Observations

A Monthly Publication Of The
CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 19, No. 2 *Two-Time Winner of the Astronomical League's Mabel Sterns Award ¤ 2006 & 2009* *February 2011*

In This Issue

Spiral Galaxy NGC 4622 Spins "Backwards"

(photo courtesy of HubbleSite.org)

To the surprise of astronomers, this galaxy, called NGC 4622, appears to be rotating in the opposite direction to what they expected. Pictures by NASA's Hubble Space Telescope helped astronomers determine that the galaxy may be spinning clockwise by showing which side of the galaxy is closer to Earth. This image shows NGC 4622 and its outer pair of winding arms full of new stars in blue.

Membership Renewals Due

02/2011	Calobrisi & Family
	Kalinowski & Family
	La Para
	Reimer
03/2011	Cini
	LaFrance
	DiSands
	Pearson & Family
04/2011	Baker
	Bower
	Imburgia
	Popovich & Family
	Mulligan & Family
	Richter

Important February 2011 Dates

2nd • New Moon 9:31 p.m.

6th • Jupiter is near the crescent Moon, a great photo opportunity

11th • First Quarter Moon 2:18 a.m.

18th • Full Moon 3:36 a.m.

24th • Last Quarter Moon 6:26 p.m.

CCAS Upcoming Nights Out

CCAS has several "nights out" scheduled over the next few months. Members are encouraged to help out during these events any way they can. See below for more information.

¤ **Friday, March 11, 2011** - Greenwood Elementary School, near Longwood Gardens, PA.

¤ **Saturday, April 9, 2011** - Anson Nixon Park, Kennett Square, PA.

¤ **Friday, May 17, 2011** - Hoopes Park, West Chester, PA. Cohosted with the West Chester Recreation Department.

Winter 2011 Society Events

February 2011

2nd • PA Outdoor Lighting Council monthly meeting, starting at 7:30 p.m. Meetings are open to the public. For more information and directions, visit the PA Outdoor Lighting Council website.

4th • CCAS Monthly Observing Session, Myrick Conservancy Center, BVA (inclement weather date February 5th). The observing session starts at sunset.

8th • DVD Lecture Series: "The Mass Density of the Universe", half-hour video presentation of a lecture by Professor Alex Filippenko, UC Berkeley. Room 113, Merion Science Center (former Boucher Building), West Chester University. The presentation immediately precedes the monthly meeting and starts at 7:00 p.m.

8th • CCAS Monthly Meeting, Room 113, Merion Science Center (former Boucher Building), West Chester University. Guest Speaker, Charles Zarcone: "Solar Sights, Storms and Sounds."

11th • West Chester University Planetarium Show: "Black Holes Don't Suck," Schmucker Science Building. The show starts at 7 p.m. and run approximately one hour in length. For more information and reservations, please contact Dr. Karen Vanlandingham, Planetarium Director, via e-mail or visit the planetarium'swebpage.

20th • Open call for articles and photographs for the March 2011 edition of *Observations*.

25th • Reservations start for the March 18th planetarium show at the WCU Planetarium. For more information, please contact Dr. Karen Vanlandingham, Planetarium Director, via e-mail or visit the planetarium'swebpage.

26th • Deadline for newsletter submissions for the March 2011 edition of *Observations*.

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Minutes from the January 2011 CCAS Monthly Meeting

by Don Knabb, CCAS Secretary and Observing Chair

Unfortunately the meeting had to be cancelled due to inclement weather. The evening's activities have been rescheduled for the meeting in February. Let's cross our fingers and hope that Mother Nature (or Father Snow) cooperates!

February 2011 Guest Speaker

by Dave Hockenberry, CCAS Program Chair

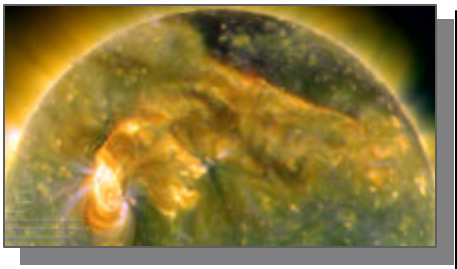


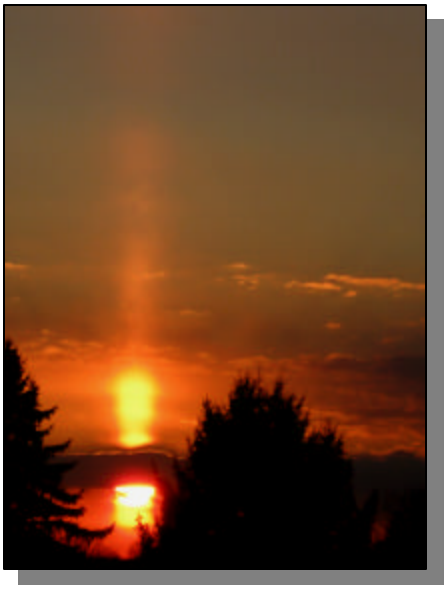
Photo courtesy of Astronomy Photograph of the Day

Due to last month's inclement weather, our January 2011 guest speaker, Charles Zarcone, is now our February speaker. A member of the Delaware Valley Amateur Association, he describes himself as "a guy who bought a solar telescope and is oriented to observing the Sun." His presentation is entitled "Solar Sights, Storms and Sounds." He includes a brief review of the interior of the Sun, and discusses the storms observed on the surface of the Sun. His presentation includes an audio presentation of the sounds emanating from two stars and concludes with a light and sound show.

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

CCAS Original Astrophotography: Sun Pillar with Mirage and Distortion

by CCAS Member Liz Smith



This photo was taken on January 9, 2011, as I was coming home from work in Eagle, PA off of Route 100. I saw the pillar starting and pulled over across from St. Elizabeth's church. When I was done taking photos, I noticed several people behind me who were just as intrigued as me. They also did not know what they were viewing.

I'm pretty sure my description is accurate but feel free to check

(Continued on page 14)

Remembering Challenger

by John C. Hepler, CCAS Webmaster & Newsletter Editor

The Challenger Crew: Front (L. to R.): Capt. Michael J. Smith, Cmdr. Dick Scobee, Dr. Ronald McNair, Ph.D.; Rear (L. to R.): Col. Ellison Onizuka, Mrs. Christa McAuliffe, Mr. Gregory Jarvis, and Dr. Judith Resnick, Ph.D.

I cannot fathom how 25 years have passed since that terrible day. We remember great national tragedies collectively, yet personally. People recall where they were when John F. Kennedy was assassinated, what they were doing when Dr. Martin Luther King was assassinated, who they were with when they learned John Lennon had been killed, the incomprehensibility of 9/11.

On Jan. 28, 1986, the space shuttle Challenger lifted off for the last time with a crew of seven. 73 second later, the Challenger exploded in midair, taking the lives of all seven of her crew, including the first teacher in space, Christa McAuliffe.

What was probably the most horrific aspect of the disaster was its visibility. With Christa McAuliffe aboard, as the first teacher in space, schools across the country were broadcasting the take-off live in every classroom. What more perfectly horrible time could this have happened?

I remember that day vividly: I was finishing a side trip to London during my junior year abroad in France. I was riding in a double-decker bus and saw the announcements posted on the newsstands. At first, I couldn't comprehend the headlines and photographs; the words and images didn't seem to make any sense. I remember feeling very

(Continued on page 11)

Voyager Flyby Anniversary

by John C. Hepler

On a happier note, the week of January 24th marks another milestone in Man's exploration of the solar system. This week we celebrate the 25th anniversary of Voyager 2's historic encounter with Uranus - the first and only time the gas giant has been visited by a spacecraft.

It tripled the number of known moons orbiting Uranus (from five to fifteen), confirmed that the atmosphere is composed primarily of hydrogen and helium, and returned beautiful images like the one below of the nine known rings (at the time) of the planet (which had been discovered telescopically in 1977), and spotted two new rings. Since then, the Hubble Space Telescope has discovered two more Uranian rings.

