



Reflections

The Newsletter of the Popular Astronomy Club

ESTABLISHED 1936



August 2020

President's Corner August 2020



Alan Sheidler

Welcome to another edition of "Reflections", the Popular Astronomy Club's monthly newsletter.

As I am writing this article, I just received a draft of the August edition. Amazingly, the August issue has more than 50 pages. Not only

is this a testament to the hard work of our newsletter editor, Terry Dufek, it is also an indication of an active and enthusiastic club. In the midst of the Covid-19 pandemic, the club has continued to focus on refurbishing the Paul Castle Observatory and conduct of club observing sessions. A number of us have completed the NCRAL Messier Seasonal Mini Marathons and pursued observing of Comet NEOWISE and the planets Jupiter and Saturn, all of which have been simply outstanding objects this summer. All of this club activity has captured the attention of NCRAL leadership. Carl Wenning asked me to write an article about what motivates people to be involved in PAC's club activities. So here is my attempt to jot down some thoughts.

PAC is indeed active, but contrary to what has been suggested, I doubt, as president, that I can take a lot of the credit for the club's success. Basically what I do as president is make suggestions, encourage people and then let things happen. This is what is happening with our observatory update project. Having a competent and enthusiastic observatory director (Rusty Case) is also a huge advantage. But everybody is pitching in and helping with it. Even folks that typically don't come to club meetings or observing sessions have stepped up to work on the observatory. It has also been refreshing to have the Holt boys (Alex and Hugh) working on the observatory, driving screws, running power tools, hammering nails, and just being involved proves there's more to astronomy than "meets the eye" if you know what I mean?

(Continued in next column)

I suppose one thing which I believe has helped encourage folks to participate is acknowledgment of participation. Every time the club gets together, we have a group photo. People love to be photographed and identified in the group. They think it's funny too when I set my camera on a timer, push the shutter release button and then run to get in with the group before the camera takes the picture. They love it too when you show them photographed by their scope. Our club's newsletter is an outstanding tool for recognizing members, to highlight activities and show off their astrophotography.

As I am writing, I realize that acknowledgment is very important. Folks love the NCRAL Messier observing program, I think, because it is an opportunity to get recognized officially for having done something. These mini-marathons are pretty easy to do too, which I think is critical to getting folks involved with observing. Because the use of a GOTO scope is allowed, many folks are able to find the objects, many of which are difficult to discern in today's light polluted skies. I think this is a great program. I encourage everyone to get involved in doing one or more of these seasonal mini-marathons. You won't regret it.

At observing sessions, the emphasis should be fun and enjoyment. PAC observing sessions are a lot of fun. I really look forward to them. There's a lot of joking around. Everyone is a "doctor" or a "professor" of something (whether or not they really are or not). This is a way of highlighting whatever it might be that the person is doing or observing at the time.

We also have a mix of visual observers and imagers at our club sessions. The visual guys are always inviting folks to come over and look in the eyepiece. The imaging guys are actually doing this too though--they want folks to come over and look on their laptops at the object they have on the screen. A couple of us have large flat screen monitors upon which we show live views of Jupiter, Saturn, etc., and time exposure images of deep sky objects. Everyone gathers round to see what's on

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the monitors and laptops. We started doing this "TV screen" observing thinking we would do it during our public outreach sessions so that visitors could social distance more easily. But, as we have become proficient with it, we have found this is a great way to do astronomy. Of course, this flies in the face of the traditional conduct at observing sessions (dark adaption is not possible if you are staring at monitors, for example). But the jocularity, spontaneity and enthusiasm during these observing sessions is contagious and exemplifies enjoyable, casual conduct during a "star party".

I think the key is keeping things fun, simple, and low key. I am very jealous of some of the results I have seen by high-end astrometers. However, I realize these results demand a lot of effort and technical competence. During one of the recent club sessions, Paul Saeger, Byron Davies and Terry Dufek set up their imaging equipment at the Castle Observatory. I was very impressed with the images they were developing of M8, the Lagoon Nebula. These guys are doing excellent work and today while I was attempting to finish this column, I was getting barraged by emails from them with their images of M8. I call it the "Lagoon Shootout". It is difficult to say who has the "best" image. If these images are here in this newsletter, I will let you decide for yourself who did the "best job". But I think this is an art form of sorts. I love it when folks figure out a new way to observe an object and then proudly show off what they have been able to do with it. This is inspirational stuff. I am now inspired to go out now and see if I can do it too. This stuff is contagious! Never lose that magic!

There is something in this hobby for everyone. Just realize we are all indulging ourselves in different ways and for different reasons. Astronomy is a way for everyone to learn about science and admire the beauty of the universe. We all have different ways of doing that. Each club has a unique set of members with diverse experience and expertise. The challenge for club leadership is to divine their member's talents, desires and enthusiasm and then to encourage them to pursue their passions. Keep looking up!

Al Sheidler

ANNOUNCEMENTS / INFO



NCRAL Seasonal Messier Marathon Program

NCRAL's Seasonal Messier Marathon observing program is NOT designed to qualify observers for the Astro-nomical League's Messier Observing program; the two programs are unrelated and observing requirements are quite different. In the NCRAL program, the main requirement is to quickly observe and essentially check off items from one of four seasonal lists of Messier objects as noted in the section to follow.

NCRAL recognition will consist a suitable printed certificate and a 3/4-inch enameled star pin (a different color for each season). There will be no direct cost to the membership for participating in the award program; the cost of the program (pins, certificates, mailers, postage) will be borne by the Region as a benefit of affiliation. Relevant program documents are linked below

[NCRAL Seasonal Messier Marathon Program Rules](#)

[NCRAL WINTER Seasonal Messier List](#)

[NCRAL SPRING Seasonal Messier List](#)

[NCRAL SUMMER Seasonal Messier List](#)

[NCRAL AUTUMN Seasonal Messier List](#)

meteoblue
weather ✨ close to you



Popular Astronomy Club Officers



PRESIDENT - Alan Sheidler
3528 56th Street Court, Moline,
IL, 61265
Phone: (309) 797-3120

VICE PRESIDENT - Dino Milani
2317 29 1/2 Street, Rock Island,
IL, 61201
Phone: (309) 269-4735

SECRETARY - Terry Dufek
2812 W. 65th Street, Davenport,
IA, 52806 Phone: (563) 386-3509

TREASURER - Dale Hachtel
1617 Elm Shore Drive, Port Byron
IL, 61275
Phone: (614) 935-5748

ALCOR - Roy E. Gustafson
11 Deer Run Road, Orion, IL,
61273
Phone: (309) 526-3592

DIRECTOR OF OBSERVATORIES -
Rusty Case
2123 W. 16th Street, Davenport,
IA, 52804
Phone: (563) 349-2444

PAST PRESIDENT -
Wayland Bauer
3256 Pleasant Drive, Bettendorf,
IA., 52722
Phone: (563) 332-4032

NEWSLETTER EDITOR -
Terry Dufek
2812 W. 65th Street, Davenport,
IA, 52806
Phone: (563) 386-3509

Contact for Information
or questions here:
[popularastronomy-
club@gmail.com](mailto:popularastronomy-club@gmail.com)

ANNOUNCEMENTS / INFO

LOOKING FOR OLDER ISSUES OF REFLECTIONS NEWSLETTER?



HISTORY OF PAC?



Popular Astronomy Club on Facebook?



Astronomical League Observing Programs

The Astronomical League provides many different Observing Programs. These Observing Programs are designed to provide a direction for your observations and to provide a goal. The Observing Programs have certificates and pins to recognize the observers' accomplishments and for demonstrating their observing skills with a variety of instruments and objects



Welcome Back

John Schaub
And

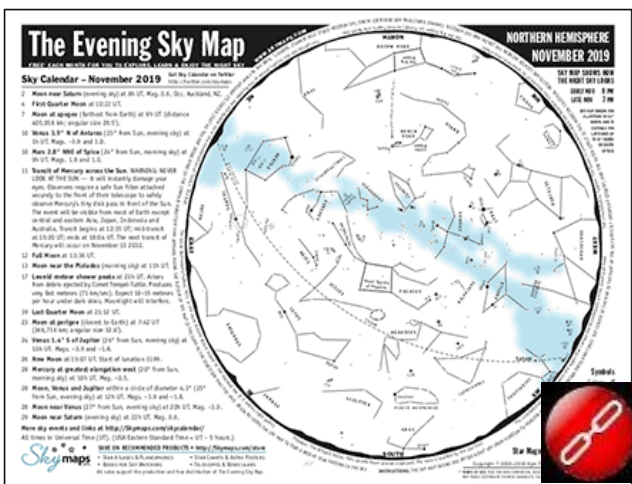
Welcome

NEW MEMBER

Paul Saeger



Check out the Astronomical League **ONLINE!**



**Check out
the North
Central
Region
of the
Astronomical
League
(NCRAL)
online**



CONTRIBUTIONS



Alex Vukasin ▸ Astrophotography for Beginners

1 hr · 🌐

Millennial Astronomers...



👍👍 99

**BBC's
The Sky At
Night**

**A Matter of
Life and
Death**



Steve Fearn ▸ Astrophotography for Beginners

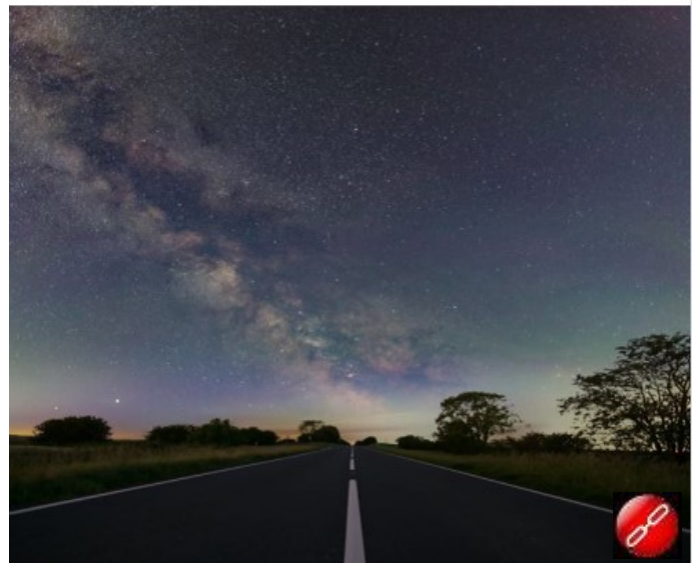
5 hrs · 🌐

Ermine Street, Lincolnshire. 18/6/20

Nikon D5300, Tokina 11-16mm, Omegon Mini Track, Hoya Red Intensifier.

Sky 5x120secs, Iso 400, f2.8 2 panels at 16mm.

Foreground 60secs Iso 800, f2.8.



Steve Fearn

12 mins · 🌐

MERCURY'S TAIL

Comet or ...? On May 27, 2020, Andrea Alessandrini used a small, 2.6-inch refracting telescope equipped with a special filter to take this remarkable photo of the planet Mercury and its glowing tail of sodium. His exposure lasted 7½ minutes at an ISO of 1000. This is one of three successful attempts to photograph the tail. Andrea Alessandrini



CONTRIBUTIONS



Astronomy is 🤖 feeling funny.
2 hrs · 🌐



Credits: StarToons



Contributed by Byron Davies



One of the most massive stars in local universe may have disappeared



*Last Year's Total Solar Eclipse on Earth,
Seen From the Moon*

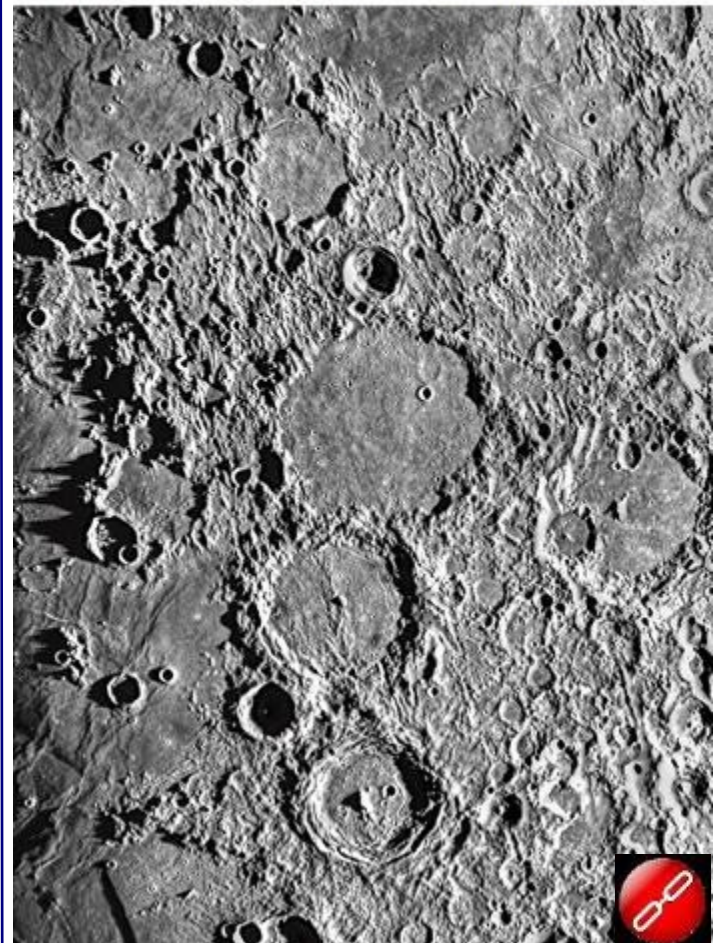


Roberto Paletta ▸ AAP - Moon observing and imaging group

Yesterday at 5:21 AM · 🌐

I reprocessed this old image, accentuating the contrasts and shadow areas close to the terminator, to highlight some structures and in particular the region near the Rupes Recta and the rima Birt where there are two volcanic domes.

