Peterborough Astronomical Association
The Reflector
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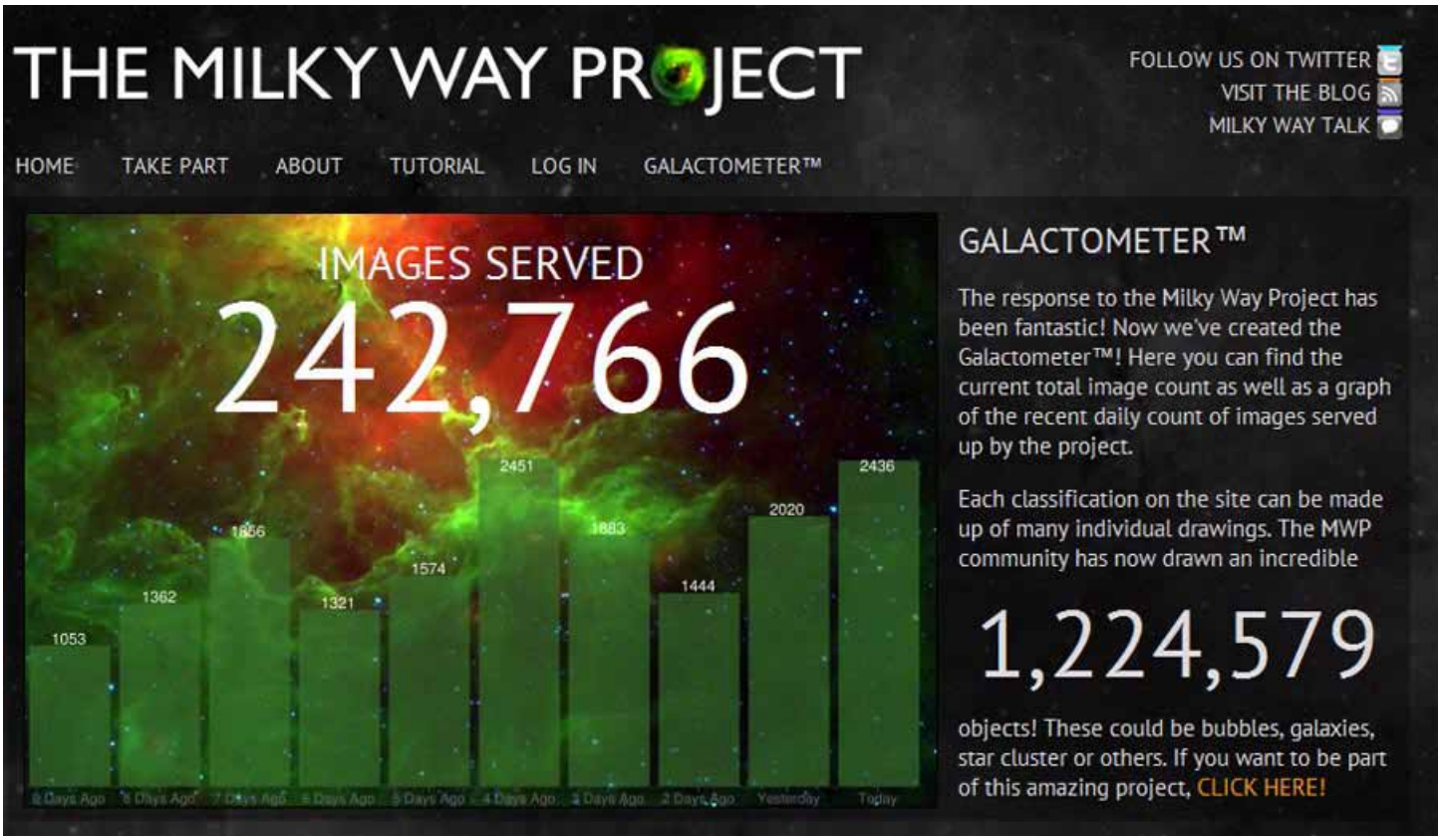
Milky Way Safari



Volunteers study infrared images of our galaxy from the Spitzer Space Telescope, identifying interesting features using the special tools of the Milky Way Project, part of the Citizen Science Alliance Zooniverse web site.

by Dauna Coulter and Dr. Tony Phillips

Safari, anyone? citizen scientists are invited to join a hunt through the galaxy. As a volunteer for Zooniverse's Milky Way Project, you'll track down exotic creatures like mysterious gas bubbles, twisted green knots of dust and gas, and the notorious "red fuzzies."

"The project began about four months ago," says astrophysicist Robert Simpson of Oxford University. "Already, more than 18,000 people are scouting the Milky Way for these quarry."

The volunteers have been scrutinizing infrared images of the Milky Way's inner regions gathered by NASA's Spitzer Space Telescope. Spitzer's high resolution in infrared helps it pierce the cloaking haze of interstellar gas and dust, revealing strange and beautiful structures invisible to conventional telescopes. The Milky Way Project is helping astronomers catalogue these intriguing features, map our galaxy, and plan future research.

"Participants use drawing tools to flag the objects," explains Simpson. "So far they've made over a million drawings and classified over 300,000 images."

