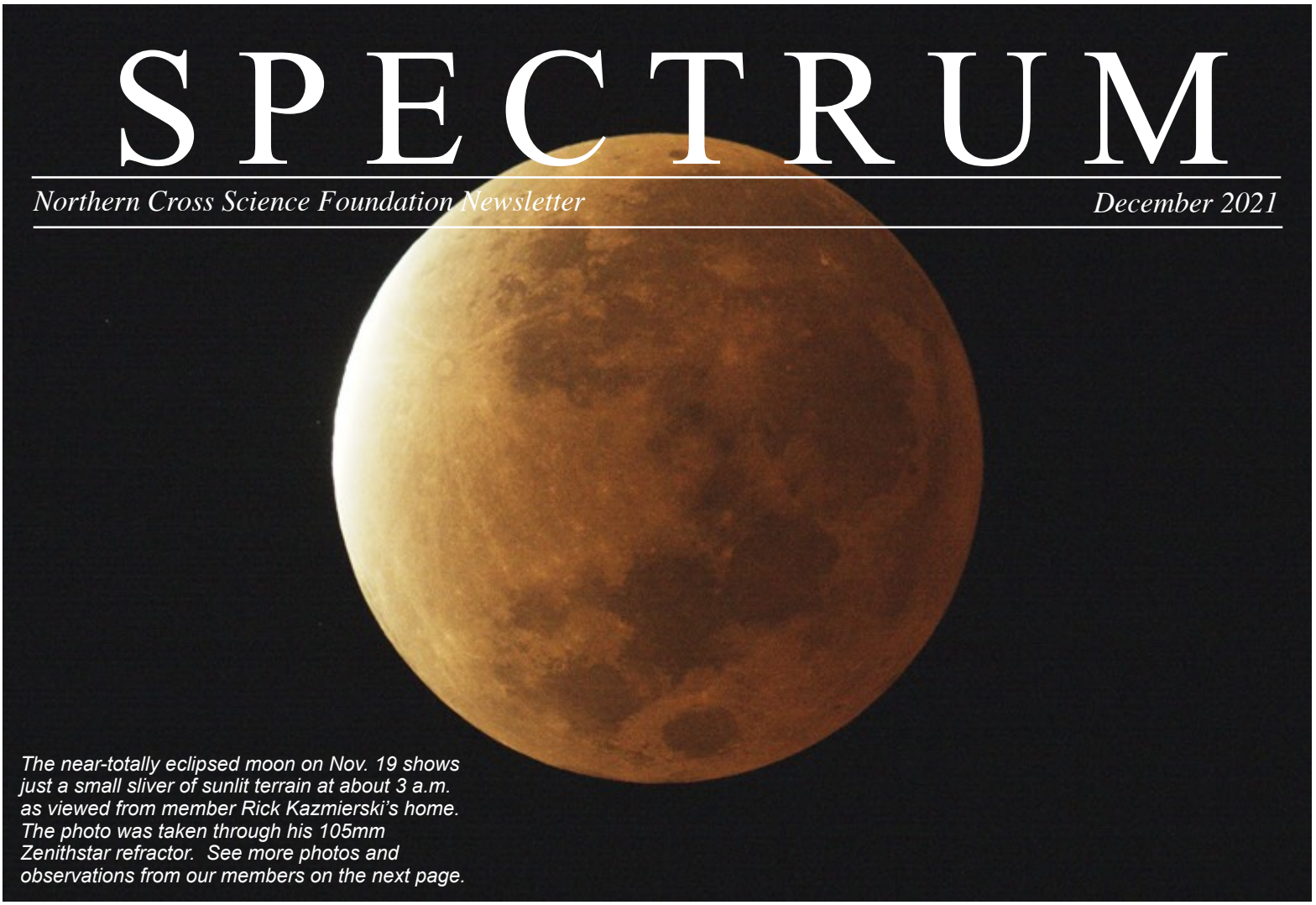
SPECTRUM

Northern Cross Science Foundation Newsletter *December 2021*



The near-totally eclipsed moon on Nov. 19 shows just a small sliver of sunlit terrain at about 3 a.m. as viewed from member Rick Kazmierski's home. The photo was taken through his 105mm Zenithstar refractor. See more photos and observations from our members on the next page.