Taken with refractor Tec140 @ f/18 and ccd PGR Chameleon



CONTRIBUTIONS



*Some **You Tube** videos for you to view while being home bound*

Astrophotography Cameras in 2020.
What's the Best Choice?



The Story behind Robert Burnham Jr -
America's Forgotten Astronomer



BBC The Sky at Night 2020
Here Comes The Sun



NASA's TESS Delivers Insights into
an Ultra hot World



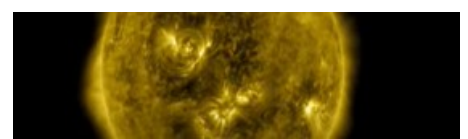
First images from ESA's Solar Orbiter



7 Astrophotography MISTAKES
Beginners Make



Time-Lapse Video Reveals 10 Years of the
Sun's Life Crushed into One Stellar Hour



AI Upscales Apollo Lunar Footage
to 60 FPS



Comet NEOWISE Live Stream from Lowell
Observatory



Comet NEOWISE



Comet NEOWISE is a retrograde comet with a near-parabolic orbit discovered on March 27, 2020, by astronomers using the NEOWISE space telescope. It was classified as a comet on March 31 and named after NEOWISE on April 1. It has the systematic designation C/2020 F3. At that time, it was a 10th-magnitude comet, located 2 AU (300 million km; 190 million away from the Sun and 1.7 AU (250 million km; 160 million mi) away from Earth. By July 2020, it was bright enough to be visible to the naked eye. It is one of the brightest visible to observers in the northern hemisphere since Comet Hale–Bopp in 1997. Under dark skies, it can be clearly seen with the naked eye^[4] and might remain visible to the naked eye throughout most of July 2020. For observers in the northern hemisphere, in the morning, the comet appears low above the north-eastern horizon, below Capella. In the evening, the comet can be seen low in the north-western sky. The comet can be seen in the morning and evening because it is circumpolar from about latitude 45N. In the second half of July 2020, Comet NEOWISE will enter the constellation of Ursa Major on July 17, below the asterism of the Big Dipper (The Plough). The comet is currently about magnitude 2.9.

Comet NEOWISE made its closest approach to the

(Continued in next column)

Sun (perihelion) on July 3, 2020, at 0.29 AU (43 million km; 27 million mi). This passage increases the comet's orbital period from about 4500 years to about 6800 years. Its closest approach to Earth will occur on July 23, 2020, 01:14 UT, at a distance of 0.69 AU (103 million km; 64 million mi) while located in the constellation of Ursa Major.

By early July, Comet NEOWISE had brightened to magnitude -1 and had developed a second tail. The first tail is blue and made of gas and ions. There is also a red separation in the tail caused by high amounts of sodium. The second tail is a golden color and is made of dust. The comet brightened from a magnitude of about 8 at the beginning of June to -2 in early July. This would make it brighter than Hale Bopp. However, as it was extremely near to the Sun, it was reported as 0 or $+1$ magnitude and remained that bright for only a few days. After perihelion, the comet began to fade at about the same rate as it had previously brightened.

From the infrared signature it is estimated that the diameter of the comet nucleus to be approximately 5 km (3 mi). By July 5, NASA's Parker Solar Probe had captured an image of the comet, from which astronomers also estimated the diameter of the comet nucleus at approximately 5 km.



Petr Horálek ▸ Astrophotography/ Amateur Astronomy Enthusiasts

Just now · 🌐

Well known comet observer Gary W. Kronk recently said: "I have observed and/or photographed over 300 comets since 1973 and this comet is now the fourth best I have ever seen. Beautiful." After this morning, July 12th, when comet rose over Suchý Vrch mount, Czech Republic, I can only be thrilled that I didn't miss this rarity!



Comet NEOWISE



Tom Masterson » Astrophotography/ Amateur Astronomy Enthusiasts
17 hrs · 🌐

Comet C/2020 F3 NEOWISE Puts on a Spectacular Show

Full Res: <https://i.imgur.com/2jY5Bj>

Comet C/2020 F3 NEOWISE is the most spectacular comet to grace Northern Hemisphere skies in decades. This image, taken from Mount Wilson in California on July 10, shows a clearly defined ion tail (blue) to complement its brighter dust tail (yellow).

Date: 7/10/2020 PDT 4:16-4:22am PDT
Canon 6D Hutech Mod William Optics Star 71 Astrograph 4x120sec @1600ISO

CLEAR SKIES



Transient Astronomer

18 hrs · 🌐



Comet C/2020 F3 NEOWISE Puts on a Spectacular Show

Full Res: <https://i.imgur.com/2jY5Bj>

Comet C/2020 F3 NEOWISE is the most spectacular comet to grace Northern H...
See More

Here is a collection of
Comet NEOWISE
photos, our Early July
Surprise comet.



Sylvestre Fonteneau

23 hrs · 🌐

Venus, noctulescents... comet!

Here is my first jet of the comet Neowise, made from Mount Guillaume (2542 m) it was a very difficult night for several reasons that I later saw with other shots.

The one I'm holding back is this one, because it really represents last night up there. I really like the composition, but it's technically missed, it's a four-picture panoramic made at 6 d with a Tamron 70-300 Daft 120 mm of focus, I should have made more picture because we sees the black frames pretty well, it's about the vignetting between each montage... so I'm pretty disappointed with the picture, but it remains pretty overall.

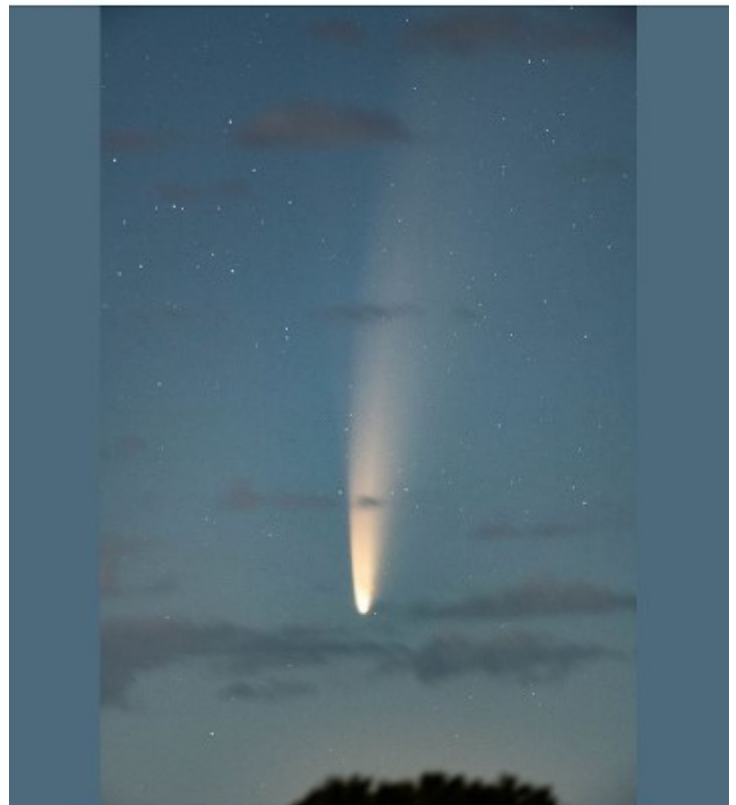
🔗 See original · Rate this translation



Glen Wurden » Amateur Astronomy - Telescope, Binocular and Imaging Forum

1 hr · 🌐

If you look just to the left of the main tail of the comet, I think there is a hint of a second (ion) tail. Nikon Z7 @ ISO1600, 15 second exposure at 4:15 AM, using 580 mm f/5.6 Stellarvue SVQ100 refractor tracking on the comet's orbital elements with iOptron EQ40 mount. — in Los Alamos, New Mexico.



👍❤️👍 61

10 Comments

Comet NEOWISE



Adam Tužňík • ZWO ASI Cameras
23 hrs



Adam Tužňík is 🤔 feeling excited
Yesterday at 9:53 AM

!! ❤️ WOW !!

This is probably the most beautiful photo of a comet I've ever taken in my life! "Morning comet bathed in Silver Clouds".



Fred Espenak
6 hrs

Follow

After missing yesterday morning because of clouds, today July 7 is my 4th day of observing and photographing Comet NEOWISE. In spite of the thin haze along the...

See More



Adam Block • Astrophotography/ Amateur Astronomy Enthusiasts

36 mins •



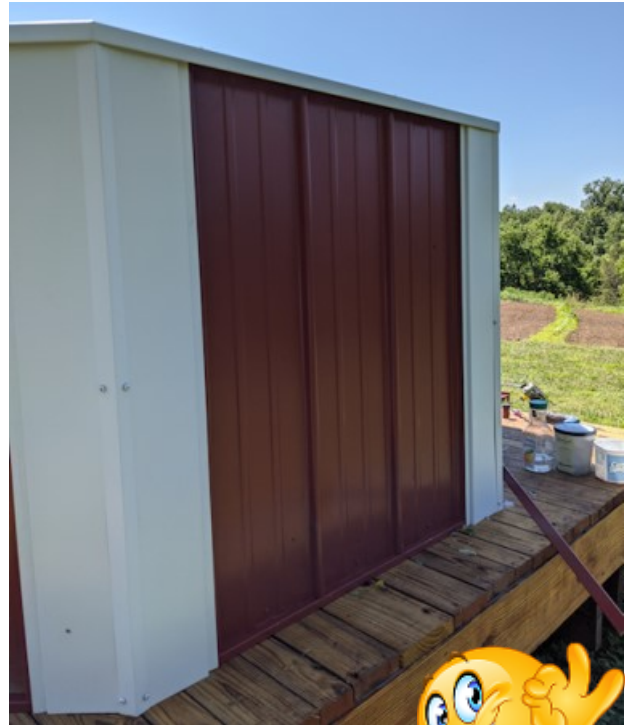
Adam Block
4 hrs

Like Page

THE PAUL CASTLE OBSERVATORY RENEWAL PROJECT

Walls Are Finished!

Reskinning of the observatory walls are finished by July 12th. They now have a nice long lasting metal covering. It looks really sharp! July 20th is the tentative date for putting the dome back into place.



THE PAUL CASTLE OBSERVATORY RENEWAL PROJECT

Dome Reassembled July 20th, 2020

Yesterday, July 20th, the Popular Astronomy Club met at the Paul Castle Observatory to reassemble and install the newly repainted dome. Here are a few pictures from the day's activities. This was a great and productive day. The dome looks better than brand new now. Those in attendance during the course of the day were: Krishna Acharya, Anne Bauer, Wayland Bauer, Rusty Case, Mike Dannenfeldt, John Douglas, Terry Dufek, Dale Hachtel, Alex Holt, Hugh Holt, Mary Holt, Tim Holt, Dino Milani, Ally Nordick, Ben Nordick, Chris Nordick, Gary Nordick, Al Sheidler, and John Weber. Hopefully I didn't forget anyone. Many, many thanks to everyone for coming out and helping to reinstall the dome.

The observatory is entering the final stages of the remodeling project. Next steps are to install the shutter opener, put a lock on the door, and install the telescope. I can hardly wait!

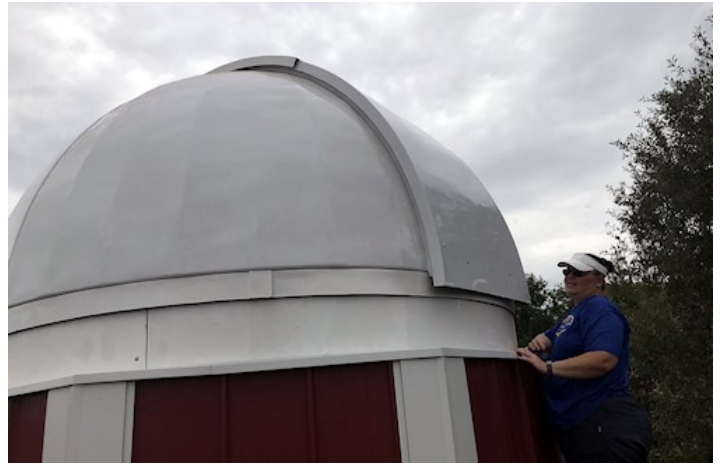
Thanks again for everyone's help on this project.
Al Sheidler.



THE PAUL CASTLE OBSERVATORY RENEWAL PROJECT



THE PAUL CASTLE OBSERVATORY RENEWAL PROJECT





THE PAUL CASTLE OBSERVATORY RENEWAL PROJECT



THE PAUL CASTLE OBSERVATORY RENEWAL PROJECT

*Al,
Thank you so much for
the photos...and please
thank everyone who
helped with the restora-
tion. It looks better than
new! What a LOT of work!
Best of luck as you use
it!!!
Marrietta Castle*

Dome Closer Installed

July 24th, 2020

On July 24th, the dome opener/closer was installed on the dome of the Paul Castle observatory. Al Sheidler, Rusty Case, Dale Hachtel and Terry Dufek worked on the project. The instructions were a little confusing but eventually it was installed and it worked. A couple of parts (that don't affect opening and closing) could not be put on and Rusty is working on a part that can complete the installation. Apparently our dome has had some updates over the years and a work around had to be developed.

More installations

July 26th, 2020

Rusty has installed the power supply for the telescope and performed more work on the shutter opener/closer. Planned installation of the telescope is August 1st.



Photo above was taken towards the end of dome installation day



photo shows the group that installed the dome closer and Rusty Case receiving 2 Messier Marathon Rewards.

ASTRONOMY IN PRINT

It's a bird, it's a plane, it's a...

