9 JUNE 2023

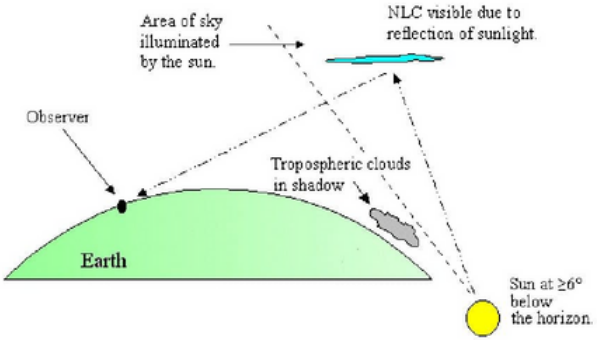
WEYMOUTH ASTRONOMY

VOLUME 18 #2

SKYWATCHER NEWSLETTER

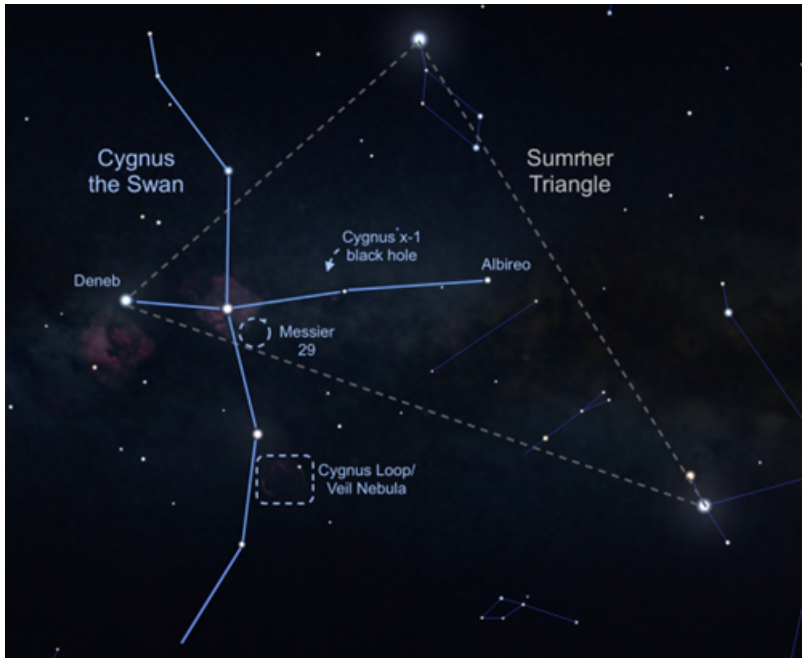
LATEST NEWS

It is almost Summer Solstice and the light evenings are very enjoyable but certainly doesn't leave much opportunity for dark sky observing! Enjoy the sunny days while we can and keep a watch out for Noctilucent clouds. There has been some amazing displays in recent years and this year we hope does not disappoint Until next month... SLK



Look Up in the Sky - It's a Bird

By: Theresa Summer



Look up after sunset during summer months to find Cygnus! Along the swan's neck find the band of our Milky Way Galaxy. Use a telescope to resolve the colorful stars of Albireo or search out the open cluster of stars in Messier 29. Image created with assistance from Stellarium: stellarium.org

Bird constellations abound in the night sky, including Cygnus, the majestic swan. Easy to find with its dazzling stars, it is one of the few constellations that look like its namesake and it is full of treasures. Visible in the Northern Hemisphere all summer long, there's so much to see and even some things that can't be seen. To locate Cygnus, start with the brightest star, Deneb, also the northeastern most and dimmest star of the Summer Triangle. The Summer Triangle is made up of three bright stars from three different constellations – read more about it in the September 2022 issue of Night Sky Notes. "Deneb" is an Arabic word meaning the tail. Then travel into the triangle until you see the star Albireo, sometimes called the "beak star" in the center of the summer triangle. Stretching out perpendicular from this line are two stars that mark the crossbar, or the wings, and there are also faint stars that extend the swan's wings.

From light-polluted skies, you may only see the brightest stars, sometimes called the Northern Cross. In a darker sky, the line of stars marking the neck of the swan travels along the band of the Milky Way. A pair of binoculars will resolve many stars along that path, including a sparkling open cluster of stars designated Messier 29, found just south of the swan's torso star. This grouping of young stars may appear to have a reddish hue due to nearby excited gas.

