

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

Volume 43

Number 2 of 5

April 2012

E mail: novanoteseditor@rasc.ca

In this issue:

Meeting Announcements	2
Nova East 2012	3
Keji's Dark Sky Weekend	3
Imager's Corner # 10	4
Sports and RV Show Report	5
March Meeting Report	6
Milky Way: Roy Blshop	7
M106: Mat Nightingale	8
Zodiacal Lights: Bruce Hamilton:	9
Cuba: Dave Chapman	10
SkyWatcher P 130 Review	11
Cosmic Debris	12
Front Page Photo: Bruce Hamilton Sun Pillar (details on page 11)	



From the editor

Quinn Smith

The last edition of Nova Notes was rather “wordy” due to all the reports from our December Meeting. I plan to have an easier time this edition by spotlighting some of our members astrophotos and the stories that accompany them. This is definitely an edition that is best served electronically, which should allow the full beauty of these photos to be revealed. I hope you all enjoy.

Also in this edition I would like to bring to your attention two August camping events. First there is the Keji “Dark Sky Weekend” and the next week our very own Nova East (see page 3). I hope you have a chance to get out of the city and enjoy these two excellent outdoor events.

On a personal note, I am hoping to finally get to see the constellations (well some of them) from the other way up—namely from the southern hemisphere. I have a business trip to Sao Paulo (Brazil) which is basically on the Tropic of Capricorn. I have already contacted the Sao Paulo astronomy club and am hoping to join them south west of the city for some excellent observing. I will be there in May and have planned the trip to coincide with the New Moon. The winter months (May, June and July) are the dry months so I am hoping for clear skies. My extended trip will end in Ontario in early June for the transit of Venus on the 5th. I am hoping that I have a better chance of clear skies in Ontario (plus an extra hour of transit) than Nova Scotia—but I will have my fingers crossed for you all as well. The upshot of all this travelling is that the next edition of Nova Notes (the June / July edition) will be not be ready for the beginning of June, but rather the beginning of July.

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	27th	2012
May	25th	2012
June	22nd	2012

Meetings begin at 8 p.m. at Saint Mary's University

Our usual room is AT 101 although check the web site (www.halifax.rasc.ca) for room changes.

April 20th 2012

Guest speaker Blair MacDonald will give the second of his seminars on Astrophotography.

May 18th 2012

Guest speaker Dr Roy Bishop will discuss the upcoming transit of Venus (evening of June 5th. 2012 starting at 7:03pm)

June 15th 2012

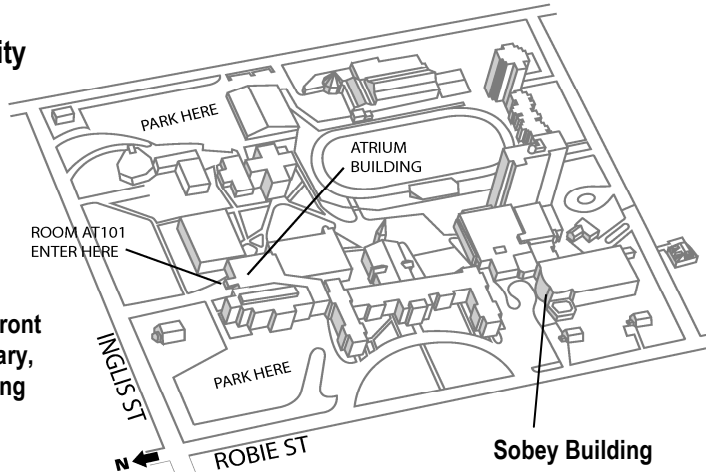
Guest speaker Pat Kelly will talk about the ongoing discovery of planets around other stars.

[The content and location of all meetings is 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) starts at 7:00 p.m., in room AT 305 (room subject to change).

Executive meetings begin at 7:00 p.m., in room AT 306, and all members are welcome.