By Jeff Struve

Comet – A mass of ice, rock and dust which often has a tail. The tail is made up of water vapor, dust and various gases which vaporize and grows as it gets closer to the sun.

Asteroid – A body made up of metallic and non-metallic rock orbiting the Sun and usually in the asteroid belt between Mars and Jupiter.

Meteoroid – Often an asteroid fragment that although orbiting the sun, will make its way to entering Earth's atmosphere.

Meteor – When a meteoroid enters the Earth's atmosphere, it becomes a meteor. As it travels through the atmosphere, it burns up, producing a streak of light. We commonly call these, Shooting Stars..

Fireball – A rare event where a meteor explodes as it travels through Earth's atmosphere, leaving behind a very bright streak of light.

Meteorite – When a meteor traveling through Earth's atmosphere does not completely burn up and strikes the ground, we call the fragment a meteorite.

Yikes! Will the Earth get struck?

Not to worry! Meteors are generally quite small, ranging from dust particles and rarely to boulder size. They are almost always small enough to quickly burn up in our atmosphere, and boulder size ones substantially reduce in size before hitting the ground and then becoming a meteorite.

How are meteors made?

When a comet gets closer to the sun, some of its surface vaporizes, releasing lots of ice, dust and rock particles. These particles follow along the comet's path, and grow in number as the sun's heat boils off more and more ice and debris. Then, as Earth travels around the

sun, its orbit crosses the orbit of the comet and its tail... the particles. When many meteors enter our atmosphere at about the same time we experience a Meteor Shower.

What time of year do meteor shows happen?

January - Quadrantids

April - Lyrids

August - Perseids

October - Orionids

November - Leonids

December - Geminids

Why do the showers have strange names?

Meteor showers are named after the constellation where the meteors appear to be coming from. So, for example, the Orionids Meteor Shower, which occurs in October each year, appear to be originating near the constellation Orion the Hunter.

What's the story on the upcoming August Perseid meteor shower?

From about July 17 to August 24, each year, the Earth crosses the orbital path of a comet that we call Comet Swift-Tuttle. It is this comet which gives off particles which we call the Perseid meteor shower.

Debris from Comet Swift-Tuttle follow the comet's orbit, but we don't cross path with the heavily populated section until after the first week of August.

The bits and pieces from Comet Swift-Tuttle enter the Earth's upper atmosphere at a speed of approximately 130,000 miles per hour, lighting up the nighttime with beautiful Perseid meteors.

If you trace back to where the Perseid meteors seem to come from you will find the constellation Perseus, which is why the meteor shower is named as such. This, howev-

(Continued in next column)

(Continued on next page)

ASTRONOMY IN PRINT

er, is a chance alignment as the stars in the Perseus constellation are light-years distant while the meteors in the shower burn up about 60 miles above the Earth's surface. Few, if any meteors in meteor showers become meteorites.

Comet Swift-Tuttle

Comet Swift-Tuttle orbits the sun every 133 years and has a very oblong orbit which passes outside the orbit of Pluto when farthest from the sun, and inside the Earth's orbit when closest to the sun.

It last reached perihelion, the closest point to the sun, in December 1992 and will do so again in July 2126.

(Continued in next column)

Why do we call the constellation by the name of Perseus?

In ancient Greek mythology, Perseus was the son of the god Zeus and the mortal Danae. Upon his death, he was honored with a place in the heavens for a number of great accomplishments which included his killing of the Gorgon, Medusa. The Perseid shower commemorates the time when Zeus visited Danae in a shower of gold.

The Perseus constellation can be found just above the horizon on August 15th at approximately 11:30 PM Central.



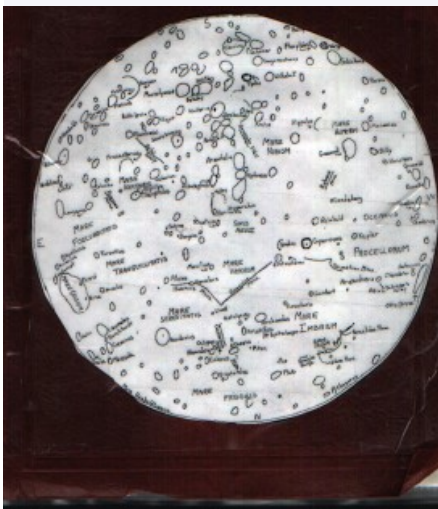


July
2020

Join Your Local Astronomy Club.

By a long shot, the best way to get into and enjoy astronomy is to become affiliated with your local astronomy club. Not only do you get access to a ton of knowledge about how to find constellations, and to choose and use your first telescope, but also you get a firsthand look at what is happening at the sky from the people who love it the most.

When I was a young teenager, one had to be sixteen years of age to join the society in Montreal. (Thank goodness, that rule no longer applies.) But younger people could indeed attend most of the meetings, and on October 8, 1960, I attended my first meeting. Isabel K. Williamson was in charge, and she gave me my first assignment, to create a map of the Moon based on my own observations. Even though I couldn't be a member yet, I embarked on a project that took me 3 years to complete. (The map is pictured in figure 1.) In Canada, most of the astronomy clubs are under the single banner of the Royal Astronomical Society of Canada. There are "centers" within most major Canadian cities. In the United States, the local clubs are independent, and I have a member of the Tucson Amateur Astronomy Association (TAAA) since 1979, and served as its President from 1980 to 1983.



(left)

This is a drawing of the Moon that I did between 1960 and the Summer of 1964.

It's based on my own observations of the Moon using my first telescope, Echo, at that time.

The observatory that Wendee and I operate from our home is called Jarnac Observatory. Unlike

(Continued in next column)

almost everything NASA does, Jarnac is not an acronym. But if it were, Jarnac could be short for Join A Really Neat Astronomy Club.



(Above) The Montreal Centre of the Royal Astronomical Society of Canada used to meet in this observatory. I took this photo of my friend Carl Jorgensen, and his daughter Christine, standing in front of it.

In recent months, astronomy clubs have stopped having in-person meetings because of the Coronavirus pandemic. But that hasn't stopped them from indulging in online events. Using platforms like Zoom cloud, Cisco Webex, or Facebook, online meetings have had an explosion in popularity. I've been attending one meeting or another almost every night this week. They have been so successful that when the pandemic is over, they may continue in some manner.

The most important thing you can get out of an astronomy club is friends. Almost all of my friends are members of one astronomy club or another. They enrich my life and increase my own enjoyment of the night sky a millionfold. I cherish their always welcome insights. In fact, Tim Hunter, one of my closest friends, recently made an independent discovery of a supernova, or exploding star, in the faraway galaxy labelled UGC 10509 and which is hundreds of millions of light years away from us. He may not have been the first to spot it, but his observation has added important new information about the Universe. That star blew up a very long time ago. Its light travelled across space and time until it landed as a speck on one of his pictures, and it is now called Supernova 2020 LQL. This is one of the best things about astronomy. It is an area of study where amateur astronomers can add to our understanding of how the Universe works. Nice work, my friend.

When you next go outside to look at the night sky, enjoy your eyeful of stars. The time after that, try it with your local astronomy club. You couldn't give yourself a better gift.

UPCOMING EVENTS



Date: August 8th, 2020

Event: Perseid Meteor Shower Watch

Location: Paul Castle Observatory

All these dates and times are Tentative due to conditions! Please check your emails for any updates as to whether the Event will Occur!

- **August 15th, 2020** Niabi Outreach at sunset
- **September 14th, 2020** PAC business meeting at Butterworth Center at 7:00 PM
- **September 19th, 2020** Niabi Outreach at sunset
- **October 17th, 2020** Niabi Outreach at sunset
- **October 24th, 2020** PAC Annual Banquet
- **November 9th, 2020** PAC regular meeting at Butterworth Center at 7:00 PM
- **November 21st, 2020** Niabi Outreach at sunset
- **December 14th, 2020** PAC Business meeting at Butterworth Center at 7:00 PM.
- **January 11th 2021** PAC regular meeting at Butterworth Center at 7:00 PM
- **February 8th, 2021** PAC regular meeting at Butterworth Center at 7:00 PM

Mark your calendars and watch upcoming e-mails for more information!



K Sudhakara Prasad ▸ Astronomy

9 hrs · 🌐



Alexandra Albani
May 8 at 4:47 PM

Follow

Spectacular image from the international space station shows the Atlantic ocean and the pacific ocean, Argentina, Chile and Uruguay.

SIGN UP REPORT

MONTH	NEWSPAPER ARTICLES	CONSTELLATION REPORT	PROGRAM
APR 2020	Jeff Struve	Frank Stonestreet	Mr. Jim Dole & Mr. Tom Dunmore, Firebaugh Observatory
MAY 2020	Dino Milani	Byron Davies	Ian Spangenberg
JUNE 2020	Terry Dufek	Anne Bauer	SMORGASBORD (SEE BELOW)
JULY 2020	Jeff Struve	None Scheduled	Mr. Dick Koos, "Go For Landing"
AUG 2020	Al Sheidler	PICNIC	PICNIC
SEPT 2020	Ian Spangenberg	Ian Spangenberg	Mr. Zach Luppen, University of Iowa, Zach will discuss the upcoming JUICE and Europa Clipper Missions)
OCT 2020	Paul Levesque	BANQUET	BANQUET
NOV 2020			Ian Spangenberg
DEC 2020	Terry Dufek		
JAN 2021			Roy Gustafson (Year n Review)
FEB 2021			
MAR 2021			SMORGASBORD (SEE BELOW)

Editors Note: If you are interested in contributing/ participating in the above programs, sign ups are available at the monthly meeting or please let The Vice President and Editor know what you are good to go with.. Any corrections please send to Vice President and Editor. This will be updated every issue.

Thank you

All these dates and times are Tentative due to conditions! Please check your emails for any updates as to whether the Event will Occur!

SMORGASBORD

MARCH

_____	_____
_____	_____
_____	_____

JUNE

_____	_____
_____	_____
_____	_____

SEPTEMBER

_____	_____
_____	_____
_____	_____

ASTRONOMICAL CALENDAR OF EVENTS

01 15:14 Mercury 6.6°S of Pollux
 01 18:30 Jupiter 1.5°N of Moon
 02 08:17 Saturn 2.3°N of Moon
 03 07:00 **Mars at Perihelion**
 03 10:59 **FULL MOON**
 05 23:00 Mercury at Perihelion
 09 02:57 **Mars 0.8°N of Moon**
 09 08:51 Moon at Apogee:
 404658 km
 11 11:45 **LAST QUARTER MOON**
 12 08:00 **Perseid Meteor
 Shower**
 12 20:00 **Venus at Greatest
 Elongation: 45.8°W**
 13 05:06 Aldebaran 4.0°S of
 Moon
 14 14:22 Moon at Ascending
 Node
 15 08:01 Venus 4.0°S of Moon
 16 14:10 Pollux 4.5°N of Moon
 17 10:00 Mercury at Superior
 Conjunction
 18 21:41 **NEW MOON**
 21 05:59 Moon at Perigee:
 363513 km
 25 12:58 **FIRST QUARTER MOON**
 25 23:04 Antares 6.2°S of Moon
 27 06:52 Moon at Descending
 Node
 28 20:33 Jupiter 1.4°N of Moon
 29 11:40 Saturn 2.2°N of Moon

The **Sun** starts off August in Cancer, moving into Leo on August 10th.

Mercury starts off in Gemini on Aug. 1st in Gemini (mag: -.91, diameter: 6.04", Illum: 72.1%). At 3° 37' of the E-NE horizon at 5 am, you might be able to glimpse it before dawn kicks into gear. It moves back toward the sun and is in superior conjunction on the 17th. It ends up at about 12 ½° from the Sun in the Evening sky and too close for viewing.

Venus starts off in Taurus on Aug. 1st (mag: -4.53, diameter 26.86", Illum: 43.7%). It is 19°

off the E-NE horizon on the 1st at 4:30am. It passes 4° north of Venus on the 15th. It stays pretty much in place throughout the month.

Mars is in Pieces on August 1st. It rises around 11:30 pm. Best time for viewing is around 5 am when it is high (51° 22') in the southern sky. On August 9th, the Moon is 48' southeast of Mars. There is an occultation but not seen here.

Jupiter is in Sagittarius on August 1st (mag: -2.71, dia: 47.11"). It is about 15° above the SE horizon at dusk and still very bright, only one month passed opposition. On the 1st, you have a nice conjunction with the Moon and Saturn nearby. The Moon passes by again on August 28th to provide a re-

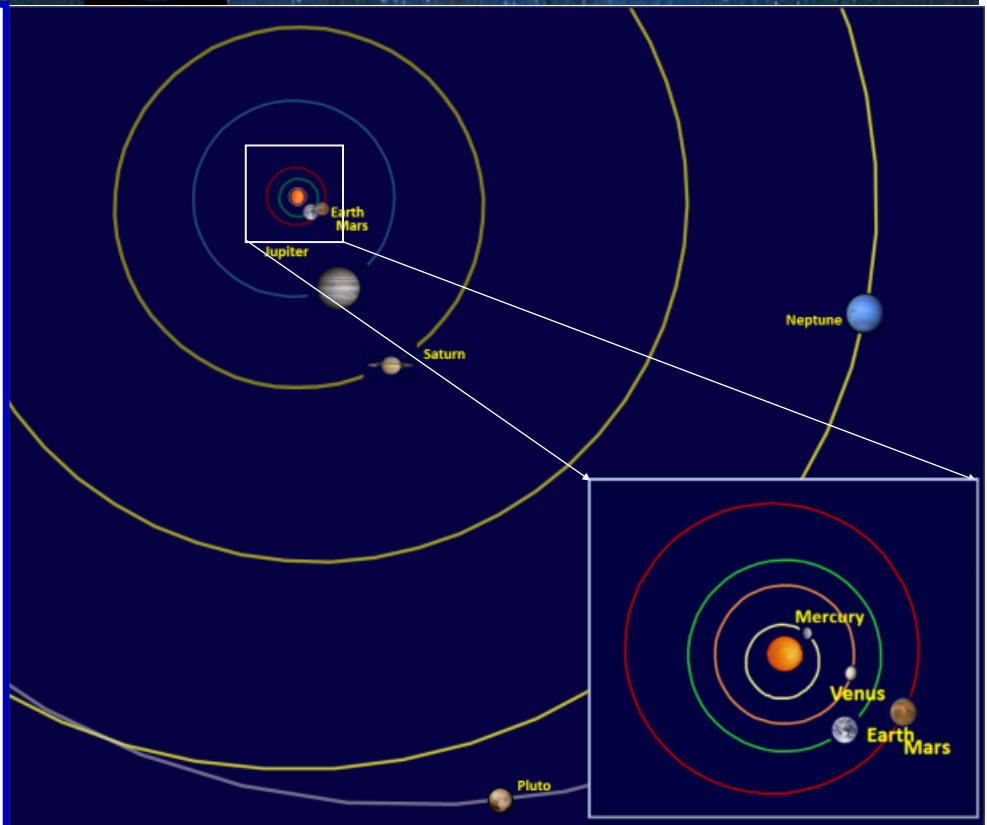
markably similar arrangement.