Scientists are especially interested in bubble-like objects believed to represent areas of active star formation. "Every bubble signifies hundreds to thousands

see "Zooniverse" on page 16

President's Message

Summer Send-off

Well, the 6th Annual "Astronomy on the Hill" has come and gone and it was a bit of a washout, but I still wish to thank all those who came out for the Sunday afternoon and gave of their time, energy and equipment to put on the show we did for the few dozen public that showed up for the event. It shows your dedication and commitment to the club. Thank you all!

I am hoping that this *Reflector* finds its way to you before our next meeting because it is the last reminder about our very special upcoming meeting, not because it is the last for the summer (none in July and August), but because of our guest speaker, Terence Dickinson. Don't miss it and don't forget to bring any chairs you have on hand, as we need all the seating we can get.

Even though we will not have another meeting or *Reflector* for a couple months does not mean the PAA evaporates. We will be having a few events planned like observing for the public at Emily Provincial Park and "Perseids on the Hill" in August. Stay tuned for more news on those upcoming events and how you can get involved.

I hope all of you have a fun and star filled summer. I also hope to see you out and about and safely back in September.

Rick Stankiewicz
President

Letter from the Editor

Snow in June?

PHILLIP CHEE, EDITOR

It cannot be disputed that the Month of May brings flowers, but perhaps we could amend it this year to say: April showers bring more May showers bring *cross-your-fingers* fewer June showers and hopefully August Perseid Meteor Showers.

We have once again a full newsletter of wonderful articles and reports. I want highlight the centrefold photo of the Milky Way galaxy taken by Nick Risinger as told in John Crossen's article. I had already seen the photo on the Internet but kudos to John for writing up a nice article describing its provenance. It will knock you out of this world!

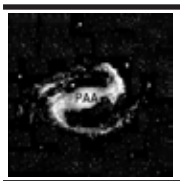
Enjoy the summer but don't forget to record your astronomical activities and submit them for the September issue. The deadline is August 26.

Happy night sky seeing!

Phillip Chee
***Editor,* The Reflector**

Correction

The recent article (*May 2001* **The Reflector**) on the Peterborough science fair student's light pollution project incorrectly quoted Mark Coady when stating that the city of Peterborough as well as the townships of SEL and GCH have passed light pollution bylaws. That should have read: "that they have agreed to replace old style streetlights with full cut-off units as the older ones fail." John Crossen apologizes for the mistake.



Peterborough Astronomical Association

The Reflector is a publication of the Peterborough Astronomical Association (P.A.A.) Founded in 1970, the P.A.A. is your local group for astronomy in Peterborough and the Kawarthas.
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Astronomy on the Hill 2011

Rodger Forsyth

Well the sixth annual Astronomy on the Hill is in the books or should I say the pail. Pails may have been more appropriate than telescopes this year. At least you could then collect the rain water. Saturday night was cancelled as Mother Nature was not going to cooperate. We did however set up Sunday in the portable at the museum and some people showed up to view exhibits, telescopes and discuss astronomy with club members.

Rick got checked out on running the inflatable planetarium although the wind made the task very difficult. Thanks to Rick's qualified instructor, mister planetarium himself, John Crossen, they put on one show. Phil had his camera set up on the AstroTrac, while Boyd and I had our 114 mm telescopes on display. Brett had a large number of Mallincam videos and other videos to delight the audience.

Trish and Nicholas ran the draws/door prizes where a number of passes to the BHO, binoculars donated by Mark and an autographed copy of *Night Watch* was given out. Mark helped with teaching five kids how to build a cardboard sundial and stardial. The Star Dial uses the position of the Big Dipper in relation to Polaris to determine time. Dean and John Cameron were on hand to help out as well.

We had somewhere between 15 and 20 people attend the event. A big thanks to the members that participated and I hope I didn't miss anyone.

June's Short Nights Are Filled with Sights

M13 Globular Cluster. The Hercules globular star cluster is a stunner through a telescope.

John Crossen

The constellations of spring are in full bloom with some of your summer favourites rising in the east and southeast as midnight approaches. Leo and Virgo are heading west about midway up the southern sky. Leo leads the way. Traveling along with Virgo is Saturn with its beautiful ring system. A small telescope is necessary to see the rings, but they are readily visible at just 50 power. If you have a friend with a telescope, make a point of seeing the ringed thing. It never disappoints.

The bright star almost directly overhead is Arcturus. It is the brightest star in the constellation Boötes (*boo-oh-tees*). The familiar Big Dipper is also high in the sky, so a bit of neck bending is in order to make out this old night-time companion.

Joining spring's cast of constellations is Hercules the strong man and Ophiuchus (*oh-fee-ew-kus*) the snake handler. Beneath Ophiuchus the constellation with a sting, Scorpius the scorpion scuttles across the southern horizon.

For those with access to binoculars or a telescope, spring is also globular star cluster season. What's a globular star cluster? Just as the name implies, it is a huge ball of stars. Most are several light years across. These are also some of the oldest stars in the universe, ranging up 10 billion years old. That's almost as old as our 13.7-year-old universe! But what makes them fascinating has nothing to do with their size or age. They are just flat out spectacular to look at through a telescope.

