Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 30, No. 9 ***Three-Time*** *Winner of the Astronomical League's Mabel Sterns Award ☼ 2006, 2009 & 2016* *September 2022*

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William Kellar's Andromeda

CCAS Member Bill Kellar' beautiful image of the Andromeda galaxy. Taken near Raystown Lake, Pennsylvania. The image was created from a stack of 7 pictures, each at an 8-second exposure. Taken with an Orion ED80T CF telescope and ZWO ASI 1600MM Pro.

September 2022 Dates

3rd • The First Quarter Moon is near Antares in Scorpius

9th • The Moon is between Saturn and Jupiter

10th • Full Moon, the Full Harvest Moon or the Full Moose Calling Moon, 5:59 a.m. EDT

16th • Neptune is at opposition, so it is visible all night

17th • Last Quarter Moon, 5:52 p.m. EDT

22nd • Fall equinox, 9:04 p.m. EDT

275th • New Moon, 5:54 p.m. EDT

CCAS Upcoming Nights Out

In addition to our monthly observing sessions at the Myrick Conservancy Center, BRC (see pg. 7), CCAS has several special "nights out" scheduled over the next few months. Members are encouraged to help out during these events any way they can. See below for more information.

☼ Friday, September 16th • CCAS Special Observing Session at Starr Farm Park, Downingtown, PA. Due to parking constraints, participation is limited to 40 attendees. For more information, contact our Observing Chair, Don Knabb.

☼ Friday, October 14th • CCAS Monthly Observing Session, Myrick Conservancy Center, BRC. The observing session starts at sunset.

☼ Friday, October 28th • CCAS Special Observing Session with the Atglen Public Library at Wolf's Hollow County Park, Atglen, PA. Non-CCAS members must register with the library to attend the event. For more information, contact our Observing Chair, Don Knabb.

For more information about future observing opportunities, contact our Observing Chair, Don Knabb.

Summer / Autumn Society Events

September 2022

9th • Planetarium show at the Mather Planetarium at WCU, "JWST: The First Images." For more information, visit the WCU Public Planetarium Shows webpage.

13th • CCAS Monthly Meeting, Merion Science Center, Room 112. CCAS Member Speaker: John Conrad, who will present "Do Look Up- DART: the worlds first asteroid deflection test."

16th • CCAS Special Observing Session at Starr Farm Park, Downingtown, PA. For more information, contact our Observing Chair, Don Knabb.

20th • Open call for articles and photographs for the October 2022 edition of Observations.

22nd • Equinox (northern autumn/ southern spring begins), 9:04 p.m. EDT.

21st-25th • York County Star Party, Susquehannock State Park, 1880 Park Dr, Drumore, PA 17518.

26th • Deadline for newsletter submissions for the October 2022 edition of Observations.

October 2022

11th • CCAS Monthly Meeting, Merion Science Center, Room 112. Guest Speaker: TBA.

14th • CCAS Monthly Observing Session, Myrick Conservancy Center, BRC. The observing session starts at sunset.

20th • Open call for articles and photographs for the November 2022 edition of Observations.

21st • Planetarium show at the Mather Planetarium at WCU, "Spectacular Saturn." For more information, visit the WCU Public Planetarium Shows webpage.

26th • Deadline for newsletter submissions for the November 2022 edition of Observations.

28th - CCAS Special Observing Session with the Atglen Public Library at Wolf's Hollow County Park, Atglen, PA. Non-CCAS members must register with the library to attend the event. For more information, contact our Observing Chair, Don Knabb.

CCAS Member Wins Student Award

by John Hepler, CCAS Webmaster & Newsletter Editor

Avni Dhargalkar's Award Certificate

CCAS student member Avni Dhargalkar won a national award this past May for an original essay she wrote. The essay was sponsored by NASA through an organization known as Future Engineers. It was a "Power to Explore" challenge and the prompt was "Learn about Nuclear Batteries that Power Space Exploration and Write About What Energizes You." Students were tasked with first researching a type of nuclear battery, a radioisotope power system (RPS), and then to write a 200-word essay about one or more uses in space of this special power system and how it inspired them. Then they had to write what they

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September 2022 CCAS Meeting Agenda

by Bruce Ruggeri, CCAS Program Chair

Our next meeting will be held on September 13, 2022, in person (as well as via Zoom) at West Chester University's Merion Science Center, Room 112. The Science Center is located at 720 S. Church St., West Chester, PA. CCAS Member Speaker: John Conrad, who will present "Do Look Up- DART: the worlds first asteroid deflection test."

Please note that inclement weather or changes in speakers' schedules may affect the program. In the event there is a change, CCAS members will be notified via e-mail with as much advance notice as possible.

As for future meetings, we are looking for presenters for our 2022-2023 season and beyond. If you are interested in presenting, or know someone who would like to participate, please contact me at programs@ccas.us.

September 2022 Speaker Profile

by Bruce Ruggeri, CCAS Program Chair

Our first monthly meeting for the 2022-2023 season is on Tuesday, September 13, 2022. Starting at 7:30 pm in MER 112, CCAS Member and NASA Ambassador John Conrad will present: **Do Look Up: DART – the World's First Asteroid Deflection Test.**

Synopsis: The threat of catastrophic impacts from Near Earth Objects (NEOs) is not just a subject for popular science fiction films like *Armageddon* (1998), *Deep Impact* (1998), and *Don't Look Up* (2021), but remains a serious global concern as evident by the marked increases in NASA's budget for planetary defense over recent years.

NASA's DART (Double Asteroid Redirection Test) spacecraft is on the way for the first live demonstration of kinetic deflection to redirect an asteroid's orbit. This spacecraft will target (impact) the Didymos eclipsing binary asteroid system's moonlet approximately 6.8 million miles from Earth at a speed of 15,000mph. Leading the world's efforts to develop our Planetary Defense against NEOs, NASA in collaboration with the ESA and Johns Hopkins University Applied Physics laboratory is coordinating the DART mission and earth-based observers (large telescopes and small – maybe yours!) to witness this impact and deflection event in late September.

DART's electric propulsion

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CCAS Original Astrophotography