Halifax RASC Executive, 2012:

Honorary President	Dr. Roy Bishop	902 542 3992	RLB@eastlink.ca
President	Robert Bussieres	902 434 4821	robertbusieres@gmail.com
1st Vice-President			
2nd Vice-President	Karl Penney	902 457 4046	karlpenney@eastlink.ca
Secretary	Chris Marriott	902 449 9347	chris@torusoft.com
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
National Representative	Pat Kelly	902 472 2322	patrick.kelly@dal.ca
Councilor	Paul Heath	902 457 0610	pheath@eastlink.ca
Councilor	Sean Dzafovic	902 430 9062	sdzafovic@gmail.com

Nova East 2012

Quinn Smith

Plans are well under way for this year's Nova East Star Party. As usual it is being held at Smiley's Provincial Park, and this year's dates are August 17th—19th.

The main speaker this year will be Canadian comet hunter Dr David Levy. For those of you that may not be aware of Dr Levy, he is one of the foremost Canadian astronomers and speakers. His talks are always entertaining and this year's Nova East will be an opportunity

to meet and talk with him in person.

David's presentation is titled "A Night-watchman's Journey: David's life as a searcher of comets". The closing speaker will be Kathryn Gray.

The registration for Nova East is already open, and for our regulars who know the site, the prime camping on the "hill" is almost filled.

For more information, and to download the registration form, go to the Nova East web site at:
<http://halifax.rasc.ca/ne/>



*Members enjoying one of last year's talks
Photo: Blair MacDonald*

Dark Sky Weekend

Quinn Smith

Last year Nova Scotia's first Dark Sky Preserve, Kejimikujik National Park held the first "Dark Sky Weekend" to celebrate the first anniversary of the Park becoming a Dark Sky Preserve.

It was a great success and will be repeated again this year. It is an opportunity for members of the RASC to join with Parks Canada

and enjoy a weekend of outreach and public observing.

There will be more details in the June/July edition of Nova Notes but the date has been fixed at August 10th—12th 2012. This is the weekend before Nova East.

Last year was great fun and I encourage our members to come out and enjoy a weekend of nature and camping in Nova Scotia's first Dark Sky Preserve.



A laser tour of the sky at Keji.

Photo: John McPhee

HALIFAX CENTRE

Nova Notes: The Newsletter of the Halifax Centre of the RASC

PO Box 31011, Halifax, Nova Scotia, B3K 5T9

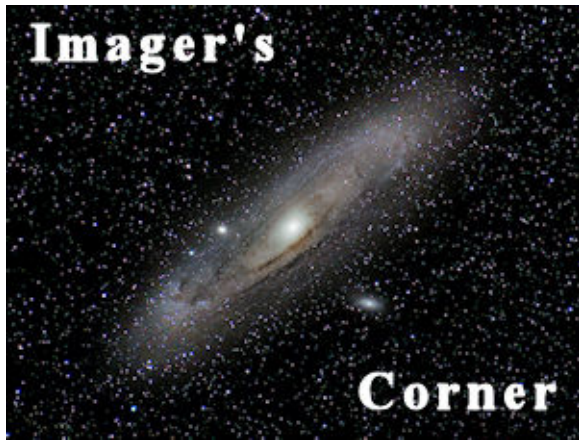
E-mail: novanoteseditor@rasc.ca Newsletter editor: Quinn Smith

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

The deadline for the next edition is June 15th 2012

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.



Part 10 in a series by Blair MacDonald

This edition continues a group of Imager's Corner articles that will focus on a few techniques that are useful in processing astrophotos. Over the next several editions of Nova Notes I'll attempt to give a guide to image stretching, background correction, SMI processing and any other technique that I happen to find useful. All the techniques discussed will be useable with nothing more than a standard image processor that supports layers and masks. No special astro-image processor is required.

This edition will deal with layered mask stretching (LMS). The LMS technique builds on the masking concept shown in column on SMI processing and a version of it has been used in daylight work for some time. The main tweak from the technique used for daytime work is to use a mask made from the image itself. This also works well for daytime work so experiment a bit.

Let's start with the rather bland image of the Orion Nebula shown below.

