

Editorial

Despite cool temperatures and periodic cloudiness, International Astronomy Day went well, with the majority of the visitors showing up later in the day. Already the PAA are bringing new ideas to make next year's even better. One idea I'm in favor for is having a barbeque, if that's possible. You can find out more on how Astronomy Day went on page 2.

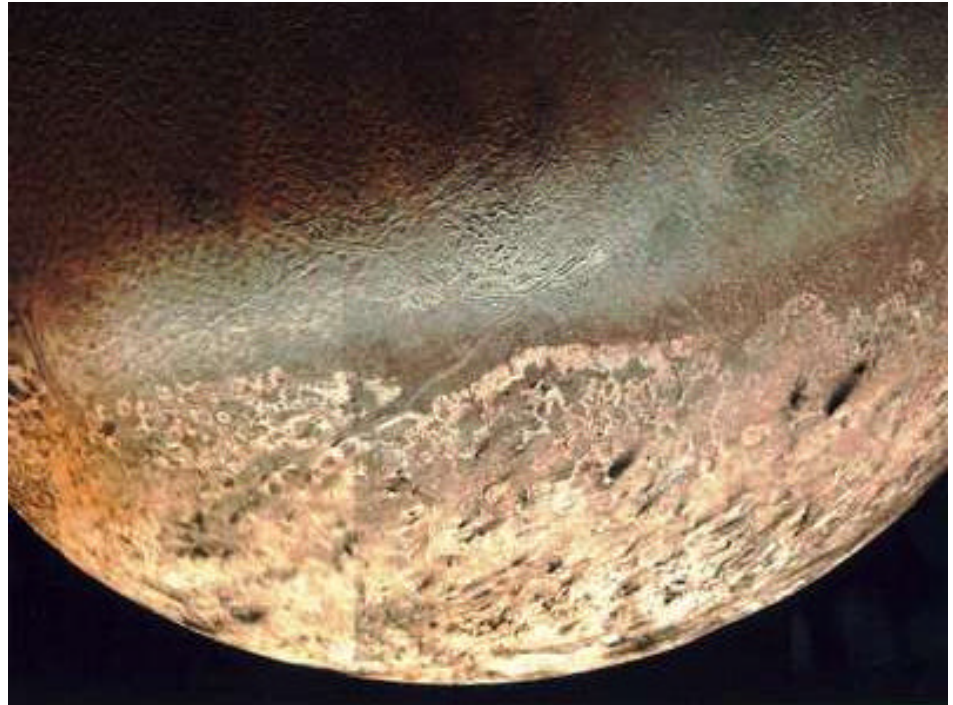
At the end of the last PAA meeting, our President John Crossen announced that he will be stepping down from his position in January 2007. I want to speak on behalf of the PAA and thank you, John, for the hard work you've done for the club. It's greatly appreciated!

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Stolen Moon

Neptune's largest moon, Triton, has a unique characteristic about it that no other large moon in our solar system has. Triton orbits in the opposite direction to its planet's rotation, in what is called a "retrograde" orbit. There are other moons in our solar system that are retrograde, but they are much smaller than the planets they orbit. For example, Jupiter and Saturn have outer moons in retrograde orbits. These moons, though, are less than a few thousandths of their mass and have larger and more eccentric orbits.

Scientists from the University of California, Santa Cruz, and the University of Maryland have put together a new model to identify the cause of Triton's unusual orbit. They now believe that



This is a picture of Neptune's largest moon, Triton. Image credit: NASA

Triton once belonged to a binary set of objects. At some point in the past, this binary and Neptune had a close encounter in their orbit around the Sun, resulting with Triton being "stolen" by Neptune. This is a possible theory that would explain the retrograde orbit.

These scientists believe that the binary Triton came from was much like Pluto and its moon Charon. Because of its size (about one-eighth the mass of Pluto), Charon doesn't really orbit

Pluto, instead, they both move around a center of mass that lies between the both of them. If a binary like that came close to a giant planet, such as Neptune, they could be pulled apart by the planet's gravitational forces.

For more information, go to :
www.ucsc.edu/news_events/press_releases/text.asp?pid=867

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All of life is a learning experience – including Astronomy Day

I won't call our second International Astronomy Day a roaring success. Compared to last year, we had about half the attendance figures. But we did get through to some people and they came out for the show – or should I say shows.

Mark and Susan Coady had a number of surprised and interested visitors to their booth on Light Pollution Abatement. Mark made maximum use of the little CCD video he had done to explain the basic concepts of shielded lighting and the cost efficiencies of such a system. Thank Bill Gates for laptops!

The PAA/BHO Planetarium ran three shows during the course of the day. And to give you an idea of how weather affected attendance, we had six people at the first show and twenty+ at the last show. Anybody care to guess if the day got clearer and clearer as the afternoon wore on?

The solar observing scopes almost outnumbered the attendees earlier on in the morning. But interest seemed to grow as the clouds thinned and Old Sol peeped out. By the night time, it was beautifully clear and we had a strong turnout for the Moon/Jupiter/Saturn observing session further up the hill.

Rick's talk on Mauna Kea was well attended by both PAA stalwarts and the public. Then again, the sky was clearing and the day seemed more inviting.

After a supper break, Gord Rife began his talk on the Eclipse in Turkey. A good turn out of PAA members managed to make the room feel cozy. As the presentation moved along, more and more stragglers from the public dropped in. By the time the eclipse talk was over, the room was filled to the point that the people in the back were short of chairs. And it was a superb presentation, thanks Gord and Laurie.

