

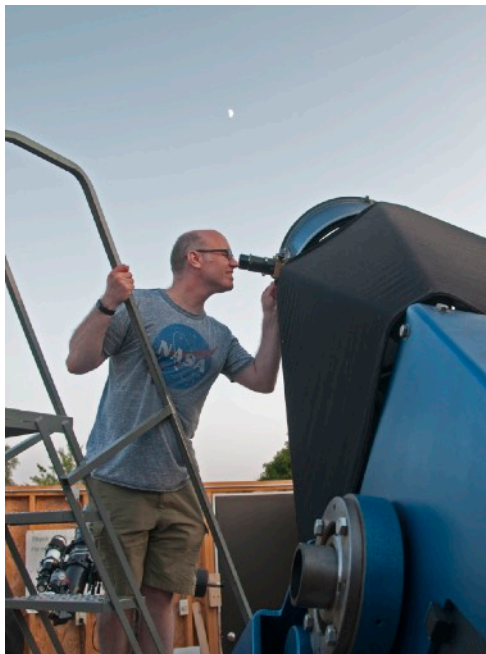
SPECTRUM

Northern Cross Science Foundation Newsletter

August 2021



Above: Visitors enjoy a clear night of stargazing at the Plunkett Observatory on Saturday, July 17. **Left:** NCSF member Dan Goetz views the waxing moon. Ernie Mastroianni photos



Public viewing returns to Plunkett Observatory

By Ernie Mastroianni

The Plunkett Observatory was once again open for public viewing on two mid-July nights after being closed for the 2020 season due to the COVID pandemic. On Saturday, July 17, I was joined by NCSF member Dan Goetz, who rolled off the roof and fired up the 20-inch Panarusky (with a freshly cleaned mirror) while I powered up the 5-inch refractor.

It's not quite like riding a bicycle, though. I had forgotten how to initialize the Sky Commander software on the 20-inch and had trouble remembering how the Celestron hand controller worked.

But after some trial-and-error flubs and consultations with the manuals, we were soon showing visitors crisp views of the

moon and the classic summer nebulae and clusters.

While clear, the night was not ideal at Harrington Beach State Park. The moon, slightly larger than half, illuminated the entire sky. Smoky haze from the western wildfires also affected atmospheric transparency. But none of the 15 or so visitors complained as they viewed such features as the Straight Wall on the moon and the Ring Nebula in Lyra.

The waxing gibbous moon, as viewed through the 20-inch, was in high-contrast and the view was a marked improvement after its mirror was cleaned by NCSF secretary Kevin Bert. I

could easily see the Hadley Rille, a sinuous

See page 4

August program:

Exploring Exoplanets

Andrew Salata, a NASA Solar System Ambassador, will present the August program. He'll review what techniques astronomers use to find planets orbiting stars. He'll explain the challenges that arise in trying to find an Earth-mass exoplanet and the methods used to locate them with current technology. The presentation will also discuss what's next in the search for Earth-like exoplanets.

July General Meeting report

By Ernie Mastroianni

With the return to public stargazing events, getting more club members to volunteer at Harrington Beach, Pike Lake and other venues is a top priority. NCSF president Jeff Setzer stressed this during the club's General Meeting on Thursday, July 1. An observing leader and an observing assistant are needed at each public viewing event at the Plunkett Observatory and Pike Lake.

As of this writing, leaders and assistants are needed at the Plunkett Observatory on August 13 and 14, and at Pike Lake on August 14.

In addition, more telescope volunteers are needed at the Port Washington Recreation's Family Campout on August 6. Planning

See page 4

Observing report: NCSF members enjoy the dark skies at the Pike River Starfest

About 75 miles north of Green Bay, near tiny Amberg, the Pike River Starfest was held in early July. The dark sky event, held on private land, is courtesy of Gerry Kocken, a member of the Neville Public Museum Astronomical Society. Six members of the NCSF attended, and had great luck with clear skies, though the humidity was high. They describe their stargazing nights, nearly free of light pollution, as follows. - *Ernie Mastroianni*

Rick Kazmierski: Highs were in the upper 70s with three out of four nights clear. The Milky Way could be seen down to the horizon. We used a 12-inch f/6 Orion go-to Dobsonian. We had crisp views to 300X. Saturn and Jupiter were great, split the Double Double in Lyra easily, the spiral structure on the Whirlpool Galaxy (M51) visible.