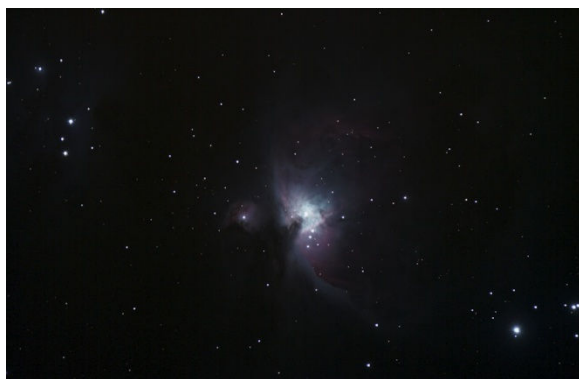


Figure 1 – Un-stretched Image

If we apply a simple curve stretch as covered in an earlier column the outer detail shows through, but at the expense of the bright core as shown below.



Figure 2 - Curve Stretched Image

The solution to this is to do a layered blend of both images. Using a mask to blend the images allows the faint detail of the stretched version to come through without the core being blown out with no detail. Start by duplicating the un-stretched image on another layer. Call the bottom layer *stretched* and the top layer *core*. Next hide the *core* layer and make the *stretched* layer active. Apply several passes of a curves adjustment to this layer to bring out the faint detail as shown in the stretched image above.

Now for the mask magic, place a mask made from the luminance channel of the stretched image on top of the core image to let some of the core detail show through. The layer stack should look something like the one below (it is a Paint Shop Pro stack)

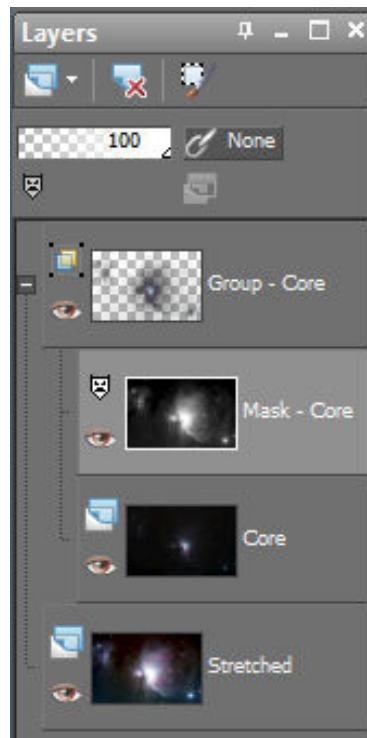


Figure 3 - Layer Stack

The problem with this approach is that it leaves a very washed-out image as all of the bright areas of the stretched layer are replaced by the dim areas of the core layer.



Figure 4 - Washed Out Image

To correct this apply a Gaussian blur to the mask layer. Experiment a bit with the blur radius to get the effect you want. To produce the image below I used a 50 pixel radius.



Figure 5 - Final LMS Image

The technique essentially provides spatial control over where the stretch is applied. Where the stretched layer is very bright and washed out the core image is allowed to show through to blend the best of both images. It is very useful on objects that have a wide dynamic range such as galaxies and bright nebulae.

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.

Sports and RV Show

Robert Buissieres

First of all, I will like to thank all who came forward and participated at the show. Your contributions have made this event an astounding success. Special thanks to, Antony Parton, Paul Heath, Andrew Tidby, Pat Kelly, Wes Howie, and Quinn Smith.

We had well over 400 visitors stopping at our booth and all had a genuine interest in astronomy. In there, we are counting family and groups of friends as one entry. So truthfully, the number should be even higher. We distributed well over 300 StarFinders before we ran out at the end of the show. Approximately 100 visitors registered for a small Galileoscope door prize and many demonstrated interest in possibly joining our group. We had numerous inquiries in regard to the upcoming solar flares and expected Northern Lights, lots of questions on the two very bright "stars" in the western horizon (Venus, Jupiter), the bright orange "star" (Mars), what type of equipment they should buy, and the price range for a good telescope / binocular.

Also, we were surprised at the number of people who already have a telescope but have yet to use it or just cannot figure out how to use it. Needless to say, they were all invited to join us at one of our Friday meetings with their equipment, so that we could help them with the set up and proper use.

The Gallileoscope was won by Max Donaldson from Tantalolon, and it was presented to him on the Tuesday after the show by Quinn Smith.



During a pause in the activity, Quinn Smith can be seen checking his life insurance policy - there was a 150lb python in the adjoining booth!

March Meeting Report

Quinn Smith

The March meeting was opened by our President Robert Bussieres to an audience of 26 which included 4 guests who were giving the Halifax Centre a “try” for the first time. Robert welcomed them and gave a full accounting of the benefits of membership.

