Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 24, No. 10 ***Three-Time*** *Winner of the Astronomical League's Mabel Sterns Award ☼ 2006, 2009 & 2016* *October 2016*

In This Issue

Moon Over The Rockies

Image by CCAS Member Don Knabb. For details, see page 12..

Membership Renewals Due

10/2016	Caldwell
	Conrad
	Kazmi
	Kurtis
	Leiden
	Rosenblatt, Harriet
	Rosenblatt, Herb
	Zandler
11/2016	Buczyinski
	Cavanaugh
	Holenstein
	Smith
12/2016	Bogusch
	Moynihan
	O'Leary

October 2016 Dates

9th • First Quarter Moon, 12:32 a.m. EDT

16th • Full Moon, 12:23 a.m. EDT

21st • Orionid Meteor Shower Peaks

22nd • Last Quarter Moon, 3:13 p.m. EDT

26th • Saturn Near Venus Evening Twilight

30th • New Moon, 1:38 p.m. EDT

CCAS Upcoming Nights Out

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.

☼ **Saturday, October 8, 2016** - CCAS Special Observing Session, Hoopes Park, West Chester, PA.

☼ **Wednesday, November 2, 2016** - CCAS Special Observing Session, Pocopson Elementary School.

☼ **Saturday, November 6, 2016** - CCAS Special Observing Session, Country Day School of the Sacred Heart, Bryn Mawr, PA.

Autumn 2016 Society Events

October 2016

5th • PA Outdoor Lighting Council monthly meeting, 1438 Shaner Drive, Pottstown, PA 19465, starting at 7:30 p.m. For more information and directions, visit the PA Outdoor Lighting Council website.

8th • CCAS Special Observing Session, Hoopes Park, West Chester, PA.

11th • CCAS Monthly Meeting, Room 113, Merion Science Center (former Boucher Building), West Chester University. Meet & Greet over coffee and refreshments for members and non-members alike from 7:00 to 7:30 p.m. The meeting starts immediately after at 7:30 p.m. CCAS Member Speaker: Frank Angelini, "Amateur Astronomer Participation in the AAVSO SIDs (Sudden Ionospheric Disturbances) program."

14th • West Chester University Planetarium Show: "Star Clusters, Stellar Siblings," in the Schmucker Science Building. The show starts at 7 p.m. and run approximately one hour in length. For more information and reservations, visit the WCU Public Planetarium Shows webpage.

20th-21st • The von Kármán Lecture Series: Asteroid Anchors, Rock Climbing Robots, Gecko Grippers, and Other Ways to Stick in Space, at the Jet Propulsion Laboratory, Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

21st-22nd • Orionid Meteor Shower Peaks. The Orionids is an average shower producing about 20 meteors per hour at their peak. A good show could be experienced on any morning from October 20 - 24. The gibbous moon will be a problem this year, hiding all but the brightest meteors with its glare.

20th • Open call for articles and photographs for the November 2016 edition of Observations.

21st • CCAS Monthly Observing Session, Myrick Conservancy Center, BRC. The observing session starts at sunset.

26th • Deadline for newsletter submissions for the November 2016 edition of Observations.

November 2016

2nd • PA Outdoor Lighting Council monthly meeting, 1438 Shaner Drive, Pottstown, PA 19465, starting at 7:30 p.m. For more information and directions, visit the PA Outdoor Lighting Council website.

2nd • CCAS Special Observing Session, Pocopson Elementary School. The observing session is scheduled for 6:30 – 8:00 p.m. The event is not open to the general public.

4th • West Chester University Planetarium Show: "Raining Stars" 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.

4th • CCAS Monthly Observing Session, Myrick Conservancy Center, BRC. The observing session starts at sunset. LAST REGULAR OBSERVING SESSION for 2016.

6th • CCAS Special Observing Session, Country Day School of the Sacred Heart, Bryn Mawr. The event is not open to the general public.

8th • CCAS Monthly Meeting, Room 113, Merion Science Center (former Boucher Building), West Chester University. Meet & Greet over coffee and refreshments for members and non-members alike from 7:00 to 7:30 p.m. The meeting starts immediately after at 7:30 p.m. CCAS Member Speaker: John Conrad, NASA/JPL Solar System Ambassador.

17th-18th • The von Kármán Lecture Series: The James Webb Space Telescope: Successor to Hubble, Jet Propulsion Laboratory, Pasadena, California. Live stream of free lecture presented by NASA & Caltech.

20th • Open call for articles and photographs for the December 2016 edition of Observations.

26th • Deadline for newsletter submissions for the December 2016 edition of Observations.

Minutes from the September 13, 2016, CCAS Meeting

by Ann Miller, CCAS Secretary

- Roger Taylor, CCAS president, welcomed our group of 24 to the 2016-2017 program season. He introduced our new members and gave a review of CCAS summer activities and star parties.
  - Many thanks were given to Don and Barb Knabb for hosting the CCAS summer picnic on Saturday, September 3rd.
  - Roger reminded the group that the Astronomy Breakfast Club moderated by Steve Leiden will continue this fall.
  - Roger also thanked members for assisting at the Anson Nixon Star Party on Saturday, September 10, 2016.
- John Hepler, CCAS webmaster and newsletter editor, shared the 2016 Mabel Sterns Newsletter Award that was presented to him at ALCon 2016 on August 13, 2016, by the Astronomical League. The society is grateful for all of his hard work and dedication in producing our excellent newsletter.
  - This was his third AL award (2005 for the webmaster award, and 2009 for the newsletter award).
  - It is the third time CCAS has won the Mabel Sterns award, with Don Anderson winning it the first time in 2006.
- Don Knabb, our Observing Chair and Treasurer, shared the book Cryptic, by Jack McDevitt, who is a Hugo/Nebula Award winner. Don has corresponded with Mr. McDevitt and he has graciously agreed to attend our October meeting to make a presentation.
- Don present the Night Sky using the Sky Safari App and highlighted asterisms that will be visible this month as well as other sky highlights.
- Don shared pictures from the CCAS summer picnic. Ed Lurcott's scope was set up for stargazing at the picnic and Don took an excellent photo of Ed reflected in the primary mirror of that scope.
- Roger Taylor presented an Astronomical League Proclamation to Ed

(Continued on page 14)

October 2016 CCAS Meeting Agenda

by Dave Hockenberry, CCAS Program Chair

Our next meeting will be held on October 11, 2016, starting at 7:30 p.m. The meeting will be held in Room 112, Merion Science Center (former Boucher Building), West Chester University. Our speaker will be CCAS member Frank Angelini, "Amateur Astronomer Participation in the AAVSO SIDs (Sudden Ionospheric Disturbances) program."

