

Nova Notes



The Newsletter of the Halifax Centre of the Royal Astronomical Society of Canada

PO Box 31011, Halifax, Nova Scotia, Canada B3K 5T9 www.halifax.rasc.ca halifax@rasc.ca

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E mail: novanoteseditor@rasc.ca

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Front Page Photo: PANSTARRS
Michael Gatto, taken from Woodside on
Monday March 18th 2013



From the editor

Quinn Smith

It is with great pleasure that I can announce that the Halifax Centre has submitted a successful bid to host the 2015 General Assembly that will take place on July 2nd-5th 2015. This will be a major undertaking for the Centre, but one that will give many of our members a chance to participate in an exciting and challenging venture. The Centre was founded in 1955 and, after a short pause, was restarted in 1970. Hosting the 2015 GA will be a fitting way to celebrate these anniversaries. Although the 2015 GA is still over two years away, there is a lot to do, and I will keep you all informed about our progress in the pages of this newsletter. Stay tuned!

Several members of the Centre left a stormy Halifax at the beginning of February and went south to the Winter Star Party hosted by the Southern Cross Astronomical Society in the Florida Keys (more details on page 10). Talking of travelling, you never know what item of astronomical significance you are going to run into whilst travelling. Last fall, while in Vegas, I happened upon a 26,000 year calendar. As astronomers, we spend a lot of time looking up. Sometimes it pays to look down!

Nova East (September 6-8th) is in the final planning stages, under the leadership of Blair MacDonald. Registration should start in early April, so keep an eye on the NE website at <http://halifax.rasc.ca/ne> for agenda and registration details.

Finally I would like to thank all the contributors to this edition. I have been blessed with lots of material, requiring me to extend this edition to 16 pages. Nova Notes is your newsletter, all I do is put it together, so keep the contributions coming!

St. Croix Observatory

Part of your membership in the Halifax RASC includes access to our observatory, located in the community of St. Croix, NS. The site has grown over the last few years to include a roll-off roof observatory with electrical outlets, use of the Centre's 437mm-dobsonian telescope and 100mm-binoculars, a warm-room, and washroom facilities.

Enjoy dark pristine skies far away from city lights, and the company of like minded observers searching out those faint "fuzzies" in the night. Observing nights (Fridays close to the New Moon) are open to both members and guests. If you are not a key holder and would like to become one, or need more information please contact the Observing Chairman, John Liddard (for contact info, see below).

Upcoming Observing Nights:

April	12th	2013
May	10th	2013
June	7th	2013

Meetings begin at 8 p.m. at Saint Mary's University in room AT 101, however due to exams, the April meeting will be held in the Loyola building in room L 173

April 19th 2013

Guest speaker: Robert Deupree. Robert will be talking about RR Lyrae variable stars.

May 24th 2013 (late date due to the Victoria Day weekend)

Guest speaker: Jeff Donaldson who will describe his BOO observatory project.

June 21st 2013

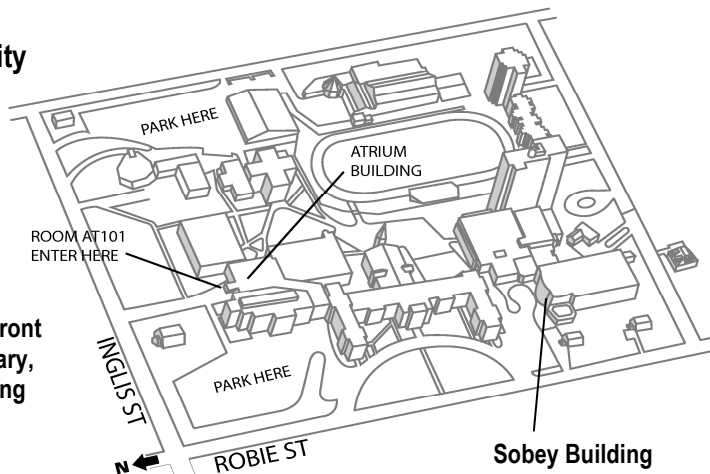
The meeting will be held at St. Croix Observatory along with a barbeque.

All meeting location and contents subject to change

Meeting Location: Saint Mary's University

Atrium Building Room AT 101

The Atrium is located in front of the Patrick Power Library, between the Burke Building and Science Building.



Meetings are usually held on the third Friday of the month, except for the months of July and August, when there are no meetings.

The NOVA program (an introductory course in astronomy) will not be held this year.

Executive meetings begin at 6:45 p.m., usually in room AT 306, and all members are welcome. In April we will meet in SB 153

Halifax RASC Executive, 2013:

Honorary President	Dr. Roy Bishop	902 542 3992	RLB@eastlink.ca
President	Paul Heath	902 457 0610	pheath@eastlink.ca
1st Vice-President			
2nd Vice-President	Karl Penney	902 457 4046	karlpenney@eastlink.ca
Secretary	Chris Young	902 441 6861	cjy@eastlink.ca
Treasurer	Ian Anderson	902 678 8009	taursagroup@yahoo.ca
Nova Notes Editor	Quinn Smith	902 852 3894	quinnjem@yahoo.com
Librarian	Graham Rose		gbrosegr@netscape.net
Observing Chair	John Liddard	902 865 7607	jliddard@gmail.com
Observing Chair assistant	Alex LeCreux		
National Representative	Pat Kelly	902 472 2322	patrick.kelly@dal.ca
Councilor	Wesley Howie	902 448 3966	wes@lightimages.org
Councilor	Sean Dzafovic	902 430 9062	sdzafovic@gmail.com



A Winter Sky
Pat d'Entremont

I watched the moon as it was falling
And for a time she graced me with her light,
And as the Seven Sisters started calling
I stood alone
Enchanted by the sight
Of a hundred thousand lights,
And the stillness of the silence
Of the night

Blair MacDonald's image of the Hyades, Venus and the Pleiades was taken at the St. Croix Observatory on April 15, 2007.



' NEATH SUN'S SHADOW
Paul Heath

Science sets the spheres, . . . aligned
An arc is drawn, a line defined.
With Reason packed on plane or train
The route before, sits clear to mind.

Upon that path we build our nest
Woven quickly with our in . . . stru . . . ments
And set upon the Clock - our EYE
Which Reason says is strict - ONE TRY!

When shadow sighted, all hands to tasks
Cameras whirring, lenses locked fast.
Then sudden shivers down our bodies pass
And Reason diverted, the world reacts.

(Photo: Solar eclipse—Australia 2012—NASA)



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E-mail: novanoteseditor@rasc.ca Newsletter editor: Quinn Smith

Nova Notes is published 5 times a year, in February, April, June/July, September/October, and December.

The deadline for the next edition is May 15th 2013

The opinions expressed herein are not necessarily those of the Halifax Centre.

Articles on any aspect of Astronomy and Allied Sciences will be considered for publication.

February Meeting Report

Chris Young (Secretary)

The Centre President, Paul Heath, opened the meeting with a poem of his own composition "Neath the Sun's Shadow". Paul begins each meeting with a poem to open both our hearts and minds for the meeting. Paul introduced the 40 members and guests to the Centre's Executive and explained the benefits of membership to the RASC.