Let's go deeper. While the bright beak star Albireo is easy to pick out, a telescope will let its true beauty shine! Like a jewel box in the sky, magnification shows a beautiful visual double star, with a vivid gold star and a brilliant blue star in the same field of view. There's another marvel to be seen with a telescope or strong binoculars – the Cygnus Loop. Sometimes known as the Veil Nebula, you can find this supernova remnant (the gassy leftovers blown off of a large dying star) directly above the final two stars of the swan's eastern wing. It will look like a faint ring of illuminated gas about three degrees across (six times the diameter of the Moon).

Speaking of long-dead stars, astronomers have detected a high-energy X-ray source in Cygnus that we can't see with our eyes or backyard telescopes, but that is detectable by NASA's Chandra X-ray Observatory. Discovered in 1971 during a rocket flight, Cygnus x-1 is the first X-ray source to be widely accepted as a black hole. This black hole is the final stage of a giant star's life, with a mass of about 20 Suns. Cygnus x-1 is spinning at a phenomenal rate – more than 800 times a second – while devouring a nearby star. Astronomically speaking, this black hole is in our neighborhood, 6,070 light years away.

But it poses no threat to us, just offers a new way to study the universe.

Check out the beautiful bird in your sky this evening, and you will be delighted to add Cygnus to your go-to summer viewing list. Find out NASA's latest methods for studying black holes at www.nasa.gov/black-holes.

LOCAL EVENTS

May 17 - CADAS - Ask the Panel

June 6 - WAS - David Smith – (Buglife) Bugs, the First Astronomers

June 21 - CADAS - Jo Richardson Dark sies of Exmoor

July 4 - WAS - Nial Tanvir – Re-ionisation of the Universe/GRBs (exact title to follow)

Aug 1 - WAS - Quiz evening

Sept 5 - WAS - David Bryant – Meteorites (exact title to follow)

VISIT OUR WEBSITE FOR THE LATEST CLUB INFORMATION

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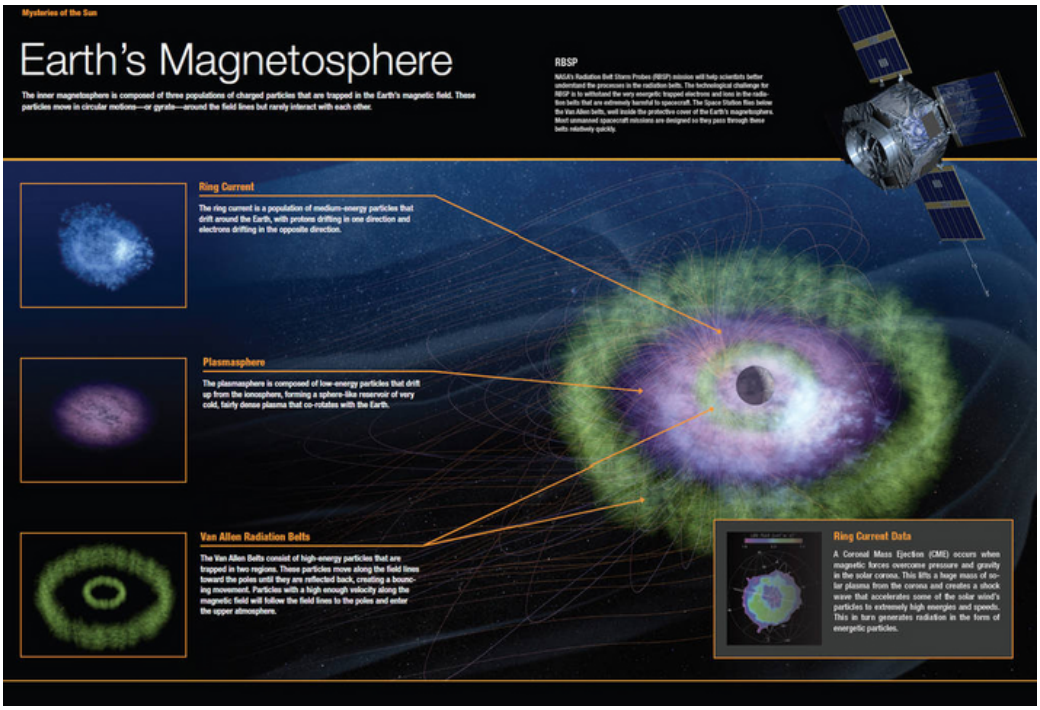
Spaceweather.com
MYSTERIOUS "AURORA BLOBS" EXPLAINED
18 May 2023

