



Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 33, No. 11 **Three-Time Winner of the Astronomical League's Mabel Sterns Award** ☼ 2006, 2009 & 2016 November 2025

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Solar Observing Session for General Public



Solar Observing Session at Downtontown Public Library on October 11, 2025.
Image courtesy CCAS member Roger Kennedy

Membership Renewals Due

11/2025	Baker Buczynski DiGiovanni Harner Holenstein Hufnagel Kurz Marks Pilgaonkar Prasad Packirisamy Scovill Skupien
12/2025	Damerau DeAngelo DellaPenna Etherington Kearns Kovic Nasserzad O'Leary
01/2026	Johnson Jose Kellerman Kennedy Kovacs McElwee Moynihan Schier

November 2025 Dates

- 2nd** • The Moon passes 4° north of Saturn, 6 a.m. EST.
- 5th** • Full Moon, the **Beaver Moon**, 8:19 a.m. EST.
- 10th** • The Moon passes 4° north of Jupiter, 3 a.m. EST.
- 12th** • Last Quarter Moon, 12:28 a.m. EST.
- 17th** • Leonid Meteor Shower Peaks.
- 19th** • The Moon passes 6° south of Venus, 4 a.m. EST.
- 20th** • New Moon, 1:47 a.m. EST.
- 24th** • Mercury passes 1.1° north of Venus, midnight EST.
- 28th** • First Quarter Moon, 12:55 a.m. EST.



CCAS Upcoming Nights Out

In addition to our monthly observing sessions at the Myrick Conservancy Center, BRC (for directions, see pg. 13), CCAS schedules special "nights out" throughout the year. Members are encouraged to help out during these events any way they can. See below for more information.

- ☼ Saturday, November 8, 2025 - CCAS Solar Observing Session at the American Helicopter Museum, West Chester, PA. The daytime observing session is scheduled from 1:30 p.m. to 3:30 p.m. EST.
- ☼ Saturday, November 8, 2025 - CCAS Special Observing Session, "Amber Stuver Memorial" Family Astronomy Night at the American Helicopter Museum, West Chester, PA. The evening observing session is scheduled from 6:00 p.m. to 9:00 p.m. EST.
- ☼ Friday, November 21, 2025 - CCAS Monthly Observing Session, Myrick Conservancy Center, BRC. The observing session starts at sunset. Last monthly observing session until March 2026.

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

Autumn/Winter Society Events

November 2025

2nd • Daylight Saving Time ends, 2:00 a.m. ET. Turn clocks back one hour.

7th • West Chester University Planetarium Show: "Galaxy Surveys with the Webb, Euclid, and Rubin Telescopes," in the Schmucker Science Building. The show starts at 7 p.m. and runs approximately one hour in length. For more information and reservations, visit the [WCU Public Planetarium Shows](#) webpage.

8th • CCAS Solar Observing Session at the American Helicopter Museum, West Chester, PA. The daytime observing session is scheduled from 1:30 p.m. to 3:30 p.m. EST. For more information, contact our Observing Chair, [Don Miller](#).

8th • CCAS Special Observing Session, "Amber Stuver Memorial" Family Astronomy Night at the American Helicopter Museum, West Chester, PA. The evening observing session is scheduled from 6:00 p.m. to 9:00 p.m. EST. For more information, contact our Observing Chair, [Don Miller](#).

11th • CCAS Monthly Meeting, in person (as well as via Zoom) at WCU's Merion Science Center, Room 112. Guest speaker: Dr. Rebecca Phillipson, Dept of Physics, Villanova University. Her presentation is titled "Chaos in the Cosmos."

20th • Open call for articles and photographs for the December 2025 edition of [Observations](#).

21st • CCAS Monthly Observing Session, Myrick Conservancy Center, BRC. The observing session starts at sunset. Last monthly observing session until March 2026. See pg. 17 for map and directions.

26th • Deadline for newsletter submissions for the December 2025 edition of [Observations](#).

December 2025

5th • West Chester University Planetarium Show: "Supermoon Rises!" in the Schmucker Science Building. The show starts at 7 p.m. and runs approximately one hour in length. For more information and reservations, visit the [WCU Public Planetarium Shows](#) webpage.

9th • Annual CCAS Holiday Party. Details and directions will appear in the December 2025 edition of Observations.

20th • Open call for articles and photographs for the November 2025 edition of [Observations](#).

21st • Solstice (northern winter/southern summer begins), 10 a.m. EST. - The South Pole of the earth will be tilted toward the Sun, which will have reached its southernmost position in the sky and will be directly over the Tropic of Capricorn at 23.44 degrees south latitude.

26th • Deadline for newsletter submissions for the November 2025 edition of [Observations](#).

October 2025 Meeting Minutes

by *Bea Mazziotta*, CCAS Secretary

- The October meeting of the CCAS was held on Tuesday October 14, 2025 in person at WCU, and via Zoom and YouTube. Club president Dave Hockenberry welcomed attendees. He thanked the evening's speaker, NASA astrophysicist Dr. Eric Huff, for honoring his commitment to address the group in spite of the ongoing government shut-down. He noted that he was searching for a new venue for the club's annual holiday party as the former venue has permanently closed. Still scheduled for the second Tuesday in December, the new location will be announced.
- Don Knabb showed some slides from this past summer's York Star Party. Pete Kellerman, club VP, informed attendees that the parking lot for Chambers Lake in Hibernia Park in Coatesville is available for observing all night even though the park itself closes at sunset.
- Bruce Ruggeri introduced the evening's speaker, Dr. Eric Huff. Dr. Huff is currently a staff scientist at JPL in Pasadena. He received his doctorate in astrophysics from UC Berkeley. His research interests include: dark energy and cosmic acceleration, gravitational lensing, precision cosmology and the large scale structure of the universe.
- His presentation was entitled Unveiling the Dark Side of the Universe with the Euclid Space Telescope. The primary mission of the Euclid Telescope is the study of dark energy. It is one of the most powerful instruments ever built and will make a 3D map of the universe that will include observations of billions of galaxies from up to 10 billion light years from Earth. Dr. Huff discussed the discoveries in galactic evolution already made, as well as the remarkable wide field images already taken.
- Euclid, developed by the European Space Agency, launched in 2023 from Cape Canaveral and will remain at Lagrange Point L2 for at least 6 years measuring the accelerating expansion of the universe. Cosmic acceleration remains "one of the biggest mysteries in all of physics" per Dr. Huff. He believes that "Whatever the future of the universe looks like, it's mostly going to be the result of whatever the properties of dark matter are."

November 2025 CCAS Meeting Agenda

by *Bruce Ruggeri*, CCAS Program Chair

Our next meeting will be held on November 11, 2025, in person at West Chester University's Merion Science Center, Room 112. The Science Center is located at 720 S. Church St., West Chester, PA.

Our guest speaker is Dr. Becca Phillipson, Assistant Professor in the Department of Physics at Villanova University. Her presentation is titled "Chaos in the Cosmos!"

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 the coming 2025-2026 season. If you are interested in presenting, or know someone who would like to participate, please contact me at programs@ccas.us.

November 2025 Monthly Meeting Guest Speaker

by Bruce Ruggeri, Program Chair

November is upon us and with it the beauty of Autumn, the festivities of Thanksgiving, and great observing opportunities before the cold weather is upon us! November is also our last monthly CCAS meeting of the Fall season.

I am pleased to announce the in-person and Zoom November CCAS meeting for Tuesday, November 11 beginning informally at 7:00 p.m. EST, with the meeting program commencing at 7:30pm. Our in-person speaker is Dr. Becca Phillipson, Assistant Professor in the Department of Physics at Villanova University. The presentation will commence at approximately 7:50 PM EST.

Our meetings are held at West Chester University's (WCU) Merion Science Center, Room 112. The Science Center is located at 720 S. Church St. in West Chester. **Please make every effort to attend this monthly meeting in person to meet Dr. Phillipson!**



Becca Phillipson, Ph.D.
Assistant Professor, Physics Villanova University

The presentation title, synopsis and brief bio sketch for Dr. Phillipson are provided below:

Title: Chaos in the Cosmos!