There's a good article at http://www.jpl.nasa.gov/news/news.cfm?release=2011-023 covering the flyby.

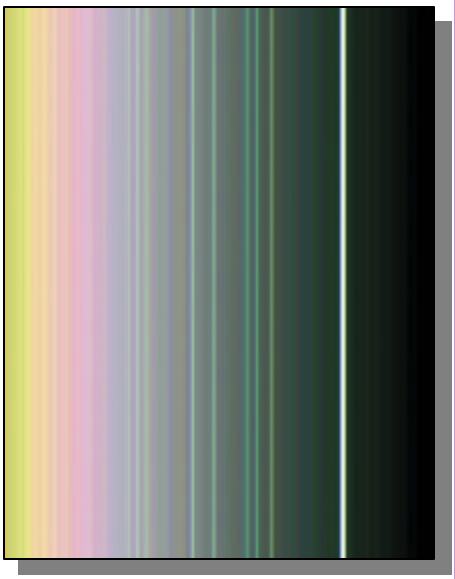
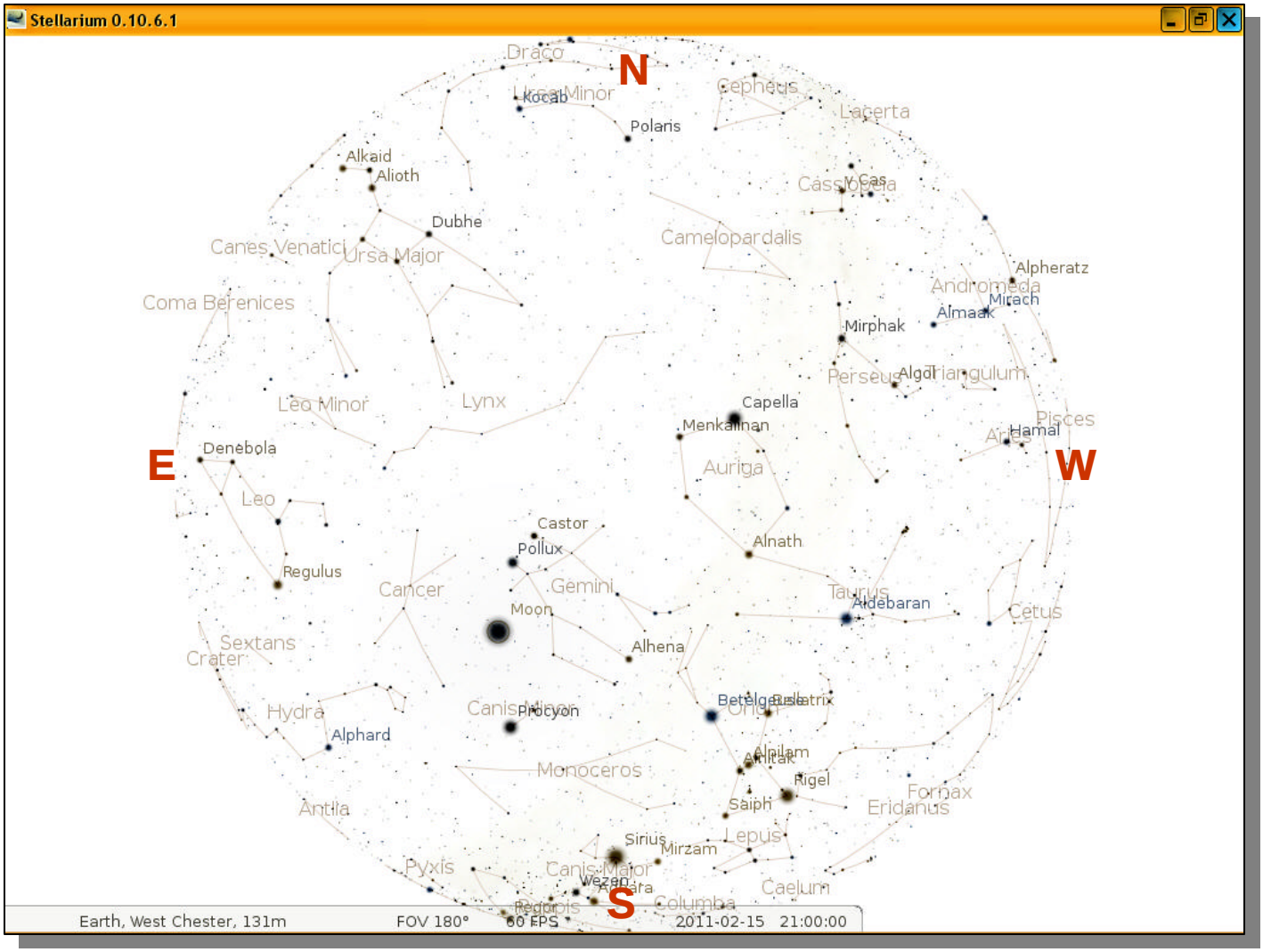


Image of Uranus's rings taken by Voyager 2.
Image Courtesy of NASA / JPL

The Sky Over Chester County

February 15, 2011 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
2/01/2011	6:41 a.m.	7:09 a.m. EST	5:19 p.m. EST	5:48 p.m.	10h 10m 05s
2/15/2011	6:26 a.m.	6:54 a.m. EST	5:36 p.m. EST	6:04 p.m.	10h 42m 21s
2/28/2011	6:09 a.m.	6:36 a.m. EST	5:51 p.m. EST	6:18 p.m.	11h 15m 10s

Moon Phases					
First Quarter	2/11/2011	2:18 a.m. EST	Last Quarter	2/24/2011	6:26 p.m. EST
Full Moon	2/18/2011	3:36 a.m. EST	New Moon	2/02/2011	9:31 p.m. EST

February 2011 Observing Highlights

by Don Knabb, CCAS Secretary & Observing Chair

February 2	New Moon, 9:31 p.m.
February 3	Europa transits Jupiter's face
February 6	Jupiter is near the crescent Moon, a great photo opportunity
February 11	First-quarter Moon, 2:18 a.m.
February 11	The Lunar Straight Wall is visible
February 11	The Pleiades is very near the Moon
February 18	Full Moon, 3:36 a.m.
February 19 – March 6	The zodiacal light is visible about 80 minutes after sunset. Jupiter is at the base of this vague, tall pyramid of light
February 24	Last Quarter Moon, 6:26 p.m.

The Best Sights This Month: A nice sight this month will be on February 6th when Jupiter and a thin crescent Moon are in the western sky just after it becomes dark. Enjoy Jupiter while it remains high enough in the sky to be viewed with a telescope. It will soon be sinking into the thick atmosphere near the horizon.

Mercury: The planet closest to the Sun is not in good position for viewing during February.

Venus: Although Venus is fading from its brightest point it is still a lovely sight in the glow of the sunrise. During the first half of February our sister planet passes through the constellation Sagittarius and the many deep sky wonders in that area of the sky. Of course you must be willing to get up about an hour before the sky begins to brighten with the approaching dawn to see these sights.

Mars: The red planet passes behind the Sun on February 4th, so it is unobservable this month.

Jupiter: We are pulling ahead of Jupiter in our race around the Sun, so it is setting earlier as each day passes. February is the last month during which telescopic viewing will be favorable for Jupiter, so take a long look at the king of the planets before he dives toward the horizon and those murky skies.

Saturn: The ringed planet is rising around 9:30 p.m. at mid-month and is brightening as February progresses. You still need to stay up late to see Saturn when it is high in the sky, but it is worth losing a little sleep for the view! If you head to bed early then just wait until spring arrives for better viewing during the evening hours.

