Observations

A Monthly Publication Of The CHESTER COUNTY ASTRONOMICAL SOCIETY

Vol. 17, No. 10 *Two-Time Winner of the Astronomical League's Mabel Sterns Award ¤ 2006 & 2009* *October 2009*

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10/2009	Anderson
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	Jay
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CCAS Upcoming Nights Out

CCAS has several "nights out" 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 17th, we are co-hosting (with the West Chester Recreation Dept.) a night out at Hoopes Park, West Chester.
- ¤ Saturday, October 24th, we are hosting "Galilean Nights: International Year of Astronomy 2009 Cornerstone Project". The event will be held at Ridley Creek State Park 7-10 PM.
- ¤ Friday, November 13th, we are hosting a private night out at Goshen Friends School. We expect 50-75 students from the ages of 3 to 11, accompanied by parents, so we'll need everyone who is available to help out with this large event. More details will follow in the next newsletter.

IMPORTANT NOTICE: THE OCTOBER 2009 MEETING HAS BEEN RESCHEDULED FOR WEDNESDAY, OCTOBER 14, 2009. WE WILL ATTEND A FREE LECTURE BY DR. ED DEVINNEY AT THE BRYN MAWR PRESBYTERIAN CHURCH. SEE PAGE 3 FOR MORE DETAILS.

Important October 2009 Dates

4th • Full Moon at 2:10 a.m.

11th • Last Quarter Moon at 4:56 a.m.

18th • New Moon at 1:33 a.m.

21st • Orionid Meteor Shower Peaks in the Early Morning Hours.

25th • First Quarter Moon, 8:42 p.m.

Autumn 2009 Society Events

October 2009

7th • PA Outdoor Lighting Council monthly meeting. Bucktown Branch of National Penn Bank, 1111 Ridge Rd, (Rt. 23 just west of Rt. 100) in South Coventry Township, PA, starting at 7:30 p.m. Meetings are open to the public. For more information and directions, visit the PA Outdoor Lighting Council website.

9th • WCU Planetarium Show, "Killer Rocks from Outer Space", Schmucker Science Building, Show starts at 7 p.m. For more information and reservations, please contact Dr. Karen Vanlandingham, Planetarium Director, via e-mail or visit the planetarium's webpage.

14th • Special Session of the CCAS monthly meeting: Free Lecture by Dr. Ed Devinney of the Metanexus Institute & Visiting Professor at Villanova University, entitled, "Our Weird Universe, Can We Ever Hope to Understand It?", at Bryn Mawr Presbyterian Church. The lecture starts at 7:30 p.m.

17th • CCAS Monthly Observing Session, Hoopes Park, co-hosted with the West Chester Recreation Dept. The observing session starts at sunset.

20th • Open call for articles and photographs for the November 2009 edition of Observations.

23rd • Reservations start for the November 13th planetarium show at the WCU Planetarium. For more information, please contact Dr. Karen Vanlandingham, Planetarium Director, via e-mail or visit the planetarium's webpage.

24th • CCAS Special Observing Session: "Galilean Nights: International Year of Astronomy 2009 Cornerstone Project". The event will be held at Ridley Creek State Park7-10 PM.

26th • Deadline for newsletter submissions for the November 2009 edition of Observations.

November 2009

4th • PA Outdoor Lighting Council monthly meeting, Bucktown Branch of National Penn Bank, 1111 Ridge Rd, (Rt. 23 just west of Rt. 100) in South Coventry Township, PA, starting at 7:30 p.m. Meetings are open to the public. For more information and directions, visit the PA Outdoor Lighting Council website.

10th • DVD Lecture Series: "Black Holes—Abandon Hope, Ye Who Enter", 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.

10th • CCAS Monthly Meeting, Room 113, Merion Science Center (former Boucher Building), West Chester University. Featured speaker: TBA. Constellation of the Month (COM): TBA. The meeting starts at 7:30 p.m.

13th • CCAS hosts a private night out at Goshen Friends School.

13th • West Chester University Planetarium Show, "Spectacular Saturn", Schmucker Science Building, Show starts at 7 p.m. For more information and reservations, please contact Dr. Karen Vanlandingham, Planetarium Director, via e-mail or visit the planetarium's webpage.

20th • Open call for articles and photographs for the December 2009 edition of Observations.

20th • CCAS Monthly Observing Session, Myrick Conservancy Center, BVA (inclement weather date November 21st). The observing session starts at sunset.

20th • Reservations start for the December 11th planetarium show at the WCU Planetarium. For more information, please contact Dr. Karen Vanlandingham, Planetarium Director, via e-mail or visit the planetarium's webpage.

26th • Deadline for newsletter submissions for the December 2009 edition of Observations.

Minutes from the September 2009 Meeting

By Don Knabb, CCAS Secretary & Observation Chair

- The meeting was held on September 8th, 2009.
- 20 people attended the meeting.
- The DVD lecture "Warping of Space and Time" was shown at 7 pm.
- Website & Newsletter – No report (John Hepler is in class Tuesday nights this fall).
- Treasurer – a report is in the newsletter.
- Observing: There are quite a few star parties scheduled for the fall observing season:
  - ◊ Simpson Meadows in Downingtown, 7 p.m. Wednesday September 23rd with Thursday and Friday as cloud dates.
  - ◊ Anson Nixon Park in Kennett Square Saturday September 19th.
  - ◊ Hoopes Park in West Chester, Saturday October 17th.
  - ◊ Ridley Creek State Park in Delaware County, Saturday October 24th
  - ◊ Goshen Friends School, Friday November 13th.
  - ◊ There is possibly a group of retired individuals sometime this autumn.
  - ◊ There is possibly a group of 4th graders on Tuesday November 17th at Penn Wood Elementary School. Kathy Buczynski is coordinating this event.
- Education – February to May we are scheduled for Backyard Observing classes if resources can be found (Kathy Buczynski is involved in Project Astro with West Chester University, along with Bob Popovich).
- John Hepler was awarded the Mabel Sterns Newsletter of the Year award from the Astronomical Society.
- Don Knabb was presented with the Constellation Hunter Northern Skies club pin and certificate.
- Roger Taylor reviewed the survey results. Of 64 sent out we got 32 back, which is considered good for surveys. The results will be published in an upcoming newsletter.
- Roger will schedule an executive committee meeting before the November meeting to review the survey results and any items that were suggested.

Facebook Advertising Experiment

by John Hepler, CCAS Webmaster & Newsletter Editor

During the month of August I ran an advertisement in Facebook promoting CCAS with a link to our website. I hoped to attract attention and new members using Facebook's business/interest group advertising feature.

For those members not familiar with Facebook, it is a free social networking website where friends can share pictures, post updates on their current activity, comment on each other's activity, send messages to each other, take member-generated quizzes (usually wrong), and whatnot.

Based on a $1.00 per day budget and a potential local audience of over 5000 people (profiled on interests), we ended up with a $30 bill for the month and only 53 click-throughs to our website.

I decided not to continue to run the advertisement as I don't think even the small amount spent was worth the low response to the advertisement. If anyone is interested in advertising on Facebook for their own business or another interest group, please contact me at webmaster@ccas.us and I'll be happy to explain how to set up a Facebook ad.

October CCAS Monthly Meeting Date & Location Change

by Roger Taylor, CCAS President

Our regular monthly session has been rescheduled from Tuesday, October 13th, to Wednesday, October 14th, so we can attend a free lecture by **Dr. Ed Devinney**, President of the Board of Directors of the Metanexus Institute and Visiting Astronomy & Physics Professor at Villanova University.

The lecture will be delivered 7:30 to 9:00 p.m. on Wednesday, October 14th at the Bryn Mawr Presbyterian Church. The lecture, ***Our Weird Universe: Can We Ever Hope To Understand It?***, presents our contemporary understanding of the universe and will be understandable by an intelligent layperson.