Synopsis: Chaos describes a system that is predictable in principle but unpredictable in practice. In other words, although the system follows deterministic rules, its time evolution appears random. Chaos theory, a branch of nonlinear dynamics, has been

invoked to explain complex systems in nature, such as the weather, and underpins the fantastic mathematical phenomena of fractals.

In this talk, Dr. Phillipson will walk through the basic requirements for chaos to occur, how we study it (through geometry!) using nonlinear dynamics techniques with machine learning, and how chaos shows up in the most dramatic ways in our universe, from the tumbling of small moons to the outbursts around hungry black holes and neutron stars.

Overview and Bio sketch: Becca Phillipson is a pioneer in the study of chaotic variability and nonlinearity of astrophysical systems, particularly those involving compact objects like black holes and neutron stars. She employs innovative time-series analysis techniques, including recurrence plot

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Expanding Universe Study Teases “Major Paradigm Shift in Cosmology”

by Ian Randall, Newsweek.com

The **expansion rate of the universe** may be slowing down, rather than accelerating at an ever-growing rate, a potentially groundbreaking new study has hinted. The suggestion challenges both the 2011 Nobel Prize-winning research that first proposed that distant galaxies were drifting apart with increasing speed—and the concept of “**dark energy**” proposed to explain what is driving this expansion.

The team from Yonsei University in South Korea has found

evidence that the way we measure distances to distant galaxies—and calculate how the universe has expanded over time—may have been distorted by a previously unknown effect.

“Our study shows that the universe has already entered a phase of decelerated expansion at the present epoch and that dark energy evolves with time much more rapidly than previously thought,” said paper author and astrophysicist professor Young-Wook Lee in a statement. “If these results

are confirmed, it would mark a major paradigm shift in cosmology since the discovery of dark energy 27 years ago.”

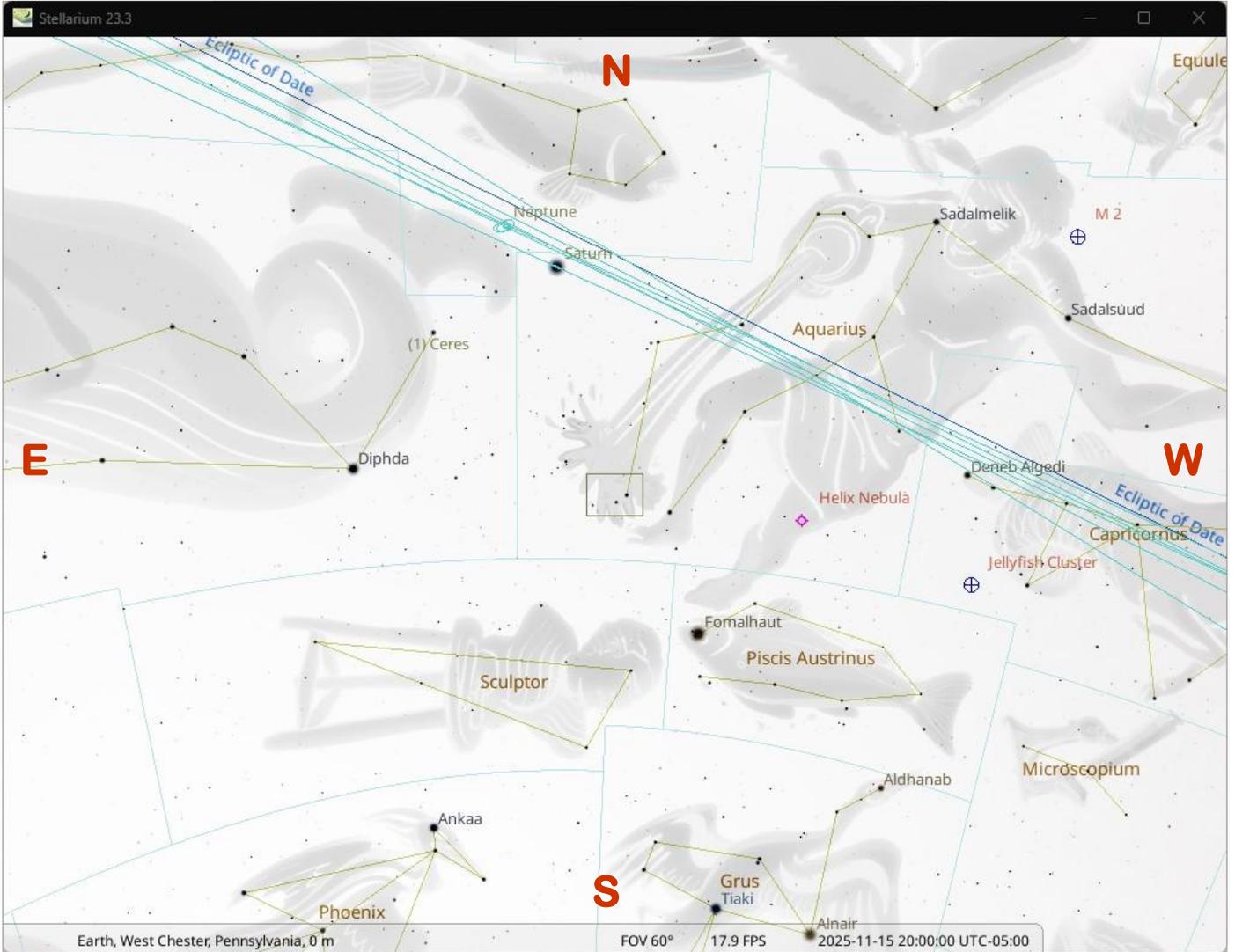
In the aftermath of the Big Bang 13.8 billion years ago, the universe at first rapidly expanded, before gravity slowed this expansion down. However, the notion that the universe had begun (some 4.8 billion years ago) expanding at an ever-increasing rate—with the distance between galaxies growing like the dis-

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The Sky Over Chester County

November 15, 2025 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
11/01/2025	7:03 a.m. EDT	7:31 a.m. EDT	5:59 p.m. EDT	6:27 p.m. EDT	10h 27m 51s
11/15/2025	6:18 a.m. EST	6:47 a.m. EST	4:45 p.m. EST	5:14 p.m. EST	09h 58m 04s
11/30/2025	6:34 a.m. EST	7:04 a.m. EST	4:37 p.m. EST	5:07 p.m. EST	09h 33m 45s

Moon Phases					
Last Quarter	11/12/2025	12:28 a.m. EST	Full Moon	11/05/2025	8:19 a.m. EST
First Quarter	11/28/2025	01:58 a.m. EST	New Moon	11/20/2025	1:47 a.m. EST

November 2025 Observing Highlights

by Don Knabb, CCAS Treasurer & ALCOR

Moon phases in November

- Full Moon November 5th
- Last Quarter November 12th
- New Moon November 20th
- First Quarter November 28th

The best sights this month: Saturn rules the evening sky during November! Share the view of the ringed planet with friends and family for a sight they will never forget.

Mercury: Mercury starts November in the evening sky then moves to the morning sky as the month progresses. You might find it early in the month, low in the west, just after darkness falls.

Venus: Our sister planet is visible in the morning sky, rising about an hour before sunrise.

Mars: Dim Mars is low in the southwest just after darkness falls early in the month.

Jupiter: The king of the planets rises around 10 p.m. at the start of the month but by month's end it will rise around 8 p.m. and will be in decent viewing position by 11 p.m.

Saturn: The most beautiful planet is ideally located for evening observation. Set up a telescope and share the view with your family, friends, and neighbors!

Uranus and Neptune: Uranus reaches opposition on the 21st so it is visible all night. Using the Pleiades as a guide will allow you to easily find Uranus with binoculars or a telescope. Neptune is 4° northeast of Saturn in the constellation Pisces. It will take careful star hopping to find Neptune, but this is a good opportunity to add the furthest planet from the Sun to your list of observed planets.