See "Summer Nights" on page 15

July Brings a Big Bang of Celestial Fireworks

John Crossen

If you're looking for sparkling treasures just look up on a clear July night. Overhead the Milky Way arches from the southern to the northern horizon. The Summer Triangle is making its way to centre stage. And to the south Scorpius and Sagittarius are playing tag shortly after darkness falls.

Naked eye astronomers with access to dark rural skies can connect the starry dots that make up a wealth of constellations. The Summer Triangle is an asterism comprised of the brightest stars in the constellations Aquila, Lyra and Cygnus. The Milky Way cuts right through Cygnus which is also known as the Northern Cross. The constellation Hercules is also overhead and moving to the west. Virgo is stretched across the southern sky while tiny Sagitta and Delphinus will test your eyesight and observing skills.

Those with binoculars will find full-time employment scanning the July skies. The Ptolemy and Butterfly Clusters are an easy catch just in front of the Teapot's spout in Sagittarius. Steaming out of the spout is the southern end of the Milky Way. Scanning slowly up will bring you to globular cluster M22, the Sagittarius Star Cloud, the Lagoon Nebula, the Trifid Nebula and more—all visible in simple, hand-held binoculars. Move up to a small backyard telescope and there's so much to see that you'll need a neck brace by the end of the month.

While we're talking telescopes, let's not overlook the planet Saturn. It will be with us all summer long and all it takes is a small scope at 35 power to show you the rings. As is always the case, bigger is better. But if you've never seen the rings, almost any scope will do.

Group outside BHO with bins. Your eyes are all the gear you need to dig out the sparkling treasure buried in the Kawartha night skies. Add a pair of binoculars and you'll be surprised how much is up there waiting for you to discover. ***Photo by John Crossen***

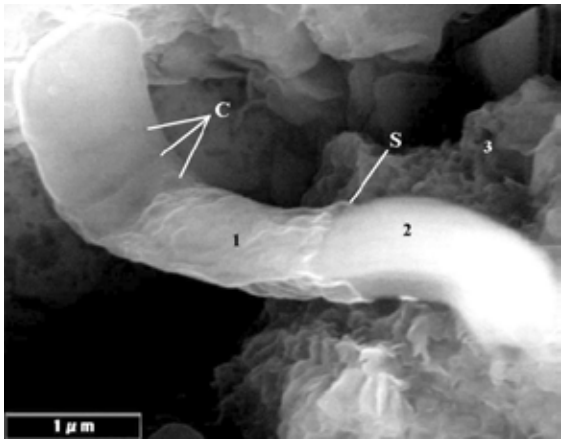
So how do you dig up all these celestial treasures? Get a map called *SkyNews Magazine*. It has a terrific monthly star chart that's easy to read and follow. You can pick up a copy at Chapters in Peterborough or any large magazine outlet. Also handy is a book called *Night Watch*. It has star charts for all the months plus detailed constellation charts that highlight the Messier Objects (like M22) in them. Happenstance Books and Yarns in Lakefield should have it in stock.

To view the Milky Way you'll need a very dark rural location. To some it appears as a misty cloud strip. In reality you are looking inward towards the core of our solar system's home galaxy. If you have the dark skies and 7 x 50 binoculars, try a little "Star-Grazing." Just lean back in a comfortable deck chair and slowly amble through the Milky Way. If you ever doubted that there are billions and billions of stars in our home galaxy, a midsummer night's stargraze will change your mind in one skinny minute.

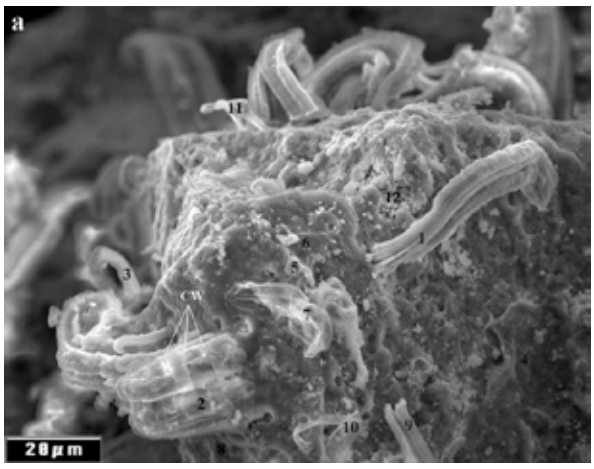
We Are Not Alone

Ben Morgan

On March 5, in the *Journal of Cosmology*, Dr. Richard Hoover published an article titled *Fossils of Cyanobacteria in CI1 Carbonaceous Meteorites: Implications to Life on Comets, Europa, and Enceladus* which confirmed the existence alien life.



Dr. Hoover took chondrite meteors he had been hunting in the Antarctic back to his lab. Hoover sliced the meteorites open and found detailed views of fossilized cyanobacteria, or also known to biologists as blue-green algae. Blue-green algae are capable of thriving in the harshest conditions, like living in space. The possibilities of contamination have been ruled out due to the fact that they were older than the Earth itself at about 10,000,000,000 years-old; the Earth is 4,500,000,000 years-old. Other forms of bacteria have also been discovered, identifying them as purely alien.