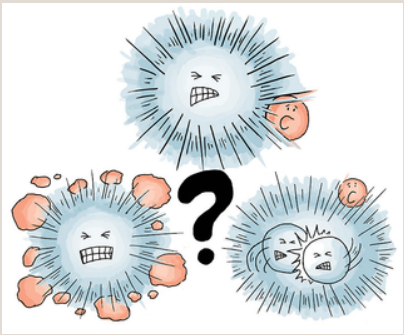
Europeans are still trying to wrap their minds around what happened after sunset on April 23, 2023. Everyone knew that a CME was coming; photographers were already outside waiting for auroras. But when the auroras appeared, they were very strange.
"I had never seen anything quite like it," says Heiko Ulbricht of Saxony, Germany. "The auroras began to tear themselves apart, pulsating as they formed individual blobs that floated high in the sky."

"It literally took my breath away," he says. "My pulse was still racing hours later!" The same blobs were sighted in France and Poland, and in Denmark they were caught flashing like a disco strobe light.
Ordinary auroras don't act like this.
Indeed, "these were not ordinary auroras," confirms space physicist Toshi Nishimura of Boston University. "They are called 'proton auroras,' and they come from Earth's ring current system."

Most people don't realize that Earth has rings. Unlike Saturn's rings, which are vast disks of glittering ice, Earth's rings are invisible to the naked eye. They are made of electricity--a donut-shaped circuit carrying millions of amps around our planet. The ring current skims the orbits of geosynchronous satellites and plays a huge role in determining the severity of geomagnetic storms.

Sometimes during strong geomagnetic storms, protons rain down from the ring system, causing a secondary shower of electrons, which strike the atmosphere and make auroras. Earth-orbiting satellites have actually seen these protons on their way down. Ordinary auroras, on the other hand, are caused by particles from more distant parts of Earth's magnetosphere and have nothing to do with Earth's ring current.
Mystery solved? Not entirely. "We still don't know why proton auroras seem to tear themselves apart in such a dramatic way," says Nishimura. "This is a question for future research."
"It was very exciting to watch," says Ulbricht. "I definitely want to see them again."
Good, because they'll be back. Solar Cycle 25 ramping up to a potentially-strong Solar Maximum next year. Future storms will surely knock more protons loose from the ring current system.
Here's what to look for: (1) Proton auroras tend to appear around sunset. Why? Electric fields in Earth's magnetosphere push the protons toward the dusk not dawn side of our planet. (2) Proton auroras love to pulse--a sign of plasma wave activity in Earth's ring current. (3) Proton auroras are sometimes accompanied by deep red arcs of light (SARs), the glow of heat leaking from the ring current system. These red arcs were also seen on April 23rd.
Solar Max is coming. Let the proton rain begin!





WAC Upcoming Events

JULY 14 - JULIAN ONIONS: COLD DARK MATTER - IS IT COLD, IS IT DARK AND IS IT MATTER? (FACE TO FACE AND ZOOM)

AUG 11 -
MEMBERS VIEWING EVENING FOR THE PERSEID METEORS AND SUMMER CONSTELLATIONS.

SEPT 8 -
ROCKETS ON THE BEACH

OCT 13 - RICHARD MILES: THE HISTORY OF AN EXPLOSIVE COMET (FACE TO FACE AND ZOOM)

MORE TO COME!!

Continued from page 1:

While the black hole Cygnus x-1 is invisible with even the most powerful Optical telescope, in X-ray, it shines brightly. On the left is the optical view of that region with the location of Cygnus x-1 shown in the red box as taken by the Digitized Sky Survey. On the right is an artist's conception of the black hole pulling material from its massive blue companion star.