The Moon: Full moon occurs November 5th. This full Moon is the [Full Beaver Moon](#). For Native Americans, the time of this full moon was the time to set beaver traps before the swamps froze, to ensure a supply of warm winter furs. It is sometimes also referred to as the Frosty Moon, but I don't think they were referring to the snowman, even though the Moon kind of looks like the head of a snowman. Native Canadian tribes called this the Rivers Freezing Moon.

Constellations: During November the Great

Square of Pegasus is at "center stage". To the left of the Great Square, sweeping up to the left is the constellation Andromeda. Use your binoculars to find our neighbor galaxy, which is also named Andromeda. It is a large fuzzy spot located between the constellation Andromeda and Cassiopeia. And by 9 p.m. the beautiful Pleiades, that really little dipper, is rising in the east ahead of Taurus the Bull. Capella in Auriga is a bright point of light upper left of Taurus. As it gets a bit later our old friend Orion returns from his summer vacation.

Messier/deep sky: I always look forward to autumn for viewing the Double Cluster between Cassiopeia and Perseus. This is a nice binocular object. Rising behind Perseus is the constellation Auriga and its three open star clusters M36, M37 and M38. If you stay up late you can get an early view of M42, the Great Orion Nebula.

Comets: I observed Comet Swan and Comet Lemmon in mid-October using only 8x32 birding binoculars. Comet Lemmon will be visible early in November just after darkness falls, low in the west. Comet Swan will be visible all evening much higher in the sky than Comet Lemmon. Seeing these comets all depends on how bright both comets are, and comets are like cats: they have tails and do what they want. Use your favorite astronomy app on your mobile device to guide you to these faint fuzzies from the outer reaches of the solar system.

Meteor showers: The Leonid meteor shower is active between the 6th and the 30th with the peak predicted on the 17th / 18th. The Moon will not interfere with the shower this year. The best view is during the hour before morning twilight.

Save the Date! 2025 CCAS Holiday Party

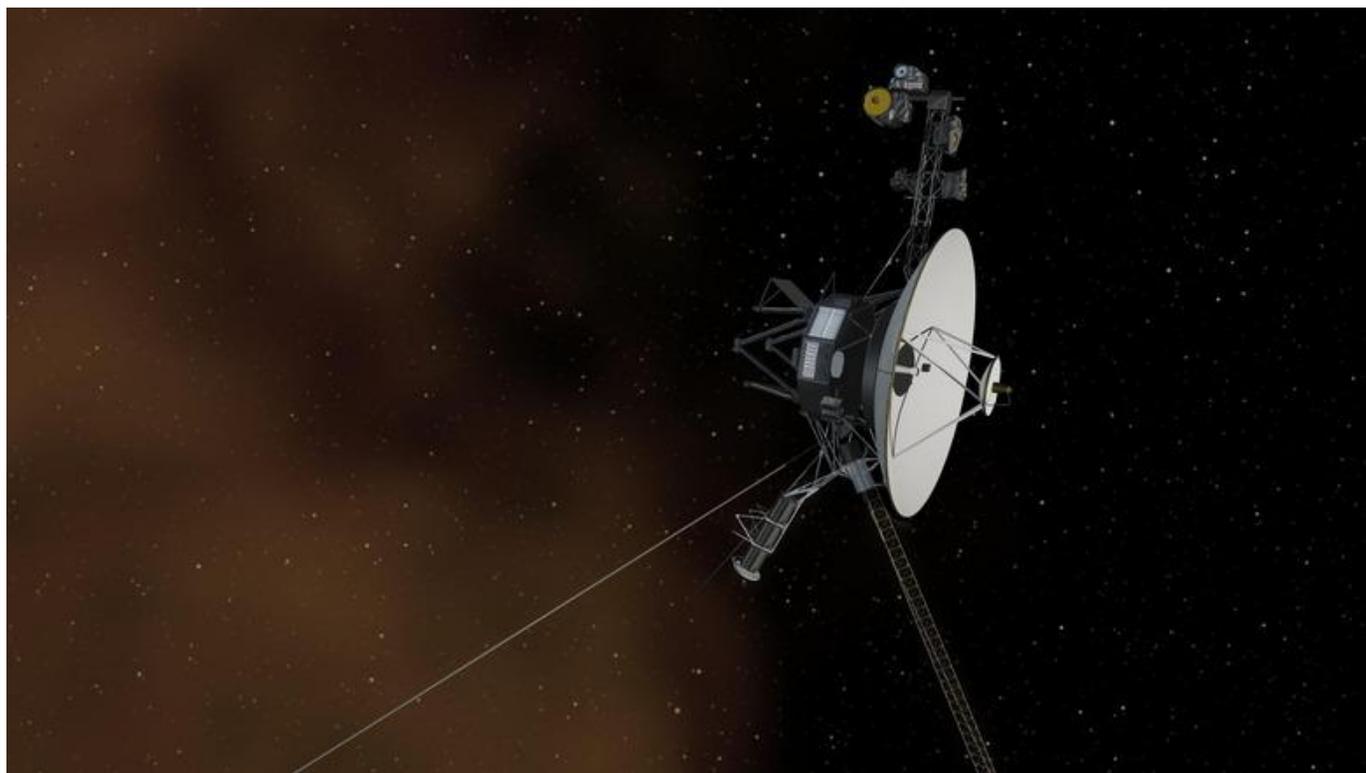
Our annual CCAS Holiday Party will be held on Tuesday evening, December 9, 2025. This corresponds to when we would usually have our monthly meeting, so save the date on your calendar.

As many of you know, our "usual" spot for our party in West Chester has closed, so we are in the process of finding a new venue. Right now, we are leaning towards Victory Brewing Company in Downingtown. It has a great menu, free parking, and of course legendary locally brewed beer. We still have a few details to work out with Victory, but as soon as the arrangements are finalized, we

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NASA's Voyager 1 Is About to Make History Again

by Michael Bizzaco, courtesy BGR.com



Voyager 1 Is About to Make History Again

When NASA launched the Voyager 1 probe back in 1977, the initial objective was to gather information about our solar system—specifically, the region beyond the asteroid belt (between the orbits of Mars and Jupiter). After more than four decades in the cosmos, Voyager 1 and its sister probe, Voyager 2, [have gathered some incredible images and data](#) of our neighboring planets and the Sun.

And now Voyager 1 is on track to become the first man-made object to travel a full light-day from Earth, an unbelievable feat for humanity. If all goes according to plan, the probe will be approximately 16 billion miles away from Earth on November 15, 2026 — the equivalent of one light-day.

Voyager 1 officially departed our solar system in August 2012, entering a region of space known as the heliopause, where the Sun's solar wind touches the galactic void beyond. Traveling around 38,000 miles per hour, it was only a matter of time before Voyager 1 would be nearing this soon-to-be milestone.

As part of the Voyager Interstellar Mission (VIM), Voyager 1 and 2 probes have been operating post-heliopause since 2012 and 2018, respectively. The current mission objectives include the measurement of magnetic fields, particles, and plasma waves in interstellar space.

The VIM is actually an extension of Voyager's primary mission, successfully completed in 1989 when Voyager 2 cruised by

Neptune. While [NASA expects both probes to fail](#) to produce enough electricity to power their scientific measurement tools in a few years, the upcoming light-day achievement is an incredible reminder of how far humanity's reach has extended.