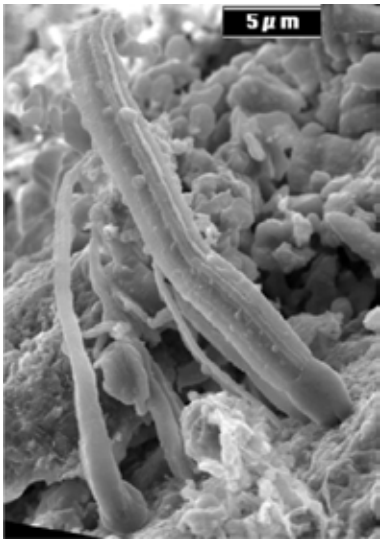
Due to the significance of this discovery, Dr. Rudy Schild, the editor-in-chief of the *Journal of Cosmology* and scientist at the Harvard Smithsonian's Centre for Astrophysics wrote an editor's note detailing how crucial the findings appear to be. "Given the controversial nature of [Dr. Hoover's] discovery, we have invited 100 experts and have issued a general invitation to over 5,000 scientists from the scientific community to review the paper and to offer their critical analysis. No other paper in the history of science has undergone such a thorough vetting, and never before in the history of science has the scientific community been given the opportunity to critically analyze an important research paper before it is published."

After the publication of the paper, scientists began to discriminate the findings, saying that Hoover has not ruled contamination out. Although these scientists weren't able to directly prove this speculation, they moved on to discriminating the journal itself, for allowing such balderdash to be published.

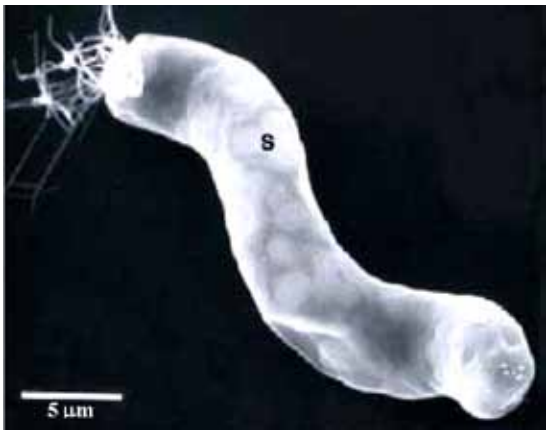
No other paper in the history of science has undergone such a thorough vetting

The *Journal of Cosmology* replied to these claims and wrote a note to these scientists. "Have the Terrorist Won? Only a few crackpots and charlatans have denounced the Hoover study. NASA's chief scientist was charged with unprofessional conduct for lying publicly about the *Journal of Cosmology* and the Hoover paper. The same crackpots, self-promoters, liars, and failures, are quoted repeatedly in the media. However, where is the evidence the Hoover study is not accurate?"

As shown, with "[charlatans,] crackpots, self-promoters, liars, and failures" trying to ruin such an outstanding paper has caused friction within the community.



What called for all these insults? Well, the crackpots and charlatans went and attacked the journal, by stating that they "have responded with a barrage of slanderous attacks." Most of these attacks stated that the journal was not significant enough to publish such a paper, hence; the paper did not provide a rigorous enough of a reviewing before being published, meaning the paper must then be wrong.



The journal responded to these types of attacks by saying that Senior Directorate of NASA, Joel Levine was the editor-in-chief at that moment. Also "Sir Roger Penrose… is guest editing the April edition." And that "Four astronauts, two who walked on the Moon, have published with the JOC. Over 30 top NASA scientists have published in JOC."

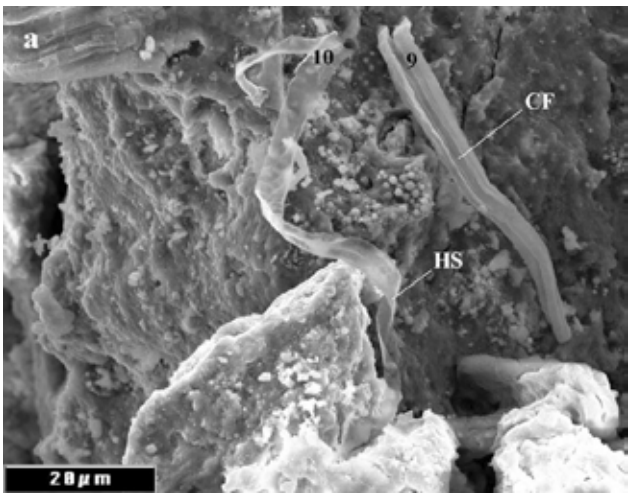
Major friction will be seen in the scientific community as to whether the article Hoover has published is legit, but as of right now, no indications can be found as to whether Dr. Hoover's finding are inconclusive. Right now, the article shows promise and concludes that we are not alone.

Now, the article has made a leap; the *Journal of Cosmology* has published a whole novel on it titled *The Discovery of Extra-Terrestrial Life: The Cosmic Origins of Life* (http://goo.gl/OSuZ6). The Amazon product description defines it as an "amazing book [which] features additional chapters detailing the evidence of the extraterrestrial origins of life, and how life on Earth, came from other planets."