Blair, the Nova East Chair, announced that the Nova East Star Party would be on the September 6th-8th, and invited members to propose any activities they would like to have at NE. Please send Blair an email requesting any topic, workshop or adventure you might like to happen. Blair also noted there are a few Centre astrophoto posters still available for sale.

Paul then introduced, the speaker for the evening, Mary Lou Whitehorne, a long-standing member of the Halifax Centre. Mary Lou gave a presentation titled "The Big Eclipse Gamble".



Toasting the eclipse! Even though clouds prevented an actual sighting of the Sun's disk!
Photo: Mary Lou Whitehorne

Standing in the shadow of the Moon is a rare privilege. Mary Lou has devoted significant time and money to belong to this exclusive club that pursues these celestial phenomena, in which only a "total" eclipse counts. Indeed, she got a job in science in order to finance being an eclipse-chaser.

Seeing and experiencing a total eclipse is reported to be one of the most rare and awe-inspiring of events a person can witness. As the Moon covers the Sun, the last beams of light graze through the rugged lunar terrain, a thin circle of light surrounds the Moon, and a sparkling diamond ring effect is momentarily seen. This is followed by the sight of a dark hole in the sky and darkness all around you. Mary Lou has seen a number of partial, and annular eclipses but had been witness to only two total events prior to this trip and would spare no effort to see a third.

This eclipse expedition was organized through the Calgary RASC Centre, who has a high success rate in achieving their goal.

On the trip to Australia, Mary Lou shared a seat with astronomy magazine contributor Gary Seronik. Aus-



Mary Lou Whitehorne

tralia looks idyllic from a distance, however the photos of shark and stinger nets (for the "jellies") on the beaches, the warnings along the Cooktown waterfront for salt water crocodiles ("salties"), then in mating season, suggest there is a dark side to this paradise. From personal experience Mary Lou added biting green ants to the list of undesirables. Happily they weren't the poisonous type.

The trip included visiting Sydney (& Bondi beach), Cairns, the 120 million year old Kuranda rainforest, and Cooktown, where James Cook had beached and repaired his vessel in 1770. One of the group's tour guides was aboriginal elder Willie Gordon. His job was to communicate the stories and culture of his people to visitors. Mary Lou described Willie as a very wise and special person who radiates serenity. Willie took the group to visit caves where the art, painted on the rock faces with ochre, was renewed by each generation for thousands of years.

Being close to the Great Barrier Reef, a side trip was arranged offshore to snorkel on the reef. The description of the corkscrewing motion of the boat in heavy seas and its effect on the passengers gave the audience the impression some parts of this excursion were less than memorable.

The day of the eclipse came, and the weather was ominous on the coast. The observing plan changed from a beach lookout to travel inland in search of open skies. The group's bus driver took the travelers inland to a ranch belonging to a friend. Their hosts were wonderful and when the eclipse began the guests shared precious moments of the view, through filtered binoculars, and between heavy clouds, of the developing eclipse.

As the eclipse progressed the shadow of the Moon darkened the Earth and sky, silencing the birds and momentarily changing the direction of the wind. But the clouds closed in and the final covering of the Sun by the Moon was concealed from view. Disappointed to have the full eclipse screened from their view, the spectators commiserated and drank the champagne brought to celebrate success. Returning back to Port Douglas, the extraordinarily high king tide that resulted from Sun & Moon pulling together near perigee, had already peaked and was withdrawing.

"Thus endeth the chase..." Mary Lou said defiantly, "but it counts!"

As a postscript, Mary Lou notes that the next total eclipse crosses Indonesia, followed by one over the North Atlantic in 2015, across the United States in 2017, and in 2024 an eclipse will cross the U.S., New Brunswick and Newfoundland – anyone interested?

She also added that "...it is interesting to let the alignment of the celestial bodies determine your travel plans...and your travel experiences are not the ones you would expect".

Following Mary Lou's presentation Paul played a series of videos from YouTube on the meteor burst over Russia, which was sobering, given that it was a relatively small rock that came in with no warning.

The meeting adjourned a little after 9:30 p.m. for refreshments and further conversation with our speaker and the members.

March Meeting Report

Quinn Smith

Paul Heath convened the March meeting right on time, and as usual, opened the meeting with a poem that he had written for the night titled "Guardians of the Sky". Paul then welcomed all present. We had 33 members and guests at the meeting, and Paul thanked the new members and guests for their participation and outlined the benefits of membership.

Paul then got right down to business by announcing that the next SCO observing night (April 12th) would start at 7 p.m. to allow new (and old) members to have an SCO familiarisation tour before darkness falls and observing begins.

We then took a count of members who had managed to see the elusive PAN-STARRS comet. Of the 33 present, 11 had managed a visual observation despite the clouds.

Paul then spoke to our desire to attract more young members and mentioned that a committee was being put together to promote youth participation. Anyone who would like to be on the committee, or who has suggestions, should contact Graham Rose (our librarian). Contact details on page 2.

Blair McDonald then informed the audience of our an astrophotography workshop that would be held on April 20th at Atlantic Photo Supply in Burnside. Details will be posted on the Hfx "chat list".

He then mentioned our annual Star Party "Nova East" which will be held on September 6th-8th at (as usual) Smiley's Provincial

Park. The Nova East website: <http://halifax.rasc.ca/ne/> will be up and running for registration by early April. Blair also mentioned that Atlantic Photo Supply was sponsoring an astrophotography competition that will be held at Nova East this year.

Guest Faye Bontje then mentioned the upcoming concert of the Holts's Planets Suite, put on by the Halifax Music Co-op on March 22nd and 23rd. She gave away two pairs of tickets to members who answered skill testing questions (won by Sean Dzafovic and Galen Thurber). Paul then mentioned a related public observing night at Bishops Landing on March 19th (weather permitting) and that the Halifax Centre will be putting on a small display at the concert.

Paul then introduced the main speaker for the evening: Dr David Turner from Saint Mary's University. Dr Turner's topic for the evening was "Origins of the Constellations, and why Ursa



Dr David Turner, the speaker for the evening

Damn Calendar!

Quinn Smith

As an astronomer, whenever I am outside I usually look up. Sometimes (in the case of PANSTARRS) I look straight ahead, but rarely do I look down. Last Fall, whilst visiting the Hoover Dam, just south of Las Vegas, Nevada, I happened upon a very interesting astronomical item, that it turned out, I was standing on!

The Hoover Dam was completed in 1936 and straddles the Colorado river between Nevada and Arizona. It is just west of the Grand Canyon and the water it holds back forms Lake Meade. It is an impressive structure and planners wanted an edifice that would document it for millennia to come.

That in itself is an interesting thought. The average life expectancy for a dam in the United States is 100 years (most are currently over 50 years old!), and despite my best effort I could not find a consistent expected working life of the Hoover Dam. Most sources agreed that the concrete structure would survive several thousand years, but its life as a functioning dam (capable of holding back water) would realistically be limited to several hundred years at the most.

Undaunted, the Hoover Dam planners wanted that future generations, regardless of language, would be able to date the dedication of the Dam for millennia into the future.

The task of achieving this goal was given to Oskar J. W. Hansen who constructed a sculpture located on the Nevada side of the dam at the location where the top of the dam wall meets the rock face (this is the road level).

