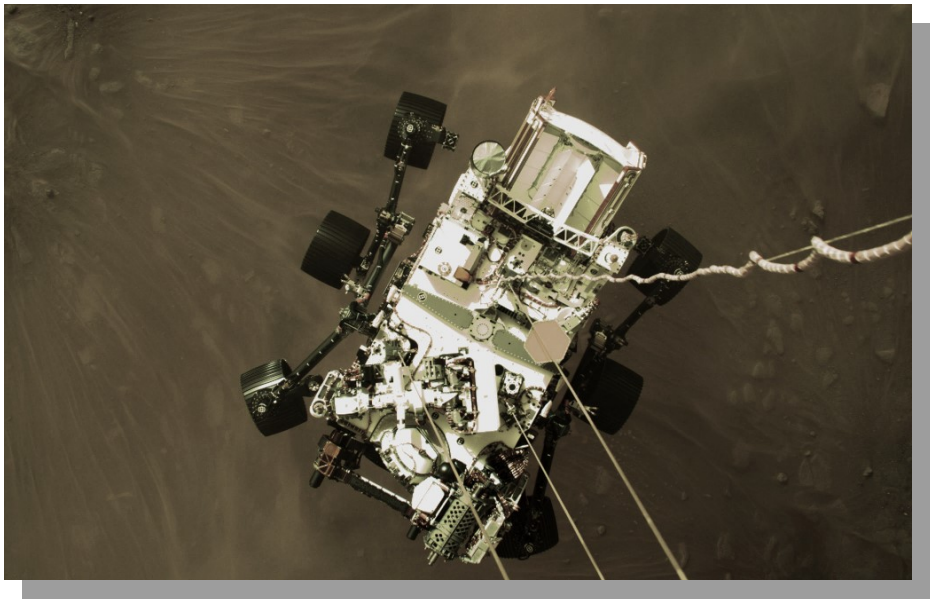
Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 29, No. 3 ***Three-Time*** *Winner of the Astronomical League's Mabel Sterns Award ☼ 2006, 2009 & 2016* *March 2021*

In This Issue

Perseverance: How to Land on Mars



Slung beneath its rocket powered descent stage Perseverance hangs only a few meters above the Martian surface, captured here moments before its February 18 touchdown on the Red Planet. The breath-taking view followed an intense seven minute trip from the top of the Martian atmosphere. Part of a high resolution video, the picture was taken from the descent stage itself during the final skycrane landing maneuver. Three taut mechanical cables about 7 meters long are visible lowering Perseverance, along with an electrical umbilical connection feeding signals (like this image), to a computer on board the car-sized rover. Below Perseverance streamers of Martian dust are kicked-up from the surface by the descent rocket engines. Image Credit: NASA, JPL, Mars 2020

Membership Renewals Due

03/2021	Angelini
	DellaPenna
	Fulton
	Sterrett
	Zandler
	Zibinski
04/2021	Chisholm
	Hepler
	Imburgia
	Miller
	Rossomando
05/2021	Aylam & Martin-Aylam
	Cunningham
	Klapholz
	LaFrance
	Ostanek
	Quinn
	Toth

March 2021 Dates

5th • Last Quarter Moon, 8:30 p.m. EST

13th • New Moon, 5:21 a.m. EST

14th • Daylight Saving Time begins, 2:00 a.m. EDT

20th • The vernal equinox arrives at 5:37 a.m. EDT

21st • The First Quarter, 10:40 a.m. EDT

28th • Full Moon, the Full Worm Moon or the Blossoming Out Moon, 2:14 p.m. EDT

Membership Dues Increase

CCAS membership dues are increasing in March 2021. They have not been increased since 2002, 18 years ago! So it is now time to put through a slight increase in our annual dues to cover our costs. All membership types will increase by $5 except for the Student membership, which will be unchanged.

Here are the current dues and the new cost:

Type	Old Rate	New Rate
Regular	$25	$30
Senior	$10	$15
Student	$5	$5
Family	$35	$40

Winter / Spring Society Events

March 2021

1st • Beginner Astronomy Class: Spaceship Earth – the Sun and its effects on the Earth. Online via Zoom starting at 7:30 p.m. EST.

2nd • Green Bank Observatory presentation, 7:30 p.m. EST via Zoom.

8th • Beginner Astronomy Class: Other kids on the block – the planets. Online via Zoom starting at 7:30 p.m. EST.

9th • CCAS Monthly Meeting, ONLINE via Zoom. The meeting starts at 7:30 p.m. Guest Speaker: Dr. Varoujan Gorjian, Spitzer Research Scientist, JPL. His presentation is entitled "The Legacy of the Spitzer Space Telescope."

11th • The von Kármán Lecture Series: Helicopters in Space. Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

15th • Beginner Astronomy Class: Our Moon: Phases and Faces. Online via Zoom starting at 7:30 p.m. EDT.

20th • Open call for articles and photographs for the April 2021 edition of Observations.

20th • Vernal Equinox (first day of spring) is on Saturday at 5:37 a.m. EDT.

22nd • Beginner Astronomy Class: Observing basics, star charts and planetarium software. Online via Zoom starting at 7:30 p.m. EDT.

26th • Deadline for newsletter submissions for the April 2021 edition of Observations.

29th • Beginner Astronomy Class: Observing equipment, binoculars and telescopes. Online via Zoom starting at 7:30 p.m. EDT.

April 2021

5th • Beginner Astronomy Class: Beyond Naked Eye Observing (deep sky stuff) . Online via Zoom starting at 7:30 p.m. EDT.

13th • CCAS Monthly Meeting, ONLINE via Zoom. The meeting starts at 7:30 p.m. Guest Speaker: Dennis O'Leary, CCAS Member and NASA Ambassador – " NASA Robotic Missions: An Update on New Horizons, Insight, Perseverance, and Juno."

15th • The von Kármán Lecture Series: Science on Ice—What Ice Says About Past, Present, and Future Climate. Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

20th • Open call for articles and photographs for the May 2021 edition of Observations.

26th • Deadline for newsletter submissions for the May 2021 edition of Observations.

Minutes from the February 9, 2021, CCAS Monthly Meeting

by Bea Mazziotta, CCAS Secretary

- Dave Hockenberry welcomed members and guests to the January 2021 CCAS meeting. Zoom and YouTube were the platforms. Attendance topped out at 55.
- CCAS has no in person events scheduled for the immediate future.
- Don Knabb invited everyone to join a Zoom watch party on 2/18 to see the live landing of the NASA rover 'Perseverance' on the surface of Mars. Details for viewing would be sent via email.
- He also announced that CCAS would once again conduct beginner astronomy classes. The classes will be held via Zoom. They will be an hour in length and will start on March 1st and continue for 6 consecutive Mondays. Start time is 7:30 PM The scheduled classes will cover (in this order) -
- The Sun and Its Effects on Earth; Our Moon Phases and Faces; The Planets; Observing Basics; Observing Equipment; and Deep Sky Objects.
- A new link will be needed for each class. Please email dknabb01@comcast.net for the Zoom link.
- Our NASA ambassador John Conrad gave an overview of the Mars 2020 mission - the participating nations, landing dates, landing locations and equipment, including the NASA helicopter Ingenuity which will do reconnaissance for Perseverance and is the first powered flight on another planet.
- Program Chair Bruce Ruggeri introduced the evening's speaker, Sarah Dodson-Robinson. Dr. Dodson-Robinson is an associate professor of Astronomy and Physics at the University of Delaware.
  - She earned her PhD at the University of California Santa Cruz and was a Spitzer Postdoctoral Fellow at the NASA Exoplanet Science Institute.
  - Her areas of interest and study are planet formation, protoplanetary disks, debris disks and galactic chemical evolution.
  - Her lecture, entitled "Enceladus and Titan - A dance of Two Saturnian Moons", explored the interconnectedness of the moons in the Saturn system and their gravitational and chemical interactions.
  - Slated for launch in 2026, NASA's Dragonfly rotorcraft lander will arrive on Titan in 2034. Taking advantage of its dense atmosphere and low gravity, Dragonfly will spend nearly 3 years exploring the icy moon looking for chemical processes similar to those found on earth.

