

### Editorial

Well, Ground Hog's Day came and went and our furry little friend tells us that we won't have to put up with this chilling weather for much longer. Warmer observing is coming sooner for us! Let's keep our fingers crossed and hope he's right this year!

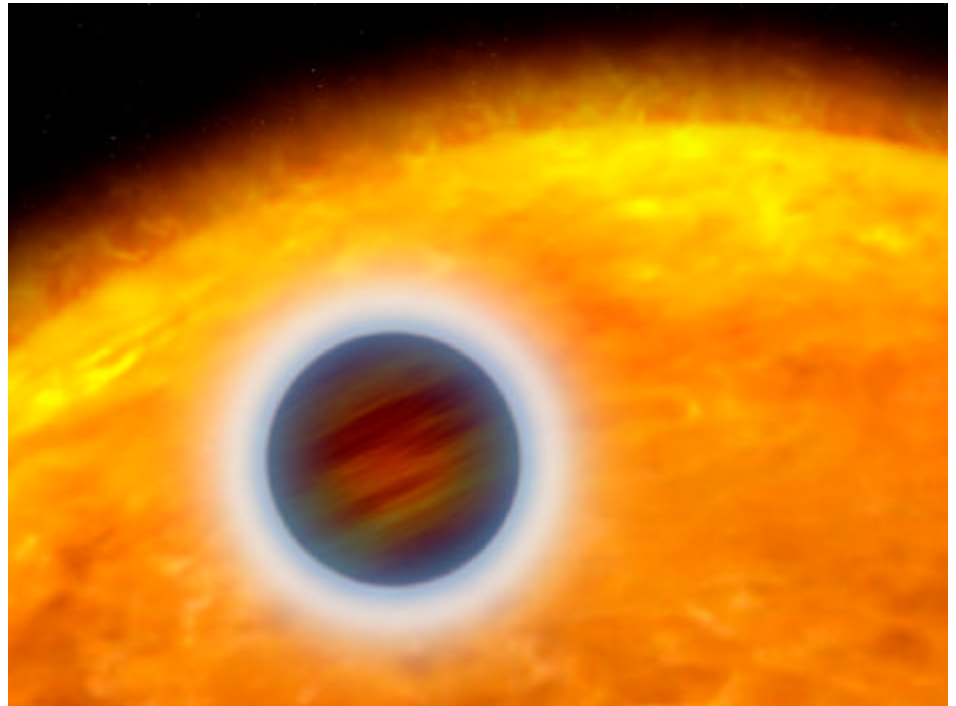
Shawna Miles  
Shawna.mi@sympatico.ca

### Yet Another Discovery By Hubble

For the first time, astronomers using observations from the Hubble Space Telescope have been able to study the structure of the atmosphere of a planet orbiting another star.

This planet is called HD 209458b, located 150 light-years away in the constellation Pegasus, and is very different from what we are used to. HD 209458b's orbit is very close to its star, causing it to be so hot that its atmosphere is being "boiled" off into space. The planet appears to have a "comet-like tail." Unless you had some really good sun lotion, and a super-cool suit to withstand the heat, I wouldn't recommend HD 209458b as a vacation spot!

The layer of atmosphere that has actually been studied is a transition zone where the temperature drastically increases from about 1 340 degrees Fahrenheit to about 25 540 degrees! By studying this zone, scientists can better understand how a planet loses its atmosphere.



Artist's illustration of HD 209458b. Image credit: NASA, ESA, G. Bacon

Although the planet seems to be losing a lot of itself, about 10 000 tons per second, it is a large planet, a "hot Jupiter" as they are referred to. Astronomers have estimated that it will last for another 5 billion years or so!

So how can you tell what's in an atmosphere? Well, Hubble doesn't have the ability to tell us, at least not directly. But did you know that HD 209458b is also the first discovered extrasolar planet that transits its star? This means that it passes in front of the

star, which allows astronomers to sample the starlight passing through the gas giant's atmosphere. By studying this light, they can analyze the structure and chemical make-up of the planet's atmosphere. Already, they have found oxygen, carbon, sodium, and a huge hydrogen upper atmosphere.

For more information, go to: <http://hubblesite.org/newscenter/archive/releases/2007/07/full/>

Shawna Miles  
Shawna.mi@sympatico.ca

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## Classic Conjunction In January

With all the hype these last few months about Comet McNaught (one of the best in decades), it has been hard for any recent celestial event to compete in the sky for our attention. However, January 20, 2007 was an exception, for the northern hemisphere at least.