In the last decade, cosmology, the study of the whole Universe, has revealed a non-intuitive picture that is strange indeed. This strangeness encompasses all aspects of the Universe—its beginning and end—and even its composition. Moreover, life in the universe is found to depend on very special conditions present at the very beginning of time. Are we special, or is our Universe merely one of an uncountable number of "universes"?

More information about the lecture is available at the Metanexus Institute website (http://www.metanexus.net/magazine/tabid/159/id/10897/Default.aspx).

This talk and all talks in **Metanexus Science and Spirit lecture series** are free to the public and will take place at 7:30 pm in Congregational Hall of Bryn Mawr Presbyterian Church, 625 Montgomery Avenue, Bryn Mawr. For more info: (484) 592-0304 or info@metanexus.net.

Sponsored by Metanexus Institute in conjunction with Bryn Mawr Presbyterian Church.

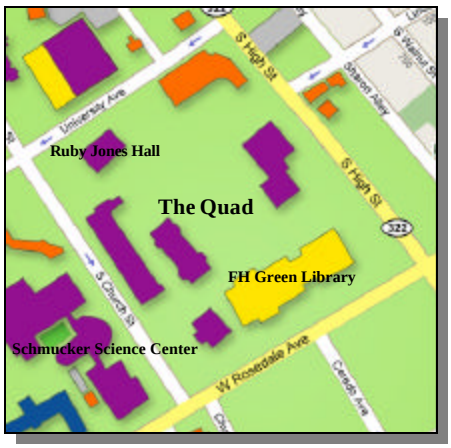
No Night without a Telescope, Part II

by Kathy Buczynski, CCAS Vice President

As reported in last month's edition of *Observations*, West Chester University is taking part in a local program involving area colleges called ***"No Night Without a Telescope"*** to celebrate the IYA. Starting on Friday October 23rd from 6:00-8:00 PM and continuing every Friday until November 20th, Dr. Bob Thornton, Dr. Karen Vanlandingham, and Dr. Marc Gagne will have portable telescopes set up on the lawn of the WCU Quad, where anyone will be able to look through telescopes at Jupiter, star clusters, the Moon, and more. CCAS members have been invited to participate in the program.

So far we have volunteers from CCAS for October 23rd and November 6th. We still need volunteers for November 13th (when we also have a large private night out scheduled at Goshen Friends' School) and November 20th.

This is a great opportunity to engage WCU students and the public in the wonders of the night sky. Perhaps we can even encourage them to join CCAS!



Telescopes will be set up on campus in the academic Quad between the main library and Ruby Jones Hall.

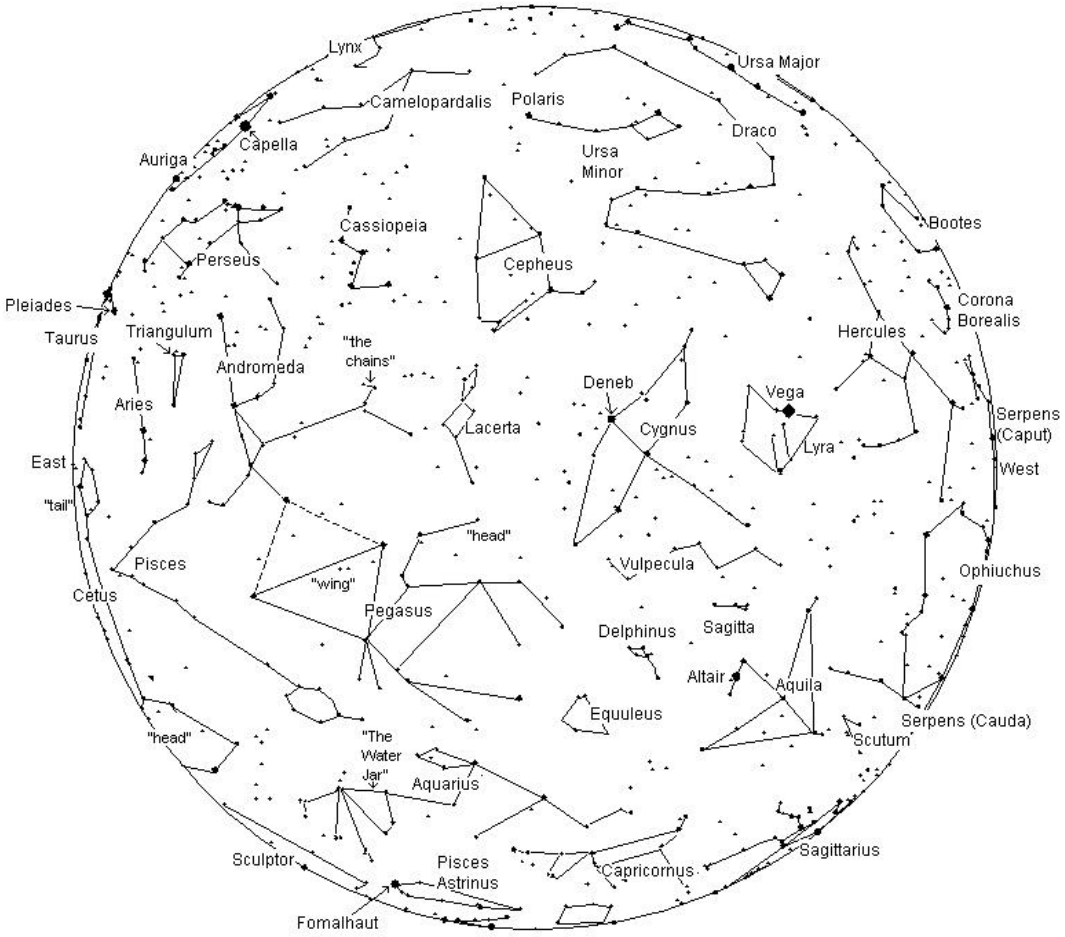
In the case of clouds or rain, WCU astronomers will either open the West Chester University Planetarium, or have a public presentation in the Merion Science Center. Notification as to whether the events will be outside or inside will be posted on the official site (http://courses.wcupa.edu/rthornton/nnwtblack.htm) by 5:00 PM each Friday.

If you would like to participate or want more details about the program, contact Bob Thornton at (610) 436-2614 or via e-mail at rthornton@wcupa.edu.

The Sky Over Chester County

October 15, 2009 at 9:00 p.m. EDT

Note: the constellation stick figures used on the chart above were adapted from the book *The Stars: A New Way to See Them*, by H. A. Rey. This excellent guide to learning the constellations can be purchased at many area book stores, or from online booksellers.



This chart was produced using *Guide 8.0* skymapping software by Project Pluto, Bowdoinham, Maine

The faintest stars shown on this chart are fifth magnitude.

Date	Sunrise	Sunset	Moon Phases		
10/01/2009	6:57 a.m. EDT	6:42 p.m. EDT	First Quarter	10/25/2009	8:42 p.m. EDT
10/15/2009	7:12 a.m. EDT	6:20 p.m. EDT	Full Moon	10/04/2009	2:10 a.m. EDT
10/31/2009	7:29 a.m. EDT	5:59 p.m. EDT	Last Quarter	10/11/2009	4:56 a.m. EDT
			New Moon	10/18/2009	1:33 a.m. EDT

October 2009 Observing Highlights
by Don Knabb, CCAS Observing Chair

October 4 Full Moon 2:10 a.m.

October 11 Last Quarter Moon 4:56 a.m.

October 18 New Moon 1:33 a.m.

October 21 Orionid meteor shower peaks in the early morning hours.

October 25 First Quarter Moon 8:42 p.m.

The Planets: Jupiter rules the evening sky during October. If you stay up quite late Mars rises around midnight, but all the other bright planets are best viewed in the hours just before dawn.

Mercury: The first half of October is the best time to see Mercury in the eastern twilight before that big ball of hydrogen and helium rises in the east.