So what was the lesson?

The first thing we learned was that the public only likes to be outdoors when the weather is bright, sunny, and warm. Next year we will ignore what the rest of the world does and schedule our Astronomy Day sometime in mid-July.

We'll also aim at holding the event on a Sunday. That way we have a better shot at getting a chunk of people's leisure time. Saturday is chore day in today's world.

A couple of members as well as Jane Wild, the Museum's event coordinator, suggested that we aim more of the activities at the small-fry. We'll delve into the matter in more detail at one of our meetings.

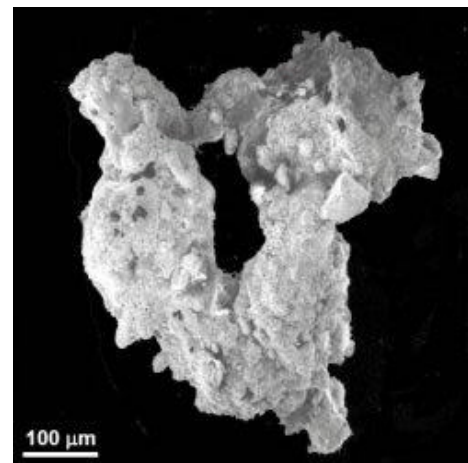
What was successful was the response we got from PAA volunteers. I thank you all for an outstanding effort.

The weather got us this year. But next year we'll reduce the weather factor as much as we can by shifting our date. We'll also make some more changes as we further analyze the results. Until then, clear skies and warm weather – if you please!

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Lunar Dust Buster

Ever get a fragile item packed in a box filled with Styrofoam peanuts? Plunge your hands into the foam peanuts to search for the item, and when you pull it out foam peanuts are clinging to your arms. Try to brush them off, and they won't fall off—instead, they seem to hop away, only to cling to your legs or elsewhere. The smaller the peanuts, the more tenacious they seem. In fact, if you break a foam peanut into bits, the tiny lightweight bits are almost impossible to brush off.



A tiny, jagged speck of moon dust. Micro-photograph courtesy of David McKay, NASA/JSC.

This behavior is classic static cling. It's also the behavior of lunar—and possibly also Martian—dust.

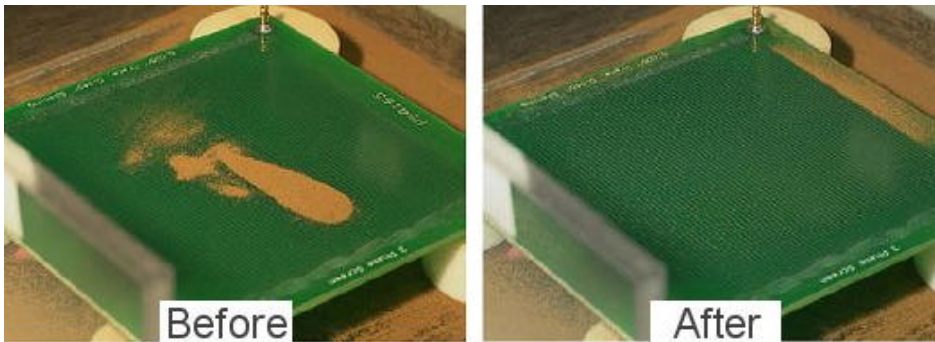
The dozen Apollo astronauts who landed on the Moon between 1969 and 1972 found moon dust to be an unexpected challenge. Not only was it so abrasive that it wore partially through the outer gloves of their space suits, but also it stuck to everything. The more they tried to brush it away, the more it worked its way into the space suits' fabric.

Part of the dust's tenacious clinging was due to the sharp, irregular shapes of individual dust grains, formed by millions of years of meteorite impacts that repeatedly melted rocks into glass and then broke the glassy rocks into powdered glass. The particles' jagged edges were almost like claws that hooked into things like microscopic burrs.

But another reason was the dust's electrostatic charge. On the Moon, harsh, unshielded ultraviolet rays from the Sun have enough energy to kick electrons out of the upper layers of the regolith (soil), giving the surface of each dust particle a net positive charge. The smaller the particles, the less their mass and the greater their charged surface area, so the more they clung—just like Styrofoam peanuts broken into small bits.

A team led by Carlos I. Calle (lead scientist at NASA's Electrostatics and

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Calle's device rapidly throws off simulated martian dust in a laboratory test at the Kennedy Space Center.

Surface Physics Laboratory at Kennedy Space Center), however, has used a bit of intellectual judo to figure out a way to take advantage of the dust grains' electrostatic charge to repel them. In fact, they've come up with a new application of an old idea.

"In the 1970s, electrical engineering professor Senichi Masuda of the University of Tokyo—well-known as a pioneer in electrostatics—came up with the 'electric curtain,'" Calle recalls.

Masuda, not even thinking about the Moon or Mars, was working on air pollution filters. Because smog particles are often charged, Masuda came up with a prototype of what he called the electric curtain.

Essentially, the electric curtain was a series of parallel electrodes—thin copper wires—spaced roughly a centimeter (half an inch) apart in a circuit board. To them, Masuda applied alternating current, such as that from an ordinary wall socket. The word "alternating" refers to the fact that the electrons in the wires are quickly—60 times a second in the United States, 50 times a second in Europe—made to move forward and backward along the wire, instead of just in one direction as in the direct current from a battery.