The clouds finally parted and a cold clear evening was in order for the conjunction of a two-day-old crescent Moon and a brilliant planet Venus at sunset. This pairing in the western horizon was a sight to behold. The 2-½ degree separation of these two worlds was striking and with the amount of “earthshine” that gave the Moon its ashen glow this night, it was particularly memorable.

I heard that a few of our members got caught without their cameras this particular evening and this was a shame, as the conditions were next to ideal. However, there was a biting northwest wind this night in my backyard and it made fiddling with the camera controls more of a



*The January 20th conjunction of the Moon and Venus.*

challenge and it also caused my camera to act up a bit too. I think it was worth the effort? Astronomy Magazine’s “Picture of the Day” carried an image from this night on their January 23<sup>rd</sup> website:

<http://www.astronomy.com/asy/default.aspx?c=ga&id=99&aid=5086>

Until next time, keep looking up.

Rick Stankiewicz  
stankiewiczr@nexicom.net

## Space Travel Gets Down To Earth At The Riverview Zoo

Ever imagined yourself relaxing by the pool of a luxury hotel – orbiting the Moon? Can you see yourself engineering a housing complex – on Mars? How about a little relaxation and deep sea diving – beneath the ice-covered oceans of Jupiter’s moon, Europa?

On the February 2 PAA meeting, you saw that future through the eyes of Talmon Firestone. Mr. Firestone is an expert on space-related entrepreneurial ventures. As part of his graduate studies at Strasbourg’s International Space University, Firestone interned with the X Prize Foundation who had offered a \$10 million dollar prize for the first space flight by a passenger-carrying craft engineered and built by private enterprise.

In 2006 SpaceShipOne soared into outer space to claim the X Prize. It was a major step forward for a growing number of companies that are blazing trails into personal space flight, space-related entertainment, and resource harvesting.

Mr. Firestone is now the Vice President of NSD-Fusion GmbH, a company that is developing IEC Fusion reactors for both terrestrial and space applications. He is also one of the industry’s



*The distance from one side of Saturn’s rings to the other is almost the same as the distance from Earth to the Moon. Image taken by Brian Colville of Maple Ridge Observatory in Cambray, Ontario.*

most eloquent spokesmen on the exciting impact that private companies will have on humanity’s future in space.

Taking a shorter-distance view into the future, here’s what’s up in Kawartha’s skies this February:

On February 2<sup>nd</sup> the Full Moon will be just 2 degrees east of Saturn and on February 6<sup>th</sup> and 7<sup>th</sup> Mercury will hug the horizon beneath bright Venus in the western twilight.

Saturn rises in mid-evening during February and will reach opposition on February 10<sup>th</sup>. On that night it will be at its brightest and closest to Earth for the year. The term “opposition” means that you can draw a line from the Sun, through Earth and straight out to Saturn. We’re all lined up like ducks in a gallery.

February 17<sup>th</sup> brings us the New Moon, which really means no Moon. That will make it at great night for stargazing – if the clouds don’t get in the way. The winter Milky Way should be an easy target from a dark sky location.

For you astro-imagers, February 23<sup>rd</sup>’s six-day old crescent Moon will be just 1 degree above the Seven Sisters of the Pleiades. This should make a great shot. Until we meet again in the backyard, aim your lights down and keep the stars up bright. You’ll save money, energy and the beautiful Kawartha night sky.

John Crossen  
JohnCstargazer@aol.com



*Is Comet Wild 2 an exception to the rule, or are comets, like people, all slightly different? Comet Hyakutake, shown here, was photographed by the author in 1996.*

## Comet's Tail Tells A Strange Tale Of Solar System's Birth

Science is filled with axioms about becoming complacent in our view of the universe. "Expect the unexpected" and "as usual, you find the unusual" are familiar variations on the same theme. But when NASA's Stardust spacecraft slammed down in the Utah desert last year, it brought back materials that were definitely not what scientists expected.

The mission began in January of 2004 when Stardust set out to rendezvous with a comet named Wild 2. The purpose of the mission was to capture particles of dust from the tail of the comet, then analyze them to confirm our theory of solar system evolution.

In 2005 Stardust captured thousands of particles from Comet Wild 2, and in 2006 the craft returned from its comet rendezvous beyond the orbit of Mars, only to slam down in the middle of the Utah desert after parachute failure resulted in aircraft being unable to snatch

the capsule in mid-air. Fortunately the cargo of comet dust survived the impact.

Now, a team of scientists have concluded their initial findings from the first batch of comet dust. Don Brownlee from the University of Washington, Michael Zolensky of the Johnson Space Centre, and Scott Sanford of the NASA-Ames Research Center characterized the findings as nothing less than shocking.

Expecting to find tiny interstellar grains of simple crystalline and non-crystalline matter, they instead found much larger particles made of highly complex materials that had been formed when they were shocked, melted, or superheated in the past.