Venus: If you have a view out an eastern window while you brush your teeth in the morning you can see the "morning star" shining brightly before the Sun rises. Better yet, set down your toothbrush and step outside into the crisp October air to see our brilliant sister planet.

Mars: Mars rises around midnight but is best viewed in the hours before dawn when it is high in the sky.

Jupiter: Jupiter is shining brightly in the south as darkness falls. It is shining at magnitude -2.6 and is easily visible just after the Sun sets. The king of the planets was a favorite at our recent star party at Anson Nixon Park in Kennett Square.

Saturn: The rings of Saturn are very thin during October and you need to get up before dawn to see them. On the morning of October 13th Venus and Saturn are very close in the pre-dawn sky.

Uranus and Neptune: Both of the outer gas giants are visible in the evening sky. Finder charts are in the September issue of Sky and Telescope magazine and also on the Sky and Telescope web site.

Pluto: Pluto is in Sagittarius as the evening glow fades, shining at a dim magnitude 14. The June issue of Sky and Telescope has a finder chart if you would like to seek out this distant ex-planet.

The Moon: The Harvest Moon occurs on October 4th. On October 26th the Moon and Jupiter make a beautiful pair in the night sky.

Constellations: During October we begin to lose the summer triangle and all the delights it holds, but here come the fall and winter treasures! The dim but huge Great Square of Pegasus dominates the southern sky and by 9:00 we can find the jewels of the night – the Pleiades rising in the east. Stay up late and Taurus the Bull leads Orion the Hunter up from the eastern horizon.

Messier/Deep Sky: The deep sky highlight of this time of year for me is the Andromeda Galaxy, M31. You don't need to be up late to catch the wonderful Double Cluster in Perseus and the compact star cluster M34 is just a bit to the south, also in Perseus. Stay up until 10:00 and you can see the star clusters in Auriga rising: M36, M37 and M38.

Comets: If predictions hold true we might have an 8th magnitude comet to gaze upon during October. Comet C/2006 W3 (Christensen) is in Aquila the Eagle during October. Use the finder chart in the October issue of Astronomy magazine and look for this comet when the Moon is absent from the night sky.

Meteor Showers: The Orionid meteor shower peaks in the early morning hours of October 21st. You could see up to 30 "shooting stars" per hour. This is a good opportunity to see meteors since the Moon will not interfere with the show.

Astronomy on the Road in South Africa

by Kos Coronaios, Soutpansberg Astronomy Club

[Editor's note: You may have noticed that the IYA logo is not in English on page one. It's in Afrikaans. Our final journey to learn how IYA2009 has been celebrated around the world takes us to the Republic of South Africa. Members of the Astronomical Society of Southern Africa and the Limpopo Astronomy Outreach Programme share their experiences.]

On Friday, June 26th, 2009, around lunch time, my son James, Cuan (a grade nine pupil from Louis Trichardt High School), and I headed north over the Soutpansberg mountain range towards Tshipise and our first stop for the weekend's outreach programme at Forever Resorts.

The display and telescope were set up at the entrance to the resort so as to cater to the local population and the resort's staff and guests. With the school holidays under way, the popular destination was packed with holiday makers and kids. James and Cuan realised that unfortunately this weekend was not going to be a holiday for them. Taking turns to man the telescope and display until well after 22:00, they were both quite exhausted by the time we called it a night.

A few minor gremlins with the equipment were sorted out during the course of the evening and fine tuned the next day.

The following morning we enjoyed a leisurely breakfast at the restaurant and soon afterwards the display and telescope were set up again at the entrance to the restaurant. This was in close proximity to the shops and we were well-rewarded with a continuous flow of kids and adults during most of the day.

Information on the Sun, Saturn, Jupiter, the solar system and Moon was handed out and everyone passing by had a view of the Sun through the telescope. An important book by Ginny Stone, Sibo in Space, was a hit with the children and copies were quickly snapped up. The IYA 2009 banner and telescope were definitely crowd pullers and one could see the kids pointing and asking their parents if they could come over and see what it was all about.

James & Cuan

At around 14:30, I moved the display to the area where we would be setting up the telescope for the evening. By 17:00 we were once again ready and my wife, Sarah, and Christopher, our 3 year old son, joined us from Louis Trichardt to lend a helping hand. This allowed Cuan to man a spotting scope trained on the Moon while I operated the telescope and camera while Sarah assisted.

Beautiful views of the Moon and Saturn were projected on the screen and I kept a running commentary on what we were viewing. Various astronomy clips were utilised during the evening

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Solar Observing at the Forever Resorts. Who's minding the stove?

Astronomy on the Road (cont'd)

(Continued from page 6)

allowing us to take a few minute's break.

All-in-all, the evening was well attended and ended around 22:30 with only a handful of people remaining as temperatures plummeted to a couple of degrees above zero. The die-hards were shown a few of the more popular targets such as M4, M6 & 7, M8, M20, Omega Centauri, Jewel Box and Alpha Crucis through the eyepiece before we all called it a night.

After a quick cup of coffee on Sunday morning, we headed east towards Pafuri (northern Kruger National Park). About 20 km from Tshipise a vibration and grating noise forced a halt to the journey and a blown tyre on the trailer had to be changed.

On arrival at Pafuri River Camp, ingredients for brunch were handed over to Robert the chef, who cooked us a lovely meal of bacon eggs and sausages. A walk along the river, followed by an hour or so of relaxing at the camp, were most welcome prior to meeting our interpreter Nelson at the community centre in Bende Mutale. The centre is still in the process of being built and the floor was mopped in preparation of our arrival, but unfortunately it was still wet when we started, so the kids carried in bricks to use as chairs.

A Big Wow for this Resort Employee

New Community Centre Underway in Bende Mutale

From 15:30 to 17:00, 50 Southern Star Wheels were completed by the kids, and shortly after sunset we were joined by Edward, who helped me translate as we showed a 70-plus strong crowd views of the Moon & Saturn on the screen.

A question and answer session followed by various astronomy related clips showing the different size of the planets and stars ended the evenings entertainment.

While packing up, a small group of visitors to Pafuri River Camp arrived and I gave them a short presentation of what's up with views through the telescope. All keen birders, they now have another use for their binoculars.

Thank you to Forever Resorts Tshipise, Pafuri River Camp, Mirror & Zoutpansberger, Maranga Phanda Office National, Leach Printers, Auke Slotegraaf (Southern Star Wheel), Edward Foster from Biospoor (fossil posters), SAAO, SAASTA and everyone else involved in making this project a success.

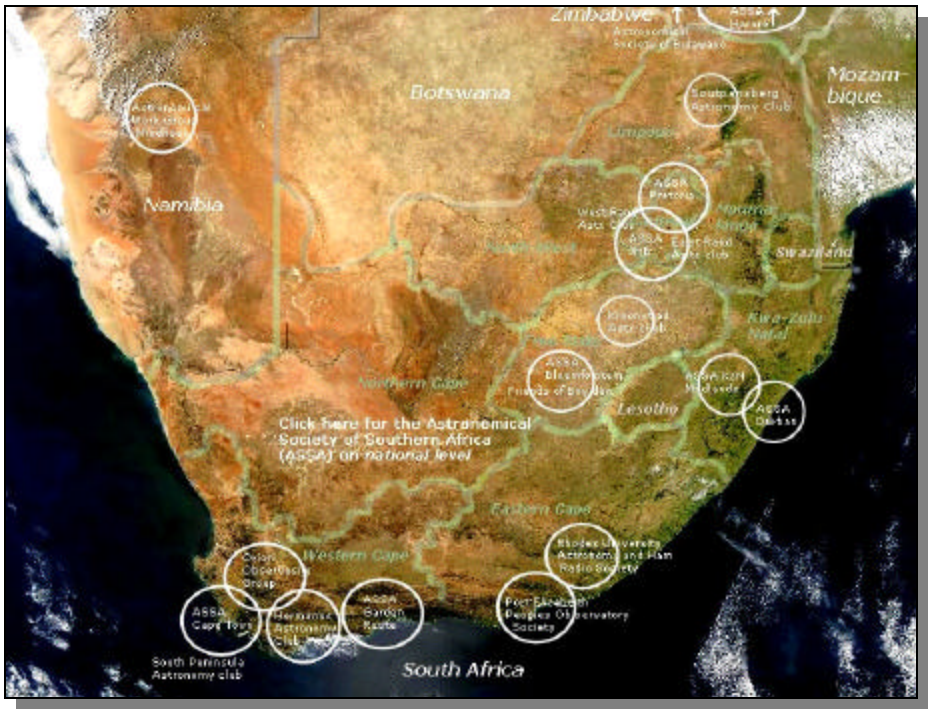
Children Constructing Southern Star Wheels in the Community Centre in Bende Mutale