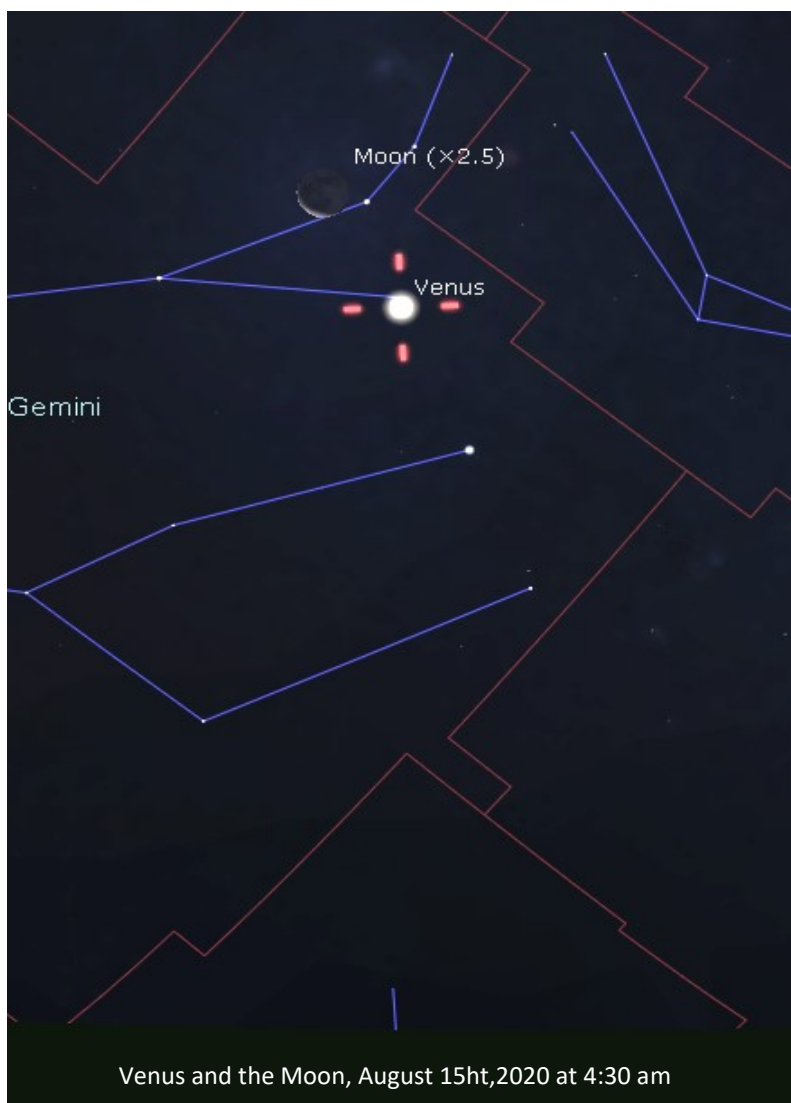
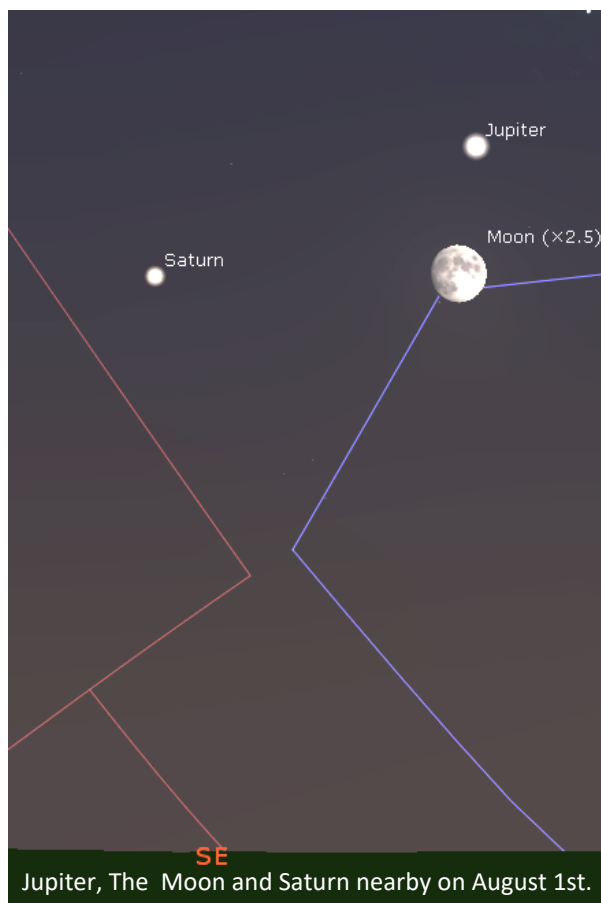
Saturn is still lingering in Sagittarius on August 1st (mag: .15, dia: 18.43", rings 42.94"). It is 7° 28' east of Jupiter. There are a couple of nice conjunctions with the Moon and Jupiter this month (see Jupiter)

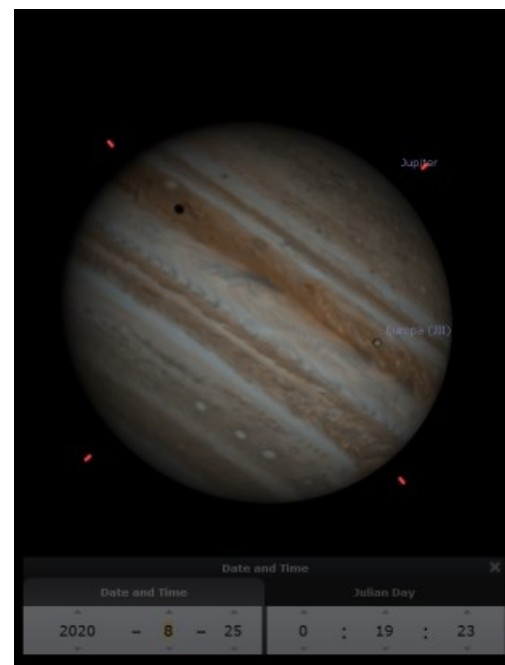
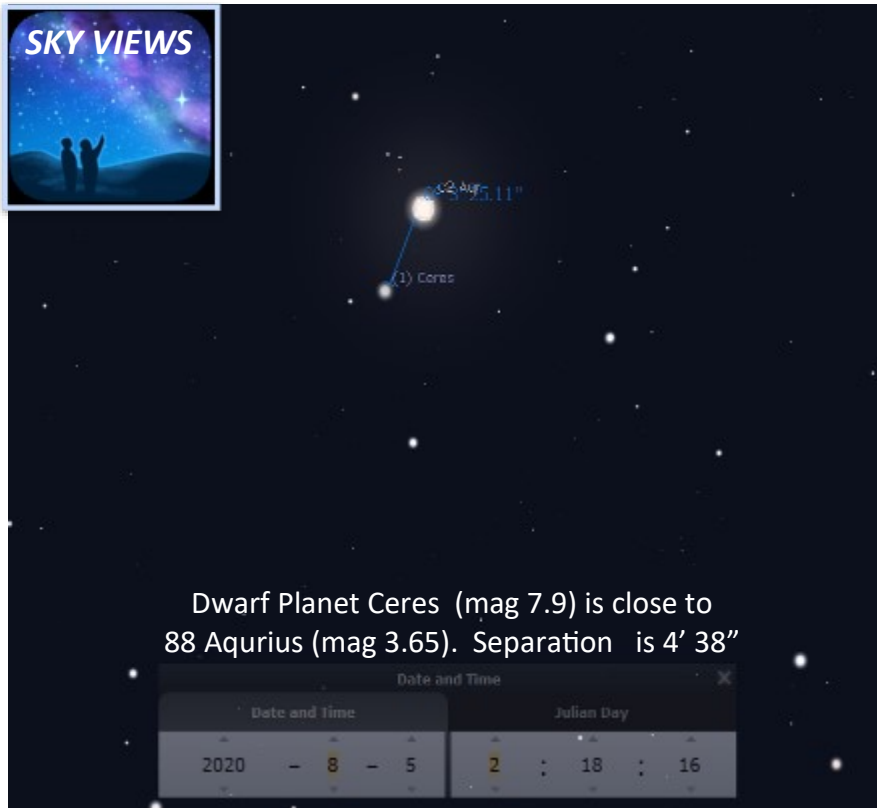
Uranus is in Aries (morning sky) on August 1st (mag: 5.78, dia: 3.56). It is 22° east of Mars. At the end of the month, Mars is 10° closer. The Moon passes about 5° south of the planet on the 10th.

Neptune is in Aquarius (morning sky) on August 1st (mag: 7.83, dia: 2.34"). It is 27° west of Mars. The Moon passes 5° south of the planet on the 6th.

THE PLANETS August 2020



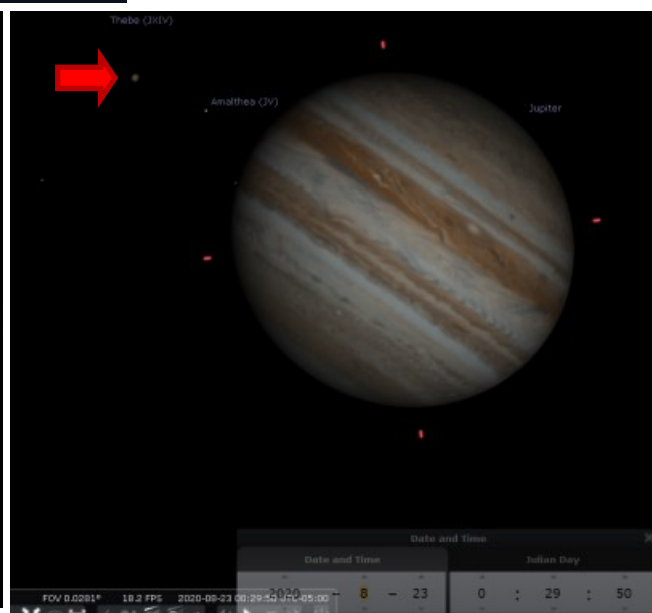




Europa transits Jupiter
August 25th, 2020 00:19 am



Io and Ganymede transit Jupiter
August 14th, 2020 11:40 pm



Io enters Jupiter's shadow
August 23rd, 2020 00:29:50 am



Planetary Alignments in August 2020

Phenomenon	Date and Time	Object 1	Object 2	Separation	Solar Elongation	Lunar Elongation
Conjunction	2020-08-01 17:01:59	Moon	Jupiter	+2°05'41.3"	+159°21'25.4"	—
Conjunction	2020-08-01 17:01:59	Jupiter	Moon	+2°05'41.3"	+159°55'54.9"	—
Conjunction	2020-08-02 09:44:38	Saturn	Moon	+2°33'16.2"	+166°56'33.7"	—
Transit	2020-08-11 09:24:57	Jupiter	Callisto (JIV)	—	+149°38'27.4"	+118°38'44.0"
Occultation	2020-08-12 13:50:08	Jupiter	Europa (JII)	—	+148°23'46.1"	+132°47'14.7"
Occultation	2020-08-15 20:41:22	Jupiter	Io (JI)	—	+144°57'05.6"	+175°22'32.8"
Conjunction	2020-08-17 09:53:05	Mercury	Sun	+1°45'42.5"	—	+19°22'12.2"
Occultation	2020-08-19 18:43:14	Jupiter	Callisto (JIV)	—	+140°52'24.6"	+129°17'41.3"
Occultation	2020-08-22 22:28:14	Jupiter	Io (JI)	—	+137°36'47.7"	+82°42'40.9"
Transit	2020-08-28 00:37:37	Jupiter	Callisto (JIV)	—	+132°24'36.6"	+11°49'10.8"
Transit	2020-08-30 21:34:48	Jupiter	Io (JI)	—	+129°30'20.1"	+26°31'21.5"
			Ganymede			
Occultation	2020-09-01 17:03:23	Jupiter	(JIII)	—	+127°41'06.6"	+49°23'12.6"

