



PeGASus

Newsletter of the

Royal Astronomical Society of Canada: Prince George Centre

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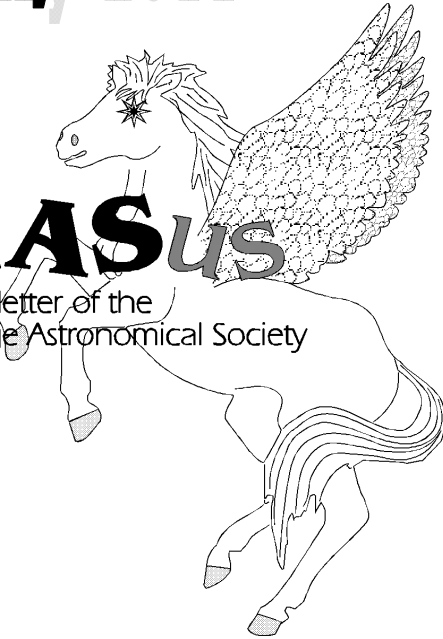
www/rasc.ca/princegeorge

February 2011

*Our pursuits are out of this world.
Our activities are astronomical.
Our aim is the sky.*

PeGASus

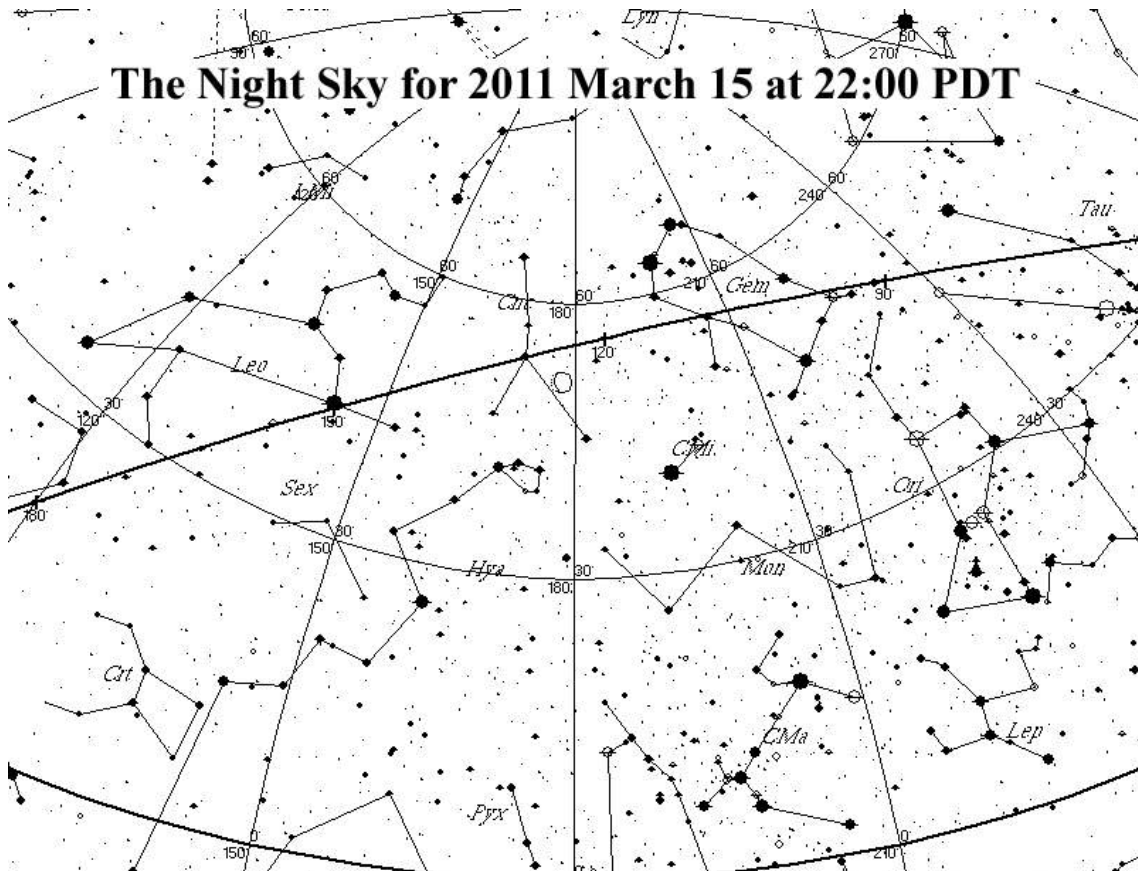
Newsletter of the
The Prince George Astronomical Society