Conventional thinking has held that comets are nothing more than big, dirty snowballs left over from the evolution of our solar system. But if so, why did we find particles that evidence a superheated past forming in the coldest part of our solar system? How could a molten clump of minerals that formed before our Sun was born, turn up in some-

thing that formed in the frigid depths of space?

According to Brownlee, "this will force astronomers to rethink ideas on the origin of comets, the solar system, and how crystalline silicates form around stars."

"Not only did Comet Wild 2 form from a wide range of complex materials," concluded Zolensky, "there is no evidence of liquid water with this comet."

Scott Sanford then went on to point out that many of the particles thus far studied from Comet Wild 2 contained organic compounds of a more diverse group than we have seen in extraterrestrial material before. Further studies may show the possibility that comets from the past seeded ancient Earth with the matter needed to spawn life.

Studies of the material from Comet Wild 2 will continue for many years into the future. But for the time being, all we've learned is that we have a lot more to learn.

John Crossen  
JohnCstargazer@aol.com

## Aloha#10 – United Kingdom Infra-Red Telescope (UKIRT)

The next stop on our tour up Mauna Kea is at the United Kingdom Infra-Red Telescope (UKIRT). Located at the 13,775 foot level (4,198 m), the UKIRT is the largest telescope in the world dedicated to infrared astronomy. It saw first light in 1979 after five years of construction and was simply a modest instrument with a great primary mirror at 3.8m (12.5 ft.) in diameter. However, over the years (1991-1999) improvements have been made so that today it's best images are comparable to those of the Hubble Space Telescope in its

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*The United Kingdom Infra-Red Telescope (UKIRT). Unfortunately, it was one of the telescopes that was damaged from the earthquake that hit the Big Island of Hawaii in October 2006.*

infrared mode. Not a bad accomplishment for a land based telescope. This facility has done much work on brown dwarf stars (as massive as Jupiter, but shine less than other stars). It has also looked at some of the most distant quasars (13 bly) and measured the mass of its black hole as being that of 3 billion suns!

This telescope is run out of the Joint Astronomy Centre – JAC building at the University in Hilo that first opened in 1985. It was one of the few that I found that did not welcome tours or tourists. I was still able to get a brochure by ringing the doorbell though.

Some of the other UKIRT highlights include the addition in 1992 of a spectrometer that is still world-class. Then in 2002 a revolutionary Integral Field Unit (IFU) “image-slicer” was added that can slice the light from astronomical objects and be reconstructed into a 3-D view. In 2004, a Wide-Field camera (WFCAM) was installed so that the UKIRT has the most powerful infrared imaging survey instrument in the world. This telescope in 2005 was the first to detect a flare from Deep Impact of Comet Tempel 1. This is an impressive list of accomplish-

ments for a scope and facility of this size. One of the unique things about the dome design of the UKIRT is the 16 square controllable vents that surround the silver roof portion of the building (see image above). These are designed to allow air to flow over the surface of the telescope mirror and therefore reduce turbulence. This of course improves image quality as the temperature inside and outside the dome can be more exactly matched. This is the same phenomena we all have to deal with in the performance of our own scopes and why we need to let them “acclimatize” to the night air before we can expect better quality images in the eyepiece and why scopes with fans built in to their housings acclimatize quicker.

For more details about the UKIRT check out their website at: <http://www.jach.hawaii.edu/> (It is shared jointly with the James Clerk Maxwell Telescope – see the May/06 issue of The Reflector Vol.5 No.5)

Rick Stankiewicz  
stankiewiczr@nexicom.net

## NASA Space Place

### A Great Big Wreck

People worry about asteroids. Being hit by a space rock can really ruin your day. But that’s nothing. How would you like to be hit by a whole galaxy?

It could happen. Astronomers have long known that the Andromeda Galaxy is on a collision course with the Milky Way. In about 3 billion years, the two great star systems will crash together. Earth will be in the middle of the biggest wreck in our part of the Universe.

Astronomer John Hibbard isn’t worried. “Galaxy collisions aren’t so bad,” he says. A typical spiral galaxy contains a hundred billion stars, yet when two such behemoths run into each other “very few stars collide. The stars are like pinpricks with lots of space between them. The chance of a direct hit, star vs. star, is very low.”

Hibbard knows because he studies colliding galaxies, particularly a nearby pair called the Antennae. “The two galaxies of the Antennae system are about the same size and type as Andromeda and the Milky Way.” He believes that the Antennae are giving us a preview of what’s going to happen to our own galaxy.