(Credit: NASA/CXC chandra.harvard.edu/photo/2011/cygx1/)

PRACTICAL OBSERVING

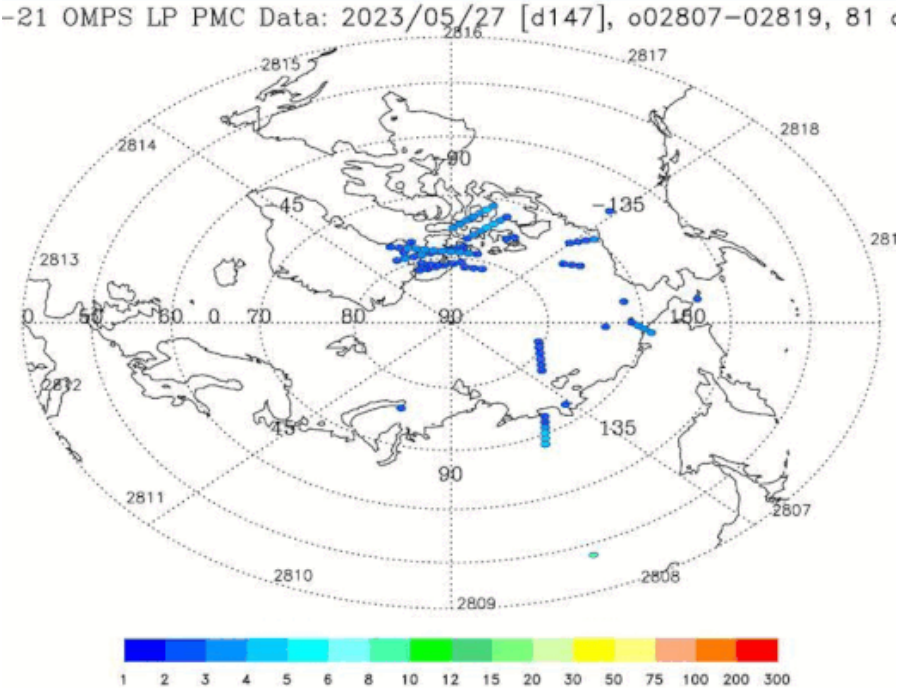
Spaceweather.com 6 June 2023

THEY'RE BACK! NOCTILUCENT CLOUDS: The summer season for noctilucent clouds (NLCs) has begun. "They're back with a bang!' says Arnim Berhorst who saw the electric-blue clouds over Bergen, Norway--one of at least seven European countries where they were observed on June 5th. Valther Jørgensen sends this picture from Djursland, Denmark:

"These luminous night clouds appeared for the first time over Denmark this summer," says Jørgensen.

NLCs are clouds of frosted meteor smoke. They form every year in summer when wisps of sunwarmed water vapor rise up to the edge of space. At altitudes greater than 80 km, the water crystallizes around disintegrated meteoroids, forming beautiful electric-blue structures.

Although these are the first NLCs seen from the ground, Earth-orbiting satellites have been monitoring them for more than a week. The NOAA-21 satellite saw them first on May 26th. In this 3 day animation, blue dots mark the location of clouds deep inside the Arctic Circle:



Noctilucent Clouds

Bad news: NASA's AIM spacecraft, which monitors noctilucent clouds, may be dead due to problems with an onboard battery. Mission controllers have not yet given up all hope, so stay tuned.

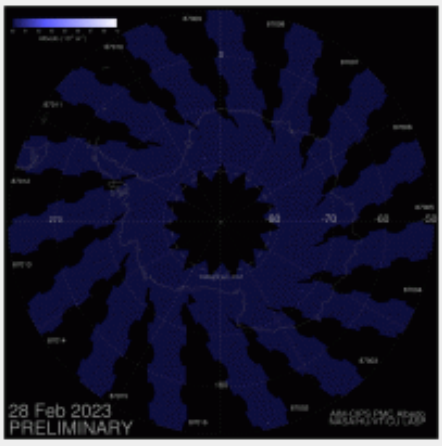


Image credit: Matt DeLand // NOAA-21 OMPS LP instrument

This is typical. NLCs always form first over the poles where temperatures are coldest--a necessity for making water molecules stick to meteoroids. From there, the clouds multiply and spread outward. In only 3 days (May 26, May 27, May 28), NOAA-21 saw cloud counts increase from 14 to 104 as they drifted south toward Europe.

Last night's sightings are just the beginning. Noctilucent cloud season typically runs from June to August. The clouds tend to brighten and become most widespread around the summer solstice, with sightings in recent years as far south as Spain and southern California. If you see an NLC, submit your photo here.

Skymaps.com—Feel free to download the full article directly each month.