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, John Conrad will be presenting in November. We are looking for presenters for future meetings in our spring 2017 season. If you are interested in presenting, or know someone who would like to participate, please contact me at programs@ccas.us.

Noted Science Fiction Author to Attend CCAS October Meeting

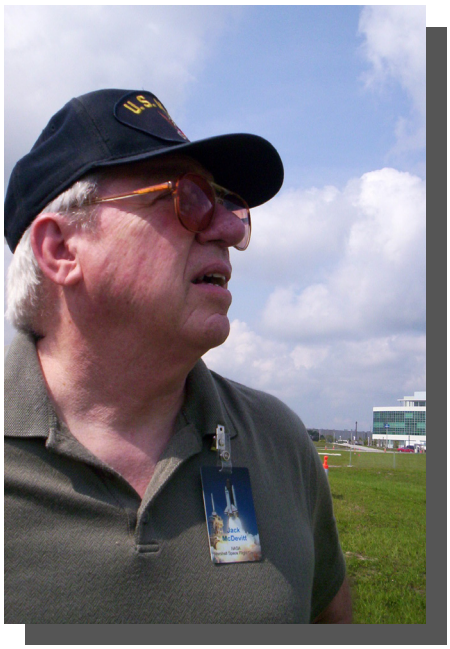
by Don Knabb, CCAS Treasurer & Observing Chair

Earlier this year I wrote a review of *Cryptic*, a collection of wonderful science fiction short stories by award winning author Jack McDevitt. When I contacted Jack for permission to use the image of the cover of Cryptic in my article he expressed interest in our astronomy club. As it turns out, Jack and his wife Maureen will be in the Philadelphia area during early October and they will attend our meeting!

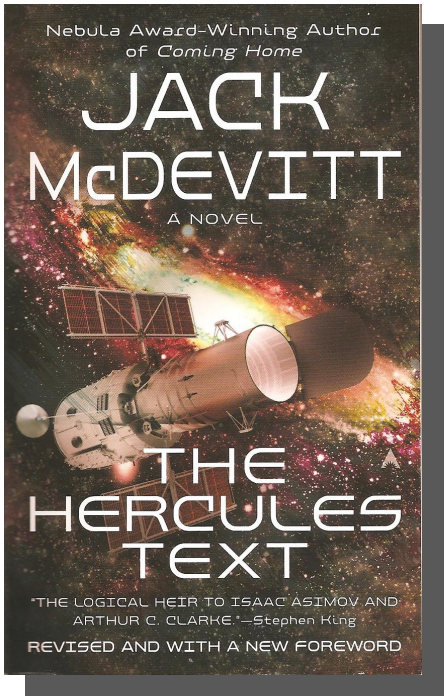
Jack will have a short presentation/discussion at our meeting prior to Frank Angelini presenting the main program of the evening: amateur astronomer participation in the AAVSO SIDs (Sudden Ionospheric Disturbances) program.

I have read several of Jack's books and am now on a steady diet of them to fulfill my hunger for great science fiction. I highly recommend the short story collection *Cryptic* as a starting point. The e-book version is only $4.99. New hardcover versions of *Cryptic* are hard to find, and used copies are going for $35 to over $100 on the internet! If you want to hear an audio adaption of one of Jack's short stories point your web browser to http://escapepod.org/2014/03/07/ep438-enjoy-moment/ . This story will bring a smile to your face, as do many of Jack's stories.

Jack McDevitt is an American science fiction author who has written 22 novels and over 80 short stories. His writings frequently deal with attempts to make contact with alien races or investigating the traces they have left behind. Jack is a former English teacher, naval officer, Philadelphia taxi driver, customs officer and motivational trainer.



McDevitt at NASA



McDevitt's First Published Novel

Stephen King has called Jack "The logical heir to Isaac Asimov and Arthur C. Clark".

The novel *Seeker* won the 2006 Nebula Award for Best Novel, given by the Science Fiction and Fantasy Writers of America. He has been nominated for the Nebula Award sixteen times. His two main series are the Alex Benedict series and the Priscilla Hutchins series.

McDevitt's first published story was "The Emerson Effect" in *The Twilight Zone* Magazine in 1981. Five years later, he published his first novel, *The Hercules Text*, about the discovery of an intelligently conceived signal whose repercussions threaten human civilization. This novel set the tone for many of McDevitt's following novels, which focused on making first contact. Frequently this theme is mixed with both trepidations before the unknown and a sense of wonder at the universe.

With *The Engines of God* (1994), McDevitt introduced the idea of a universe that was once teeming with intelligent life, but contains only their abandoned artifacts by the time humans arrive on the scene. McDevitt's novels frequently raise questions which he does not attempt to answer. He prefers to leave ambiguities to puzzle and intrigue his readers: "Some things are best left to the reader's very able imagination."