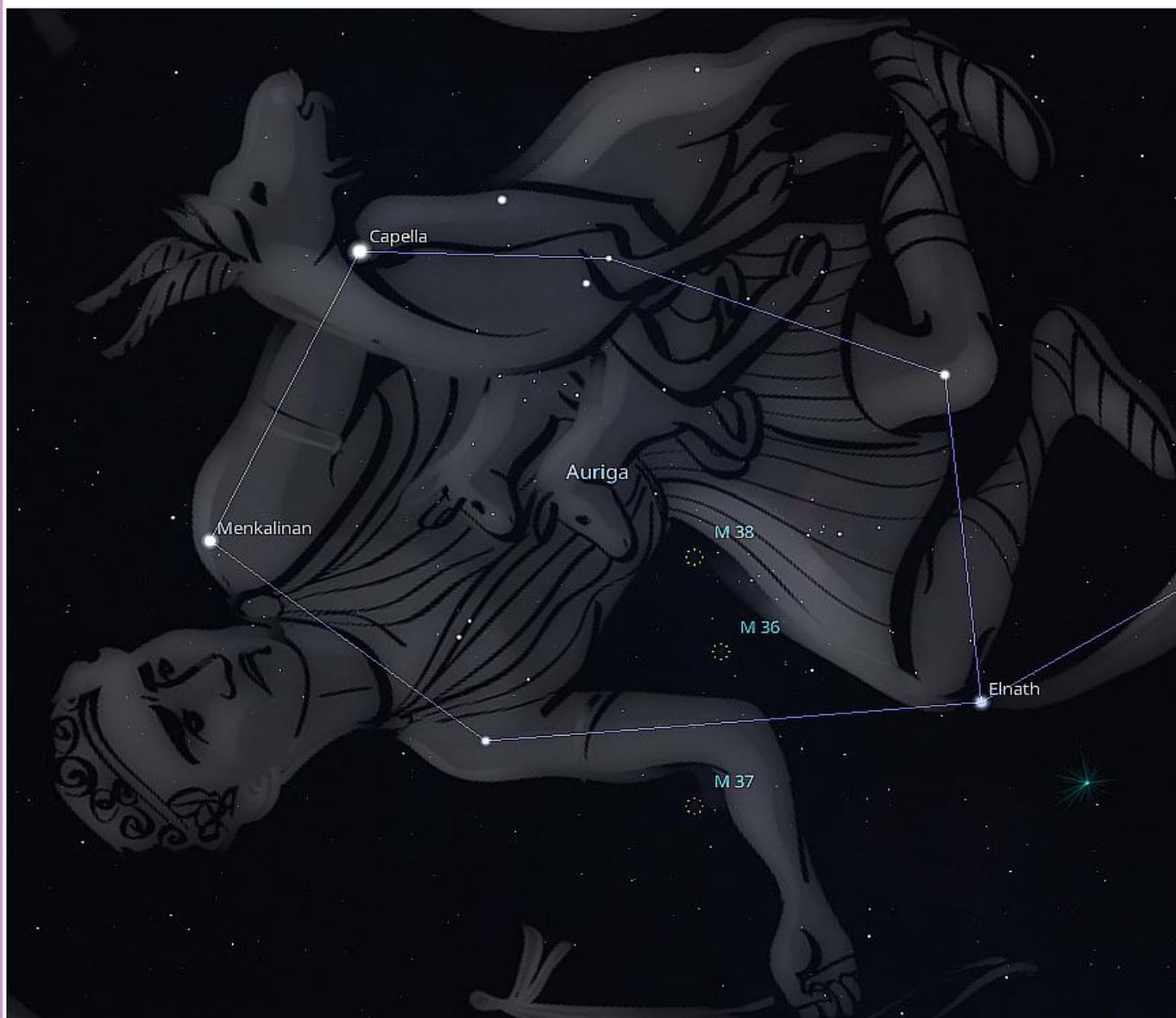
And let's not forget the fact that Voyager 1 was built using 1970s technology, and is still managing to capture data nearly half a century since its launch, not to mention Voyager 1's signals, traversing billions of miles through space, are still able to ping Earth's antennas with enough strength for scientists to unpack the data.

Read More:

<https://www.bgr.com/1994256/nasa-voyager-1-mission-make-history-november-2026-light-day-from-earth/>

Through the Eyepiece: The Open Clusters in Auriga: M36, M37 and M38

by CCAS Treasurer & ALCOR Don Knabb



Sky map created using Stellarium, the free planetarium software

As autumn begins and the time arrives when the leaves start to turn color and fall to the ground, I always look forward to the bright star Capella rising in the east not long after sunset. I often ask myself, is that a plane, a UFO, or Capella?

Capella, in the constellation Auriga, is the 6th brightest star in the sky. Auriga is called the Charioteer, or sometimes the

Wagoneer. Auriga is one of the oldest constellations going back to Babylonian times.

Here's today's trivia for you: What other meanings are associated with the word Auriga? How about "a Roman slave chauffeur"? Or the name of a spaceship in the movie *Alien: Resurrection*? This is according to Wikipedia.

When I see Capella, rising in

the glow of West Chester on our northeastern horizon, I know the deep sky wonders of the autumn and winter sky are not far behind. The first of these deep sky objects I look for are the three open star clusters in Auriga: M36, M37 and M38.

Open clusters, also called galactic clusters, contain fewer

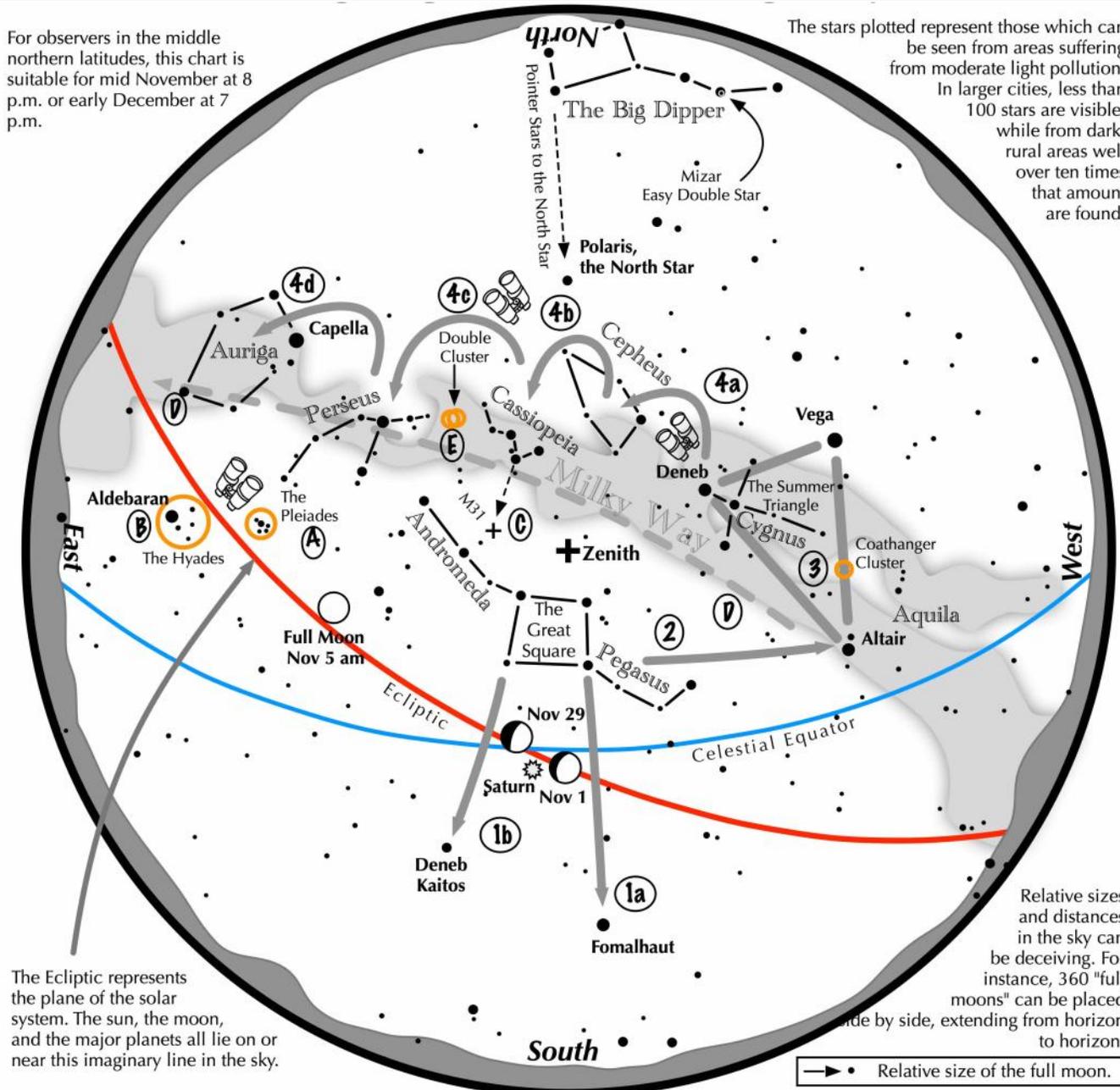
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Navigating the mid-November Night Sky

courtesy of the Astronomical League

For observers in the middle northern latitudes, this chart is suitable for mid November at 8 p.m. or early December at 7 p.m.