The Southern Star Wheel

by Auke Slotegraaf

The 22 students in the 5th grade class at Ridgeway Independent School in Louis Trichardt couldn't wait for the Sun to set and try out the Southern Star Wheel. Designed by me and first used for Astronomy Month in 2008, the planisphere has become a popular activity. The kids enjoy building it, and it has at least four different kind of inserts (bright stars, star lore, constellations, etc.). It is an ideal way for kids and adults alike to learn about the South African Sky.

Astronomical Organizations in Southern Africa



Map of Southern Africa identifying the local centres of the ASSA

ASSA History & Organization

The **Astronomical Society of Southern Africa** is a body consisting of both amateur and professional astronomers. Membership is open to all interested persons, regardless of knowledge or experience.

The goals of the Society as published in the constitution are:

1. the encouragement and stimulation of the study of astronomy in Southern Africa;
2. the association of observers and their organisation in the work of astronomical observation and research;
3. the dissemination of such current astronomical information as may be helpful to observers and others interested in astronomy.

Two years after the 1910 apparition of Halley's Comet, the **Cape Astronomical Association** was established, with S.S. Hough, His Majesty's Astronomer at the Cape, as President. In 1918, the **Johannesburg Astronomical Association** was created, with R.T.A. Innes, Union Astronomer, as President. Following an invitation from the Cape Association it was decided in 1922 to merge the two Associations to form the "Astronomical Society of South Africa". The Society changed its name to the **Astronomical Society of Southern Africa** in 1956.

Local chapters ("centres") of the ASSA hold regular meetings in Cape Town (Cape), Durban, Harare, Hermanus, Johannesburg, Bloemfontein, Pietermaritzburg (Natal-Midlands), Pretoria and Sedgefield (Garden Route). Visitors are welcome at meetings and may, if they wish, join a local centre without becoming full members of the Society.

There are eleven sections within the Society which co-ordinate the activities of the members of these special-interest groups.

There are six observing sections:

- Comets and Meteors
- Deep-sky
- Double Stars
- Occultations and Variable Stars
- Solar
- Cosmology

The other special interest sections are:

- Dark Sky
- Education and Public Communication
- Historical
- Imaging section (including astrophotography)
- Computing

http://assa.saao.ac.za/

Limpopo Astronomy Outreach

by Kos Coronaios, Soutpansberg Astronomy Club

Limpopo Astronomy Outreach visited Vaalwater on the 19th and 20th of August, 2009.

Two hours after leaving Louis Trichardt, the road headed up the northern slopes of the Waterberg Mountains and saw me dodging fallen rock slides and baboons rushing across the road.

Arriving at Boschdraai Primary School (40 km from Vaalwater) shortly after lunch, I was greeted by the learners who rushed towards the vehicle and trailer. They were expecting me one hour earlier and could not wait for my arrival, Katie and Toboha explained, as they welcomed me to the school.

My two assistants helped with translation (which was not really needed) and handing out materials, etc. They explained that the Headmistress was away for the day on a workshop, but would join us for the evening's stargazing later on.

The next couple of hours were spent building Southern Star Wheels and MoonScopes with the eager learners who had loads of questions to ask.

During the afternoon we practised how to use the Star Wheel and the MoonScope, stressing that they must not look at the Sun with it. Explaining the basic principals of the Star Wheel, I had a couple of the kids imagining that they were the Sun and Earth, and showed them how the view of the sky changed as the Earth rotated, while at the same time orbiting the Sun.

IYA2009 Poster translated into isiXhosa

Information on the Moon came next, with some interesting facts which the kids found really exciting, especially when they learned that they could jump really far, and that they could not hear their teachers shouting at them to keep quiet.

After the presentation, I had just enough time to head to Windsong Cottages to meet Dr. Philip

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Boschdraai Primary School Students Construct Their Own Southern Star Wheels

Outreach (cont'd)

(Continued from page 9)

Calcott who had kindly supplied the accommodation. After hurriedly unpacking, I rushed back to the school to set up equipment for the evening's stargazing.

Children, adults and learners arrived at the school around sunset and after meeting headmistress Johanna Motshodi, who apologised for missing the afternoon session, we started the evening's proceedings.

Views of Jupiter and deep sky objects were shown on the improvised screen, including various clips explaining, for example, how big and far stars are. Once again the children had lots of questions to ask about falling stars, rockets and space travel.

The audience found our South African star lore very interesting and we finished the evening with a quick look at some of the constellations that were visible in the crystal clear, unpolluted and light-free Waterberg skies.

Unfortunately, views of the Moon with their newly built MoonScope would have to wait for a couple of nights when the crescent Moon would be visible in the west.

Midday the following day found me addressing pupils and a few teachers at the Waterberg Academy a few kilometres outside the small town of Vaalwater. The Director of the ASSA Imaging Section, Oleg Toumilovitch, and his daughter Alicia joined us, and Alicia helped with handing out material: scissors, glue, and the various components to construct the MoonScopes and Star Wheels. A very capable Mike Burton, a teacher at the school, was instrumental at crowd control and once again the learners were full of enthusiasm and questions.

Oleg was called upon to assist in answering a couple of the questions and it was a pleasure having someone with his knowledge

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The colorful exterior of the primary school showcases the IYA2009 poster inside. Which represents the past, which represents the future?

Starstuff: What Dreams May Come

by Roger Taylor, CCAS President

OK, I admit it. I am a science fiction fan. It's been in my blood since junior high school when I read Robert Heinlein's 1947 book *Rocket ship Galileo.* No, it was an old book when I read it! It spoke of a group of entrepreneurial types who would finance and build a spacecraft that could travel to the moon. They made sure that all of the latest equipment would be on board, including Slide rules.

In E.E. "Doc" Smith's *Lensman* series written in the 1930's and 40's, our heroes were fully enabled space travelers of the 1960's. They had faster than light travel and inertial dampers on the space ships, so they could change directions instantly. "Doc" Smith even postulated a version of a captive "black hole" he called a "negasphere". The story heroes would shepherd asteroids in ever increasing sizes into it to create a huge mass of planet destroying capability. How did they manage their energy needs? They used huge Copper "buss bars" , essentially huge switches thrown by big sweaty guys in engineering to make the power flow. Add to this the huge glass fuses necessary to change every time they fired a primary energy weapon.

In Fritz Lange's epochal and archival film *Metropolis* personal aircraft filled the skies over a 1980 New York. All of these little airplanes had propellers. Ah, who knows what the future holds in store?

In the movie *The Mysterians* first seen on the big screen in 1957, we are introduced to a huge toroid of a space station in earth orbit in 1978. It was subsequently destroyed in an attack by the "Mysterians" spacecraft from beyond the asteroid belt.

It would be a shame to leave out Stanley Kubrick's 1968 movie based on a 1950 Arthur C. Clarke short story *2001: a Space Odyssey.* Dave slowly removes the memory chips the size of Hershey chocolate bars from the computer that operates the mutinous space ship.