Joyce Jentges: I was at the star party Wednesday through Sunday. It rained on the way up there and was just a bit drizzly as we set up. The rest of the star party from Thursday to Sunday we had temperatures starting in the mid 60's and by Sunday it was a comfortable 75 degrees.

Skies were fantastic: darker than you normally see here. The Milky Way was splendid! It's worth it to be away from the light pollution. There were six NCSF members present. There were maybe four or five people up on a hill farther up on the property and two others across the field from us.

With my 10-inch Dobsonian I saw something I've never seen. Near the Swan Nebula (M17), there is a good-sized puff cloud a distance behind it. Apparently some astronomers call this Swan Gas. I thought that was hilarious. Later with Jupiter we saw two moons that appeared to be almost stacked upon each other. Saturn on Friday evening was incredible. The way the planet is tipped, the Cassini Division was clearly visible. The planet was crisp and very clear.

From Charlotte DuPree: Gene operated the computer for me on our 18-inch Obsession telescope. I saw NGC 4631 (the Whale Galaxy) for the first time. I didn't know until later there was a companion I should have been able to see. The nights were in the low 50's, and very dewy. There were suppose to be about 20 attendees, but only 6 from NCSF and 6 from the Green bay club were there.

From Mark Zellner: This new stargazer had his first chance to see a truly dark sky. It really turned out to be a learning experience in how difficult it can be to find objects and make all the equipment work. The days were beautiful and the nights clear, cool and WET.

I used my Orion SkyQuest XT8 Dobsonian with no go-to or computer capabilities. I've been tweaking this scope with dew heaters and a fan on the back end to keep the air moving over the primary mirror. I had dew straps on my finder scopes but on Night One a heater shorted out. My uncovered red dot finders become useless in the heavy dew.

I talked with Rick, Gene, and Joyce the next day and spent the day applying remedies to my previous night's issues. I also spent most of an afternoon with Gerry Kocken in his library and telescope workshop. He has a truly staggering collection of books, photos, astronomy diagrams and models.



Unmarred by light pollution, the southern Milky Way was photographed by Rick and Jason Kazmierski from the campsite at Amberg. The exposure was just 15 seconds long. Visible as small red glows are deep sky objects M16, M17, M8, and M20.



The campsite of NCSF members at the Pike River Starfest. At far right is the DuPree's 18-inch Obsession telescope. Gene and Charlotte DuPree photo



As an aside: Gerry is an incredible and thoughtful host. He was always looking for ways to be helpful and assist our observing. I will go back next year. With equipment issues solved, I then found that finding my targeted objects was much harder when the sky overwhelmed me with points of light and a glowing Milky Way spanning from one horizon to the other. I looked at numerous miraculous sights but mostly, I was never sure what I was observing. I identified the Lagoon Nebula and a couple of globular clusters. But I

needed help making my way around the night sky in some kind of orderly manner. Rick helped me set up a plan for a night's observing. That'll be my goal for my next night out with my scopes with new go-to equipment finally arriving after long delays.

I learned so much and am eager to get out to more places. I'll plan to attend more star parties and plan family camping trips to include those along with our other summer travels. Thanks for everyone's help!

Panarusky telescope mirror cleaned, plus a look back at the mirror history

Editors note: In early July, NCSF secretary Kevin Bert and his wife Kathy cleaned the 20-inch primary mirror of the club's Panarusky telescope at Harrington Beach State Park. Mindful of the observatory's reopening after the long pandemic shutdown, their timing of the cleaning was ideal. "Man was it dirty," said Kevin in a post on the club's Slack channel. "The primary mirror coating shows a little deterioration but cleaned up nicely, he added. "The coatings should be good for at least several more years. The secondary mirror was cleaned too and looks great."

By Kevin Bert

Most club members may not know that the original 20-inch mirror for the Panarusky was purchased at a popular star party in the 1980's. It was nearly 4 inches thick, had a Cassegrain perforation and weighed almost 100 pounds. This satisfied the original design for the telescope. It would be Newtonian, but by exchanging the secondary it could be used as a Cassegrain as well.