The stars plotted represent those which can be seen from areas suffering from moderate light pollution. In larger cities, less than 100 stars are visible, while from dark, rural areas well over ten times that amount are found.



The Ecliptic represents the plane of the solar system. The sun, the moon, and the major planets all lie on or near this imaginary line in the sky.

Relative sizes and distances in the sky can be deceiving. For instance, 360 "full moons" can be placed side by side, extending from horizon to horizon.

→ • Relative size of the full moon.

Navigating the November night sky: Simply start with what you know or with what you can easily find.

- 1 Face south. Almost overhead lies the "Great Square" with four stars about the same brightness as those of the Big Dipper. Extend a line southward following the Square's two westernmost stars. The line strikes Fomalhaut, the brightest star in the south. A line extending southward from the two easternmost stars, passes Deneb Kaitos, the second brightest star in the south.
- 2 Draw a line westward following the southern edge of the Square until it strikes Altair, part of the "Summer Triangle."
- 3 Locate Vega and Deneb, the other two stars of the Summer Triangle. Vega is its brightest member, while Deneb sits in the middle of the Milky Way.
- 4 Jump along the Milky Way from Deneb to Cepheus, which resembles the outline of a house. Continue jumping to the "W" of Cassiopeia, then to Perseus, and finally to Auriga with its bright star Capella.

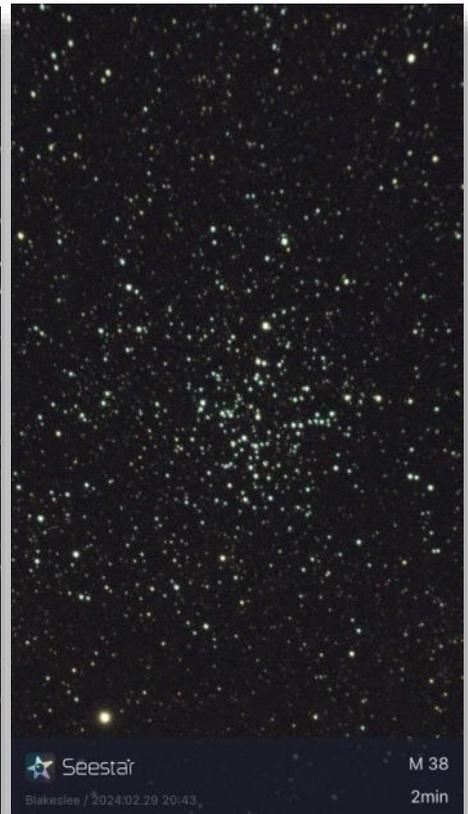
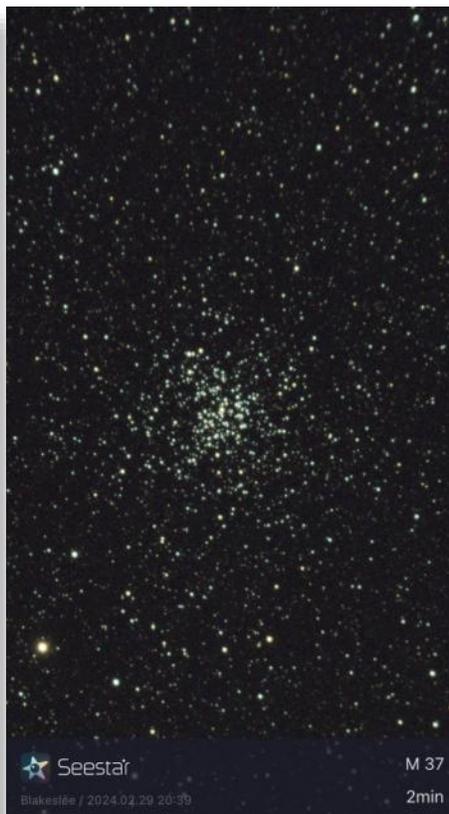
Binocular Highlights

A and B: Examine the stars of the Pleiades and Hyades, two naked eye star clusters. **C:** The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval. **D:** Sweep along the Milky Way from Altair, past Deneb, through Cepheus, Cassiopeia and Perseus, then to Auriga for many intriguing star clusters and nebulous areas. **E:** The Double Cluster.



Astronomical League www.astroleague.org/outreach; duplication is allowed and encouraged for all free distribution.

Eyepiece (Cont'd)



All images taken by the author with a Seestar S50

(Continued from page 7)

and younger stars than globular clusters. Also, unlike globular clusters, open clusters are generally confined to the plane of our galaxy. I like to look at all three in a short time span and compare the unique appearance of each cluster to the others.

Auriga has many open clusters and other objects because the Milky Way runs through it. M36, M37 and M38 are all visible in binoculars or a small telescope in suburban skies. A larger telescope resolves individual stars. The clusters are about 4100, 4400, and 4200 light years distant, respectively. Their apparent visual magnitudes are 6.3, 6.2, and 7.4, respectively.

M36, known as the Pinwheel Cluster, is a rather faint cluster

of about 50 to 60 stars, in a very compact area. A large scope is necessary to resolve the individual stars. The brightest members are arranged in chains that give the cluster a crab-like appearance.

M37, known as the Salt and Pepper Cluster, is considered the most spectacular of the three Messiers. Binoculars will only show a large fuzz ball; you really need a telescope to delve deep into this cluster. A medium sized scope should reveal at least twelve red giants, with the brightest one found at the center of the cluster. Some observers find this star more orange than red. The cluster is about 200 million years old.

M38, which carries the nickname Starfish Cluster, is just to

the northwest of M36. Some observers have described this cluster of about a hundred stars as having a cross-shape or an oval shape.

So, aim your binoculars or telescope toward Auriga and add M36, M37 and M38 to your Astronomical League Messier Observing Program list!

Information sources:

- Pasachoff, Jay M. 2000. *A Field Guide to the Stars and Planets*. New York, NY. Houghton Mifflin.
- http://en.wikipedia.org/wiki/Auriga_%28constellation%29
- <http://www.coldwater.k12.mi.us/lms/planetarium/myth/auriga.html>
- http://www.dibonsmith.com/aur_con.htm
- http://www.seds.org/Maps/Stars_en/Fig/auriga.html
- iPad app Sky Safari Pro

Expanding Universe (Cont'd)

(Continued from page 3)

tance between dots marked on an inflating balloon—was first proposed in the late 90s.

The cause of this expansion has been attributed to “dark energy”—a mysterious, hidden influencer thought to make up a whopping 68 percent of the universe. The hypothesis was based on the taking of distance measurements to faraway galaxies using type 1a supernovae, stellar explosions that occur in twin star systems where one of the stars is a white dwarf.

Type 1a supernovae have long been regarded as what astronomers call a “standard candle”—an object with a known, intrinsic

brightness that can be compared to its apparent brightness as seen from Earth to determine how far away such is.

In their new study, however, Lee and colleagues have presented evidence based on a large study of some 300 galaxies that suggests a flaw in this assumption. Instead, they argue, the intrinsic brightness of type 1a supernovae is strongly affected by the age of the stars that formed them.