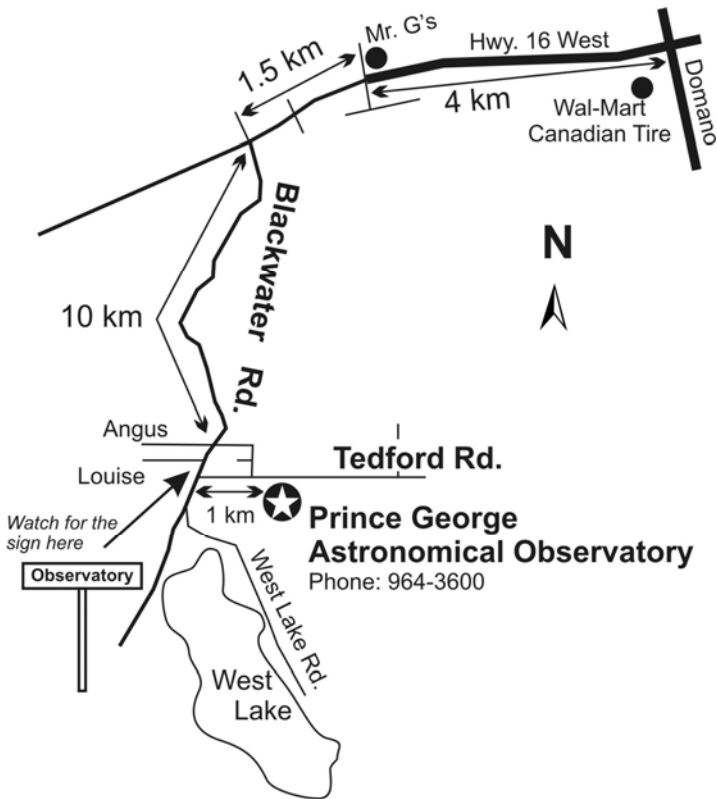


In Issue # 182

P.G. Centre Executive	2
Editorial	3
The Night Sky	4
Cold Weather Gear	5
Confessions of a Lunar Addict	6
Astronomy Books	7
The Astronomy Club	8
Asian Astronomy	9
The Online Astronomer	10
What's Out There	11

Coming Events– Page 2





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Contributions to the newsletter are welcome.

Deadline for the next issue is
March 25,2011

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Coming Events

*To Volunteer to help run an event please leave
 A message At the Observatory 250-964-3600*

<i>Date</i>	<i>Event</i>	<i>Time</i>	<i>Place</i>	<i>Volunteers</i>
March 9	Business Meeting	7:30pm	SpeeDee	Members welcome
March 11/ 18/ 25	Open House	7:30pm	Observatory	Everyone welcome

A Lunar Marathon is scheduled for March 11 and 12 and for April 8 and 9 please check website for current details
 Or contact Glen Harris at < g_harris@telus.net >

For an up to date list of the Volunteer Schedule / meetings / classes visit our website in the MEMBERS AREA
www.rasc.ca/princegeorge

Editorial

Gil Self

In this modern era, things that will amaze you are pretty few and far between! What do I mean by that? There are things around us every single day that are quite amazing. Most especially in areas that we all share a passion for, science and astronomy. I could spend the rest of this page, in fact the rest of this newsletter just listing some of the wondrous equipment and technologies that are available to us just by lifting a finger. Click a mouse button and you are exploring a mystic temple in Asia or viewing a renaissance masterpiece in the Louvre. In fact recently approximately five thousand people responded to a website appeal and donated a portion of the purchase price of a German renaissance masterpiece (“The Three Graces”, Lucas Cranach—1531, purchased December 2010 for 5.3 million dollars by the Louvre). I digress, there are an almost unfathomable number of unbelievable and or amazing things around us everyday. I have written here before of some of the materials or resources or just simply the pretty pictures that are available to us primarily on the internet. Or as Trevor Padgett illustrates so well in his series “On Line Astronomer”, the depth and breadth of the content is truly vast.

Where am I going with this you ask? I have a thought experiment for you. My wife and I were talking about the changes we have seen together over the last forty five years. Not just the lifestyle differences but mainly the technology. We all have memories of the former, stay at home moms, big cars, dress-up for a date and check in with her mom before and after that date. (they weren't all good times back then ,were they?). Depending on your perspective I think the changes in technology are by far the biggest differences between then and now. Suppose my muse and I were transported from one of those dates in 1967 into our future. Dropped into our home, our family, our bank account, our bills our life today. What would be the single “Most Amazing” thing? Think about all the modern conveniences you enjoy everyday. I just used one, I wasn't sure of the spelling for conveniences, there are lots of similar words that spell check would be happy with, even if you end up with a different meaning. So I Goggled conivience (hey its late ok) and with a click on “did you mean” and a click or two more ended up at Wikipedia, read the definition — I've got my word. But this isn't really what I'm talking about , that's just an everyday miracle. That happens all the time we take this for granted. There are so many modern conveniences that we take for granted. Don't worry I'm not getting up on my soapbox to campaign for a better world or climate change, all good causes but I think we have it pretty darn good and maybe my thought experiment will help us realize how many things around us are just amazing.

Arthur Clarke wrote that “any sufficiently advanced technology would be indistinguishable from magic. I submit that the young couple transported from 1967 into today's world would be in OZ.

That Pontiac sitting in the driveway is a fairly ordinary car, I like it but to a gear head in 1967 it would be a Hot Rod. All the goodies that they spent a years salary souping up their car is standard equipment today. There is a lot of technology that we would recognize, a lot of what has happened in the last forty five years are simply improvements. A refrigerator is still a refrigerator. A stove is still a stove, we would be quite amazed at the features and improvements around the house, but what is that

big white cabinet hanging under the counter above the stove? It has a lot of buttons and glass windowed door that opens to a large cupboard with a turntable inside ? We will figure that one out later. You get the idea.

I want to know what would be the most amazing! There is lots of technology that was anticipated in 1967, meaning improvements on existing technology, the fridge—stove—car for example, but what would the big surprise? There would be lots of surprises of course, anyone arriving from 1967 would have difficulty believing we don't even have a presence on the moon, we haven't been to Mars yet? Paul McCartney is 69 !! So the biggest surprise could be the internet, it wasn't even dreamed of back then. The internet is such, it's a big step, the quantum leap, and that's not even mentioning all the things you can do on the internet? Also in the race for the biggest surprise, would be astronomy, for example wasn't it just a short while ago, Deep Impact dropped an impactor on comet Hartly 2 and they took pictures of the impact with Hubble, and they also re-tasked a used spacecraft to flyby and have a look at the damage to the comet— that's impressive! Try and think what would be most impress you if you were moved forty five years into your future arriving into today's world. Drop me a note or better still write an article for our newsletter.