From stellarium



From in the sky. org

AUGUST DOUBLE STARS

Object	RA	DEC	MAG	SEP	PA	Year
Alpha Herculis	17 ^h 14 ^m .6	+14° 23'	3.5, 5.4	4.8"	103°	2013
Delta Herculis	17 ^h 15 ^m .0	+24° 50'	3.1, 8.3	12.4"	289°	2013
36 Ophiuchi	17 ^h 15 ^m .3	-26° 36'	5.1, 5.1	4.9"	142°	2012
Omicron Ophiuchi	17 ^h 18 ^m .0	-24° 17'	5.2, 6.6	10.0"	355°	2013
Rho Herculis	17 ^h 23 ^m .7	+37° 09'	4.5, 5.4	4.1"	319°	2013
Nu Draconis	17 ^h 32 ^m .2	+55° 11'	4.9, 4.9	62"	311°	2012
Psi Draconis	17 ^h 41 ^m .9	+72° 09'	4.6, 5.6	30.0"	16°	2013
40/41 Draconis	18 ^h 00 ^m .2	+80° 00'	5.7, 6.0	18.7"	231°	2013
95 Herculis	18 ^h 01 ^m .5	+21° 36'	4.9, 5.2	6.2"	257°	2013
70 Ophiuchi	18 ^h 05 ^m .5	+02° 30'	4.2, 6.2	5.9"	130°	2013
Epsilon Lyrae	18 ^h 44 ^m .3	+39° 40'	5.2, 6.1, 5.4, 5.4	2.3", 208.7", 2.4"	346°, 172°, 78°	2013
Zeta Lyrae	18 ^h 44 ^m .8	+37° 36'	4.3, 5.6	43.7"	150°	2013
Beta Lyrae	18 ^h 50 ^m .1	+33° 22'	3.6, 6.7	44.8"	147°	2012
Struve 2404	18 ^h 50 ^m .8	+10° 59'	6.9, 7.8	3.4"	181°	2013
Otto Struve 525	18 ^h 54 ^m .9	+33° 58'	6.1, 7.6	45.2"	350°	2012
Theta Serpentis	18 ^h 56 ^m .2	+04° 12'	4.6, 4.9	22.3"	104°	2013
Beta Cygni	19 ^h 30 ^m .7	+27° 58'	3.2, 4.7	34.7"	55°	2012
57 Aquilae	19 ^h 54 ^m .6	-08° 14'	5.7, 6.4	35.6"	171°	2013

From the Astronomical League

DEEP SKY WONDERS

For August
Evening Skies

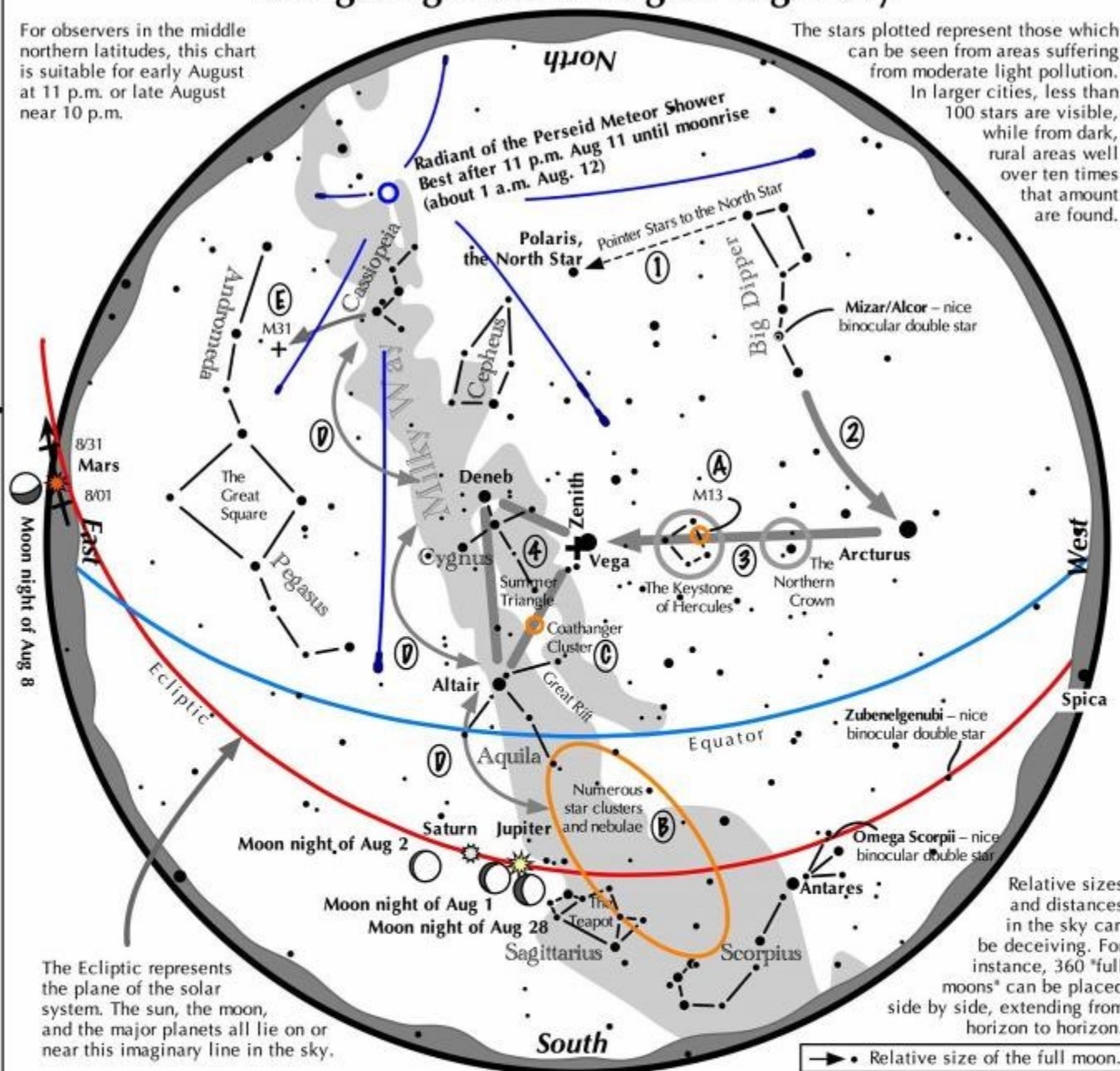
Name	RA (J2000)	Dec (J2000)	Mag.	Transit	Type
M 5 (Rose Cluster)	15h18m33.2s	+2°04'51.7"	6.86	19h36m	globular star cluster
M 80	16h17m02.4s	-22°58'33.9"	8.21	20h35m	globular star cluster
M 4 (Crab Globular Cluster)	16h23m35.2s	-26°31'32.7"	6.28	20h42m	globular star cluster
M 13 (Great Star Cluster in Hercules)	16h41m41.6s	+36°27'40.7"	5.93	20h59m	globular star cluster
M 12	16h47m14.2s	-1°56'54.7"	7.86	21h05m	globular star cluster
M 10	16h57m09.1s	-4°06'01.1"	6.59	21h15m	globular star cluster
M 62 (Flickering Globular Cluster)	17h01m12.6s	-30°06'44.5"	7.81	21h20m	globular star cluster
M 19	17h02m37.7s	-26°16'04.6"	7.82	21h21m	globular star cluster
M 92	17h17m07.4s	+43°08'09.4"	6.53	21h35m	globular star cluster
M 9	17h19m11.8s	-18°30'58.5"	8.68	21h37m	globular star cluster
M 14	17h37m36.2s	-3°14'45.3"	8.50	21h56m	globular star cluster
M 6 (Butterfly Cluster)	17h40m19.9s	-32°15'10.8"	4.66	21h59m	open star cluster
IC 4665 (Summer Beehive Cluster)	17h46m18.0s	+5°43'01.2"	4.36	22h04m	open star cluster
M 7 (Ptolemy's Cluster)	17h53m51.1s	-34°47'34.8"	3.84	22h12m	open star cluster
M 23	17h57m04.1s	-18°59'06.0"	5.76	22h15m	open star cluster
NGC 6543 (Cat's Eye Nebula)	17h58m33.4s	+66°37'59.5"	8.24	22h16m	planetary nebula
M 20 (Trifid Nebula)	18h02m42.0s	-22°58'19.2"	6.60	22h21m	cluster associated with nebulosity
M 8 (Lagoon Nebula)	18h03m37.0s	-24°22'40.8"	6.32	22h22m	HII region
M 21 (Webb's Cross)	18h04m13.0s	-22°29'24.0"	6.20	22h23m	open star cluster
M 24 (Small Sagittarius Star Cloud)	18h16m48.0s	-18°33'00.0"	4.86	22h35m	star cluster
M 16 (Eagle Nebula)	18h18m48.0s	-13°48'25.2"	6.23	22h37m	cluster associated with nebulosity
M 18 (Black Swan Cluster)	18h19m58.1s	-17°06'07.2"	7.15	22h38m	open star cluster
M 17 (Omega Nebula)	18h20m47.1s	-16°10'19.2"	6.25	22h39m	cluster associated with nebulosity
M 28	18h24m32.9s	-24°52'11.4"	7.99	22h43m	globular star cluster
M 69	18h31m23.1s	-32°20'53.1"	8.80	22h50m	globular star cluster
M 25	18h31m47.1s	-19°07'01.2"	4.87	22h50m	open star cluster
M 22 (Great Sagittarius Cluster)	18h36m23.9s	-23°54'17.1"	5.43	22h55m	globular star cluster
IC 4756 (Graff's Cluster)	18h38m31.2s	+5°29'24.0"	4.77	22h57m	open star cluster
M 26	18h45m18.0s	-9°22'58.8"	8.22	23h04m	open star cluster
M 11 (Wild Duck Cluster)	18h51m05.0s	-6°16'12.0"	6.50	23h10m	open star cluster
NGC 6709 (Flying Unicorn Cluster)	18h51m18.0s	+10°19'04.8"	6.86	23h10m	open star cluster
M 57 (Ring Nebula)	18h53m35.1s	+33°01'45.0"	8.94	23h12m	planetary nebula
M 54	18h55m03.3s	-30°28'47.5"	8.16	23h14m	globular star cluster
NGC 6755 (Possible Binary Cluster)	19h07m49.0s	+4°16'01.2"	7.67	23h26m	open star cluster
M 56	19h16m35.6s	+30°11'00.5"	8.54	23h35m	globular star cluster
M 55 (Specter Cluster)	19h39m59.7s	-30°57'53.1"	8.00	23h59m	globular star cluster
NGC 6819 (The Foxhead Cluster)	19h41m18.0s	+40°11'13.2"	7.44	23h59m	open star cluster
NGC 6826 (Blinking Planetary Nebula)	19h44m48.2s	+50°31'30.3"	8.94	0h03m	planetary nebula
NGC 6830 (Poodle Cluster)	19h50m59.0s	+23°06'00.0"	8.05	0h09m	open star cluster
M 71 (Angelfish Cluster)	19h53m46.5s	+18°46'45.1"	6.26	0h12m	globular star cluster
M 27 (Dumbbell Nebula)	19h59m36.4s	+22°43'15.8"	7.56	0h18m	planetary nebula
NGC 6885 (20 Vulpeculae Cluster)	20h12m01.0s	+26°28'40.8"	8.26	0h30m	open star cluster
M 29 (Cooling Tower)	20h23m55.9s	+38°31'22.8"	6.75	0h42m	open star cluster
NGC 6940 (Mothra Cluster)	20h34m25.9s	+28°16'58.8"	6.46	0h53m	open star cluster
NGC 7009 (Saturn Nebula)	21h04m10.9s	-11°21'48.3"	8.38	1h23m	planetary nebula
M 15 (Pegasus Cluster)	21h29m58.3s	+12°10'01.2"	6.54	1h49m	globular star cluster
M 39	21h31m48.0s	+48°25'58.8"	4.77	1h50m	open star cluster
M 2	21h33m27.0s	-0°49'23.7"	6.63	1h52m	globular star cluster
IC 5146 (Cocoon Nebula)	21h53m24.0s	+47°16'01.2"	7.38	2h12m	cluster associated with nebulosity

* Data from Stellarium

Navigating the mid August Night Sky

For observers in the middle northern latitudes, this chart is suitable for early August at 11 p.m. or late August near 10 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.



Navigating the mid August 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 June evening sky.
- 3 To the northeast of Arcturus shines another star of the same brightness, 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 High in the East lies the summer triangle stars of Vega, Altair, and Deneb.

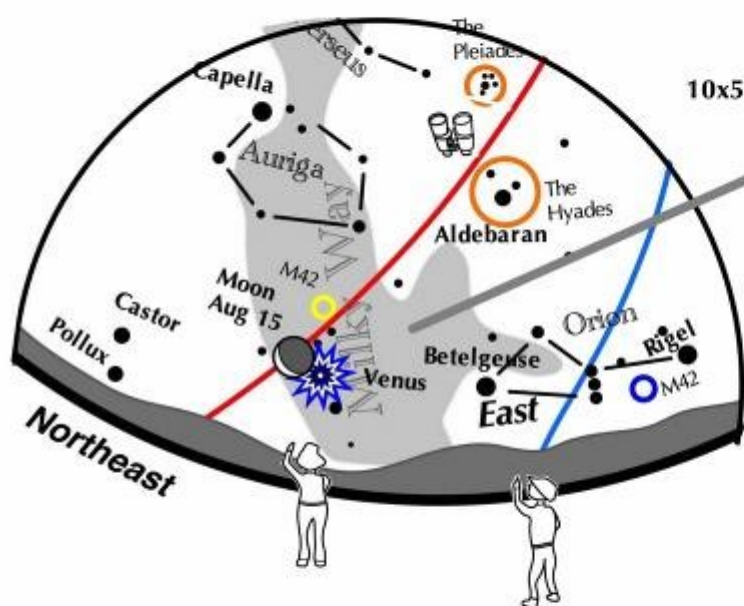
Binocular Highlights

- 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.