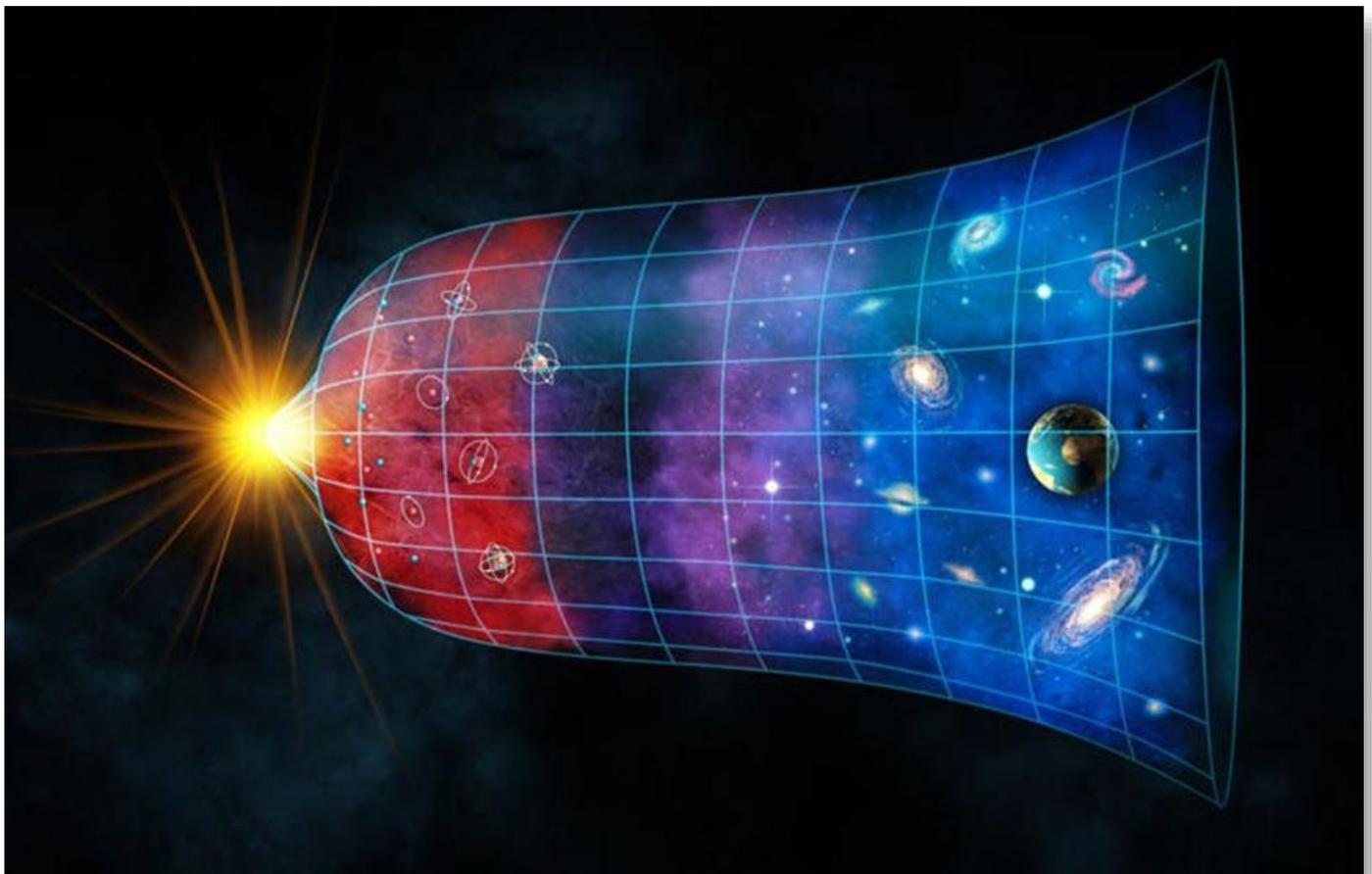
Specifically, supernovae derived from younger stellar populations appear fainter, while their older counterparts appear brighter. According to the researchers, their analysis has confirmed this

effect to extremely high significance—with 99.999 percent confidence.

According to the team, accounting for this systematic bias in the supernova data meant that the latter no longer aligns with the leading Big Bang model—”Lambda cold dark matter”, or “Lambda-CDM”—which features a cosmological constant, lambda, that accounts for the effect of dark energy.

Instead, the findings appear to better align with a new model derived from the “sound of the Big Bang,” or, properly, “baryonic acoustic oscillations [BAO]” and the cosmic micro-

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A diagram showing the expansion of the universe from the Big Bang to the present day (Andreas / iStock / Getty Images Plus)

Expanding Universe (Cont'd)

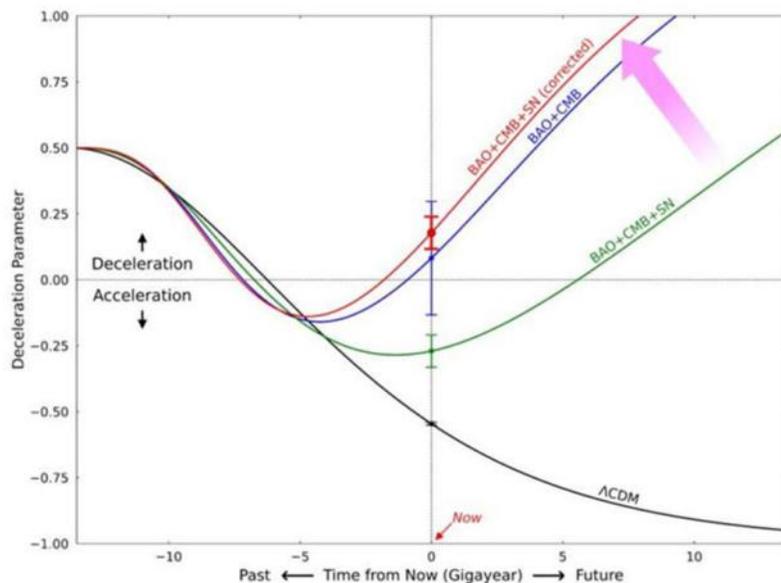


Diagram showing how the combined analysis from the corrected supernovae and BAO+CMB data (red) suggests that the universe is experiencing a decelerating expansion, rather than the accelerating expansion predicted by the lambda CDM model. (Son et al. / Monthly Notices of the Royal Astronomical Society)

(Continued from page 10)

wave background (CMB), the afterglow of the Big Bang which pervades the universe.

The BAO+CMB model is favored by the Dark Energy Spectroscopic Instrument (DESI) project, operated by the Lawrence Berkeley National Laboratory, which is probing the expansion history of the universe.

Both the updated supernovae data and BAO+CMB results suggest that the influence of dark energy has been weakening with time—with the universe having already transitioned into a state of decelerated expansion.

“In the DESI project, the key results were obtained by combining uncorrected supernova data with baryonic acoustic oscillations measurements, leading to the conclusion that while the universe will decelerate in the

future, it is still accelerating at present,” said Lee.

“By contrast, our analysis—which applies the age-bias correction—shows that the universe has already entered a decelerating phase today. Remarkably, this agrees with what is independently predicted from BAO-only or BAO+CMB analyses, though this fact has received little attention so far.”

With their initial study complete, the researchers have moved on to carrying further tests, the preliminary results of which also support their main finding, they report. Additional tests of the hypothesis are likely to follow.

“Within the next five years, with Vera C. Rubin Observatory discovering more than 20,000 new supernova host galaxies, precise age measurement will

allow for a far more robust and definitive test of supernova cosmology,” said paper author and astronomer professor Chul Chung in a statement.

Based atop a mountain in the Chilean Andes, the Vera C. Rubin Observatory—which launched scientific operations this year—is home to the world’s most powerful digital camera.

The observatory is conducting a ten-year-long survey of the southern sky, dubbed the Legacy Survey of Space and Time, which has as one of its principal goals improving our understanding of the nature of both dark energy and **dark matter**.