Which reminds me, I would like to take a moment to thank the folks that have stepped up to help me keep this newsletter such a really good read. Last month I was fortunate to receive just the kind of article I like from Pam den Ouden. What I mean by that is (if I remember high school English well enough) that its an article written as a first person narrative. A lot of the articles in the newsletter are written this way, this describes usually an astronomical event and what you did when you were there. This helps those that were not there to get in on some of the activities. Pam and some of our other contributors do this very well, we can all then share in some of these activities. Thanks so much Pam. Another great writer would be my very reliable friend Trevor Padgett. Trevor is also a narrative writer, there is a fine article this month titled Asian Astronomy as always unique and enjoyable to read. But Trevor also bridges the gap to technical writer. This months continuation of Online Astronomer, demonstrates he is a very adept technical writer (providing or illustrating technical information). Another contributor this month is also a writer that not just bridges these two types of writing, he builds a four lane highway across. The not often heard from but always enjoyable Glen Harris. When Glen writes you always learn something but the good part is you enjoy learning it. Next there is another more lyrical style of writing and I'm not sure what it's properly called , we are lucky to have two contributors that have this gift. Fae Mooney and this month Vince Hogan on page eight. I can't name this style of writing but this kind of article helps you remember why you enjoy astronomy.

Oh Oh, the bottom of the page fast approaches and I haven't even mentioned Wayne Sanders, Maurice Sluka, Blair Stunder, Doug Wayland. They are all great writers and welcome contributors but I can not forget to ask, Were would this newsletter be without Dr. Bob, Bob Nelson, as far as I can remember Bob has never missed an issue.

Thank you all very much from all of us that read and enjoy PeGASus.

The Night Sky for March 2011

by Bob Nelson, PhD

Hi Folks,

I submitted this to Gil early this month because the day after, Lois and I will have left for a 3-week holiday in Cuba (Air Canada flies there directly from YVR). Although we have talked to a number of people that have gone there, we are not quite sure what to expect. When we tell people we are going to Cuba (or anywhere else for that matter), they often ask 'where are you staying?' Well, it doesn't work that way. Always, we travel all over, trying to see the country and take in what it has to offer. Often we just 'wing it'—which is the case here. We may try to rent a car (after Havana), but we'll see. I see from the internet that there is an observatory in Havana with a 24" telescope, and one sad little astronomy club with 7 members! (Their website does not work.) I'll try to get in touch and report back.

After Havana, we hope to visit the Bay of Pigs (the diving is supposed to be great there) and the historic town of Trinidad (de Cuba), but after that, I cannot say. There are mountains to climb, caves to explore, and many beaches to enjoy. It should be quite an adventure!

Anyway, here's what will be happening in our skies next month: All times are PDT.

MERCURY is an evening object all month. On March 1 at sunset, it will be only 2.5° above the WSW horizon at sunset, but by month's end, this will advance to almost 13° above the western horizon, setting over 1.5 hours later. At that time, it will be a 10" crescent, 11% illuminated and of magnitude 2.1. For us northern hemisphere dwellers, it will be a favourable apparition, so this is a good time to hunt for the tiny planet. (It will reach the greatest eastern elongation = 18.6° on March 21.)

VENUS, is a morning object this month. At mid-month, rises about an hour before the Sun, but at sunrise, it lies only 6° above the SE horizon. Then, it's a 14" gibbous blob 75% illuminated, but of magnitude -4.0.

MARS, in Aquarius until March 25, after which it

passes into Pisces, is technically a morning object this month. At mid-month, it rises about 07:25, but this is only 5 minutes before the Sun (owing to the tilt of the ecliptic, the Sun-Mars line is almost parallel to the horizon at sunrise). By month's end, this has improved to only 10 minutes. Bide your time.

JUPITER, in Cetus, until March 7, after which it passes into Pisces, is an evening object, but it's going rapidly. (It will reach conjunction on April 5.) At midmonth, it will lie 13° above the WSW horizon at sunset, setting about 1.5 hours later. It's a 33" disk of magnitude -2.1.

SATURN, in Virgo until late 2012, is a morning object all month. At mid-month, it rises at 20:54, transits at 02:41 and lies only about 8° above the WSW horizon at sunrise. It's a 19" disk of magnitude 0.4.

URANUS, in Pisces until May, is lost in the glare of the Sun this month, reaching conjunction on March 20. (At mid-month, it will lie only $3^\circ 47'$ above the western horizon at sunset.) As usual, it's a 3.6" disk at about magnitude 5.7.

NEPTUNE, in Aquarius all decade, is a morning object all month. At mid-month, it rises at about 06:51 and lies only 4° above the SE horizon at sunrise. As usual, it's a 2.3" disk at about magnitude 8.0.

Starlight wasting time begins on March 13 at 02:00 PST (which becomes 03:00 PDT). Hiss, boo!

March Equinox occurs on 2011 March 20 at 16:21 PDT. Spring is here!!!

CONSTELLATIONS to look for in March (at 9:00 PM, PST) are Pyxis, Puppis, Western Hydra, Cancer and Lynx.

Pyxis ("the compass on the Argonaut's ship") is visible on the extreme south at 9:30 PM on the 15th. It's just at the edge of the Milky Way but contains little of interest (no open clusters, etc.).

Puppis ("the stern on the Argonaut's ship") is just to the northwest of Pyxis. Straddling the Milky Way, it contains numerous goodies including open clusters M46, M47, M93, NGC 2477 and others. M46 (at 7

deg south, and therefore visible in P.G.) is a rich open cluster, about 1/2 degree in diameter containing around 150 stars between magnitude 8 and 13 lying about 500 light years away. It also contains the planetary nebula NGC 2438 about 7' north of the cluster centre.