There are two sculptures known as the Winged Figures of the Republic, placed on either side of a 142-foot flag pole. The castings are 30 feet high. Their shells are 5/8 inches thick and contain more than four tons of statuary bronze.

Major does not look like a Bear!”

Dr Turner told of some of the mythology associated with not only Ursa Major but several of the larger constellations in the sky. He explained that there were several periods in history when constellations were identified and named, and proceeded to list what constellations were named in which period, and by whom.

He showed that originators of the constellations could be identified by reference to the size of the constellation (larger tends to be older) as well as considering the sky view at various locations and time periods. When one considers the effect of precession (the cyclic change in the orientation of the Earth’s axis), the sky view changes considerably over the millennia. Dr Turner showed the sky view from several locations in several millennia, explaining the reasoning for the dating of the naming of the constellations.

But what of the reason that Ursa Major does not look like a bear? Dr Turner pointed out that although precession accounts for the major change in the sky view over the millennia, there is a smaller, less noticeable change in the constellations due to the real motion of the stars in the constellations—in particular in the constellations of Ursa Major and Bootes. The stars in these constellations are close and have a relatively large apparent motion in the sky. They are also large constellations and would have been identified and names over 5,000 years ago. In the case of Ursa Major, it did look like a bear 5,000 years ago and the name has stuck!

The talk was well received and there were several ques-

tions. After Dr Turner’s talk we turned our attention to observing in the here and now.

Dave Chapman introduced the (not yet released) Beginner’s Lunar Observing Program. This is a beginner-level lunar observing program based on RASC maps and feature lists in the Observer’s handbook and Beginner’s Observing Guide.

Paul Gray introduced several of the RASC observing programs by referencing the Nation RASC website and in particular the observing programs at:

<http://www.rasc.ca/observing/certificate-programs>.

Sean Dzafovic then gave us a “What’s up?” using an on-line planetarium program, with particular reference to the observing objects required for the *Explore the Universe Certificate*. Some of the objects he mentioned included the constellations of Orion and Taurus, as well as their main stars, Betelgeuse, Rigel, and Aldebaran. He also pointed out that Jupiter and Saturn are visible and reminded us to check out comet PANSTARRS.

The meeting concluded at 9.45 p.m. after the usual snacks and discussions. All in all, a great meeting!



Sean Dzafovic (L), and Galen Thurber (R) receiving their Planet Suite tickets from Faye Bontje.

The figures were formed from sand molds weighing 492 tons. The bronze that forms the shells was heated to 2,500 degrees Fahrenheit, and poured into the molds in one continuous, molten stream.

The figures rest on a base of black diorite, an igneous rock. In order to place the blocks without marring their highly polished finish, they were centered on blocks of ice, and guided precisely into place as the ice melted. After the blocks were in place, the flagpole was dropped through a hole in the center block into a pre-drilled hole in the mountain.

Surrounding the base is a terrazzo floor, inlaid with a star chart, with the flag pole located at the ecliptic pole, and a brass circle, some 25 feet in diameter surrounding the flag pole. The circle represents line traced by the precession of the Earth's axis, and the width of the circle accounts for the short-term wobble in the precession.

Stars are represented by brass inserts in the floor, and the size of each insert reflects the absolute magnitude (rather than apparent magnitude) of the star (presumably for ease of use by extra-



Inscription: "This diagram traces a complete sidereal revolution of the Equinox, otherwise known as the Platonic or Great Year. The average length of a complete sidereal revolution is 25,694.8 tropical years; but may differ from the mean time of revolution by 281.2 years the mean line of the precession of the role of the Earth's equator shown here by the outside circumference on this white metal circle. It's 46.9 degrees in diameter."

"The inclination of the Earth's equator may vary relative to the fixed ecliptic, from 21 deg 59 min to 24 deg 36 min and her role therefore nutates in a zone 2 deg 37 min as shown here by this yellow band."

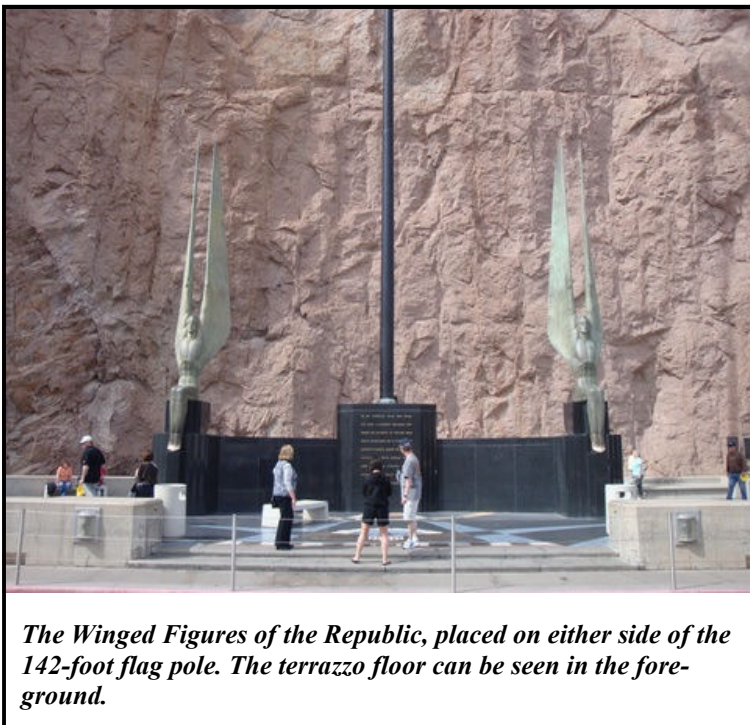
terrestrials).

This celestial map shows the precession of the Earth's north celestial pole through the stars. Since this precession takes

approximately 26,000 years, the terrazzo floor represents a celestial calendar of 26,000 years duration. The dates (the location of the pole on the brass circle) are marked for the building of the pyramids, 1AD and, of course, the building of the Hoover Dam.

To quote the inscription; "The chart preserves for future generations the date on which President Franklin D. Roosevelt dedicated Hoover Dam, September 30, 1935".

Sometimes it pays to look down!



The Winged Figures of the Republic, placed on either side of the 142-foot flag pole. The terrazzo floor can be seen in the foreground.



The path of the north celestial pole among the stars due to precession. Vega is the bright star near the bottom.

Volunteer!!

Paul Heath

DEFENITION: A Volunteer

He or she, who 'IS' placed (or places themselves) before the rolling stone on the mountain top. The farther one goes down the slope, the faster one needs to travel, and the larger the wall of snow that builds up behind you, becomes!

It was suggested at a RASC meeting that I should tabulate my volunteer activities for the Centre. After completing my Councillors' report this year, I decided to do this, as I was surprised at all I had been involved in during the past year. With John Higgins' Centre records and my calendar notes, I have put together a fairly accurate picture of my 'free' time. My hours are fairly accurate, as scheduled events had set times, the exceptions being family, sidewalk, and outreach events—these I rounded off.

