

Volume 16, Issue 10

October 2009

HAMILTON
AMATEUR
ASTRONOMERS

Event Horizon

**NASA hit the moon's south pole 7:30AM
Friday October 9th to find water
LCROSS mission concluded
See breaking story on page 14**



HAA's September Meeting! By Heather Neprozel

Don Pullen, HAA Treasurer, welcomed attendees to the September General meeting after a two-month summer hiatus. Don mentioned that 2 positions on the HAA council are open: Secretary and Publicity and he asked interested members to join our council and help the HAA foster interest in and enjoyment of astronomy in the Hamilton area.

(Continued on page 2)

From The Editor's Desk

It has now been three years that I have been at the helm of the HAA's newsletter—the Event Horizon. In that time, I have made many changes to the newsletter and, I hope, made it a better publication. It has been a challenging task, but I hope that I have produced a quality publication that we can all be proud of.

Now the time has come for me to pass the torch to someone else. It is important that new blood be transfused into the club every now and again to keep new ideas flowing and to keep the publication fresh.

I would like to thank everyone for their help and support over the past three years.

Tim Philp, Editor



Inside this issue:

Chair Report	3
Kepler—an Overview	4-5
The moon Illusion	7
The Sky this Month	9-12
Report—The Black Forrest Star Party	13
New Saturnian Ring Discovered	15
Space Place	19

Articles Wanted!

Want to see your name in print? The Event Horizon is looking for authors to contribute to the club's newsletter.

Contact:

editor@amateurastronomy.org



HAA'S September Meeting (continued)

(Continued from page 1)

Don invited Mike Jefferson up to the floor for a report on the LOFAR radio antenna. A recent power hiccup has necessitated the purchase of a UPS for the LOFAR, costing about \$ 50.00. In astronomy you just never know when the next really interesting "event" will happen, and an uninterrupted power supply is probably a good thing!

After Mike's update, Don introduced HAA Observing Director John Gauvreau and his presentation for "The Sky this Month". John started off with a discussion on the ISS (International Space Station). Due to on-going construction of the station, a visit by the Space Shuttle as well as an advantageous angle of the sun reflecting light off both ISS and shuttle, a recent pass in this area by the ISS was particularly noteworthy. A few attendees described a single source of light (not flashing like a plane), very bright, moving very fast: a quite impressive sight.

John then brought our attention to a couple of coups for Kerry-Anne Leckburn: a NASA "Picture of the Day" or APOD (not her first!) of M42 in Orion and a great image of the dark nebula vdB141 in Cepheus, a collaboration with Paul Mortfield. Check out this fascinating full-page image in October's Sky & Telescope magazine. Congratulations Kerry.

Staying in the "imaging" vein, John showed some of the wonderful new images from the newly refurbished Hubble Space Telescope (HST). An image showing the effects of gravitational lensing on the light emanating from galaxies was particularly fascinating to yours truly. But nothing can quite replace the experience of having individual photons of light from the cosmos ending their long journey in your eyes. John says there are more clear nights in September and October than at any other time of the year - so get out there and observe!

(Continued on page 8)



Treasurer's Report

By Don Pullen

Oct 2009 Treasurer's Report

(Unaudited)

Cash opening Balance (1 Sep 2009)	\$ 4013.50
Expenses	\$ 1436.48
Revenue	\$ 480.54
Closing Balance (30 Sep 2009)	\$ 3113.60

Notes: Major revenue sources included: Memberships (\$350), 50/50 (\$22), Coffee Fund (\$63.10), Donation (\$45.44).

Major expenses included: Spec Auditorium Rental (\$1050), Dark Sky Assoc Donation (\$56.04), NPCA/Binbrook Donation (\$100), CSC Donation (\$56.33), SkyNews shipping (\$42.86), Mailbox rental – prepaid (\$131.25)



From the Chair

by Steve Germann

It seems not a week goes by that I don't get a few questions from someone planning to buy a telescope, and wanting advice.

The best answer I can give them is 'don't buy a telescope until you try some'. The next best advice is to recommend binoculars, or if the person already has binoculars, a tripod and a binocular holder for them.

A steady pair of binoculars opens up the skies to you. You will be able to see a thousand times more with them, and you can explore the sky as you never could without them. The magnification level of binoculars is low enough that you can even just let the sky sail serenely past your field of view and admire the stars you catch. One thing about binoculars though... they are not much good for looking straight up. For that you either need to wait a few hours for your target to get lower in the sky, or consider a telescope.

Using binoculars, you have a chance to apply some of your knowledge of the sky, in finding constellations and star clusters. John's excellent sky tours can acquaint you with enough of the sky that you can find things, just starting with the big dipper and travel-

ling in different directions from there.

If the desire for a telescope continues unquenched, then may I suggest you consider attending an event where you can examine telescopes and discuss their ease of use, setup time, difficulties, and joys, with their owners.

The HAA has booked the spectator Auditorium for a 'Telescope Clinic' on November 27, 7:30 PM. This is the perfect chance for you to fish up the parts of that old telescope in your closet, and bring them in. Keen members of the HAA will have all kinds of ideas about cleaning, setup, accessories, and use of telescopes. If it turns out that some parts are missing, they will be able to help figure out what the missing parts look like, and if need be, recommend compatible replacement parts.

Perhaps you have an antique telescope and don't even know it?

Being an indoor event, the telescope clinic runs rain or shine, and there's a good chance to get ideas for new purchases, from people who have your best interests foremost in their minds.

As I write this article, I am also preparing for Sunday's public night in Burlington. It turns out that many of the current HAA

council members are avid sidewalk astronomers. This is not a requirement for council, but it reflects the very true fact that it's fun to do sidewalk astronomy, and set up for public nights and entertain the public with views through your telescope.

You don't need any special qualifications for it. Just an interest in astronomy, and a few hours to spare. You will be amply rewarded in terms of 'job satisfaction'.

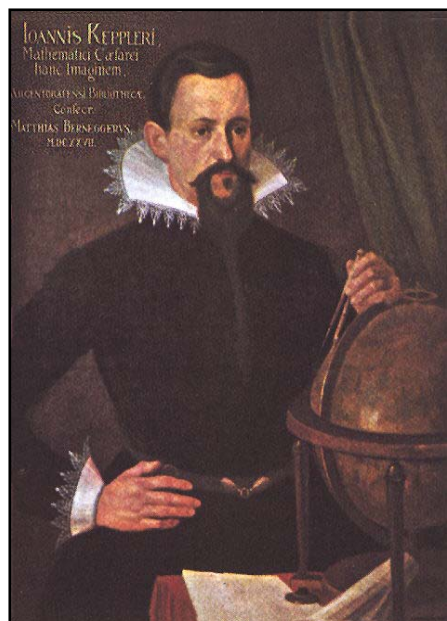
October is traditionally the month for our Annual General Meeting. At this time we select new council members, and review the club's finances and prospects. The club's ability to organize public events, benefit from the Binbrook Conservation Area, book the Spectator and speakers for meetings, organize events for the members, craft and print the Event Horizon, and maintain our website depends on your membership money and your council volunteers.