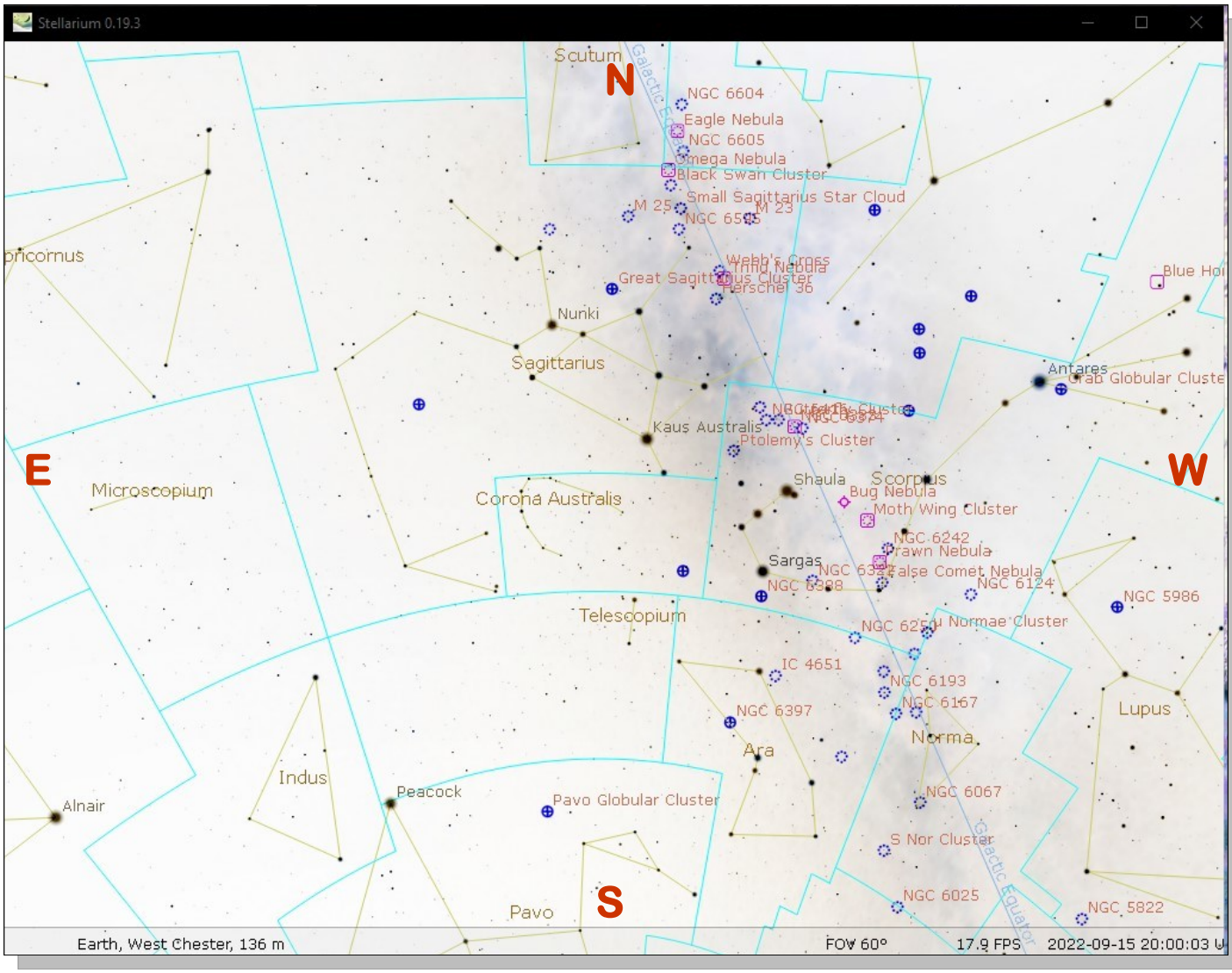
by CCAS Member Jeffrey Cunningham

Image taken August 21, 2022. Looking south, clockwise from bottom: Corona Australis, Sagittarius, Scutum, Ophiuchus/Serpens, Libra & Scorpius, along with the Milky Way. Canon Rebel T6 f/2.8 50mm ISO200, 108 seconds. Processed with Canon Digital Photo Professional 4, adjusting white balance, contrast, shadow highlights, gamma and saturation. Sensor hot spots removed. Used Topaz DeNoise AI to handle background noise.

The Sky Over Chester County

September 15, 2022 at 8:00 p.m. ET

Note: This screen capture is taken from Stellarium, the free planetarium software available for download at www.stellarium.org.



Date	Civil Twilight Begins	Sunrise	Sunset	Civil Twilight Ends	Length of Day
09/01/2022	6:02 a.m. EDT	6:33 a.m. EDT	7:33 p.m. EDT	8:01 p.m. EDT	13h 03m 26s
09/15/2022	6:16 a.m. EDT	6:43 a.m. EDT	7:11 p.m. EDT	7:38 p.m. EDT	12h 27m 34s
09/30/2022	6:30 a.m. EDT	6:57 a.m. EDT	6:46 p.m. EDT	7:13 p.m. EDT	11h 48m 30s

Moon Phases					
First Quarter	09/03/2022	2:07 p.m. EDT	Full Moon	09/10/2022	5:59 a.m. EDT
Last Quarter	09/17/2022	5:52 p.m. EDT	New Moon	09/25/2022	5:54 p.m. EDT

September 2022 Observing Highlights

by Don Knabb, CCAS Treasurer & Observing Chair

3	**The First Quarter Moon is near Antares in Scorpius**
4	**The Lunar Straight Wall is visible this evening**
7	**The Moon is near Saturn**
9	**The Moon is between Saturn and Jupiter**
10	**Full Moon, the Full Harvest Moon or the Full Moose Calling Moon, 5:59 a.m. EDT**
16	**Neptune is at opposition, so it is visible all night**
17	**Last Quarter Moon, 5:52 p.m. EDT**
22	**Fall equinox, 9:04 p.m. EDT**
25	**New Moon, 5:54 p.m. EDT**
26	**Jupiter is at opposition, so it is visible all night**

The best sights this month: Stay up late to welcome Saturn and Jupiter back into the late evening sky! The best viewing is near midnight, but if you have a good view to the east, you can see Saturn quite early and Jupiter a bit later. On September 9th the Moon will be between these two gas giants.

Mercury: Mercury is poorly placed for observation during September.

Venus: The Morning Star is nearing the end of its reign in the morning sky and by the end of the month rises only a half hour before the Sun. Before long it will pass behind the Sun and not be visible until December.

Mars: Red Mars joins red Aldebaran in the constellation Taurus the Bull, rising just before midnight during September.

Jupiter: The king of the planets reaches opposition on September 26th so it will be visible all night, but it is best viewed when it is high in the sky during the hours around midnight. Any telescope will give you a wonderful view of this huge planet and its 4 bright moons.

Saturn: Saturn is also best viewed around midnight when it is highest in the sky. The rings will be visible in any telescope, so share this view with your neighbors for a sight they will never forget.

Uranus and Neptune: Neptune reaches opposition on September 16. This distant gas giant can be seen with binoculars if you are good at star hopping and have an astronomy app on your phone or tablet. A telescope will reveal a faint blue color. Uranus rises a bit after 9:00 and is in good viewing position around midnight. Uranus is much easier to find then Neptune and will show a green/blue color in binoculars or a telescope.

The Moon: Full Moon is on September 10th. This is the Full Harvest Moon. Traditionally, this designation goes to the full moon that occurs closest to the fall equinox, which is on September 22nd this year. This year's Harvest Moon comes unusually early. At the peak of the harvest, farmers can work into the night by the light of this moon. Usually, the moon rises an average of 50 minutes later each night, but for the few nights around the Harvest Moon, the moon seems to rise at nearly the same time each night: just 25 to 30 minutes later across the U.S., and only 10 to 20 minutes later for much of Canada and Europe. Corn, pumpkins, squash, beans, and wild rice — indigenous staples in North America — are now ready for gathering. Native Canadians called this the Moose Calling Moon.

Constellations: The September sky is dominated by the constellations of the Summer Triangle; Lyra, Cygnus and Aquila. But stay out a little later and the Great Square of Pegasus is rising, and you can find our neighbor galaxy Andromeda with binoculars. Stay up a bit later yet and you will get a preview of the fall and winter constellations with the beautiful Pleiades leading the charge.

Messier/deep sky: September is your last chance of 2022 to catch the Messier objects in the southern constellations of Sagittarius and Scorpius. If you can find a clear view of the southern horizon you can find M4, M6, M7, M17, M8, M22 and more! On the other side of the sky, if you stay out late,

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Through the Eyepiece: NGC 6871, the Cygnus Star Chain
by Don Knabb, CCAS Observing Chair & Treasurer

JWST's NIRCam took these two commissioning images of Jupiter using its 2.12-micron filter (left) and 3.23-micron filter (right). Visible features include the Great Red Spot, moons Europa, Metis, and Thebe, and Jupiter's elusive rings. NASA, ESA, CSA, and B. Holler and J. Stansberry (STScI)

The Cygnus Star Chain is a nice binocular object that is best viewed lying on your back on a sleeping bag or a lounge chair with your binoculars in your hands. That's because Cygnus is very high in the sky during September and if you try to see it holding your binoculars while you are standing up, you'll only get a stiff neck, or worse you could end up falling over backwards. I speak from experience, since that nearly happened to me recently when I observed the Cygnus Star Chain in preparation for writing this article.

