- To the upper left of Saturn is the very large Sagittarius Star Cloud, M24, forming the 'steam' rising out of the Teapot of Sagittarius.



**South-southwest
75 minutes after sunset
before Sept. 13.**





This article is provided by NASA Space Place.

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A Trip Through the Milky Way

By Jane Houston Jones and Jessica Stoller-Conrad

Feeling like you missed out on planning a last vacation of summer? Don't worry—you can still take a late summertime road trip along the Milky Way!

The waning days of summer are upon us, and that means the Sun is setting earlier now. These earlier sunsets reveal a starry sky bisected by the Milky Way. Want to see this view of our home galaxy? Head out to your favorite dark sky getaway or to the darkest city park or urban open space you can find.

While you're out there waiting for a peek at the Milky Way, you'll also have a great view of the planets in our solar system. Keep an eye out right after sunset and you can catch a look at Venus. If you have binoculars or a telescope, you'll see Venus's phase change dramatically during September—from nearly half phase to a larger, thinner crescent.

Jupiter, Saturn and reddish Mars are next in the sky, as they continue their brilliant appearances this month. To see them, look southwest after sunset. If you're in a dark sky and you look above and below Saturn, you can't miss the summer Milky Way spanning the sky from southwest to northeast.

You can also use the summer constellations to help you trace a path across the Milky Way. For example, there's Sagittarius, where stars and some brighter clumps appear as steam from a teapot. Then there is Aquila, where the Eagle's bright Star Altair combined with Cygnus's Deneb and Lyra's Vega mark what's called the "summer triangle." The familiar W-shaped constellation Cassiopeia completes the constellation trail through the summer Milky Way. Binoculars will reveal double stars, clusters and nebulae all along the Milky Way.

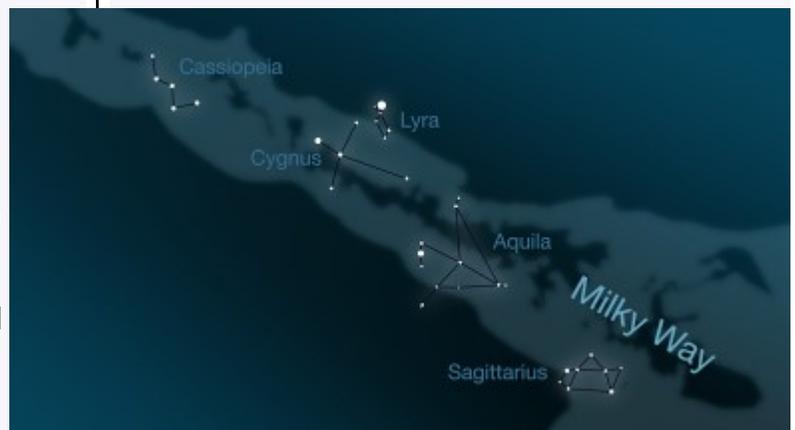
(Continued in next column)

Between Sept. 12 and 20, watch the Moon pass from near Venus, above Jupiter, to the left of Saturn and finally above Mars!

This month, both Neptune and brighter Uranus can also be spotted with some help from a telescope. To see them, look in the southeastern sky at 1 a.m. or later. If you stay awake, you can also find Mercury just above Earth's eastern horizon shortly before sunrise. Use the Moon as a guide on Sept. 7 and 8.

Although there are no major meteor showers in September, cometary dust appears in another late summer sight, the morning zodiacal light. Zodiacal light looks like a cone of soft light in the night sky. It is produced when sunlight is scattered by dust in our solar system. Try looking for it in the east right before sunrise on the moonless mornings of Sept. 8 through Sept 23.

You can catch up on all of NASA's current—and future—missions at www.nasa.gov



Caption: This illustration shows how the summer constellations trace a path across the Milky Way. To get the best views, head out to the darkest sky you can find. Credit: NASA/JPL-Caltech

Watch 2 meteors hit the moon!