I have grouped my activities as follows:

SCHOOLS: Classroom talks, curriculum based Gr. 6, general for other classes

LIBRARIES: Astronomy talks / Teen Zone presentations

PARKS: Daytime astronomy presentations with Solar Observing when possible

DISCOVERY CENTRE: Astronomy talks and Science Camp workshops

SUMMER CAMPS: Astronomy talks at summer say camps / half day week-long Astronomy camps

PUBLIC OUTREACH (as part of a group): mall displays, RV show, Saltscapes, Earth Hour, Keji Dark Sky weekend, GCBYCO (great Canadian backyard camp out), ARISS event.

PUBLIC OUTREACH (on my own): Planetarium Shows, BGO tours, School Spring Fairs, Community Fairs, (Solar obs./Astronomy demos), youth group presentations (Brownies/Cubs/YNC)

Not included were the many times when observing at home or with fami-

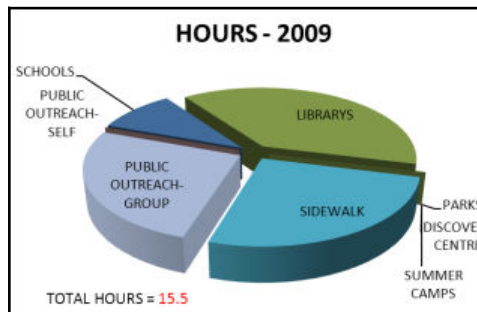
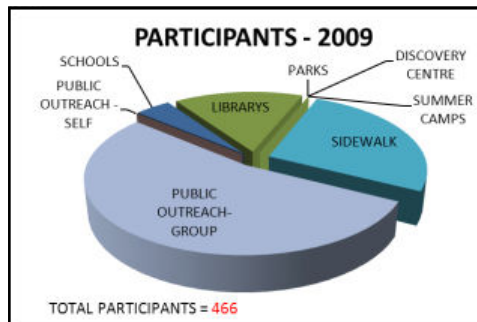
lies and neighbours, when I shared my telescope or binocular views. Also not included were short presentations (What's Up) at RASC meetings. But as they say "... it's but the tip of the iceberg". Not recorded are the hours spent at planning meetings – emails – developing Power Points – building and repairing my "hands on" model/demos – folding and taping Star Finders – and rerolling my 'Toilet Paper Solar System'.

YEAR	2009	2010	2011	2012	TOTALS
EVENT	9	22	37	52	120
PARTICIPANTS	466	1,732	1,057	2,081	5336
HOURS	15.5	77.0	76.5	101.5	270.5

Fig. 1 Overview

2009

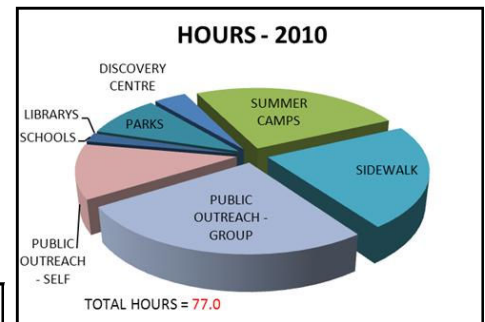
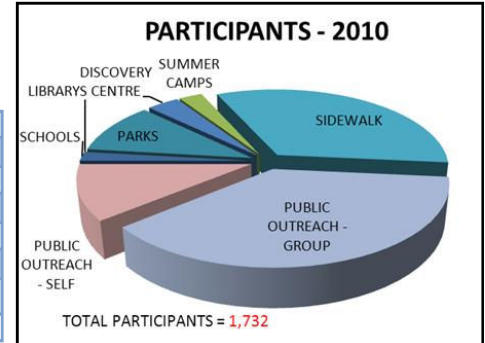
My time was almost equally divided among School Talks/ Library Talks/ Sidewalk and Public Outreach. Large numbers for Sidewalk and Public Outreach, were a result of PR for the IYA events.



2010

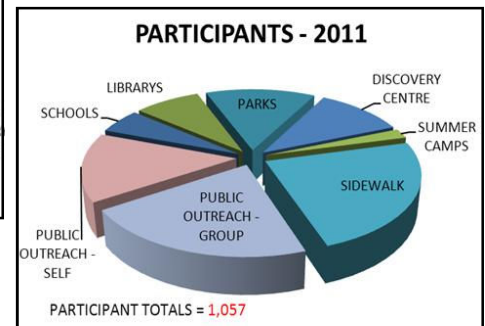
I took on more youth related events, expanding my talks to Discovery Centre and summer day camps, as well as

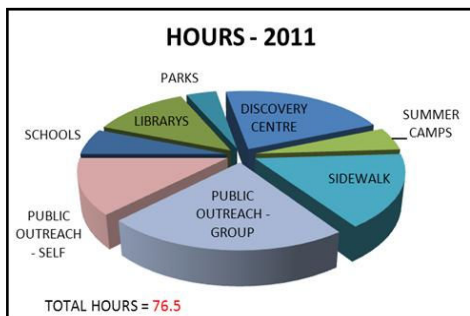
a weeklong astronomy camp, I taught in Chester. Large public turnout to events like InOMN at Bishops Landing, Earth Hour at Grand Parade, RV show, Graves Island Prov. Park, public observing, and North Preston Days, swelled the numbers for Sidewalk and Public Outreach.



2011

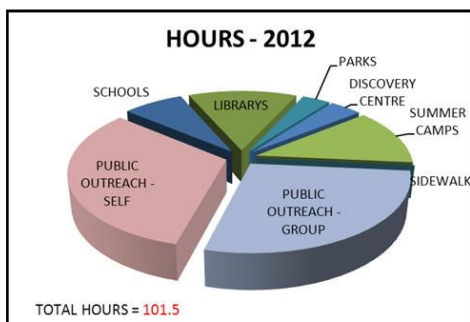
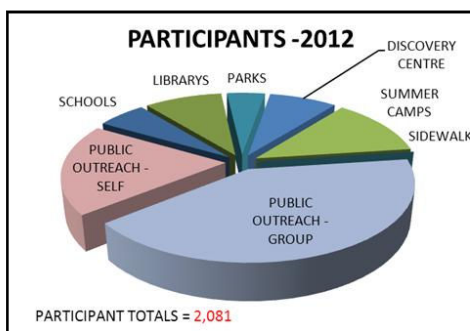
I began a monthly astronomy talk series at Discovery Centre, and late in the year, began coordinating Library Astronomy talks. Once again InOMN pushed up Sidewalk numbers, my first Keji Dark Sky Weekend and North Preston Days kept Public Outreach numbers high.





2012

Bad weather cancelled all sidewalk events. This didn't reduce my activities as I began to do planetarium shows and BGO tours. I also began as the RASC liaison for the Young Naturalist Club board of directors, organizing astronomy events for the club. The highlight of the year was the ARISS event at Keshen Goodman Library. Outreach numbers stayed high with large public turnout to events like ARISS, RV show, SaltScapes, Enfield observing night, and Fundy Tidal Int. Centre events. Also, I had become the 'kid guy', doing youth presentations for library talks, meeting talks, and planetarium shows for Brownies/Cubs/ YNC, summer day camp demo's, and solar observing, and astronomy activities at school spring fairs. I also continued with my weekly constellation poster on my school bus.