March 2021 CCAS Meeting Agenda

by Bruce Ruggeri, CCAS Program Chair

Our next meeting will be held on February 9, 2021, starting at 7:30 p.m. The meeting will be held online via Zoom.us. Guest Speaker: Dr. Varoujan Gorjian, Spitzer Research Scientist, JPL. His presentation is entitled "The Legacy of the Spitzer Space Telescope."

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.

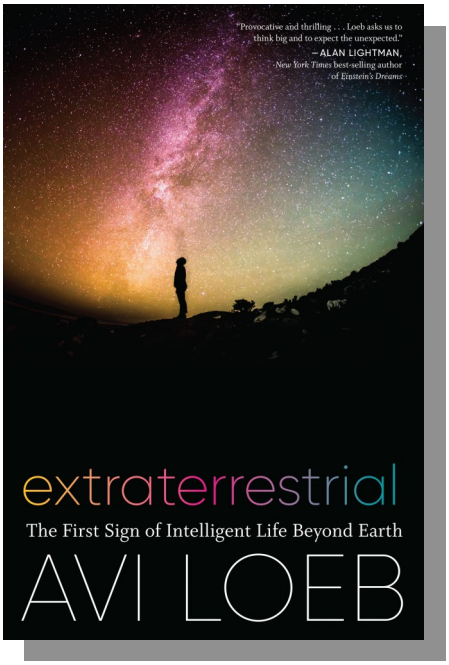
As for future meetings, we are looking for presenters for our 2021-2022 season and beyond. If you are interested in presenting, or know someone who would like to participate, please contact me at programs@ccas.us.

Book Review: *Extraterrestrial*, by Avi Loeb

by Chris Trunk, CCAS Member

What would it mean for humanity if we discover an indication that intelligent life exists elsewhere in the universe? What if an alien object went zipping through our solar system and we failed to recognize it? *Extraterrestrial* explores the distinct possibility that interstellar visitor 'Oumuamua, (once thought to be a comet) is neither comet nor asteroid, but is an artificial object created by another civilization! 'Oumuamua (1I/2017 U1) was discovered in 2017 by the Pan-STARRS telescope on Maui; its name means "Scout" or "Messenger" in Hawaiian.

I first learned of Avi Loeb's new book when he was interviewed on a recent episode of The Planetary Society's podcast *Planetary Radio* https://www.planetary.org/planetary-radio/0127-2021-avi-loeb-extraterrestrial. Loeb's hypothesis and reasoning regarding 'Oumuamua piqued my interest. *Extraterrestrial* covers a lot of ground regarding astronomy, astrophysics and our not-so-unique place in the universe, along with Loeb's personal journey. Written in plain & easy to understand terms, the book not only considers the origin of 'Oumuamua but also challenges the bias and pre-conceived notions of many in the mainstream astrophysics community.



Cover Art, Extraterrestrial by Avi Loeb
Available at Amazon

Loeb uses the limited available data along with solid scientific reasoning to rule-out various attributes that would indicate 'Oumuamua is a natural object, until we are left to conclude that there is the distinct possibility it is an artificial object from outside of our solar system. Certain key observations, like the fact 'Oumuamua is ten times more reflective than typical comets or asteroids, that it's velocity increased after passing the sun (with no observable outgassing), and it's unusual pancake shape (it's unlikely to be cigar-shaped as some artists have depicted), lead Loeb to conjecture that 'Oumuamua may be some form of light-sail. In short, we may have had a passive encounter with an alien object! Other scientists disagree and think that 'Oumuamua could possibly be a fragment of frozen Nitrogen. Unfortunately we'll never know for sure, 'Oumuamua is quickly receding and is well beyond the

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Dr. Varoujan Gorjian, Guest Speaker at Our March 2021 Meeting

by Bruce Ruggeri, CCAS Program Chair

Varoujan Gorjian, Ph.D.

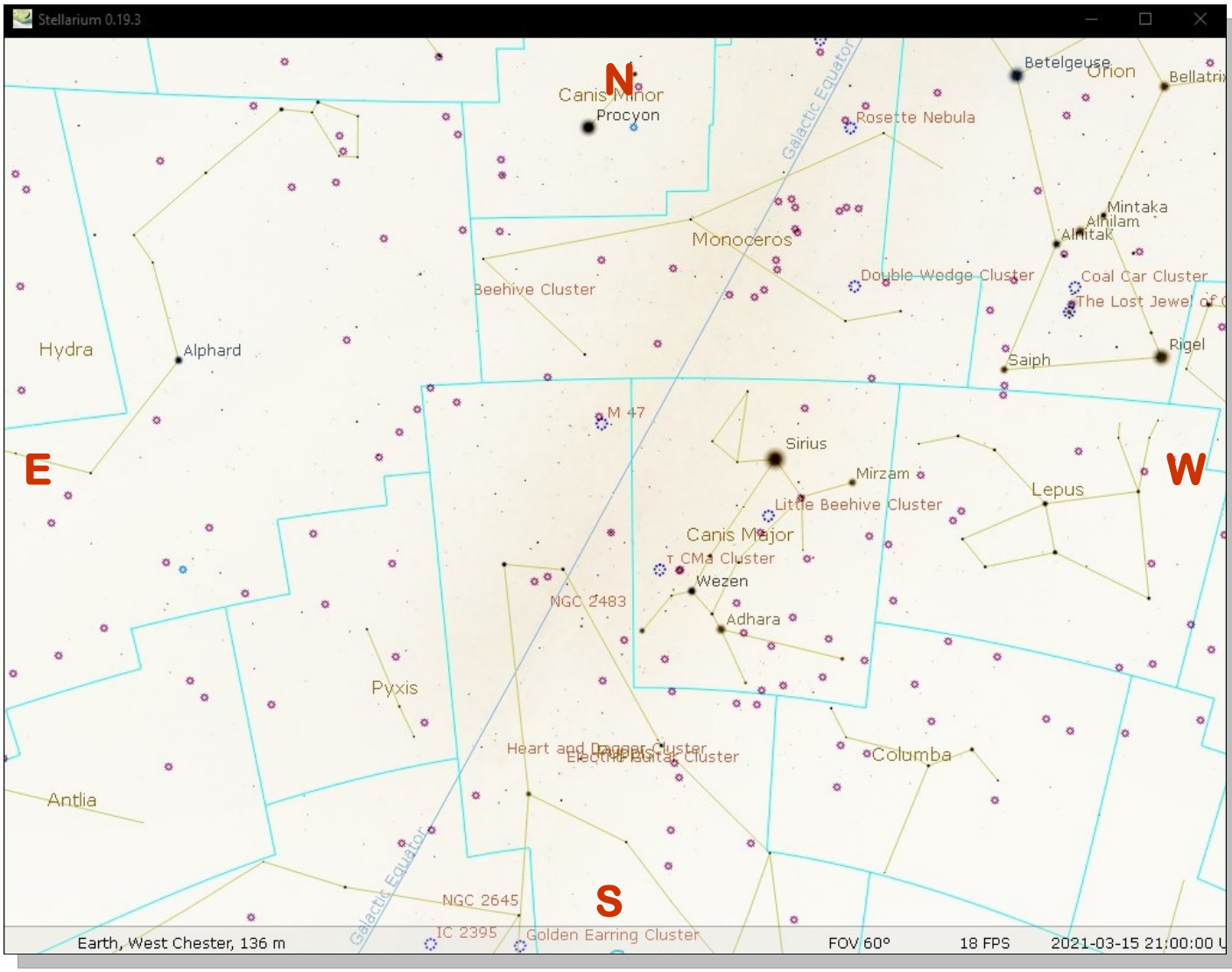
The Spitzer Space Telescope was launched in 2003 as part of NASA's Great Observatories program. It operated at the infrared portion of the spectrum and finished its observations in January of 2020. In this talk we'll take a look at some of the amazing highlights and the lasting legacy of this incredible observatory ranging from the rings of Saturn in our solar system, to planets around other stars in our Galaxy, to finding the farthest galaxies in our Universe.