Robert gave a short report on the recent Sports and RV show, where the Centre had a booth. Thanks were given to the show organisers who donated the booth space to the Centre. There was no main speaker for the evening, instead several members gave shop talks on various topics. Tony Schellinck started off the talks with “Magic Lanterns”.

Tony told us how he started collecting magic lanterns (projectors) during a trip to England in 1994. Tony explained that Christian Huygens produced the first magic lantern that used a lens in 1650, and that they soon became quite common. Initially they were used as theatrical props and mainly used to project images of ghosts or deceased persons. This was, of course before photography, and all the slides were hand painted.

By the mid 1850’s most well-to-do Europeans would have a Phantasmagoria (as they were then called). These were the TV of the day, and by the end of the 1800’s were quite sophisticated. By this time simulated “motion” was achieved by quickly changing slides,



Tony, Mark, and the magic lantern.



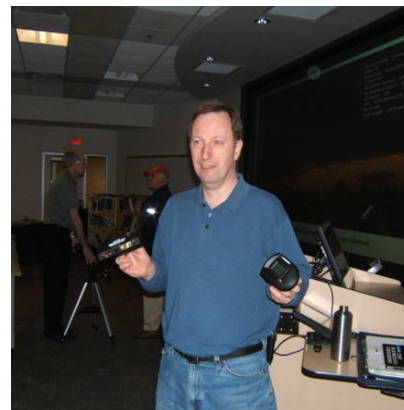
the forerunner of the movies that were to follow.

The next speaker was also Tony who discussed some new eyepieces that he had acquired. Tony explained the positive and negative points of the three eyepieces. He explained that using 3 different telescopes, 2 observers, the 3 eyepieces and by looking at 8 different objects he was able to compare each eyepiece under different conditions. The conclusion? Each eyepiece has its advantages, but the greatest factor in improving the view was to use a good star diagonal. In every case improving the diagonal improved the view through the eyepiece.

Our third speaker was Sean Dzafovic who brought along a light pollution mapping device he had designed and built while studying for an electronic engineering technology programme at NSCC. The device was built around a Unihedron Sky Quality Meter which was coupled to a GPS unit and other electronics (which I did not under