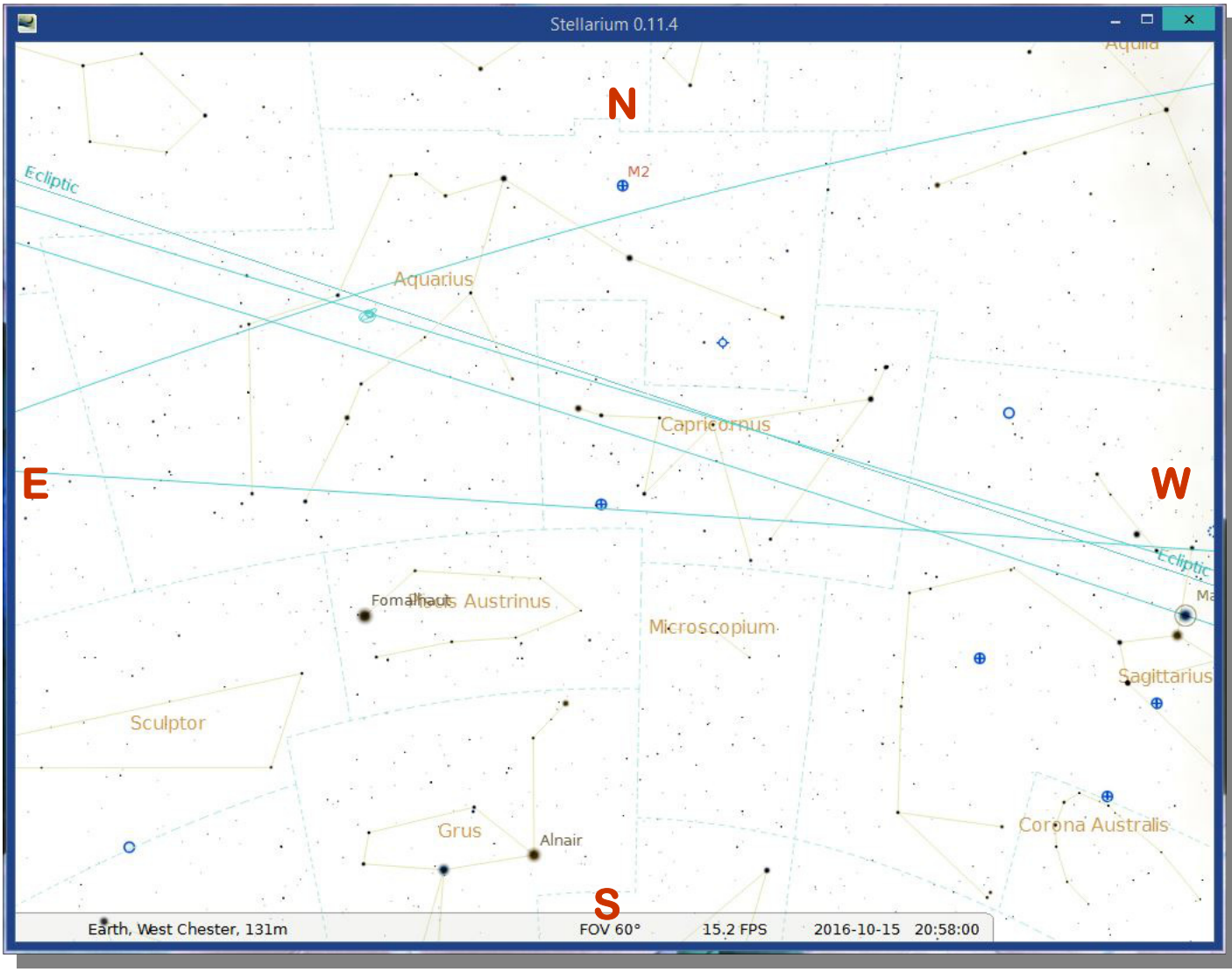
McDevitt went to La Salle University, where a short story of

(Continued on page 13)

The Sky Over Chester County

October 15, 2016 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
10/01/2016	6:30 a.m. EDT	6:57 a.m. EDT	6:42 p.m. EDT	7:09 p.m. EDT	11h 44m 46s
10/15/2016	6:44 a.m. EDT	7:12 a.m. EDT	6:20 p.m. EDT	6:48 p.m. EDT	11h 08m 47s
10/31/2016	7:01 a.m. EDT	7:29 a.m. EDT	5:59 p.m. EDT	6:27 p.m. EDT	10h 29m 48s

Moon Phases					
First Quarter	10/09/2016	12:32 a.m. EDT	Full Moon	10/16/2016	12:23 a.m. EDT
Last Quarter	10/22/2016	3:13 p.m. EDT	New Moon	10/30/2016	1:38 p.m. EDT

October 2016 Observing Highlights

by Don Knabb, CCAS Treasurer & Observing Chair

3	**The thin crescent Moon is near Venus in evening twilight**
5	**The thin crescent Moon is near Saturn**
9	**First quarter Moon, 12:32 a.m. EDT**
15	**Uranus is at opposition and is as bright as it gets in 2016**
16	**Full Moon, the Hunter's Moon, 12:23 a.m. EDT**
19	**The Moon occults Aldebaran around 1:30 a.m.**
21	**The Orionid meteors peak**
22	**Last Quarter Moon, 3:13 p.m. EDT**
26	**Saturn is near Venus in evening twilight**
30	**New Moon, 1:38 p.m. EDT**

The best sights this month: Watch the dance of the planets Venus, Saturn and Mars as they move eastward against the background of stars through October. And for an observing challenge, seek out Uranus as it reaches opposition on October 15 when it is at maximum brightness for 2016.

Mercury: Mercury is visible in the pre-dawn sky during the first two weeks of October. On October 11th Mercury is joined by Jupiter for a close encounter in the glow of the dawn. By mid-month Mercury sinks into the glow of the sunrise.

Venus: The "evening star" continues to be quite low throughout October, but when you see it there is no mistaking the brilliant shine of our sister planet in the glow of the fading sunset. On October 20th Venus passes through the claws of the Scorpion and on the 27th Venus passes between Saturn and Antares.

Mars: Mars fades in brightness as if falls behind in our race around the Sun. But it continues to shine brightly and the color of The Red Planet continues to be obvious. On October 5th, 6th and 7th Mars and the globular clusters M28 and M22 in Sagittarius will be fairly close and should be visible in a wide field telescopic view or in binoculars. The 3rd magnitude star lambda Sagittarius will also be in the field of view.

Jupiter: The king of the planets passed behind the Sun in late September and emerges from the glow of the dawn sky around October 8th and continues to climb higher each day. By the end of the month Jupiter will rise about 2 ½ hours before the Sun.

Saturn: The ringed planet continues to float above Antares in the evening sky. By the end of October Saturn is only 10 degrees above the horizon an hour after sunset, so get ready to say good-bye to this beautiful planet.

Uranus and Neptune: Uranus is at opposition on October 15th so it is in the best position for viewing around midnight when we look through the least amount of atmosphere. It also peaks in brightness that night, shining at magnitude 5.7, which is just barely visible at a dark sky site. Neptune rises a few hours ahead of Saturn and will be high overhead earlier in the evening. A finder chart for both planets is in the October issue of Sky and Telescope magazine and on the Sky and Telescope website.