But instead of providing the same alternating current to all the parallel electrodes at once, Masuda did something ingenious. He slightly delayed the onset of the current to each successive electrode. That slight delay made the electromagnetic field of each electrode to be out of phase with its neighbors, creating an electromagnetic wave that rapidly trav-

eled horizontally across the surface on which the electrodes lay. Moreover, any charged particles lying on the surface got lifted and moved by that traveling electromagnetic wave, as if they were surfers being pushed along by an ocean wave.

Fast forward to the present: After seeing how Martian dust that collected on the solar panels of Mars Pathfinder deprived it of electric power and impaired performance, Calle and his collaborators began wondering if the electric curtain could be adapted to keep solar panels on the Moon and Mars dust-free. After all, he reasoned, "human and robot astronauts can't always be cleaning windows."

To let sunlight through, however, the device would need transparent electrodes. So instead of using copper wires, Calle and his colleagues made electrodes out of indium titanium oxide (ITO), transparent semiconducting oxides "that are now a mature technology, used in the touch screens of PDAs (personal digital assistants)," Calle explains. They also moved the electrodes closer together—just a few millimeters apart. The result was a transparent film that "is flexible, like a sheet of vinyl," that they call an electrodynamic dust shield.

When the transparent dust shield was covered with simulated lunar or Martian dust (which is mostly ground-up volcanic ash and cinders from terrestrial volcanoes) and put in a vacuum chamber that was then pumped down to the rarefied atmospheric pressure of Mars or the Moon, it worked like a

champ. Most of the dust was thrown off to the side in seconds.

None of the simulated lunar and Martian soils, however, contains either the pure iron or shards of glass found in real moon dust. This difference might affect the dust shield's effectiveness. "I'm hoping to try the experiment again with a vial of actual lunar dust," he says.

While Calle is optimistic about the dust shield's effectiveness for large flat or gently curved surfaces such as solar panels and the visors of astronauts' helmets, "folds in the fabric of a space suit are more challenging," he says. "ITOs are flexible, but after a point will break." He's also working to fine-tune the voltage, frequency, phase, and other electrical properties of the traveling electromagnetic wave to repel the greatest amount of dust. And he's curious to see how it would behave in lower gravity.

There's much work to be done, says Calle, but one day his device might draw the curtain on the troubles with moon dust.

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Production Editor: Dr. Tony Phillips
Credit: Science@NASA
Submitted by: Mark Coody

Who left the bathroom lights on!

What's wrong with something that's good for our environment, better for our health, saves taxpayers and municipalities lots of money, and helps preserve the dark night sky of cottage country? If you said "nothing" you're absolutely right.

The hero of this tale is shielded lighting. The culprit is called light pollution. Simply put light pollution is having things lit up that don't need it. Like those

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big round driveway lamps that light up the sky when all you want to do is light up the ground. The wasted light goes up to illuminate the clouds and bird bellies, or into your eyes as glare. But what the heck, it's only light!

Turns out, light pollution can do a lot of harm. It disturbs the nocturnal patterns of animals and birds. It has the same effect on plants growing around buildings and homes. Plus there has recently been a growing mountain of evidence that artificial light can lead to illnesses – particularly for those who work the night shift. And the glare from poorly designed lights can actually make driving and walking less safe. Hey maybe this light pollution thing has something to it.

Something to the tune of about \$2 billion USD wasted in North America every year. And who generates most of the wasted light, wasted energy and wasted money? Ironically, the same people who are urging you and I to cut back...turn off the lights...set the thermostat lower in the winter...don't use the air conditioner...put everything on timers...and let's extend daylight savings time, too. I won't argue for a second over their advice. We should be doing just what they say. But instead of first pointing the finger of incrimination at you and I, perhaps our municipalities had better start looking closer to home when it comes to saving energy and tax dollars.

A few years ago the nearby village of Hastings did something wonderfully right. They got rid of their energy-wasting, badly-designed street lights and



The biggest money waster (light polluter) of them all – the ancient cobra style streetlight. Great for generating glare on rainy nights, too.



The comet 73P (Schwassmann Wachmann 3) passing by the Ring Nebula (M57).

installed a new system that was in step with our changing world. The lamps were fully shielded and focused the light down where it is needed. Annoying, and sometimes dangerous, glare was virtually eliminated. Because the light went only where it was needed, lower wattage bulbs could be used. This required less energy and ultimately less money from you and I to get the job done. According to my information, the retrofit paid for itself in a few years. And the money it saves today can go into other programs – or back into our pockets. Isn't that a novel idea!

Calgary did the same thing, only on a much larger scale. And is it working? Every year the money saved by one phase of the retrofit pays for the next. Plus emissions are down because Calgary uses fossil fuel to run its generators...only now it uses a lot less.

Learn how we can all save money, energy, wild life, our own health, and the night sky by visiting: < <http://www.ec.gc.ca/pp/en/print.cfm?storyid=103> > < <http://www.darksky.org> > < <http://www.muskokaheritage.org/natural/ecologynight.asp> > And that applies double if your name is McGuinty or Harper.

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Nebula – Comet Flyby!

On May 7th, Fragment “C”, of Comet 73P (Schwassmann Wachmann 3), raced by the Ring Nebula (M57). "The comet was moving so fast that I could see movement in only 5 seconds," says [John Chumack](#) of Ohio, who took the picture above.