I thank all the members of the 2008-2009 council for their contributions to the club in the past year, and welcome many of them back for another year. Nothing happens without them.



Johannes Kepler

by Jeff Lillycrop



**Joanne Keplero Joannis
Keppleri Johannes Kepler**
1571-1630

IYA 2009 is and has been a truly great year for astronomy. Not only has astronomy awareness increased everywhere, we have celebrated its amazing and exciting history. Now, just about everyone is aware of Galileo's great achievements, but there was another major discovery 400 years ago. This discovery contributed as much to changing our understanding of the universe that we live in, as any of the discoveries of the renaissance

The first 2 laws of planetary motion were published

Now, at first you may think, we have known that planets move in the sky since man was first able to recognize order in the stars. This is true, but the laws of planetary motion were additional proof that we were not the centre of the universe. The geocentric philoso-

phy was being challenged. Proof was being given, it may not have been accepted, but it was there.

The 1st Law has to do with the shapes of the planetary orbits and states:

The orbital paths of the planets are elliptical, with the sun at one focus.

This law was ground breaking, and no small advance. It must have been laughed at by even the most harden heliocentric believer. Aristotelian belief in perfection of the circle had governed astronomy since antiquity; Galileo himself even rejected this discovery.

Only because the planetary orbits are so close to circular were the Ptolemaic and Copernican models able to come as close as they did in describing their models.

This belief may even have driven Aristarchus of Samos to denounce his heliocentric hypothesis when he failed to reconcile it with the "supposed" circular movements of the planets. But Kepler had Tycho Brahe to thank. Tycho (arguably one of the greatest observational astronomers that ever lived) compiled meticulous and accurate records of the stars and planets. His measured positions of the planets were accurate within 1', all observed without the aid of a telescope!! . Kepler inherited these records when Tycho died. For 29 years, he labored to explain the motions of the planets. His goal was to find a simple and elegant description that fit the Copernican framework. Kepler too believed in the perfection of the circle, but had to abandon this philosophy after many

false starts and dead ends. First he had to determine the earth's orbit around the sun; then he determined the shape of each planet's orbit by Triangulation from different points along the earth's orbit. Just imagine the number of calculations he must have performed in 29 years. It is no wonder when he published his paper he stated that these laws had only been proven for Mars

The 2nd Law has to do with the speed at which a planet traverses its elliptical orbital path and states:

An imaginary line connecting the Sun to any planet sweeps out equal areas of the ellipse in equal intervals of time

Gone were the circles within circles that had dominated the Ptolemaic and Copernican models. Kepler's Laws gave the universe greater predictive accuracy. These laws are so accurate that they apply to ANY and ALL orbiting objects. Ten years later he published his 3rd Law and expanded the first 2 Laws to include all known heavenly bodies:

"The square of the orbital period of a planet is directly proportional to the cube of the semi-major axis of its orbit."

Kepler was involved in many of the sciences and has an incredible list of achievements.

A List of Kepler's Firsts

- First to correctly explain planetary motion
- First to investigate the formation of pictures with a pin hole camera;

(Continued on page 5)

Johannes Kepler

(Continued)

(Continued from page 4)

- First to explain the process of vision by refraction within the eye;
- First to formulate eyeglass designing for nearsightedness and farsightedness;
- First to explain the use of both eyes for depth perception.
- First to describe: real, virtual, upright and inverted images and magnification;
- First to explain the principles of **how** a telescope works; (I wonder if Galileo agreed with this either!!)
- First to discover and describe the properties of total internal reflection.
- His book *Stereometrica Doliorum* formed the basis of integral calculus.
- First to try stellar parallax to measure the distance to the stars
- First to suggest that the Sun rotates about its axis
- First to derive the birth year of Christ, that is now universally accepted.
- First to derive logarithms purely based on mathematics

He coined the word "satellite"

That's not bad for someone accused of being a "son of a witch"! This year would be a great time to read about other great discoveries and achievements made by some interesting characters in the history of astronomy. Reading about history and star gazing have a common ground, you learn a lot about what happened in the past.

"I measured the skies, now the shadows I measure, sky bound was the mind, earth bound the body rests" Kepler's epitaph.



The Moon Illusion

By Tim Philp

For a few days each month, the moon appears almost full blotting out fainter objects in the night sky. In fact, the moon is so bright that most amateur astronomers give up trying to look at faint objects and just look at planets or the moon.

One of the things that many people have noticed is that the moon appears to change size in the sky, depending upon where you see it. This change is quite dramatic and sometimes quite disconcerting. I myself saw this change quite sharply during an observing session last year.

During the early evening, the

moon was high in the sky, blotting out faint stars with its light. When I decided to call it quits early in the morning, the moon was near the horizon. Driving home, I was struck by how large the moon looked as it sat just over the road on which I was driving.

This apparent change in size is called the moon illusion. It has been noticed for centuries, but there was never a good explanation for the effect. We know it is an illusion because if you hold a ruler up over the moon at arm's length, you will see that the moon measures the same size whether it is on the horizon or high in the sky. It just

appears much larger when low in the sky against the horizon.

While the moon does actually change size, as it appears from our vantage point on the Earth, the amount of change is almost unnoticeable to the naked eye. This change is caused by the fact that the moon's orbit is not quite a circle, but a very slight ellipse.

This means that sometimes the moon is closer to us than at other times in its orbit and its diameter can actually be measured to be slightly larger. This change, however, is too slight to be no-

(Continued on page 6)

The Moon Illusion

(Continued)

(Continued from page 5)

ticed in the same dramatic fashion that the moon illusion appears to make the moon larger.

The explanation seems to depend upon our brains and how

we perceive the world.

While we know that the sky is not a solid surface, our brains seem to recognize it as such, but it is not a circular dome, as most people think, but rather a flattened one.

Check out

the illustration of the flattened sky to see the effect.