Uranus and Neptune: Uranus is falling behind Jupiter but is still easy to find with the finder charts available at http://www.skyandtelescope.com/uranusneptune. Neptune, however, is unobservable during February as it passes behind the Sun.

The Moon: Full moon is on February 18th. If we have a snow covered landscape it will be very bright outside! This full Moon was called the Full Snow Moon by Native Americans since the heaviest snow usually falls during this month. Some tribes also referred to this Moon as the Full Hunger Moon, since harsh weather conditions in their areas made hunting very difficult.

Constellations: February evenings are full of "shapes in the sky," or as we call them, constellations. The Great Square of Pegasus is setting in the west as the triangle tail of Leo the Lion is rising in the east. Five-sided Auriga is nearly overhead with the "V" of Taurus the Bull to the lower right and the tall Gemini twins to the lower left. The southern sky is dominated by Orion the Hunter, probably the most recognizable constellation in the sky.

Messier/Deep Sky: Grab your binoculars to search the February sky for deep sky objects since binoculars have nearly zero set up time compared to a cold telescope. The hardest part of telescopic viewing during the cold months is putting a telescope away. It's hard to handle a telescope and tripod with gloves on so the cold metal parts chill your hands

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Quest for Dark Energy May Fade to Black

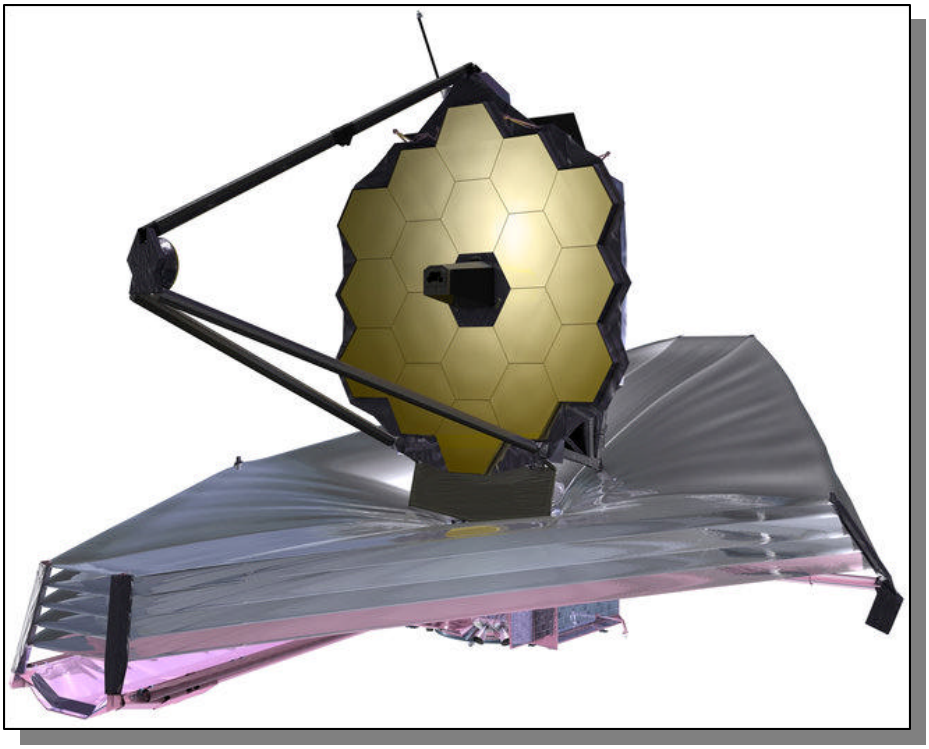
by Dennis Overbye, NYTimes

What happens to a dark energy dream deferred?

An ambitious $1.6 billion spacecraft that would investigate the mysterious force that is apparently accelerating the expansion of the universe — and search out planets around other stars, to boot — might have to be postponed for a decade, NASA says, because of cost overruns and mismanagement on a separate project, the James Webb Space Telescope. The news has dismayed many American astronomers, who worry they will wind up playing second fiddle to their European counterparts in what they say is the deepest mystery in the universe.

"How many things can we do in our lifetime that will excite a generation of scientists?" asked Saul Perlmutter, an astronomer at the University of California, Berkeley, who is one of dark energy's discoverers. There is a sense, he said, "that we're starting to give up leadership in these important areas in fundamental physics."

Last summer, after 10 years of debate and interagency wrangling, a prestigious committee from the National Academy of Sciences gave highest priority among big space projects in the coming decade to a satellite telescope that would take precise measure of dark energy, as it is known, and also look for planets beyond our solar system. The proposed project goes by the slightly unwieldy acronym Wfirst, for Wide-Field Infrared Survey Telescope.



HUBBLE SUCCESSOR NASA's James Webb Space Telescope would require at least another $1.6 billion and several more years to finish.

The Academy's report was ambushed by NASA's announcement in November that the successor to the Hubble, the James Webb Space Telescope, which had been scheduled for a 2014 launching, would require at least another $1.6 billion and several more years to finish, pushing the next big mission to 2022 at the very earliest. The Webb will search out the first stars and galaxies to have formed in the universe, but is not designed for dark energy.

To take up the slack until 2025 — or whenever the American mission can finally fly — the space agency has proposed buying a 20 percent share in a European dark-energy mission known as Euclid that could fly as soon as 2018. In return, NASA would ask for a similar investment by Europe in Wfirst.

But, said Dr. Perlmutter, "most of us think it is hard to imagine if we do Euclid now that we will do a dark-energy mission then." Alan P. Boss of the Carnegie Institution for Science, who heads a committee that advises NASA on astrophysics, said: "If Euclid goes ahead, they're going to own the field. There's no way the U.S. can stop them."

Last month, the American astronomers' worries about falling

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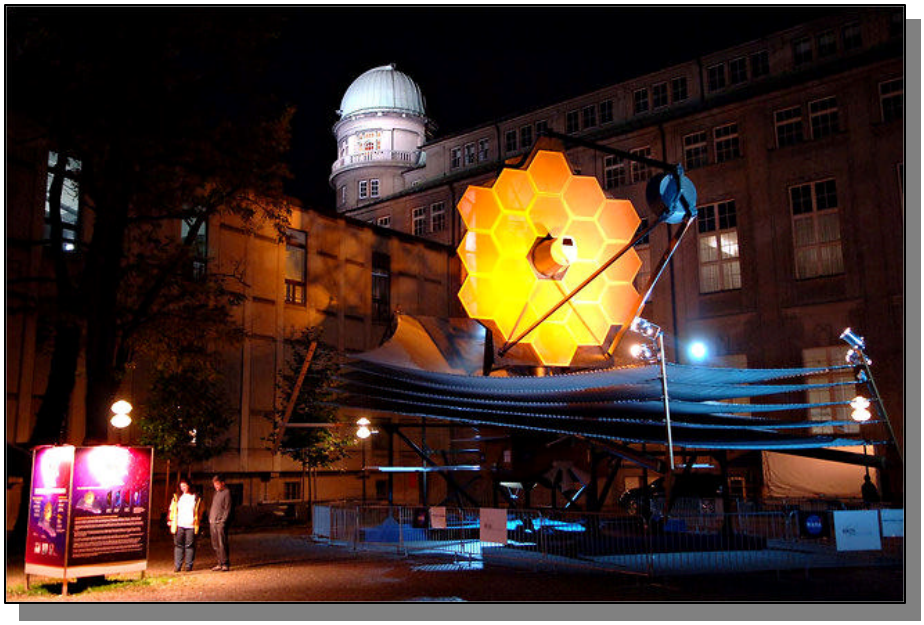
Quest for Dark Energy (Cont'd)



AHEAD IN THE GAME A Model of the Webb Space Telescope in Dublin. A European dark-energy mission known as Euclid could fly as soon as 2018.

