



LOCAL ASTRONOMY

Macomb Community College Astronomy Newsletter

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The Star of the 2020 Summer Sky: Comet Neowise

Not often enough a visitor from the outer regions of our solar system visits our night sky. MCC's Prof. Skonieczny welcomed the *star* of the night skies of this past summer with his Nikon Camera.

What makes Comet Neowise special is that it was visible with the naked eye! No special equipment was necessary to see it.

According to Prof. Skonieczny, "Comet Neowise was the best comet visible from this latitude in many years. While just barely visible to the unaided eye as seen from the suburban sky, its tail was impressive in binoculars. It hinted at the great beauty of comets I've observed previously like Bennet, West, Hyakutake, and Hale-Bopp." The next time Prof. Skonieczny will be able to greet Comet Neowise again will be in 6800 years when it returns from its aphelion distance of 725 AUs. Until then he will need to be satisfied with the great image he captured that you can see below. Notice Neowise is in the center of the image with its magnificent tail. For more information about Comet Neowise visit [NASAs Neowise Website](https://www.nasa.gov/feature/neowise) . ★

"It hinted at the great beauty of comets I've observed previously ..."

-Professor Skonieczny



Comet Neowise July 16, 2020 Sterling Heights
Image courtesy of Professor Skonieczny

THE SOLAR STORM OF AUGUST 1972

BY TIMOTHY SKONIECZNY

A solar storm is a high-energy release of plasma that is often associated with a major solar flare causing a Coronal Mass Ejection. The charged particles of the solar wind typically take 2 to 4 days to reach the Earth, but in the case of a solar storm, they can be ejected at high velocities and may take less than a day to traverse the distance. Upon reaching the Earth, these particles interact with the Earth's magnetic field and can produce a variety of effects, including a spectacular display of the northern lights. In past history, these events were considered as curiosities and sources of entertainment. In more recent years with the rapid advance of technology, they are now considered as potential triggers of anything between a small inconvenience to the potential collapse of human civilization.

Whether one's view of solar storms is good or bad, they are not everyday occurrences. Intense storms appear to occur on average once every decade or so. The 1859 Carrington event, named for the amateur astronomer who recorded the solar flare that produced it, is considered the most intense storm of the last two centuries, but the effects on society were

minimal because of the limited use of technology. Telegraph lines, the most advanced method of communicating over long distances at the time, were disrupted. But the electrical grid system that would be vulnerable was two decades away, space travel was a futuristic dream, and most people took little notice.

Since the beginning of the Space Age, there have been about 10 solar storms of varying intensity. The one that is now considered by some measures the most intense began with a solar flare that occurred on August 4th, 1972. This was during the final months of the Apollo Program and while the United States was actively involved in the Vietnam War. The flare triggered a Coronal Mass Ejection that was aimed toward the Earth. The particles from that ejection reached the Earth in only 14.6 hours, which is the fastest time ever recorded. Perhaps the first signs of the strength of the storm were the effects on at least three Department of Defense satellites orbiting the Earth, one of which lost power that ended its mission. The Vela satellite, which was designed to detect nuclear explosions, reported the event as a possible detonation. Recently declassified secret documents indicate that as many as 4,000 magnetically triggered mines planted by the U.S. Navy in North Vietnam spontaneously detonated due to the reverberations of the Earth's magnetic field. Radio transmissions were significantly affected and power outages and disruptions to telephone communications in the Great Lakes region were reported.



August 5th, 1972 Aurora Corona. The stars appear elongated due to the Earth's motion during the long time exposure. Film was less sensitive than modern digital cameras

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The storm could have had a disastrous affect on the Apollo Program had a mission been in progress during the storm. Astronauts well outside the protective shield of the Earth's magnetic field would have been exposed to severe, if not lethal, doses of radiation. Fortunately, the storm occurred between the Apollo 16 and 17 missions, but the potential danger became apparent.



August 5, 1972 Auroral Rays looking North from Stargate Observatory

On August 5th and for nights to follow, the northern lights were widely observed across the Great Lakes region. At the time, I was preparing for my senior year at De La Salle Collegiate High School, then located in Detroit, and had just completed Astronomy 1 at Macomb Community College under Professor John Mitchel. I developed a serious interest in amateur astronomy in 1969 and had seen several displays before this while out observing with my telescopes, but this display left a big impression on me. Before the internet and informative web sites like Spaceweather.com, these events occurred without notice. On that evening, the display was so bright that it was startling to see from my parents' home near the corner of 12 Mile Road and Hoover. Back then, light pollution was less of a problem and the Milky Way could be seen on rare occasions when overhead. But for the display to be that striking from the city, I knew it had to be a major event.