The Moon: Full Moon occurs on October 16th. This full Moon is often referred to as the Full Hunter's Moon, Blood Moon, or Sanguine Moon. Many moons ago, Native Americans named this bright moon for obvious reasons. The leaves are falling from trees, the deer are fattened, and it is time to begin storing up meat for the long winter ahead. Because the fields were traditionally reaped in late September or early October, hunters could easily see fox and other animals that come out to glean from the fallen grains. Probably because of the threat of winter looming close, the Hunter's Moon is generally accorded with special honor, historically serving as an important feast day in both Western Europe and among many Native American tribes.

In the early morning hours of October 19th the Moon will pass in front of (occult) the bright star Aldebaran in the constellation Taurus the Bull.

Constellations: High up in the sky we see the Summer Triangle overhead. Look to the left of the large triangle and you'll find another geometric shape in the sky, the Great Square of Pegasus. And a bit toward the east and nearly overhead is the constellation Cassiopeia in the shape of a large "W". According to Greek myths, Cassiopeia was the Queen of Ethiopia. Her husband, Cepheus the King is honored by the constellation just to the west of Cassio-

(Continued on page 7)

Through the Eyepiece: Messier 11, The Wild Ducks in the sky

by Don Knabb, CCAS Treasurer & Observing Chair

It has been over 10 years since I saw Messier 11, The Wild Duck Cluster, for the first time. It remains among my favorite deep sky objects and I still experience a sense of awe and wonder whenever I look at this marvelous open cluster. Many open clusters are exactly that – open. But the Wild Duck Cluster has so many stars that it looks like you are viewing a globular cluster upon first getting it in your field of view.

The Wild Duck Cluster is quite small for an open cluster and you will need more than the usual low power eyepiece to view the details of the cluster. At 60X the impression is of a loose globular cluster. At 140X the individual stars stand out and they are very easily observed. If only a picture could capture the actual experience of viewing such a sight in the eyepiece.

Burnham's describes M11 as an "Exceptionally fine galactic star cluster, lying on the north edge of the prominent Scutum Star Cloud, and one of the outstanding objects of its type for telescopes of moderate aperture."

There are not too many weeks left in 2016 to see M11 before it slips below the horizon. During October if you look to the southwest just after it gets dark you can find the Wild Ducks in the small constellation Scutum.

There are an estimated 2,900 stars, about 500 of which are brighter than magnitude 14 in the Wild Duck Cluster. A planet at the center of M11 would have a remarkable night sky filled

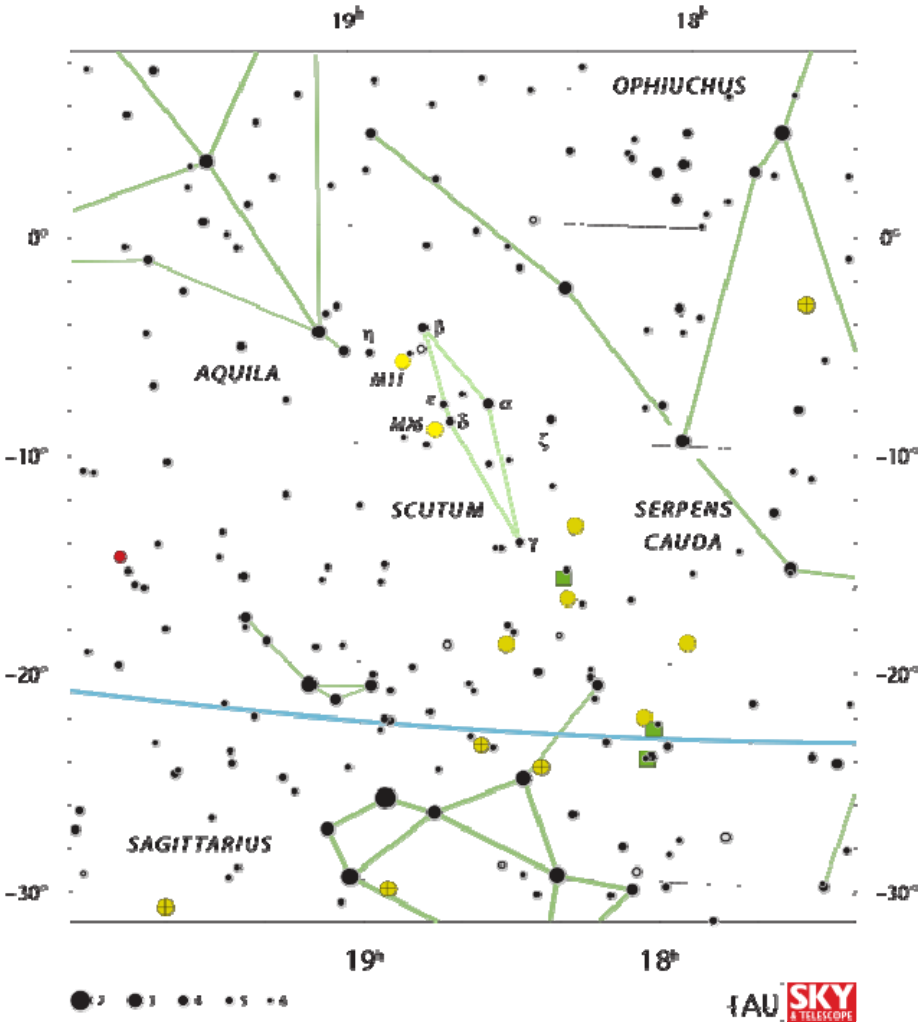


Image credit: IAU and Sky & Telescope magazine (Roger Sinnott & Rick Fienberg) https://en.wikipedia.org/wiki/Scutum#/media/File:Scutum_IAU.svg

with several hundred first magnitude stars. Go out and find Vega, the brightest star of the Summer Triangle. Now imagine a sky filled with several hundred stars of this brightness!

M11 was discovered by the German astronomer Gottfried Kirch of the Berlin observatory in 1681, but it appeared as nothing more than a fuzzy blob in his telescope. Charles Messier included it in his catalog on May 30, 1764 as M11. According to Burnham's it was Rev. Wm. Derham of England who first resolved the cluster into stars in 1732. It was Admiral Smyth who named M11 the Wild Duck Cluster as he wrote in his notes: "This object, which somewhat resembles a flight of wild ducks in shape, is a gathering of minute stars, with a prominent 8th-magnitude in the middle, and two following;"

So where do the "wild ducks" come into play? It is the general consensus that the name arose as a result of the object resem-

(Continued on page 7)

Duck Cluster (cont'd)

(Continued from page 6)

bling the V-shape of a flight of ducks, when viewed through a small telescope.