"As the comet's dust tail crossed over M57, it actually caused the nebula's central star to flicker--that was really neat!" he said.

John took this amazing RGB image at 30 seconds for each of the colors, in a moonlit sky while it was still low on the horizon. Using a 16" F4.5 Homemade Newtonian telescope and ST9-CCD camera from his observatory in Yellow Springs, Ohio. (near Dayton, OH). The detail is amazing when you consider you can see the central star of M57.

The above image appeared on the NASA SpaceWeather website on May 9, 2006. John Chumack is an accomplished astrophotographer that has been known to annually visit Rice Lake to do some fishing. He graciously allowed me to use his image for our newsletter. To see more of John's work, check out the website for his observatories (The

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Dayton Research Station and Yellow Springs Research Station) at:
www.galacticimages.com

John took enough frames before and after the crossing on May 7th, that he might be able to piece together a cool full color movie, so stay tuned. In the meantime, check out John's B&W link to this rare celestial event:
http://www.galacticimages.com/videos/m57COMET_0002.wmv

Before I went to bed on the night of the 7th, I witnessed this event in my ETX 90 from my front yard and although my view was fainter, John's B&W image comes close to what I saw (though not as detailed). To see these galactic wonders so tightly fit in an eyepiece was spell-binding. Even at 100 power, they were only taking up the centre of the field of view. What an end to a day!

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A Night At Cedar Knoll Observatory

I'm not surprised that our second gathering at Brett Hardy's Cedar Knoll Observatory brought out a big batch of PAA stargazers. Like they say about the Bahamas; "Once is not



This shot represents less than half of the people who showed up for the star show. According to those who hung in, the night turned out to one of our best observing sessions yet.

enough." And after the word of our first superb gathering there spread through the club, the ranks swelled even more for our second visit.

Buckets of coffee were hot and ready by the time the last members of the group arrived – thank you very much Trish. And the night was spectacular. We all enjoyed watching the sun set behind the hills surrounding Brett and Trish's farm house. And then the stars began to wink back at us from the slowly darkening sky.

In addition to the TMB refractor inside the observatory, Brett had his LX200 set up outside along with his laptop. Mark and Susan Coady brought along their scopes as did some other members. Colin Cross even hauled out his barn-door tracker for a bit of low-tech astrophotography.

Unfortunately Marina Bedard, Mike Ricks, and myself had to leave early because BHO was also open that night. So as we departed, we waved at hell/goodbye to Jim Webster who was just arriving.

Thank you very much Trish and Brett for putting up with us for the night and for sharing your observatory, superb site and wonderful hospitality.

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The large observatory holding the James Clerk Maxwell Telescope.

Aloha #4 – James Clerk Maxwell Telescope (JCMT)

Next on our tour of Mauna Kea, Hawaii, was the large observatory that held the James Clerk Maxwell (submillimeter) Telescope (JCMT), with its 50ft (15m) antenna, at the 13,428ft (4,093m) level. I believe the observatory was open on our visit to Mauna Kea (although I didn't realize it at the time), you can see my only shot of it (above). You will also notice it was not a typical dome shape and yet is one of the larger facilities in operation on Mauna Kea. There are many unique features at this facility that I will explain later, but first, who is James Clerk Maxwell?

James Clerk Maxwell (1831 – 1879) was a Scottish mathematician and physicist who contributed greatly to our understanding of electromagnetism, astrophysics, thermodynamics and color vision. In 1861 he produced the first color photograph. He also studied Saturn's rings and argued that they were made up of small solid particles (which the first Voyager spacecraft confirmed). As a result, a small gap in the C-Ring has been named after him (Maxwell Gap). He also developed and published the unified formulation of electromagnetic waves. Today we refer to these equations as the Maxwell equations. No wonder there is a telescope named after him!

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The Joint Astronomy Centre operates the JCMT 42km away.

So what is so special about the JCMT? Since it saw “first light” in April of 1987, it is the world’s largest single-dish submillimeter telescope (as wide as a basketball court!) and is constructed of 276 aluminum panels that cover the surface of the antenna. It is funded by the UK, Canada and the Netherlands. When in operation, it is covered by the world’s largest piece of Gore-Tex, which covers the opening of the enclosure to keep the wind, dust and moisture from the telescope. The Gore-Tex is transparent to submillimeter radiation, so the antenna can operate though it looks covered (see picture above). This telescope focuses on the electromagnetic spectrum (between infrared and radio waves). This type of radiation comes from the “cooler” material in the universe, like the gas and dust between the stars (interstellar medium), from which new stars are born and old stars contribute.

This telescope collects data for imaging on a device called the Submillimeter Common User Bolometer Array (SCUBA). The unique thing about this (other than the name), is that this “camera” has to be cooled to within one tenth of a degree of absolute zero! This makes it one of the coldest places on earth (459.5F or -273.3C), or the universe for that matter. They are working on a SCUBA-2, which will be 1,000

times more sensitive and cover an even greater portion of the sky. (This puts a different spin on Brett Hardy’s talk about video camera imaging at our May 12th meeting).

This whole facility is operated from The Joint Astronomy Centre (42km or 26mi away) at the University of Hawaii (Hilo Research Park). This building complex is depicted in the following image. It was the only building at the Research Park that did not allow me inside. They did provide me with some literature about the facility once I explained over an intercom who I was and what I was looking for. Better than nothing, I guess.

The JCMT is just one more example of why Mauna Kea is “clearly the best”!