Sean Dzafovic

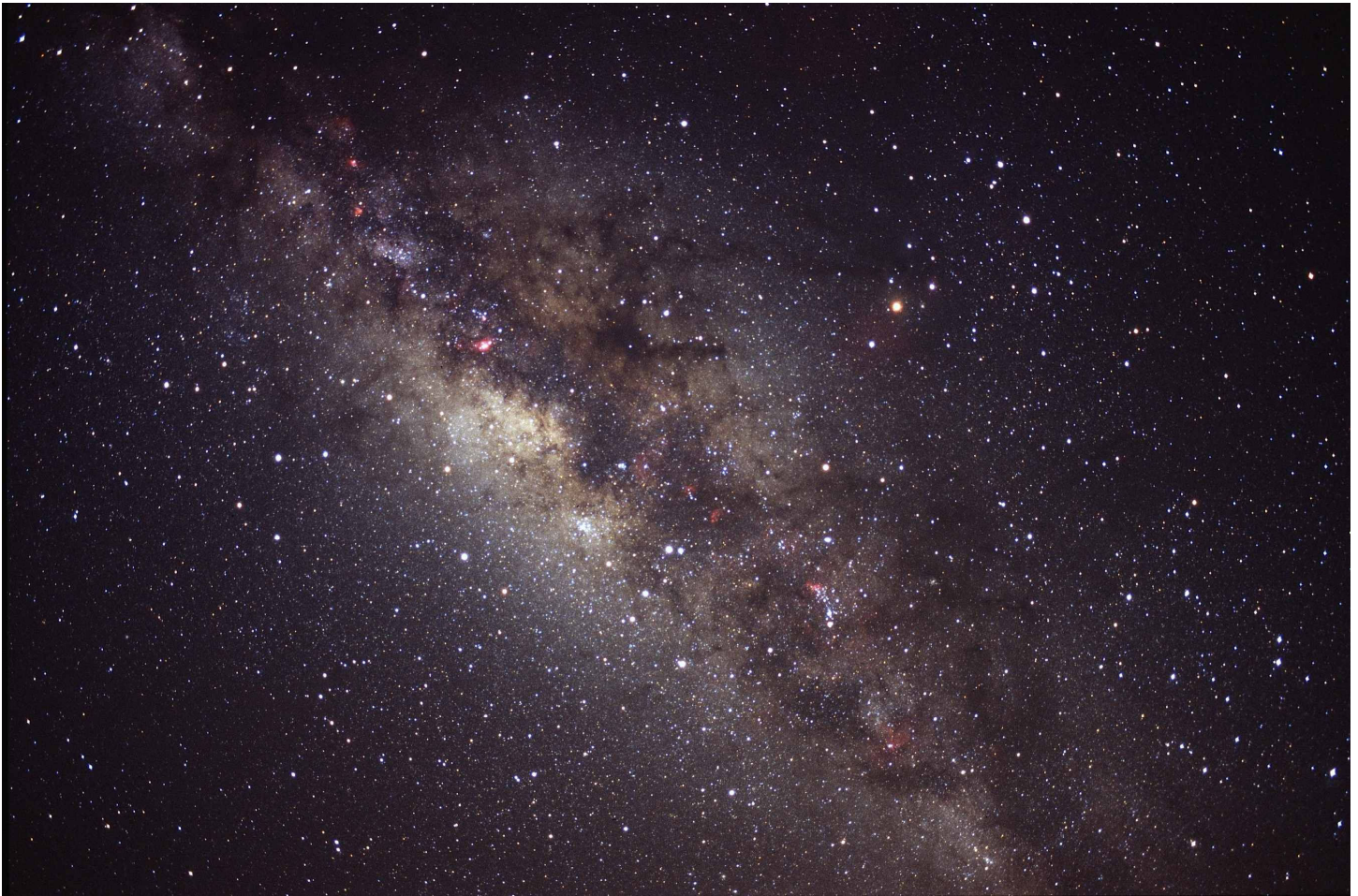


Blair MacDonald

stand). The end result was a unit that would record the SQM readings and couple them to location, time, and other data. A very handy device!

Blair MacDonald was next up and discussed the new Celestron NexGuide that he had acquired. Blair explain how during long exposure astrophotography the telescope must be guided. The easiest way to guide is via a tracking mount but every mount has periodic errors. In order to eliminate these errors a guide star and guide ‘scope are used to correct the tracking (in the old days by allowing the operator to adjust the tracking speed by hand). An auto-guider does this automatically and the NexGuide is the latest of these auto-guiders. As Blair summed up—these auto-guiders sure beat hand controlling for minutes or hours at a time, especially while trying to swat mosquitoes or avoid freezing to death.

Our final speaker was Quinn Smith who just happened to be carrying his portable ‘scope set up in his car. It consists of a Vixen “Porta Mount” and a Stellar View ED80 telescope. This combination is easy to transport (even on an aircraft), quick to set up and simple to use. What is really nice about the mount is the hand operated slow motion controls and the ease of clutch adjustment. Quinn explained that even though he still has a C8 telescope on an equatorial wedge, it is the ED80 that gets the most use due to the ease of set up and portability. Size does indeed matter!



Editor's note: I had put out a request for member's favourite astrophotos, asking what where, when, and how. Most importantly I asked why this was a favourite picture. Here are some of the responses:

Roy Bishop: Milky Way Galaxy

What: Wide-angle view of the central portion of the Milky Way Galaxy.

When: 2002 April 13, approximately 03:30 local time.

Where: Summit of Mauna Kea, Big Island, Hawaii.

How: Camera on a miniature, home-made equatorial mount, affixed to a tripod and hand tracked using a small refractor telescope (aperture 20 mm, 5x magnification) to guide on one of thousands of stars.

Why this picture is special to me:

(1) While hand guiding this 20-minute exposure, I was essentially alone, standing in the cold black night on the Moon-like summit of the highest mountain on Earth (as measured from its base on the floor of the Pacific Ocean). Nearly half of

Earth's atmosphere was below me, while above the stars were very bright and un-twinkling against an unusually dark sky. The centre of our galaxy and the entire constellations of Scorpius and Sagittarius occupied the central portion of the immense field of stars and dust I was capturing on film. Surrounding the Big Island 14,000 feet below me in the dark was the Pacific Ocean.