The Antennae get their name from two vast streamers of stars that resemble the feelers on top of an insect’s head. These streamers, called “tidal tails,” are created by gravitational forces—one galaxy pulling stars from the other. The tails appear to be scenes of incredible violence.

But looks can be deceiving: “Actually, the tails are quiet places,” says Hibbard. “They’re the peaceful suburbs of the Antennae.” He came to this conclusion using data from GALEX, an ultraviolet space telescope launched by NASA in 2003.

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*This GALEX UV image of the colliding Antennae Galaxies shows areas of active star formation, which is not in the tidal tails as one might expect.*

The true violence of colliding galaxies is star formation. While individual stars rarely collide, vast interstellar clouds of gas *do* smash together. These clouds collapse. Gravity pulls the infalling gas into denser knots until, finally, new stars are born. Young stars are difficult to be around. They emit intensely unpleasant radiation and tend to “go supernova.”

GALEX can pinpoint hot young stars by the UV radiation they emit and, in combination with other data, measure the rate of star birth. “Surprisingly,” Hibbard says, “star formation rates are low in the tidal tails, several times lower than what we experience here in the Milky Way.” The merging cores of the Antennae, on the other hand, are sizzling with new stars, ready to explode.

So what should you do when *your* galaxy collides? A tip from GALEX: head for the tails.

To see more GALEX images, visit [www.galex.caltech.edu](http://www.galex.caltech.edu). Kids can read

about galaxies and how a telescope can be a time machine at [spaceplace.nasa.gov/en/educators/galex\\_puzzles.pdf](http://spaceplace.nasa.gov/en/educators/galex_puzzles.pdf).

*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

## University Of Waterloo Grad To Command Mission To “Mars”

This was the byline for an article that ran for a story in the Kitchener-Waterloo Record on November 11, 2006. Record staff member Bar-

bara Aggerholm did a great interview type article with UW graduate Melissa Battler, about her training and connections to future travel to Mars. For anyone that is interested in reading the article, link on to the following web link at the K-W Record:

[http://www.therecord.com:80/links/links\\_061227154745.html](http://www.therecord.com:80/links/links_061227154745.html)

The whole article is posted including the accompanying picture from the original article. The Record does this for non-profit organizations like ours. Check it out and see what future space travel is all about. A “Mars” bar anyone?

Rick Stankiewicz  
stankiewiczr@nexicom.net

## True Fakes: Scientists Make Simulated Lunar Soil

Life is tough for a humble grain of dirt on the surface of the Moon. It's peppered with cosmic rays, exposed to solar flares, and battered by micrometeorites—shattered, vaporized and re-condensed countless times over the billions of years. Adding insult to injury, Earthlings want to strip it down to oxygen and other elements for “in situ resource utilization,” or ISRU, the process of living off the land when NASA returns to the Moon in the not-so-distant future. But, as Robert Heinlein famously observed, “the Moon is a harsh mistress.” Living with moondust and striping it down may be trickier than anyone supposes.

To find out how tricky, researchers would like to test their ideas for ISRU and their designs for lunar rovers on real lunar soil before astronauts return to the Moon. But there's a problem:

“We don't have enough real moondust to go around,” says Larry Taylor, director of Planetary Geosciences Institute at the

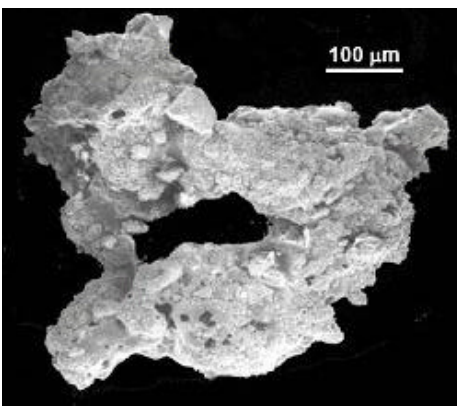
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University of Tennessee in Knoxville. To run all the tests, "we need to make a well-qualified lunar simulant." And not just a few bags will do. "We need tons of it, mainly for working on technologies for diggers and wheels and machinery on the surface," adds David S. McKay, chief scientist for astrobiology at the Johnson Space Center (JSC).