Hydra (“the Sea Serpent” - not to be confused with Hydrus, a small boring constellation) extends all the way up to declination +5°. The western part contains M48, another fine open cluster. It does contain the bright eclipsing binary KW Hya. This system, which has a period of 7.75 days and varies between 6.11 and 6.6 magnitudes, is one of the brightest Algols in the sky. While not a classical Algol (which is supposed to have the cooler star filling its Roche lobe), this contains two type A (hot) stars which are detached (completely separate). SIMBAD (the engine that finds all the papers on a given celestial object) tells me that there are 42 publications that at least mention KW Hya, so it appears to have been well studied.

Cancer (“the Crab”) is more familiar to us northerners, lying as it does between Gemini and Leo. It contains the famous “Praesepe” or “Beehive” Cluster, M44 and M67, a rich old cluster. It also contains RS Cancr, a RR Lyrae semi-regular variable star that is comprised of a type M6 supergiant star that pulsates in and out with a period of around 120 days.

Lynx (“the Lynx” -- gee!) lies to the north of Cancer, out of the Milky Way and contains only NGC 2419, the famous “Intergalactic Wanderer”, the most distant of the globular clusters. It was discovered in 1788 by William Herschel (and rediscovered by his son John in 1833), observed by Lord Rosse in 1861, and finally classified as a globular in 1922 when photos were taken by the 42" reflector at Lowell Observatory. The distance was determined by observing 31 RR Lyrae stars in the cluster; it's some 182,000 light years (55,800 pc) from us (and 210,000 light years = 64,400 pc) from the galactic centre. This distance is comparable to that of the Magellanic Clouds and suggests that this cluster indeed is intergalactic.

Clear skies,
-Bob

This month I have included an article first printed in issue 172, November 2009. Maurice Sluka is a very experienced observer and he makes many excellent suggestions for keeping warm and comfortable on cold nights while enjoying the night sky. You may say “but winter is all but over”, well maybe but have you been out on a June night that promised beautiful clear skies, and ended up freezing your - - - fingers—off. The reason those skies are going to be clear is because of an arctic cold front is sneaking in from the north, its going to be cold out there. Check out Maurice’s article, take his advice and all that will interfere with a great evenings viewing will be an occasional mosquito.

Enjoy !
Gil

Cold Weather Astronomical Observing Gear for northern BC

The nights are getting cooler and longer now (more time to observe!), good gear make you observing experience much more rewarding. The late fall sky can become clear once the temperatures drop low enough that fog does not form. Since observing does not generate much heat warm clothes are necessary. I have observed at -35C for a few hours comfortably with good clothing.

The key for keeping comfortable is keeping your entire body, hands, feet and head warm & dry. Here is some recommended gear:

Feet:

-10C

Wool socks with normal footwear, avoid cotton in cold weather since it can easily get damp and become very cold and uncomfortable.

-15C

Light duty winter boots with thinsulate is effective for short periods, providing they are not too tight and crush the air out of the insulation.

-20 to -40C

The best cold weather boots I have used are the Baffin ‘Doug Stoup’ & ‘Impact’ designed for extreme cold with a temperature rating for -100C. These are too large & bulky for use while driving, but fantastic for cold nights under crystal clear sky. These boots are best worn with bare feet,

Confessions of a Lunar addict

OK, I'll admit it; I'm addicted to viewing the moon. It could be in the dead of a flesh freezing frigid winter night with tree sap cracking in the cold, or when there is a huge ring around the moon, caused by all the moisture in the air. Maybe it's when the moon is so low in the summer sky that even late in the evening it's like looking down a hot summer road, with the earth giving up the heat accumulated during the day, or most recently, attempting to discern lunar objects through a thickening haze of cloud.

In previous years, I had been interested in viewing deep sky objects - galaxies, clusters, nebulae. At that time I didn't really own a telescope up to the challenge, so I would drive out to the observatory and use the 24" scope. I'd usually talk Brian into going with me and we'd use the ST6 CCD camera to take images. The moon was just a big pain in the butt, wasting two weeks of good viewing every month.

Eventually, I purchased an 8" Meade LX90 scope and used it in my backyard, or more often than not, packed everything into the Volvo, travelled to the observatory, and set it up on the viewing deck. Much fun was had during the many open houses and tours, sharing my enthusiasm with fellow members and the general public. I even got started on the Messier list, my results getting posted on the huge spreadsheet in the control room.

And then it all started going downhill when I attended the Centre's first NOVA course. You see, one of the challenges was to obtain the 'Explore the Universe Certificate'. Identify constellations and bright stars, the planets of the solar system, deep sky objects, meteor showers, comets, and double stars - all the things I was familiar with...and objects on the moon. No problem, the moon wouldn't take long to finish. Record the phases, nab a few lunar basins and impact craters, this would only take a month - NOT! How was I to know that if you wanted to view the rays of Tycho, the moon needed to be full, or if you *really* wanted to see Grimaldi, something called 'libration' came into play? By the time I got through the lunar requirements, which took a few months, I was hooked.

About the time I earned the 'Explore the Universe Certificate', the RASC Observing Committee came out with a new program called the 'Isabel Williamson Lunar Observing Certificate' - sixty pages of craters, mountains, valleys, scarps, dorsa, and more. There was also an additional challenge, view over 1000 lunar features. Enamored by the moon as I now was, I rose to the challenge. I bought a copy of Antonin Rukl's Atlas of the Moon, installed a copy of Virtual Moon Atlas (VMA) on my computer and got started.