This is not just a trip down memory lane but various examples of how we project current events and trends onto future events. This was not just limited to fanciful novelists. A 1967 front page New York Times article stated "The most ambitious U.S. space endeavor in the years ahead will be a campaign to land men on neighboring Mars. Most experts estimate the task can be accomplished by 1985." The RAND corporation, a forward thinking group, predicted that there was a sixty percent chance that there would be a manned lunar base by 1986. As late as 1980 *The Book of Predictions*

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Cover for the Audio Book Series

Through the Eyepiece: The Helix Nebula, NGC 7293

by Don Knabb, CCAS Observing Chair

It is difficult for me to select a single astronomy photograph as my favorite, but this picture of the Helix Nebula would certainly be a finalist. It is a blend of ultra-sharp images from the Hubble Space Telescope combined with the wide view of the Mosaic Camera on the National Science Foundation's 0.9-meter telescope at Kitt Peak National Observatory near Tucson, Arizona. One can see why this photograph was widely circulated on the Internet several years ago as the "Eye of God".

The Helix Nebula, also known as The Helix or NGC 7293, is a large planetary nebula located in the constellation of Aquarius. Discovered by Karl Ludwig Harding, probably before 1824, this object is one of the closest to the Earth of all the bright planetary nebula. It is similar in appearance to the Ring Nebula in the constellation Lyre.

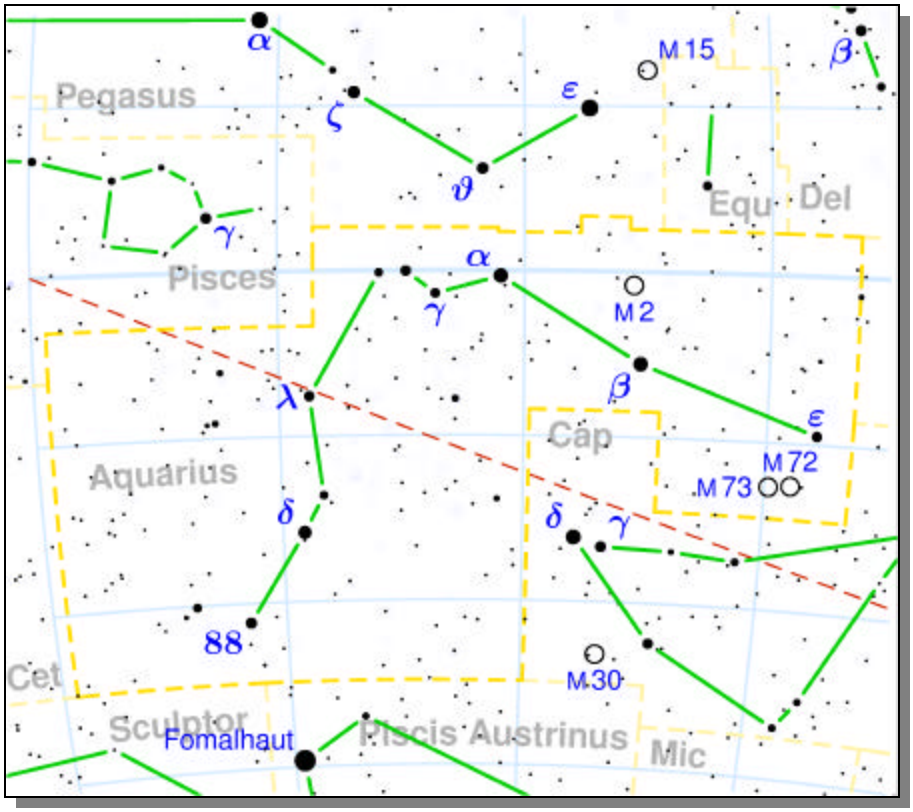
The Helix Nebula is an example of a planetary nebula formed at the end of a star's evolution. Gases from the star in the surrounding space appear, from our vantage point, as if we are looking down a helix structure. The remnant central stellar core is destined to become a white dwarf star. The glow of the central star is so energetic that it causes the previously expelled gases to brightly fluoresce.

During October the Helix Nebula will be visible just after the sky is fully dark. You will need to be at a dark sky observing site and have a good size "light bucket" telescope to pick out this large and dim fuzzy object. A large Dobsonian would be ideal to seek out the Helix Nebula, and you'll probably see it best using averted vision. The nebula is located below the constellation Aquarius the Water Bearer.

Helix Nebula. Photo credit: Hubble Space Telescope

The apparent size of the Helix Nebula covers an area of 16 arc minutes diameter, more than half of that

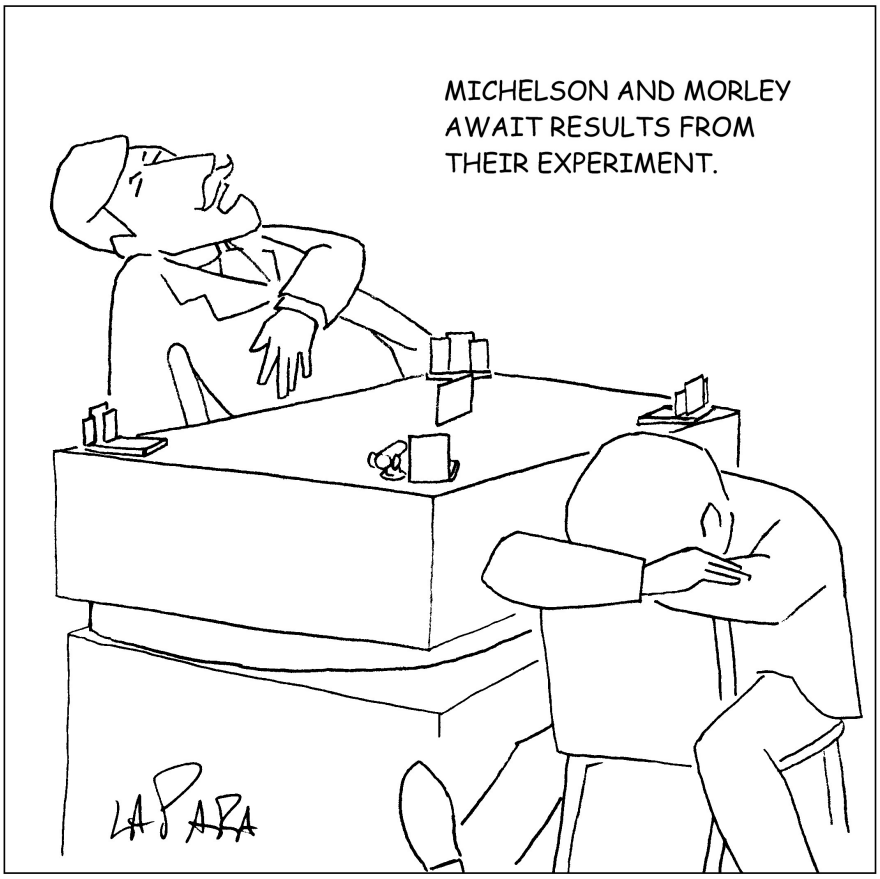
(Continued on page 17)



Sky map credit: http://en.wikipedia.org/wiki/File:Cygnus_constellation_map.png

Nicholas's Cartoon Corner

by Nicholas La Para



Outreach (cont'd)

(Continued from page 10)

to help out.

About 130 people, mostly learners, attended both sessions and it was really great to see the interest and their willingness to learn about astronomy and science and I must wonder if last years Planetary Festival and the upcoming one has any significance.

A big thank you to Phil and his team (Windsong Cottages), the heads of the two schools Ray Gordon and Johanna Motshodi and their staff, to the sponsors and designers of the MoonScope (Maranga Phanda, Office National and SAAO), Southern Star Wheel (Zoutpansberger, Mirror and Auke Slotegraaf), media (print and radio) and everyone else involved with this outreach initiative (SAASTA, DST and NRF).

Students line up for solar observing

Starstuff (cont'd)

(Continued from page 11)

forecasted that there would be fifty thousand people working in Space by the year 2000. Right now, I think that there are three. Eventually the International Space Station will have a habitable volume equal to three 3-bedroom houses.