(Continued from page 6)

behind seemed to be validated by a second Academy panel convened to consider the Euclid option. The panelists pointed out that part of the reason that Wfirst had been given such high priority was that it could be launched sooner rather than later. The panel urged NASA to stay the course or to explore merging Wfirst and Euclid in a joint operation.

Everybody agrees that nothing is cast in stone yet. Euclid must survive a bake-off with two other projects before it is approved by the European Space Agency, or E.S.A. Not until then, European astronomers say, will they be able to talk about changes to the project.

NASA has not said how it plans to get the $1.6 billion it needs to finish the Webb telescope, and thus how much will be left for other projects this decade. Some of the answers will be in the 2012 NASA budget due next month. "Fitting the E.S.A. and NASA processes together at this stage would be a challenge, but the scientific benefits are clear," according to the new report by the Academy, which was delivered in December.

Jon Morse, director of astrophysics at NASA headquarters, said in an interview that NASA was committed to carrying out the recommendations of the original Academy survey that endorsed Wfirst. It is the "sense of Congress," he said, that the Academy "should guide NASA science programs."

Asked about worries that Euclid could give the Europeans a big leg up in dark-energy work, Dr. Morse said, "The Europeans have developed a significant capability for doing their own missions." "The scientific return for their investment has been outstanding," Dr. Morse said, adding that European astronomers are looking for "frontier scientific discoveries" to make.

Dark energy certainly counts as frontier science. The discovery a decade ago that the universe is speeding up, in defiance of common sense or cosmic gravity, has thrown into doubt notions about the fate of the universe and of life within it, not to mention gravity and even the nature of the laws of physics. It is as if, when you dropped your car keys, they shot up to the ceiling.

Physicists have one ready-made explanation for this behavior, but it is a cure that many of them think is worse than the disease: a fudge factor invented by Einstein in 1917 called the cosmological constant. He suggested, and quantum theory has subsequently confirmed, that empty space could exert a repulsive force, blowing things apart. But the best calculations predict an effect 10 to the exponent of 120 times greater than what astronomers have measured, causing physicists to metaphorically tear their hair out and mutter about multiple universes.

The astronomers who made this discovery were using the exploding stars known as Type 1a supernovae as cosmic distance markers to track the expansion

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Quest for Dark Energy (Cont'd)

(Continued from page 7)

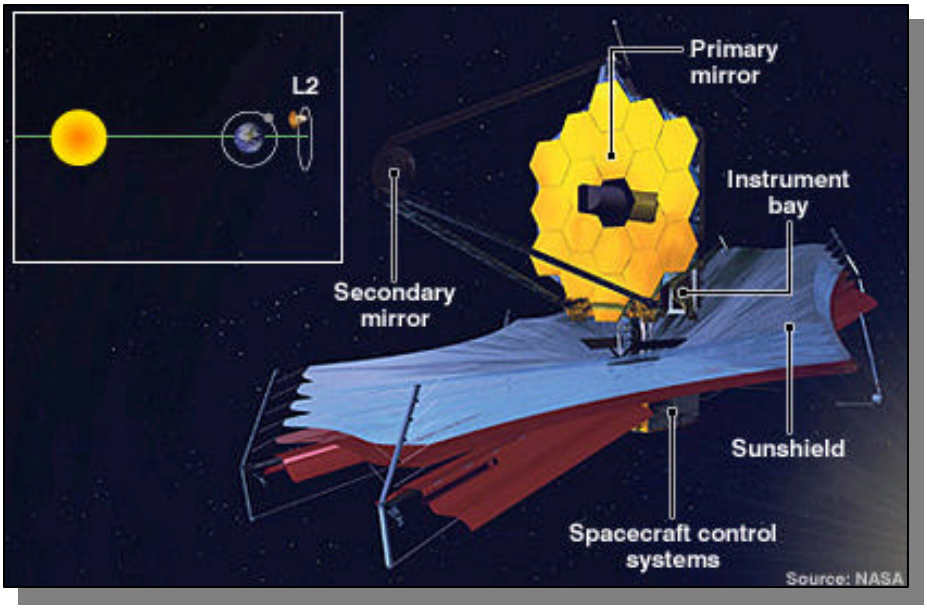
rate of the universe.

Since then, other tools have emerged by which astronomers can also gauge dark energy by how it retards the growth of galaxies and other structures in the universe. So far the observations are consistent with it being Einstein's constant, but not definitive; more precise measurements, many of which can only be done from space, are needed.

Dr. Perlmutter, who works in the Department of Energy's Lawrence Berkeley National Laboratory, proposed a dark energy mission known as SNAP (Supernova Acceleration Probe) in 1999. In 2003, the White House asked the Energy Department to partner with NASA on the project, which became known as JDEM, for Joint Dark Energy Mission, and a call went out for competing proposals.
But NASA and the Energy Department found it hard to collaborate, and several rounds of meetings and committees went nowhere. "Maybe we shouldn't have tried to ride two horses," Dr. Perlmutter said.

In 2008, NASA and the Energy Department budgeted $600 million, not including launching costs, for a mission, but a working group of dark-energy scientists could not come up with a design that would fit in the budget.

Feeling that the blessing of the National Academy of Sciences was needed to proceed with a more expensive project, Dr. Morse submitted a couple of versions of the dark energy mission to the Academy panel — also known as Astro2010 — that was charged with setting priorities for the astronomical community for the next decade.



Main components of the James Webb Space Telescope. Inset: The orbit in which the telescope will move

Alan Dressler of the Carnegie Observatories, who led one of the panel's subcommittees, noticed that three of the submitted projects — including dark energy, a search for planets around other stars, dubbed exoplanets, and a survey of infrared radiation from the heavens — all required the same hardware. He proposed combining them into a larger mission ("putting more eggs into the basket," in Dr. Perlmutter's words), in a project that could launch around 2020. That larger mission they dubbed Wfirst.

"It looked then and it still looks to me like a good deal," said Roger Blandford of Stanford, an astrophysicist and the chairman of the Astro2010 panel.

Meanwhile, the European Space Agency had also made dark energy a priority. Last February, the Europeans sent NASA a letter offering the Americans a 20 percent piece of Euclid and two slots on the mission's science team. American astronomers were ambivalent. Joining Euclid would divert resources from their own mission, thus delaying it.

In September NASA's advisory committee on astrophysics, which is led by Dr. Boss of the Carnegie Institution, concluded that Euclid could spend three or four years "skimming the cream off the dark energy pail" before

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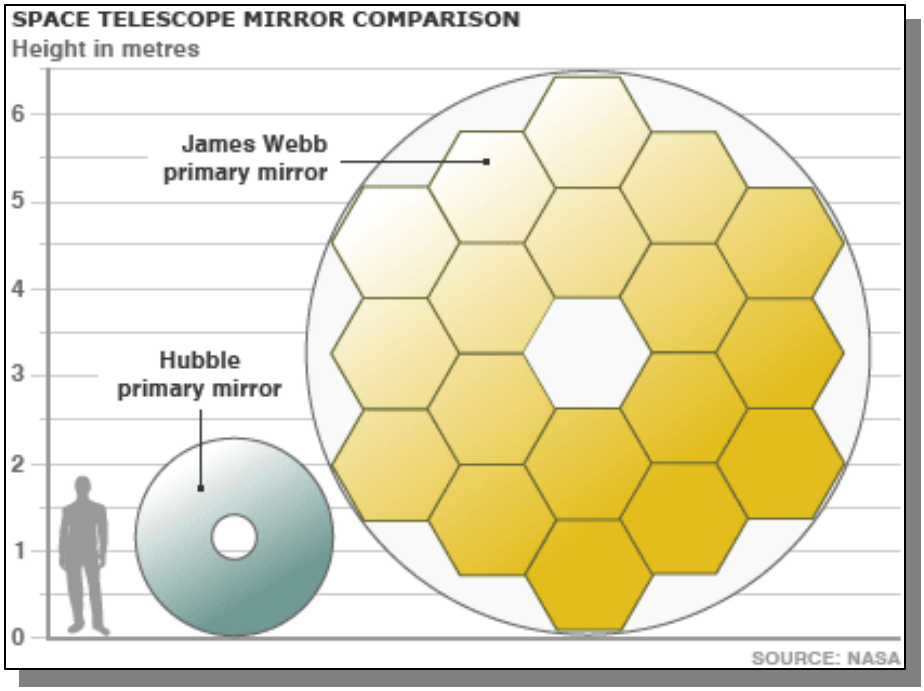
Quest for Dark Energy (Cont'd)



The mirrors of the James Webb Space Telescope and Hubble Space Telescope compared

(Continued from page 8)

Wfirst got into the sky.