Binoculars are the recommended method of seeing this interesting object. It is too widespread to capture in anything but the widest field/lowest power telescopic view. The star chain is not terribly far from the famous Coat Hanger Cluster, which is also best viewed with binoculars, so you can see both these objects within a few minutes of gazing into the starry skies.

And starry skies you will see indeed! The Cygnus Star Chain is within the Cygnus Star Cloud, a wide band of stars that appears like a glowing oval between Albireo (the head of the Cygnus the Swan) and Sadr (the center star of Cygnus). If you have a clear night with no Moon to wash out the stars, your view will be filled with thousands of stars. It is good that you will be lying down; otherwise, you might pass out from this amazing view.

While you are looking into this area of the sky, scan the area with your binoculars. The binocular view into this section of the Milky Way reveals a multitude of star groupings. Some of the star groupings are real clusters, not just chance alignments of distant stars. Such is the case with NGC 6871, which appears as a 1-degree long star chain, starting South of 27 Cygni, and running first North and then Northeast through 27 Cygni, ending just beyond 28 Cygni.

When I observed the Cygnus Star Chain, I found it quickly in our Orion 10x50 binoculars. The chain-like appearance of the cluster was immediately apparent. It reminds me a little of Kemble's Cascade, which I wrote about in previous editions

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Eyepiece (Cont'd)

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of Observations. There are images of NGC 6871 on the internet, but I did not include any because they really don't show this cluster as it appears to your eyes when using binoculars. The Cygnus Star Chain is something that should be experienced live.

NGC 6871 was discovered by Friedrich Georg Wilhelm von Struve (1793-1864) in 1825. Von Struve was a German-Russian astronomer who is best known for studying double stars. Open star clusters are widely distributed in our galaxy and represent a loose collection of stars which number from a few dozen to a few hundred stars and are weakly held gravitationally. Perhaps the three most famous such open

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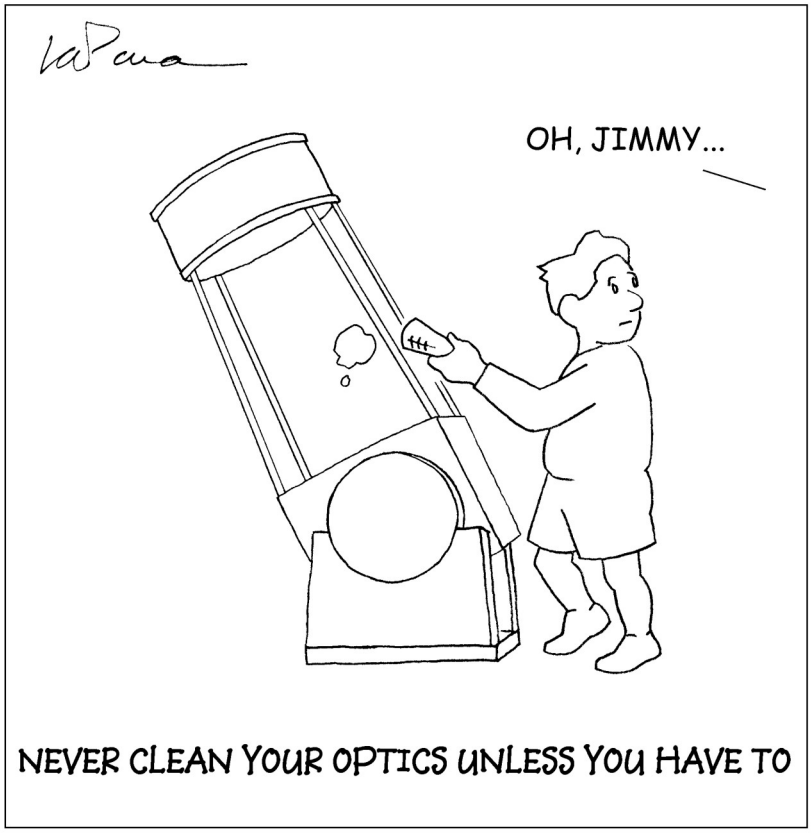
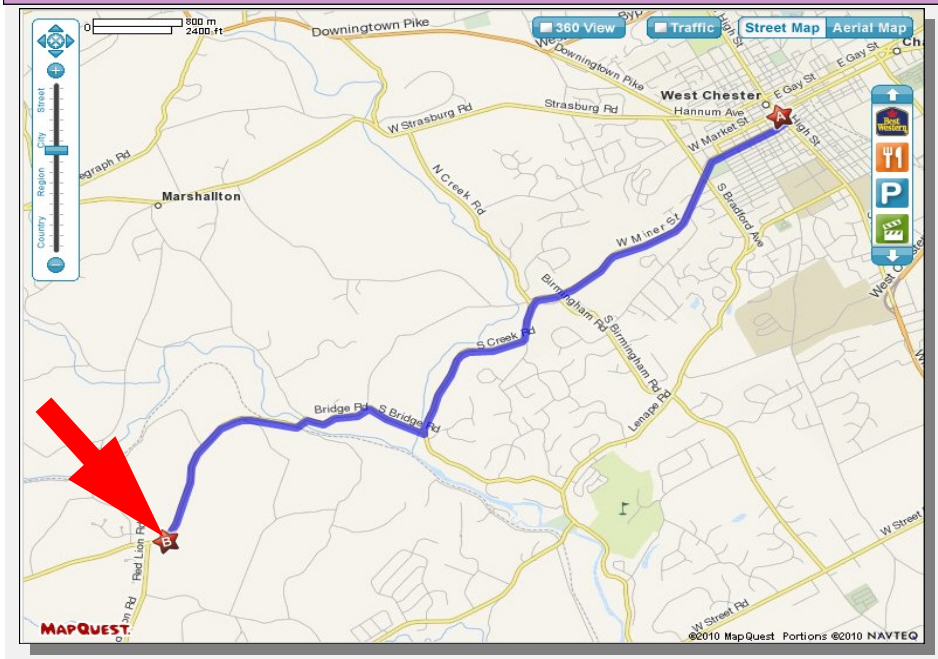
Classic La Para

by Nicholas La Para



CCAS Directions



Brandywine Red Clay Alliance
1760 Unionville Wawaset Rd
West Chester, PA 19382
(610) 793-1090
http://brandywinewatershed.org/

BRC was founded in 1945 and is committed to promoting and protecting the natural resources of the Brandywine Valley through educational programs and demonstrations for all ages.

Brandywine Red Clay Alliance

The monthly observing sessions (held February through November) are held at the Myrick Conservation Center of the Brandywine Red Clay Alliance.

To get to the Myrick Conservation Center from West Chester, go south on High Street in West Chester past the Courthouse. At the next traffic light, turn right on Miner Street, which is also PA Rt. 842. Follow Rt. 842 for about 6 miles. To get to the observing site at the BRC property, turn left off Route 842 into the parking lot by the office: look for the signs to the office along Route 842. From that parking lot, go left through the gate and drive up the farm lane about 800 feet to the top of the hill. The observing area is on the right.

If you arrive after dark, *please turn off your headlights and just use parking lights* as you come up the hill (so you don't ruin other observers' night vision).