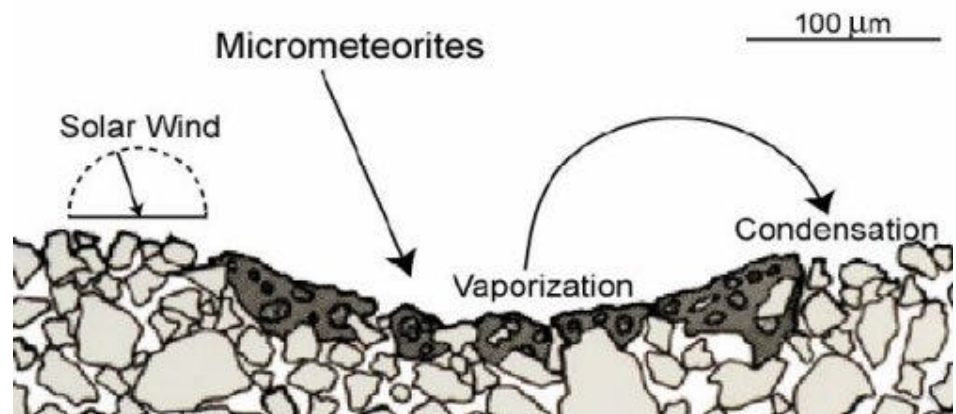
Taylor and McKay are lead members of a small group of self-styled "lunatics" whose careers have focused on lunar soil and rocks. They are among several consultants to NASA's Marshall Space Flight Center (MSFC), which manages the Lunar Regolith Simulant Development Program.

Carole McLemore is the program manager at Marshall. Back in the 1990s, she explains, researchers used a lunar simulant called JSC-1 developed at JSC. But "there is no more JSC-1 available." So, to get started, researchers at Marshall are working with the Astromaterials Research and Exploration Science office at Johnson to create a replica of the JSC-1 simulant: JSC-1A. It comes in three types based on grain size (fine, medium and coarse). MSFC has also begun work on more demanding simulants representing various locations on the Moon.

Until the Apollo astronauts brought lunar soil samples to Earth during 1969-72, the belief was that the Moon's dry, airless environment left the soil largely undisturbed. Reality is much harsher.



*A speck of Moon dirt. The strange shape tells a tale of violence: It results from the welding of rock, mineral and glass by the heat of micrometeoroid impacts. Image credit: David S. McKay, NASA/JSC.*



*The lunar surface is exposed to solar wind and constantly pounded by micrometeorites. Credit: Larry Taylor, Univ. of Tennessee.*

Micrometeorites, many smaller than a pencil point, constantly rain onto the surface at up to 100,000 km/hr (about 62,000 mph), chipping off materials or forming microscopic impact craters. Some melt the soil and vaporize and recondense as glassy coats on other specks of dust. Impacts weld debris into "agglutinates." Complicated interactions with the solar wind convert iron in the soil into myriads of "nano-phase" metallic iron grains just a few nanometers wide.

These processes form the "regolith" -- Greek for stone blanket (litho + rhegos) -- covering the Moon's surface. What greets astronauts and spaceships is a complex material comprising "sharp, abrasive, interlocking fragile glass shards and fragments," Taylor says. It grinds machinery and seals, and damages human lungs.

"Some of the stuff that got into the Apollo spacecraft was very finely ground," McKay said. Dust was everywhere and impossible to brush off. All the lunar astronauts had lung reactions to this dust, some more than others, like Harrison H. (Jack) Schmitt's "lunar dust hay fever."

The Apollo specimens are America's Crown Jewels and are doled out in ultra-small samples to scientists who can demonstrate that nothing else will do for high-value experiments. Renewed interest in lunar exploration in the late 1980s meant that lunar simulants were needed to test schemes for

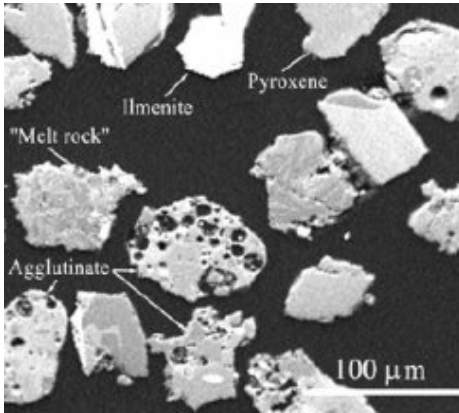
building structures on the Moon or for extracting oxygen and other materials. That led to JSC-1 in 1993, made of basaltic volcanic cinder cone deposits from a quarry near Flagstaff, AZ. The 25-ton lot -- distributed in 50-pound bags -- proved popular.

"We're totally out, but that's soon to be corrected," said McKay. MSFC has a Small Business Innovative Research (SBIR) contract with Orbitec of Madison, WI, to manufacture about 16 metric tonnes of three types of JSC-1A: 1 tonne of fines (delivered); 14 tonnes of moderate grains (being delivered); and 1 tonne of coarse grains (coming soon). The U.S. Geological Survey in Denver and the University of Colorado at Boulder -- key partners -- are checking the chemical, mineralogical, and geotechnical properties.