Both Dr. Boss's council and yet another committee, the Astronomy and Astrophysics Advisory Committee, which counsels the National Science Foundation and Energy Department as well as NASA, concluded that joining Euclid was not in keeping with the original Academy recommendations.

By the time the second Academy panel reported in December, the news about the Webb telescope's problems had made everything worse. The Webb, which was the highest Academy priority 10 years ago and has already cost $5 billion, could not be launched any earlier than 2015 and would probably be even later, because of NASA's inability to correctly estimate how long it would take to do things like test the telescope. How much of the $2.2 billion that NASA was to have available for new astrophysics missions this decade will be left once Webb is taken care of is anybody's guess.

On top of that, NASA faces what Dr. Morse calls "an evolved difficult fiscal environment," with Republicans bent on reducing the federal budget taking over the House of Representatives.

Some astronomers said they felt ambushed by NASA and Dr. Morse, who briefed the Astro2010 panel during its two years of deliberations. "He didn't know? He should be fired," said Dr. Dressler of the Carnegie Observatories.

Dr. Morse said he understood and shared his colleagues' frustration. But said he had warned the panel all along that its plans could be upset by the Webb, which has always been known to have problems. "The community," he said, referring to the Astro2010 panel, "did the best job they could with what they were given. The fiscal constraints are far worse now than we could imagine a year ago."

Or, as Michael Turner, a cosmologist at the University of Chicago and a member of Astro2010, put it, "We're in a terrible mess."

In December, NASA solicited proposals from astronomers who want to join Euclid and named a team that will begin meeting in February to begin planning Wfirst.

One problem with Euclid from the Academy point of view is that it does not include observations of supernovae, the technique by which dark energy was discovered. Nor does the United States play a leadership role.

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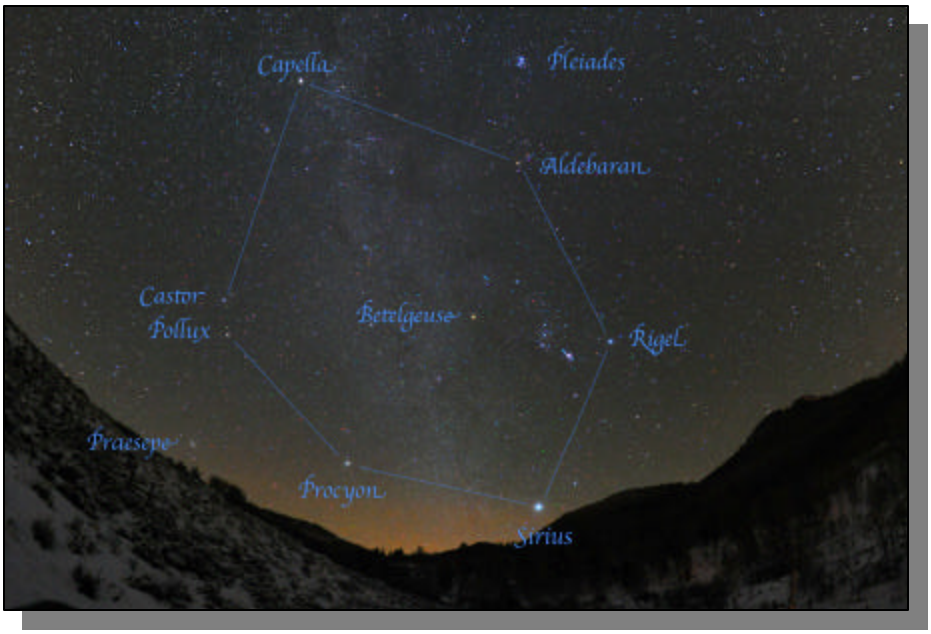
Looking Up: The Winter Hexagon

by Don Knabb, CCAS Secretary & Observing Chair

Telescopic observing during the winter months is not easy in our climate. Setting up, taking down and operating a telescope means you need to have your gloves off to turn knobs and set equipment into place. Eyepieces can easily be fogged by your breath and they can slip out of your hands due to the cold temperatures and your frozen fingers. Even worse is taking your equipment apart after everything is down to very cold temperatures. Holding a tripod leg for even a few seconds chills your hands to the bone!

So during the winter I tend to do more naked eye and binocular observing. Naked eye observing requires nothing more than holding a star map in your gloved hand with a red flashlight in the other hand. Binoculars, once you have them focused correctly, are also easy to handle with gloved hands. And with a lounge chair, warm, layered clothing and a sleeping bag you can be quite comfortable for an hour or so even in below freezing temperatures.

The winter night sky holds many "shapes in the sky". Most of these are constellations, but there are also asterisms, that is, a pattern of stars in the sky. An asterism may form part of an official constellation, or be composed of stars from more than one. Like constellations, asterisms are in most cases composed of stars which, while they are visible in the same general direction, are not physically related, often being at significantly different distances from Earth. The mostly simple shapes and few stars make these patterns easy to identify, and thus particularly useful to those learning to familiarize themselves with the night sky.



Winter Hexagon Over Stagecoach Colorado
Credit & Copyright: Jimmy Westlake (Colorado Mountain College)
Used with permission

My favorite winter asterism is the Winter Hexagon. This asterism covers a huge area of the sky. If you can find Sirius, the brightest star in the sky, you can find the Winter Hexagon. If you aren't sure which star is Sirius, you can certainly find the constellation Orion. Then look to the lower left of Orion and that really bright star is Sirius. From Sirius you can proceed clockwise up to Procyon, then to Pollux (and Castor), on to Capella, down to Aldebaran and on around to Rigel. The band of our Milky Way Galaxy runs through the center of the Winter Hexagon, while the Pleiades open star cluster is visible just above it.

Above is a picture taken by astrophotographer Jimmy Westlake. It was featured on the NASA Astronomy Picture of the Day website on January 3rd of this year. Jimmy is Professor of Astronomy and Physics at Colorado Mountain College in Steamboat Springs, Colorado. You can find his pictures at http://www.jwestlake.com/JRWjr_Astrophotography/Welcome.html. He was gracious to allow me to use this copyrighted picture for this article.

This is an unrivalled collection of stars: Sirius is the brightest star in the night sky, Capella is the 6th brightest, Rigel is the 7th, Procyon the 8th and Aldebaran, Pollux and Castor are

(Continued on page 11)

Quest for Dark Energy (Cont'd)

(Continued from page 9)

Dr. Boss, however, speaking personally, said he worried that those recommendations were out of date with new realities — budget and otherwise — and that following them could keep the United States out of what might be the only dark-energy mission for some time. "It's time for some creative thought," he said.

"The European Union is producing more papers per year than the U.S.," Dr. Boss went on. "They passed us a year ago and are doing quite well."

Dr. Blandford, the chairman of the original Academy panel, agreed. "Dark energy and exoplanets are both fields of tremendous scientific importance and have caught the public's attention," he said. "In both cases, the U.S. is currently the leading contributor. To abdicate that investment and opportunity would seem a terrible shame, but it doesn't mean we have to see Europeans as enemies we have to vanquish."