August 2nd, 2018

CLICK HERE for
link to News Article



Astronomers discover a free-range planet with incredible magnetism

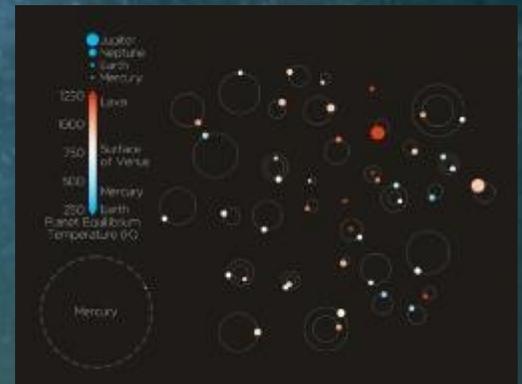
August 3rd, 2018

CLICK HERE for
link to News Article

Largest haul of extrasolar planets

August 7th, 2018

CLICK HERE for
link to News Article



Oldest-ever igneous meteorite contains clues to planet building block



August 3rd, 2018

CLICK HERE for
link to News Article

MEMBER OBSERVATIONS

(written, visual or photographic welcome)



Photo taken on August 1st by Terry Dufek
Conditions were not great and all the planets were low in the sky



Photo (right) shows that the dust storms were starting to diminish by August 12th, 2018. The polar cap is plainly visible and what is left of the dust storm has reduced in size to a small patch in the upper right.
(photo by Terry Dufek)



Mars
08.12.2018
10:06 pm
FireCapture v2.5 Settings

Camera=ZWO ASI120MC
Diameter=23.62"
Magnitude=-2.57
CM=323.4° (during mid of capture)
FocalLength=1950mm
Duration=240.013s
Frames captured=9876
Binning=no
FPS (avg.)=41
Shutter=17.66ms
Gain=21 (21%)
Brightness=17



MEMBER OBSERVATIONS

A Report of photographing the Perseids

August 11, 2018 -- This was my first attempt at photographing meteors, using a DSLR, on a tripod, a fisheye lens, and a timer remote controller.

Images were acquired on August 11, 2018, at the PAC picnic & Perseid meteor watch. Times are Central Daylight Time, 24-hour time, format: T= hours:minutes:seconds

IMG_7425 T= 18:56:16" (pictured) was taken during daylight. 1/80 sec, f/4, ISO 100 – sky is overexposed. As you can see, sky coverage is complete, with the horizon at the edge of the round image, and the zenith at the center. **N is at the bottom, E is right, S is top, & W is left.** The small dark trapezoidal thing sticking into the bottom edge of the image is the end of one of the handles of the tripod head.

Canon EOS 50D DSLR, All of the night exposures are 30 sec. @ ISO 2000 Lensbaby 5.8 mm Circular Fisheye Lens @ f/4 Canon Timer Remote Controller TC-80N3 start new exposure every 33 seconds

Unfortunately, the camera battery gave out after about only 40 minutes. The battery was fully charged. I don't know if the battery is too old, or if I need to use some sort of external power supply for a long series of time exposures in the future.

IMG_7456 T=21:25:21 Faint streak NE, directly from 1/3 of the way above the horizon to 2/3 of the way to the zenith. This must be a satellite, because the image extends into the next two frames – so the streak is roughly 60 seconds long.

IMG_7457 T= 21:25:54 Streak is brighter, and continues through the zenith.

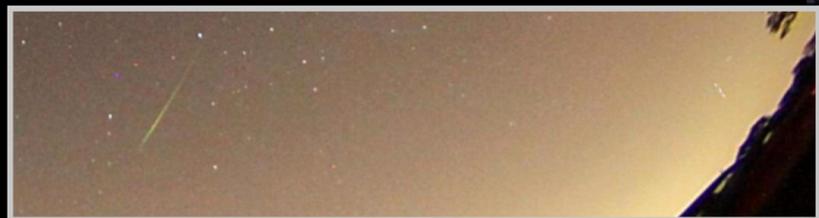
IMG_7458 T=21:26:27 Streak is fainter, continuing toward the SW horizon.