The article doesn't just say, "Hey, I found REALLY little green men in my meteorite, beat that!" It also states that the bacteria found had nitrogen levels below the limit of detection for the machine to find. Indicating that nitrogen is next to nothing as the bacteria is concerned. The bacteria then have no nitrogen in it.

The mandatory ingredients for life include nitrogen, yet Dr. Hoover's findings say not. A while back, NASA discovered that life can also supplement arsenic for phosphorus, which phosphorus was previously held as another mandatory ingredient.

The article states that we are not alone. That we too are aliens. That life is a lot different than it seems.



On March 11, Rudy Schild wrote a letter to Bruce Alberts and Philip Campbell explaining that the data in the *Journal of Cosmology* is not fool's gold. They explain that if people are getting burned to the stake still, then why isn't there scientific progress?

See "Cyanobacteria" on page 11

One man's world tour to photograph our galaxy

One year, 90000 km and 37,444 images later Nick Risinger had the most aesthetically appealing image ever taken of the Milky Way Galaxy. To view it in detail, visit his website: http://skysurvey.org

How far would you go to take the best photograph yet of the Milky Way? Nick Risinger traveled 90000 km to do just that. The results were worth every "k" along the way. But let me give you a few background details.

I have a number of friends who take images of clusters, nebulae and distant galaxies. I often feature them in my column. What they shoot are called deep sky objects and photographing them (it's called astro-imaging now) is a combination of hard work along with some expensive gear, computer skills and a bit of luck. But the end result can deliver results that rival those of professional observatories just a few years ago.

First they take a number of exposures through red, green blue and hydrogen alpha filters. Then they stack the images so that they have maximum detail and colour saturation. After a few dozen hours at the computer they have one finished image.

What Nick Risinger did was to image the entire night sky from different locations around the world. In the end he took 37,444 exposures and stitched them together in a 360-degree panoramic view of our Milky Way Galaxy. The detail is so rich that viewers can zoom in on portions to find the Big Dipper, Orion, Southern Cross—all 88 constellations plus all the planets of our solar system and a host of other stellar objects.

To do this Nick needed a number of things. First is a mount that would track his camera along with the stars. For his work, Nick used six monochrome cameras equipped with filters on his equatorial mount. He then fed the raw images into his laptop.

Then he quit his day job so he was free to shoot the sky from various locations in northern and southern hemispheres. Nick's 90000 km trek took him from the mountains and deserts of the southwest United States to South Africa. He had to pre-plan each night so that he was imaging when there was no Moon to washout the sky. His locations were always far from light-polluted cities. And the weather also had to be taken into account.

When all the images were collected Nick returned to his home in Seattle and began finishing what would ultimately be a 5,000-megapixel image. Says Risinger, "this is not a scientifically useful image. This is for educational and artistic appreciation."

Now us amateur stargazers have another point of reference other than Google Sky. To quote Risinger: "It was always hard to describe what I was doing that would make sense to people that aren't familiar with astronomy. But once they see it, they get it."

—John Crossen

PHOTO GALLERY

May's "Dance with the Planet!"

Just like the television show, "Dancing With the Stars", you just never know what will actually happen. This past month proved, that with Mother Nature, things could never be "fixed" or predicted for that matter either. What am I talking about? Well, the planetary dance in the month of May, of course. May was the gathering of four planets (Mars, Mercury, Venus & Jupiter) in dawn's early light that was their closest gathering (10 degree area of the sky) since August of 1966. It turned out to be a bit of a "wash" for me. Between cloud cover and the relative positioning to the rising of the Sun "washing out" the twilight of morning sky, I found this event all but impossible to see. Our latitude was our worst enemy for witnessing this. The further north you were, the lower this dance of the planets took place. I knew all of this going into the month, but I never envisioned how difficult it would be actually be. If you have seen images throughout the month on the Internet, they all appeared to be from at least the south U.S.A. to Argentina.

The morning of May 11th and 12th were to be the best times to see the "planetary tango", as the brightest planets of Venus and Jupiter were at their closest, but as they got high enough above the horizon a thin veil of cloud played havoc with my optics and I never did see Mars, Mercury was barely visible and Venus and Jupiter changed brightness like variable stars. Even getting up at 4:30 a.m. and heading for the highest vantage point in Keene to see the eastern horizon was no guarantee. The attached image attests to my best attempt on May 12th with an uncropped image from my camera and a tripod mounted 300mm lense taken at 5:13 a.m. Not very impressive, but illustrates how challenging it was. This is close to a binocular view that morning, which I hoped would have made the planets "pop out" of the sky, but instead Venus and Jupiter took turns as to who would appear brightest and Mercury was all but a mystery in the twilight (Can you even see it?) The early bird usually catches the worm, but these proved a little too tough of this old bird. I was able to capture some nice sunrise shots these same mornings though, so it was definitely worth getting up for and who doesn't like a challenge? If it were too easy, everyone would be doing it! Maybe better luck next time? There will be lots of other nice conjunctions and alignments in years to come, so stay tuned and don't give up, but instead... keeping looking up!