But the mirror's focal length was too long, so club members ground the primary mirror to the required 90 inches and had the polishing about 80% complete. This process took much longer than expected, so the club decided to have the primary mirror finished professionally. After completion and installation, the telescope was ready for the first public showing of this telescope on Thursday, May 16, 2002.

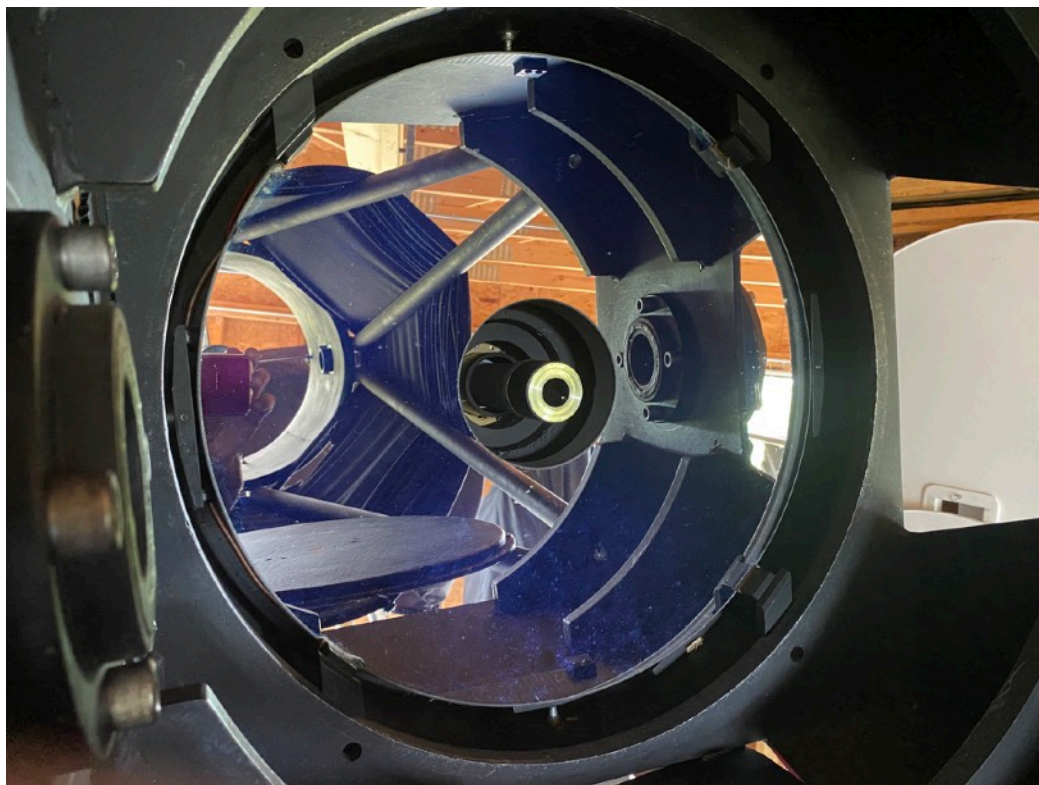
Mirror fail

Unfortunately, the optics were not performing properly. After additional testing, we discovered that the glass was not properly annealed, causing stress that was twisting and distorting the precisely-polished surface. Refiguring the mirror's surface was not an option as the stress would most likely distort the surface again.

So we looked to Optical Mechanics Inc. of Ohio. They were making a dozen 20-inch f/5 mirrors for Obsession Telescopes and they offered one to us. We accepted and made alterations in the truss tube to accommodate the mirror, which was only half the weight of the original but had a longer, 100-inch focal length. All was ready for the July 21, 2007 dedication.

Cleaning

There is often debate on how often you should clean telescope optics. How often it is used, whether it has an open or closed tube and the weather condition in your area are the main factors. You can tolerate quite a bit of accumulated dust and condensation sediment on the surface with



The newly-cleaned Panarusky mirror crisply reflects the surroundings of the Plunkett Observatory. Ernie Mastroianni photo

Cost of both mirrors

\$800	Original star party purchase
\$1,200	Nova optics, for final figuring
\$300	QSP, to aluminize Nova's work
\$3,640	OMI, for replacement mirror

almost no drop in performance. As bad as a mirror might look, experts agree that it should not be cleaned too often.