Astronomical League www.astroleague.org/outreach; duplication is allowed and encouraged for all free distribution.

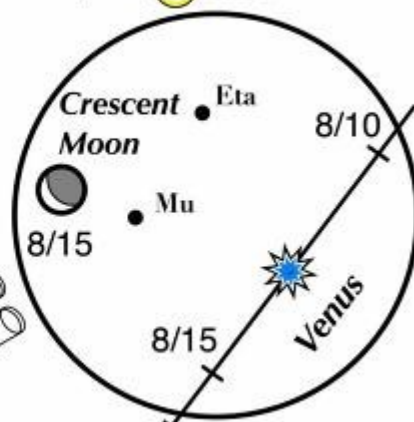
If you can observe only one celestial event this month,
consider this one:

⊕ M35



East-northeast
90 minutes
before sunrise
August 15

View
through
10x50 binoculars



Crescent Moon, brilliant Venus,
and faint, mysterious M35

Look to the east-northeast 90 minutes before sunrise on August 10–15.

- The brilliant star-like object is Venus.
- Use binoculars to spot the faint star cluster M35. It dimly glows in the upper left of the field from Venus on Aug. 10.
- On Aug. 15, the crescent Moon, seemingly full of Earthshine, hangs low above the e-ne horizon.
- Use binoculars to better spot M35 lying to the upper right of the Moon on August 15.
- For a better view, aim binoculars at each member of the celestial at the trio.

Perseid Meteor Shower

August 12th, 2020

From <https://in-the-sky.org/>

The Perseid meteor shower will be active from 17 July to 24 August, producing its peak rate of meteors around 12 August.

Over this period, there will be a chance of seeing Perseid meteors whenever the shower's radiant point – in the constellation Perseus – is above the horizon, with the number of visible meteors increasing the higher the radiant point is in the sky.

From Davenport the radiant point is circumpolar, which means it is always above the horizon and the shower will be active throughout the night.

The radiant point culminates (is highest in the sky) after dawn – at around 07:00 CDT – and so the shower is like-

(continued in next column)

ly produce its best displays shortly before dawn, when its radiant point is highest.

At this time, the Earth's rotation turns Davenport to face optimally towards the direction of the incoming meteors, maximising the number that rain vertically downwards, producing short trails close to the radiant point. At other times, there will be fewer meteors burning up over Davenport, but those that do will tend to enter the atmosphere at an oblique angle, producing long-lived meteors that may traverse a wide area of the sky before completely burning up.

The shower is expected to reach peak activity at around 08:00 CDT on 12 August 2020, and so the best displays might be seen before dawn on 12 August.



The sky at 13:14 CDT on 12 Aug 2020

Spotlight: NGC 6811– The Hole in the Cluster

NGC 6811 is an open cluster in the constellation of Cygnus, near the constellation of Lyra. It has an angular size half that of the full Moon and includes about 1000 stars of roughly similar magnitude. It has also been called "The Hole in the Cluster" because of its dark center.

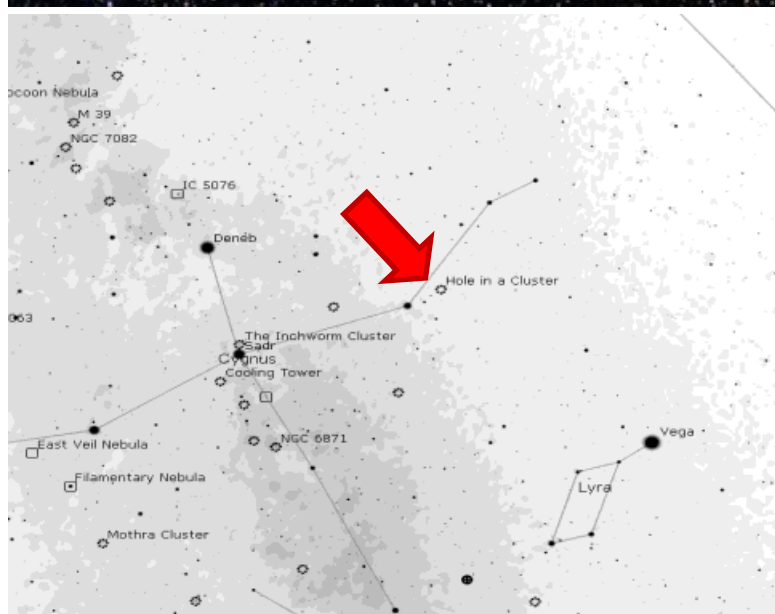
NGC 6811 lies far away from the galactic plane, a feature it shares with many other old open clusters. It is about 3,285 light years distant and 14–20 light years in diameter, with a total luminosity of 2100 suns. Approximately 1.00 ± 0.17 billion years old, the cluster probably contained some 6000 stars at birth, but gravitational interactions and stellar evolution have since reduced the number substantially. A recent study reported 377 confirmed member stars, with spectral types ranging from mid-F to early K, and surface temperatures relatively similar to the Sun's. The same study argued that the original cluster population likely included 8 O-type stars and 125 B-type stars, but all have evolved off the main sequence and are undetectable. The cluster has a rich cluster with equally bright stars with no noticeable central concentration. The stars do, however, have an unusual (if not concentrated) distribution, with an apparent stellar corona surrounding the core, leaving the impression of a hole.

NGC 6811 was first observed by John Herschel in 1829 and was added to his General Catalogue of Nebulae and Clusters in 1864. The cluster has been the subject of study by the Kepler mission, with the aim of characterizing its stars' rotation rate, age, and distance to help the hunt for exoplanets.

NGC 6811 is best observed from Earth in the Northern Hemisphere in summer. In these conditions it lies close to the zenith during the night, northeast of Delta Cygni. It is considered an aesthetically pleasant object for amateur astronomers, even if the brightest members are just 10th magnitude objects. It appears as a hazy patch in 10x binoculars, but it is best seen at around 70x with a moderate-aperture telescope. It has been described by amateur astronomers as a "smoke ring of stars".

Two planets (Kepler 66b and Kepler 67b), orbiting Sun-like stars in the NGC 6811 cluster,

(continued in next column)



have been discovered by the Kepler mission using the transit method. Both planets are smaller than Neptune and are both the first sub-Jupiter planets and the first transiting planets discovered orbiting stars within an open cluster. Given that the age and distance of the cluster have been accurately measured, the two planets are among the few of which age and distance are accurately known. This finding suggests that the frequency of planets in clusters is similar to that in stars not belonging to clusters or associations and that planets can form and survive in environments more crowded and violent than the one of our own Sun.



This article is distributed by NASA Night Sky Network

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit <https://nightsky.jpl.nasa.gov/> to find local clubs, events, and more!

Summer Triangle Corner: Deneb

David Prosper

The Summer Triangle is high in the sky after sunset this month for observers in the Northern Hemisphere, its component stars seemingly brighter than before, as they have risen out of the thick, murky air low on the horizon and into the crisper skies overhead. Deneb, while still bright when lower in the sky, now positively sparkles overhead as night begins. What makes Deneb special, in addition to being one of the three points of the Summer Triangle? Its brilliance has stirred the imaginations of people for thousands of years!

Deneb is the brightest star in Cygnus the Swan and is positioned next to a striking region of the Milky Way, almost as a guidepost. The ancient Chinese tale of the Cowherd (Niulang) and the Weaver Girl (Zhinü) - represented by the stars Altair and Vega - also features Deneb. In this tale the two lovers are cast apart to either side of the Milky Way, but once a year a magical bridge made of helpful magpies - marked by Deneb - allows the lovers to meet. Deneb has inspired many tales since and is a staple setting of many science fiction stories, including several notable episodes of *Star Trek*.

Astronomers have learned quite a bit about this star in recent years, though much is still not fully understood - in part because of its intense brightness. The distance to Deneb from our Sun was measured by the ESA's Hipparcos mission and estimated to be about 2,600 light years. Later analysis of the same data suggested Deneb may be much closer: about 1,500 light years away. However, the follow-up mission to Hipparcos, Gaia, is unable to make distance measurements to this star! Deneb, along with a handful of other especially brilliant stars, is too bright to be accurately measured by the satellite's ultra-sensitive instruments. Deneb is unusually vivid, especially given its distance. Generally, most of the brightest stars seen from Earth are within a few dozen to a few hundred light years away, but Deneb stands out by being thousands of light years distant! In fact, Deneb ranks among the top twenty brightest night time stars (at #19) and is easily the most distant star in that list. Its luminosity is fantastic but uncertain, since its exact distance is also unclear. What is known about Deneb is that it's a blue-white supergiant star that is furiously fusing its massive stocks of thermonuclear fuel and producing enough energy to make this star somewhere between 50,000 and 190,000 times brighter than our Sun if they

were viewed at the same distance! The party won't last much longer; in a few million years, Deneb will exhaust its fuel and end its stellar life in a massive supernova, but the exact details of how this will occur, as with other vital details about this star, remain unclear.

Discover more about brilliant stars and their mysteries at nasa.gov.



Long exposure shot of Deneb (brightest star, near center) in its richly populated Milky Way neighborhood. Photo credit: Flickr user jpstanley.

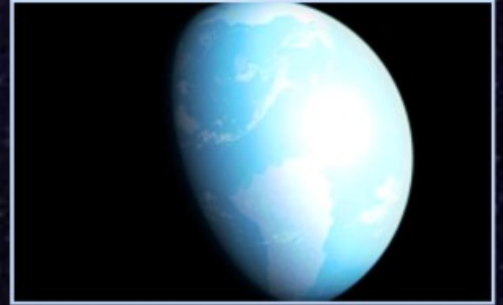


Spot Vega and the other stars of the Summer Triangle by looking straight up after sunset in August!

(continued in next column)

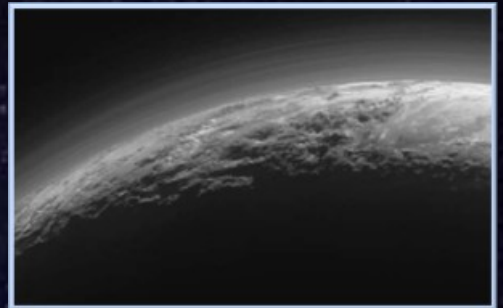
One-in-a-million: 'Super-Earth' discovered
near center of our galaxy

May 24th, 2020



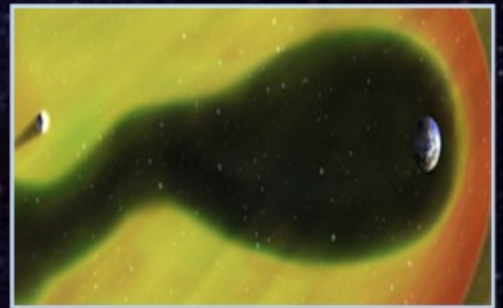
Beyond Pluto: the hunt for our solar
system's new ninth planet

June 28th, 2020



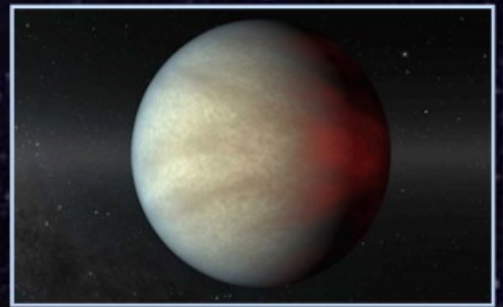
NASA Spacecraft Helps Identify Solar Radia-
tion Patterns That Expose the Moon

June 30th, 2020



Do Hot Jupiters Form Close in, or Do They
Migrate? A Newly-Discovered Planet Might
Help Answer This

June 30th, 2020



More Evidence that Europa's Oceans Could be Habitable

June 30th, 2020



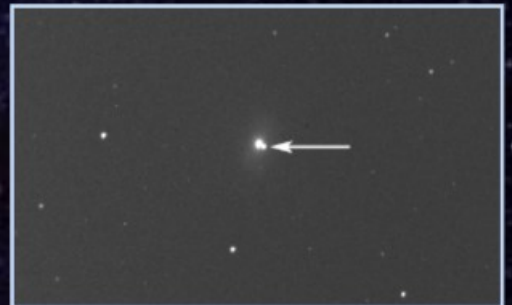
Astronomers discovered the first exposed core of a planet

July 2nd, 2020



A supernova candidate has just been reported in NGC 4457, labelled AT 2020nzb.