Lunar viewing was great. I didn't need to pack up all my equipment and drive to a dark site. I didn't have to worry about dark adapting my eyes, sky glow, or the

neighbour leaving his porch light on. It wasn't necessary to find a location in the back yard where structures and trees hid the street lights, or make sure all the lights in the house were off. It just didn't matter. After all, a lamp would be illuminating my log sheet so I could sketch whatever object was in the eyepiece. I was looking at the moon, that bright object in the sky I had avoided only a short time ago. I could start viewing before the sky was pitch black, and continue until just before sunrise. My telescope could remain attached to the tripod, the diagonal, eyepiece, and dew heater already mounted, and be ready to go in minutes.

It didn't take me very long to determine that it was going to take more than my observing log sheets to keep track of all the objects viewed, there were just too many, 552 to be exact when all the challenge and libration objects were factored in. I also realized I'd need some kind of system to determine what was visible during a particular viewing period, and a viewing session list of what those objects were. This would be critical if I wanted to maximize the results at the eyepiece.

So I built an Excel spreadsheet with all 1199 objects listed in Rukl's book and cross referenced them to the objectives required for the Williamson Certificate. Utilizing the information available in VMA, I built another spreadsheet with entries for every lunar day of a month and cross referenced it to the numbered objectives in the Williamson guide.

Armed with the spreadsheets, modified log sheets (the circles on the sheets provided by RASC just weren't large enough for sketching multiple objects), Rukl's moon atlas, and the VMA program, I started on my quest, painstakingly recording dates and times of the observation, location, viewing conditions, equipment used, etc. About 40 objects into the program, I realized the only thing I had accumulated was data. There were no photos, sketches - only numbers. So I started sketching, not very well I might add, what I saw in the eyepiece.

That's when the magic occurred. It was amazing how the shadowing of a crater or mountain range changed over the course of a few hours, or how an object I knew from the book and computer was supposed to be there, but just wasn't visible. So I'd locate and sketch other objects, then come back and try again and again. And then there it would be. That fine little line called Vallis Alpes, or Vallis Schroter, or Rupes Recta, or even the elusive Rima Sheepshanks.

Initially there were many objectives on my viewing list to catalog, some evenings they numbered over 50. Time flew by as I sketched away, and page by page the results filled my log book. But as time went on, the remaining objects required some serious planning to view. The lunar phase had to be just right, libration - the way in which the moon wobbles from west to east, and north to south, became increasingly important. And of course, the weather was always the determining factor for a successful

viewing session.

Many times I found myself setting the telescope up in an area of the back yard to take advantage of a location where some neighbourhood structure wasn't blocking the view and I could see the moon at a specific time. It wasn't unusual for me to set up and cover my equipment in the evening, catch a few hours of sleep, and then get up at 3 AM and traipse outside to capture that elusive object only visible during a waning lunar phase, or a mountain range or crater rim perched on the edge of the moon, illuminated against the darkness of the night sky. Had the neighbours looked out their windows at those times, they would have thought I had lost what sense I still had. I'm sure my family thought the same thing.

My 8" LX90 wasn't capable of capturing the more difficult objects, some requiring up to 20" of aperture, so I would pack up my log book, spreadsheets, and eyepieces and drive out to the observatory where I could use the big scope in the dome. Opening and rotating the dome in the wee hours of the morning makes a lot of noise, and the neighbourhood dogs let me know it.

It took over 2 years to view all but six of the Williamson objects, an additional year to log the remainder of the 1000 objects for the extra lunar challenge, and to this day I still look for those exactly correct conditions to log the Vallis Alpes rille, Arago dome summit pits, Linne crater, Walter sunset ray, Rimae Parry, and the Plato floor craters. Maybe I'll be successful during one of the lunar marathons.

So there you have it. I have an obvious fascination with the moon, the various certificate requirements fueling my desire to observe it. Hmm, maybe I should attach my imaging equipment to the telescope and start collecting digital images of those 1000+ objects, or perhaps look at them all over again with those new binoviewers I purchased not long ago. If the floaters in my eyes don't distract me too much, it will be a lot of fun.

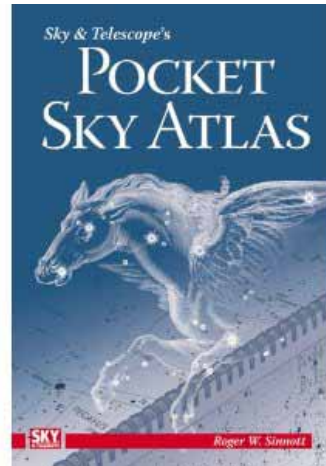
Submitted by Glen Harris



Glovebox Astronomy

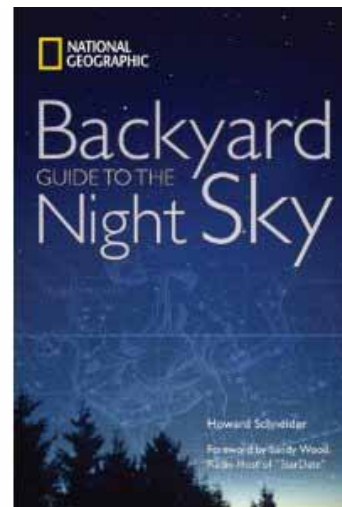
There are two very good books that an amateur astronomer can take with them as a handy reference. Both are both affordable at under \$20.00 each, and have great amount of detail. Both are very compact, and perfect for keeping in one's glovebox, and reading while waiting at the boarder or ferry ride or anytime you want to check on tonight's sky.

Sky & Telescope's Pocket Sky Atlas



The Sky & Telescope Pocket Sky Atlas is nicely laid out with colour charts and a spiral binding. It uses popular names for deep space objects. The 80 charts cover over 30,000 stars to magnitude 7.6. Those who own the Sky Atlas 2000 or are familiar with it will notice the format is similar, you will find it easy to use.