The real point of this little article is not what a sci-fi fan that I am, but why we do such a poor job of predicting the future of space flight, or indeed much anything else. The reason that we don't seem to be very good at this is that so many of the changes that we have seen are not enlargements of things that already exists, but entirely new things, or new versions of things.

In 1955, in a pre-transistor world, who would have thought that you could possible launch a building sized ENIAC computer with it's 18,000 vacuum tubes into space? Having a computer to guide a spaceship would be out of the question. A laptop?!? If you don't know that the transistor is in your future, how can you imagine how to handle huge amount of power without the requisite giant switches? If the only way to keep an airplane up in the air is with a propeller, then how can you imagine a jet?

On the other hand, could you have predicted that the end of the cold war and the collapse of the Soviet Union would have dire consequences on our current space program? Could you pre-

(Continued on page 15)

Spitzer, the Sequel
by Jet Propulsion Laboratory

The Spitzer Space Telescope is getting a second chance at life.

The liquid helium "lifeblood" that flows through the telescope has finally run out, bringing Spitzer's primary mission to an end. But a new phase of this infrared telescope's exploration of the universe is just beginning.

Even without liquid helium, which cooled the telescope to about 2 degrees above absolute zero (-271°C), Spitzer will continue to do important research—some of which couldn't easily be done during its primary mission. For example, scientists will use Spitzer's "second life" to explore the rate of expansion of the universe, study variable stars, and search for near-Earth asteroids that could pose a threat to our planet.

"We always knew that a 'warm phase' of the mission was a possibility, but it became ever more exciting scientifically as we started to plan for it seriously," says JPL's Michael Werner, Project Scientist for Spitzer. "Spitzer is just going on and on like the Energizer bunny."

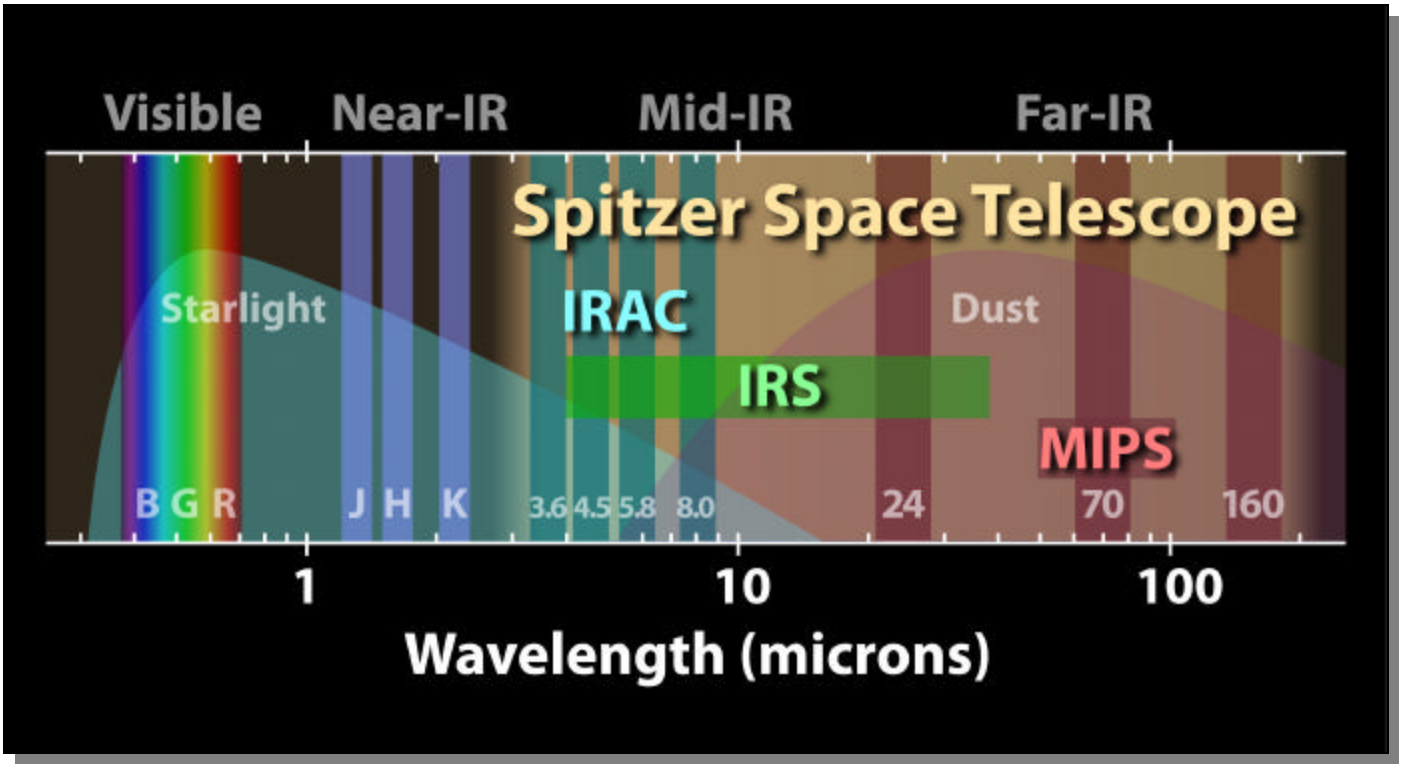
Launched in August 2003 as the last of NASA's four Great Observatories, Spitzer specializes in observing infrared light, which is invisible to normal, optical telescopes.

That gives Spitzer the power to see relatively dark, cool objects such as planet-forming discs or nearby asteroids. These objects are too cold to emit light at visible wavelengths, but they're still warm enough to emit infrared light.

In fact, all warm objects "glow" with infrared light—even telescopes. That's why Spitzer had to be cooled with liquid helium to such a low temperature. Otherwise, it would be blinded by its own infrared glow.

As the helium expires, Spitzer

(Continued on page 15)



The "warm mission" of the Spitzer Space Telescope will still be able to use two sensors in its Infrared Array Camera (IRAC) to continue its observations of the infrared universe.

Spitzer (cont'd)

(Continued from page 14)

will warm to about 30 degrees above absolute zero (–243°C). At that temperature, the telescope will begin emitting long-wavelength infrared light, but two of its short-wavelength sensors will still work perfectly.

And with more telescope time available for the remaining sensors, mission managers can more easily schedule new research proposals designed for those sensors. For example, scientists have recently realized how to use infrared observations to improve our measurements of the rate of expansion of the universe. And interest in tracking near-Earth objects has grown in recent years—a task for which Spitzer is well suited.

"Science has progressed, and people always have new ideas," Werner says. In its second life, Spitzer will help turn those ideas into new discoveries.

For kids, The Space Place Web site has a fun typing game using Spitzer and infrared astronomy words. Check it out at spaceplace.nasa.gov/en/kids/spitzer/signs.