Dr. Varoujan Gorjian obtained his undergraduate degree in Astronomy at Caltech in 1992 and his Ph.D. at UCLA in 1998. He then went to work at JPL on the Spitzer Space Telescope project and he has been there ever since. His research interests range from supermassive black holes at the centers of galaxies to planets orbiting around nearby stars. He is also very involved with education and public outreach and does research with high school science teachers from across the country.

The Sky Over Chester County

March 15, 2021 at 9:00 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
03/01/2021	6:08 a.m. EST	6:35 a.m. EST	5:54 p.m. EST	6:21 p.m. EST	11h 19m 20s
03/15/2021	6:46 a.m. EDT	7:13 a.m. EDT	7:09 p.m. EDT	7:36 p.m. EDT	11h 56m 07s
03/31/2021	6:20 a.m. EDT	6:47 a.m. EDT	7:25 p.m. EDT	7:53 p.m. EDT	12h 38m 20s

Moon Phases					
Last Quarter	03/05/2021	8:30 p.m. EST	New Moon	03/13/2021	5:21 a.m. EST
First Quarter	03/21/2021	10:40 a.m. EDT	Full Moon	03/28/2021	2:14 p.m. EDT

March 2021 Observing Highlights
by Don Knabb, CCAS Treasurer & Observing Chair

1	**The zodiacal light is visible from a dark site for the next 2 weeks**
5	**Last Quarter Moon, 8:30 p.m. EST**
13	**New Moon, 5:21 a.m. EST**
14	**Daylight Saving Time begins, and it is Pi Day!**
18	**The Moon is near Mars this evening**
20	**The vernal equinox arrives at 5:37 a.m. and the Lunar X is visible at 7 p.m.**
21	**First Quarter Moon and the Lunar Straight Wall is visible this evening**
28	**Full Moon, the Full Worm Moon or the Blossoming Out Moon**

The best sights this month: Mars is the only planet in the evening sky, and it is in the constellation Taurus the Bull between the Pleiades and Hyades star clusters. This is the closest Mars will be to the Pleiades since 2006 or until 2038! And on March 18th and 19th a crescent Moon fills out the sky near Mars and the Hyades. For lunar observers the elusive Lunar X is visible on March 20th around 7 p.m. and the Lunar Straight Wall is visible on March 21st.

Mercury: Mercury is visible in the morning just before the sky begins to lighten. On March 5th it will be only 0.3° from Jupiter.

Venus: Venus is too close to the Sun to be observed, and passes behind the Sun on March 26th.

Mars: The red planet inhabits the space between the Pleiades and the Hyades star clusters during March. On March 4th it will be 2 ½° from the center of the Pleiades, which is the closest it has been since 2006 or will be until 2038. This will be a beautiful view in binoculars or a wide field telescope. On March 18th and 19th the crescent Moon adds to the show.

Jupiter: Jupiter is visible in the early morning hours before the sky lightens.

Saturn: Saturn rises a little before Jupiter in the early morning sky.

Uranus and Neptune: Both Uranus and Neptune are poorly positioned for observation during March. Neptune passes behind the Sun on March 11th.

The Moon: The Moon is full on March 28th. This is the Full Worm Moon according to Native Americans. As the temperature warms and the ground begins to thaw, earthworm casts appear (an earthworm cast is a nice word for worm poop), heralding the return of the robins. This full moon is also called the Full Crow Moon, the Full Crust Moon and the Full Sap Moon. Native Canadians called this the Maple Sugar Moon or the Blossoming Out Moon.

Constellations: In mid-March around 9:00 p.m. the winter constellations are in the western half of the sky heading toward their summer sleep before too many weeks have passed. Catch the Pleiades, Taurus and Orion before we lose them to the spring constellations that are rising in the east. In the spring group Leo the Lion is heading toward center stage. The Big Dipper in Ursa Major is high overhead. Follow the arc of the Dipper handle to bright Arcturus in Boötes.

Messier/deep sky: There are many wonderful deep sky sights as winter turns to spring. Early in the evening look to the left of Canis Major, Orion's hunting dog companion, for M46, a beautiful open cluster. The star clusters in Auriga are heading toward the western horizon but are still well positioned for viewing through the minimum amount of atmosphere early in the evening. Later in the night look overhead to find the galaxies M81 and M82 in Ursa Major. And use your binoculars to look for M35 in Gemini, an open star cluster containing several hundred stars in an area the size of the full Moon.

Comets: There are no bright comets visible during March.

Meteor showers: There are no meteor showers during March. However, from March 1st until March 14th you can look for the Zodiacal Light, a cone-shaped glow of light that is created when sunlight reflects off dusty debris in the inner solar system.

Bruce Blackburn, Designer of Ubiquitous NASA Logo, Dies at 82

by Alex Vadukul, NY Times

Bruce Blackburn, a graphic designer whose modern and minimalist logos became ingrained in the nation's consciousness, including the four bold red letters for NASA known as the "worm" and the 1976 American Revolution Bicentennial star, died on Feb. 1 in Arvada, Colo., near Denver. He was 82. The death, at a nursing home, was confirmed by his daughter, Stephanie McFadden.

In a design career of more than 40 years, Mr. Blackburn developed brand imagery for clients like IBM, Mobil and the Museum of Modern Art. But he is best known for the NASA worm, which has become synonymous with space exploration and the concept of the technological future itself.

In 1974, his small New York-based design firm, Danne & Blackburn, was barely a year old and eager for a big project when he and his partner, Richard Danne, were approached by the Federal Graphics Improvement Program to rebrand NASA's classic logo, which depicted a patriotic red chevron soaring across the stars.

Known as "the meatball," the original logo wasn't exactly cutting edge, evoking instead a vintage Buck Rogers sensibility of space travel. With the eyes of the world suddenly on the agency after the moon landing in 1969, NASA sought a more forward-looking image.