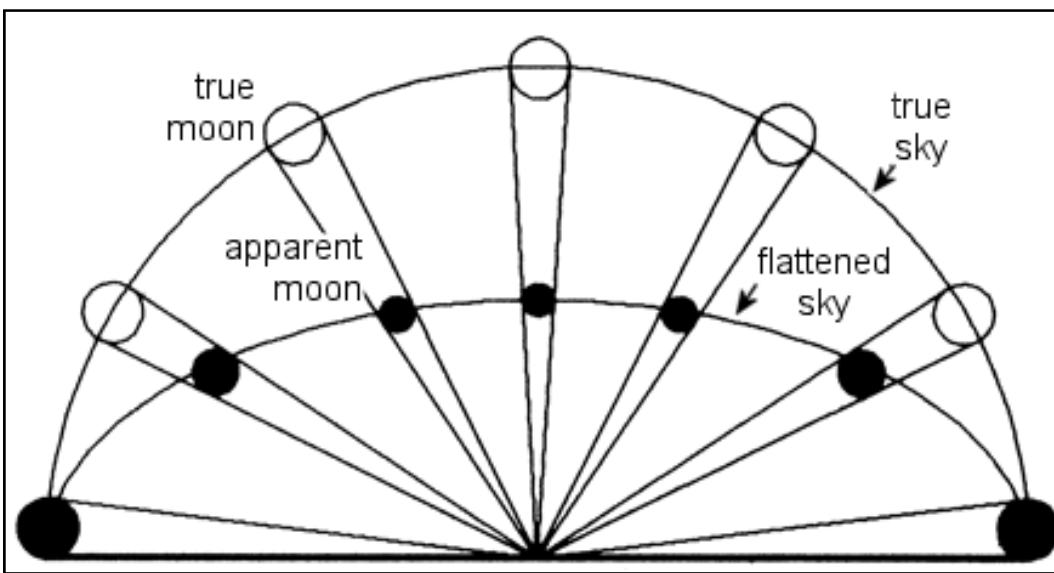
Here's how it works. The distance to objects that are closer to us, is determined by our two eyes and our stereoscopic vision that pinpoints distances to objects. However, that is only effective for nearby objects. Beyond a few metres, we rely on clues surrounding the object to help the brain determine the object's distance.

So, we know that the horizon is a long distance away, so

any object that appears on the horizon will appear to our brain to be farther away than an object hanging high in the sky where there are no clues to distance. Therefore, our brains will tell us that the moon is farther away when it is on the ho-

This illusion also encompasses the stars and planets, but it is far less noticeable because the stars and planets are simply pinpoints of light. However, the next time you are out on a clear night, take a close look at the sky

and you will perceive that the sky is somewhat flattened. Rather than seeing a dome of stars above you, what you will perceive is



While the moon does not change its size, when the full moon is low in the sky, it appears to be much larger than when it is high in the sky. This is the famous Moon Illusion.

zizon than when it is high in the sky.

Since the moon stays the same size, we judge that the moon must be larger when it is low in the sky than when it is high above us because it appears to be farther away when low than when it is high. When it is high in the sky, our brains tell us that it must be closer. If it is actually the same size, but our brains tell us it is farther away, it 'must' be larger when on the horizon.

a flattened dome with the zenith closer to you than the horizon.

The next time the moon is full, try to catch it when it is high in the sky and a few hours later when it is about to set. I am sure that you will be astounded by the difference that you perceive in the size of the moon. When it is near the horizon, it will appear to almost fall down to the Earth. It is quite a sight to see.



The Black Forest Star Party Report

By Glenn Muller

The success of a star party is generally dependant on four main factors: location, weather, organization and participation. Each factor may not always score a perfect 10, but now into it's eleventh year the Black Forest Star Party (BFSP) is obviously attaining a respectable average.

Located high in the hills of Pennsylvania, Cherry Springs State Park (CSSP) is an official dark sky preserve. With a dedicated astronomy field, good horizons, and no light domes the park has become a preferred spot for astronomers who live within a day's drive. While the field is open to enthusiasts pretty well year round, the BFSP has become the major annual stargazing event.

Although the official dates for this year's party were Friday, Sept 18th to Sunday, Sept. 20th, keeners arrived as early as the previous weekend. Gail and I have always found it a pleasant drive down, and with the whole area around the NY/PA border being so scenic we decided to break the trip into three segments.

Our first stop was at Watkins Glen State Park (WGSP) situated right next to the famous



Watkins Glen gorge which boasts nineteen waterfalls within a two mile stretch. We camped at WGSP for a couple of days, fitting in a tour of the local wineries, then moved on to Leonard Harrison State Park (LHSP) in Pennsylvania.

LHSP is a small 28 site campground on the eastern rim of Pine Creek Gorge which is also known as the Grand Canyon of Pennsylvania. The campground caters to day trippers with a modern visitor's centre and gift shop, a landscaped lookout, and a maintained yet arduous trail down to the bottom of the gorge.

We camped there for a couple of days also, but since it is less than an hour's drive from CSSP

we highly recommend it to astronomers looking for a little diversion from the star party.

We pulled into the BFSP on Thursday afternoon under cloudy skies and quickly found HAA member Ed Smith. It didn't take long for us to set up beside him, but the overcast skies would stick around and produce a couple of brief showers overnight before breaking up on Friday morning.

As the observing field filled to capacity, the weather steadily improved with a forecast for clear skies from 11pm Friday right through until Sunday – this proved to be correct with both Friday and Saturday nights providing the kind of skies that astronomers dream about.

In Fall, though, clear skies can be cold skies and, while most had brought suitable clothing for observing, many tenters found it a challenge to stay warm in their sleeping bags. Still, after each clear night, the morning found everyone sport-

(Continued on page 13)

September Meeting (continued)

(Continued from page 2)

At the conclusion of John's talk, Don introduced our main speaker for the evening, HAA member and Event Horizon editor Tim Philp and his talk: Galileo, 400 Years, The First Scientist. It has been 400 years since Galileo pointed a telescope at the night sky and recorded what he saw. Galileo was born in Pisa Italy during the Renaissance. Galileo went to the University of Padua and tutored students in math to earn a living. Though Galileo was a math "geek" he also had a practical and creative side that led him to invent a thermometer and an agricultural pump. Galileo also improved on the military compass.

Galileo had heard of a description for a device that made distant objects appear closer, and within a 24-hour period proceeded to build one for himself. He then turned the telescope to the sky. Galileo was the first person to follow the "scientific method": he described what he had seen in his telescope by writing down his impressions in a journal. And what had he seen? Saturn's rings, but he didn't know what they were; the phases of Venus; mountains on the moon; the "Medician" Stars, known to us as the moons of Jupiter. Galileo saw a *lot*. His drawings of Jupiter's moons are especially poignant.

Of course all of this new knowledge had the potential to upset the "status quo", and Galileo found himself under house arrest during the last twenty years of his life. But Galileo's achievements could not be blunted. For, as Tim pointed out, the technology of today is a result of the scientific method refined by Galileo. Thank you Tim for this look at one of the founders of modern science.

THE SCOPE STORE

at CAMTECH

588 Concession St
Hamilton, ON L8V 1B1

The Largest Selection Of Scopes
in the Golden Horseshoe.

Dealers for Orion, Celestron,
Bushnell, Pentax, Nikon, Swift
and Zeiss.