Webb's Jupiter Images Showcase Auroras, Hazes
by Elizabeth Landau, NASA Headquarters

With giant storms, powerful winds, auroras, and extreme temperature and pressure conditions, Jupiter has a lot going on. Now, NASA's James Webb Space Telescope has captured new images of the planet. Webb's Jupiter observations will give scientists even more clues to Jupiter's inner life.

"We hadn't really expected it to be this good, to be honest," said planetary astronomer Imke de Pater, professor emerita of the University of California, Berkeley. De Pater led the observations of Jupiter with Thierry Fouchet, a professor at the Paris Observatory, as part of an international collaboration for Webb's Early Release Science program. Webb itself is an international mission led by NASA with its partners ESA (European Space Agency) and CSA (Canadian Space Agency). "It's really remarkable that we can see details on Jupiter together with its rings, tiny satellites, and even galaxies in one image," she said.

The two images come from the observatory's Near-Infrared Camera (NIRCam), which has three specialized infrared filters that showcase details of the planet. Since infrared light is invisible to the human eye, the light has been mapped onto the visible spectrum. Generally, the longest wavelengths appear redder and the shortest wavelengths are shown as more blue. Scientists collaborated with citizen scientist Judy Schmidt to translate the Webb data into images.

In the standalone view of Jupiter, created from a composite of several images from Webb, auroras extend to high altitudes above both the northern and southern poles of Jupiter. The auroras shine in a filter that is mapped to redder colors, which also highlights light reflected from lower clouds and upper hazes. A different filter, mapped to yellows and greens, shows hazes swirling around the northern and southern poles. A third filter, mapped to blues, showcases light that is reflected from a deeper main cloud.

Citizen scientist Judy Schmidt of Modesto, California, processes astronomical images from NASA spacecraft, such as the Hubble Space Telescope

The Great Red Spot, a famous storm so big it could swallow Earth, appears white in these views, as do other clouds, because they are reflecting a lot of sunlight.

"The brightness here indicates high altitude – so the Great Red Spot has high-altitude hazes, as does the equatorial region," said Heidi Hammel, Webb interdisciplinary scientist for solar system observations and vice president for science at AURA. "The numerous bright white 'spots' and 'streaks' are likely very high-altitude cloud tops of condensed convective storms." By contrast, dark ribbons north of the equa-

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In Case You Missed It...

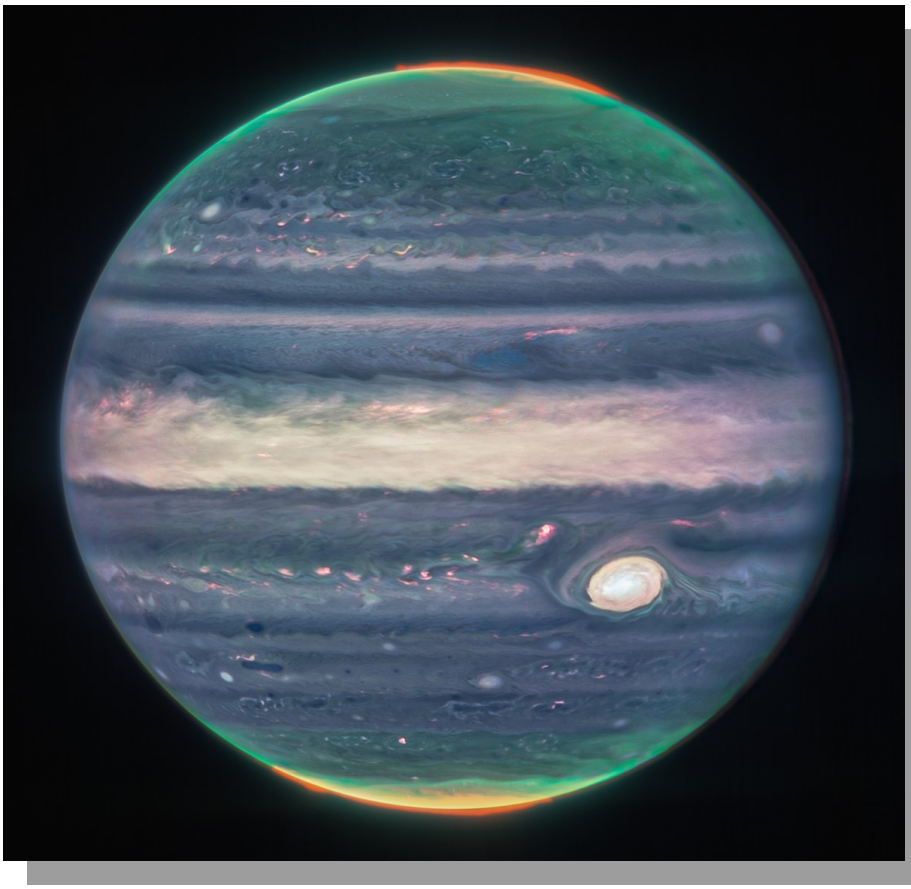
The James Webb Space Telescope – hereinafter referred to as Webb – is already many things to our 21st century world. Among other things, it's in our face! News and findings and especially pictures will be everywhere for a while. NASA and the Space Telescope Science Institute (STScI), together with the media, will feed the public's interest for months to come. And like all exciting new things, it will hold the public's interest for only so long . . . .

But CCAS is not the typical 'public'! We amateur astronomers and 'space nuts' will continue our Webb interest long into the future, seeking out news and findings wherever we can.

So this and future features are not intended to satisfy the appetite of an average reader. There are whole newsletters / blogs out there with lots of good recent Webb stuff for the masses (including me). The intent is to please the discerning palate of discerning astronomy club consumers. As the title says, this will be *In Case You Missed It* findings.

~ John Conrad, CCAS Member & NASA Ambassador

Webb's Jupiter (Cont'd)



Webb NIRCam composite image of Jupiter from three filters – F360M (red), F212N (yellow-green), and F150W2 (cyan) – and alignment due to the planet's rotation. Credit: NASA, ESA, CSA, Jupiter ERS Team; image processing by Judy Schmidt.

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torial region have little cloud cover.

In a wide-field view, Webb sees Jupiter with its faint rings, which are a million times fainter than the planet, and two tiny moons called Amalthea and Adrastea. The fuzzy spots in the lower background are likely galaxies "photobombing" this Jovian view.

"This one image sums up the science of our Jupiter system program, which studies the dynamics and chemistry of Jupiter itself, its rings, and its satellite system," Fouchet said. Researchers have already begun analyzing Webb data to get new science results about our solar system's largest planet.

Data from telescopes like Webb doesn't arrive on Earth neatly packaged. Instead, it contains information about the brightness of the light on Webb's detectors. This information arrives at the Space Telescope Science Institute (STScI), Webb's mission and science operations center, as raw data. STScI processes the data into calibrated files for scientific analysis and delivers it to the Mikulski Archive for Space Telescopes for dissemination. Scientists then translate that information into images like these during the course of their research (here's a podcast about that). While a team at STScI formally processes Webb images for official release, non-professional astronomers known as citizen scientists often dive into the public data archive to retrieve and process images, too.

Judy Schmidt of Modesto California, a longtime image processor in the citizen science community, processed these new views of Jupiter. For the image that includes the tiny satellites, she collaborated with Ricardo Hueso, a co-investigator on these observations, who studies planetary atmospheres at the University of the Basque Country in Spain.

Schmidt has no formal educational background in astronomy. But 10 years ago, an ESA contest sparked her insatiable passion for image processing. The "Hubble's Hidden Treasures" competition invited the public to find new gems in Hubble data. Out of nearly 3,000 submissions, Schmidt took home third place for an image of a newborn star.