Many stars like our Sun were formed in open clusters like M11. The stars in M11 all formed together about 250 million years ago. Open clusters, also called galactic clusters, contain fewer and younger stars than globular clusters. Also unlike globular clusters, open clusters are generally confined to the plane of our Galaxy.

So before all the ducks head south for the winter grab your binoculars or telescope and enjoy the view of one of the most amazing clusters in the night sky!

Information credits:

http://www.daviddarling.info/encyclopedia/W/Wild_Duck_Cluster.html
http://www.seds.org/messier/m/m011.html
https://en.wikipedia.org/wiki/Wild_Duck_Cluster
http://www.universetoday.com/31352/messier-11/

Observing Cont'd)

(Continued from page 5)

peia that is in the shape of a house.

Messier/deep sky: October is a great month to study the Andromeda galaxy, M31. This is the most distant object you can ever see without binoculars or a telescope to help, although you'll need to go to a dark sky site to pick out its soft glow. It is many times further away than any star in the sky. It is so far away that the light you see as that fuzzy spot in the sky left Andromeda 2.5 million years

(Continued on page 9)

Image credit: This image was taken by the Wide Field Imager on the MPG/ESO 2.2-metre telescope at ESO's La Silla Observatory in northern Chile.

One Incredible Galaxy Cluster Yields Two Types of Gravitational Lenses

by Dr. Ethan Siegel

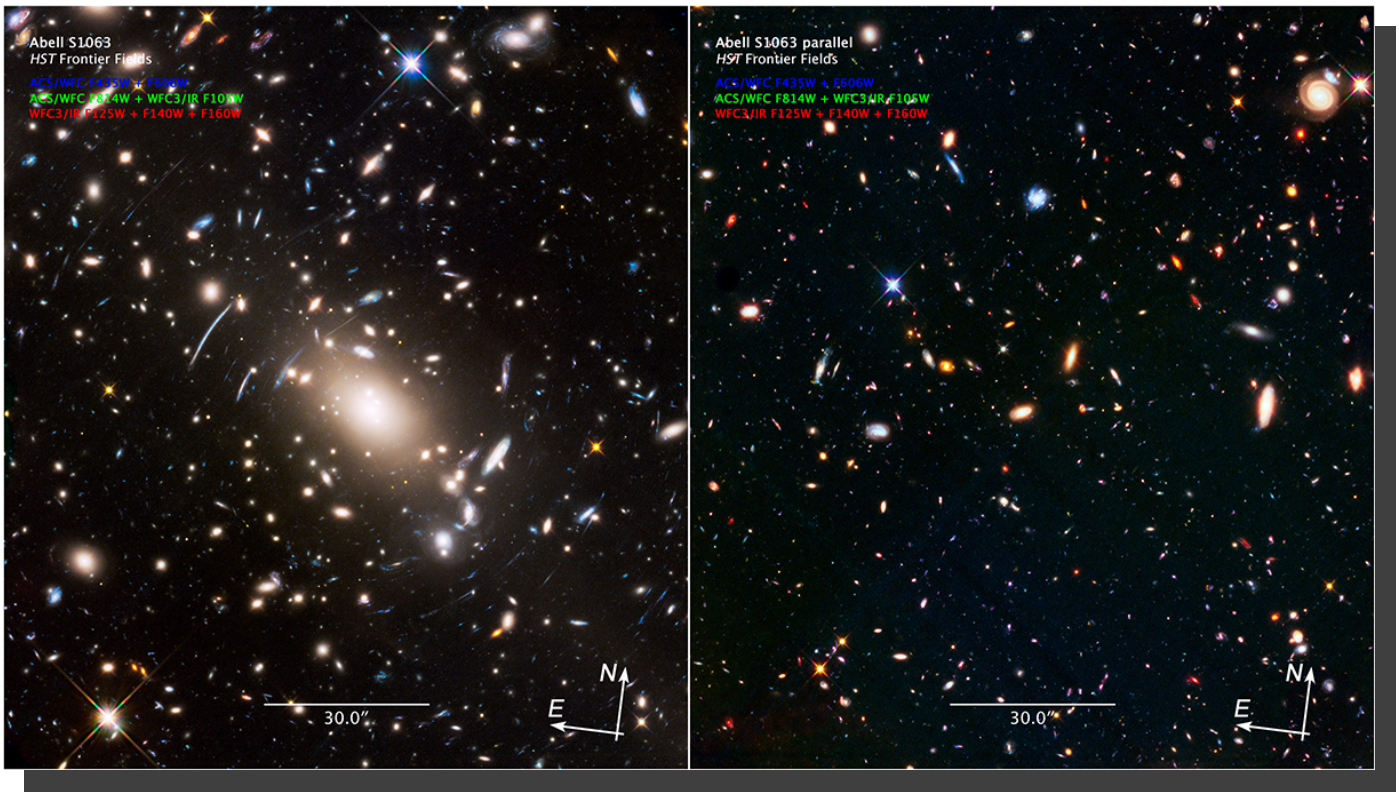
There is this great idea that if you look hard enough and long enough at any region of space, your line of sight will eventually run into a luminous object: a star, a galaxy or a cluster of galaxies. In reality, the universe is finite in age, so this isn't quite the case. There are objects that emit light from the past 13.7 billion years—99 percent of the age of the universe—but none before that. Even in theory, there are no stars or galaxies to see beyond that time, as light is limited by the amount of time it has to travel.

But with the advent of large, powerful space telescopes that can collect data for the equivalent of millions of seconds of observing time, in both visible light and infrared wavelengths, we can see nearly to the edge of all that's accessible to us.

The most massive compact, bound structures in the universe are galaxy clusters that are hundreds or even thousands of times the mass of the Milky Way. One of them, Abell S1063, was the target of a recent set of Hubble Space Telescope observations as part of the Frontier Fields program. While the Advanced Camera for Surveys instrument imaged the cluster, another instrument, the Wide Field Camera 3, used an optical trick to image a parallel field, offset by just a few arc minutes. Then the technique was reversed, giving us an unprecedentedly deep view of two closely aligned fields simultaneously, with wavelengths ranging from 435 to 1600 nanometers.