A friend of mine and President of the Warren Astronomical Society, Frank McCollough, called me and wanted to know if I would be interested in driving out to Stargate Observatory, located on the grounds of Camp Rotary. Today, it is part of Wolcott Mills Metropark. For the entire night, we watched a brilliant and colorful dance of lights that went past the zenith, producing a rare effect coveted by aurora watchers called the corona. The corona appears as if streams of light are emanating from the top of the sky directly



Stargate Observatory, Wolcott Mill MetroPark

down to you. Displays continued for nights and we stopped driving out to the Observatory. In retrospect, I should have been out every night because I have not witnessed a display that was as intense and as long-lasting since then. The only celestial events I have seen that exceed the beauty and awe of these displays are 11 total solar eclipses, the first one observed just one month before this in Nova Scotia.

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“The images do not do justice to the beauty of the display because they lack the undulating and rhythmic motion that was part of the experience.”

The images shown with this article were taken by me using a 35 mm camera (Ricoh TLS 401) and Ektachrome 400 film. The exposures were about 30 seconds long and I had to wait some days to see the results because the film was shipped to Findlay, Ohio, where Kodak had a processing plant. One had to be patient in those days to see the results, but it added a level of anticipation that is lacking in photography today. Modern photography is far more convenient and less expensive than it was in



August 5, 1972 Notice these images are all different due to the motion of the particles.

the past, but I believe that it has lost a lot of magic and excitement. The images do not do justice to the beauty of the display because they lack the undulating and rhythmic motion that was part of the experience. ★

DECEMBER SKIES

BY JONATHAN SCHEMKE

As we move in to winter in Michigan, the weather can be a deterrent to going outside to star gaze. However, the cold temperatures make for clearer skies, at least when the clouds aren't in the way. This means that observation is often better during the chilly winter months. With this in mind, December has a number of treats, including several that require no equipment.

Planets

Saturn and Jupiter continue to hang low together in the southwestern sky just after sundown. To the naked eye Saturn has a slight yellowish tint, but Jupiter will likely be the one that catches your eye first. Other than the Moon, Jupiter is one of the brightest objects in the night sky and is hard to miss on a clear night. If you happen to have a good pair of binoculars you might even be able to make out some of the Galilean satellites (The four largest moons of Jupiter) as tiny points of light near the planet. This can also be achieved using a camera with a good zoom and a stable base as shown below.



"Jupiter and its moons" by [Kuba Bożanowski](#) is licensed under [CC BY 2.0](#)
From top left to bottom right: Ganymede, Europa, Io, (Jupiter), Callisto.
Taken with the 70-300mm G VR Nikkor @ 300mm, 1s exposure, f/11, ISO 400
(tripoded, VR off).

If you're an early riser, another of the brightest objects in the sky, Venus, is visible just before sunrise through most of the month. Venus will appear a brilliant bright white just above the Eastern horizon, and like Jupiter, is hard to miss.

Meteor Activity

The Geminid shower reaches its peak December 13th and 14th. If the weather cooperates it should be a sight with a predicted 100+ meteors per hour. According to NASA, astronomers consider it one of the "best and most reliable" showers of the year. Like all showers it is named for the constellation from which the meteors appear to originate. This means that the Geminids appear to radiate out from the constellation Gemini, which will be in the eastern sky during the shower. However, increased activity will occur everywhere throughout the sky. There is a new Moon on the 14th so it will not interfere with viewing, making the display potentially even more spectacular. My plan is warm clothes, possibly a space heater, and a lawn chair if the clouds stay away.

A second shower comes later in December, the Ursids. This is a minor shower producing 5 to 10 meteors per hour at its peak December 21st and 22nd. This is a far cry from the Geminids, but if weather prevents viewing of the more active shower, this gives a second chance in the month to see an increase in activity.

The Moon

On December 16th and 17th the waxing crescent will pass by first Jupiter and then Saturn on its march across the sky. The three objects can be found above the southwestern horizon after sunset on those nights.

The month of December draws to a close with a full moon on December 30th. The December full moon was called the Cold Moon by the Native Americans. It is also sometimes called the Long Nights Moon due to the short daylight hours of December. When it occurs early in the month it is referred to in some cultures as the Moon Before Yule, as it proceeds the Yuletide.

Man-Made

Normally more of a pest to astronomical photographers than something to see there are numerous man-made satellites that can be found moving across the night sky. This number is rapidly growing, and it doesn't take long outside on a clear night before you start noticing these moving lights among the stars. That said, there is one object of note, particularly now. The International Space Station is bright even to the naked eye and makes regular passes over head. This is a fast-moving object so you need to check your location to know when exactly to look up. NASA provides up to date information about the [ISS](#) location and observation opportunities.