"They were totally unprepared for that kind of attention," Mr. Blackburn said in "Blackburn" (2016), a short documentary about him. "Their unpreparedness descended to the level of how they presented themselves to the public."

Bruce Blackburn, left, and Richard Danne at their New York-based design firm, Danne & Blackburn. They were approached in the 1970s to rebrand NASA's logo. Image Credit: Alan Orling

NASA introduced the worm in 1975. A sleek sequence of wind-

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The "worm" logo was designed by Bruce Blackburn. He and his design firm partner, Richard Danne, overhauled the visual appearance for NASA in 1975. Credit: NASA

Blackburn (Cont'd)

(Continued from page 6)

ing red letters, it quickly became a symbol of a boundless space age that lay ahead.

"We did get what we set out to accomplish," Mr. Blackburn said. "Anybody we showed it to immediately said: 'Oh, I know what that is. I know them. They're really great. They're right on the leading edge of everything.'"

But in 1992, a few years after the Challenger explosion, NASA dropped the worm and revived the meatball in a decision that was said to be intended to improve agency morale.

Mr. Blackburn and other designers lamented the choice. "They said, 'This is a crime, you cannot do this,'" he said. "'This

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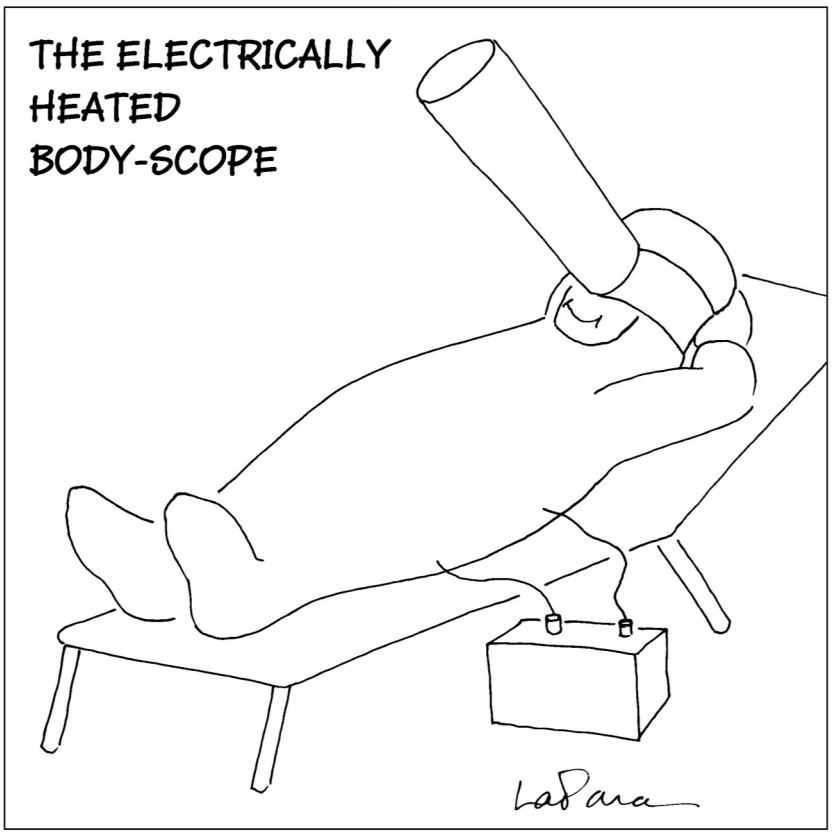
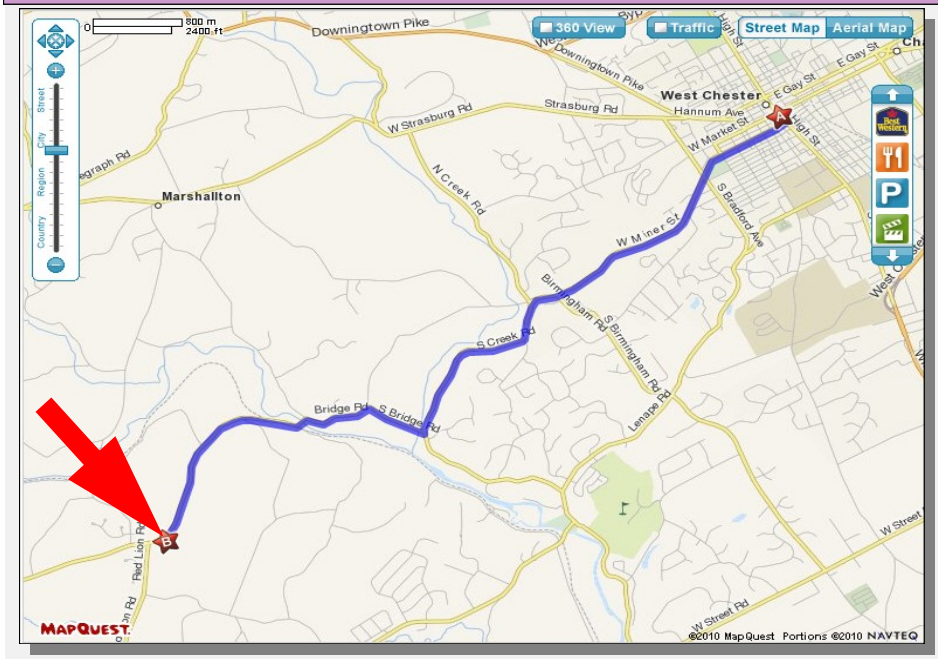
Classic La Para

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).

Through the Eyepiece: The Lunar X and Lunar V

by Don Knabb, CCAS Treasurer & Observing Chair

Of all the letters in our alphabet, X is perhaps the one imbued with the most intrigue. The letter that represents an unknown quantity in an algebraic equation, X has come to be associated with anything unknown or mysterious, as in Planet X and X -rays.

Is the Lunar X a sign of an alien visitation? No, it's an example of how lighting and topography can combine to produce a pattern that seems familiar to the human eye.

The Lunar X is a famous optical feature on the moon, visible through telescopes or binoculars when the terminator, the line between light and dark on the moon, is located in just the right place. The Lunar X is a distinct letter X on the moon's surface.

This pattern repeats at each cycle of the moon, but only for a short time. The X is observable for about 4 hours around the first quarter moon phase. Because the Earth is not always in the same place when the Moon is in this ideal location, not everywhere on Earth will always see the Lunar X every month. However, it occurs frequently enough for most areas that it can usually be seen every few months. And its bright enough that it can even be seen in daylight - if you know when and where to look.

Actually, the X isn't even real; it's just an optical illusion created for a very brief time each month when the light from the Sun reflects off of the ridges of a group of three lunar craters - Purbach, LaCaille, and Blanchinus - at just the right angle.