Until I had actually put it all together, I did not feel that I was really doing all that much. I helped out where I could and had fun, especially working with the kids. There were frustrations, like when the computer crashed at the start of a Solar Dynamics talk. Gr. 9's tend to lose focus when you try to draw diagrams from memory! Or when only 3 people showed up to a Discovery Centre talk. We had not known the 'Pride Parade' was passing by outside.

There were many "OH MY GOD" and "#&!*" is that REAL" moments, as people got their first look at Saturn or Jupiter or the Moon through the telescope. Many discussions about "Aliens" and have I seen any (yes . . . and I have pictures!). The looks of wonder and amazement, when kids or adults grasped, at least somewhat, the size of our Solar System, as we pace outward, step by step from the Sun.

But perhaps the most rewarding is when you find that you have reached someone and maybe passed on some of your love and joy of astronomy. One incident that stays in my mind, is with a young girl (6 or 7 yrs. old) who attended a constellation talk at the library. At the time, she had asked a few questions and had found a "butterfly" constellation on her star sheet.

However, at a Brownie talk a few weeks later, she asked me if I remembered her, . . . she said "my constellation was a butterfly". I did remember the "butterfly". What sticks in my mind is what happened while I was setting up the telescope for observing after the talk. She looked around the sky then said to a couple of the other girls, "See those 2 stars, they point up to the North Star - right there (pointing) - that bright one there is a red giant in the ice cream cone, [sic] Booties". She turned to me very seriously - "That's right isn't it?". I said Yes, as she had used the pointer stars of the Big Dipper to find Polaris, and Arcturus is the red giant in the 'ice cream cone' of Bootes the Herdsman.

The SMILE that filled her face from

ear to ear, said it all. Later, her mother said that she had been using the Star Finder she got at the library talk, every chance she could.

It may seem a small thing in this busy electronic world of ours, but if you can get just one other person to follow you out to a star filled sky, and look up in wonder and joy, then perhaps all the work and effort is worth it. We volunteer to help, to teach, to pass on the love of something, to others. Often we wonder if we really make a difference in anyone's life. It may sound cliché, yet sometimes, that one BIG SMILE makes it all worthwhile.

Paul Heath

Still running before the avalanche !

Paul Heath is a long time member of the Halifax Centre and Centre Executive, and is our current President.

He has been a strong supporter of our Outreach events and has developed a strong interest (and considerable skill) in presenting to youth groups of all ages.

This is a group that often "scares the hell" out of many members (me for one). That was until I finally took the plunge and did a presentation to a group of 8-9 year olds. Were my eyes opened! Kids make a fantastically interested group full of wonderful questions and wonderful ideas.

Thanks to Paul and all the other volunteers who make our outreach programmes such a success.

Winter Star Party

Dave XVII Chapman

The Winter Star Party (WSP) is a 6-night camping/observing event held in the dead of winter in the Florida Keys, organized by the Southern Cross Astronomical Society. In 2013, I travelled there with my wife, Chris, and joined fellow Halifax RASCals Dave VIII Lane, Greg Palman (our member in Maine), and Quinn Smith. I was the only “newbie” of this Gang of Four at WSP.

Night Zero:

After dark, Chris and I finally arrive (via Montréal and Miami) at our chalet in Little Torch Key, following an eventful day that started with a 4 a.m. wake-up. So tired! Even from here (10 minutes away by car from the WSP site) the sky has a sky quality meter (SQM) reading of 21.2 magnitudes per square arcsecond, similar to Keji. Our position is N 24° 40' W 81° 23'.

It is Night Zero because we can't enter the site yet, and Dave VIII, Quinn, and Greg have yet to arrive. I nap and take the binoculars out later, having already seen brilliant Canopus in the south! (The sky is good, but there is too much glare from nearby lights—typical!) My first impression: it is wonderful to observe winter stars in summer clothes!

Night One:

The Gang of Four finally convene at WSP and we observe from dusk until 11:30 p.m. (all times EST), when a band of cloud intervenes. It is a quiet night, with many telescopes still under cover, likely because many people have travelled long distances and are sleeping it off.

Myself, I tour the southern Milky Way with the famous discount 15x70 Celestron binoculars, including objects from Chris Beckett's new “Wide-Field Wonders” (WFW) observing list (p. 328 of the Observer's Handbook 2013). Some of these objects appear to the naked eye as noticeable concentrations in the star field, and open up in binoculars, but are too broad for typical telescopes, unless the optics are specifically set up for wide-field views. I finally convince the others that the sky glow to the west is the Zodiacal Light, although light pollution from Key West may contribute at the lowest altitudes. The zenith SQM reading varies around 21.1, but is worse (lower) in directions of obvious light pollution.

When the wind dies, the telescopes present a jitter-free view of Jupiter in pretty good seeing conditions. We just miss an eclipse reappearance of Ganyমেদে, but then all eyes are on the Great Red Spot (GRS). Much is learned from this experience, including the use of filters and the role of astigmatism in the observer's eye (i.e.

wear eyeglasses if your astigmatism is strong).

The skies are not darker than the best Nova Scotian skies, but the mild weather allows one to observe the “winter” sky with a great deal of comfort, plus there are another 20 degrees of southern declination on offer, and five more nights of it. There is a radio tower nearby to the north, but we did not come south to look north! I also have a bunk with the others in the “chickee” hut for naps and sleeping at the end of the night.

Many other WSP participants are staying at the same resort as Chris and I, and we end up chatting with Al Nagler of Tele Vue over continental breakfast. Al asks me what I observed, and he shows a lot of interest in the WFW, as he feels his telescopes and eyepieces are up to it. Al encourages me to look for the asterism Nagler 1, which is not catalogued anywhere, but is included in the Tele Vue Sky Tour push-to software.

Night Two:

This night is very similar to Night One, although now Dave VIII has his 333 mm (13-inch) f/4.5 travel dob assembled (some missing essential parts were express-mailed to him!). We start out observing a GRS transit on Jupiter. I continue with more WFW, adding a few of my own from southern declinations in Hydra, Puppis, and Vela. I have been “reverse”



The Winter Star Party is held on a beach campground in the Florida Keys (24° N). (All photos by Dave Chapman).



The Gang of Four (Quinn Smith, Greg Palman, Dave XVII Chapman, and Dave VIII Lane)—we were happier than we look in this photo “painted” with a red flashlight.



A wide-field photo of Crux (right) and α and β Centauri (left), taken at about 4:00 a.m. one morning. (Canon XSi, ISO 1600, 50 mm f/1.8 lens, 30s, untracked)



Moonrise, 2013 February 7, with the Milky Way parallel to the horizon. (Canon XSi, ISO 1600, 50 mm f/1.8 lens, 15 s, untracked)

observing, finding interesting smudges and concentrations by naked eye, investigating with binoculars, and then looking at the chart.

Greg Palman brought his Astrophysics 130 mm (5-inch) f/6 triplet refractor on a go-to Mach 1 mount, and we easily follow up some objects by punching the object catalogue number into the controller. There are hundreds of people here, and they are spread in a band along the beachfront. It takes 20 seconds to walk across the width, and several minutes to traverse the length. I am sure this contributes to the low-key vibe of the event. There is no public observing, everyone on site is a paid participant or staff. Every so often, someone wanders by for a look or a chat. There are some interesting and well-known people around, but how to find them?