National Geographic Backyard Guide to the Night Sky



The National Geographic Backyard Guide to the Night Sky a compact and comprehensive book that covers not only charts, but also many astronomical subjects in brief articles, and designed for the northern hemisphere.

By Maurice Sluka

The Astronomy Club

In nineteen sixty three, thirty years before I joined the Prince George Astronomical Society, I had been a member of the Clearbrook Junior Secondary Astronomy Club. Mr. Horner, the school science teacher, occasionally supported by our mathematics teacher, organized ten or twelve boys together, once a month, to observe the night sky. In nineteen sixty three things were still determined by gender; there were no girls in the astronomy club—but neither were there any boys in the Home Economy Club. Not that in Grade 9 any fourteen year old boy who joined up expected to meet a girl there—in that era joining the astronomy club, or using a slide rule, could easily lead to social death if you were looking for female companionship. Our motto “*Searching for Heavenly Bodies*”, a word play on the club members’ two major preoccupations, only one of which was astronomy, nicely encapsulated our universe and our adolescent desperation.

Nineteen sixty three was a pretty good year to join an astronomy club. The space race was on; John Kennedy had launched the American mission to the moon, and had not yet met his cruel death. During the previous three years, in the hour before I left for school, the black and white TV followed the Mercury Astronauts as they left Florida for Space. The Russians were off to an early lead in the years since Sputnik and its rocket booster first flickered across the night sky, and Yuri Gagarin and Ghermin Titov were names we all recognized—they were superstars and they weren’t even hockey players. For students from a mainly rural junior high school the astronomy club was as close as we were getting to the glamorous space race. Mr. Horner had a telescope which was really cool—although many of us were very interested in science, and had crystal radios we had built at home, or electrical circuit board kits or chemistry sets, or even a rocket we could blast off, a telescope was something simply beyond our financial grasp. This may sound really nerdy but we even passed around used copies of *Scientific American*—you could look at the Questar Telescope advertisements. Don’t misunderstand me, that was not the only magazine my male teenage friends were passing around.

That year the four lane Highway 1 was being built in the Fraser Valley; we didn’t realize that it was going to bring the cars, and the people, and the houses and the lights and the pollution that would destroy the night sky. In nineteen sixty three I could lay in

our farm fields at night, on an old mattress, and see objects with my naked eye that today must make a rare appearance, perhaps only during an electrical failure. At the end of the year Mr. Horner kindly took the club to Victoria, and we camped out overnight. We were taken on a tour of the observatory in Victoria, and although it was cloudy, --good training for a future observer in Prince George--the astronomers made us feel like we were part of something big and important.

It is also amazing to think how much astronomy has advanced since the early 1960’s and how easily accessible its ideas have become to the general public. Inflation then was a term that was still associated only with economics; a big bang and black holes were ideas which existed only in the minds of a few very advanced thinkers i.e. Physicists with fuzzy hair, like ‘Doc Brown’ in *Back to the Future*. The idea that comets or asteroids had a significant role to play in the formation of our planet, or might have been involved in the evolution of life, or in mass extinctions, would have been regarded as pretty sketchy—maybe something that a only a questionable thinker like Immanuel Velikovsky might propose. My nineteen sixty six first year UBC Geology course, of which Astronomy was mentioned as a minor afterthought, seems almost childlike when you look at it now—no discussions of plate tectonics, or the formation of the moon, as a result of a collision between the early earth and a planetoid. If I had told my Geology professor that I thought there was a good likelihood of cosmic background microwave radiation being left over from the initial expansion of the universe—or that people were already listening to it-- or that the Antarctic ice shelf might be a good place to look for chunks of Mars, I doubt I would have done very well in that course. (“Science fiction, Mr. Hogan, is best dealt with over in Creative Writing”) You can’t help but be grateful for living in such a time of intellectual advancement and adventure.

The Catholic religious order, the Jesuits, had a saying to the effect that ‘give me the boy and I will give you the man’ and I think that is the same for Science and Astronomy. If we can encourage young people in their curiosity about the universe that interest should never die.

Editors Note , Vince Hogan has always had a rich and very enjoyable writing style, I think you could give me articles from three authors and I could pick out Vince’s. Or in the e-mail he sent me saying I might have overstated his early involvement. “I was more like an Egyptian pulling a stone block around who later heard himself described as one of the builders of the Pyramids. Technically correct, and flattering, but a bit exaggerated. ;-)

Asian Astronomy

So often in the world we get stuck into “our” way of seeing, thinking and acting that we barely take a moment to realize that perhaps “our” way is simply “a” way. This goes for everything, education and customs – we in the west learn math in a much different fashion than the children here in Asia; we in the west shake with our outstretched hand to greet somebody, while around the world there are an equal amount of greeting methods as there are linguistic variations. Simple and not that important as they all reach the same goal, but different. Different, and we don’t even think of it as we carouse through our days meeting people. Or teaching math. Or using math. Or anything...

To answer an aliens probing question (because all aliens love to probe, it seems, and they are always looking for answers, it seems...if tabloid abduction stories are true that is!) of “*how do you greet each other*”, you could not say “*why, we stretch out our right hand and grasp another persons, firmly, and shake two to three times. More if you know the person. Less if you don’t like them*”. That would be excellent if the aliens were only interested in traveling to various points on our globe where that is common. But, let’s be honest...there is so much kissing, head bobbing, gesturing and heart-patting that goes on in other regions greeting rituals that you would really be doing that alien a disservice. Help that alien travel to Italy and see how far a simple handshake gets them.