The 20-inch Panarusky telescope is used often and with an open tube, it is prone to airborne dust and condensation from humid air. We use a heat pipe inside the mirror cell to slightly warm the cool primary mirror early in the morning to prevent condensation. It works fairly well as long as the warming light bulb does not burn out.

The mirror was last cleaned prior to the 2014 Astronomical League convention. The normal cleaning process of reflecting telescopes is to remove the primary mirror. For a large mirror and heavy mirror cell it is time-consuming and cumbersome, requiring an engine lift and large tub to soak the mirror. We decided to clean it in place.

The telescope is pointed straight up and all the side panels and Cassegrain focuser

are removed to access the primary mirror. Now you have the equivalent of a giant bird bath with a drain hole in the middle. A sheet of plastic is taped to the underside of the mirror's central perforation to form a funnel that drains into a five-gallon pail. Spray bottles with water mixed with mild dishwashing detergent start the cleaning process by blasting the optical surface flushing off the big debris.

After soaking a while, we use plain water in a spray bottle to flush the remaining soap down the center drain. The process is then repeated.

To remove particles still stuck to the mirror, we use surgical cotton balls and hand-dab the entire soapy surface, replacing dirty cotton balls with fresh ones. To prevent scratching, no dragging cotton across the mirror is done, only dabbing.

After a couple rinsing sessions, a final rinse of distilled water via spray bottle is applied, then the mirror is dabbed dry.

Once all the potential scratching grit and sediment is removed, the next step is to use a spray of isopropyl alcohol followed by slightly wiping the surface with cotton balls to remove any remaining film. Similar cleaning steps are used on the secondary mirror. The optics now look great and the reflective coating is holding up well.

I am looking forward to the new and improved views through the 20-inch.

From page 1 valley explored by the Apollo 15 astronauts.

----- We showed our visitors the usual summer treats, such as the Dumbbell Nebula (M27), the Hercules Cluster, (M13), the Owl Cluster (NGC457) and the colorful double star Albireo.

Later on, I sought out, but could not confirm seeing the galaxy cluster Stephan's Quintet through the 20-inch. Perhaps the moon and smoke affected the view. But we did crank up the power to 390x on the colorful Cat's Eye nebula, and its electric blue hue was evident. We closed the roof shortly after midnight after a successful session with well-engaged and enthusiastic visitors.

From page 1 for the 2022 NCRAL convention is going smoothly. Most speakers
----- for our canceled 2020 conference have agreed to return, including UW astrophysicist Francis Halzen, who is the principal investigator for the Ice Cube neutrino observatory at the South Pole.

Treasurer Gene DuPree reported \$12,151 in the club account and paid the \$19.41 electric bill and a \$10 state report fee. Board member Mike Borchert touted NCSF Slack channel. The active site is filled with photos, observing reports, and tips on NASA activities.

The main program, by NASA Solar System Ambassador John Fontana, was a mind-bender. He discussed multiple ideas on the beginning, the end, and current state of the universe. Did it all start with a Big Bang? Will it all end with a Big Crunch, or a Big Rip, or a Big Freeze? Do other universes also exist and if so, are they also going through similar cycles?

And really, how can the universe expand faster than the speed of light? You can see the [presentation on Slack](#).

Cabin available for NCSF at Northwoods Starfest

I have some good news for Northwoods Starfest! The NCSF has a designated cabin for all of our members who wish to bunk together. I know I'll be in there along with Mark Weber. Who else wants in? If you haven't registered yet, just note that you want to be in the NCSF cabin when you [fill out the form](#). If you've already registered, just let me know and I'll have them add you to the list.