My reason for mentioning the station is that the Dragon Crew Capsule launch on November 15th was the first official crew launch from American soil since the Shuttle program ended nearly a decade ago. The four Crew-1 members consist of NASA astronauts Michael Hopkins, Victor Glover and Shannon Walker as well as Japanese JAXA astronaut Soichi Noguchi. They join NASA astronaut Kate Rubins and Russian cosmonauts Sergey Ryzhikov and Sergey Kud-Sverchkov already aboard.



"ISS Crew 64" by NASA is in the [Public Domain](#)

(from left) Flight Engineers Kate Rubins, Victor Glover and Soichi Noguchi, Commander Sergey Ryzhikov and Flight Engineers Michael Hopkins, Shannon Walker

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So, if you happen to catch a glimpse of the ISS this month, remember that these seven men and women are living and working aboard that bright dot traveling at around 17,000 miles per hour about 250 miles above your head. ★

STUDENT HIGHLIGHTS

Provided by Christopher Zin



Chris Zin decided to have some viewing fun with his MOTO X4 cell phone camera on December 2 capturing Mars in the St. Clair Shores sky.

“I observed Mars too. It's so crazy how you can tell it's Mars when you see it, because it's so bright and noticeably very red! I hope your observations went well. The photo I've posted had the exposure time of 0.10 seconds, which I think was a good amount for a clear image!”

~Kelly Calandrino
Astronomy Student



It doesn't take fancy equipment to have fun taking images of planets in the sky. In this image by Chris Zin we can easily see that Mars is red. Image taken with MOTO X4 cell phone in St. Clair Shores on December 2.

Student Highlights continues on page 8.

Not only do MCC Astronomy students look to see what there is in the night sky in their own neighborhoods they also get to use the *MicroObservatory* Robotic Telescope Network operated by the Harvard-Smithsonian Center for Astrophysics. After students select their target, field of view, exposure time, and filter they submit their request to the MicroObservatory. A telescope in Massachusetts or Arizona captures the requested images and sends them to the requester. This is possible because of the NASA funded program *Observing with NASA*.

“I attached a picture below that includes 3 images along with the settings that were adjustable when requesting them. They provide so much more detail compared to what I could see in my own observation. The moon, early this morning, seemed much brighter to my eyes than in the images, but that is probably due to the low exposure time selected.”

~Holden DeRush
Astronomy Student



Camera: Wide
Exposure Time: 0.1 Seconds
Filter: Grey

Camera: Normal
Exposure Time: 0.1 Seconds
Filter: Grey

Camera: Zoom
Exposure Time: 0.1 Seconds
Filter: Grey

This year the Winter Solstice is Monday, December 21 at 5:02 am. On December 21 the length of the day will be 9 hrs 4 mins 46 secs as compared to the summer solstice day length of 15 hours 16 mins 51 sec. Sunrise will occur at 7:58 am and Sunset at 5:03 pm.

“As time went on through the day, the shadow, while facing south, moved clockwise. This was what I expected due to the Sun changing positions in the sky. For the day of the winter solstice, I predict that the shadow will change slightly because the Sun will be in a lower position in the sky and won't be present for as long as it was this week. The time of my shortest shadow was 11:30 am, and at this time the Sun was 35 degrees in the sky. The altitude of the Sun will slowly rise for the rest of the year after the winter solstice.”

~Sara Durant
Astronomy Student

Image courtesy of Sara Durant



“Many ancient civilizations commemorated the winter solstice with architecture, notably the Newgrange. This Irish monument is somewhat similar to the Scottish Stonehenge. The Newgrange is built so precisely that, every winter solstice, the Sun shines through an opening and fills the entrance and inside with light. I would love to visit this on the winter solstice to see the accuracy of the architects who built it. It's amazing how primitive societies are able to make such precise calculations in order to build things like this.”

~ Caleb Noble
Astronomy Student

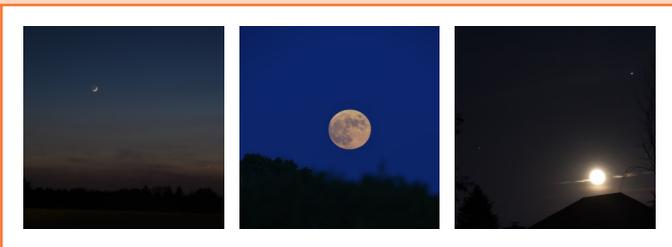


Newgrange Image [Source](#)

Student and Faculty Highlights

We want your submission!

Have you done, created, or photographed anything interesting relating to astronomy? We would love to read about it. Send submissions to SkoniecznyT@macomb.edu or FeyF@macomb.edu with permission for us to publish it.



Images by Timothy Skonieczny

Our Newsletter needs a catchy name! We're taking suggestions. If the name you submit is selected you will win a \$50 gift card for the Macomb Community College bookstore or Amazon.com (your choice). Contact:

feyf@macomb.edu or skoniecznyt@macomb.edu