June 30th, 2020



Tranquil Planetary System Just 11 Light-Years Away Raises Hopes of Habitability

July 6th, 2020



Dazzling Comet NEOWISE could be an astronomical bonanza

July 16th, 2020



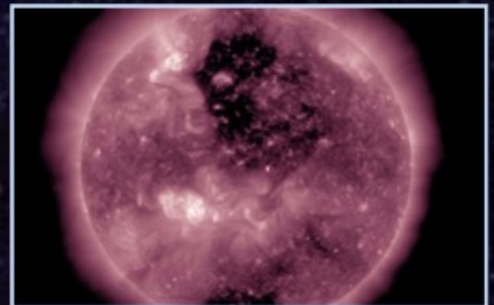
Thermonuclear Supernova Ejects White Dwarf from Binary System

July 15h, 2020



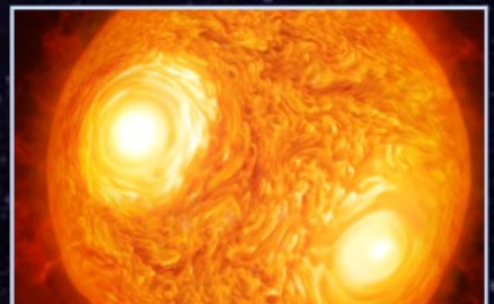
An elemental problem with the Sun

July 15th, 2020



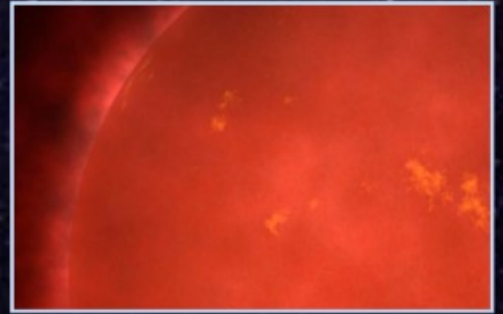
Stars Like Our Sun Become Lithium Factories as They Die

July 14th, 2020



1 in 10 Red Giants are Covered in Spots,
and They Rotate Surprisingly Quickly

July 14th, 2020



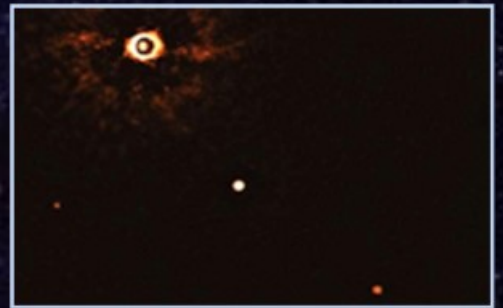
The newly formed Moon might have
taken up to 10 times longer to solidify
than previously thought

July 17th, 2020



Astronomers reveal the first-ever photo
of 2 planets orbiting a sun-like star,
taken from 300 light-years away

July 22nd, 2020



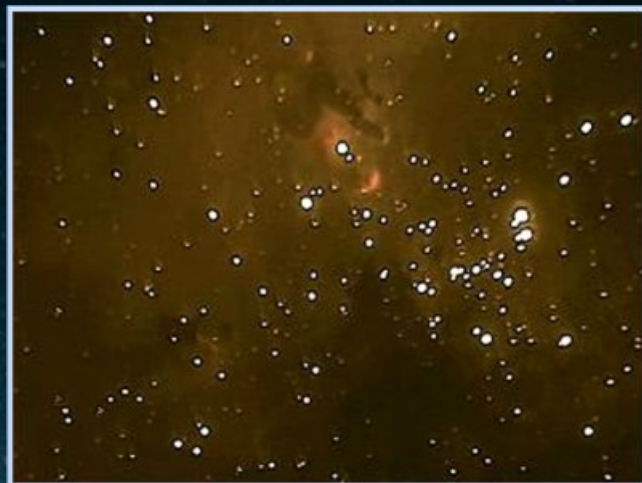
The star cluster closest to Earth
is in its death throes

July 24th, 2020



MEMBER OBSERVATIONS

These are photos taken by Rusty Case with his Revolution Imager 2. They were taken on June 24, 2020 at Paul Castle.



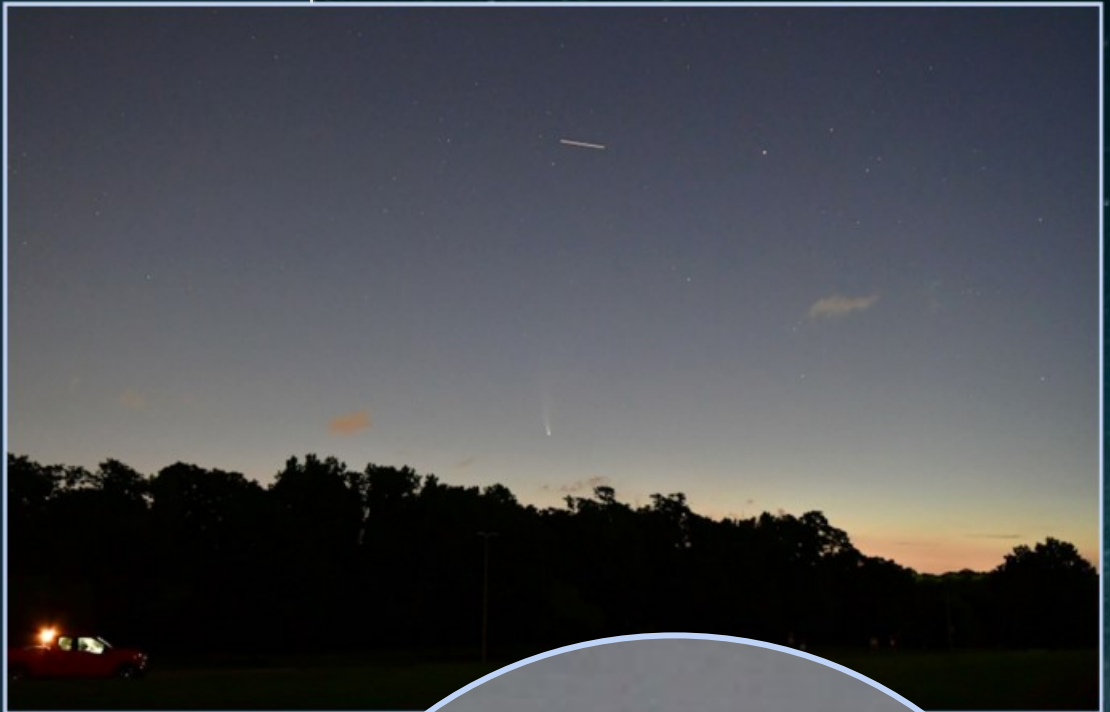
MEMBER OBSERVATIONS

Comet NEOWISE Capture

July 12th, 2020

Sara and I went out this morning and took these pictures of the comet. This was at 4:15 this morning. The comet is clearly visible to the naked eye, but it is pretty low in the sky. Camera settings: FL = 24mm, f6.3, iso 6400, 5 sec & 10 sec exposures. We noticed too a bright satellite passing by at the time.

Al Sheidler



MEMBER OBSERVATIONS

Comet NEOWISE Capture July 13th, 2020

I went to Sunset Park last night to see if I could see the comet. I succeeded in finding it, despite all the lights in the park. I didn't realize how well lit it was. I've attached three pics for your viewing pleasure. They were taken with a Canon Rebel, with exposures ranging from 6 to 8 seconds at ISO 1600. I was particularly pleased with the two shots where the comet is framed by the overlook (the comet is just left of the taller left hand pole beneath the roof) and an opening within some bushes. People who know me well have noted that I don't have an art bone in my body, but maybe there's still some hope!

Ken Boquist



MEMBER OBSERVATIONS



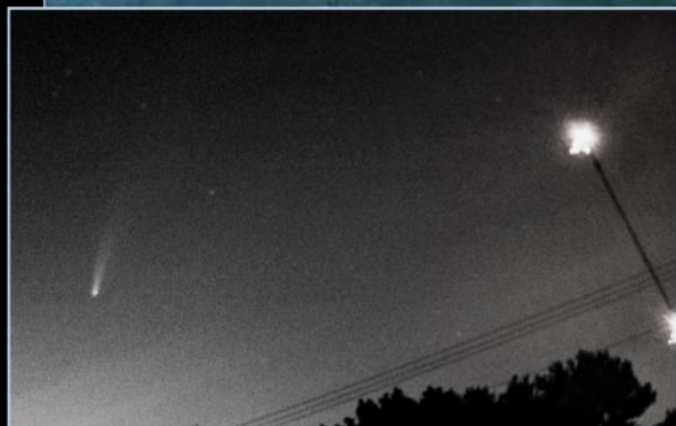
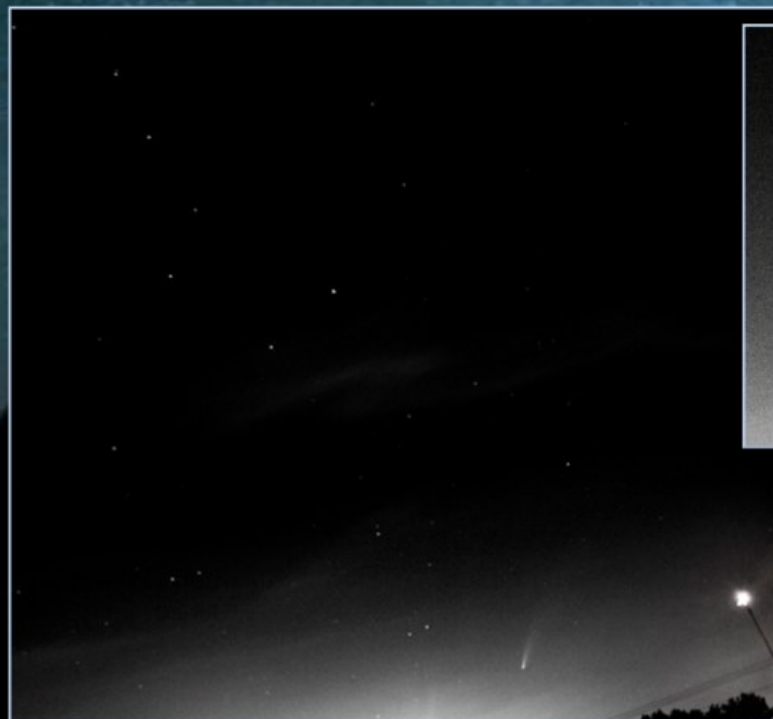
A raccoon and I scared the hell out of each other to make this happen.

Canon 60D ; Tokina 11-16mm ; 11mm @ F2.8 ISO 2500 for 10 seconds

*Fortuitous light painting brought to you by brake lights.
Matt Neilssen on July 16th, 2020*



*(right) Here is the cell phone picture I took using the club Meade 7" LX200 scope showing Jupiter and the four moons.
Dale Hachtel*



Comet NEOWISE and the Big Dipper last night (July 16th, 2020). Will go out again tonight. Roy Gustafson

MEMBER OBSERVATIONS

Milky Way by Matt Neilssen
July 25, 2020

I went out to Christian Allen's place last night to shoot the Milky way. We ended up doing a bunch of light painting and

Lagoon Nebula
by Byron Davies



MEMBER OBSERVATIONS

Photos by Byron Davies
July 25, 2020



(above) Helix Nebula



(above) Messier 24



(above) The Trifid Nebula

MEMBER OBSERVATIONS

Elephant Trunk Nebula by Paul Saeger

July 10th, 2020

I ran just about 3 hours on this last night. The most I've ever imaged before.

Lagoon Nebula by Paul Saeger

July 27th, 2020

I saw several great Lagoons last night. I wasn't able to use Astro Pixel Processor but here is my image from Castle.

Photo Stats

Explore Scientific FCD100 127mm
ZWO ASI 294 MC Pro -13 degrees C
ZWO Off Axis Guider , Optolong L-Enhance Filter
9 300" images , Deep Sky Stacker and Photoshop



Paul Castle Observing Sessions

Paul Castle Observing Session

July 4th, 2020

Last evening we had a very enjoyable observing session at the Paul Castle Memorial Observatory. In the group photo are Eric Sheidler, Al Sheidler, Terry Dufek, Steve Sinksen, Dale Hachtel and Rusty Case. John Douglas came by later but missed out being included in the group photo. Our main goal was to observe double stars and the planets Jupiter and Saturn. The full moon was extremely bright even though it was undergoing a penumbral eclipse last evening. This prevented us from observing galaxies, but the conditions were very good for observing Jupiter and Saturn which will reach opposition July 14th and 20th respectively.

Al Sheidler

Editors Note: Stephen Sinksen while observing Saturn got some very good views and could even see banding on the planet. Dale did visual observing of double stars while Al and Rusty did video versions. Terry did a Polemaster alignment of his Celestron SCT to see if it would work on a wedge mounted telescope (it works). We stayed until around 2 am and watched Mars rising which Stephen was eagerly awaiting. Al could see the polar ice cap. It was 84% illuminated



About Al's Photos

The following are some pictures I took of a number of double stars and the planets. I used my Nikon D7500 camera attached to a 10" Meade LX200 telescope.

The pictures of Jupiter and Saturn were obtained by stacking approximately 60 seconds of video frames using AutoStakert Software.

Al Sheidler



continued on next page)

Paul Castle Observing Sessions



Dione
Rhea
Tethys
Enceladus
Titan

Camera settings: FL = 5000mm, 3200 ISO, 5 sec

2 Canum Venaticorum, gold and blue double star, magnitudes 5.8 x 8.1, separation 11.4arcsec, distance 834LY

FL = 5000mm, 6400 ISO, 5 sec

Epsilon Lyrae (The Double-Double)
ε1 magnitudes 5.4 x 6.5, separation 2.6 arcsec
ε2 magnitudes 5.1 x 5.3, separation 2.3 arcsec
distance 160LY
FL = 5000mm, 1600 ISO, 1/10 sec

Alpha Herculis, orange and bluish-green double star, magnitudes 3.5 x 5.4, separation 4.7 arcsec, distance 382LY

FL = 5000mm, 6400 ISO, 1/5 sec

Mu Bootis, wide double star, magnitudes 4.3 x 7.0, separation 108 arcsec, distance 120LY

FL = 5000mm, 12800 ISO, 1/5 sec

Cor Caroli, double star, magnitudes 2.9 x 5.5, separation 19.4arcsec, distance 110LY

FL = 5000mm, 3200 ISO, 2 sec

Xi Bootis (Izar), beautiful yellow and redish-orange double star, magnitudes 4.7 x 7.0, separation 6.6 arcsec, distance 22 LY

FL = 5000mm, 12800 ISO, 1/15 sec

Epsilon Bootis (Izar), gold and blue double star, magnitudes 2.9 x 4.9, separation 2.8 arcsec, distance 210LY

FL = 5000mm, 800 ISO, 1/10 sec

Paul Castle Observing Sessions

The following pictures were taken at Paul Castle on July 4th, 2020. Even though it was a very moonlit landscape, I shot globular clusters with my ZWO ASI294 camera.