- [Jeff Setzer](#)

A new event: Autumn WOW star party

NCSF President Jeff Setzer has organized an autumn version of the Wisconsin Observers Weekend, set at Hartman Creek State Park in Waupaca on Oct. 1-3. Group sites 1 and 2 have been reserved for NCSF members and the cost, \$87 for each site, will be split by those who will attend. Interest has already been noted from the Kazmierskis, the DuPrees and the Zellners. Astronomical twilights ends at 8 pm that weekend, so there will be lots of observing time. The Moon doesn't come up until nearly 3 a.m.

Contact [Setzer](#) for more details.

Webb telescope event to be held at Port Washington Library

I am working with the library in Port Washington on an official James Webb Space Telescope event. The event is on **October 27, 2021 from 3-8 pm**. This is what I am looking for:

1. Several members to attend the event and be on hand at an information table.
2. Displays that the library could borrow for the month of October that would be placed in a locked display cabinet near the entrance of the library.
3. Some sort of space-related hands-on activities or something for a display table.
4. Possibly telescopes for evening observing. I don't know how well this will work due to trees and buildings.

Let me know if you plan to attend or can help in any way. - [Joyce Jentges](#)

The Webb telescope could launch this year, according to a [June 3 NASA release](#): *NASA's James Webb Space Telescope, which will be the premier observatory of the next decade, remains on schedule for a launch readiness date no earlier than Oct. 31, 2021. Webb will ship to the launch site in August with little to no schedule margin; launch processing will take two months. We are working closely with the European Space Agency (ESA) and Arianespace on establishing the launch date.*

Looking ahead

August 5, Thursday

General Meeting

7:30 pm, online via Zoom

Port Washington Recreation

Family Campout,

August 6 Friday, 8 pm - 11 pm
Upper Lake Park 650 N Lakeview Dr,
Port Washington,
Jim Hahn will attend,

more volunteers needed

Public viewing

August 13, 8 pm Harrington Beach
August 14, 8 pm Harrington Beach and
Pike Lake, **volunteers needed**

Northwoods Starfest

August 6-8

Hobbs Observatory, Fall Creek, Wis.

<https://www.cvastro.org/northwoods-starfest/nwsf-information/>

Perseid meteor show

Peaks at 2 pm on August 12

Best times locally are before dawn or late evening on that day.

ALCON Astronomical League

Convention:

August 19-21

Virtual, online only

Register:

<https://www.astroleague.org/content/register-alcon-21-virtual>

Small Scope star party

August 28, Saturday, 8 pm

Harrington Beach (member event)

Telescopes limited to 6 inches of aperture or less, visual only, no binoculars

Binocular star party

Sept. 29, Wednesday, 8 pm

Harrington Beach (member event)

Autumn WOW

Oct. 1-3

Hartman Creek State Park

N2480 Hartman Creek Rd, Waupaca

Sheboygan Swap-n-Sell

October 23, 2021

Aviation Heritage Center,
Sheboygan Airport

NCRAL convention

May 13-14, 2022

Port Washington

Hosted by the Northern Cross
Science Foundation

Astronomy and spaceflight links

Any comprehensive list of online astronomy links could fill dozens of pages, and as such, this list is selective and is subject to change. Many are well known to members, others might be new. Please email me with any more suggestions that you feel would be useful to NCSF members, and let me know if any links are no longer working. - *Ernie Mastroianni, editor*

Astronomy clubs, newsletters and websites

NCSF: <https://ncsf.info>
 Astronomical League: <https://www.astroleague.org/>
The Reflector magazine: <https://www.astroleague.org/reflector>
 Milwaukee Astronomical Society:
<http://milwaukeeastro.org/index.asp>
 North Central region of the AL: <https://ncral.wordpress.com/>
 NCRAL newsletter archive:
<https://ncral.wordpress.com/newsletter-archive/>
 US list of astronomy clubs:
<https://www.astroleague.org/astronomy-clubs-usa-state>

Astronomy gear, vendors and online sellers

<https://www.bhphotovideo.com/>
<https://www.highpointscientific.com/>
<https://optcorp.com>
<https://www.telescope.com/>