So, where does this fit in to astronomy? Well, it won’t be new to anybody to hear that all cultures have their own hero’s and architects of their national astronomical identity (past and future – next on the moon, India or China? Japan? New hero’s to yet be made). Nor should it be news to anybody that some cultures had early astronomy, Islamic cultures for instance, that eventually lost it (and the rest of their science prowess). And it might not be news to anybody that some places simply don’t have the resources to fund major space-aged projects to the likes of ESA, NASA, CSA, JAXA, etc. Poverty and a tiny population may keep New Guinea and Madagascar off the technologically advanced astronomy movers and shakers list.

But, they do have astronomy. Their culture has astronomy. No manner of poverty or population can keep down that global need to know where you are, where you are going and to tell stories. Every culture wants to tell stories, just in different ways. Every nation grew up upon celestial knowledge of their ancestors – navigation, seasons, and the like. All used the night sky, just in different ways. But they got the same results. They knew when the weather was going to get cold based on the twinkling spots on the sky, they knew if they were going north or south based on the simply geometry of those same twinkling dots. We all needed to do the same thing – just like greeting and learning the basics of math – but we got around to it in a slightly varied manner. Our way is not “the” way; it is “a” way. So was their way just “a” way. Was and is today, still.

But here is where the story, for me, took a little turn. My wife and I, fresh off our Chinese New Year holiday, just returned from our second sojourn to Borneo. Last year we visited the west, this year the east. I have become enchanted not only with the biology of Borneo, but also in the people and the lifestyles

therein. I feasted on many books in order to be able to better understand what I saw – I wanted context for the new sights, not just blind awe. One of the most memorable and most shaking realizations was not about their biodiversity, the horrendous oil-palm industry or the grandiose scale of everything in the jungle, but it was about their astronomy.

The forests of Borneo have produced many different tribes; Iban, Penan, Kenyah, Dyak, Kaynan and Kejaman, and all others omitted, each with their own language, customs and, yes, greetings. But they seem (generally) to share something - No astronomy. I thought about this, I tried to read about it. I pondered a culture, an entire history, void of a cosmic view, a stellar map or a story to be told by the arrangement of the stars in the sky. Why is this? Why *was* this? There is, no doubt, a strong astronomical life in all parts of Borneo today. There are amateur clubs, star parties, lectures, associations, university groups, everything. But the history of the cultures in Borneo is seemingly void of a star - literally.

The answer is the jungle and darkness. The inland tribes never needed to navigate as we know it (rivers only go two ways...) and they had this thick cover of biology above them *all the time*. They didn’t *see* the stars, therefore had no urge to make a story or try to explain them. Why would they? How could they? Not only did they not see them, they didn’t look for them. The world – food, water and danger – was on the ground. It’s like a cloudy day, everyday, when you have the world’s most dense forest as your home. No seasonal variations that bring clear skies for months at a time, no open spaces to sit and ponder that above you...this biological paradise just had too much of its own biological paradise to allow the people to see the sky. It has even been mentioned that in the case of an open space in the forest, many people would avoid the sunbeam and the open space at all cost. Nomadic life in the forest gives you no open space, therefore no window. If you look up, you see trees, the underside of the canopy, not stars.

I stood on the same land that those tribes had inhabited for generations, and I looked up. I saw stars. But I was not standing where they would have been standing in ancestral times. I was on the edge of the city, I was in a clearing made by a national park, or I was lucky enough to have proper footwear and a headlamp which allowed me to tramp about the riverside at night. They never moved at night. It was when accidents happened. You couldn’t see, so once darkness fell there was no moving about. You were in your shelter, sleeping. Night had the same demons that our early maps placed in inner China (“there be dragons”). The unknown, but also unwanted.

The stars escaped a whole culture for a vast expanse of time; biology won. I had always been interested in other cultures perception of the night sky, but never thought that I would find equal interest in another cultures absence of perception of the night sky. I was trying to look past “my” way of seeing, and I ended up finding nothing. Which made it all the more interesting.

Trevor Padgett

The Online Astronomer

The online world just keeps getting bigger and bigger...just last week I added another three podcasts to my library of shows I am dedicated to. One general science in the news, another skeptical and critical thinking, and the last all about the moon. A show every week about the moon. Amazing...the deeper you look, the more you find.

While Cassini keeps sending back inspiring and amazing images of Saturn and its moons, the 24-hour webcam of the construction of the next mars rover ticks on and on, and the Kepler satellite regales us with continuous (possibly) new planets to research, us astronomers rarely have a quiet moment...which is awesome! The internet spills with information and considerably cool and entertaining ways to look at our universe.

This week I want to share two more highlights I came across. One more blog, one more podcast, wrapped up in one tight bundle. I sure hope that you are digging into the podcasts...they really are a brilliant advent of the internet age. So here we go – one more place that is PGRASC approved (that's an unofficial approval, I add J) and sure to cause you to sit back, pause and think about our universe.

Blog and Podcast: My Moon

<http://www.lpi.usra.edu/mymoon/>

This is something to behold – fun, witty and shows the passion and creativity behind the creator of the site. This is a website with periodic interviews, podcasts and media embedded within it, but most importantly it is a website full of great astronomical information presented in a creative way. The perfect education tool that marks the power of the internet as not only a place to dump information (wiki-style) but also as an interactive play space for academic matters.

Use this as a resource, a time-killer over a cup of java in the morning, a place to browse to find cool trivia and news, and most importantly use it as a fun place to learn. *My Moon* covers news and the science with great gusto, while also handling timelines, global moon stories, and other things that Luna-loving folks will love to dig their teeth into. You can easily pop to it for a moment, and hour or a coffee break and come back to it later. From strange to all points beyond, this is an astronomy based website that melds the art and the science of our universe.