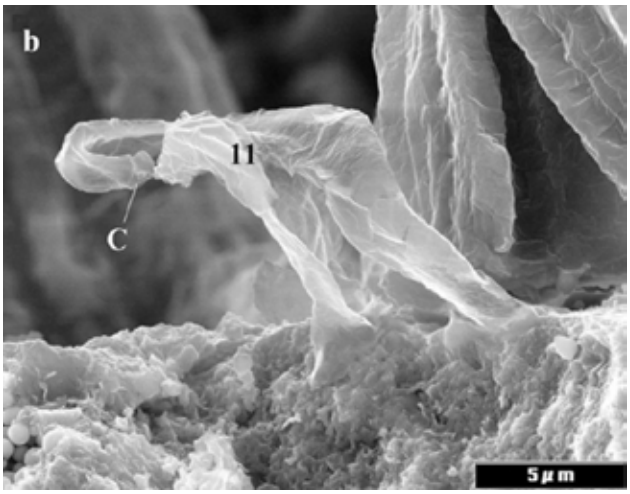
Photo by Rick Stankiewicz

continued from page 7

Cyanobacteria

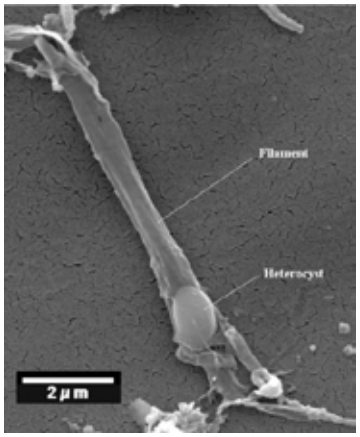
The *Journal* speaks through this letter that the data is again sound, that there are "charlatans and quacks", and that they are again a prestigious journal. The main concept of the letter is to issue proposals:

"1) JOC, Nature, *and* Science *each appoint an expert-judge who has a background in astrobiology.*



"2) These 3 expert-judges will appoint and unanimously agree on a panel of 12 esteemed experts who will be guaranteed anonymity if they desire.

"3) This expert panel of 12 will have 30 days to review the Hoover paper, ask for supplementary material, and to question Richard Hoover and to call upon the expertise of additional experts, if they so choose. Each of these experts will issue their reports to the 3 expert-judges.



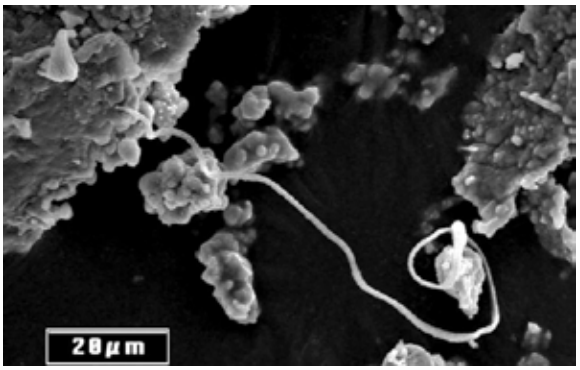
"4) The 3 expert-judges will issue their own report(s) summarizing these findings, and issue a verdict on or their opinion of the validity of Hoover's paper as based on the reports issued by the 12 expert panel.

"5) Science, Nature, *and* JOC, *will publish the reports of the 12 member expert-jury, and the expert-judges.*

"6) If the weight of opinion is that Hoover's findings are not valid, the Journal of Cosmology *will withdraw the paper.*

"7) If Hoover's findings are validated, we ask not for a apology, but congratulations."

"We believe our proposal is scientifically sound and eminently reasonable. We are completely open to working out the fine details with the editorial boards of Science *and* Nature.



"If Science *and* Nature *decline, then any refusal to cooperate, no matter what the excuse, should be seen as a vindication for the* Journal of Cosmology *and the Hoover paper and an acknowledgment that the editorial policies of the* Journal of Cosmology *are beyond reproach. The very fact that we have made this proposal, coupled with all our previous efforts to open this issue to scientific discussion and debate, is, itself, testament to the integrity of* JOC *whose mission has always been to promote and advance science."*

I wonder what we will see in the next month or two?

Solar-powered airplane makes first international flight

Solar Impluse in Flight. Imagine flying from Switzerland to Belgium using no fuel and doing so in complete silence. André Borschberg just did it, no imagination required.

John Crossen

It wasn't far and it wasn't fast, but it was a first. Not an ounce of fossil fuel was burned in the flight from Switzerland across France to Brussels, Belgium. Here are the specifications of the craft that did it.

Christened the Solar Impulse, the plane features 11,000 solar panels along its 210-foot (64 m) wingspan and stabilizer. Go power consists of four 10-horsepower (7 kW) electric motors. The propellers are 11 feet (3.5 m) long, and the whole shootin' match weighs about as much as a mid-sized car (3,500 lb/1588 kg), and that includes all the batteries required to keep it aloft for eight hours of darkness.

Piloted by André Borschberg, the solar ship crabbed into the wind and at just 35 km/h, lifted off from Payerne, Switzerland. The craft rose to 3600 metres and 12 hours, 59 minutes later touched down at Brussels's airport.

Maximum speed for the flight was a leisurely 77 km/h. A regular jet would have taken 2 hours to make the Switzerland to Brussels hop and traveled between three and four times that speed. It would also have generated tons of hydrocarbons and burned a few thousand litres of non-replaceable fuel. Something else it would have generated was a lot of noise. But Solar Impulse flew so silently that pilot Borschberg could hear sounds on the ground. So you'd better be careful what you say when solar power reigns.