Astrophotographers

Astrobin (a paid site for astrophotography uploads):
<https://welcome.astrobin.com/>
 Rogelio Bernal Andreo <http://www.deepskycolors.com>
 Chad Andrist <https://www.astrobin.com/users/SparkyHT/>
 Bob Franke <http://bf-astro.com/>
 Harrington Beach Imagers Group (Ernie Mastroianni and Tom Schmidtkunz)
https://www.astrobin.com/users/Harrington_Beach_Imagers_Group/
 Trevor Jones <https://astrobackyard.com/>
 Rick Kazmierski <http://skyhawkobservatory.com>
 Jerry Lodriguss <http://www.astropix.com/index.html>
 Gabe Shaughnessy: <https://www.astrobin.com/users/AstroGabe/>
 Babak Tafreshi <https://babaktafreshi.com/>

Classifieds

<https://astromart.com/>
<https://www.cloudynights.com/>

Clear sky forecasts

Astrospheric <https://www.astrospheric.com/>
 Clear Dark Sky <https://www.cleardarksky.com/csk/>
 Clear Outside <https://clearoutside.com/forecast/50.7/-3.52>

Digital star atlases

Cartes du Ciel <https://www.ap-i.net/skychart/en/start>
 Stellarium <https://stellarium.org/>
 Sky Safari <https://skysafariastrometry.com/>

Magazines and online astronomy news

Sky & Telescope <https://skyandtelescope.org/>
Astronomy <https://astronomy.com/>
Astronomy Now <https://astronomynow.com/>
Skynews <https://skynews.ca/>
The Reflector <https://www.astroleague.org/reflector>
Sky at Night <https://www.skyatnightmagazine.com/>
 Astronomy Picture of the Day
<https://apod.nasa.gov/apod/astropix.html>



NASA Hubble Space Telescope captures the chaotic activity atop a three-light-year-tall pillar of gas and dust that is being eaten away by the brilliant light from nearby bright stars in the stellar nursery called the Carina Nebula. NASA/ESA/STSc photo

NASA images and missions

James Webb telescope https://www.nasa.gov/mission_pages/webb/main/index.html
 Hubble telescope <https://hubblesite.org/>
 NASA JPL Curiosity <https://www.jpl.nasa.gov/missions/mars-science-laboratory-curiosity-rover-msl>
 NASA JPL Juno at Jupiter <https://www.jpl.nasa.gov/missions/juno>
 NASA JPL Mars 2020 <https://www.jpl.nasa.gov/missions/mars-2020-perseverance-rover>
 NASA Johnson Space Center on Flickr
<https://www.flickr.com/photos/nasa2explore/>
 NASA Images
<https://www.nasa.gov/multimedia/imagegallery/index.html>
<https://images.nasa.gov/>
 NASA International Space Station
https://www.nasa.gov/mission_pages/station/main/index.html
 NASA Kennedy on Flickr
<https://www.flickr.com/photos/nasakennedy/>
 NASA Project Apollo Hasselblad scans:
<https://www.flickr.com/photos/projectpolloarchive/albums>

NASA Research Centers

Ames Research Center <https://www.nasa.gov/ames>
 Armstrong Flight Research Center
<https://www.nasa.gov/centers/armstrong/home/index.html>
 Jet Propulsion Laboratory
<https://www.nasa.gov/centers/jpl/home/index.html>
 White Sands https://www.nasa.gov/centers/wstf/index_new.html
 Johnson Space Center
<https://www.nasa.gov/centers/johnson/home/index.html>
 Marshall Space Flight Center
<https://www.nasa.gov/centers/marshall/home/index.html>
 Michoud Assembly Facility
<https://www.nasa.gov/centers/marshall/michoud/index.html>

Astronomy and spaceflight links



The main engine on the Virgin Galactic VSS Unity aircraft lights up on July 11, carrying two pilots and four passengers, including Virgin Atlantic CEO Richard Branson. The flight reached to about 53.5 miles above the earth during the 15-minute sub-orbital flight.