Night Three:

The evening starts off partly cloudy and breezy, but warm. We meet Carlos, a Cuban friend of Alejandro Jimenez (my astronomy friend in Havana), now a US resident. He is imaging at WSP. It is a great visit, and we talk a lot about Cuba and the astronomers we know there! We observe for a few hours, then sleep until 2 a.m. The darkest portion of the sky reads 21.4 on the SQM. We watch Crux rise, then α and β Centauri, then Scorpius,

then the Moon. We observe some of Alan Whitman's "Southern Hemisphere Splendours" (p. 330 in the Observer's Handbook 2013), but the haze obscured them a little: γ Centauri (GC), the Jewel Box (OC), and the Carina Nebula (EN). The waning crescent Moon is at elongation 39° west of the Sun, and we try to memorize the Earthshine to compare on the next day.

Night Four:

A clear night, but humid; even dew problems. We all watch a lovely GRS transit followed by an Io transit ingress and shadow transit ingress. The seeing is excellent, as are the views in Greg's refractor. I take a few wide-field exposures with my Canon XSi camera on my MusicBox EQ mount while Dave VIII and Greg image the Orion Nebula.

With a little internet research, I found the location of the Nagler 1 asterism (RA 6h 23m Dec $-26^\circ 17'$), and I observe and sketch this inverted chevron of stars in Canis Major in the 4.4° field of my binoculars.

We all take a nap, and Quinn and I rise at 3:00 a.m. to enjoy some Southern Hemisphere Splendours in the lower part of Scorpius. Much to see! Quinn sees a brilliant fireball; I only see the very end and the 20-second trail. The Moon rises at 5:30 a.m., just before dawn, and we wait to see Venus

before sunrise. The earthshine does not look as bright, but it is hard to be sure. The geometry looks favorable for observing an Old Moon about 20 h from New the following day, although the sky looks questionable, as there seems to be a persistent band of haze at the horizon,

Night Five:

We have had an unprecedented string of 5 nights' observing at the WSP.

This night is a relaxed night, but we make two remarkable observations:

- (1) Sirius B, also called "The Pup".
- (2) An Old Moon 20 hours from New.

(1) A WSP neighbor directs his 406 mm (16-inch) tracking dob to Sirius (mag. -1.5) at high power, and at the edge of the shimmering diffraction pattern, we spy Sirius B (mag. $+8.5$) at separation $10''$.

This is an observation aided by narrow field of view, and Quinn discovers that he can block out brilliant Sirius by backing his head away from the eyepiece and positioning his eye slightly to one side. I am going to try this at home with my 12-inch dob.

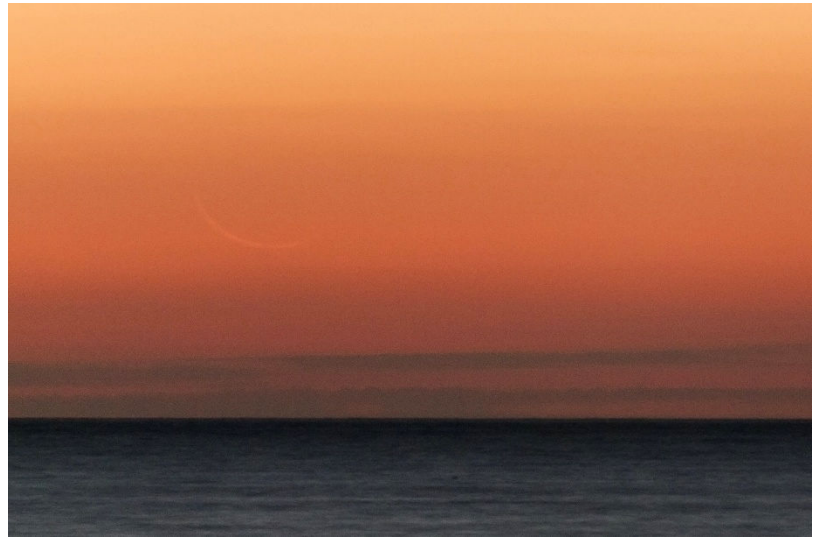
(2) We rise at 5:30 a.m. to prepare for moonrise at 6:14 a.m. Quinn and I had made a dry run the previous day, and we had been talking about it before



Orion was splendidly high in the sky all night long. (Canon XSi, ISO 1600, 50 mm f/1.8 lens, 60s, tracked with MusicBox EQ mount)

midnight, so a small group joins us to look, while everyone else is in bed or actually packing to leave. There are few clouds, but the haze is thick for a couple of degrees at the horizon. Before dawn's light, I measure an SQM reading of 21.5 away from obvious sky glow.

Greg slews his go-to refractor to the Moon's position shortly after moonrise and finds it in the eyepiece. Dave XVII finds the slim crescent at about the same time, sweeping with his dob at VERY low altitude. Quinn finds it in his ED80 f/7.5 refractor, and then uses the red dot finder to locate the point in the sky to look with the unaided eye. I find it in binoculars but cannot see it unaided, until I use Quinn's method. The time is 6:26 a.m., 12 minutes after moonrise, 36 minutes



The Old Moon less than 20 hours from New, 2013 February 9, 6:19 EST. (Canon XSi, ISO 1600, 300 mm f/5.6 lens, 4s, untracked)

before sunrise, with the Moon at an altitude of just under 3°.

After this, we cannot maintain unaided eye contact, as the sky was brightening. While searching for the Moon, I snapped several exposures with a Canon SXi and 300 mm lens to set the background brightness, and I later discover that I

have captured the crescent in the haze on several frames around 6:19 a.m. Venus rises after the Moon, and for a short time I see both the Moon and Venus in binos, and then Venus unaided, but never the two together, unaided.

This observation is aided by several factors: a low (ocean) horizon, clear (although hazy) skies, a moderately steep ecliptic angle at the sunrise azimuth (due to our southern latitude), the Moon being north of the ecliptic, and the 12° elongation from the Sun (perigee was 2 days previous), not to mention alert, prepared, and experienced observers!

Night Six:

It was too much to ask for 6 nights of uninterrupted viewing! Our last night is slightly spoiled by clouds, but we have to sleep sometime, especially

since we are all compelled to clear out by 10 a.m. the next day and some of us are driving. Many participants have already left!

So the last night is fairly social, starting with viewing Mercury after sunset, rising higher every night into the Zodiacal Light. I explore more WFW in and around Cassiopeia, not in binoculars, but with the aid of Greg's refractor and Dave VIII's low-power eyepiece.

I had an extra Handbook to give to someone, and I choose the owner of the large dob in which we had observed The Pup. It turns out he is named Patrick Moore! He is a member of the Raleigh Astronomy Club (NC). Everyone is yawning, so we repair to the chickee for some liquid Vitamin B, chat, and sleep.

Everyone sleeps through the night, but Greg rises at 4:30 a.m. for one last observing session. He was supposed to shake us, but he said "everyone was sawing logs" (imagine this with a Maine accent). We all get up to watch the last sunrise and to pack. I can't say I have ever observed six nights in a row!