Reference

Son, J., Lee, Y.-W., Chung, C., Park, S., & Cho, H. (2025). Strong progenitor age-bias in supernova cosmology. II. Alignment with DESI BAO and signs of a non-accelerating universe. *Monthly Notices of the Royal*

Holiday Party (Cont'd)

(Continued from page 5)

will be sure to let our membership know. As always, CCAS members along with family and friends are welcome and encouraged to join us for the event!

If you are planning to attend, please let me know as soon as possible. The sooner we know how many of our folks will be attending, the better the staff at Victory can plan and prepare for the event. In the past, CCAS has provided appetizers and individual members/families/friends have covered the cost of their own drinks and dinner. Hopefully this will remain the same for this year. As always, a 20% gratuity is added for large groups.

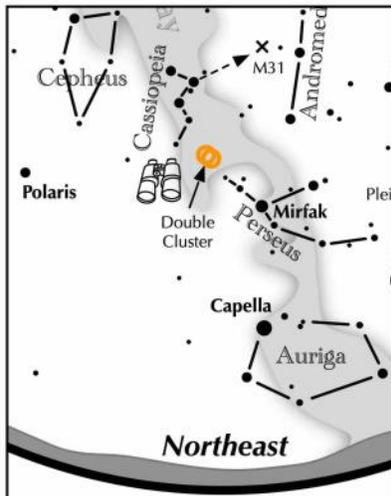
So mark your calendars!! Let me know at toxophilus1@verizon.net if you plan to attend. We hope to see you for good food, fun and fellowship on December 9th. Cheers!



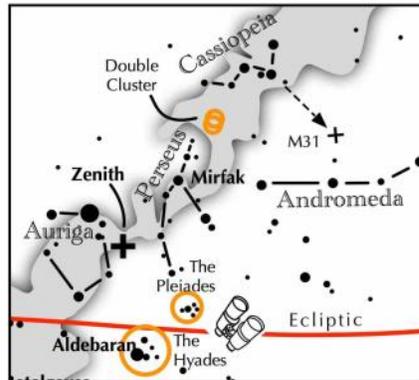
Can you easily find this open cluster showpiece?
**Every Curious Skywatcher should know
how to find the Double Cluster**



Visible in the early evening sky from late October through late March.



November in the northeast



January facing south
looking past the zenith



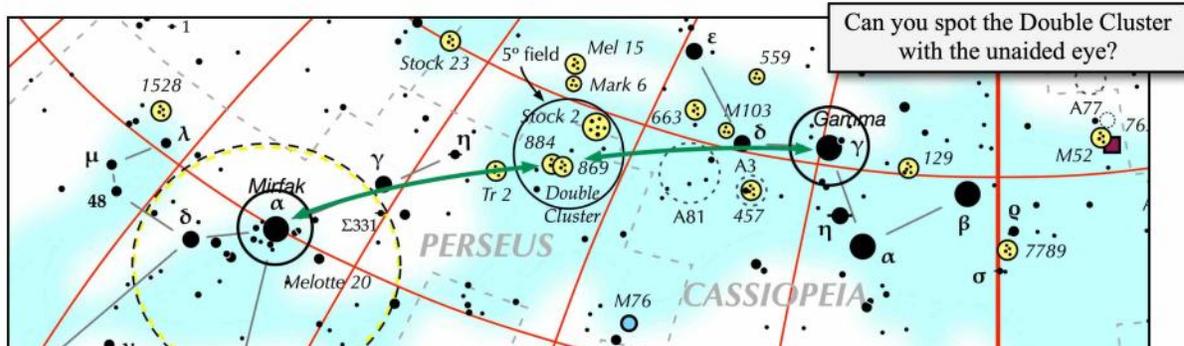
March in the northwest

The **Double Cluster** can be spotted with unaided eye from a dark sky as a dim glow in the Milky Way between Perseus and Cassiopeia. Through 10x50 binoculars, it is an obvious sight, revealing its brighter glittering lights. The neighboring cluster, **Stock 2**, can be seen as a much dimmer and more spread out grainy glow.



How to find the Double Cluster (aka NGC 869 & 884, and Caldwell 14):

1. Find the "w" shaped constellation Cassiopeia and the neighboring constellation to its southeast, Perseus. Identify Perseus' brightest star, 1.8 magnitude Mirfak.
2. Mid way between the center star of Cassiopeia's "w" (Gamma Cas) and Mirfak lies a soft glow.
3. Binoculars aimed at the glow reveal the famous Double Cluster, also called NGC 869 and 884, Caldwell 14, and h Persei and Chi Persei.
4. Place the Double Cluster near the southern edge of the field. Near its center lies Stock 2, the Musclemans Cluster, which appears as a large, dim grainy glow.



Speaker Bio (Cont'd)

(Continued from page 3)

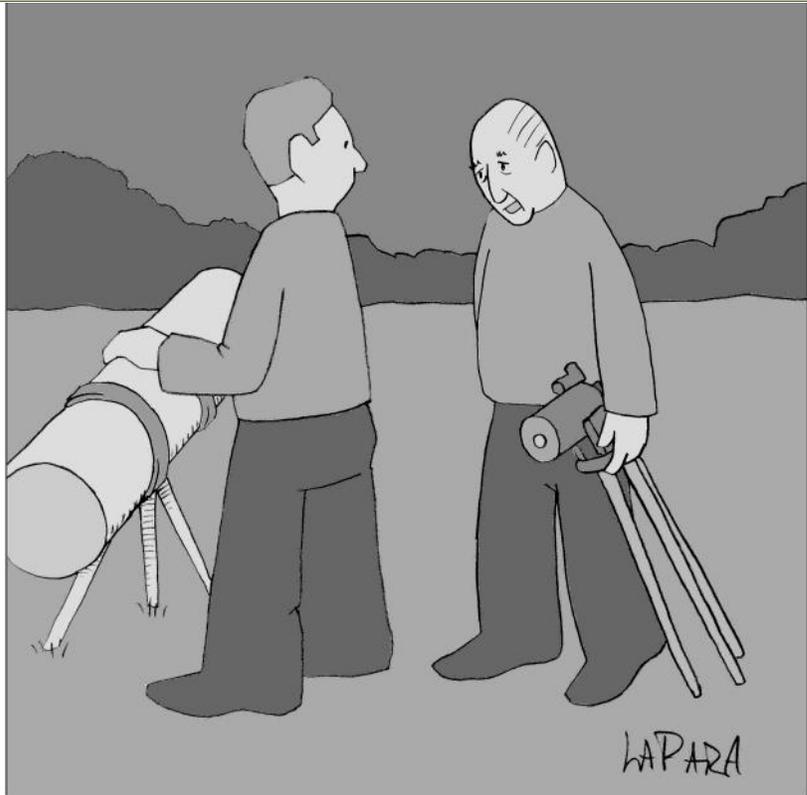
analysis, to uncover hidden patterns in the complex light curves of X-ray binaries and active galactic nuclei.

The Phillipson High-Energy Astrophysics group investigates the timing variability of accreting black holes and neutron stars using data from on board several observatories including the Rossi X-ray Timing Explorer, Swift, Maxi, Kepler, and TESS.