NASA Research Centers (continued)

Stennis Space Center

<https://www.nasa.gov/centers/stennis/home/index.html>

Glenn Research Center

<https://www.nasa.gov/centers/glenn/home/index.html>

Plum Brook Station <https://www.nasa.gov/centers/glenn/about/testfacilities/index.html>

Katherine Johnson IV&V facility

<https://www.nasa.gov/centers/ivv/home/index.html>

Goddard Space Flight Center <https://www.nasa.gov/goddard>

Mary W. Jackson NASA headquarters

<https://www.nasa.gov/centers/hq/home/index.html>

Wallops Flight Facility

<https://www.nasa.gov/centers/wallops/home>

Langley Research Center <https://www.nasa.gov/langley>

Kennedy Space Center

<https://www.nasa.gov/centers/kennedy/home/index.html>

Observatories

UW Astronomy <http://www.astro.wisc.edu/>

Gemini <http://www.gemini.edu/>

WM Keck <http://www.keckobservatory.org/>

European Southern Observatory <https://www.eso.org/public/>

ESO images <https://www.eso.org/public/images/>

National Optical Astronomy Observatory

https://www.noao.edu/image_gallery/

National Radio Astronomy Observatory <https://public.nrao.edu/>

Lowell Observatory: <https://lowell.edu/>

Observing

Clear Skies Observing Guides <https://clearskies.eu/csog/>

Current comets: <http://www.aerith.net/comet/weekly/current.html>

Fred Espenak's eclipse guide: <http://mreclipse.com>

Upcoming and seasonal events: <https://in-the-sky.org/>

ISS transits: transit-finder.com

CCD calculator: <https://new-astronomy-ccdcalc.software.informer.com/>

Tonight's Sky localized <https://telescopius.com/>

Outreach organizations

Planetary Society <https://www.planetary.org/>

Night Sky Network from JPL/NASA <https://nightsky.jpl.nasa.gov>

Citizen science participation <https://cosmoquest.org>

NASA Solar System Ambassadors <https://solarsystem.nasa.gov/solar-system-ambassadors/events/>

Sky calendars

<https://skyandtelescope.org/observing/sky-at-a-glance/>

<https://astronomy.com/observing>

Upcoming and seasonal events <https://in-the-sky.org/>

Spaceflight news, blogs, commercial and foreign space agencies

Earth and Sky: <https://earthsky.org/>

NASA blogs: <https://blogs.nasa.gov>

NASA Spaceflight <https://www.nasaspaceflight.com/>

NASA Watch <http://www.nasawatch.com>

Spaceflight Now <https://spaceflightnow.com/>

Spaceflight Insider: <https://www.spaceflightinsider.com/>

Space News: <https://spacenews.com/>

Space Weather <https://spaceweather.com/>

Space Journal of Asgardia (a borderless nation of space enthusiasts) <https://room.eu.com/>

Universe Today <https://www.universetoday.com/>

Spaceflight: commercial and foreign space agencies

Blue Origin <https://www.blueorigin.com/>

Boeing <https://www.boeing.com/space/>

China National Space Agency : <http://www.cnsa.gov.cn/english/>

European Space Agency <http://www.esa.int/>

India space agency: <https://www.isro.gov.in/>

Lockheed Martin Space

<https://www.lockheedmartin.com/en-us/capabilities/space.html>

Roscosmos (Russian space agency): <http://en.roscosmos.ru/>

Sierra Nevada Corp. <https://www.sncorp.com/space-systems/>

SpaceX: <https://www.spacex.com/>

United Launch Alliance <https://www.ulalaunch.com/>

Virgin Galactic: <https://www.virgingalactic.com/>

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NCSF is a member of the [North-Central Region of the Astronomical League](#).



NCSF supports the [International Dark Sky Association](#)

Imaging Report: The other ring nebulae in Lyra

We've known about the venerable Ring Nebula (M57) since Charles Messier's days in the 18th century.

But a much dimmer ring also resides in Lyra, though it was unknown until 1946. Astronomer Rudolph Minkowski spotted it during a photographic search for emission nebulae at Mount Wilson Observatory.

Named Minkowski 1-64, this tiny ring is just 20 arc-seconds across and glows at just under 13th magnitude.

You'll probably need a 10-inch scope under dark skies to see it, though it should be easy in the club's Panaruskys 20-inch at Harrington Beach.

Both pictures are at a similar scale and taken with a 9.25-inch Celestron from my Whitefish Bay backyard. - Ernie Mastroianni

**SPECTRUM newsletter**

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