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

Starstuff (cont'd)

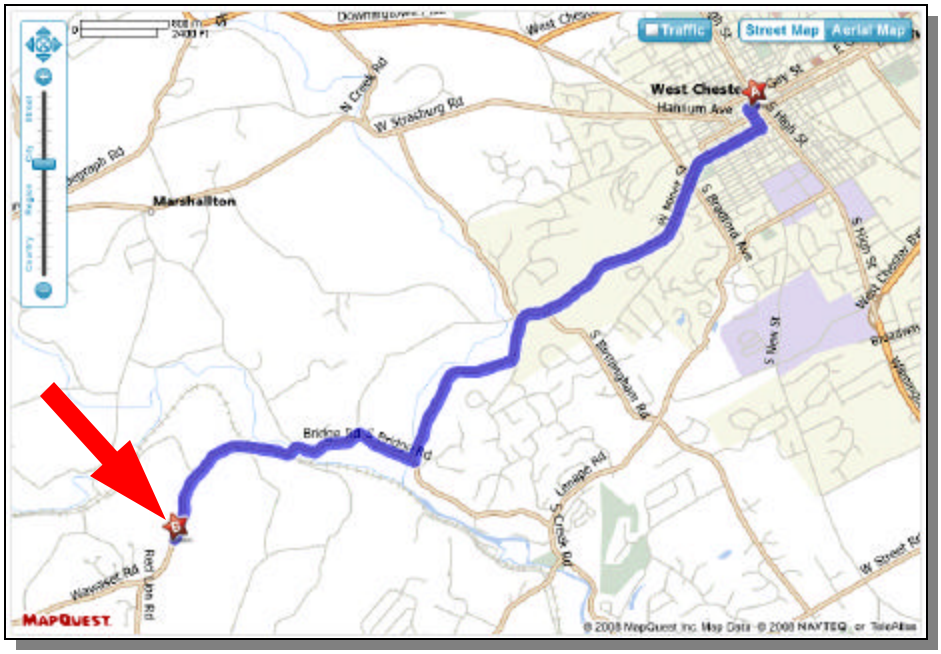
(Continued from page 13)

dict uninspired leaders or a populace much more interested in what's at the mall rather than what the Martian rover *Spirit's* latest discovery is on the red planet?

Can you see into the future? Not very well. The punctuated events that occur from time to time have a far grater effect on history than the slow linear processes that we are used to. Perhaps the dreams of tomorrow are in the hands of a child whose mental clarity will see through some heretofore commonly held misbelief, and voilà, we will have the keys to eternity.

Who would have thought it?

CCAS Directions



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.

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).

NASA Resources and Teacher Training Help Students See Stars

by Mark Nichol, senior producer for Edutopia, The George Lucas Educational Foundation.

There's nothing final about the final frontier. We live in a seemingly infinite universe, full of new things to learn and discover. And for young astronomers just beginning to learn about space, the Hubble Space Telescope is an ideal jumping-off point.

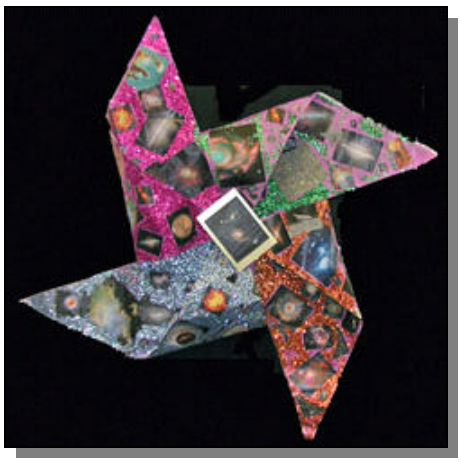
Though the May 2009 visit to Hubble by astronauts aboard the space shuttle Atlantis was the last scheduled servicing mission for the orbiting observatory (which is expected to remain in orbit until at least 2014), the National Aeronautics and Space Administration has already collected galaxies of data from it. In fact, NASA and its partner organizations have created rich Web-based and print classroom resources for educators based on that data.

Hubble, about as big and heavy as a school bus but a lot faster -- it orbits some 350 miles above Earth at 17,500 miles per hour -- is much more than a swiftly careening camera, and it gets much better resolution than earthbound telescopes because there's no terrestrial atmosphere in the way.

According to the **Space Telescope Science Institute (STScI)** (http://www.stsci.edu/resources/), a NASA contractor, Hubble has informed our understanding of the evolution of the universe. It has revealed that the expansion of the universe, triggered by the big bang, has sped up relatively recently. It has boosted our knowledge of and corrected misconceptions about black holes.

Credit: Courtesy of NASA/HUBBLESITE

And it's an active agent in the hunt for extrasolar planets -- worlds that orbit other stars. To help in that exploratory effort, Hubble recently took the first visible-light photograph of a planet outside our solar system.



Star Turn: Teacher Jamie Welebob's class created a giant pinwheel collage of stellar images from the Hubble Space Telescope.
Credit: Jamie Welebob

Teachers can use the **STScI's** two Web sites, the public-interest **HubbleSite** (http://hubblesite.org/) and the education-centric **Amazing Space** (http://amazing-space.stsci.edu/), to infuse their curriculum with cutting-edge data and images. In addition to presenting games and activities for kids, the institute offers professional development in which its scientists and master educators team up to develop workshops for training K-12 teachers to teach about the telescope and about space science in general.

"It's amazing to see what people can do with good learning," says Bonnie Eisenhamer, who oversees the **Hubble Space Telescope** formal-education program at **STScI**, located in Baltimore. Eisenhamer has seen a variety of classroom work samples that include poetry about the telescope, Microsoft PowerPoint presentations about how it works, and models of it made from recycled materials.

"When teaching about space, the biggest challenge is presenting the content in a way that makes it real for the students," says Jamie Welebob, a science teacher at the **Odyssey School** (http://www.theodysseyschool.org/), a learning environment for dyslexic students in Stevenson, Maryland, who has used **Amazing Space** resources.

Welebob says her students en-

(Continued on page 17)

NASA Resources (cont'd)

(Continued from page 16)

tered an **STScI** contest in which they had to decide which direction Hubble should be pointed, make a collage of telescope images showing their choice, and submit a persuasive argument for their choice in written or video form. After completing research projects and holding an election to determine their choice, the students wrote and produced a video and also created a giant pinwheel-shaped collage (see above).

Mary Bishop, who conducts **STScI** workshops and has taught at Saugerties Junior Senior High School, in Saugerties, New York, for all but two of her 42 years in education, says she uses both **HubbleSite** and **Amazing Space** with her eighth- and ninth-grade students. She describes how she uses Amazing Space: "Students start out with several questions to answer from different parts of the site, and then they have about ten minutes to choose one topic or game, go through it, critique it, and submit the final product as an email to me."

Bonnie McClain, an education specialist at NASA's **Goddard Space Flight Center** (http://www.nasa.gov/centers/goddard/home/index.html), in Greenbelt, Maryland, and co-lead for the Hubble Education Plan, says the space agency partnered with the National Institute of Aerospace for a pilot project in which university-level engineering students teamed with teenagers to solve a real-life design challenge related to a Hubble servicing mission. Participants gave presentations to NASA officials, and the winning team was treated to a visit to Goddard.

McClain notes that in fall 2009, NASA will release images and data from new instruments installed during the most recent servicing mission. "Hubble now has some 30 times the capability it had before," she adds. An IMAX film about Hubble will open in 2010.

Mark Nichol is a senior producer for Edutopia.

This article was also published *in the October 2009 issue of Edutopia magazine as "Capturing the Cosmos".*

The Helix Nebula (cont'd)

(Continued from page 12)

of the full moon. Its halo extends even further to 28 arc minutes or almost the moon's apparent diameter. Although the nebula is quite bright, its light is spread over this large area so that it is not an easy object for visual observing. But it is a good object for amateur astrophotographers. Top the right is a photograph taken by Brent Crabb in southern California.

Information credits:

Dickinson, Terence 2006. Nightwatch: a practical guide to viewing the universe. Buffalo, NY. Firefly Books
http://en.wikipedia.org/wiki/Helix_Nebula
http://antwrp.gsfc.nasa.gov/apod/ap030510.html
http://www.seds.org/messier/xtra/ngc/n7293.html

Photo credit: Brent Crabb, astrophotographer, Fountain Valley, CA

Movie Review: Sleep Dealer

by Don Knabb, CCAS Secretary & Observing Chair (and Sci Fi Movie Buff!)