IMG_7464 T= 21:29:45 (pictured) Fairly short bright streak NNE, about 40% of the way from the edge to the center of the image. Streak points NW-SE, aiming at N horizon. **I THINK THIS IS A METEOR TRAIL.**

IMG_7484 T= 21:40:45 Very faint long streak ENE about 60% of the way from the edge to the center of the image. Streak points NNW-SSE. This must be a satellite, because the image extends about 15 seconds into this frame, and about 15 seconds into the next frame, for a total of about 30 seconds. (The gap between the streaks in the two images corresponds to 3 seconds, and the length of the streaks in the two images are about 5 times the length of the gap.) **IMG_7485 T= 21:41:18** The streak continues northward.

At around T= 22:20:00 I noticed that the lens was fogged up with a coating of dew. I might need to do something to prevent dew in the future.

~ Gerald Pearson, 13 August 2018



MEMBER OBSERVATIONS

(written, visual or photographic welcome)



Attached are pictures that I was able to capture last night, (August 11th) at the viewing at the QCAS Meteor Shower at Pleasant Valley Junior High School.



I was trying to include the Milky Way in the shots, but there was too much light pollution to pull out a lot of the distinct detail of the Milky Way.

Mike Ombrello

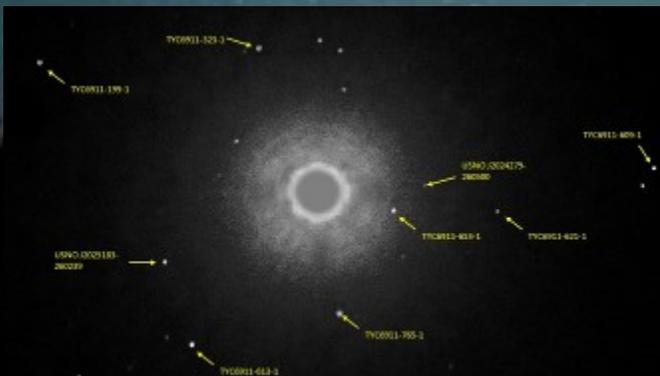
Paul Castle Observing Sessions

Paul Castle August 1, 2018

An observing session was held on August 1st at Paul Castle. After looking at a questionable weather situation, it was decided that we could at least have observing of planets and the clouds would clear out until after 10:30 p.m. Chris Griffin, Mike Mack, Dale Hachtel, Al Sheidler and Terry Dufek brought telescopes. Other members attending were John Douglas, Mike and Wanda Gacioch along with guests, Eva Griffin and Liz Sierra, and Frank Stonestreet. This was a record number of members and guests at Paul Castle for the year. Venus was showing a less than half phase. Jupiter was high in the south at dusk. It had no red spot showing, however its four moons were visible. Terry did imaging of the four planets. Al was trying to get an image of Mars moons, Phobos and Deimos but was lost in Mars glares. Chris did viewing of Jupiter also. We wrapped up around 11:30 p.m. as clouds were filling the sky and a very red last quarter moon was rising in the east.



Here are my pictures from last night at our planetary observing session at the Paul Castle Observatory. I got one of my videos of Mars to stack well enough to provide a not-too-bad image of Mars. The attempt at finding Phobos and Deimos I'm afraid was a failure. These moons would be visible were it not for the excessive brightness of the planet. I included a slide from Starry Night which shows the exact star field I had in the image I took which you can verify for yourself by comparing the pictures. The Martian moons are buried in the glare of the planet. Oh well! It was still a highly successful observing session and I really enjoyed it! Thanks. Al.





2018 PICNIC

Here are some pictures from the annual PAC picnic last evening. It was really a great time-- the camaraderie and the food was great. Thanks to Wayland and Anne for bringing a cake and allowing us to help them celebrate their 51st anniversary. The weather was clear and warm and perfect for observing. Using the observatory's 6" refractor, we also got some nice views of Mars which displayed some darker features as well as a polar ice cap. A number of Perseid meteors were seen as well as an Iridium flare which evoked some gleeful exclamations. We also gave Terry his richly deserved Mabel Sterns Newsletter Editor Award. Thanks to everyone for coming out and sharing in this great event. Al.



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2018 PICNIC



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2018 PICNIC



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2018 PICNIC