Members capture Comet PANSTARRS



Jeff Donaldson (left)

Canon T1i, EF 75–300 mm @ 300 mm, f/5.6, 2 second exposure. Clouds plagued the sky tonight but I think the comet is brightening! I ran this through Pixinsight 1.8, Unsharp Mask, Curves, Histogram transformation, HDRMultiscale, Colour boost to the max to give the sky a more natural look, Light noise reduction. Used a lightness mask to bring out more detail in the comet.

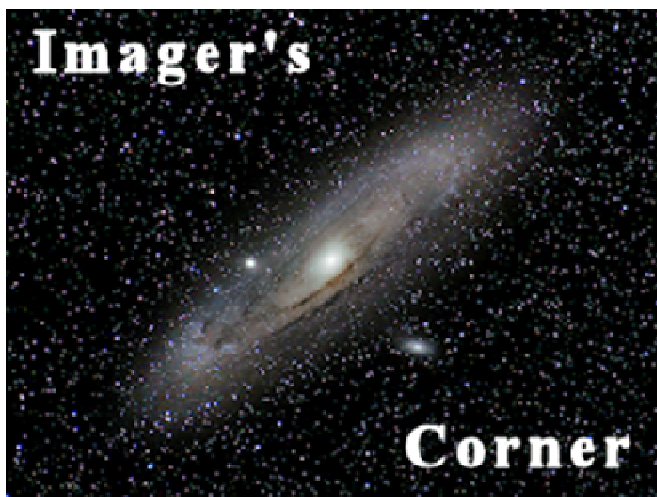


Chris Turner (above)

Comet PANSTARRS , taken from my deck March 17, 2013 at approximately 8 p.m.

Art Cole (above left) Comet PANSTARRS with Canon Rebel T3i taken on March 18th 2013

Finally, after several tries, I managed to image this guy through my telescope. I didn't do a whole lot to this image other than some mild stretching, layered noise reduction, brightness and contrast adjustment. For scale, the nucleus of the comet and the star at upper right (HD 3433) are slightly less than a degree apart (two times the Moon's width). ISO 1600, 13 seconds.



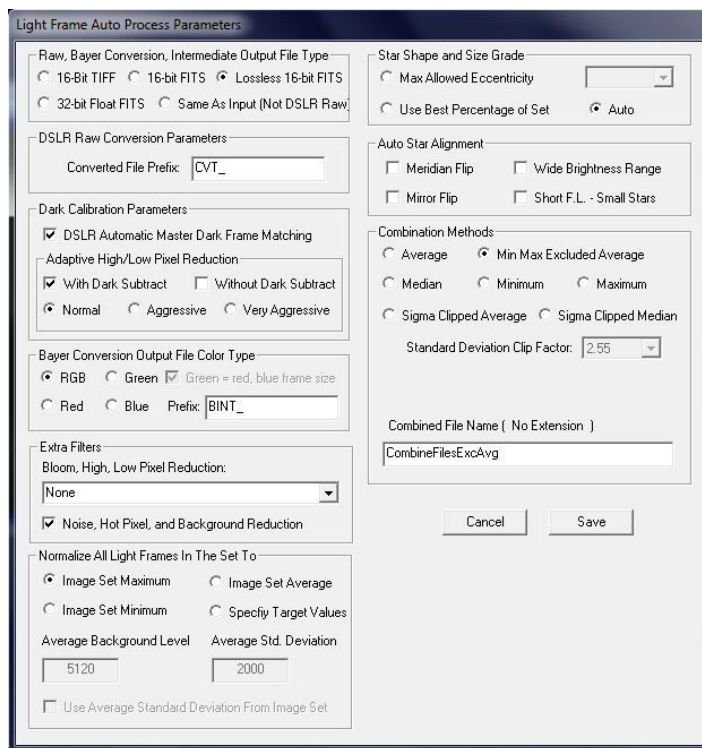
Part #13 in a series by Blair MacDonald

In this edition we will take a look at the latest version of Images Plus by Mike Unsold.

When I retired my old CCD camera and first started using a DSLR for my imaging, I went looking for a decent program for stacking and calibrating images. I came across Deep Sky Stacker and was very pleased with the results in the early going. Eventually I started to run into some stacking issues and having to take darks each time I went imaging was becoming a pain, not to mention a great waste of imaging time. Several fellow DSLR imagers told me about Images Plus so I decided to give it a try.

My first impression after using the software was that its author did an excellent job on the image processing, but had a rather quirky interface that didn't necessarily follow the usual Windows standard, having some very strange menu conventions. Now since my day job involves electrical engineering (yes I'm a geek), with a large amount of digital signal processing, I could see the strange logic in the menu names and I was very impressed with the calibration and stacking capabilities of the software, so I decided to fork over some hard earned dollars and buy a copy of the software. Since that day, Images Plus has gone through several iterations and has grown into an excellent processing package that makes most tasks easy and intuitive.

Let's start with the calibration capabilities. After all, this was one of the main reasons I purchased the software in the first place. Like a lot of software out there, Images Plus completely automates image calibration and stacking. You simply tell it what light, dark and other calibration frames to use and it pretty much takes-it from there. One thing that stands out is the ability to auto scale darks to minimize the noise in the final calibrated image. This allows me to create a dark library, even though the DSLR I use has no temperature regulation. The software allows me to create a master dark library and reuse darks over about a five to ten degree temperature range, so it is ideal for DSLR image calibration. The light-frame



processing parameters dialog is shown above

This dialog gives the user control over the stacking parameters as well, and it offers the usual bevy of options from stacking modes to meridian flip modes. The rest of the process is pretty much fully automated with one more dialog to select camera type and how you want to handle colour data.

Once you click the process button, the software automatically calibrates each image, identifies stars in the image, aligns the

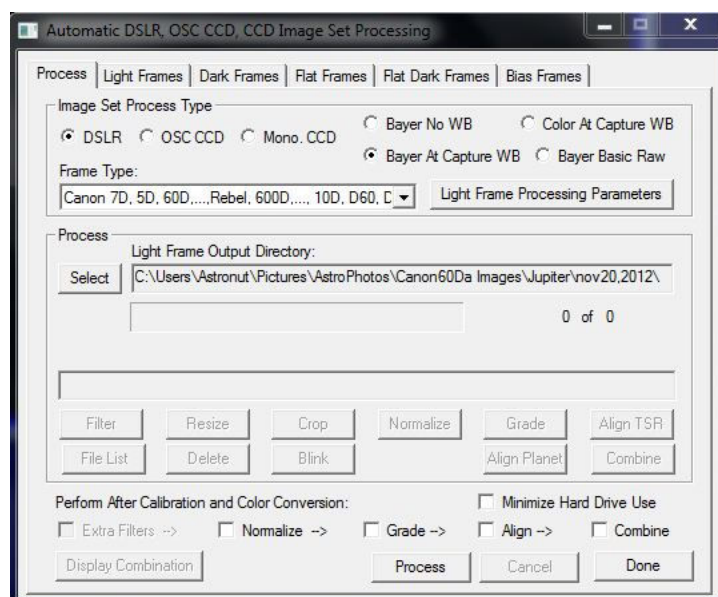


Figure 2 - Automatic image set processing dialog



Figure 3 - Unprocessed image

images by colour channel and produces the final output. All processing is done in 32 bit floating point, so scaling is rarely an issue. In addition to the fully automatic modes, there are several manual modes in which the user selects up to three stars for use in alignment.