November's General Meeting touched on Webb event, northern lights and the club's first in-person meeting in nearly two years

The NCSF General Meeting was held via Zoom on Thursday, Nov. 4. The meeting opened with president Jeff Setzer taking nominations for the board of directors. Seats currently occupied by Kevin and Dan Bert (who were not present) are open for nominations. Mike Borchert moved that Kevin and Dan be renominated, and Ernie Mastroianni seconded. Member Jim Macak nominated Ernie Mastroianni for a board seat but Ernie thanked Jim and the club but respectfully declined, saying his duties as newsletter editor kept him busy enough with NCSF activities.

Also mentioned was that the next meeting, the holiday dinner at Libby Montana on Dec. 2, will be our first in-person since the COVID pandemic began. The last in-person gathering of the club was also held at Libby Montana on March 5, 2020.

Many members spoke about the predictions for the northern lights display that might be visible on Halloween weekend, but no one reported seeing them in our area of Wisconsin, though observers in northern Wisconsin saw them a couple days later. Photos that showed the northern lights from the Marshfield area were posted on Instagram by a couple photographers in that area.

Joyce Jentges reported on the Webb Telescope event and talk at Port Washington's Niederkorn Library. About 90 people participated, with some attending talks by our own Jeff Setzer. A display case was filled with items about astronomy, and activities and displays for children were also included (see pictures on page 6).

Jentges also asked for volunteers to help with a stargazing event for Random Lake elementary school students on Nov. 10 or 11. About 50 families showed interest. In the end, the November weather was unfavorable and the event was canceled.

The meeting's main program, on the sun, was presented by Mike Borchert. The wide-ranging presentation, which included a look at the Kitt Peak solar observatory, was well documented, nicely flowing, technical, but easily understandable. Illustrated with many compelling illustrations (all credited to the source), the program was packed with interesting facts and figures and left everyone knowing something interesting about our nearest star. - *Ernie Mastroianni*

Looking ahead

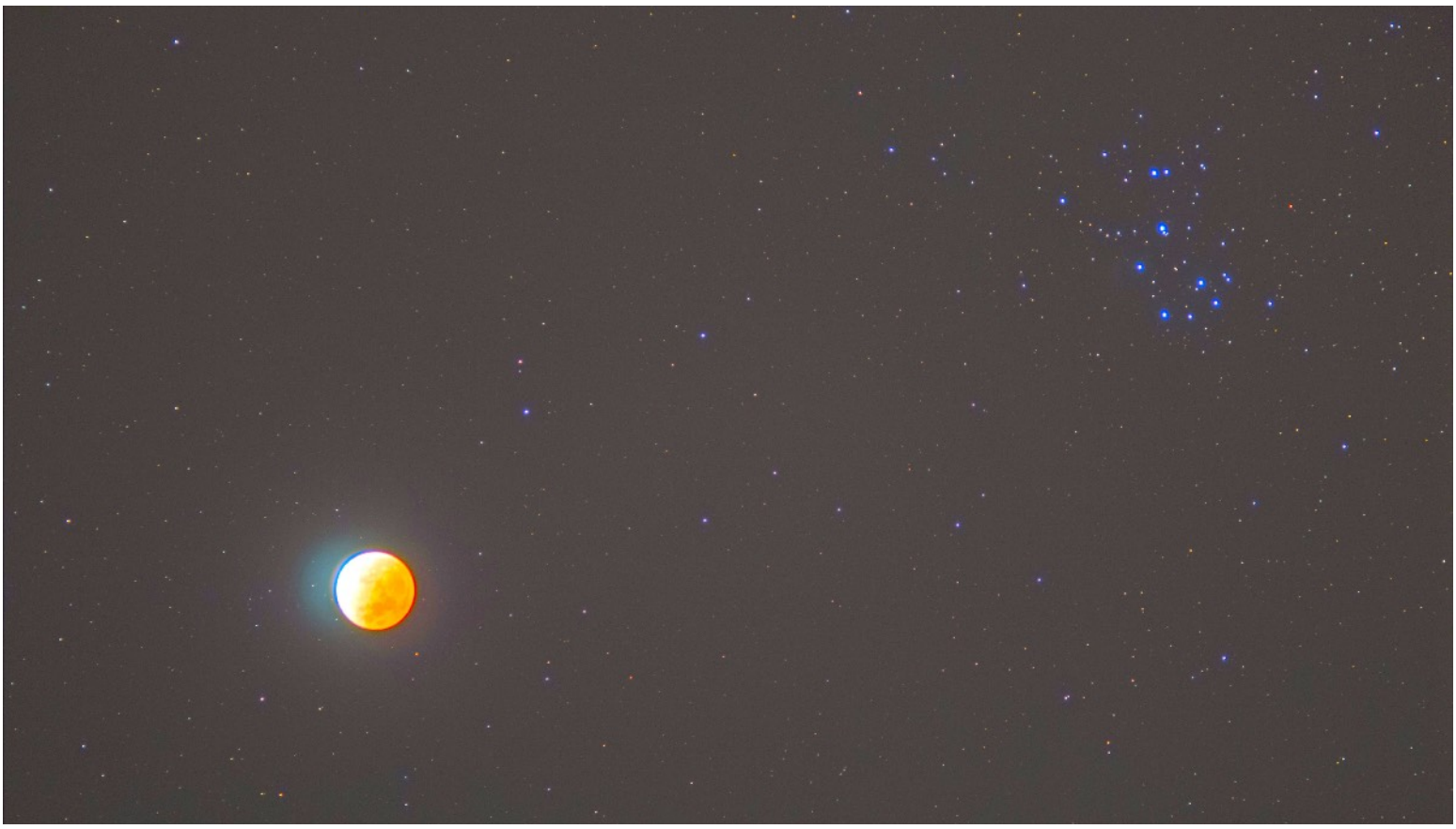
December 2 6:00 pm
Holiday Dinner Meeting
Libby Montana restaurant
5616 W Donges Bay Rd.