(2) The camera that memorable night on top of the world was an Olympus OM-1, possibly the best 35 mm camera of all time for astrophotography. It had already served me well for a quarter of a century, but within another two years would be rendered obsolete by the digital revolution. Many years earlier I had used it and the same 28 mm lens to record a double rainbow over Isaac Newton's birthplace, the most widely-published image I have had the good fortune to capture during 62 years of photography. The week on Mauna Kea in April 2002 was the last time I made long-exposure images with that remarkable camera.

Technical information:

Camera: Olympus OM-1
Film: Kodak Elite Chrome 200 slide film
Lens: Olympus Zuiko 28 mm 1:3.5
Exposure: 20 minutes at f/3.5



Mat Nightingale: M106

All were taken from my home in Simms Settlement using an 8" Newtonian on a Skywatcher NEQ6 Pro mount. All processing is done in Nebulosity and Photoshop.

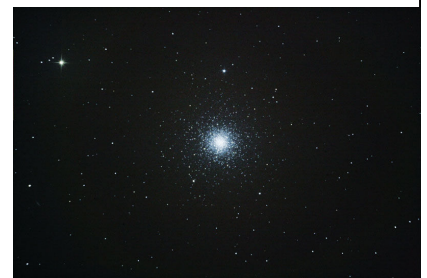
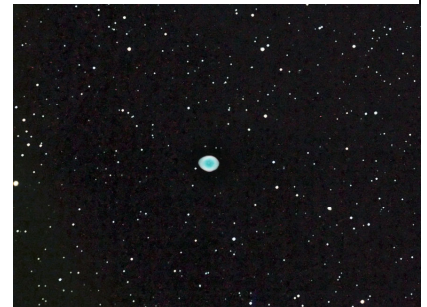
M106 was taken 2011.06.07, I like this image as it's the first galaxy I'd imaged that you could really "see" the colours, the learning curve in astro processing is steep, but this was the first deep space object that I thought I'd processed good enough for me to think that if I'd seen it on a website somewhere I'd have thought it looked pretty good. It's a stack of 12 x 300s.

M57 was taken 2011.06.22, this image is special to me as M57 was the first deep space object that I located with the first scope I'd had for 8 years. At the time the scope was still on a Newtonian base and I'd made a set of setting circles for it out of strips of paper and a paperclip. The circles along with a cheap magnetic inclinometer from Home Depot meant I had a push-to scope which was amazingly accurate.

M3 was taken 2011.06.01, I like this as GC's were something I'd never really considered worth imaging as they look pretty much like what you see through the eyepiece, but after taking this one (11x120s) I can appreciate the beauty and I've taken plenty more since.

NGC7635 was taken 2011.09.26 (6x300s), this is an object where I'd really not expected to see much of a "bubble" with my equipment, but after a bit of processing it popped right into view.

My all time favorite image though is the Horse Head that you've already used, that was the culmination of many years of hoping to get a chance to take the image, and when I saw the





Bruce Hamilton: Zodiacal Lights

What: Venus, Jupiter and Zodiacal Lights

When: March 09 at 8:04:29 pm AST

Where: Litchfield – North of Annapolis Royal on the Fundy Shore.

How: Canon EOS REBEL T2i mounted on a tripod

Why this picture is special to me:

This is one of my favourite Zodiacal Light shots, because of the nice clean western horizon of the Bay of Fundy. Roy Bishop pointed out that the little light bubble is Eastport Maine. This picture shows the Zodiacal light, with Venus and Jupiter embedded within it, and topped with the Pleiades. The reflection of Venus made it a truly magical moment that will not soon be forgotten. Melody and I are really enjoying our new found hobby.