Telescopes, Spotting Scopes, Microscopes,
Binoculars and Accessories. Starry Night
Software.

905-389-8545

www.camtechphoto.com





The Sky this Month

by John Gauvreau

Crisp nights, no bugs, little dew and the last chance for spending time outside without worrying about numb fingers and frostbite. Autumn is a wonderful time of year to be out observing.

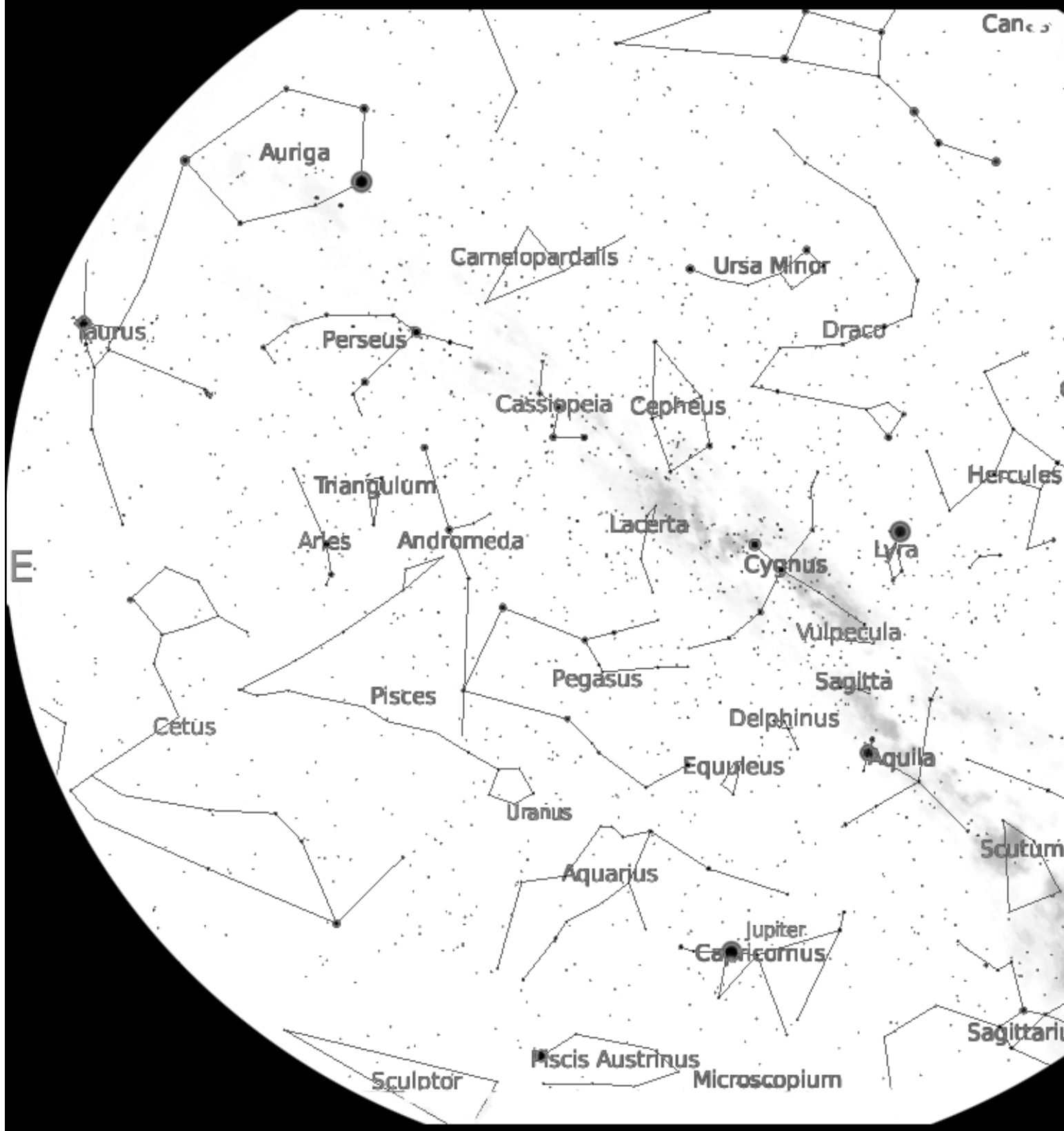
The **Moon** will be at first quarter on the night of October 25th. **First quarter** is a favourite time to look at the moon, since the terminator, where we see the most detail on the lunar surface, runs right down the centre of the disk. At this time of year though, the moon is low in the sky during first quarter, joining Jupiter in Capricornus. In fact, the next night, on the 26th, the Moon and Jupiter make a lovely pair less than 4 degrees apart. During the spring you can see the first quarter moon ride high overhead, but right now is a great time of year to observe the **third quarter** moon. If you can get up early enough, you can enjoy a view of the moon that is seen much less than the common first quarter. The Moon is at last quarter on the morning of the 12th (night of the 11th) when it is only 6 degrees from Mars and 4 degrees from M44, the Beehive cluster in Cancer. And since it rises 55 degrees high in the sky at this latitude (instead of the 25 degrees that the first quarter moon rises) you can enjoy crisp and clear telescopic views, relatively unobstructed by Earth's atmosphere. The moon will be at third quarter again a month later, on November 9th, again in the company of Mars and the Beehive. In between first quarter and last quarter, don't miss out on the **Full Moon**. The HAA may be the only astronomy club around that has an active group that goes out to observe the full moon! On November 2nd the full moon rises at 5:44 EST, and will be this year's 'Hunter's Moon'. Two nights later, on November 4th, the moon will pass by the Pleiades. It will actually occult some members of this brilliant open cluster, giving observers a chance to watch stars wink out as they disappear behind the limb of the moon. Watch for this event between 11pm and 2am.

Speaking of **Mars**, it rises by the first of November and rises around midnight, making it a viable observing target for the late night observer. Or better yet observe it early in the morning before sunrise, when it is high in the southeast. As mentioned, it is in close proximity to the Beehive cluster in Cancer, and actually spends the mornings of October 31st, November 1st and November 2nd within the cluster. What a remarkable sight that will be, to see brilliant red Mars, shining at magnitude 0, set against a backdrop of sparkling members of this large open cluster.