December 22, 7:20 am EST
(Tentative launch date)
James Webb Telescope
European Spaceport,
Kourou, French Guiana

January 6, 2022
General Meeting via Zoom

May 13-14, 2022
NCRAL convention
Country Inn & Suites
Port Washington
Website:
https://ncsf.info/ncral-vision-2022/

Observing Report



Above: *The moon glows orange and the Pleiades shine blue during the deep partial eclipse of November 19. Ernie Mastroianni used a vintage Nikon DSLR and a 135mm telephoto lens.* ***Below left:*** *Gene DuPree used an iPhone aimed through an eyepiece to take this picture near mid-eclipse.* ***Below right****: Mike Borchert used a Canon DSLR and his 400mm lens with a 2x teleconverter. Though the lunar eclipse was not total, it was the longest partial eclipse to be seen since 1440. The next partial eclipse of such a length won't happen until 2669.*

Clear skies for the November lunar eclipse brings members out in the chilly dawn

From Rick Kazmierski: I've never paid much attention to partial eclipses, but this one was nearly total so I thought I'd take a look. Got up at 2:20am so as not to miss totality and spent an hour under beautiful clear skies. There was just a sliver of moon visible at totality and a soft rusty color covered the eclipsed portion of the moon. Deciding to take a photo at totality, I setup my 105mm Zenithstar refractor and camera and took a number of images at different exposures during totality. Once back in bed I found I couldn't warm up no matter how many covers I added. I shivered the rest of the night but it was worth it.

From Mark Hirschman: I was up three times during the night. The moon looked like a bite had been taken out of it. I was left with the impression that the earth's shadow is always there and a lunar eclipse gives me the sense of how real it is!

From Charlotte DuPree: We went out in the backyard around 2:30. The first thing Gene noticed was the Pleiades, above the Moon. We have seen a few lunar eclipses, and I don't remember them looking that dark. We were back in bed after 3:30.

From Mike Borchert: I wasn't going to set the alarm for the eclipse, but at the last minute, I changed my mind. I set the alarm for 15 minutes before the darkest part of the eclipse. I was not fully awake. I stumbled outside and it was cold! I have a pair of light gloves for such occasions but did not used them. I used my Canon camera with a 400mm lens and a 2x teleconverter for an effective 800mm focal length.

Some lessons I relearned:

- It is hard to focus, even the bright moon, through a viewfinder or LCD viewer. Set up a computer with a larger screen.
- Turn on the shutter delay feature on my camera. The pressure of hitting the exposure button and the instantaneous shutter opening, creates camera movement.
- Try varied exposures and ISO settings. I thought taking a shot of a lunar eclipse would be easier than other types of astrophotography. It is not. It takes the same preparation as any other astrophotography session. I took more than 50 exposures and did manage to get one that passed as a lunar eclipse. Hopefully, I learned my lessons for the next northern lights event.