Since the ESA contest, she has been working on Hubble and other telescope data as a hobby. "Something about it just stuck with me, and I can't stop," she said. "I could spend hours and hours every day."

Her love of astronomy images led her to process images of nebulae, globular clusters, stellar nurseries, and more spectacular cosmic objects. Her guiding philosophy is: "I try to get it to look natural, even if it's not anything close to what your eye can see." These images have caught the

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NASA Night Sky Notes: The Summer Triangle's Hidden Treasures

by David Prosper

This article is distributed by the NASA Night Sky Network, a coalition of hundreds of astronomy clubs across the US dedicated to astronomy outreach.

Visit nightsky.jpl.NASA.gov to find local clubs, events, stargazing info and more.

September skies bring the lovely **Summer Triangle** asterism into prime position after nightfall for observers in the Northern Hemisphere. Its position high in the sky may make it difficult for some to observe its member stars comfortably, since looking straight up while standing can be hard on one's neck! While that isn't much of a problem for those that just want to quickly spot its brightest stars and member constellations, this difficulty can prevent folks from seeing some of the lesser known and dimmer star patterns scattered around its informal borders. The solution? Lie down on the ground with a comfortable blanket or mat, or grab a lawn or gravity chair and sit luxuriously while facing up. You'll quickly spot the major constellations about the Summer Triangle's three corner stars: Lyra with bright star Vega, Cygnus with brilliant star Deneb, and Aquila with its blazing star, Altair. As you get comfortable and your eyes adjust, you'll soon find yourself able to spot a few constellations hidden in plain sight in the region around the Summer Triangle: **Vulpecula the Fox**, **Sagitta the Arrow**, and **Delphinus the Dolphin**! You could call these the Summer Triangle's "hidden treasures" – and they are hidden in plain sight for those that know where to look!

Vulpecula the Fox is located near the middle of the Summer Triangle, and is relatively small,

like its namesake. Despite its size, it features the largest planetary nebula in our skies: M27, aka the Dumbbell Nebula! It's visible in binoculars as a fuzzy "star" and when seen through telescopes, its distinctive shape can be observed more readily - especially with larger telescopes. Planetary nebulae, named such because their round fuzzy appearances were initially thought to resemble the disc of a planet by early telescopic observers, form when stars similar to our Sun begin to die. The star will expand into a massive red giant, and its gasses drift off into space, forming a nebula. Eventually the star collapses into a white dwarf – as seen with M27 - and eventually the colorful shell of gasses will dissipate throughout the galaxy, leaving behind a solitary, tiny, dense, white dwarf star. You are getting

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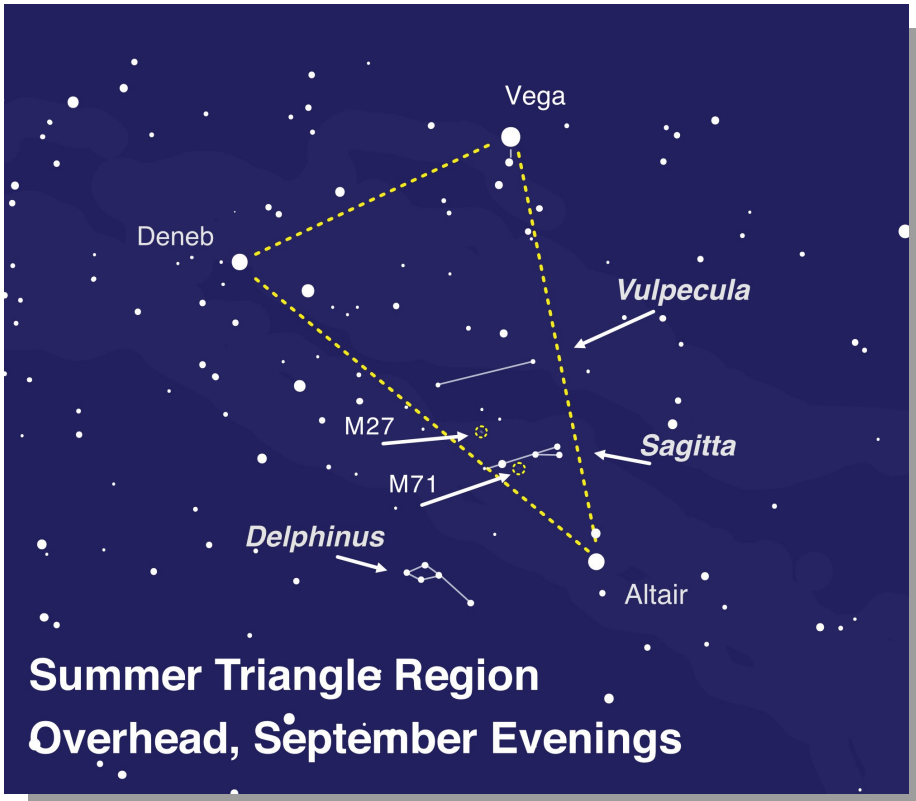

Search around the Summer Triangle to spot some of its hidden treasures! To improve readability, the lines for the constellations of Aquilla, Lyra, and Cygnus have been removed, but you can find a map which includes them in our previous article, Spot the Stars of the Summer Triangle, *from August 2019. These aren't the only wonderful celestial sights found around its borders; since the Milky Way passes through this region, it's littered with many incredible deep-sky objects for those using binoculars or a telescope to scan the heavens. Image created with assistance from Stellarium: stellarium.org*

Night Sky Notes (Cont'd)

M71 as seen by Hubble. Your own views very likely won't be as sharp or close as this. However, this photo does show the cluster's lack of a bright, concentrated core, which led astronomers until fairly recently to classify this unusual cluster as an "open cluster" rather than as a "globular cluster." Studies in the 1970s proved it to be a globular cluster after all – though an unusually young and small one! Credit ESA/Hubble and NASA. Source: https://www.nasa.gov/feature/goddard/2017/messier-71

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a peek into our Sun's far-distant future when you observe this object!

Sagitta the Arrow is even smaller than Vulpecula – it's the third smallest constellation in the sky! Located between the stars of Vulpecula and Aquila the Eagle, Sagitta's stars resemble its namesake arrow. It too contains an interesting deep-sky object: M71, an unusually small and young globular cluster whose lack of a strong central core has long confused and intrigued astronomers. It's visible in binoculars, and a larger telescope will enable you to separate its stars a bit more easily than most globulars; you'll certainly see why it was thought to be an open cluster!

Delicate **Delphinus the Dolphin** appears to dive in and out of the Milky Way near Aquilla and Sagitta! Many stargazers identify Delphinus as a herald of the fainter water constellations, rising in the east after sunset as fall approaches. The starry dolphin appears to leap out of the great celestial ocean, announcing

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Observing (Cont'd)

(Continued from page 5)

you can catch the open star clusters in Auriga: M36, M37 and M38.

Comets: There are no bright comets visible during September but if you want to chase 7th magnitude Comet C/2017 K2 (PanSTARRS) you can find a sky map in the September issue of Astronomy magazine. The comet spends most of September in the constellation Scorpius.

Meteor showers: There are no significant meteor showers during September.

Conrad (Cont'd)

(Continued from page 3)

system is NASA's Xenon Thruster- Commercial (NEXT-C), a next generation ion propulsion system with improved performance and efficiency compared to its predecessors. The inclusion of this system on DART will allow for in flight testing and demonstrate its importance for future deep space missions.

This presentation will review the Planetary Defense program, including the latest on our inventory of NEO threats, and highlight the development, mission objectives and significance of DART in preparing us for the future of planetary defense from NEOs.