For more information, link to the JCMT via the Joint Astronomy Centre website:

www.jach.hawaii.edu/outreach/articles/aboutjcmt/

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Resurrecting Trashescopes

Maybe you know someone who got a department store 60mm telescope, with their .965” eyepieces and barlow lenses, for Christmas and realize that the darn thing is just no good for astronomy. Maybe you came across one at a garage sale, or found one on Ebay at a ridiculously low price, and picked it up. It’s no wonder they earned the nickname “Trashescopes”. But, regardless of how they came into your possession, and before relegating them to the local dump, consider upgrading them to fully functional astronomical telescopes.

Exchanging the .965” Eyepieces

Quite often the lenses in these trashscopes are actually quite good and capable of viewing the heavens but the .965” eyepieces that come with them won’t allow you to focus properly on anything other than the moon - and not even that with some of them. You need at least inch and a quarter eyepieces to view the heavens - anything smaller just won’t do - and there are two ways of adapting inch and a quarter eyepieces to these types of telescopes, both with their advantages and disadvantages.

The simplest, and cheapest, is to buy a .965” to inch and a quarter hybrid diagonal. These fit into the focuser and act as a 90° star diagonal at the same time. The cost is between \$40 and \$50 from astronomy retailers but sometimes they can be found cheaper on Ebay. You will need inch and a quarter eyepieces but with the usual $f/10$, or greater, focal ratio you can get away with Kellners which will set you back about \$20 to \$30 for a pair. The one disadvantage is that the extra focal length added by the diagonal can result in possible inability to focus when using high power eyepieces or barlow lenses.

A better, but more expensive, way to achieve this is to replace the actual focuser with an inch and a quarter focuser. You simply take out the three screws

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The author's restored 70mm f/4.3 Orion telescope.

where the old focuser attaches to the tube, replace it with the new focuser, and put the screws back in. A standard star diagonal will be necessary if you want to comfortably view the heavens. With the focuser changed, high power eyepieces, and sometimes even Barlow lenses, can be used. The cost for a new focuser can be upwards of \$75 depending on where one is obtained. Occasionally, one can be found on Ebay, with the star diagonal included, for between \$40 and \$50 (including shipping).

Changing the Finderscope

These trashscopes usually have finderscopes that are totally useless as their



A view of the Waxing Gibbous Moon taken through the author's 70mm Orion with an electronic eyepiece.

field of view is just too small and their magnification, if any, is meaningless at this size. Replace them with a red dot finder. If the new finder won't fit where the old one went, drill new holes in the red dot finder base or use tie-wraps to secure them to the tube. These will set you back between \$30 and \$50. Sometimes they can be cheaper on Ebay.

Changing the Mount

Next to the cheapo eyepieces and finderscopes, the worst thing about these trashscopes are the rickety mounts and tripods. They aren't designed with astronomy, or ease of use, in mind and can often move, or bounce around, in the slightest of breeze.

Sometimes these can be fixed with a few replaced bolts, nuts, and washers but often they are beyond repair. If you can't repair the mount then consider adapting the tube to a sturdy photographic tripod. Take a piece of 2X2 wood and tie-wrap it to the tube. Then drill a hole in the wood and set a long nut in it that takes 1/4"X20 bolts (the same bolt used on photographic tripods - 45 cents each at Home Depot). Then mount the assembly on the tripod and you're all set.

Caveat Emptor - may the buyer beware

If the price of upgrading a trashscope is going to approach the cost of a new telescope or a good used one, then the decision whether to upgrade a trashscope becomes a moot point and it can then be happily disposed of at the local dump. But, with a little ingenuity and some modest cash outlay, a trashscope can be resurrected and given new life. I have successfully resurrected a 60mm Tasco with a replaced focuser - which recently was donated to the PAA and auctioned off at the April 14th meeting - and a 70mm Orion with a hybrid diagonal which will stay in my arsenal of telescopes.

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NASA Space Place

Not A Moment Wasted

The Ring Nebula. Check. M13. Check. Next up: The Whirlpool galaxy.

You punch in the coordinates and your telescope takes off, slewing across the sky. You tap your feet and stare at the stars. These Messier marathons would go much faster if the telescope didn't take so long to slew. What a waste of time!

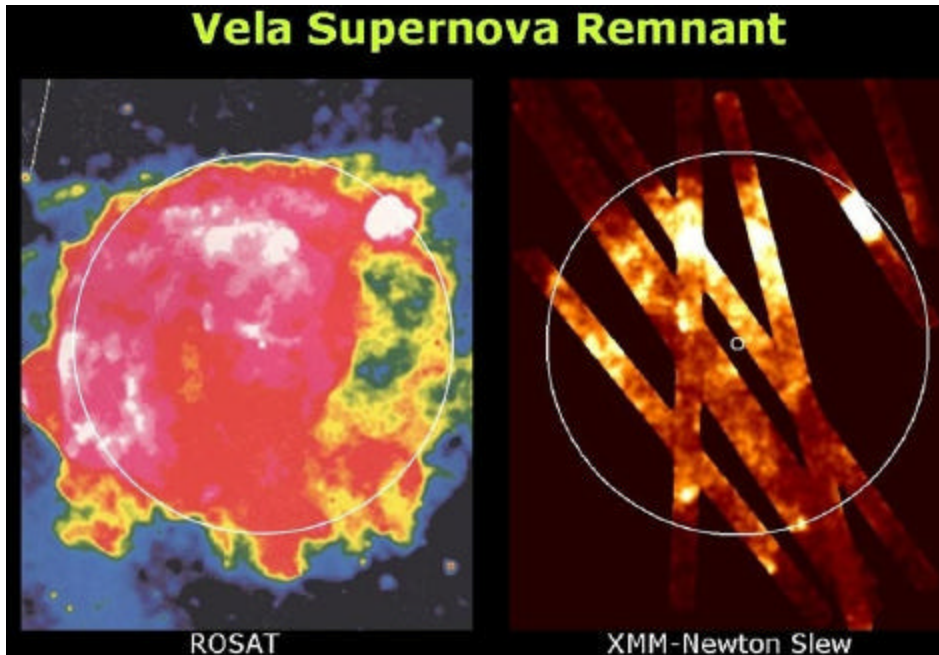
Don't tell that to the x-ray astronomers.