From Ernie Mastroianni: I set my alarm for about 1:30, but could not sleep, so I just stayed up. It took me nearly an hour to set up my telescope with two cameras: A Nikon D700 through my SkyWatcher 5-inch Maksutov, and a Nikon D300 with a 135mm telephoto lens riding piggyback.

Taking the photos was work - the fun was seeing the eclipse through 10x50 binoculars. The moon glowed orange contrasted by the icy blue stars of the nearby Pleiades cluster.

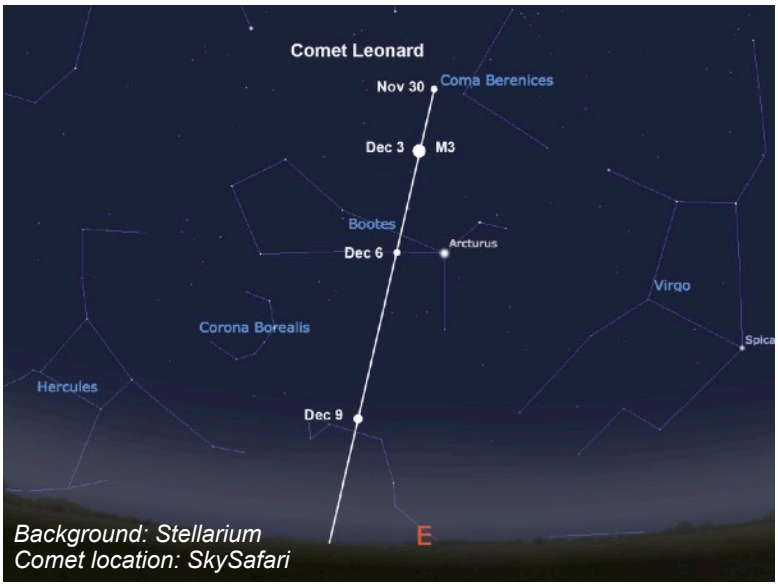
Christmas Comet Leonard could be naked eye this month, but just barely

The brightest comet of this year is well-placed in the early morning sky this month, and some predictions foresee a peak at 4th magnitude in December. Comet C/2021 A1 (Leonard) was discovered on January 3 by astronomer Greg Leonard of the Lunar and Planetary Laboratory at the University of Arizona. He was working at the Mt. Lemmon observatory and spotted the 19th magnitude comet on a photograph.

Comet Leonard will make its closest approach to earth on Dec. 13, but before that, it will sweep through Coma Berenices, Bootes, and Serpens before fading into the early morning glare. As of this writing, it is glowing at about magnitude 7 with a noticeable tail in photographs.

On the morning of December 3, it will pass near the globular cluster M3, and both should be visible in the same low-power telescope field of view. The pairing should make for a spectacular photograph. The comet has an 80,000 year orbit, but reports indicate that it will be on a trajectory for ejection from the solar system after perihelion on January 3.

A good series of locator maps and a photo of the comet can be found at this earthsky.org link. - *Ernie Mastroianni*



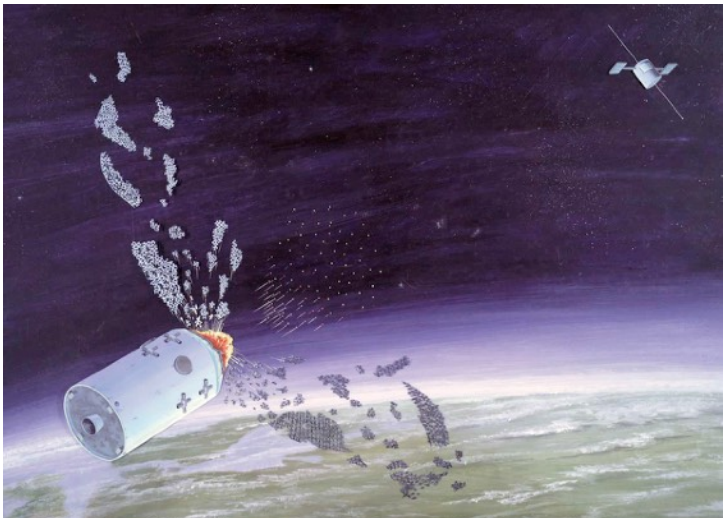
Russian anti-satellite debris field assessed, ISS crew resumes normal operations

This story combines text from the NASA Space Station blog and Goddard Space Flight Center - Ernie Mastroianni

Nov. 17 - NASA and U.S. Space Command continue to monitor the debris cloud created by a recent Russian anti-satellite test. The International Space Station and crew members are safe and have resumed normal operations. The largest risk was in the first 24 hours and telemetry from the space station indicates no issues during that time. Hatches that isolated various ISS modules from one another were closed after the test. They have since been reopened.