MSFC is developing three new simulants. Two will represent mare and polar highlands regions. A third will represent the glassy, sharp, jagged edges of regolith that test the best of hardware and humans. But matching every location on the Moon would require large numbers of small, unique, expensive batches.

"Instead, we will develop root simulants and manufacture specific simulants from these, but also enable investigators to enhance the products as needed," McLemore added. "I liken this process to baking a cake: depending on the type of cake you want, you need certain ingredients for it to come out right and taste

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This photomicrograph of soil from a lunar mare hints at the underlying variety of genuine Moon dirt and the difficulty of reproducing it.

right. Getting the recipe right whether for a cake or lunar simulants is critical."

For example, the new mare simulant will be enriched with ilmenite, a crystalline iron-titanium oxide. Source materials used to produce the three simulants will potentially come from locations as diverse as Montana, Arizona, Virginia, Florida, Hawaii, and even some international sites.

Initial lots will weigh just tens of pounds to ensure that the simulant is made correctly. "Eventually we will scale up to larger quantities when we can make sure that there is little variation from batch to batch," McLemore said.

Once NASA understands how to make the various simulants, plans are to farm the work out to companies to produce larger batches. "We will have certification procedures in place for vendors to follow so users know that the simulants meet the NASA standards," McLemore said.

And that will be the best way to tell it's a "true fake." Accept no substitutes.

Submitted by: Mark Coady  
 Author: Dave Dooling  
 Credit: [Science@NASA](mailto:Science@NASA)

## Three Movies For Spaceship Earth

Over the holidays I had the opportunity to enjoy my second favorite hobby, movies. Among my usual diet of Sci-Fi thrillers and comedy flicks was a trio of excellent and very frightening documentaries. All three can be rented locally.

An *Inconvenient Truth* is a fact-filled, educational commentary on global warming by one-time presidential hopeful, Al Gore. Before you start pointing fingers, no group is singled out as being the culprit. We all share responsibility, government, business leaders, you, and me.

The truth surfaced when big insurance companies became alarmed by the increase in weather-related calamities and the resultant red ink on the bottom line of their books. Now the light bulb is going on in the heads of more people each day. Most world are governments are listening. But the pea-brained Texan still won't sign the Kyoto Accord.

The film *Who Killed the Electric Car* takes a more focused look at global warming. According to the film, the answer to our decaying air quality and global warming problems went down to the interests of big business, big government, and big oil. In the end, what could have been a new breed of pollution-free vehicles is disappearing in the rear-view mirrors of gas-guzzling SUVs and Hummers. This film is anything but a playful romp, and anyone concerned about Earth's environment will find it filled with nagging questions our politicians and business leaders should be answering.

The third movie in the series is *Why We Fight*. The film begins decades ago with an address by President Dwight D. Eisenhower. In it he warns very strongly of the potential for environmental, economic, and moral disaster if the military-industrial complex (a phrase good old "Ike" coined) becomes



All three movies are available at Movie Gallery in Lakefield, and I have seen their jackets in numerous other video shops in the area. They're more frightening than any Stephen King movie because they're real.

the driving force in establishing American foreign policy – known today as the business of war.

In the half century since Eisenhower's warning, the U.S. has built the largest standing army in the world. A growing number of U.S. foreign policy makers have emerged from the business community to cast America in the role of world policeman. The rest is history played out in Viet Nam, Grenada, Panama, and now in Iraq via blatant invasions (now toned down as pre-emptive strikes by the spin doctors).

Have a look. Draw your own conclusions. Let me know your comments. Until we meet again in the backyard, keep the lights down and the stars up bright. You'll save money, energy, and the beautiful Kawartha night sky.

John Crossen  
 JohnCstargazer@aol.com

## The Sky This Month

### MERCURY

Mercury reaches greatest elongation east on February 7th and then is not well

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placed for observing until it glides far enough away from the solar glare about three weeks later. It will reappear in the morning sky next month.

#### **VENUS**

By mid-month Venus dominates the west-southwest shortly after sunset. It is there at the beginning of the month, but rather low.

#### **MARS**

The red planet rises only an hour or so ahead of the Sun, making it a difficult object low in the dawn sky.

#### **JUPITER**

The brilliant "morning star" is Jupiter, now rising in the early hours. Jupiter is in Ophiuchus.

#### **SATURN**

Saturn is in the constellation Leo, near Regulus. It rises 2-3 hours after sunset at mid-month and is visible the remainder of the night. Look for it in the east by mid-evening, high overhead about 2 a.m., and in the western sky shortly before sunrise.

#### **URANUS**

This distant gas giant is approaching conjunction next month and is probably lost in the solar glare.

#### **NEPTUNE**

A telescope is usually necessary to view the most distant planet in the solar system but observations are impossible this month because Neptune is at conjunction on 8 February.