Dr. Phillipson's research combines nonlinear dynamics techniques with machine learning to conduct large-scale ensemble studies of black hole systems, connecting variability patterns to fundamental physical properties like accretion rates

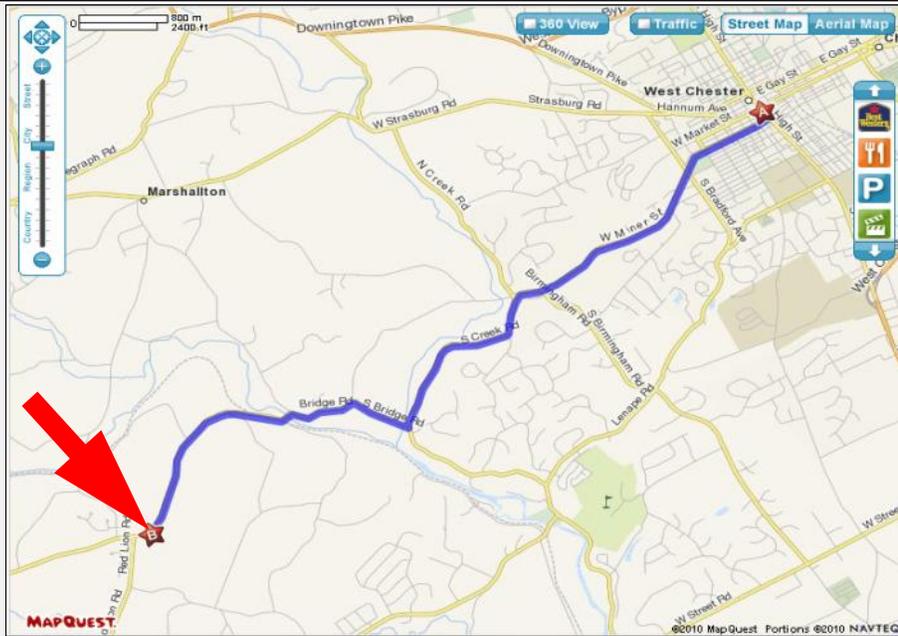
(Continued on page 14)

Classic La Para by Nicholas La Para



"JUST WHEN THE UNIVERSE IS ACCELERATING, I'M SLOWING DOWN."

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.

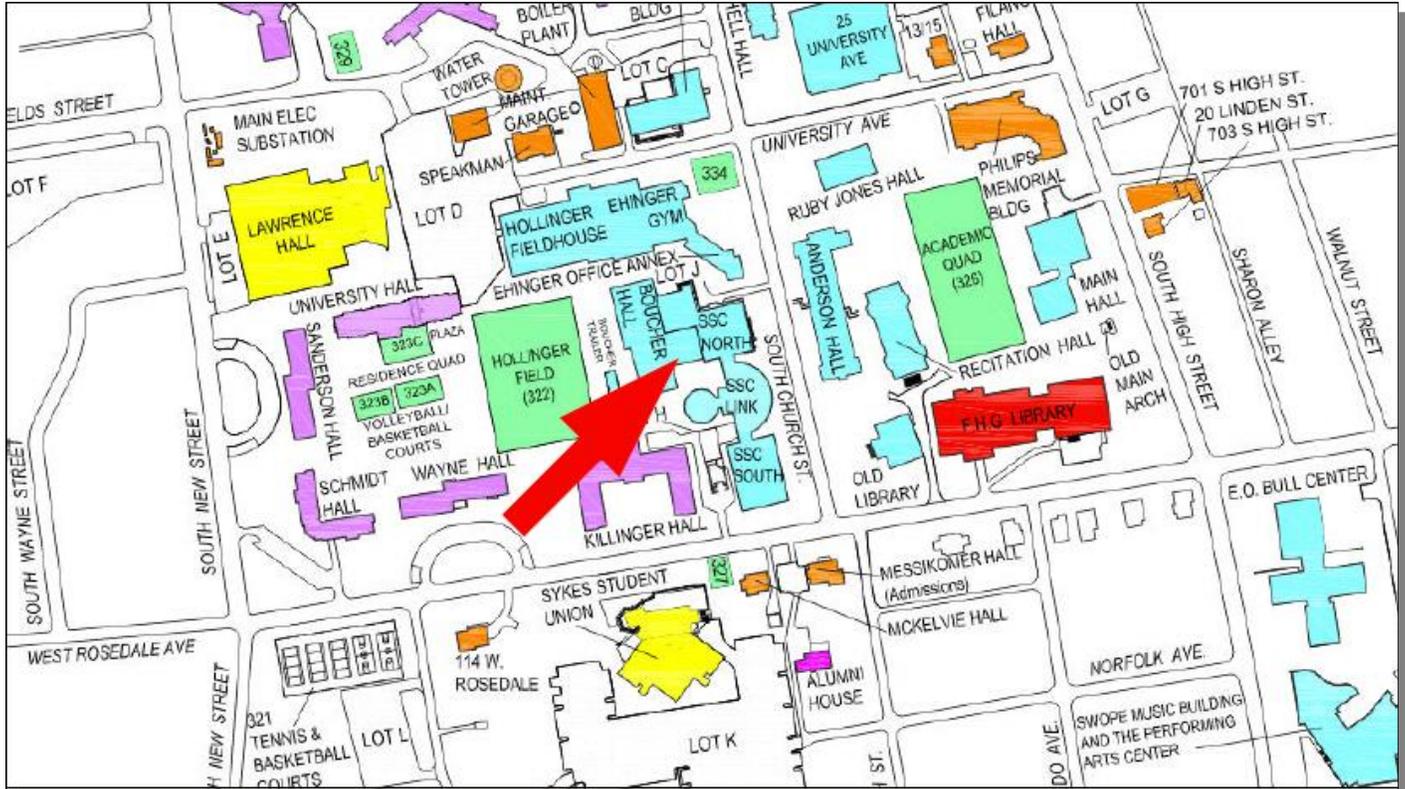
To get to the Myrick Conservation Center from West Chester, go south on High Street in West Chester past the Courthouse. At the next traffic light, turn right on Miner Street, which is also PA Rt. 842. Follow Rt. 842 for about 6 miles. To get to the observing site at the BRC property, turn left off Route 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).

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).



Speaker Bio (Cont'd)

(Continued from page 13)

and black hole masses, while also applying novel approaches to understand complex astrophysical data.

Dr. Phillipson earned her MS and Ph.D. in Physics from Drexel University. Beyond her research program, she is also committed to mentoring the next generation of astrophysicists, involving them directly in her research projects and publications, and she actively engages in science policy and public outreach, including serving on the AAS Committee on Astronomy and Public Policy.

CCAS Membership Information and Society Financials

Treasurer's Report by Don Knabb

Oct. 2025 Financial Summary

Beginning Balance	\$1875
Deposits	\$215
Disbursements	-\$0
Ending Balance	\$2090

New Member Welcome!

Welcome to new CCAS members Stephan Suchower from Malvern, PA, and Stephen Catarinella from Exton, 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.

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 \$35.00 for one year. Send to:

International Dark-Sky Association
 5049 E Broadway Blvd, #105
 Tucson, AZ 85711
 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.lymebasics.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 Phoenix, Arizona.

Phone: 520-280-3846

<http://www.starrynightlights.com>



LIGHTHOUSE
 OUTDOOR LIGHTING

Lighthouse Outdoor Lighting is a dedicated lifetime corporate member of the [International Dark-Sky Association](http://www.ida.org). 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.

211 North Walnut St.
1st Floor
West Chester, PA 19380

Phone: 484-291-1084 or 800-737-4068

<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.



High Point Scientific is a retailer of telescopes, binoculars, eyepieces and telescope accessories from Meade, Celestron, Televue, Orion, StellarMate, Takahashi, and many more. They also have an extensive blog of advice and education for amateur astronomers.

High Point Scientific
 442 Route 206
 Montague NJ, 07827

Phone: 800-266-9590

<https://www.highpointscientific.com/>



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: 267-297-0423
 Fax: 215-965-1524

Hours:
 Monday thru Friday: 9AM 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.

Contributing to Observations

Contributions of articles and images 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 to:

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

The deadline for submissions to the monthly newsletter is the 26th of each month. Articles and images should be original or the author/artist must be given credit. Articles should be in MS Word format with 12 point Times New Roman Font with single row spacing and one-inch margins on all four sides. Images should be in JPG or PNG file format. The submission window opens on the 20th of each month.

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 & Treasurer: Don Knabb
610-436-5702

Observing: Don Miller
610-247-8712

Secretary: Beatrice Mazziotta
610-933-2128

Program: Bruce Ruggeri
610-256-4929

Education: Don Knabb
610-436-5702

Dennis O'Leary
610-701-8042

Webmaster & Newsletter: John Hepler
484-883-0533

CCAS Membership Information

The 2023 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 & Telescope Magazine

The club membership subscription cost for *Sky and Telescope* magazine has increased to **\$45.75**. This is still a good saving from the regular rate of **\$57.75**.

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.