Technical information:

Camera Model: Canon EOS REBEL T2i

Tv (Shutter Speed): 30 seconds

Av (Aperture Value): 3.5

ISO Speed: 3200

Lens: EF-S10-22mm f/3.5-4.5 USM

Focal Length: 10.0 mm

Image Size: 2500x1667

Tripod mounted (unguided)



Dave Chapman - "Sirius Reflections" (Cuba)

Here is my favourite "snapshot" of Cuban skies: Canon XSi, ISO1600, 17 mm, f/5.6, 30 s, long-exposure noise reduction, slight adjustment of levels at the dark end, and some noise reduction. The bright star is Sirius (setting) and you can see the OC M41 to the lower left of that star. The foreground rocks are conveniently illuminated by the security lights of the beach resort. The skies above were an amazing SQM 21.3!

Skywatcher Heritage P130 Review

Graham Rose

This report is long overdue. As some may recall, I desired to acquire another telescope - not for myself, but for my 9 year old daughter as a Christmas present. Well, long story short, the purchase was made via CanadianTelescopes.com and the telescope arrived just in time for Christmas. Service and delivery time was excellent, with a pretty decent Christmas discount to boot - total cost \$230.00 CDN before tax.

I purchased Skywatcher's table top "dobsonian" - the Skywatcher Heritage P130. I would not call it a dob though, it's more reminiscent of Sir Isaac Newton's table top Newtonian, albeit larger. I suspect either deceptive or clever marketing at play with this product's name - take your pick. It's collapsible similar too Skywatcher's collapsible dob's, has a diameter of 130mm, and a focal length of 650mm (F/5).

Optically, the 130p is excellent. Minimal coma, and well collimated despite ground shipment from Canadian Telescope's Burnaby, B.C. warehouse. It includes a crappy red dot finder, and the telescope is held to its base by a metal knob that tightens onto a vixen style plate connected to it's table top mount. I'm not too fussy with this arrangement, but I guess you get what you pay for. The telescope is not that heavy either - around 14 lbs. I was concerned that my daughter would find it too heavy, but she plays the cello through HRSB's after school musical programme and it's about equal weight with the cello I rented for her, so it's quite manageable for her too lift.

It also included two eyepieces - Skywatcher's 10mm Super Plossl, and 20 mm Super Wide. The 20mm Super wide is not that super, yielding a very "soft" image that's not to sharp except at the very centre of it's field of view, regardless of coma. Even then, images from that Super Wide are not great. The plossl is pretty decent though, and is the same 10mm



Plossl that came with my dob. For now, the 20mm is good enough for her to use, although I may replace it with a better quality plossl at some point. I would consider the 20mm Super wide as a throw away eyepiece. Both the 25mm Super Plossl that came with my Skywatcher dob and some Celestron plossls I have since purchased are superior.

The focuser is not that great, basically a tunable bolt, and it has a short focus. Nonetheless, the telescope is quite easy to use for my daughter and makes a great starter telescope for her. She has not had any complaints with its usability, and looks forward to a clear night. All complaints are mine, and despite it's faults, my daughter has zero problems using it. For her, it's an excellent telescope that she enjoys using. Setup time and usage is pretty quick and simple for her - just a quick grab of a wooden T.V. dinner table and her scope - under 5 minutes.

All in all, a pretty good purchase and I would recommend it as a decent starter scope for a young child or as a simple go-to scope for a casual observer.

Front Page Photo: Sun Pillar

Bruce Hamilton

Photo By: Bruce Hamilton
Camera Model Canon EOS REBEL T2i
Shooting Date/Time 29/03/2012 7:55:16 PM ADT
Tv(Shutter Speed) 1/20
Av(Aperture Value) 5.0
ISO Speed 100
Lens EF70-300mm f/4.5-5.6 DO IS USM
Focal Length 70.0 mm

Cosmic Debris

Odds and Sods from the world of astronomy and astrophysics

NASA science news - March 27 2012

In a series of tantalizingly close flybys to the moon, named "Enceladus," NASA's Cassini spacecraft has revealed watery jets erupting from what may be a vast underground sea. These jets, which spew through cracks in the moon's icy shell, could lead back to a habitable zone that is uniquely accessible in all the solar system.

"More than 90 jets of all sizes near Enceladus's south pole are spraying water vapor, icy particles, and organic compounds all over the place," says Carolyn Porco, an award-winning planetary scientist and leader of the Imaging Science team for NASA's Cassini spacecraft. "Cassini has flown several times now through this spray and has tasted it. And we have found that aside from water and organic material, there is salt in the icy particles. The salinity is the same as that of Earth's oceans."