With a huge, towering galaxy cluster in one field and no comparably massive objects in the other, the effects of both weak and strong gravitational lensing are readily apparent. The galaxy cluster—over 100 trillion times the mass of our sun—warps the

(Continued on page 9)



Galaxy cluster Abell S1063 (left) as imaged with the Hubble Space Telescope as part of the Frontier Fields program. The distorted images of the background galaxies are a consequence of the warped space dues to Einstein's general relativity; the parallel field (right) shows no such effects. Image credit: NASA, ESA and Jennifer Lotz (STScI)

Space Place (Cont'd)

(Continued from page 8)

fabric of space. This causes background light to bend around it, converging on our eyes another four billion light years away. From behind the cluster, the light from distant galaxies is stretched, magnified, distorted, and bent into arcs and multiple images: a classic example of strong gravitational lensing. But in a subtler fashion, the less optimally aligned galaxies are distorted as well; they are stretched into elliptical shapes along concentric circles surrounding the cluster.

A visual inspection yields more of these tangential alignments than radial ones in the cluster field, while the parallel field exhibits no such shape distortion. This effect, known as weak gravitational lensing, is a very powerful technique for obtaining galaxy cluster masses independent of any other conditions. In this serendipitous image, both types of lensing can be discerned by the naked eye. When the James Webb Space Telescope launches in 2018, gravitational lensing may well empower us to see all the way back to the very first stars and galaxies.

If you're interested in teaching kids about how these large telescopes "see," be sure to see our article on this topic at the NASA Space Place: http://spaceplace.nasa.gov/telescope-mirrors/en/

*This article is provided by **NASA Space Place.** With articles, activities, crafts, games, and lesson plans, NASA Space Place encourages everyone to get excited about science and technology. Visit **spaceplace.nasa.gov** to explore space and Earth science!*

Observing (Cont'd)

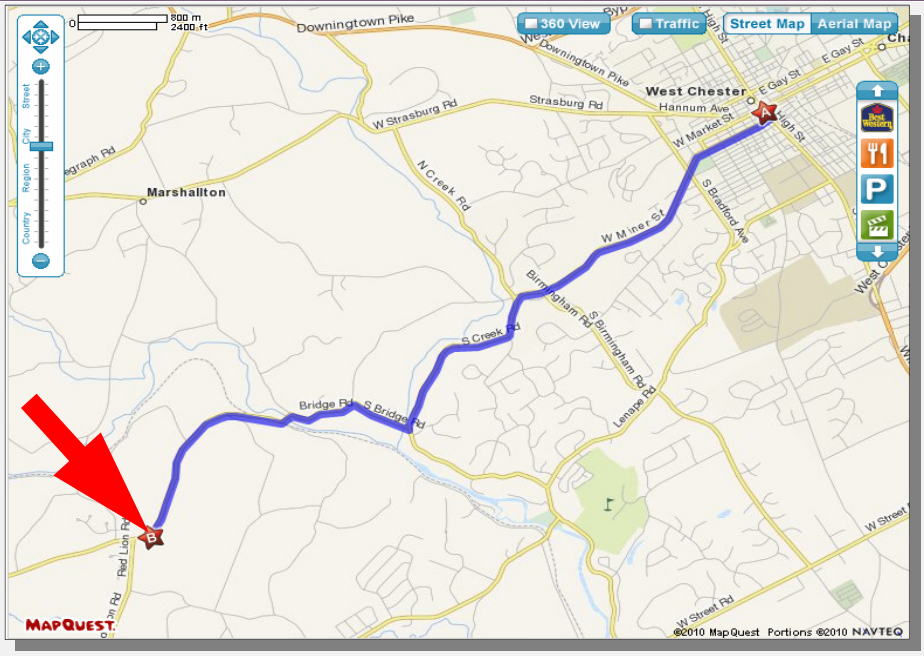
(Continued from page 7)

ago! In Chester County skies we need to use binoculars or a telescope, but the view is still wonderful.

Comets: There are no bright comets in the sky during October.

Meteor showers: The Orionid meteor shower peaks in the early morning hours of October 21st. You could see up to 15 "shooting stars" per hour. Unfortunately, the waning gibbous Moon will overpower many of the meteors. This meteor shower is made up of dust particles from Comet Halley. The peak of this shower is broad, so look for shooting stars a few days before and after the peak.

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).

PoleMaster-GEM Polar Alignment Made Easy

by CCAS Member Steve Leiden

The PoleMaster is a German Equatorial Mount (GEM) polar alignment (PA) product that is video-based using a rudimentary video camera and accompanying software.

What's included (see Figure 1):

- Video Camera with lens cover
- Mounting bracket with cover
- Mount adapter that attaches to the back of the camera so the camera can be easily removed when not in use
- USB 2.0 cable with lock
- Two Allan Wrenches (attaching the mount, adjusting the focus)

The software is available via download.

The PoleMaster is installed (see Figure 2) onto the mount per PoleMaster manufacturer instructions (a bit of the install is left as an exercise for the student). The installation of the SW (from download) is pretty simple and straightforward.

Setup the mount per normal vendor instructions. For my CGEM-DX, I point the lead tripod leg north and set the RA and Dec indexes to their home position. I use the finderscope to locate and center Polaris in the finderscope Field of View (FOV).

Run the PoleMaster SW and connect to the camera. Adjust exposure and gain to bring Polaris into the PoleMaster FOV (11 degrees per QHY). After confirming that you have Polaris identified (it's the brightest star in the FOV), rotate the SW FOV mask with red circles that you align to stars in the FOV. Usually I align to the same 3 stars since they are always there just in different spots depending on time of day/year. When aligned, the SW will direct you to select a star and perform two approximately 30 degree rotations in the

(Continued on page 11)

Figure 1. PoleMaster Package Contents

Figure 2. PoleMaster Installed on CGEM-DX

PoleMaster (Cont'd)