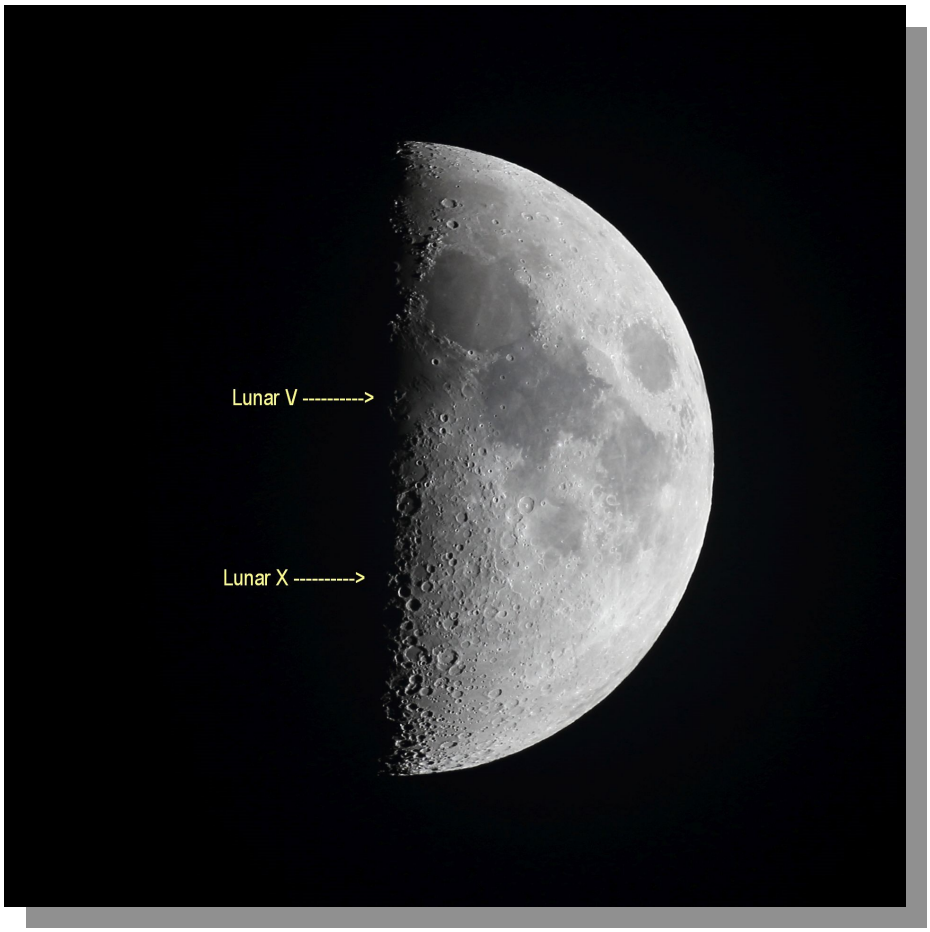


Photo credit: the author

You can see the Lunar X on March 20th around 7 p.m. The Sun will just be setting when the Lunar X appears and it should be visible for an hour or two. And after you gaze upon the Lunar X, scan northward along the terminator to find the Lunar V, which is mentioned at the end of this article.

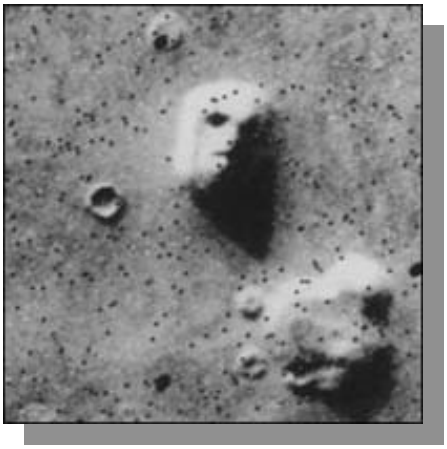


Image credit: NASA

The Lunar X is an example of pareidolia, or the tendency of the human mind to discern familiar objects when looking at random patterns. The name for this phenomenon comes from the Greek words for "image" and "instead of." Pareidolia is when we see an image of something instead of what's really there. This same process is what allows us to imagine shapes in the clouds, star formations, abstract art, and even burn marks on toast. The famous "face on Mars" is an example of

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Upcoming Spring 2021 Astronomy Classes

by Don Knabb, CCAS Treasurer & Observing Chair

For several years the Chester County Astronomical Society has been offering beginner astronomy classes through the Chester County Night School. However, the Chester County Night School has temporarily (we hope!) closed their office due to the pandemic. Under normal circumstances we like to encourage our members to sign up through the Chester County Night School to support their mission for the community.

However, our club has quite a few new members and many have limited experience with astronomy and a good way to get started in astronomy is with our classes. So, this year we will offer our beginner astronomy classes to our members free of charge. In addition to our club, we will be inviting three other local astronomy clubs to attend: Delaware Astronomy Society, Delaware Valley Amateur Astronomers and ChesMont Astronomical Society.

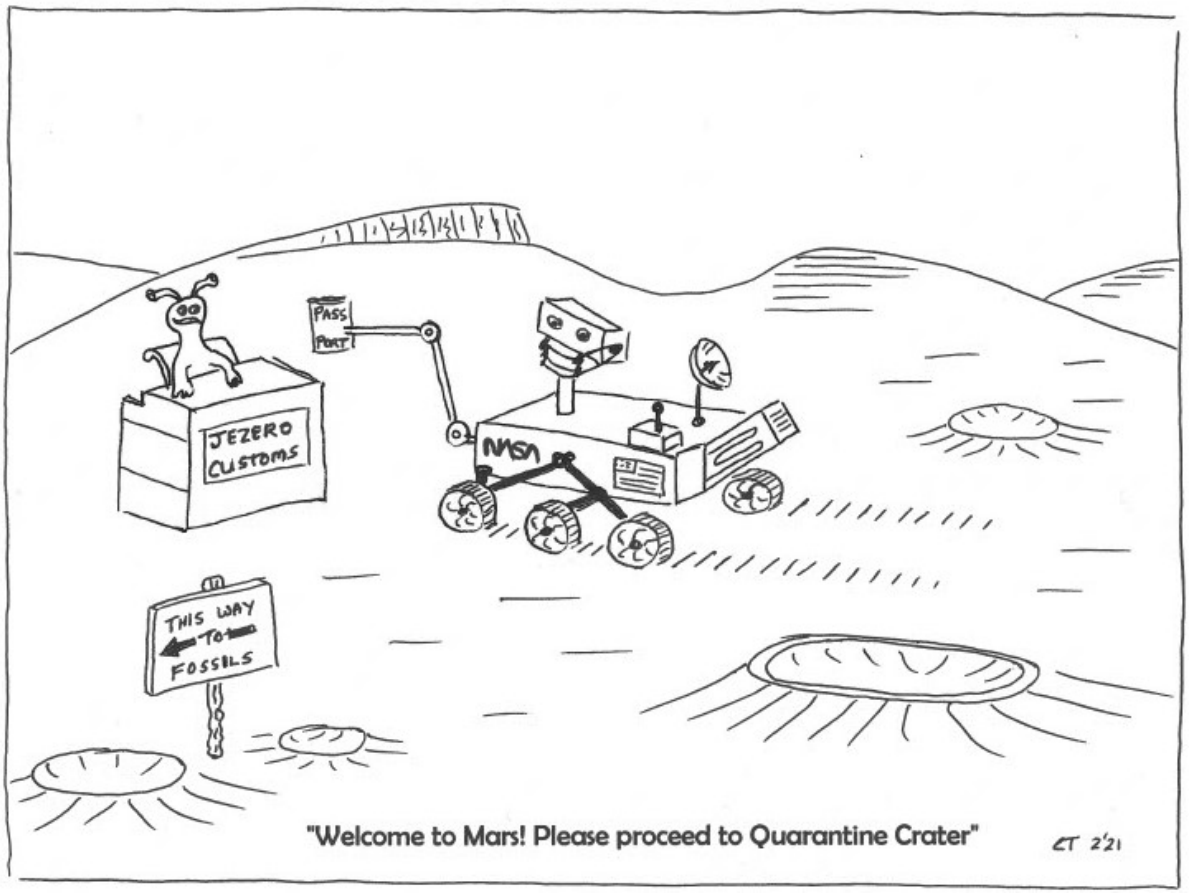
Classes are approximately 1 hour in length and will be taught on 6 consecutive Mondays beginning on March 1st. Classes begin at 7:30 and will be presented using the CCAS Zoom account. Here is a list of the class topics and the instructors, who are all CCAS members:

- Monday March 1 - Spaceship Earth – the Sun and its effects on the Earth - Kathy Buczynski
- Monday March 8 - Other kids on the block – the planets – John Conrad
- Monday March 15 - Our Moon: Phases and Faces – Dennis O'Leary
- Monday March 22 – Observing basics, star charts and planetarium software – Don Knabb
- Monday March 29 – Observing equipment, binoculars and telescopes – Dave Hockenberry
- Monday April 5 - Beyond Naked Eye Observing (deep sky stuff) - Don Miller

If you would like to attend these classes please send an email to dknabb01@comcast.net.

Exploration in the Age of Covid-19

by Chris Trunk, CCAS Member



Blackburn (Cont'd)

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is a national treasure, and you're throwing it in the trash bin.'"

"His design sensibility was offended by what happened," his daughter said. "He thought the meatball was clumsy and sloppy and not representative of the future."

Creating the symbol for the American Revolution's Bicentennial celebration was another big federal commission for Mr. Blackburn in the 1970s. The result was a soft red, white and blue star that applied a modern aesthetic to patriotic themes. By 1976 the logo was appearing on everything from stamps to coffee mugs to government buildings.

"They say in life there are moments that are once-in-a-lifetime opportunities," Mr. Blackburn said. "And I got two of them."

He also worked on logos for the Department of Transportation and the Army Corps of Engineers. In the 1990s, he was a finalist in the International Olympic Committee's design competition for a centennial logo. President Ronald Reagan recognized his work with a Presidential Design Award in 1984. He served as the president of the American Institute of Graphic Arts in the mid-1980s.

In the documentary, Mr. Blackburn described his style as "programmatic" — design that "fosters imagery in the public's eye that is permanent." He added, "The art in design is problem solving and then giving it visual life."

Another of Mr. Blackburn's creations appeared on everything from stamps to coffee mugs to government buildings. Image Credit: Standards Manual

Bruce Nelson Blackburn was born on June 2, 1938, in Dallas and raised in Evansville, Ind., on the Ohio River. His father, Buford Blackburn, was an electrical engineer. His mother, Ruby (Caraway) Blackburn, was a homemaker and real estate agent. As a boy, Bruce spent hours painting and drawing in his bedroom. In his teens he formed a Dixieland band and won state music competitions playing the French horn.

He graduated from the University of Cincinnati in 1961 with a bachelor's degree in design and served in the Navy as a communications officer.

By the late 1960s, Mr. Blackburn had moved to New York to work for the design firm Chermayeff & Geismar. He later left it to found Danne & Blackburn. He parted ways with Mr. Danne in the 1980s and started his own firm, Blackburn & Associates, on Park Avenue. He married Tina Harsham in 1979.

In addition to his daughter, Ms. McFadden, Mr. Blackburn is survived by his wife; two sons, David Blackburn and Nick Sontag; a sister, Sandra Beeson; and eight grandchildren.

He and his wife moved to Santa Fe, N.M., a decade ago, and they settled in Lakewood, Colo., in 2017. A project that became important to him was designing logos for two Episcopal churches

(Continued on page 11)

Blackburn (Cont'd)

Last year NASA revived the worm logo for the SpaceX Falcon 9 rocket, which launched into orbit in the spring. Image Credit: SpaceX

(Continued from page 10)

of which he was a longtime congregant: Emmanuel Episcopal Church in Weston, Conn., and St. Bede's Episcopal Church in Santa Fe.

Last year, Mr. Blackburn was surprised when NASA revived the worm logo and put it on the side of a SpaceX rocket that was launched into orbit in the spring. The fate of the worm had always remained a tender subject for him.

"I think he was glad to know that his design was finally back in space," his daughter said.

A version of this article appears in print on Feb. 20, 2021, Section B, Page 11 of the New York edition with the headline: *Bruce Blackburn, 82, Designer of NASA Logo And Bicentennial Star.*

Eyepiece (Cont'd)

(Continued from page 8)

pareidolia.

Scientists suggest there is actually an evolutionary advantage to pareidolia. By using this form of mental shorthand to instantly match new visual data to stored memories, our prehistoric ancestors were able to recognize food sources or predators more quickly. And for our forebears, those split seconds could make all the difference between eating or being eaten.

The mental process responsible for pareidolia takes place in the same part of our brains that is responsible for facial recognition, which is probably why so many examples of the phenomenon involve imagining human faces, such as the Man in the Moon and the "face on Mars".

The first documented sighting of Lunar X was made by Tennessee astronomer Dr. William Busler in June of 1974, though it's likely that the feature was known informally prior to that. It wasn't until the mid-2000s that stalking the feature became popular, thanks to reports published on the Internet. Our astronomy club has held Lunar X parties in the past, and we should do so again someday when we can gather together safely.

The feature, which can be seen in daylight, sits on the lower half of the Moon's surface, which is pocked with numerous craters. Though it can't be discerned with the naked eye, a good set of tripod-mounted binoculars or a small telescope are all that's needed to find it. Just slowly follow the terminator line upward from the bottom edge of the Moon until the X comes into view.

The Lunar X is located in the southern section of the Moon, where there are numerous craters. The southern highlands are filled with them, whereas much of the northern region is dominated by the darker, lava-filled maria.

Somewhat less well known is the Lunar V. This feature is similar to the X in size, but is visible for quite a bit longer after the "X" has dissolved into the back-

(Continued on page 13)

NASA Night Sky Notes: Taking the Dog Stars for a Springtime Walk: Sirius and Procyon

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.