A welcome addition for planetary imagers is that Images Plus also automates aligning and stacking data from video files as well, and the camera control system allows remote control of your camera for both still and video capture over a USB or other connection.

There is a whole host of processing features from true HDR capability, various contrast stretch methods, smoothing and sharpening functions as well as various colour balancing and saturation control capabilities.

Sharpening capabilities run the gamut from kernel filters, wavelet based multi-resolution smoothing and sharpening, a variety of de-convolution routines including an adaptive Richardson-Lucy algorithm and several contrast-based sharpening that are particularly useful for lunar and planetary images. The images below demonstrate the effectiveness of the statistical difference contrast-based sharpening for planetary imaging.

With the advent of version five, Images Plus now has the ability to combine images with various combine modes and masks duplicating the functionality of layers and masks in more general image-processors. There are some well thought out mask-generation tools that allow masks based on luminance, colour, saturation, edge and area detection, as well as high-pass filtering.



Figure 4 - Processed with statistical difference sharpening

As I've mentioned before, all processing is carried out in 32-bit floating point, so saturation due to stretching is pretty much a thing of the past, at least up until you set the black and white point for display. The software is also multi-threaded and can use multiple cores to speed processing. You can even process multiple images through iterative functions such as de-convolution at the same time. There is an unlimited undo feature, as each processing step produces a temporary file that are deleted automatically when you finish with an image. The entire processing history can be displayed and even copied and applied to another image.

There are some areas that could use some improvement: the paint function only contains a square brush of limited size, painting on masks does not show the result in real time (you have to click on the apply button), and there is no transparent view of the mask so you can see what you are painting. In addition, there are still some quirks in the interface that are not the normal windows standard, but the processing capability of the package more than makes up for an ever-decreasing list of quirks. Each new version of Images Plus adds well thought-out refinements, and with the latest version, it has taken a big leap into high-end image processing.

Remember, this column will be based on your questions, so keep them coming. You can send them to the list at hfxrasc@lists.rasc.ca, or you can send them directly to me at b.macdonald@ns.sympatico.ca. Please put "IC" as the first two letters in the topic so my email filters will sort the questions.

Cosmic Debris

Odds and Sods from the world of astronomy and astrophysics

March 21, 2013: NASA News release. Editor: Dr. Tony Phillips

Europe's Planck spacecraft has obtained the most accurate and detailed map ever made of the oldest light in the universe. The map results suggest the universe is expanding more slowly than scientists thought, and is 13.8 billion years old, 100 million years older than previous estimates. The data also show there is less dark energy and more matter in the universe than previously known.

"Astronomers worldwide have been on the edge of their seats waiting for this map," said Joan Centrella, Planck program scientist at NASA Headquarters in Washington. "These measurements are profoundly important to many areas of science, as well as future space missions. We are so pleased to have worked with the European Space Agency on such a historic endeavor."

The newly estimated expansion rate of the universe, known as Hubble's constant, is 67.15 plus or minus 1.2 kilometers/second/megaparsec. A megaparsec is roughly 3 million light-years. This is less than prior estimates derived from space telescopes, such as NASA's Spitzer and Hubble. The new estimate of dark matter content in the universe is 26.8 percent, up from 24 percent, while dark energy falls to 68.3 percent, down from 71.4 percent. Normal matter now is 4.9 percent, up from 4.6 percent.

Planck is a European Space Agency mission. NASA contributed mission-enabling technology for both of Planck's science instruments, and U.S., European and Canadian scientists work together to analyze the Planck data.

The map, based on the mission's first 15.5 months of all-sky observations, reveals tiny temperature fluctuations in the cosmic microwave background,

ancient light that has traveled for billions of years from the very early universe to reach us. The patterns of light represent the seeds of galaxies and clusters of galaxies we see around us today.

"As that ancient light travels to us, matter acts like an obstacle course getting in its way and changing the patterns slightly," said Charles Lawrence, the U.S. project scientist for Planck at NASA's Jet Propulsion Laboratory in Pasadena, Calif. "The Planck map reveals not only the very young universe, but also matter, including dark matter, everywhere in the universe."

Planck launched in 2009 and has been scanning the skies ever since, mapping the cosmic microwave background, the afterglow of the theorized big bang that created our universe. This relic radiation provides scientists with a snapshot of the universe 370,000 years after the big bang.

The cosmic microwave background is remarkably uniform over the entire sky, but tiny variations reveal the imprints of sound waves triggered by quantum fluctuations in the universe just moments after it was born. These imprints, appearing as splotches in the Planck map, are the seeds from which matter grew, forming stars and galaxies. Prior balloon-based and space

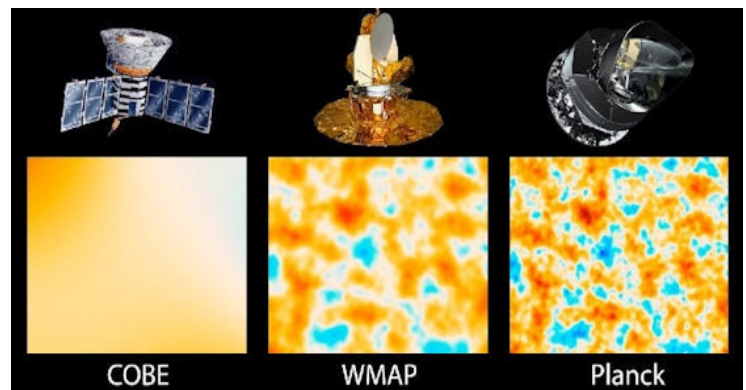
missions learned a great deal by studying these patterns, including NASA's Wilkinson Microwave Anisotropy Probe (WMAP) and the Cosmic Background Explorer (COBE), which earned the 2006 Nobel Prize in Physics. Planck is the successor to these satellites, covering a wider range of

light frequencies with improved sensitivity and resolution.

The age, contents and other fundamental traits of our universe are described in the so-called "Standard Model" of cosmology, which has been developed over the years by astronomers. These new data have allowed researchers to test and improve the Standard Model with the greatest precision yet. At the same time, some curious features are observed that don't quite fit with the simple picture. For example, the model assumes the sky is the same everywhere, but the light patterns are asymmetrical on two halves of the sky, and there is a spot extending over a patch of sky that is larger than expected.

"On one hand, we have a simple model that fits our observations extremely well, but on the other hand, we see some strange features which force us to rethink some of our basic assumptions," said Jan Tauber, the European Space Agency's Planck project scientist based in the Netherlands. "This is the beginning of a new journey, and we expect our continued analysis of Planck data will help shed light on this conundrum."

Complete results from Planck, which still is scanning the skies, will be released in 2014.



This graphic illustrates the evolution of satellites designed to measure ancient light leftover from the big bang that created our universe 13.8 billion years ago. Planck has created the sharpest all-sky map ever made of the universe's cosmic microwave background, revealing light patterns as small as one-twelfth of a degree on the sky.