#### **METEOR SHOWERS:**

Alpha Centaurid meteor shower on February 8th. This is not a good year for viewing this particular shower.

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

## **Meeting Notes**

**January 5, 2007**

Our first meeting of 2006 got the club off to a great start. Headlining the night was guest speaker, Randy Attwood. Randy is an avid eclipse chaser and after his marvelous presentation on the subject, it's easy to understand why.

During his talk, Randy took us around the world to various sites he had visited as he and numerous others chased the Moon's shadow through exotic and far away countries. It is no exaggeration to say that the photographs and video clips Randy shared with us were stunning.

Randy also gave us the benefit of his tremendous knowledge on the subject by showing us how solar eclipses occur and why they are not a regular monthly event. We have the Moon's 5-degree orbital tilt to thank for that. He also explained ascending and descending nodes (points at which the Moon's orbit intersects that of Old Sol so that it passes directly in front of the Sun from our point of view).

It was fascinating to see how apogee and perigee (the Moon's distance from Earth) factors into both the length

of and type of solar eclipse we receive. I remember being at Star Hill Inn for the 1994 annular eclipse and being stormed out to the point that we couldn't even watch the eclipse on television from our mountain retreat. Meanwhile, back in Toronto folks had a great view. Grrrrr!

Our thanks go to Randy for an extremely exciting and informative presentation. Now let's start piling up the Air Miles so we can journey off to the next eclipse.

The night became even better as we welcomed four new members to our growing fold. Joining us for the night – and the next year as PAA members are Lena Lawrence and Phil Keegan of Omeeme, Beverly Langille from Campbellford and Ed Tape from Peterborough. We look forward to helping you learn your way around the night sky and to enjoy this hobby even more. Welcome aboard!

During the evening's activities, the club took a few moments to thank me for my three years at the helm of the good ship PAA. My sabbatical at the moment is open ended. It all depends on how long it takes to get my observatory business in full flight.

So, as I fade into the background a bit more, Rick Stankiewicz, Rob Fisher,

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*Everyone at the January 5th PAA meeting.*

Mark Coady, Brett Hardy and you other members will be stepping forward to keep things moving forward. Many thanks for your good wishes and the nifty gifts.

Mark Coady took a few moments to present us with his thoughts (and a DVD) on Astronomy Day 2007. Mark is going to be point man this year, and he'll need lots of help from all of us to make the multi-faceted event a big success. Let's make sure that he gets all that it takes.

The club's library grew by one book thanks to Colin Cross's contribution of the Astronomy Magazine special edition of *Mars*. It was a timely addition because this month marks the fourth year that the Mars rovers Spirit and Opportunity have been traversing the red planet.

John Crossen also presented the club with two new DVDs related to preserving the environment of our favourite planet – good old Earth. Entitled *Who Killed the Electric Car* and *Why We Fight*, the two make some very strong statements about the business and military/industrial complex that are running (and ruining) our home planet. The new DVDs will fit in nicely with last month's addition of Al Gore's documentary, *An Inconvenient Truth*.

We should also thank our "carryin' librarians" Bob and Joanne Stockton for

lugging two boxes of books and DVDs to the meeting. Great biceps guys! Don't forget you can order up a book or DVD for the next meeting by giving them a call or an email. It's all available at the club website – [www.peterboroughastronomy.com](http://www.peterboroughastronomy.com)

That was the night that was. My thanks again go to everyone for their good wishes. Here's to a great (and clear) new year for the PAA.

John Crossen  
JohnCstargazer@aol.com

### January 20, 2007

The Friday, Jan 19th observing run was clouded out, but our backup night on the 20<sup>th</sup> was spectacularly clear. It was also -20 by the evening's end. Perhaps that's why Brett Hardy was the only clubbie to make the trek to Buckhorn Observatory. He certainly did live up to his name, albeit spelled differently.

Sky conditions for the night were good. Transparency was above average, though the twinkle of the stars told me that the upper atmosphere was anything but steady at the beginning of the evening. None of which mattered because it was the first clear night in a while and I was intent on making the most of it.

Brett's arrival was followed by that of seven guests who were comprised of one family with a Korean exchange student and three Peterborough residents, one of whom is interested in joining the PAA.

The cold weather caused the scope's hand paddle and its readouts to malfunction, so I ran the whole session the old-fashioned way with power by arm-strong. The cold also took its toll on the laser pointer and it dimmed to near invisibility after about five minutes. So the sky tour I gave my guests was a bit slower than usual because I had to change pointers (yes I have a backup unit). Another five minutes with the backup pointer and it, too, bit

the biscuit. So it was back to the bad old days with people lining up behind me as I pointed out Orion, the Orion nebula, Taurus, the Pleiades, Gemini, Auriga, and Cassiopeia.