I also managed to get a polar alignment on my Celestron SCT telescope with a Pole-master Camera, rigged with a conduit clamp (see photo below). It was easy to use and worked quite well.

Terry Dufek



Messier 9 110 exposures at 10 sec
(18 min 20 sec exp)

Messier 10 22 exposures at 10 sec
(3 min 40sec exp)

Messier 3 26 exposures at 10 sec (4 min 20 sec exp)

Paul Castle Observing Sessions

Paul Castle Observing Session July 10th, 2020

An observing session was held on a fairly decent Friday evening at Paul Castle. Members attending were Al and Eric Sheidler, Dale Hachtel, and Terry Dufek. Al did large area photography and caught the elusive M24, the Sagittarius Star Cloud which measures about 5X3 degrees. He also caught an image of Pluto and verified it with Stellarium. He came back Sunday night to be sure. Eric was mastering getting a good alignment with his phone. He had nice views of Jupiter and Saturn with his scope. Dale and Rusty completed the NCRAL Summer Messier list. We continued until about 12:30 am.



Photos by Al Sheidler

M21, Webb's Cross

M20, Trifid Nebula

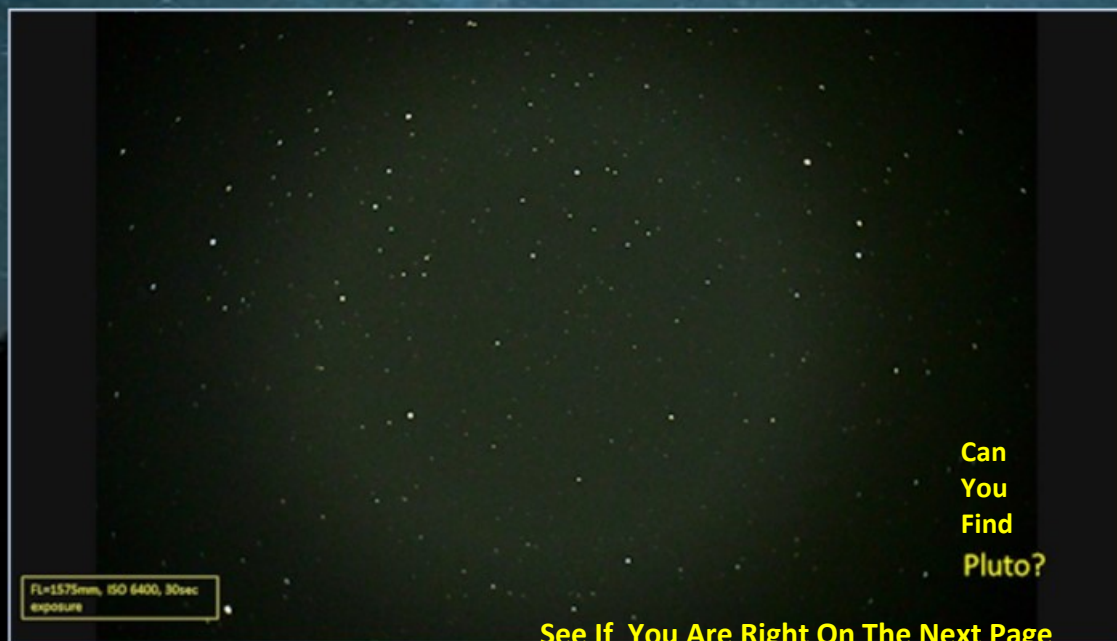
M8, Lagoon Nebula

FL=400mm, ISO 6400, 30sec
exposure

Paul Castle Observing Sessions



Photos by Al Sheidler



Paul Castle Observing Sessions

Observations of Pluto

The photos to the right are a pair of observations I made from the Quad Cities of the dwarf planet Pluto on the evenings of July 10th and July 12th. It is very difficult to discern Pluto in one image, so what I did was to orient the two images in as close of alignment as possible--slide 2 shows the star field on July 10th, and slide 3 shows the same field on July 12th. If you pop back and forth between these two slides repetitively (back and forth), if you have sharp eyes, you may be able to see one of the smaller stars jump a short distance across the screen. Give it a try and see if you can see it. On slides 4 and 5 I superimposed screen shots from Stellarium to verify my observations. Amazingly, Stellarium agrees exactly with the camera images and Pluto is in the predicted position for both images. Pluto at Magnitude 14.25 is certainly diminutive and unimpressive in my images here. But it is very satisfying to be able to find this pint sized dwarf planet.

I believe the technique of popping back and forth between star field images is very similar to the technique Clyde Tombaugh used to discover Pluto in 1930. Mr. Tombaugh used a device called a blink comparator to compare star field images taken a few days apart to reveal rapidly moving objects. The blink comparator is a viewing apparatus which permits rapid switching from viewing one photograph to viewing the other, "blinking" back and forth between the two images taken of the same area of the sky at different times.

Al Sheidler



Paul Castle Observing Sessions

Paul Castle Observing Session

July 12th, 2020

An observing session was held at Paul Castle this evening, attend by Ken Boquist , Stephen Sinksen, John Douglas and Terry Dufek. The sky was very clear though the humidity was really high. The Milky Way was really standing out once it got dark. Stephen had some great visuals of Jupiter and Saturn. The detail in the Jupiter's bands was phenomenally clear and distinct. He caught the Red Spot before it disappeared over the limb. Terry did some deep sky photography until Jupiter and Saturn got high enough. We waited until Mars got high enough for viewing and could see the polar ice cap. We left about 2 am.

Editors note: a few photos from the evening are on this page by Terry Dufek



Paul Castle Observing Sessions

Paul Castle Observing Session

July 16th, 2020

Last evening Steve Sinksen, Al Shiedler, Terry Dufek and Dale Hachtel met at the Paul Castle Observatory to view Comet Neowise and do some planetary observing. Dale also received his award certificate and pin for the NCRAL Spring Messier Observing Marathon he recently completed. Conditions for observing were not ideal with partly cloudy conditions, fog and heavy dew. Nevertheless we got some spectacular views of the comet and Jupiter before getting clouded out around midnight.

The close up images of the comet were taken at a focal length of 100mm, ISO 6400 and 5 sec exposure time using a Nikon D7500 camera affixed to a tripod. One of these images also captured a firefly as it flew past during the exposure. This comet is the best one we've had in years and easily visible to the unaided eye.

(Continued in next column)



The pictures of Jupiter were taken with the Nikon D7500 camera used as a video camera. The larger image was taken through a 10" Meade LX200 using eyepiece projection with a 10mm eyepiece. We were also interested to do the same shot using the same camera and 10mm eyepiece projection setup attached to Steve's recently refurbished Astro-Physics 6" F12 refractor. Personally, I don't think comparing these images gives a fair assessment of the relative performance of these two scopes. I would judge the visual image quality of Steve's scope to be outstanding, but I think the camera image here suffered from the incursion of clouds obscuring some of the video footage. Obviously this gives us another excuse (if we need one) to have another observing session, right Steve?

The images of Jupiter show the shadow of Europa as it transited. The Red Spot can also be seen beginning to swing into view. Absolutely stunning views of the action in the Jupiter system last night.

Al Shiedler

((photos on next page))



Paul Castle Observing Sessions



Paul Castle Observing Sessions

Paul Castle Observing Session

July 17th, 2020

Last evening Al Sheidler, Wayland Bauer, Eric Sheidler, Hugh Holt, Mary Holt, Alex Holt and Terry Dufek met at the Paul Castle Observatory to observe Comet Neowise. We also handed out awards for the NCRA Mini Messier Marathons to Al, Wayland and Eric.

The pictures of the comet were taken using a Nikon D7500 camera at FL = 200mm, F5.6, ISO 640 and 30 second exposure time. The camera was piggy-backed on top of an LX200 telescope which allowed tracking the comet for each exposure. It is interesting to note the motion of the comet between the two images which were captured 13 minutes apart. If you carefully look at the stars near the head of the comet, you can discern a significant shift in position even over that short timespan.

Al Sheidler



Paul Castle Observing Sessions

Please find attached two of
my photos from last night.
Both images taken at iso
3200 and 5 seconds, image
9426 FL35mm, F/4; image
9431 FL 125, F/6.3.
Wayland Bauer



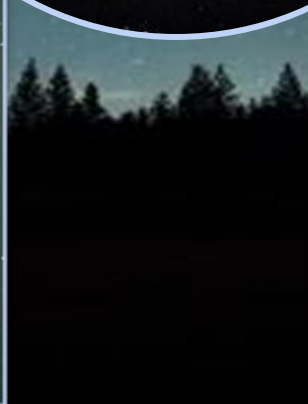
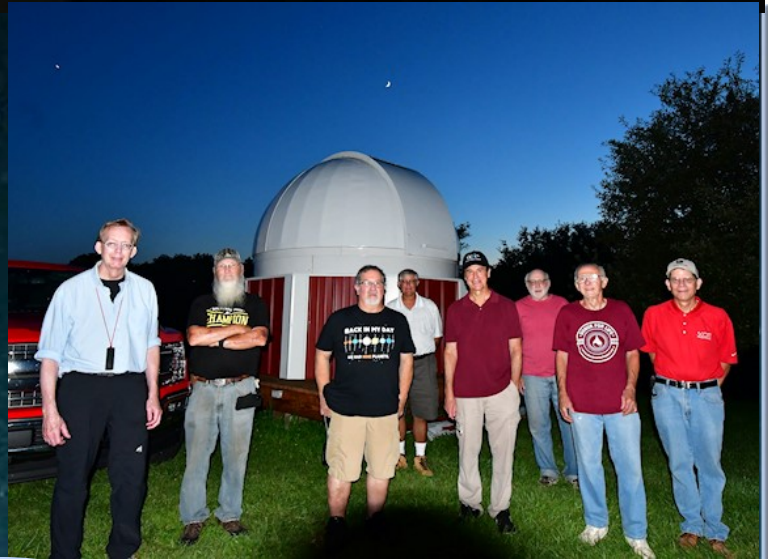
Paul Castle Observing Sessions

Paul Castle Observing Session

July 25th, 2020

Last night a group of us met at the Paul Castle Observatory to pursue Comet NEOWISE and observe other objects in near ideal conditions. In the group photo are: Steve Sinksen, Rusty Case, Dave Smith, Ken Boquist, Kurt Rexroth (guest), Terry Dufek, Dale Hachtel, John Douglas and Al Sheidler. Conditions were very good for planet viewing last night. Steve's AstroPhysics 6" F12 refractor rendered superior views of Saturn last night. The comet showed up very well last night. Attached are a few of my photos shot at varying focal lengths and exposure times.

Al Sheidler





PAC MONTHLY MEETING

President Alan Sheidler arranged (with the help of Dale Hachtel) for the July 2020 meeting of the Popular Astronomy Club to be conducted via (Zoom) at 7:00 p.m. local time, on July 13th, 2020. We had 21 members and 9 guests attending. Also attending was our guest speaker, Richard H Koos.

President Al Sheidler did a brief introduction of our speaker for evening Dick Koos.

Mr. Koos covered his early career in the space industries and how he got his start with NASA.

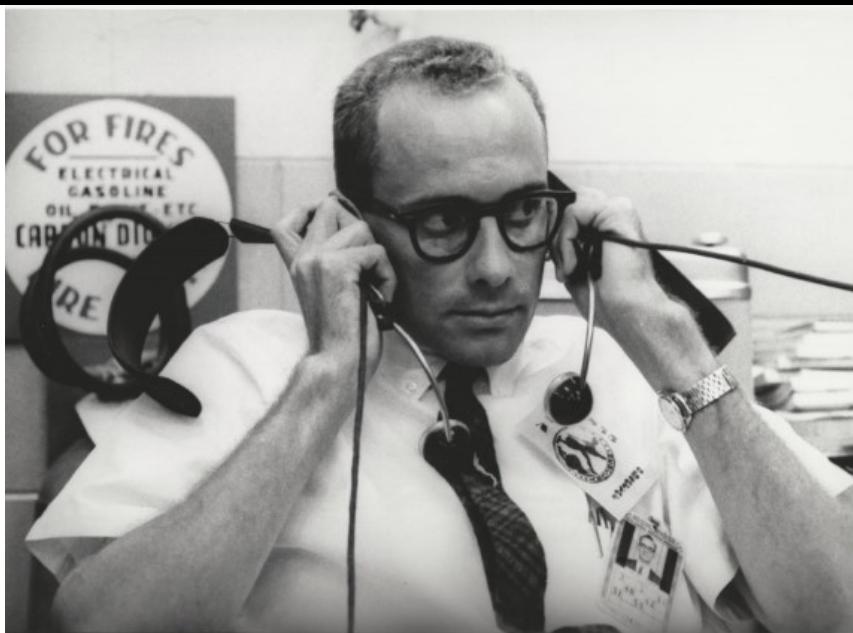
He covered his participation in the Apollo Space Program through development of the Apollo simulation design.

He showed video of the Apollo 11 Moon landing and the controllers involvement.

There was a Q and A with Mr. Koos. afterwards.

Al showed his photo captures of Pluto.

The meeting was adjourned.



Dick Koos (1969), the last man standing of the original Sim Guys

Thanks so much for the club coffee cup. It's a nice way to remember our talk together. Sure appreciate it very much.

I tried to make it not so much about me but show how the space center in Houston came into being and developed as well. There are a couple books I didn't get to mention that if anyone is interested they might enjoy. One is "Apollo Race to the Moon" by Charles Murray, 1989. Is a good well researched book. More recently "Eight Years to the Moon", 2019 by Nancy Atkinson. It has a lot of interviews and deals with a lot of the challenges in the program in those years, not all operational. For anyone who may be interested.

Dick Koos