"We're putting our slew time to good use," explains Norbert Schartel, project scientist for the European Space Agency's XMM-Newton x-ray telescope. The telescope, named for Sir Isaac Newton, was launched into Earth orbit in 1999. It's now midway through an 11-year mission to study black holes, neutron stars, active galaxies and other violent denizens of the Universe that show up particularly well at x-ray wavelengths.

For the past four years, whenever XMM-Newton slewed from one object to another, astronomers kept the telescope's cameras running, recording whatever might drift through the field of view. The result is a stunning survey of the heavens covering 15% of the entire sky.

Sifting through the data, ESA astronomers have found entire clusters of galaxies unknown before anyone started paying attention to "slew time." Some already-known galaxies have been caught in the act of flaring—a sign, researchers believe, of a central black hole gobbling matter from nearby stars and interstellar clouds. Here in our own galaxy, the 20,000 year old Vela supernova remnant has been expanding. XMM-Newton has slewed across it many times, tracing its changing contours in exquisite detail.

The slew technique works because of
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Are you attracted to Jupiter? Join the crowd

If you feel the urge to look up at the sky this month, you might be feeling the pull of Jupiter.

The giant planet is having a close encounter with Earth all month long. On May 6th, the date of closest approach, Jupiter will be 410 million miles away, which is almost 200 million miles closer than it was just six months ago in October. This makes Jupiter unusually big and bright.

Look for it rising in the east at sunset. Jupiter is unmistakable, shining ten times brighter than any star around it. The view through a backyard telescope is dynamite. You can see Jupiter's cloud belts, the Great Red Spot and four large moons (Io, Europa, Ganymede and Callisto) circling the planet.

Many are also observing a second red spot that is still developing. Nicknamed "Little Red" because it is smaller than the Giant Red Spot, this unusual storm developed when three smaller white spots merged a few years ago. Many scientists...
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The image on the left is the Vela Supernova Remnant as imaged in X-rays by ROSAT. On the right are some of the slew images obtained by XMM-Newton in its "spare" time.

XMM-Newton's great sensitivity. It has more collecting area than any other x-ray telescope in the history of astronomy. Sources flit through the field of view in only 10 seconds, but that's plenty of time in most cases to gather valuable data.

The work is just beginning. Astronomers plan to continue the slew survey, eventually mapping as much as 80% of the entire sky. No one knows how many new clusters will be found or how many black holes might be caught gobbling their neighbors. One thing's for sure: "There *will* be new discoveries," says Schartel.

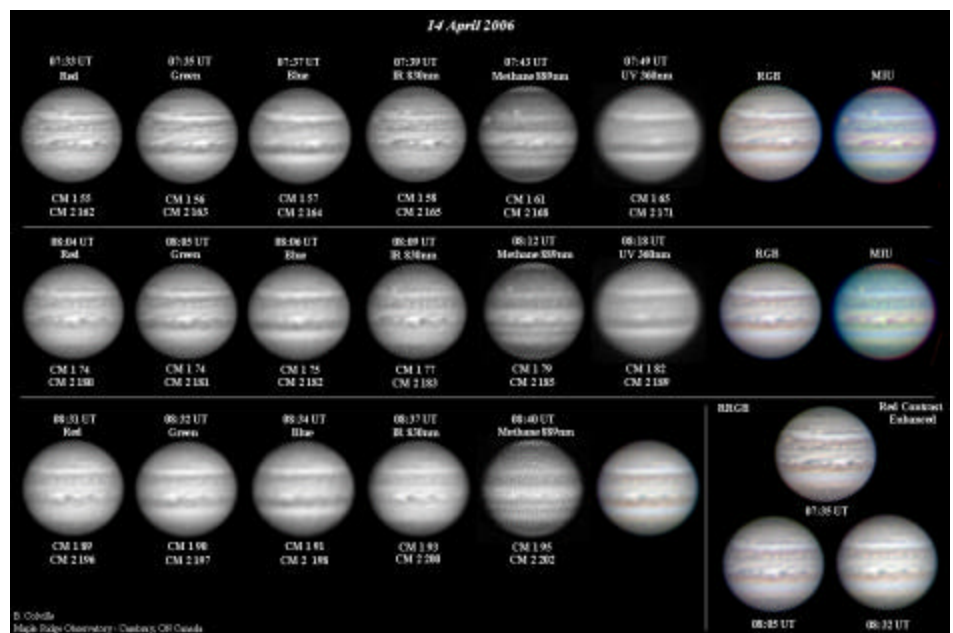
Tap, tap, tap. The next time you're in the backyard with your telescope, and it takes off for the Whirlpool galaxy, don't just stand there. Try to keep up with the moving eyepiece. Look, you never know what might drift by.