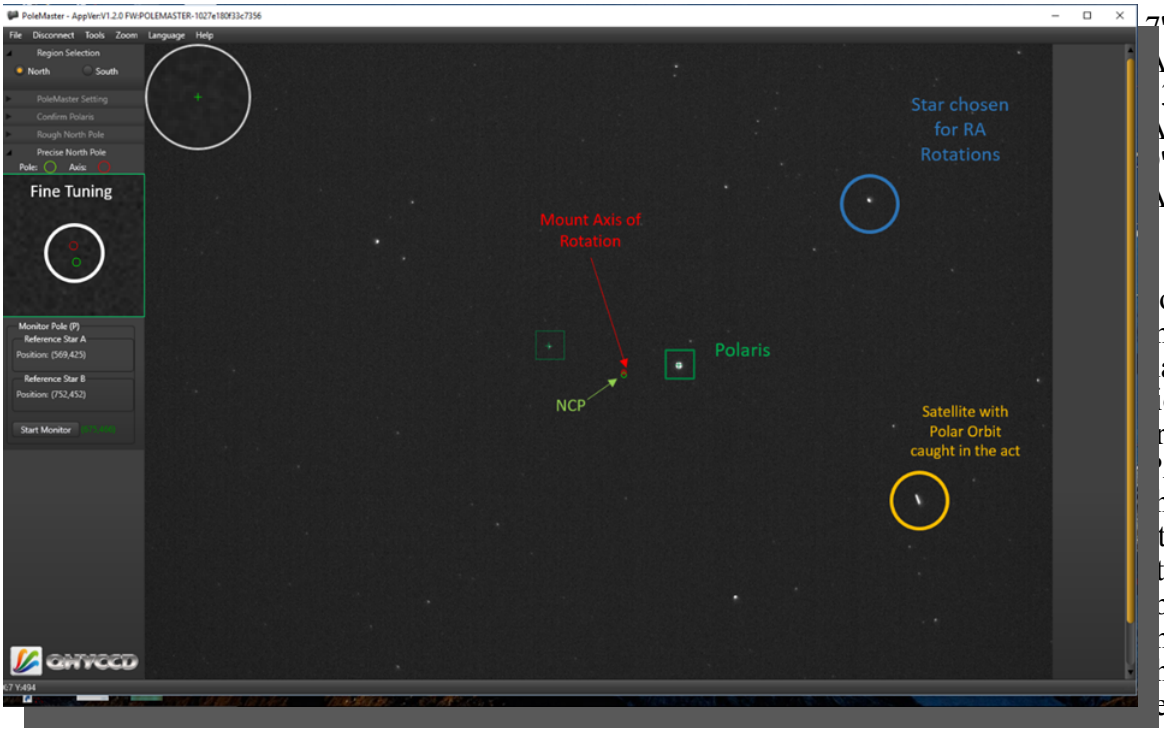


Figure 3. Final Polar Alignment Achieved

(Continued from page 10)

same direction. The SW will construct a green circle representing the rotational path of the selected star with a small red dot indicating the axis of rotation of the mount. The SW will direct you to reverse the RA rotation taking the star back to its original position and verify that the star stays on the green circle. I usually get assistance by watching the RA index marker on the mount and take it back to the home position. Note the little red dot this is the mount axis of rotation.

The SW determines and identifies the north celestial pole (NCP). The SW identifies where Polaris should be and directs you to use the mount altitude and azimuth controls to position Polaris in the little green circle (not shown here). Once that has been successfully done and the alignment against the other stars is valid, the SW directs you to place the mount axis of rotation over the NCP (note small green circle near the red dot - see Figure 3). When you have the red dot inside the green circle, you have successful PA. The question is to what degree. (Notice the short trail on the lower left of a satellite with a polar orbit caught in the act.)

As can be seen here, if I can let go of my "close enough" attitude, very-very good PAs can be achieved. Later I learned to pay attention to fine tuning box on left. Note, I wasn't spot on in this early attempt.

Here are some examples of my PA for a few times out:

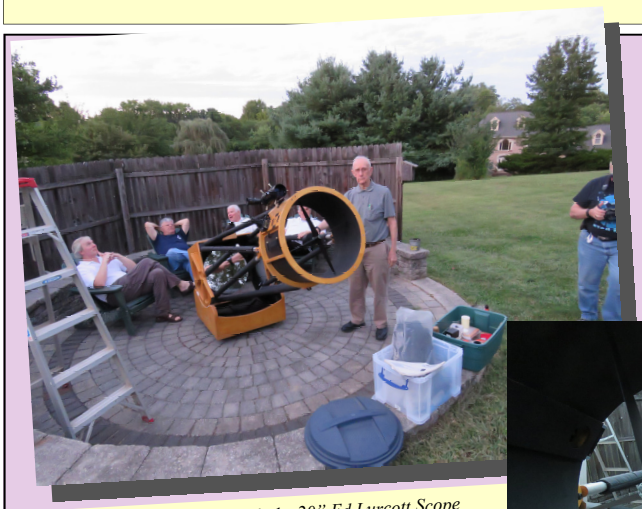
-58" Az, -6'55" Alt;

7'41" Az, 3'41 lt;
3'13" Az, 0'33" lt
' 27" Az, 2' 42" lt

do think seeing onditions can nake this a bit arder. The addi- ional benefits rom this improved 'A performance, is he standard mount tar alignments two star and 3 cal- ration stars) are nuch easier since he mount's at- empt to point to a selected alignment star gets much closer to the star than I experienced previously. Another advantage is that with the better PA, unguided imaging can be done for a bit longer. The last time out, after my final calibration star, I did 3.5 hours of DSLR camera imaging and never put an eyepiece back in the scope. I'm processing the data from this session with all images taken unguided (up to 90 sec.) and preliminary results are promising. This is so much more convenient than using the Celestron Polar Alignment scope. Getting down on my knees to look through that just once was enough. In addition, it is more convenient than using their All-star PA method. At this point the cost is certain to rise ($299 complete system).

Note, their web site really needs to be improved. When you get off the beaten path you will be reading Chinese.

CCAS Photo Collage



2016 Summer Picnic with the 20" Ed Lurcott Scope

Roger Taylor & John Hepler at the September 13th meeting with the Astronomical League's 2016 Mabel Sterns Newsletter Award.