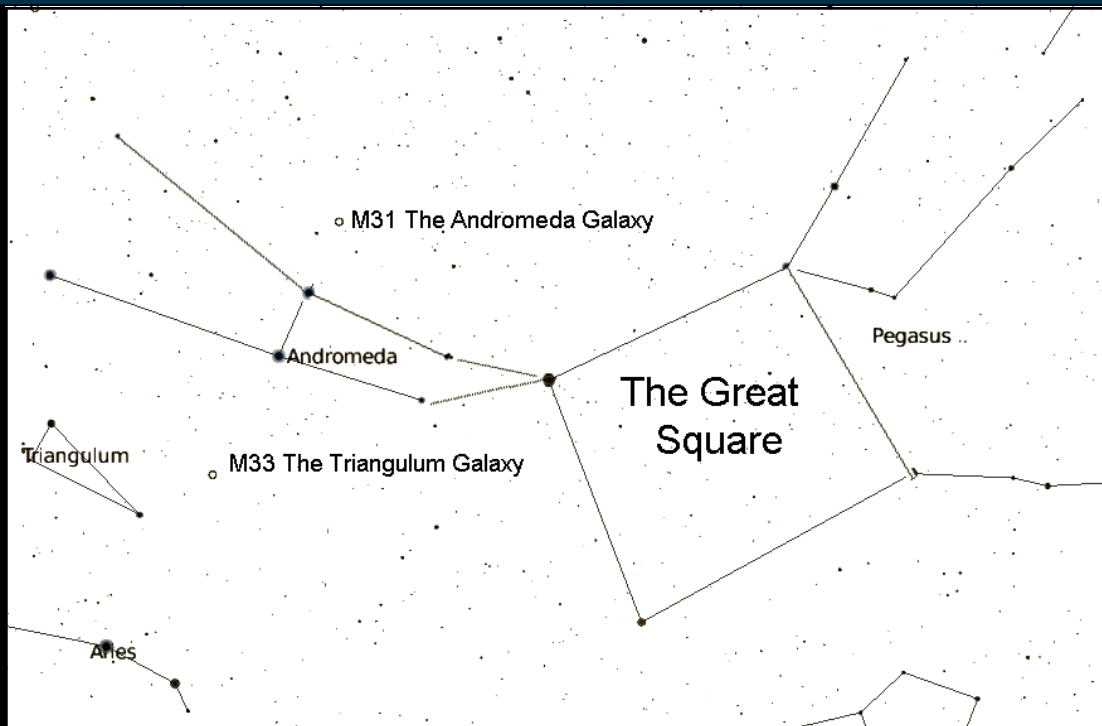
For yet another month **Jupiter** continues to dominate the night sky. At magnitude -2.5 it outshines anything else with ease. Jupiter's moons, always fascinating to watch, are currently going through a period when their orbital planes line up with Earth's position, allowing us to see moons pass right in front of each other. On the night of October 24th, Io and Europa will pass so close together that they will appear to touch. After watching this close encounter at 9:20pm keep an eye on Europa, since from 11:25 until 11:29 it will be eclipsed by Io's shadow. Ganymede and Io have a similar close encounter at 10:05pm on the night of Octo-

(Continued on page 12)

The Sky th



This Month



Binocular Object: The Great Galaxies

Like last month's binocular object, the Coat hanger, this month's is really a naked eye object, or rather a pair of naked eye objects. But, also like last month's, they really shine when observed with binoculars.

M31, the Andromeda Galaxy, is perhaps the most observed and one of the best known deep sky objects. Shining at magnitude 4.4 it can be spotted in a dark sky, if you know where to look.

The northeast corner of the Great Square of Pegasus is actually the star Alpheratz, and technically the brightest star in Andromeda. From here you move along the constellation Andromeda to three pairs of ever widening stars. The second, or middle pair will lead us to our galaxies. From the bottom (or eastern) star draw a line to the top star and then go the same distance again. That fuzzy spot is our goal. If you can see it with the unaided eye, marvel that you are looking more than two million light-years out into space. Through your binoculars the bright stellar like core is surrounded by a soft elongated disk of material that in fact stretches over 4 degrees of sky. How much can you see, and can you see M31's two companion galaxies, M32 and M110?

By going back to our second pair of stars in Andromeda and going down instead of up, we come to our other galaxy, M33. Much fainter than M31, this galaxy is seen face on. We can realize just how thin a galaxy is by straining to pick out the full extent of its low surface brightness disk through our binoculars. Remember though, that you're looking for a big object, as this galaxy appears larger than the full moon. It's difficult, so if at first you don't succeed, you may want to try a darker observing site.

The Sky this Month

(Continued)

(Continued from page 9)

ber 29th and Ganymede and Europa meet up around 11:50pm the next night. Enjoy this while you can, for soon Jupiter will slip into the west, and this opportunity will pass.

By the time we meet again in November, early morning risers will have had opportunity to see **Saturn**, rising in the east before the Sun. Those with a telescope can observe the rings opened about 2 degrees, just as when we last saw Saturn before it slipped behind the Sun. This time though, we are looking at the other side of the rings for the first time in 13 years. Speaking of Saturn, last month I told you about the conjunction of **Saturn, Mercury and Venus** in the early morning sky. As you receive this copy of the Event Horizon, that event is occurring. so be sure to catch that lovely sight right away.

One of the key constellations of autumn is Pegasus, with its Great Square being one of the easiest asterisms to identify. For a beginner it's a great starting point for the fall sky, using its large size and even geometry to point you to other constellations. For such a large chunk of sky though, the spare itself is relatively uninteresting. It contains no deep sky objects or bright stars. One interesting thing you can do with it is try to count the stars you see within the square. There are only four stars brighter than magnitude 5, and 13 stars brighter than magnitude 6. How many can you count from your backyard? Now compare that to how many you can count from a dark sky like the club's observing site at Binbrook Conservation Area. If you count a higher number you can put an immediate quantitative value on the worth of a dark observing site. You can also use this trick to gauge the quality of the sky. How does it compare from one night to another? Does moisture in the air affect it, and how much is the sky quality diminished by the presence of the moon? One final thing; to really understand how many stars are out there recall that I said there are 4 stars visible in a magnitude 5 sky and 13 visible in a magnitude 6 sky. There are over 70 stars visible within the Great Square of Pegasus in a magnitude 7 sky. I certainly couldn't accurately count that, but it sure makes me want to move to Chile or Hawaii!

Over the years many people have taken advantage of a special October holiday to do a little sidewalk astronomy. On the night of October 31st many little Hallowe'eners will be walking up to your door in search of a treat. Aside from the usual tasty morsel, think about setting up a telescope to offer a view of the gibbous moon or Jupiter. There will be four moons visible that night, two on each side, and for a while even Callisto's shadow will be visible on the surface of Jupiter. A sight like that would really make for a memorable night, and something for children to cherish long after the last candy has been eaten.

As always, thanks to those who have helped out by contributing thoughts and images, and feel free to submit reports, anecdotes or observations to:

observing@amateurastronomy.org

The Black Forest Star Party Report

(Continued)

(Continued from page 7)

ing a smile.

Celestial highlights for me were several nebulae including the Veil, Helix, Swan, Eagle, and Lagoon all enhanced by our newly acquired Celestron O-III filter. I managed to add about a dozen new objects to my log including the faint grouping of galaxies known as Stephan's Quintet and a lovely, long edge-on galaxy in Andromeda known as NGC 891.