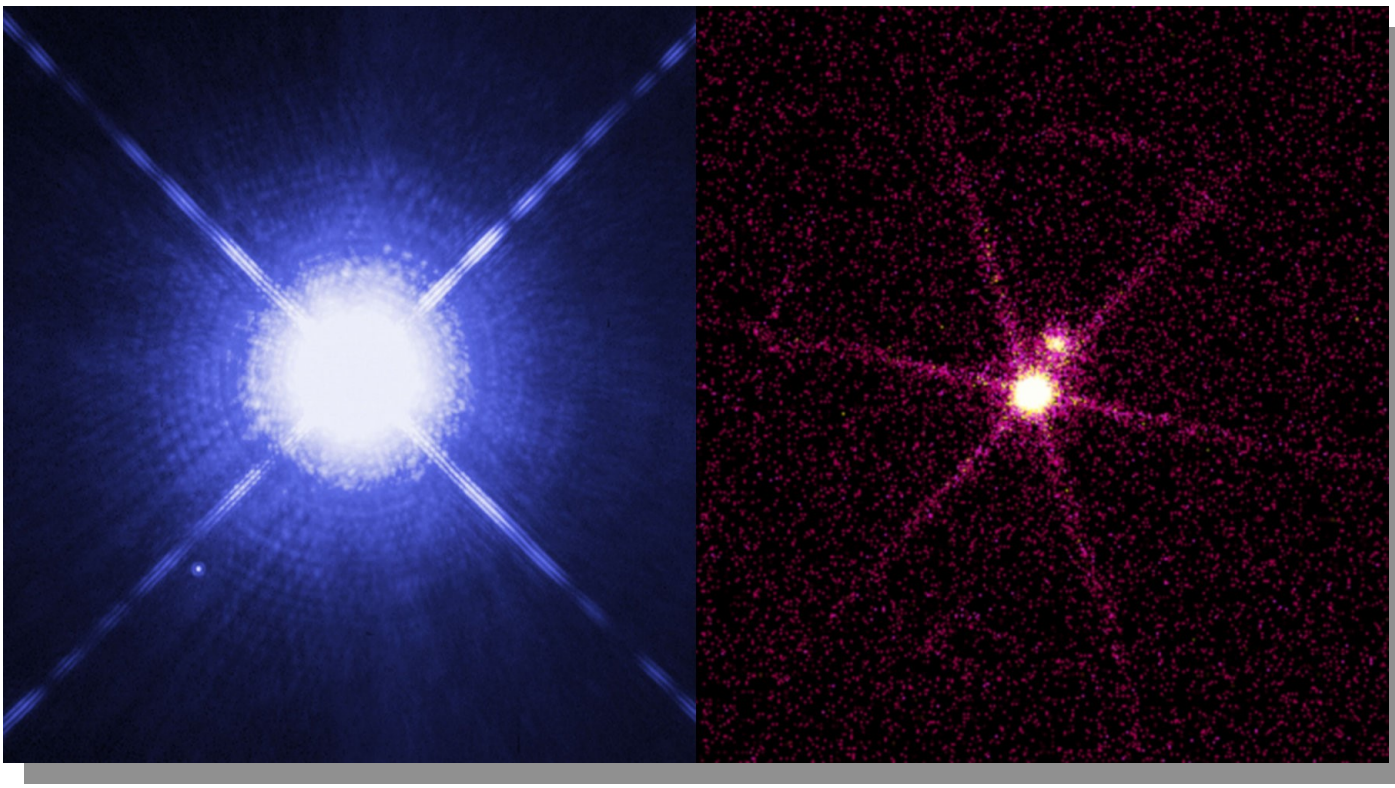
March skies feature many dazzling stars and constellations, glimmering high in the night, but two of the brightest stars are the focus of our attention this month: Sirius and Procyon, the dog stars!

Sirius is the brightest star in the nighttime sky, in large part because it is one of the closest stars to our solar system at 8.6 light years away. Compared to our Sun, Sirius possesses twice the mass and is much younger. Sirius is estimated to be several

hundred *million* years old, just a fraction of the Sun's 4.6 *billion* years. Near Sirius - around the width of a hand with fingers splayed out, held away at arm's length - you'll find Procyon, the 8th brightest star in the night sky. Procyon is another one of our Sun's closest neighbors, though a little farther away than Sirius, 11.5 light years away. While less massive than Sirius, it is much older and unusually luminous for a star of its type, leading astronomers to suspect that it may "soon" – at some point millions of years from now – swell into a giant star as it nears the end of its stellar life.

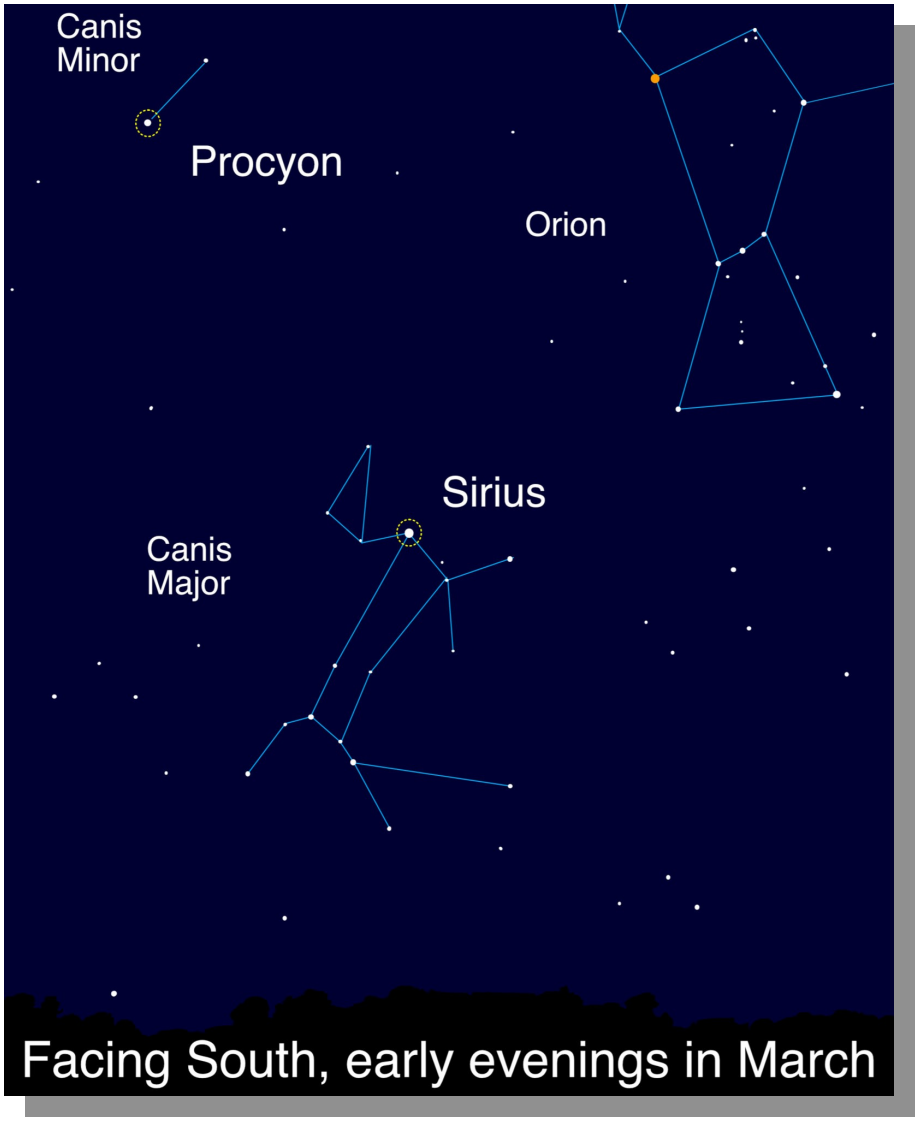
Sirius and Procyon are nicknamed the "Dog Stars," an apt name as they are the brightest stars in their respective constellations – Canis Major and Canis Minor – whose names translate to "Big Dog" and "Little Dog." Not everyone sees them as canine companions. As two of the brightest stars in the sky,

(Continued on page 13)



Sirius A and B imaged by two different space telescopes, revealing dramatically different views! Hubble's image (left) shows Sirius A shining brightly in visible light, with diminutive Sirius B a tiny dot. However, in Chandra's image (right) tiny Sirius B is dramatically brighter in X-rays! The "Universe in a Different Light" activity highlights more surprising views of some familiar objects: http://bit.ly/different-light-nsn
NASA, ESA, H. Bond (STScI), and M. Barstow (University of Leicester) (left); NASA/SAO/CXC (right)

Night Sky Notes (Cont'd)



Sirius and Procyon, the loyal hunting dogs of nearby Orion the Hunter! What other stories can you imagine for these stars? Learn about "Legends in the Sky" and create your own with this activity: https://bit.ly/legendsinthesky Image created with assistance from Stellarium.