See some of the other XMM-Newton images at <http://sci.esa.int>. For more about XMM-Newton's Education and Public Outreach program, including downloadable classroom materials, go to <http://xmm.sonoma.edu>. Kids can learn about black holes and play "Black Hole Rescue" at The Space Place, <http://>

spaceplace.nasa.gov/, under "Games."

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

By: Dr. Tony Phillips



A spread of Jupiter images taken by Brian Colville.

think that the Little Red is now dragging up material from within Jupiter's cloudy atmosphere and that it is changing in color as it is exposed to the dim sunlight.

For those who like to count, Jupiter is growing moons even faster than it is new surface markings. Its current satellite count is 63. That's a big jump from a few years ago when I was in high school. (Did I say a few years ago?) OK, make that about 48 years ago.

Shown on the previous page is a spread of Jupiter images taken by local amateur Brian Colville. Brian is one of Canada's finest imagers and has had his work published nationally. Brian has imaged each shot with a different filter to bring out specific detail in Jupiter's surface detail. Great work Brian. Thanks for sharing.

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International Astronomy Day Prize Winners

Raffle Prize – SkyWatcher Telescope

Donated by the Peterborough Astronomical Association
(www.peterboroughastronomy.com) and
Buckhorn Observatory
(www.buckhornobservatory.com)

Winner – Buckhorn Elementary School

Draw Prize - \$50 Gift Certificate

Donated by EfstonScience of Toronto
(www.telescopes.ca)

Winners – Jessica Perveril of Peterborough
Kathern Blanchard of Peterborough
Richard Ide of Buckhorn

Draw Prize – RASC Astronomy Calendars

Donated by Buckhorn Observatory

Winners – Hypatia Baetsen of Orono
Sophie of Keene

International Astronomy Day is a global event that is held each year to encourage public interest in astronomy. On May 6, astronomy clubs, observatories, and institutions around the world held free public events that featured guest speakers, astronomical presentation, solar observing during the day and stargazing at night.

For more information contact John Crossen, President, Peterborough Astronomical Association at:
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The Sky This Month

MERCURY

Mercury is in superior conjunction on May 18th and is difficult to see. It will be better viewed on the last few days of the month.

VENUS

Venus is in the low eastern sky for a short while before dawn.

MARS

Mars is too low for good observing. It moves from Gemini to Cancer by the end of the month.

JUPITER

Jupiter is in Libra, high in the southeast night sky. It has a magnitude of about -2.5.

SATURN

Saturn is low in the west-northwest for a few hours after sunset. It is located in Cancer.

URANUS

Uranus is in Aquarius. It rises about an hour after Neptune.

NEPTUNE

Neptune is in the constellation Capricornus, and rises just after midnight.

PLUTO

Pluto is in Serpentis, but has a magnitude of 14, making it well beyond the site of all but the best telescopes.

METEOR SHOWERS:

The Eta Aquarids peak on May 6th.

For details, see <http://comets.amsmeteors.org/meteors/calendar.html>.

Meeting Notes

May 12, 2006

What would make the perfect follow-up to our previous observing session at Brett Hardy's observatory? How about a talk from Brett on what he uses the observatory for – namely video astronomy?

During the course of the Power Point presentation Brett took us through various stages (and price ranges) of video astronomy. Brett started with the simple ToUcam from Philips and the Celestron LPI which are used expressly for planetary and lunar imaging and come in at around \$100.

As his talk progressed, we eventually came to his favorite, the MallinCam. Made in Ottawa by Rock Mallin, the camera delivers amazing results – instantly. As Brett said, Rock will supply you with a page of his preferred settings for the camera and you will instantly be

Continued...

viewing stars down to 15th magnitude or dimmer. But what is really cool is the fact that you'll be doing your observing on a monitor...indoors if you like...in a nice comfortable chair...with no mosquitoes or frozen fingers.

It also means you'll see the central stars in the Ring Nebula, as well as the starry remains of the white dwarf at the centre of the Dumbell Nebula. You'll also be able to observe on nights when there is a full Moon or the high hazy cloud layer moves in. So the camera can not only show you more details than the naked eye can take in, it will also make more nights available on which to see them.

You can have a star party around the monitor, instead of a line-up at the eyepiece of the telescope. So multiple people can observe the same object at the same time! And because nobody has to squint through the eyepiece, you don't encounter the old "I can't see a thing" from viewers unfamiliar with telescopes. That's a real bonus to small children and seniors, both of whom can have difficulty viewing through an eyepiece.

Now imagine being able to view something like the recent comet Schwassmann Wachmann P3 streaking past the Ring Nebula in real time! Or an occultation. How about a transit? And



From \$100 to \$1000, choose the kind of video astronomy that suits your budget and your needs.

you can not only see it, you can archive it too.

It was a great talk, and we thank Brett for the time he spent imaging and pulling together all the bits for this presentation. A lot of work went into it, and we greatly appreciate it. Great presentation!

Mark Coady wound the meeting down by presenting an update on his latest adventures in light pollution abatement. Progress was made with Smith Ennismore county agreeing to require shielded lighting on all new subdivisions go up around Lakefield. The immediate result is that Buckhorn Observatory won't live in fear of being drowned in light pollution in the next few years.