About the speaker: John Conrad followed his childhood interest in space and spaceflight – just before the dawn of the Space Age – earning his Astronautical Engineering degrees from the US

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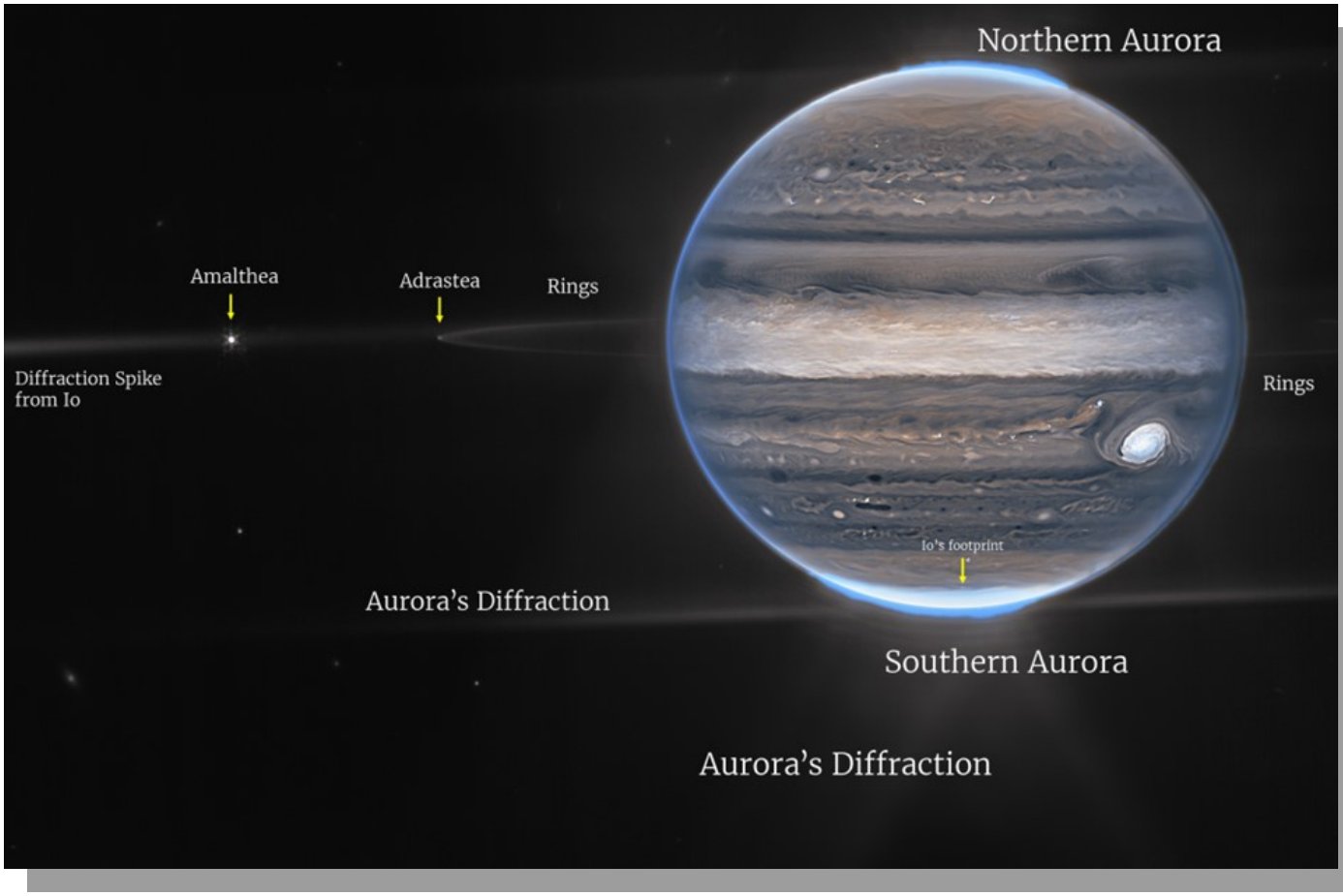
Webb's Jupiter (Cont'd)



Webb NIRCam composite image from two filters – F212N (orange) and F335M (cyan) – of Jupiter system, unlabeled (top) and labeled (bottom). Credit: NASA, ESA, CSA, Jupiter ERS Team; image processing by Ricardo Hueso (UPV/EHU) and Judy Schmidt.

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attention of professional scientists, including Hammel, who previously collaborated with Schmidt on refining Hubble images of comet Shoemaker-Levy 9's Jupiter impact.

Jupiter is actually harder to work with than more distant cosmic wonders, Schmidt says, because of how fast it rotates. Combining a stack of images into one view can be challenging when Jupiter's distinctive features have rotated during the time that the images were taken and are no longer aligned. Sometimes she has to digitally make adjustments to stack the images in a way that makes sense.

Webb will deliver observations about every phase of cosmic history, but if Schmidt had to pick one thing to be excited about, it would be more Webb views of star-forming regions. In particular, she is fascinated by young stars that produce powerful jets in small nebula patches called Herbig–Haro objects. "I'm really looking forward to seeing these weird and wonderful baby stars blowing holes into nebulas," she said.

[Editor's Note: Read the original blog post at https://blogs.nasa.gov/webb/2022/08/22/webbs-jupiter-images-showcase-auroras-hazes/]

Eyepiece (Cont'd)

(Continued from page 7)

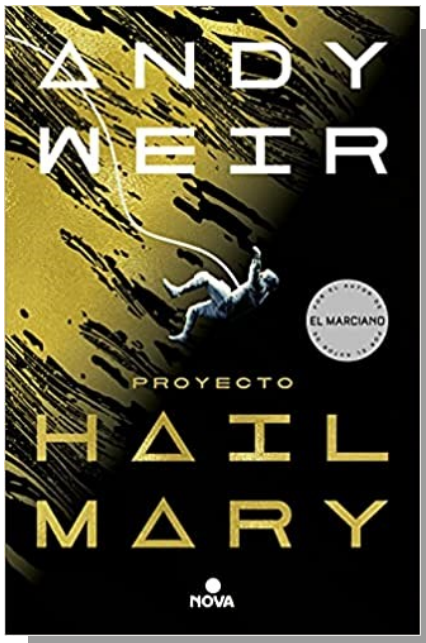
clusters are the Pleiades (M45) in Taurus, the Beehive (M44) in Cancer and the Double Cluster in Perseus. They are all characterized with a handful of hot and white prominent stars and nebular material surrounding these stars.

It is easy to find the Cygnus Star Chain. As you can see in the screen capture from Stellarium, NGC 6871 is just east of the center line of Cygnus the Swan, about one third of the way from

(Continued on page 13)

Book Review: *Hail Mary,* by Andy Weir

by CCAS Member Frank Angelini



If you enjoyed *The Martian*, you're in for a real treat when you read Andy Weir's latest novel. In his familiar style, the author's fast-paced narrative finds the earth in real trouble when scientists discover that the sun is losing energy at an alarming rate. Scientist Ryland Grace and two crewmates volunteer for a one-way trip to another star system to find a solution and save humanity.

This is a book that grabs you, keeps you engaged, and takes you on an emotional roller coaster.

Essay Contest Winner (Cont'd)

(Continued from page 2)

thought their unique power was and how it would help them achieve one or more of their long-term goals in life. Avni was one of 15 national winners in the 5th to 8th grade category. She and her family kindly offered to share her essay with CCAs members. Her work appears below.