Solar Impulse's speed may seem agonizingly slow, but considering the in-

See "Solar Flight" on page 15

PAA Observing Run

A Conversation Beneath the Clouds

John Crossen

While it was disappointing not to have a clear sky for observing (yes, the weather folks lied to us again), we did enjoy an evening of casual astronomy chatter.

While waiting for the clouds to part, Mark Coady introduced us to his new cat, Ollie, via his cell phone photos and gave us a little rundown on his latest astro activities with the Bellville RASC. Mark is still delighted with his Celestron Next Star 8-inch. After a year in storage he just fired it up, updated the time and coordinates and bingo, it pointed right where he wanted it to. Mark also brought along his Sky Meter to check how much light pollution from Peterborough, Lakefield and Bobcaygeon had encroached on the observatory's magnitude 5.5 skies. Unfortunately mean old Mr. Cloud put an end to that plan.

Boyd Wood brought along his two grandkids to see the BHO scope as well as getting his own up and running. Boyd's granddaughter has been out to a couple of PAA observing runs in the past, but this was grandson Mathew's first visit. Happily we had a dozen doughnuts to keep the kids merrily munching along.

Harold Briggs hobbled in on crutches following surgery to his Achilles tendon. Ever the game lad, Harold brought along his image-stabilizing binoculars. Harold has a very nice William Optics 110 mm APO refractor, but it's a bit much to try to manage along with a GoTo mount while hopping around the field — full marks for a valiant effort Harold.

Ben Morgan and his dad also ventured out and joined in the astro-patter. Ben took home the physics award at this year's regional science fair. Along with Francesca Elliott that makes two PAA members who were recognized for their achievements. You've done yourselves and us proud!

That was it for the night. About 10:30 p.m. the clouds parted long enough for us to get a good view of Saturn along with its bright moon Titan. Then it was time to roll the roof shut and bid each other farewell.

Sometimes it's nice to just sit an talk. So, while things didn't go according to plans, we did enjoy a pleasant evening under the... a... a... clouds.

MUSIC REVIEW

I discovered this CD while on the hunt for a used copy of "Tubular Bells" by Mike Oldfield. I saw this on the shelf instead and just the artwork on the cover caught my attention so I took a chance and what a surprise. This turned out to be some of the best $10 I ever spent for music! Some of you might remember Mike Oldfield from his now famous "Tubular Bells" recording of 1973. It was partially used as the soundtrack for the blockbuster horror flick "The Exorcist".

In true Oldfield tradition, he wrote, produced and engineered all 17 tracks on this CD. The music is very "electronic" but is reminiscent of "space themed music", but I heard influences of an Aboriginal nature, combined with *Chariots of Fire*, monks in an abbey, African and Enya, all rolled into one.

With song titles like "In The Beginning", "Let There Be Light", "Supernova", "First Landing" and "The Shining Ones" you know you are in for some potentially space-oriented tunes. This CD has some great tracks for background to a space-oriented slideshow or presentation. I personally enjoy this music even as mindless "elevator music", when it is called for. I would recommend this CD if you can find a copy and are interested in an interesting musical journey. Put on the headphones, sit back and relax because it is very therapeutic.

Your Music Reviewer,
Rick Stankiewicz

The Sky this Month

Mercury reaches superior conjunction on the 13th reappearing in the western evening sky at twilight later in the month.

Venus in eastern morning sky. Begins to appear higher as elongation decreases from the sun as ecliptic tilts higher.

Mars low in the eastern dawn sky. Viewing improves as elongation lengthens and ecliptic gets steeper.

Jupiter low in the eastern morning sky near Aries-Pisces border.

Saturn well-placed in western late-evening sky. Retrograde motions ends on the 14th.

Moon Phases

New Moon	5:03 PM	June 1
First Quarter	10:11 PM	June 8
Full Moon	4:14 PM	June 15
Last Quarter	7:48 AM	June 23

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Summer Nights

Most can be spotted with binoculars, but to really appreciate what makes globular clusters so appealing you need to see them through a telescope. And as is the case with telescopes, the bigger, the better.

To take them in I suggest you check out your local astronomy club. The Peterborough Astronomical Association (PAA) has monthly observing sessions that are open to the public. Check them out at www.peterboroughastronomy.com. To our east the Bellville Chapter of the Royal Astronomical Society of Canada also have regular public observing nights. Their website is www.rascbelleville.ca.

Insomniacs can snag a preview of the Summer Milky Way and Sagittarius by staying up past midnight. Early risers on the other hand have a plethora of planets to view in the pre-dawn sky. Bright Venus crests the eastern horizon about thirty minutes prior to sunrise. Above and to the right of the goddess of Love is the god of War, Mars. Still further up the dawn sky is the solar system's largest planet, Jupiter.

Lunatics will have a delicate Thin Crescent Moon to view just after sunset on June 5. A few days later on June 8 comes the First Quarter Moon. This is the best time to view our celestial dance partner because the Moon's surface is lit from the side which creates long shadows that emphasize the craters and surface detail. Binoculars or a small telescope will unlock a wealth of detail that the unaided eye can't make out.