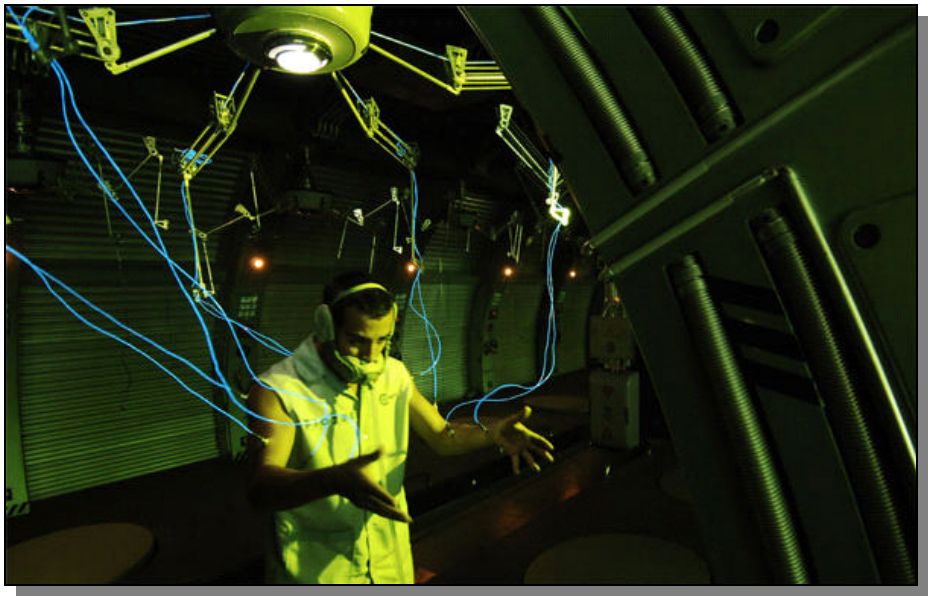
I like all kinds of science fiction movies. But I like some kinds better than others. I loved the latest **Star Trek**. It was a lot of fun and very well made. The special effects were incredible. And I liked the **Star Wars** movies, but they were not what I call serious science fiction.

Serious science fiction movies are first and foremost a good story, not just eye candy and lots of action. I like science fiction movies that you think about for days afterward. A movie Barb and I saw recently on DVD is this kind of movie.

I had first heard of this movie on a podcast when it first came out several months ago. I didn't follow up and try to see it on the big screen but while cruising the DVD rental store a couple of weeks ago I felt like I had found buried treasure when I saw it on the shelves.

Sleep Dealer is the first movie by Mexican director Alex Rivera. It is a low budget movie (by Hollywood standards) that is presented in Spanish with English subtitles. That means it is a bit more work to watch then a movie in English, but this movie is worth the effort.

The special effects are not spectacular, but they are reasonably good. However, this movie uses special effects to help tell the story, not as the center of attention.



A scene from the film: the protagonist "wired in" at work.

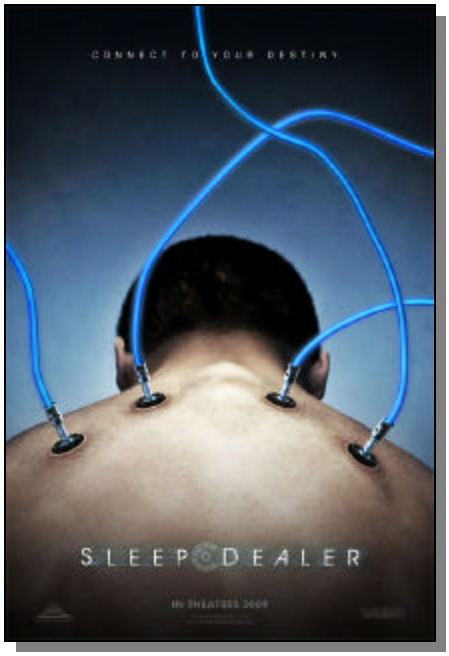
The movie is set in the near future when the Internet has taken the next leap forward. Workers in Mexico can connect to robots in any part of the world and control their activity, whether it is building a skyscraper in New York City or picking vegetables in California.

Sleep Dealer is the story of one man's journey into the connected factories of the future. Along the way he meets a woman who also uses the internet in a futuristic way. She downloads and sells her memories and experiences directly into

(Continued on page 19)

Downloading memories for sale on the Internet.

Sleep Dealer (cont'd)



Official Movie Poster

(Continued from page 18)

the internet. Her experiences with the main character are sold to buyers like we would download podcasts.

I don't want to tell too much of the story since the joy of discovery is much of the fun with a new movie, so rent this one when you want to sit down and be thoughtfully entertained. It is a chilling vision of the near future.

The website for this movie is http://www.sleepdealer.com/ where you can see the trailer.

CCAS Original Astrophotography: M74

by Dave Hockenberry

Photo of M74 taken 09/20/09, under some difficult cloud conditions, stack of 15 5-minute images with Starlight Xpress VF color camera, through Meade Lx200R 10" scope focal reduced F/6.3. Autoguided and stacked with MaxIm DL, guide scope Stellarvue 70mm. Hot pixel removal and slight color adjustment in Photoshop CS3.

Upcoming IYA2009 Event at Ridley Creek State Park

by Dr. Bruce Holenstein, Ph.D.

Galilean Nights: International Year of Astronomy 2009 Cornerstone Project Event. I officially registered our night out on the Galilean Nights website (http://www.galileannights.org/). We may have a BIG crowd for the 24th event. Ranger Stacey Bamash has really promoted the event. Google: galilean nights "ridley creek state park" to see what I mean. Local radio, TV and other sites all have hits! We may need crowd control.

I have been working with Ranger Stacey (610-892-3908) to plan the event. She is the Environmental Education Specialist at the park and is planning the activities for the public and campers.

Here's the agenda: At 6:00PM, CCAS members arrive and meet at Picnic area 11. Roger Taylor and I will go over the final details for the evening and objects for the various scopes. Also, a decision on an ending time will be made. I have a key to the front gate so we can observe past 10:00 PM but we must all leave together.

At 7:00 PM the event starts at the designated pavilion in Area 11. We will go over some ground rules and talk about the following: An introduction by **Ranger Stacey**. Stacey will have a megaphone if needed; A description by **Bruce** of "Galilean Nights" significance; **Don Knabb** will give the distance scale talk. **Roger Taylor** to go over telescope types and what we will see tonight. **Deb Goldader** will show how to use the Sky Maps and a lesson on safety, including red balloons, tripping/touching scopes, flash photography, laser pointers, parents watching kids.

At 10:30 PM the gates will be locked – last time to leave before the final group 11:30, midnight, or ? Those remaining in the final group must depart together.

In Case of Emergency:
Dial 911, Ranger Cell: 484-390-4977

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).

Hercules Cluster Meetings Suspended

by Kathy Buczynski

Until further notice, the regular meetings of the Hercules Observing Clusters have been suspended. My other commitments have caused my time to become a premium. However, the **International Year of Astronomy** has brought us out observing many times and I've committed to **Project Astro**, a program that pairs an astronomer to a classroom and teacher in a local school. Although the Hercules gatherings have been successful in the past, we have had a rash of bad weather this year and participation has dropped off.

However, if there are some clear nights during the season, you may find me out observing. If you are interested in joining me, please give me a call at (610) 436-0821. I'd love to observe with you.

CCAS Membership Information and Society Financials

Treasurer's Report

by Bob Popovich

July 2009 Financial Summary

Beginning Balance	$1,376
Deposits	$70
Disbursements	$0
Ending Balance	$1,446

Welcome New Members!

This month we welcome back a family to the Society: Mr. & Mrs. Stanley Dascaloff, Jr. and Family, of Coatesville, PA.

We're glad you decided to join us again 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:

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:

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 **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:

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:

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**

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**

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**

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

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, Linda Lurcott Fragale, 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. Linda's phone number is 610-269-1737.

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
500 W. Rosedale Ave.
Apt. A-3 Trinity Bldg.
West Chester, PA 19382

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:

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 (484-266-0699) 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 "star nights" 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:	Linda Lurcott Fragale 610-269-1737
Program:	Dave Hockenberry 610-558-4248
Education:	Kathy Buczynski 610-436-0821
Webmaster and Newsletter:	John Hepler 484-266-0699
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 **610-363-8242.**

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.**