(Continued from page 12)

they feature prominently in the sky stories of cultures around the world. Sirius also captures the imaginations of people today: when rising or setting near the horizon, its brilliance mixes with our atmosphere's turbulence, causing the star's light to shimmer with wildly flickering color. This vivid, eerie sight was an indication to ancient peoples of changes in the seasons, and even triggers UFO reports in the modern era!

Both of these bright stars have unseen companions: tiny, dense white dwarf stars, the remnants of supermassive companion stars. Interestingly, both of these dim companions were inferred from careful studies of their parent stars' movements in the 1800s, before they were ever directly observed! They are a challenging observation, even with a large telescope, since their parent stars are so very bright that their light overwhelms the

(Continued on page 14)

Extraterrestrial (Cont'd)

(Continued from page 3)

reach of telescopes.

The 222 pg. book is published by Houghton/Mifflin/Harcourt, and is printed in the United States. The well written text consists of 13 chapters including charts and graphs, a detailed section of notes, an extensive listing of references (including hyperlinks to source material), a comprehensive index and some attractive cover art. Loeb is currently the chair of the Astrophysics Department and Professor of Science at Harvard, and has published numerous papers in various scientific journals.

I highly recommend *Extraterrestrial*! It's in bookstores now and is bound to make the NYT best sellers list.

~Happy reading, Chris

Eyepiece (Cont'd)

(Continued from page 11)

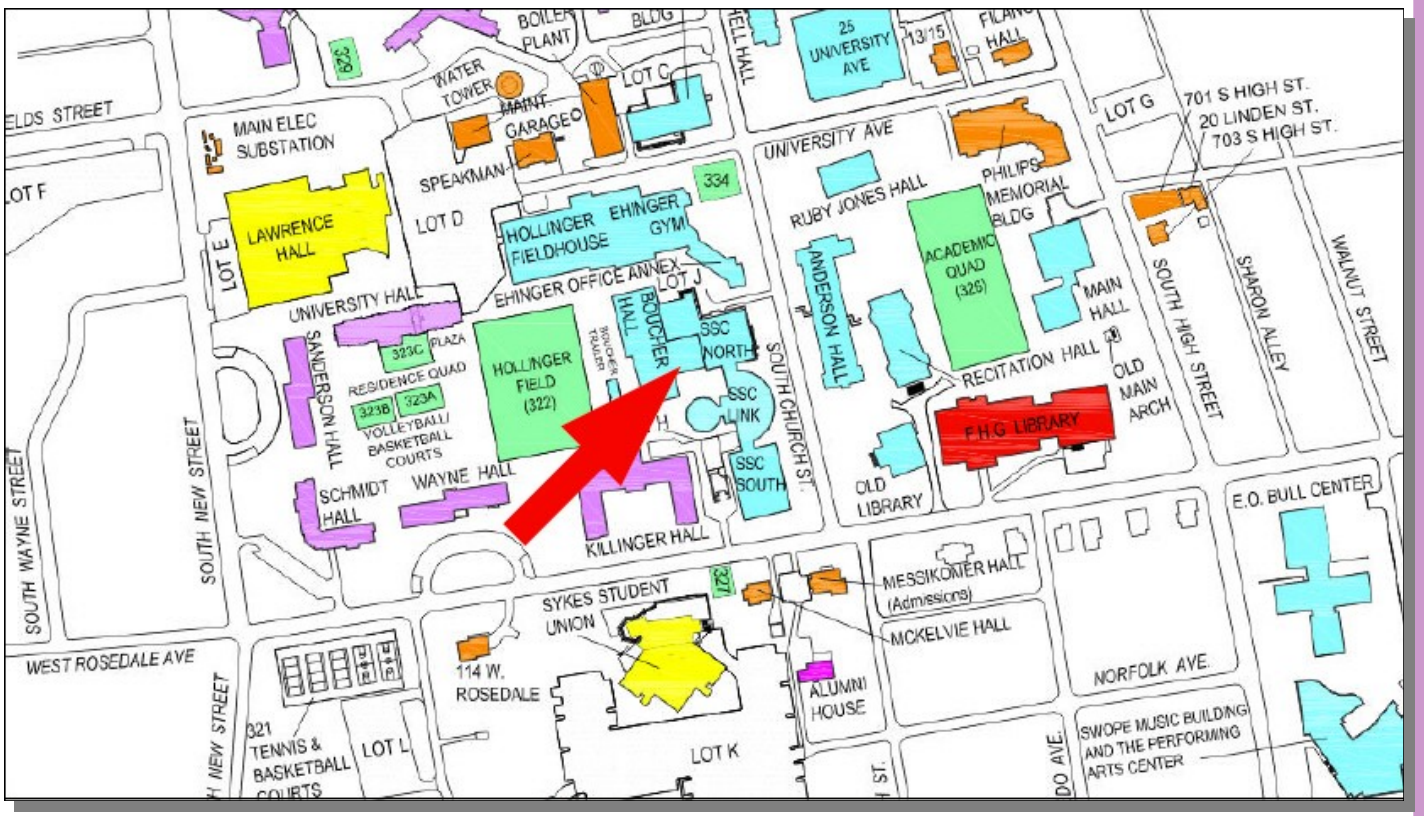
ground craters. Created by sunlight striking the tops of the crater Ukert and ridges nearby, the "V" shape is slightly larger than the "X", though quite a bit further north, just south of the small Mare Vaporum. As the "X" becomes less prominent over time, the "V" still maintains a distinct shape and may also be viewed with most any small telescope or tripod-mounted binoculars.

Information credits:
https://earthsky.org/astronomy-essentials/what-is-lunar-x
https://www.farmersalmanac.com/what-is-lunar-x-23985
https://eyesonthesky.com/charts/find-and-observe-the-lunar-x-on-the-moon/

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 13)

much dimmer light of their tiny companions. The white dwarf stars, just like their parent stars, have differences: Sirius B is younger, brighter, and more energetic than Procyon B. Careful observations of these nearby systems over hundreds of years have helped advance the fields of: astrometry, the precise measurement of stars; stellar evolution; and astroseismology, the study of the internal structure of stars via their oscillations.

Discover more about our stellar neighborhood at nasa.gov!

CCAS Membership Information and Society Financials

Treasurer's Report
by Don Knabb

Feb. 2021 Financial Summary

Beginning Balance	$1250
Deposits	$160
Disbursements	-$0
Ending Balance	$1410

New Member Welcome!

Welcome new CCAS members Clare Carlton from Exton, PA, Debbie Belczyk from Downingtown, PA, Bryan Reese from Chadds Ford, PA, David Sutton from Pottstown, PA, and Thomas McCaffrey from Thorndale, 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

PENNSYLVANIA OUTDOOR LIGHTING COUNCIL

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!

Starry Night Lights

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

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

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

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Spectrum Scientifics
Quality Science Products for All Ages

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
501 Main St.
Ashland, PA 17921

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 (410) 639-4329 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 **$54.95**.

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.