A number of bright meteors were spotted and several folks managed to catch an electrically-charged aerosol cloud that a NASA rocket had released into the upper atmosphere. Apparently, the experiment was to simulate a noctilu-

cent cloud and appeared to be successful – it's just too bad they didn't pre-announce the release so more of us could have seen it.

The Central Pennsylvania Observers (CPO) do a nice job of organizing the star party; allowing only 475 registrations. This seems to be about all the field

can comfortably hold particularly with camping trailers becoming more popular. Three more HAA members would eventually join our enclave; Andrew Bruce, Margaret Walton, and Bruce Peart – Andrew and Margaret would claim two of the top door prizes; a 6" Celestron Nexstar GoTo scope, and a microscope, respectively.

For Saturday afternoon's entertainment there were a number of interesting speaker presentations. The keynote talk was given by Terence Dickinson who is well-known as the editor of Skynews Magazine and author of the popular astronomy books *Nightwatch*, and *The Backyard Astronomer's Guide*.

Sunday morning would arrive far too quickly yet it was a nice day if you had to pack up. Although more clear skies were forecast for that evening Gail and I joined the exodus of folks who still have to work to pay for their toys. However, like all the others, we felt that this star party had certainly given us our monies worth.





NASA Spacecraft Impacts Lunar Crater

MOFFETT FIELD, Calif. -- NASA's Lunar Crater Observation and Sensing Satellite, or LCROSS, created twin impacts on the moon's surface early Friday in a search for water ice. Scientists will analyze data from the spacecraft's instruments to assess whether water ice is present.

The satellite traveled 5.6 million miles during an historic 113-day mission that ended in the Cabeus crater, a permanently shadowed region near the moon's south pole. The spacecraft was launched June 18 as a companion mission to the Lunar Reconnaissance Orbiter from NASA's Kennedy Space Center in Florida.

"The LCROSS science instruments worked exceedingly well and returned a wealth of data that will greatly improve our understanding of our closest celestial neighbor," said Anthony Colaprete, LCROSS principal investigator and project scientist at NASA's Ames Research Center in Moffett Field, Calif. "The team is excited to dive into data." In preparation for impact, LCROSS and its spent Centaur upper stage rocket separated about 54,000 miles above the surface of the moon on Thursday at approximately 6:50 p.m. PDT.

Moving at a speed of more than 1.5 miles per second, the Centaur hit the lunar surface shortly after 4:31 a.m. Oct. 9, creating an impact that instruments aboard LCROSS observed for approximately four min-

utes. LCROSS then impacted the surface at approximately 4:36 a.m.

"This is a great day for science and exploration," said Doug Cooke, associate administrator for the Explo-

ration Systems Mission Directorate at NASA Headquarters in Washington. "The LCROSS data should prove to be an impressive addition to the tremendous leaps in knowledge about the moon that have been achieved in recent weeks. I want to congratulate the LCROSS team for their tremendous achievement in development of this low cost spacecraft and for their perseverance through a number of difficult technical and operational challenges."

Other observatories reported capturing both impacts. The data will be shared with the LCROSS science team for analysis. The LCROSS team expects it to take several weeks of analysis before it can make a definitive assessment

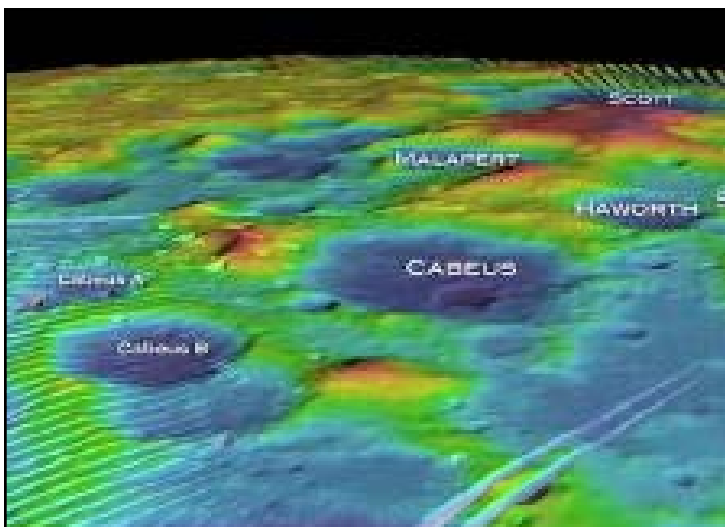
of the presence or absence of water ice. "I am very proud of the success of this LCROSS mission team," said Daniel Andrews, LCROSS project manager at Ames. "Whenever this team would hit a roadblock, it conceived a clever work-around allowing us to push forward with a successful mission."

The images and video collected by the amateur astronomer community and the public also will be used to enhance our knowledge about the moon.

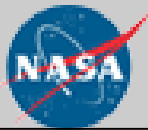
"One of the early goals of the mission was to get as many people to look at the LCROSS impacts in as many ways possible, and we succeeded," said Jennifer Heldmann, Ames' coordinator of the LCROSS observation campaign. "The amount of corroborated information that can be pulled out of this one event is fascinating."

"It has been an incredible journey since LCROSS was selected in April 2006," said Andrews. "The LCROSS Project faced a very ambitious schedule and an uncommonly small budget for a mission of this size. LCROSS could be a model for how small robotic missions are executed. This is truly big science on a small budget."

For more information about the LCROSS mission, including images and video, visit: <http://www.nasa.gov/lcross>



A false colour image of the impact area at the lunar south pole. The LCROSS mission was designed to find water on the moon.



Spitzer Discovers Saturn's Largest Ring

By Dr. Tony Phillips

NASA's Spitzer Space Telescope has discovered an enormous and previously unknown infrared ring around Saturn.

"This is one supersized ring," says Anne Verbitser, an astronomer at the University of Virginia, Charlottesville. "If you could see the ring in the night sky, it would span the width of two full Moons."

Verbitser is co-author of a paper about the discovery to be published online tomorrow by the journal *Nature*. The other authors are Douglas Hamilton of the University of Maryland and Michael Skrut-

skie of the University of Virginia.

The new belt lies at the far reaches of the Saturnian system, with an orbit tilted 27 degrees from the main ring plane. The bulk of its material starts about six million kilometers (3.7

million miles) away from the planet and extends outward roughly another 12 million kilometers (7.4 million miles). It

would take about one billion Earths stacked together to fill the voluminous ring. One of Saturn's farthest moons, Phoebe, circles within the new-found ring, and is likely the source of its material.