Thermal measurements of Enceladus's fissures have revealed temperatures as

high as -120 deg Fahrenheit (190 Kelvin). "If you add up all the heat, 16 gigawatts of thermal energy are coming out of those cracks," says Porco.

She believes the small moon, with its sub-surface liquid sea, organics, and an energy source, may host the same type of life we find in similar environments on Earth.

"The kind of ecologies Enceladus might harbor could be like those deep within our own planet. Abundant heat and liquid water are found in Earth's subterranean volcanic rocks. Organisms in those rocks thrive on hydrogen (produced by reactions between liquid water and hot rocks) and available carbon dioxide and make methane, which gets recycled back into hydrogen. And it's all done entirely in the absence of sunlight or anything produced by sunlight."

But what makes Enceladus special is that its habitable zone offers itself up for easy access.

"It's erupting out into space where we can sample it. It sounds crazy but it could be snowing microbes on the surface of this little world. In the end, it's the most promising place I know of for an astrobiology search. We don't

even need to go scratching around on the surface. We can fly through the plume and sample it. Or we can land on the surface, look up and stick our tongues out. And voilà... we have what we came for."

The source of Enceladus's heat appears to be Saturn itself. Researchers say Saturn's gravitational pull causes the moon's shape to change slightly on a daily basis as it orbits. Flexing motions in its interior generate heat--like the heat you feel in a paperclip when you bend it back and forth rapidly.

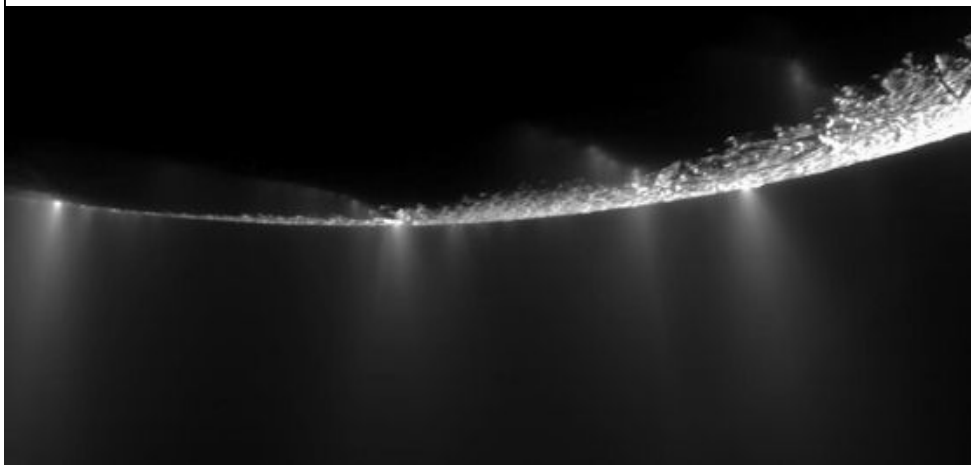
"But the tidal flexing occurring now is not enough to account for all the heat presently coming out of Enceladus. One way out of this dilemma is to assume that some of the heat observed today was generated and stored internally in the past."

Porco believes Enceladus's orbit could have been much more eccentric, and the greater the eccentricity, she says, the greater the tidal flexing and resulting structural variations that produce the heat. In this scenario, the heat would have been stored inside the little moon by melting some of the ice to recharge the liquid sea.

"Now that the orbit's eccentricity has lessened, the heat emanating from the interior is a combination of heat produced today and in the past. But since more heat is coming out presently than is being produced, Enceladus is in a cooling off stage and the liquid water is returning to ice. There are models to show that it never really freezes entirely, so the eccentricity may increase again, restarting the cycle."

Whatever is turning up the heat, Porco has a plan of action. It's simple: "We need to get back to Enceladus and check it out."

Author: [Dauna Coulter](#) | Editor: [Dr. Tony Phillips](#) | Credit: Science@NASA



Dramatic plumes, both large and small, spray water ice from many locations near the south pole of Saturn's moon Enceladus. More than 30 individual jets of different sizes can be seen in this image captured during a flyby of NASA's Cassini spacecraft on Nov. 21, 2009