While I was taking the guests on their sky tour, Brett was checking out the optics on the Celestron 11-inch. He allowed as how they seemed quite good with the Orion nebula filling the 35mm Panoptic's field of view. (Too bad the computer and drives didn't want to work.)

The balance of the night was comprised of trips to the warm-up room while I slung the scope to a new target, then back to the eyepiece for viewing. Telescope targets for the night included M45 in the short tube refractor at 16x, then M41, M42, and bright Procyon at 80x in the 11-incher. One of the guests wanted to see if stars looked bigger in a telescope. We wound the evening down with views of Saturn at 80X and 200X and it was, indeed a treat to see the ringed thing again.

By 10:30 we were frozen enough to quit, so I bid farewell to my guests and Brett. After changing into some warm shoes, I went back to the scope, re-aligned it and it worked nearly perfectly. Grrrrr! The lesson for the night was simple, both people and telescopes take poorly to extremely cold weather. And that was the numbingly cold night that was.

John Crossen  
JohnCstargazer@aol.com

J O K E I J O K E I J O K E I J O K E I

Two atoms are walking down the street and they run into each other. One says to the other,

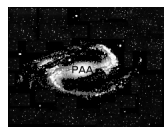
"Are you all right?"

"No, I lost an electron!"

"Are you sure?"

"Yeah, I'm positive!"

I J O K E I J O K E I J O K E I J O K E



## 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.

### Website

[www.peterboroughastronomy.com](http://www.peterboroughastronomy.com)

### Email

JohnCstargazer@aol.com

### Club Mailing Address

John Crossen  
2254 County Road 507  
Buckhorn, ON, Canada K0L 1J0

## 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:

Shawna Miles  
2192 Bass Lake Rd.  
Bobcaygeon, ON  
K0M 1A0

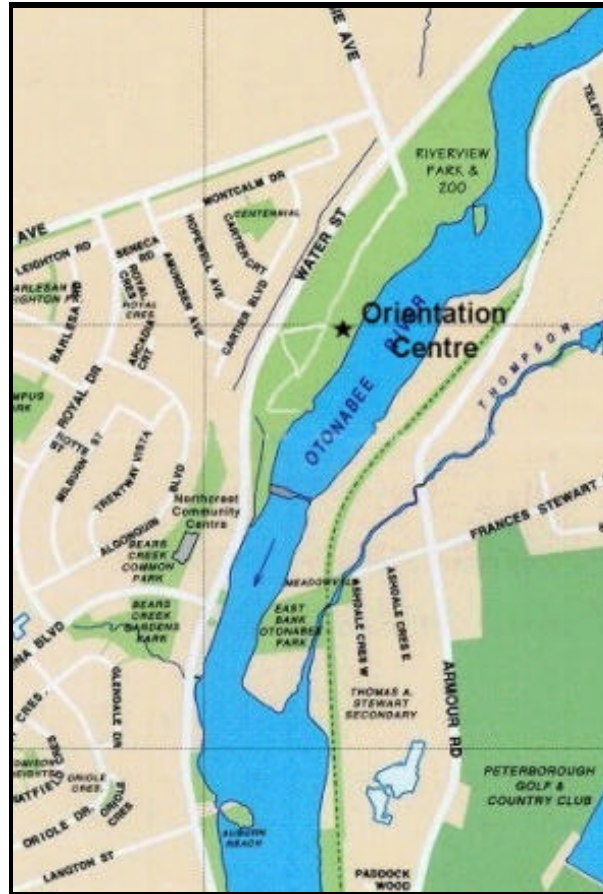
or via e-mail at:  
Shawna.mi@sympatico.ca

**Please contact me first if you are sending a large file.**

**NEXT ISSUE'S  
DEADLINE IS  
Feb. 15, 2007**  
⌘

## MEETINGS

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



### 1 CALENDAR OF EVENTS 1

- |                  |   |
|------------------|---|
| February 2, 2006 | General Meeting— Speaker - Talmon Firestone on “Space Entrepreneurship” |
| March 2, 2007    | General Meeting— Speaker Guy Nason on “Asteroid Occultations”           |
| April 20, 2007   | General Meeting— To Be Announced  |

### 1 Moon Phases 1

- |   |                   |                |
|---|-------------------|----------------|
| Full Moon      | February 2, 2007  | March 3, 2007  |
| Last Quarter   | February 10, 2007 | March 11, 2007 |
| New Moon       | February 17, 2007 | March 18, 2007 |
| First Quarter  | February 24, 2007 | March 25, 2007 |