Dr. Perlmutter, one of the discoverers of dark energy, sounded a similar note. "What's sad here is that everybody's been trying hard, there are no villains," he said. "We all feel it is important to be at the table. At the end of the day we're scientists, you want to see science done."

Link to original article: http://www.nytimes.com/2011/01/04/science/space/04telescope.html?nl=todaysheadlines&emc=tha210&pagewanted=all

Challenger (Cont'd)

(Continued from page 3)

alone, despite the warmth and generosity of my British hosts; I just wanted to go home, to be with family and friends. The only way I could convey the depths of my shock and loss was to ask them, "How would you feel if the Queen Mother died?" That question seemed to create a common bond of comprehension and emotion.

Many people have been online over the last few days, sharing their memories of that morning that seems so long ago yet emotionally like it happened just yesterday. To read some of their comments, visit Yahoo! News, ABC News, and AOL News.

Take a few moments to send me your thoughts and memories at newsletter@ccas.us. I'll share them in next month's newsletter.

Observing (Cont'd)

(Continued from page 5)

very quickly. Binoculars however, once you get them focused, can be easily handled with gloves on your hands. And even a small pair of binoculars will bring many deep sky objects within view.

Look for the three open clusters in Auriga – they might be in one field of view, or nearly so. Then find one of my favorites, the Beehive, in Cancer the Crab. Then aim at Orion's belt and see the beautiful "S" curve of stars on the right side of his belt.

Comets: There are no good comet targets during February as Comet Hartley fades away and leaves us for 12 years.

Meteor Showers: There are no major meteor showers during February.

Looking Up (Cont'd)

(Continued from page 10)

among the night's 25 brightest stars.

This asterism is also called the Winter Circle. The earliest reference to the designation Winter Hexagon that I can find is from the March 1988 issue of Astronomy magazine, although I am sure this shape was seen centuries into the past.

So bundle up on even the coldest night and step outside, if only for a few minutes. That is all it takes to find the Winter Hexagon!

Information credits:

http://en.wikipedia.org/wiki/Winter_Hexagon
http://homepage.mac.com/kvmagruder/bcp/aster/constellations/win6.htm
http://www.daviddarling.info/encyclopedia/W/Winter_Hexagon.html
http://newton.dep.anl.gov/newton/askasci/1993/astron/AST015.HTM
http://antwrp.gsfc.nasa.gov/apod/ap110103.html

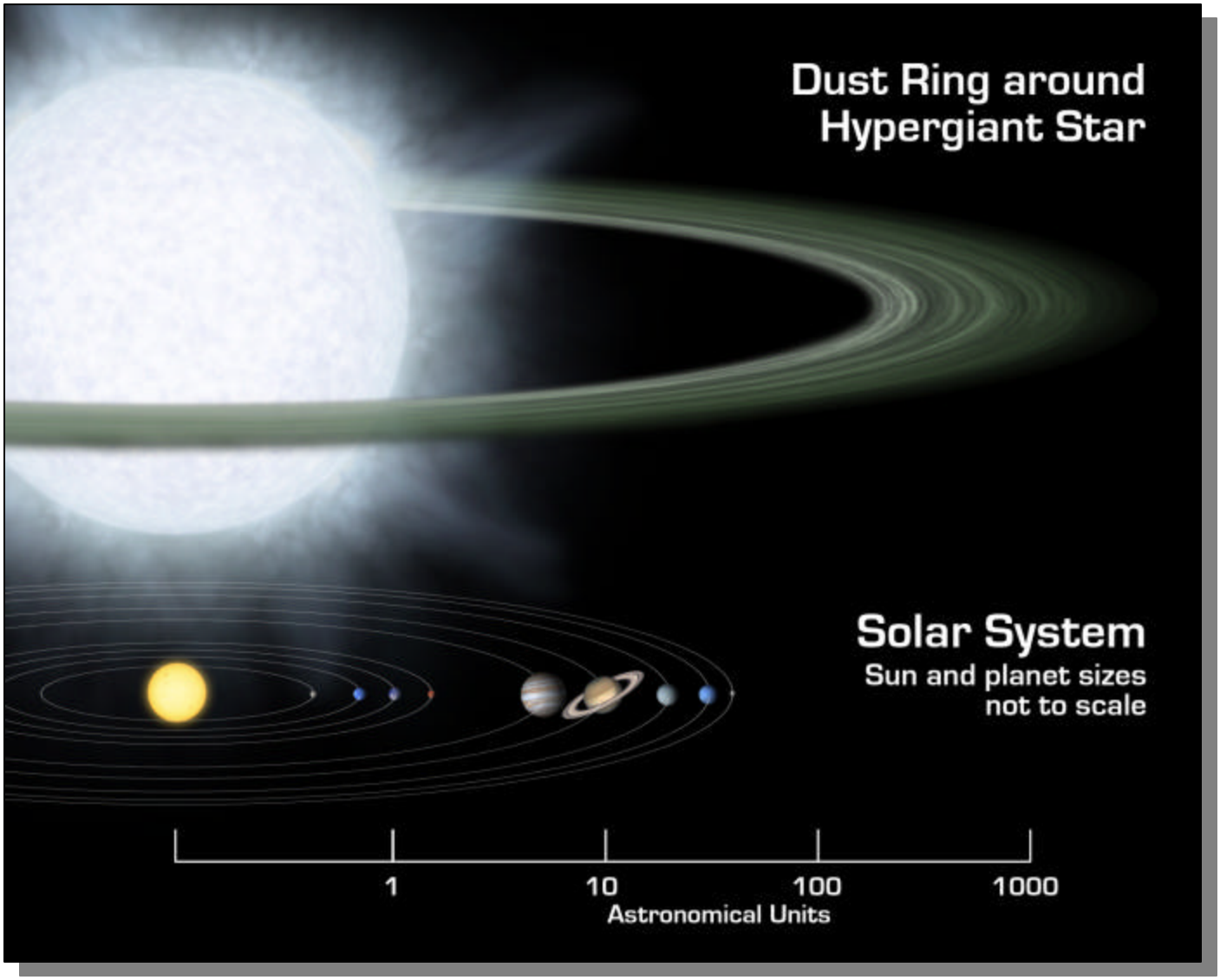
Planets in Strange Places

by Trudy E. Bell

Red star, blue star, big star, small star—planets may form around virtually any type or size of star throughout the universe, not just around mid-sized mid-dle-aged yellow stars like the Sun. That's the surprising impli-cation of two discoveries in 2006 from the 0.85-meter-diameter Spitzer Space Telescope, which is exploring the universe from orbit at infrared (heat) wave-lengths blocked by the Earth's atmosphere.

At one extreme are two blazing, blue "hypergiant" stars 180,000 light-years away in the Large Magellanic Cloud, one of the two companion galaxies to our Milky Way. The stars, called R 66 and R 126, are respectively 30 and 70 times the mass of the Sun, "about as massive as stars can get," said Joel Kastner, pro-fessor of imaging science at the Rochester Institute of Technol-ogy in New York. R 126 is so luminous that if it were placed 10 parsecs (32.6 light-years)

(Continued on page 13)



Artist's rendering compares size of a hypothetical hypergiant star and its surrounding dusty disk to that of our solar system.

Space Place (cont'd)

(Continued from page 12)

away—a distance at which the Sun would be one of the dimmest stars visible in the sky—the hypergiant would be as bright as the full moon, "definitely a daytime object," Kastner remarked.

Such hot stars have fierce solar winds, so Kastner and his team are mystified why any dust in the neighborhood hasn't long since been blown away. But there it is: an unmistakable spectral signature that both hypergiants are surrounded by mammoth disks of what might be planet-forming dust and even sand.