"RPS stands for 'Radioisotope Power Systems'. RPS are a type of spacecraft energy source that utilize a form of nuclear power to create electricity from heat. Unlike solar power, RPS don't require light to function, helping spacecraft proceed to remote and treacherous places in our universe. This is inspiring because we, as humans, can only truly pursue our quest into space using a power that doesn't depend on light, seeing as most places in the universe are cloaked in darkness. Being able to recognize that and create a system that operates in darkness is the ultimate motivation. It demonstrates bravery and human perseverance. Superpowers are the mark of most comic book heroes. Those heroes can sometimes inspire us to do amazing things. A superpower I have is the ability to persevere, even when things are tough. One of my goals in life is to start a business that could raise money for charity. Being an entrepreneur is challenging, but I know that my persistence will help me never give up when obstacles come my way. I may not be able to fly or read minds, but I know my diligence will help me accomplish my ambitions someday."

Visit Future Engineers :: Power to Explore Challenge to learn more about the Power to Explore contest.

Conrad (Cont'd)

(Continued from page 11)

Air Force Academy and Purdue University and assuming leadership roles in space programs for the Air Force, NASA, and the aerospace industry. Upon retirement, he was selected by NASA/JPL as a NASA Solar System Ambassador.

In this role, he reaches a broad range of audiences with the latest and greatest in NASA's programs and achievements. John has been an active member of CCAS and The Planetary Society and speaker for events in both organizations, addressing a number of topics drawing considerable interest from diverse audiences, including *Global Climate Change: The View from Space*, *A Hitchhiker's Guide to the Solar System – Celebrating the 60th Anniversary of NASA*, and *The Cassini/Huygens Mission to Saturn and its Moons*.

Eyepiece (Cont'd)

(Continued from page 12)

Sadr to Albireo. You can also see the Cygnus Star Cloud in the Stellarium image, that glow of stars that fills the sky from Sadr to Albireo.

So, grab your binoculars and a sleeping bag or a lounge chair and drink your fill of the Milky Way as you seek out the beautiful Cygnus Star Chain!

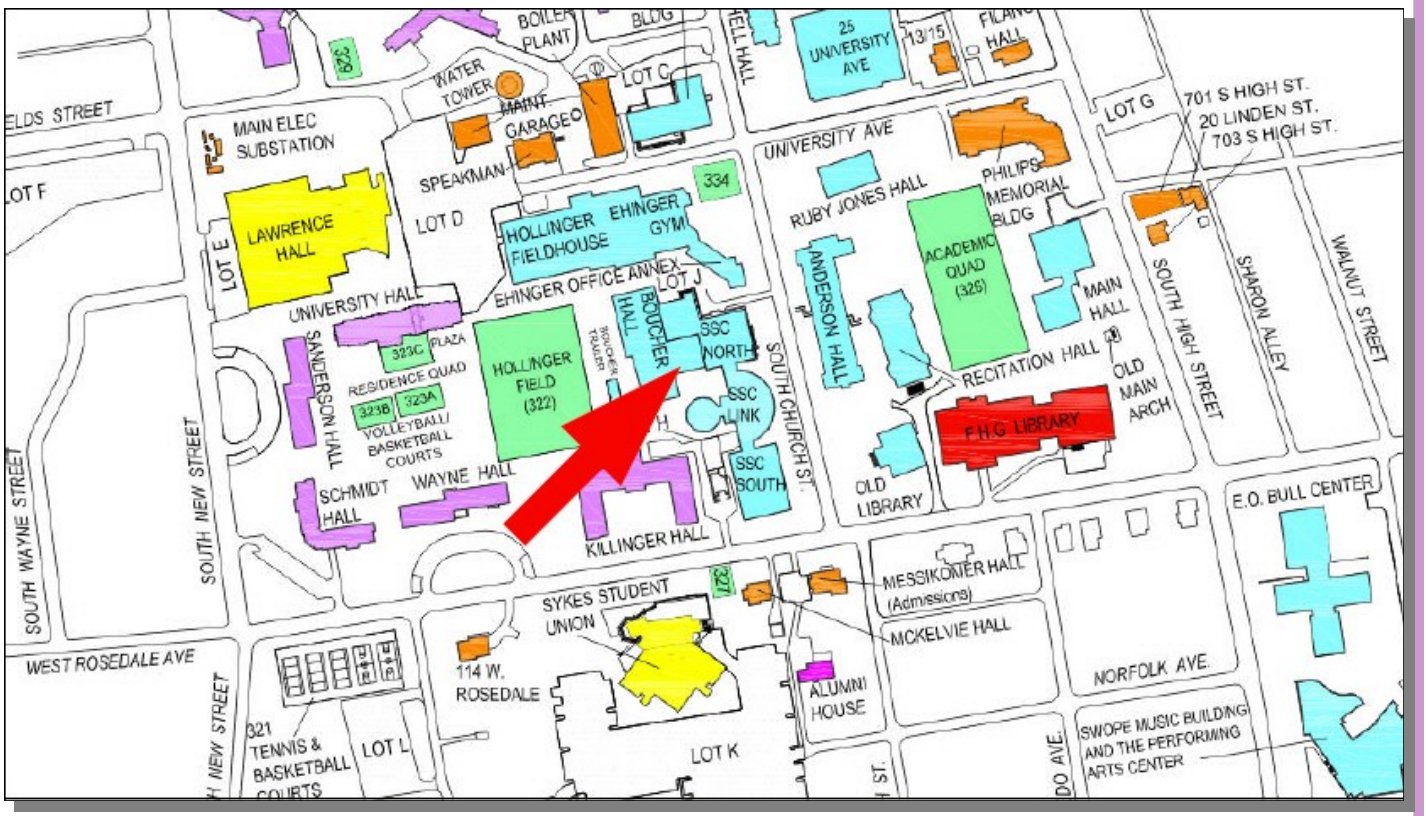
Information credits:

- Dickinson, Terence 1996. *Summer Star Gazing.* Buffalo, NY. Firefly Books
- Astronomy Sketch of the Day, http://www.asod.info/?p=1260 Disrupting the Cygnus Star Cloud by Rony De Laet
- Craig Crossen, Gerald Rhemann 2004. *Sky Vistas: Astronomy for Binoculars and Richest-Field Telescopes*. New York, NY: *Springer*
- http://www.perseus.gr/Astro-DSO-NGC-6871.htm
- http://cs.astronomy.com/asy/m/starclusters/450561.aspx

CCAS Directions

West Chester University Campus

The monthly meetings (September through May) are held in Room 112 in Merion Science Center (formerly the Boucher Building), attached to the Schmucker Science Center. The Schmucker Science Center is located at the corner of S. Church St & W. Rosedale Ave. Parking is generally available across Rosedale in the Sykes Student Union parking lot (Lot K).



Night Sky Notes (Cont'd)

(Continued from page 11)

the arrival of more wonderful sights later in the evening.

Want to hunt for more treasures? You'll need a treasure map, and the Night Sky Network's "Trip Around the Triangle" handout is the perfect guide for your quest! Download one before your observing session at bit.ly/TriangleTrip. And of course, while you wait for the Sun to set - or skies to clear - you can always find out more about the objects and science hidden inside these treasures by checking out NASA's latest at nasa.gov.

CCAS Membership Information and Society Financials

Treasurer's Report
by Don Knabb

August 2022 Financial Summary

Beginning Balance	$1054
Deposits	$315
Disbursements	-$0
Ending Balance	$1369

New Member Welcome!

Welcome to our new CCAS members William Kellar from Phoenixville, PA, and Sharon Shultz from Downingtown, PA.

We're glad you decided to join us under the stars! Clear skies to you!