The ring is tenuous, consisting of widely-dispersed particles of

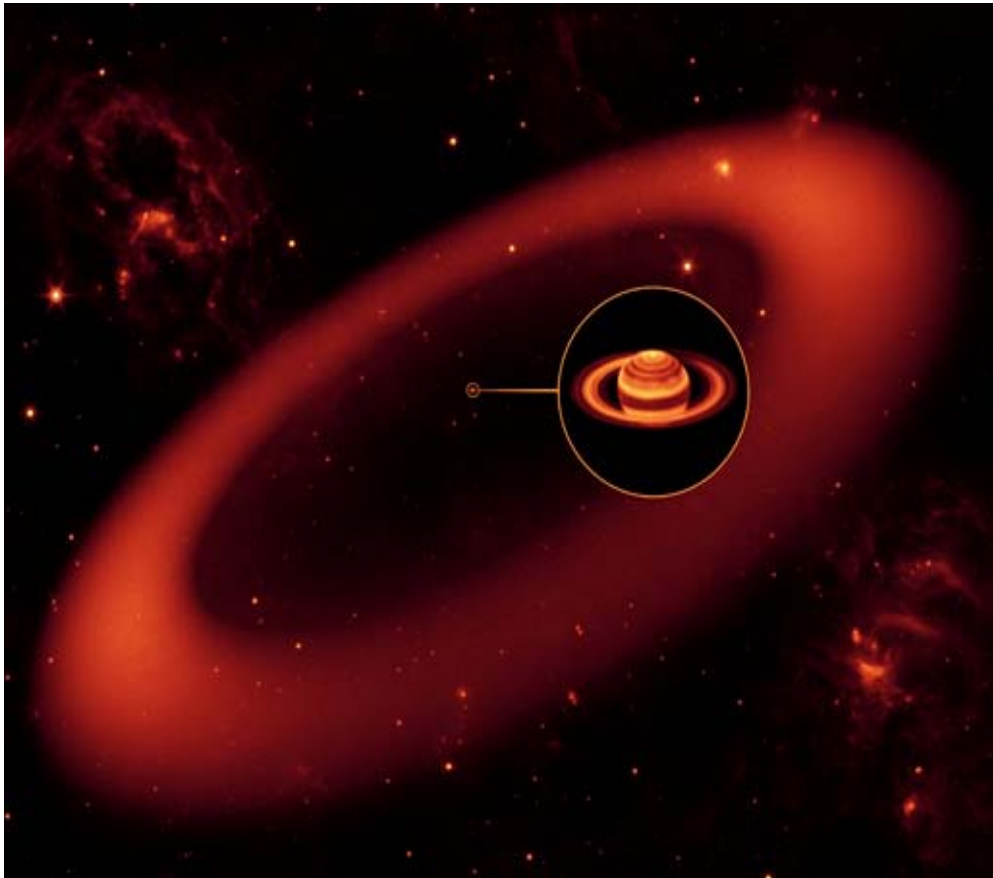
ice and dust. Spitzer's infrared eyes were able to spot the glow of the cool dust, which has a temperature of only about 80

Kelvin (minus 316 degrees Fahrenheit).

The discovery may help solve an age-old riddle of one of Saturn's moons. Iapetus has a strange appearance — one side is bright and the other is really dark, in a pattern that resembles the yin-yang symbol. The astronomer Giovanni Cassini first spotted the moon in 1671, and years later

figured out it has a dark side, now named Cassini Regio in his honor.

Saturn's supersized ring could explain how Cassini Regio came to be so dark. The ring is circling in the same direction as



An artist's concept of the newly-discovered infrared ring around Saturn.

(Continued on page 16)

Spitzer Discovers Saturn's Largest Ring

(continued)



Saturn's moon Iapetus. One side of the moon is darkened as the moon plows through the dust of Saturn's newly-discovered infrared ring.

(Continued from page 15)

Phoebe, while Iapetus, the other rings and most of Saturn's moons are all going the opposite way. According to the scientists, some of the dark and dusty material from the outer ring moves inward toward Iapetus, slamming the icy

moon like bugs on a windshield.

"Astronomers have long suspected that there is a connection between Saturn's outer moon Phoebe and the dark material on Iapetus," said Hamilton. "This new ring provides [the missing link]."

Verbiscer and colleagues used Spitzer's longer-wavelength infrared camera, called the multiband imaging photometer, to scan through a patch of sky far from Saturn and a bit inside Phoebe's orbit. The astronomers had a hunch that Phoebe might be circling around in a belt of dust and, sure enough, when the scientists took a first look at their Spitzer data, a band of dust jumped out.

The ring would be difficult to see with visible-light telescopes. The relatively small numbers of particles in the ring wouldn't reflect much visible light, especially out at Saturn where sunlight is weak.

"The particles are so far apart that if you were to stand in the ring, you wouldn't even know it," said Verbiscer. "By focusing on the glow of the ring's cool dust, Spitzer made it easy to find."

For additional images relating to the ring discovery and more information about Spitzer, visit <http://www.spitzer.caltech.edu>.



The Great White Scope Makeover

By Steve Germann

As you all know, I bought my Meade Lightbridge 16 a bit more than 2 years ago, after a brief bout of Aperture Fever. I took it to Starfest and was very proud of it, but I also saw that many people there have scopes as big and fancy as mine.

They say 'The Shoemaker's kids have the worst shoes'; which

means, if you know how to repair something, you don't need to get a new one yet. Well, I know how to repair, or work around deficiencies, but that does not mean it's always convenient. Some people have asked me how much work is it to have a telescope. Well, in answer, I have crafted this wish-list of repairs, maintenance and improvements which the Great White Scope is currently in need of.

At Starfest I learned the hard way about dew affecting the Secondary mirror of a Newtonian, and got good advice for a remedy.

That Kendrick DG-3 has served me well for more than 2 years now, keeping the secondary dry with just a 9V battery. Other parts of the dew heating system don't



The Great White Scope (GWS) waiting for darkness at Silent Lake

have the same power-sipping tendencies. Also, I tend to leave the DG energized when the scope is put away, to prevent dew in storage, and mostly due to forgetting to turn it off.

After bad weather, the skies often clear up very nicely, but there's so much moisture around that everything is a condensing surface. Now having more time for all-nighters, at places like Cherry Springs State Park, I realize it's time to add something to the GWS to make it fully dew-ready.

I have recently purchased a 33 AH power tank, on sale at Canadian Tire, for \$101, and a 4-channel adjustable Kendrick Dew Heater Controller for another \$100.

I plan to attach the latter to the frame of the GWS in an

appropriate spot, compatible with storage and transport, and add sufficient cabling so that dew heaters can be easily deployed for the secondary, the eyepiece, the Telrad, the finder scope and the finder scope eyepiece.

There's also a red-dot finder on the finder scope, but now having the Telrad, I only need

that one when doing the initial calibration of the finder scope to main scope. After that, I don't use it, so I can get away without keeping it warm.