At the other extreme is a tiny brown dwarf star called Cha 110913-773444, relatively nearby (500 light-years) in the Milky Way. One of the smallest brown dwarfs known, it has less than 1 percent the mass of the Sun. It's not even massive enough to kindle thermonuclear reactions for fusing hydrogen into helium. Yet this miniature "failed star," as brown dwarfs are often called, is also surrounded by a flat disk of dust that may eventually clump into planets. (This brown dwarf discovery was made by a group led by Kevin Luhman of Pennsylvania State University.)

Although actual planets have not been detected (in part because of the stars' great distances), the spectra of the hypergiants show that their dust is composed of

(Continued on page 16)

Nicholas's Humor Corner

by Nicholas La Para

CCAS Original Astrophotography

by Dave Hockenberry

NGC891, large spiral galaxy seen edge on in the constellation Andromeda about 27 million light-years away. Shot 1/14/11 with QSI 583wsg camera through AT8RC 8" telescope, Losmandy G11 mount autoguided off-axis with SX Lodestar camera. Stack of 80 minutes Luminance, 30 minutes each Red/Blue/Green filters. Stacked and calibrated and DDP adjustment in CCDStack, LRGB merged and adjusted in Photoshop CS3.

CCAS Original Astrophotography

by Michael J. Joniec

Observation: 2:22 AM until 4:32 AM. The weather was unusually clear, with light northerly winds from 5-15 mph. Quiet & Stillness conspicuous in the environment, and "Moon-shadows" varied from brilliant to nonexistent then returning to brilliant. Birds & other animals not moving with any notice throughout the event, no air traffic, no "shooting stars". The air quality was clear, crisp, with no apparent odors..... lots of peace & quiet.

Coincidences: This lunar eclipse falls on the date of the northern winter solstice. How rare is that? Total lunar eclipses in northern winter are fairly common. There have been three of them in the past ten years alone. A lunar eclipse smack-dab on the date of the solstice, however, is unusual. Geoff Chester of the US Naval Observatory inspected a list of eclipses going back 2000 years. "Since Year 1, I can only find one previous instance of an eclipse matching the same calendar date as the solstice, and that is 1638 DEC 21," says Chester. "Fortunately we won't have to wait 372 years for the next one...that will be on 2094 DEC 21."

The luminosity of the eclipse reveals much about the state of Earth's upper atmosphere. University of Colorado Prof. Richard Keen explains: "At the distance of the Moon, most of the light refracted into Earth's shadow passes through the stratosphere. When the stratosphere is clear (not 'dirtied' by volcanic aerosols) the shadow and therefore the eclipsed Moon is relatively bright."

Keen observed the eclipse on Dec. 21st and was able to draw some conclusions. "Using an 8x reversed monocular, I estimated the visual magnitude of the eclipsed moon at mid-totality as -1.9. This compares with a 'clear stratosphere' value of -2.1 to give a volcanic aerosol optical depth of 0.004--essentially zero. **The stratosphere remains clear**."

This is timely and important because the state of the stratosphere affects climate; a clear stratosphere "lets the sunshine in" to warm the Earth below. Yesterday's bright eclipse reinforces a conclusion Keen reported at the SORCE conference in 2008: "The lunar eclipse record indicates a clear stratosphere over the past decade, and that this has contributed about 0.2 degrees to recent warming."

Camera info: Canon 40D, ISO 200 (bright phases) - 800 (deep totality phase), Picture style "standard" (at factory default), Daylight (full sun) color balance, Large, .jpg. Lens info: Canon 100-300 mm zoom lens EF, 1/125"-1" @ F/5.6, 6.7, 8. Manfrotto tripod & cable release.

Sun Pillar (Cont'd)

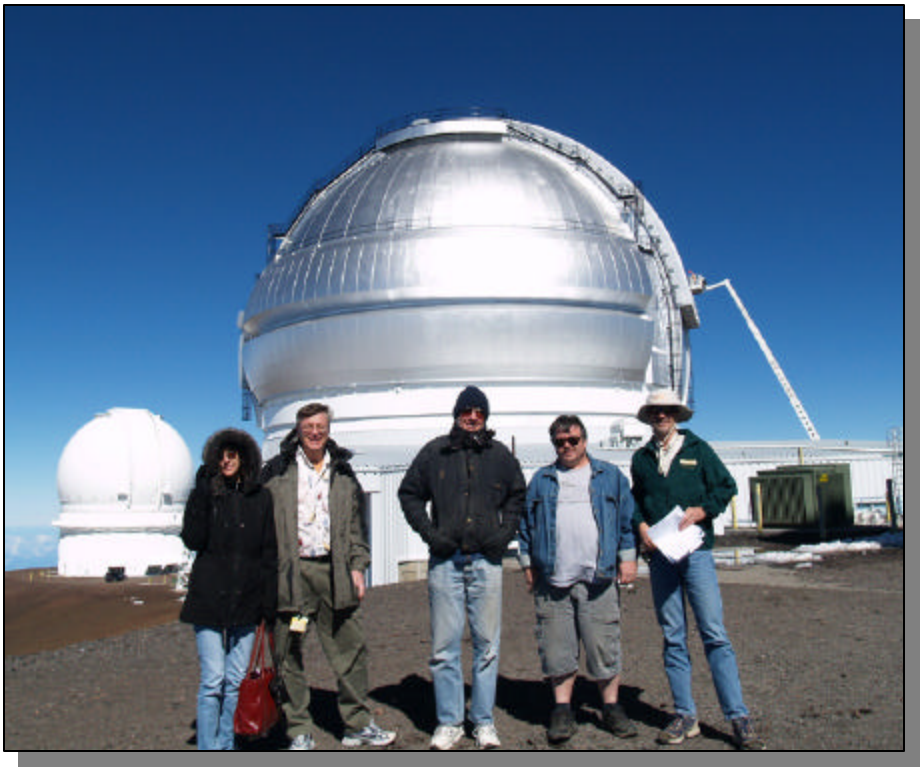
(Continued from page 2)

out this site and tell me what you think: http://www.atoptics.co.uk/

I have really come to enjoy atmospheric optics this year and encourage you to take a look during the day...it can be just as nice as evening viewing!

CCAS Original Astrophotography

by Dr. Bruce Holenstein, Ph.D.

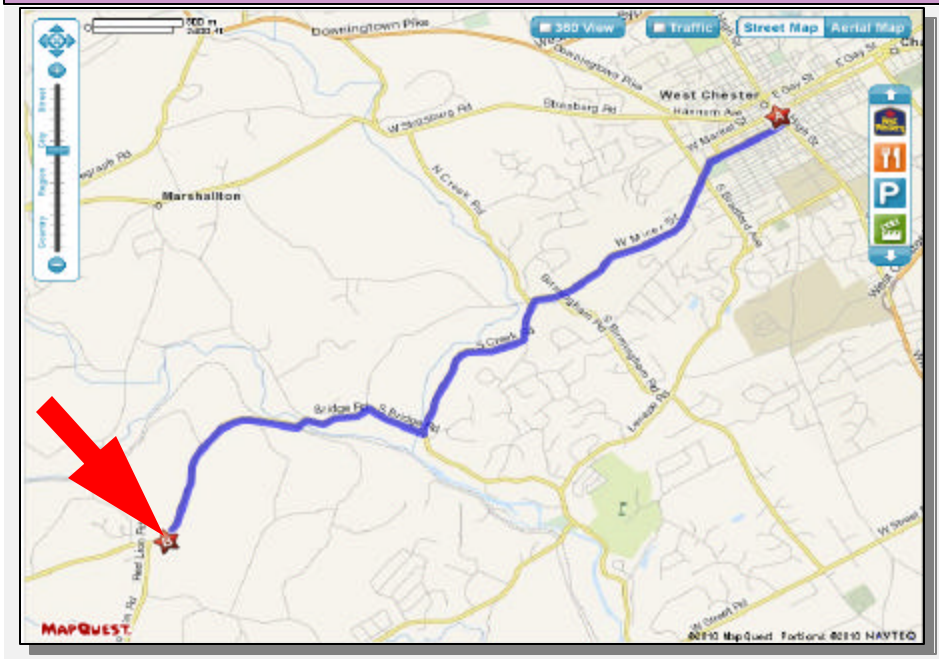


Denise and Bruce Holenstein (on left), Russ Genet (Alt-Az Initiative & LBA conference co -chair), Chris Erickson (West Hawaii Astronomy Club member and MKO visitor center volunteer), and Peter Michaud (our guide from Gemini).