If you'd like to learn more about the night sky pick up a copy of Terence Dickinson's ***Night Watch***, join a local astronomy club or visit buckhorn observatory.

Until we meet again by the backyard telescope, clear skies.

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Solar Flight

creasing pace of technology that crawl will rapidly gain speed. Solar-powered cars, trains and aeroplanes will definitely be transportation options for our future. Feed this into your hard drive and see if it computes.

The Wright Brother's first flight covered less distance than the wingspan of a 747 Jumbo Jet. Thirty years later Lindberg flew the Atlantic single-handed. Shortly thereafter cross-country commercial flights became commonplace. Next in line was the turbo-prop followed closely by commercial jet flight. In 1969 mankind had set foot on the Moon. That's just 60 years after the Wright Brother's first flight. Given the snowballing speed at which technology is currently advancing, I'd say solar power definitely has the potential be our motivating force in our future.

It has already taken flight, joining us in space with satellites, the International Space Station, shuttles and probes all using solar power. On Mars the Opportunity Rover is entering its 7th year exploring the Red Planet with solar power. Next up will be the Solar Sail which hitchhikes on the solar wind to take us to distant planets.

For all practical purposes solar power is infinite. Harness just a fraction of that energy and mankind has a free ride for as long as there's a Sun and an Earth to soak up its glow. If you'd like to learn more visit www.solarimpulse.com. Next up Sola Impulse will make an around-the-world flight.

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Zooniverse

of young, hot stars. Our volunteers have circled almost 300,000 bubble candidates, and counting," he says.

Humans are better at this than computers. Computer searches turn up only the objects precisely defined in a program, missing the ones that don't fit a specified mold. A computer would, for example, overlook partial bubbles and those that are skewed into unusual shapes.

"People are more flexible. They tend to pick out patterns computers don't pick up and find things that just look interesting. They're less precise, but very complementary to computer searches, making it less likely we'll miss structures that deserve a closer look. And just the sheer numbers of eyes on the prize mean more comprehensive coverage."

Along the way the project scientists distill the volunteers' data to eliminate repetitive finds (such as different people spotting the same bubbles) and other distortions.

The project's main site (http://www.milkywayproject.org) includes links to a blog and a site called Milky Way Talk. Here "hunters" can post comments, chat about images they've found, tag the ones they consider especially intriguing, vote for their favorite images (see the winners at http://talk.milkywayproject.org/collections/CMWS00002u), and more.

Zooniverse invites public participation in science missions both to garner interest in science and to help scientists achieve their goals. More than 400,000 volunteers are involved in their projects at the moment. If you want to help with the Milky Way Project, visit the site, take the tutorial, and ... happy hunting!

You can get a preview some of the bubbles at Spitzer's own web site, http://www.spitzer.caltech.edu/. Kids will enjoy looking for bubbles in space pictures while playing the Spitzer concentration game at http://space-place.nasa.gov/spitzer-concentration/.

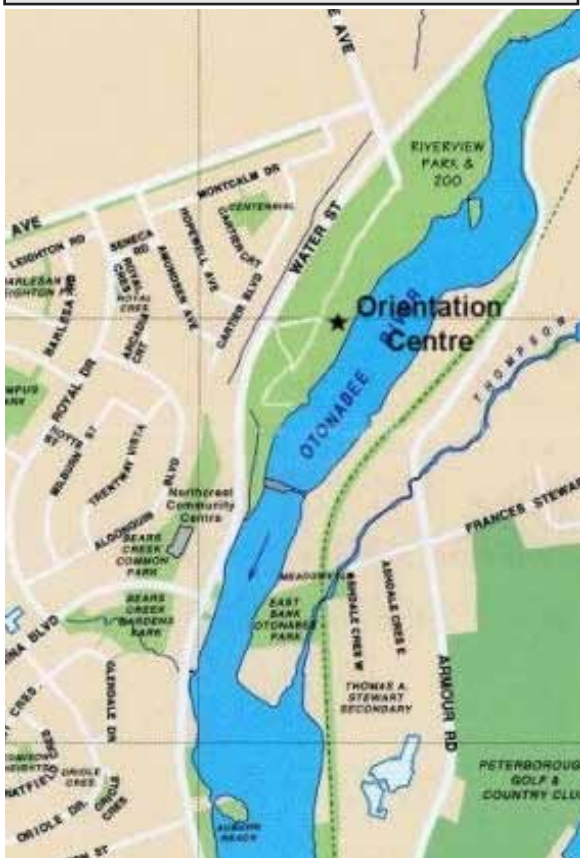
This article was provided courtesy of the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

Articles

Submissions for *The Reflector* must be received by the date listed below. E-mail submissions are preferred (Microsoft Word, OpenDoc, ASCII and most common graphic formats are acceptable). If your article contains photso or graphics, please provide a separate file for each. 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:

phillip.chee@gmail.com

NEXT SUBMISSION DEADLINE:
AUGUST 26, 2011



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 p.m. P.A.A. executive business will be conducted starting at 7:30 P.M. Members and the public are welcome to attend the earlier time.