In addition to dew heaters and cabling, the scope needs some other things. For one, I had to replace the particle board base of the scope with 13-layer birch plywood. A coat of verathane on it will protect it against wet grass and the like.

A proper mount for the finder scope needs to be done. What's most appropriate would be to put a rail on the primary can, on which to mount the finder scope easily. There are still some issues with balancing the scope. It turns out that it balances fine until the eyepiece is put in, then it tends to droop. The

(Continued on page 18)

The Great White Scope Makeover

(Continued)

(Continued from page 17)

brake needs to be very tight to prevent this. Mounting a bit of extra weight on the end near the main mirror would bring things back into balance.

I sometimes see the shroud encroaching on the optical path; It needs some 'hoops' to keep it out of the way, or perhaps a strip of Velcro sewn onto it so that it can be 'gathered' and held in a more rigid position.

I have an excellent zippered cover for the scope, which makes it resemble a telephone booth. This needs to be made a little smaller by some means, so it won't

need to be bungeed when used. Having the verathane on the base will mean i don't have to worry so much if some water runs down the cover to the base.

The equatorial platform has lost one of it's adjustable feet. It's not too big a

deal yet, but would be nice to have it complete again. It supports a guide port, but i have never used it for guiding yet. It would be worth taking an evening to get that working.

I think it would be good to have a cover for the eyepiece rack, so that eyepieces put there won't gather dew during the evening. I have used an eyepiece case as a kind of hat for them, to keep the dew off them. That works too.

My hard cases are a bit disorganized. I have so much more stuff now, that it's all compressed in there with the foam. A good afternoon spent re-arranging the stuff,

and making new foam inserts for the cases would go a long way to making things tidy. I also have a number of items which i don't yet keep in a hard case, and end up bringing miscellaneous boxes of stuff with me when i camp. Finding space for them in an organized way, or in a special part of one of my 2 hard cases, would make that better.

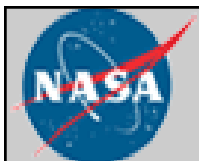
I fashioned lids for the primary and both sides of the secondary, a long time ago, from hardboard. The white tape that circles their edges has worn out over time, and the bungees that hold them in place have lost their touch. Cleaning them up and per-

haps a coat of paint, and some weather stripping for a better seal, would make things travel with lest vulnerability to road dust.

So, now that I have a complete list of renovations and repairs, I can sit and budget the time for them.



The GWS making it's way home in almost ALL of my VW



NASA—Space Place

Spitzer, The Sequel!

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 (-273°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.

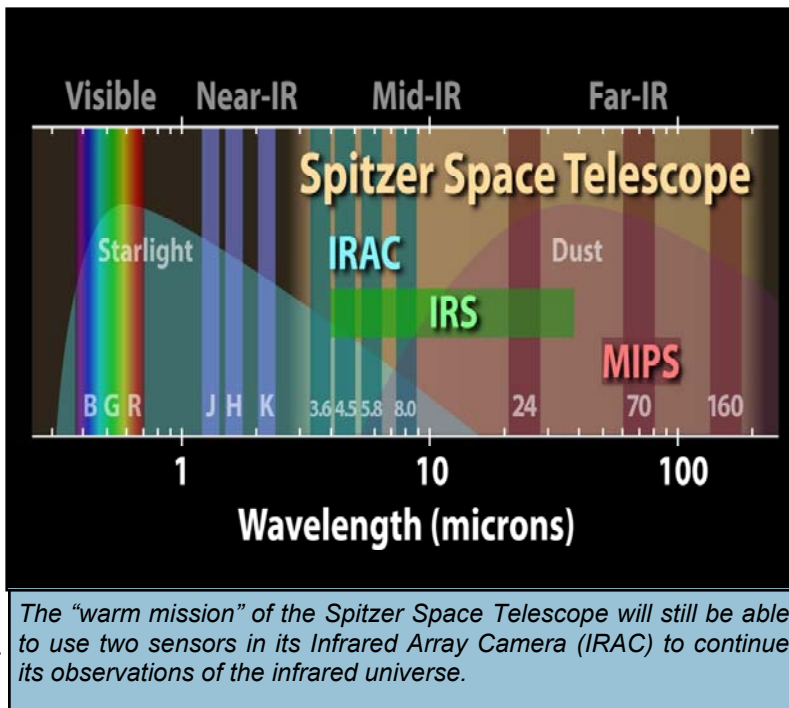
“We always knew that a ‘warm phase’ of the mission was a possibility, but it became ever more exciting scientifically as we started to plan for it seriously,” says JPL’s Michael Werner, Project Scientist for Spitzer. “Spitzer is just going on and on like the Energizer bunny.”

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 tele-

scopes. 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



scopes.

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

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.

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



HAMILTON AMATEUR ASTRONOMERS

PO Box 65578
Dundas, Ontario
L9H 6Y6

General Inquiries
secretary@amateurastronomy.org
Membership
membership@amateurastronomy.org
Meeting Inquiries
chair@amateurastronomy.org
Public Events
publicity@amateurastronomy.org
Observing Inquiries
observing@amateurastronomy.org
Newsletter
editor@amateurastronomy.org

We're on the Web!

www.amateurastronomy.org

Article Submissions

The HAA welcomes your astronomy related writings for the Event Horizon newsletter. Please send your articles, big or small, to:

editor@amateurastronomy.org

The submission deadline is two weeks before each general meeting.

The Event Horizon is a publication of the Hamilton Amateur Astronomers (HAA). The HAA is an amateur astronomy club, for people of all ages and experience levels, dedicated to the promotion and enjoyment of astronomy. The cost of the subscription is included in the \$25 individual or \$30 family membership fee for the year. Event Horizon is published a minimum of 10 times a year.

2009 HAA Council

Chair	Steve Germann
Second Chair	Jackie Fulton
Secretary	Darrell Maude
Treasurer	Don Pullen
Membership Director	Jim Wamsley
Observing Director	John Gauvreau
Event Horizon Editor	Tim Philp
Webmaster	Bob Christmas
Recorder	Ann Tekatch
Councillor	Brenda Frederick
Councillor	Heather Neproszel
Councillor	Ray Badgerow
Councillor	Harvey Garden
Councillor	Vacant

Next Meeting

Friday, November 13th, 2009

7:30 PM @ The Spectator

Observing site for the HAA provided with the generous support of

Binbrook Conservation Area..

Come out observing with other members and see what a great location this is for stargazing, a family day or an outdoor function. Please consider purchasing a season's pass for \$70 to help support the park.

www.conservation-niagara.on.ca/conservation_areas/binbrook/binbrook.html

(905) 692-3228

Domain name and web hosting for the Hamilton Amateur Astronomy club supplied by

Axess Communications

Corporate and Residential DSL and Web Hosting

www.axess.com

support@axess.com