This picture was taken on the summit of Mauna Kea (14,000 ft) on December 30, 2010. We were about to tour of the 8-m Gemini North telescope. In the background on the crane if you look carefully, you can see people working on the dome. The Canada France Hawaii Telescope dome is visible behind Gemini.

More pictures and slides are available at the LBA conference site. Another conference in Hawaii is planned for the end of January, 2012, on portable meter-class astronomy and equipment. There will be again insider tours of several major observatories (probably Keck and Gemini).

CCAS Directions



Brandywine Valley Association

The monthly observing sessions (held year-round) are held at the Myrick Conservation Center of the Brandywine Valley Association.

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 BVA 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).

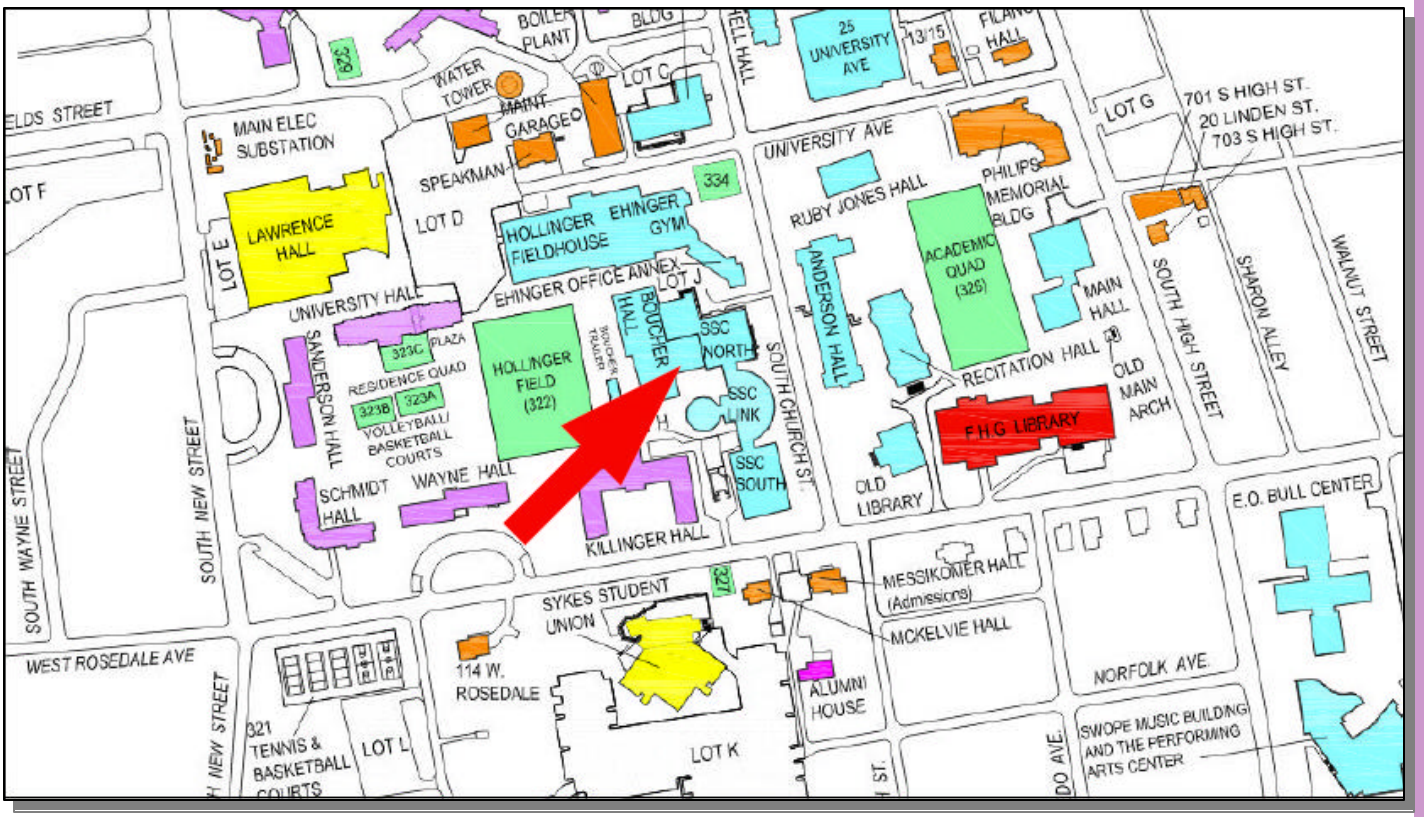
Brandywine Valley Association
1760 Unionville Wawaset Rd
West Chester, PA 19382
(610) 793-1090
http://brandywinewatershed.org/

BVA 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.

CCAS Directions

West Chester University Campus

The monthly meetings (September through May) are held in Room 113 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).



Space Place (cont'd)

(Continued from page 13)

forsterite, olivine, aromatic hydrocarbons, and other geological substances found on Earth.

These newfound disks represent "extremes of the environments in which planets might form," Kastner said. "Not what you'd expect if you think our solar system is the rule."

Hypergiants and dwarfs? The Milky Way could be crowded with worlds circling every kind of star imaginable—very strange, indeed.

Keep up with the latest findings from the Spitzer at www.spitzer.caltech.edu. Kids and their grownup friends can enjoy beautiful images from Spitzer while playing Spitzer Concentration at The Space Place (spaceplace.nasa.gov/en/kids/spitzer/concentration).

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

CCAS Membership Information and Society Financials

Treasurer's Report
by Bob Popovich

Dec. 2010 Financial Summary

Beginning Balance	$1,792
Deposits	$49
Disbursements	$97
Ending Balance	$1,744

Membership Renewals

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

Bob Popovich
416 Fairfax Drive
Exton, PA 19341-1814

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

Note that our CCAS Webmaster John Hepler has a link to the IDA home page set up on our Society's home page at **http://www.ccas.us**.

Dark-Sky Website for PA

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

http://www.POLCouncil.org

Find out about Lyme Disease!

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

http://www.LymePA.org

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

CCAS Event Information

We've set up a special phone number you can dial to find out if our monthly observing session and other scheduled events will be held or postponed. Call **610-436-0829** after 5 PM ET to hear a recording to find out the latest news.

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

★ ★ ★ ★ ★

Green Earth Lighting
Formerly
Outdoor Lighting Associates

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

Green Earth Lighting LLC
620 Onion Creek Ranch Rd
Driftwood, Texas 78619

Phone: **512-944-7354**

http://www.greenearthlighting.com

Local Astronomy-Related Stores

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

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 Kathy Buczynski 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. Kathy's phone number is 610-436-0821.

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
2115 Lazor St.
Apt. 227
Indiana, PA 15701

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 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 (724-801-8789) 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 Pres:	Kathy Buczynski 610-436-0821
ALCor and Treasurer:	Bob Popovich 484-467-5562
Secretary and Observing:	Don Knabb 610-436-5702
Librarian:	Barb Knabb 610-436-5702
Program:	Dave Hockenberry 610-558-4248
Education:	Kathy Buczynski 610-436-0821
Webmaster and Newsletter:	John Hepler 724-801-8789
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 Treasurer's Report in 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:

Bob Popovich
416 Fairfax Drive
Exton, PA 19341-1814

Phone: 484-467-5562
e-mail: B2N2@verizon.net

*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 Bob Popovich.

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 Bob first at **484-467-5562.**

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 Bob Popovich.**