On November 15, Cosmos 1408, an obsolete and non-operational Russian spy satellite, was destroyed in a Russian kinetic anti-satellite test, generating a cloud of debris including some 1500 pieces of trackable size.

Following the incident, crew members were notified of the debris and asked to close specific hatches according to safe haven procedures. Hatches between the U.S. and Russian segments also were closed initially, but were later opened when the higher risk period passed. Crew members' daily tasks were adjusted during this time. After closing the hatches, the crew then entered their Soyuz and Crew Dragon spacecraft for approximately two hours, from 2 am to 4 am EST. No debris avoidance maneuver was performed.



A 1986 illustration from the US Defense Intelligence Agency depicts a Soviet-era kinetic anti-satellite weapon. An updated version destroyed Cosmos 1408. From Wikimedia Commons

A debris cloud simulation was created by Hugh Lewis, a space debris modeling expert at the University of Southhampton.

Space debris is tracked by Space Command and analysis is performed by NASA. Any possible debris collision threats are countered with debris avoidance maneuvers. If orbital debris were to strike the station and cause an air leak, the crew would close hatches to the affected module. If crew members do not have time to close the affected module, they would enter their respective spacecraft and, if necessary, undock from the space station to return to Earth.

This debris cloud has increased the risk to the station. The cataloging of of identifiable pieces of debris is ongoing. Once the debris cloud is dispersed and items are tracked and catalogued, NASA will receive notifications of potential threats to the station and perform maneuvers as necessary. NASA will continue to perform visual inspections and review telemetry data to ensure vehicle health.

Teams are assessing the risk levels to conduct various mission activities. Any changes to launches, spacewalks and other events will be updated as needed.

See related stories at these links:

https://www.space.com/russia-anti-satellite-missile-test-first-of-its-kind

https://www.nytimes.com/2021/11/15/science/russia-anti-satellite-missile-test-debris.html

https://www.state.gov/russia-conducts-destructive-anti-satellite-missile-test/

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. All underlined websites are actively linked. 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/

Astrophotography and software
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/
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
N.I.N.A astrophotography suite:
https://nighttime-imaging.eu/download/
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://skysafariastronomy.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

The famous Apollo 8 earth rise photo, taken 53 years ago this month, was also photographed in black and white. You can view and download high-resolution scans of nearly every Apollo mission photograph at https://www.flickr.com/photos/projectapolloarchive/albums

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/projectapolloarchive/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

The Cerro Tololo Inter-American Observatory (CTIO), in the Coquimbo Region of northern Chile, is pictured well after sunset as in this time exposure. Most prominent is the Víctor M. Blanco 4-meter Telescope. This location gives astronomers access to the southern sky to see objects not visible from the northern hemisphere. The observatory is run by the National Science Foundation's NOIRLab, formerly called NOAO. Credit: CTIO/NSF NOIRLab/AURA/Babek Tafreshi

https://www.nasa.gov/centers/marshall/michoud/index.html

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/
NOIRlab: formerly National Optical Astronomy Observatory
https://noirlab.edu/public/images/
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 Espanek'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/
Jupiter's Great Red Spot transit

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/

NCSF is a member of the North-Central Region of the Astronomical League.

NCSF supports the International Dark Sky Association

Webb Telescope presentation at the Niederkorn Library in Port Washington

The James Webb Space Telescope talk, organized by NCSF vice president Joyce Jentges, was a great success. Held at Port Washington's J. W. Niederkorn Library on Oct. 27, the event included speakers Sarah Parker, from the Horwitz-DeRemer Planetarium in Waukesha, and NCSF president Jeff Setzer.

An estimated 90 attendees listened to talks and participated in activities. The launch date for the James Webb Space Telescope is now December 22, 2021.

Above: *Gene DuPree and Jentges at the club's display table.* ***Left:*** *Items about astronomy and the Webb telescope were on display at the library.*

SPECTRUM newsletter

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