Membership Renewals

You can renew your CCAS membership by writing a check payable to "Chester County Astronomical Society" and sending it to our Treasurer:

Don Knabb
988 Meadowview Lane
West Chester PA 19382

The current dues amounts are listed in the *CCAS Information Directory*. Consult the table of contents for the directory's page number in this month's edition of the newsletter.

CCAS Information Directory

Join the Fight for Dark Skies!

You can help fight light pollution, conserve energy, and save the night sky for everyone to use and enjoy. Join the nonprofit International Dark-Sky Association (IDA) today. Individual memberships start at $30.00 for one year. Send to:

International Dark-Sky Association
3225 North First Avenue
Tucson, AZ 85719

Phone: **520-293-3198**
Fax: **520-293-3192**
E-mail: **ida@darksky.org**

For more information, including links to helpful information sheets, visit the IDA web site at:

http://www.darksky.org

Dark-Sky Website for PA

The Pennsylvania Outdoor Lighting Council has lots of good information on safe, efficient outdoor security lights at their web site:

http://www.POLCouncil.org

Find out about Lyme Disease!

Anyone who spends much time outdoors, whether you're stargazing, or gardening, or whatever, needs to know about Lyme Disease and how to prevent it. You can learn about it at:

http://www.LymePA.org

Take the time to learn about this health threat and how to protect yourself and your family. It is truly "time well spent"!

Good Outdoor Lighting Websites

One of the biggest problems we face in trying to reduce light pollution from poorly designed light fixtures is easy access to good ones. When you convince someone, a neighbor or even yourself, to replace bad fixtures, where do you go for good lighting fixtures? Check out these sites and pass this information on to others. Help reclaim the stars! And save energy at the same time!

Light pollution from poor quality outdoor lighting wastes billions of dollars and vast quantities of valuable natural resources annually. It also robs us of our heritage of star-filled skies. Starry Night Lights is committed to fighting light pollution. The company offers the widest selection of ordinance compliant, night sky friendly and neighbor friendly outdoor lighting for your home or business. Starry Night Lights is located in Park City, Utah.

Phone: **877-604-7377**
Fax: **877-313-2889**

http://www.starrynightlights.com

★ ★ ★ ★ ★

Lighthouse Outdoor Lighting is a dedicated lifetime corporate member of the International Dark-Sky Association. Lighthouse's products are designed to reduce or eliminate the negative effects outdoor lighting can have while still providing the light you need at night.

Phone: **484-291-1084**

https://www.lighthouse-lights.com/landscape-lighting-design/pa-west-chester/

Local Astronomy-Related Stores

Listing retail sites in this newsletter does not imply endorsement of any kind by our organization. This information is provided only as a service to our members and the general public.

Skies Unlimited is a retailer of telescopes, binoculars, eyepieces and telescope accessories from Meade, Celestron, Televue, Orion, Stellarvue, Takahashi, Vixen, Losmandy and more.

Skies Unlimited
Suburbia Shopping Center
52 Glocker Way
Pottstown, PA 19465

Phone: **610-327-3500** or **888-947-2673**
Fax: **610-327-3553**

http://www.skiesunlimited.net

★ ★ ★ ★ ★

Located in Manayunk, Spectrum Scientifics educates and entertains customers with an array of telescopes, microscopes, binoculars, science toys, magnets, labware, scales, science instruments, chemistry sets, and much more.

4403 Main Street
Philadelphia, PA 19127

Phone: **215-667-8309**
Fax: **215-965-1524**

Hours:
Tuesday thru Saturday: 10AM to 6PM
Sunday and Monday: 11AM to 5PM

http://www.spectrum-scientifics.com

CCAS Information Directory

CCAS Lending Telescopes

Contact Don Knabb to make arrangements to borrow one of the Society's lending telescopes. CCAS members can borrow a lending telescope for a month at a time; longer if no one else wants to borrow it after you. Don's phone number is 610-436-5702.

CCAS Lending Library

Contact our Librarian, Barb Knabb, to make arrangements to borrow one of the books in the CCAS lending library. Copies of the catalog are available at CCAS meetings, and on the CCAS website. Barb's phone number is 610-436-5702.

Contributing to *Observations*

Contributions of articles relating to astronomy and space exploration are always welcome. If you have a computer, and an Internet connection, you can attach the file to an e-mail message and send it to: **newsletter@ccas.us**

Or mail the contribution, typed or handwritten, to:

Dr. John C. Hepler
21 Medinah Drive
Reading, PA 19607

CCAS Newsletters via E-mail

You can receive the monthly newsletter (in full color!) via e-mail. All you need is a PC or Mac with an Internet e-mail connection. To get more information about how this works, send an e-mail request to Dr. John Hepler, the newsletter editor, at: **newsletter@ccas.us**.

CCAS Website

Dr. John Hepler is the Society's Webmaster. You can check out our Website at:

http://www.ccas.us

Dr. Hepler welcomes any additions to the site by Society members. The contributions can be of any astronomy subject or object, or can be related to space exploration. The only requirement is that it is your own work—no copyrighted material! Give your contributions to Dr. Hepler at (484) 883-5033 or e-mail to webmaster@ccas.us

CCAS Purpose

The Chester County Astronomical Society was formed in September 1993, with the cooperation of West Chester University, as a non-profit organization dedicated to the education and enjoyment of astronomy for the general public. The Society holds meetings (with speakers) and observing sessions once a month. Anyone who is interested in astronomy or would like to learn about astronomy is welcome to attend meetings and become a member of the Society. The Society also provides telescopes and expertise for "nights out" for school, scout, and other civic groups.

CCAS Executive Committee

For further information on membership or society activities you may call:

President:	Dave Hockenberry 610-558-4248
Vice President:	Pete Kellerman 610-873-0162
ALCor, Observing, & Treasurer:	Don Knabb 610-436-5702
Secretary:	Beatrice Mazziotta 610-933-2128
Librarian:	Barb Knabb 610-436-5702
Program:	Bruce Ruggeri 484-883-5092
Education:	Don Knabb 610-436-5702 Dennis O'Leary 610-701-8042
Webmaster & Newsletter:	John Hepler 484-883-0533
Public Relations:	Ann Miller 610-558-4248

CCAS Membership Information

The 2021 membership rates are as follows:

REGULAR MEMBER……$30/year
SENIOR MEMBER…….$15/year
STUDENT MEMBER……..$ 5/year
JUNIOR MEMBER……..$ 5/year
FAMILY MEMBER…….$40/year

Membership Renewals

Check the Membership Renewals on the front of each issue of *Observations* to see if it is time to renew. If you need to renew, you can mail your check, made out to "Chester County Astronomical Society," to:

Don Knabb
988 Meadowview Lane
West Chester PA 19382-2178

Phone: **610-436-5702**
e-mail: **treasurer@ccas.us**

*Sky & Tel*escope Magazine

The club membership subscription cost for *Sky and Telescope* magazine has increased to **$43.95**. This is still a good saving from the regular rate of **$56.05**.

There is no need to go through the CCAS treasurer for subscriptions or renewals. Just go to the Sky and Telescope website and select "Magazine", then under the FAQs you can subscribe at the club rate.

https://skyandtelescope.org/subscribe/

If you have **any** questions call Don Knabb at 610-436-5702.

Astronomy Magazine Group Rates

Subscriptions to this excellent periodical are available through the CCAS at a reduced price of **$34.00** which is much less than the individual subscription price of **$42.95** (or $60.00 for two years).

There is no need to go through the CCAS treasurer for subscriptions or renewals. Just call customer service at 877-246-4835 and request the club rate for your new subscription or renewal.