Dean Shewring took a few moments to remind us that Terry Dickinson would be speaking at Wynjack Theatre at Trent University at 7:00 p.m. on May 24th. Terry will give us a tour of the universe for just \$10.00 a head for big people and \$5.00 for children.

Mr. Dickinson is the author of 18 different books on Astronomy including the million-seller, *NightWatch*. He is a superb speaker and has access to some amazing images from the world's biggest and most sophisticated telescopes. This is a must-see event even

if you are just remotely interested in astronomy.

Tickets are available through HappenStance Books in Lakefield, the Ontonabee Conservation Centre at 250 Milroy Dr. in Peterborough and the Harvest Cupboard on Highway 45 in Norwood. Be there or be square.

Club President, John Crossen opened the meeting with some remarks about the series of light pollution articles he is writing his column in the Lakefield Herald. It's a three-part series that covers light pollution from the government, business, and private citizen aspects. With reference to the latter, Crossen brought along a \$39.95 outdoor lighting fixture that is currently available at Home Depot that is approved by the International Dark-Sky Association.

Crossen also presented club Treasurer with a pouch containing \$266 from the Astronomy Day Raffle along with the suggestion that we donate it to the PCMA for their help in staging A-Day. The executive will vote on this matter.

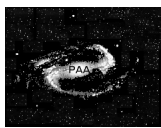
Crossen closed with the announcement that he will be stepping down from the position of President in January of 2007. At that point club members will have their first opportunity to vote for a new executive council. I think we were supposed to do that this year, but things got busy.

And that was the meeting that was. If you missed it – shame on you. You missed a very good one. Thanks again to Brett for his hard work and sharing his expertise.

John Crossen
JohnCstargazer@aol.com



A woman at a gas station noticed a spaceship landing in front of her. An alien stepped out of the spaceship and started to pump gas into it. The woman noticed the letters "U.F.O." printed on the side of the ship. She turned to the alien and asked "Does U.F.O. stand for Unidentified Flying Object?" The alien answered, "No, it stands for Unleaded Fuel Only!"



**Peterborough
Astronomical
Association**

The Reflector is a publication of the Peterborough Astronomical Association (PAA). Founded in 1970, the PAA is your local group for astronomy in Peterborough and the Kawarthas.

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ARTICLES

Submissions for *The Reflector* must be received by the date listed below. E-mail or “sneaker-net” (i.e., floppy disk) submissions are preferred (Microsoft Word, ASCII and most graphics formats are acceptable). Typed or hand-written submissions are acceptable provided they are legible (and not too long). Copyrighted materials will not be published without written permission from the copyright holder. Submissions may be edited for grammar, brevity, or clarity. Submissions will be published at the editor’s sole discretion. Depending on the volume of submissions, some articles may be published at a later date. Please submit any articles, thoughts, or ideas to this address:

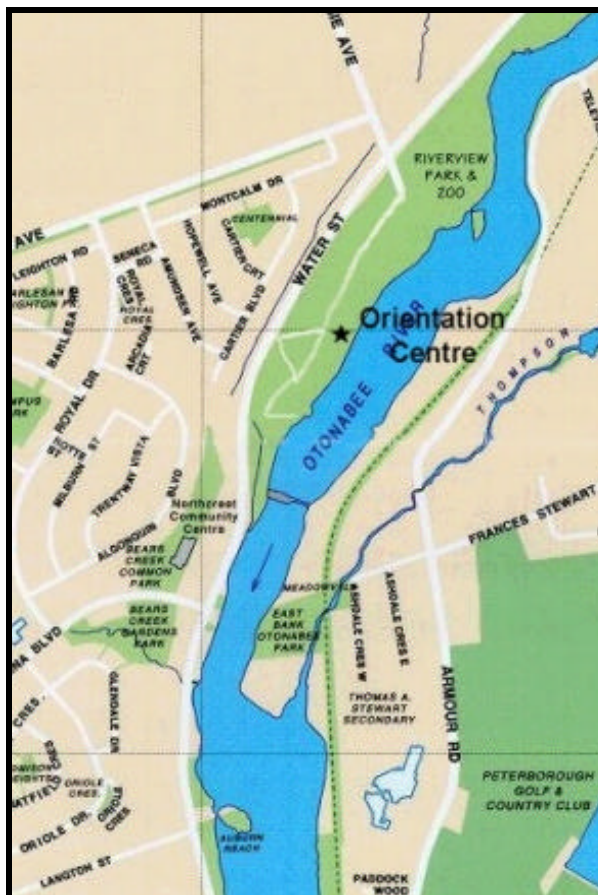
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**NEXT ISSUE'S
DEADLINE IS
June 13, 2006**
⌘

MEETINGS

The Peterborough Astronomical Association meets every second Friday at the Peterborough **Zoo Orientation Centre** (Next to the PUC Water Treatment Plant) at **8:00 pm**.



1 CALENDAR OF EVENTS 1

May 26, 2006	General Meeting— Club Observing Night - Buckhorn Observatory
June 9, 2006	General Meeting— PAA tour to Haliburton Forest Observatory
June 23, 2006	General Meeting— Club Observing Night - Jaan Teng’s
July 7, 2006	General Meeting— Andre Bordeleau - Montreal Planetarium - Riverside Zoo

1 Moon Phases 1

First Quarter	May 5, 2006	June 3, 2006
Full Moon	May 13, 2006	June 11, 2006
Last Quarter	May 20, 2006	June 18, 2006
New Moon	May 27, 2006	June 25, 2006