The Maker in the Mirror

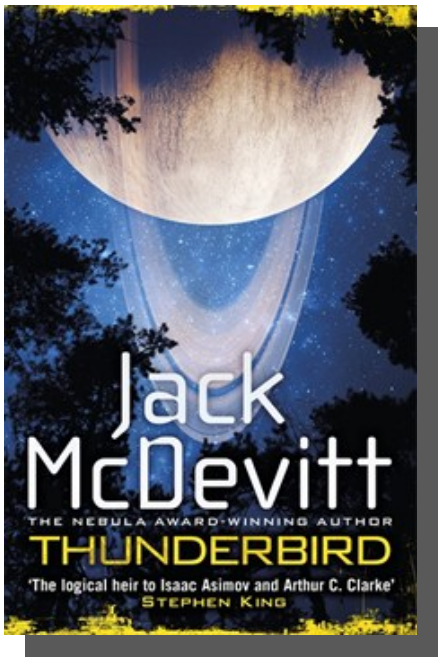
Setting up for Bucktoe Preserve Star Party

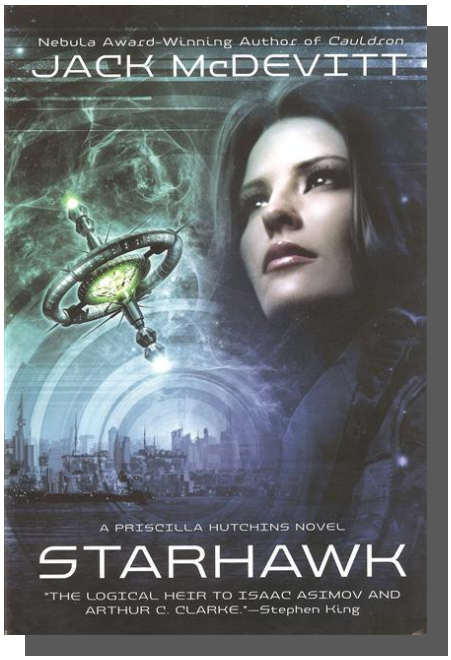
Blue Moon, by Herb Rosenblatt—Lunar X and lunar V (near top) taken with my phone manually held up to telescope eyepiece. Galaxy S5 phone; Celestron Nexstar Evolution 8 telescope probably with 32mm eyepiece, about 60 X. Blue coloration because it was taken while sky was still light.

Ed Lurcott & Roger Taylor holding the Astronomical Leagues' Proclamation recognizing Ed's years of service to the field and

On the cover: Moon over the Rockies by Don Knabb. Taken on September 15t, 2016, from the YMCA of the Rockies with a Canon SX60 HS point and shoot "super zoom" camera set for high dynamic range images and image stabilization. ISO was set automatically to 160 and shutter speed was also set automatically to 1/250 of a second. Focal length was 247mm.

McDevitt (cont'd)





Other McDevitt Titles

(Continued from page 3)

his won the annual Freshman Short Story Contest and was published in the school's literary magazine, *Four Quarters*. As McDevitt explained in an interview, "I was on my way. Then I read David Copperfield and realized I could never write at that level, and therefore I should find something else to do. I joined the Navy, drove a cab, became an English teacher, took a customs inspector's job on the northern border, and didn't write another word for a quarter-century." McDevitt received a master's degree in literature from Wesleyan University in 1971. He returned to writing when his wife, Maureen, encouraged him to try his hand at it in 1980.

As of 2007, McDevitt lives near Brunswick, Georgia.

You can find out more about Jack McDevitt at his website: http://www.jackmcdevitt.com/

CCAS Member Original Astrophotography

by Dave Hockenberry

NGC869, one half of the Double Cluster in Perseus

Image collected 8/29/2016 with Hyperion 12.5" telescope, QSI 583wsg camera, SX Lodestar and SX AO guiding. Observatory control and image acquisition with MaxIm DL. Calibration, RGB creation with CCDStack. Minimal adjustments with Photoshop CS5. Stack of 100 second subframes X 3 each Red, Green, and Blue Generation 2 Astrodon broadband filters. This is the more compact and denser member of the Double Cluster, and is easily recognizable through a telescope eyepiece because of the "smiley face" pattern in the middle. The Double Cluster is just becoming visible in our skies well after dark, but will be in better position as the fall progresses and well into the winter months.

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).

Minutes (Cont'd)

(Continued from page 2)

Lurcott to honor his participation in astronomy education and outreach and the founding of CCAS in 1993.

- David Hockenberry, Program Chair, introduced our evening's guest speaker, Dr. Alex Hill.
  - Dr. Hill was a senior postdoctoral fellow at Haverford College.
  - His presentation, entitled "Star Stuff" reviewed the life of a star and the effects of interstellar medium on star formation.

CCAS Membership Information and Society Financials

Treasurer's Report
by Don Knabb

Sept. 2016 Financial Summary

Beginning Balance	$2,500
Deposits	$225
Disbursements	$335
Ending Balance	$2,390

New Member Welcome!

Welcome new CCAS members Jeanne Lane from Kennett Square, and Harold & Maruta Skelton from West Chester. 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

★ ★ ★ ★ ★

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:

John Hepler
21103 Striper Run
Rock Hall, MD 21661

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 John Hepler, the newsletter editor, at: **newsletter@ccas.us**.

CCAS Website

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

http://www.ccas.us

John 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 John 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:	Roger Taylor 610-430-7768
Vice President:	Liz Smith 610-842-1719
ALCor, Observing, and Treasurer:	Don Knabb 610-436-5702
Secretary:	Ann Miller 610-558-4248
Librarian:	Barb Knabb 610-436-5702
Program:	Dave Hockenberry 610-558-4248
Education:	Kathy Buczynski 610-436-0821
Webmaster and Newsletter:	John Hepler 410-639-4329
Public Relations:	Deb Goldader 610-304-5303

CCAS Membership Information

The present membership rates are as follows:

REGULAR MEMBER……$25/year
SENIOR MEMBER…….$10/year
STUDENT MEMBER……..$ 5/year
JUNIOR MEMBER……..$ 5/year
FAMILY MEMBER…….$35/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 & Tele*scope Magazine Group Rates

Subscriptions to this excellent periodical are available through the CCAS at a reduced price of **$32.95,** much less than the newsstand price of $66.00, and also cheaper than individual subscriptions ($42.95)! Buying a subscription this way also gets you a 10% discount on other Sky Publishing merchandise.

To **start** a **new** subscription, make **sure** you make out the check to the **Chester County Astronomical Society**, note that it's for *Sky & Telescope*, and mail it to Don Knabb.

To **renew** your "club subscription" contact Sky Publishing directly. Their phone number and address are in the magazine and on their renewal reminders. If you have **any** questions call Don first 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). If you want to participate in this special Society discount offer, **contact our Treasurer Don Knabb.**