My Moon also has a podcast...sort of. It's actually a webcast, an online interview section. If you know of "Bloggingheads" (if not, search for it and you will find a wide range of science, humanity, political and entertaining interviews!) it follows a similar format. Two people, one the interviewer and the other the professional astronomer / researcher / amateur chat over the internet with webcams. "Astronomy Skype", basically. You can watch them chat with each other about astronomy or just listen, whatever your preference. The archive has lots of old shows us that you can re-watch, and if you get one while its live – check the calendar for who/when – then you can also take part in the conversation while they chat by asking questions and adding comments. Again, a twist on the normal way we use the internet to learn and communicate. Lots of variety, lots of astronomical voices (and faces!) to enjoy. Try it out.

It took me one minute to see the fun in *My Moon*, and it has since been many days and I am still realizing the breadth and depth of the content. This website is something to pass along to any teachers, homeschoolers, interested kids or to simply use and enjoy yourself. The link to the webcast is on the main page...you can't miss it!

Something Extra:

http://www.ted.com/talks/richard_feynman.html

I will admit that this is not strictly "astronomy", but it is physics and what is astronomy without physics, really?!? A voice from the past, Richard Feynman is here in a candid little interview about the wonders of the world through the eyes of physics. No math involved, but some thinking required!

-Trevor Padgett



so your feet remain dry. Baffin is a Canadian company also. I have spent over 5 hours with my bare feet in these boots in -35 C and only near then did I feel a hint of cooling. They may seem a little expensive (approximately \$150.00) for those occasional nights, but are cost less than a quarter of a typical TeleVue eyepiece and you can get the most out of both. After use they you need to remove the liner to dry.

Hands:

Most telescopes have steel parts, since plastic can become brittle in -0C temperatures, these can be very uncomfortable to handle with bare hands. There are many good glove manufacturers; you can consider ones designed for skiing since they are designed for cold & dexterity without bulk. Some members use gloves with retractable cover over the fingers to make brief delicate adjustments to their scope. Some gloves even have an outside pocket above the knuckles where you can place a chemical heating pad and maintain complete dexterity. Look for gloves that have a gauntlet that extends past the wrist and over your coat arm.

Coats:

A good coat designed for cold winter weather can make a huge difference. Look for a coat with the following:

- Wind resistant shell & long enough to protect the upper thigh
- Thick insulation (synthetic or down), the insulation should be in sewn pockets so the insulation does not pack down and leave other areas thin.
- Waist draw cord to keep the warmth in, cuffs that seal at the wrists
- An insulated hood & drawstring to protect your head, and lots of pockets for your gear (the inside ones are good for keeping battery powered items operating, spare red light batteries etc.).
- Remember to get a size big enough, so when wearing heavy thick sweaters it is not too tight, looser is better.

Some members use industrial 'pipe liner' coats & bib pants, these are effective and not too bulky.

Headgear:

Warm headgear is very important so your observing is fun and not an endurance test. A cotton or wool ball cap can protect well down to -10C , but the brim can sometimes get in the way near the scope and eyepiece. An inexpensive and effective cover is a 'hard hat liner', which covers the head very well and cost under \$10. Toques are very good and are available in knit acrylic up 6 layers thick, wool, fleece. They should not be tight and extend down low enough to cover the ears. Some toques even extend down enough to

cover one's "mutton chop" sideburns also.

Neck:

One can also wear a fleece 'neck gaiter' or scarf, to keep out the drafts from the neck while leaning over the eyepiece. A bandana is also useful, since you can pull it up so you cannot breathe directly on the eyepiece and fog or frost it up.

Thermal long-johns etc

Thermal Long Johns are widely available; some of the best are designed for mountain climbing. Fleece sweaters or jacket can make an effective additional layer.

Other tips:

Remember all insulating winter clothes use air for insulation, so be careful that they do not get crushed or compressed during storage, since they will lose their insulating effectiveness.

Staying out of the direct wind makes a significant difference, since a layer of warm air against your skin and clothes is not stripped away as fast in the wind.

Chemical heating pads are nice to have, you can use in each glove and pockets when it gets down to -20C . They are very effective and offer warmth of hours.

Stop for a break when you feel cold. You can bring a hot drink & snack, so your body can create more of its own heat. You can also go inside, just remember to minimize your white light exposure to preserve your dark adaptation. You should shed your outer layers, so you do not sweat and dampen your inner layers, this also allows your outer layers (gloves, headgear, coat, and boots) to warm up and evaporate any moisture.

Hardcore gear for the determined observer during those deep January nights:

If you are determined to bag your quarry of a Jupiter triple shadow transit during a high-pressure cold weather system, here are some additional gear you can consider:

- Black Neoprene face mask to prevent frostbite
- Thinsulate balaclava and loose fitting toque on top
- Russian style fox fur hat

Some of this gear can be found at the end of season for deep discounts, so if your timing is good you make some nice savings. I hope these tips will help you have a more rewarding winter observing season. See you under our cold crystal clear skies pierced with stars.

Maurice

Sometimes it's nice to just enjoy a well written article. You can tell when someone is well educated. You can tell when someone has a flair for words. You can tell when someone has a unique take on life and even more special they can share that with words. Fae Mooney is one of those people, I always look forward to and enjoy her stories and I'm sure you will to. Reprinted from November 2009, enjoy.
Gil

WHAT'S OUT THERE

Playing with Strings

by
Fae Collins Mooney

"One cannot help but be in awe when one contemplates the mysteries of eternity, of life, of the marvelous structure of reality," Einstein once stated. *It is enough if one tries merely to comprehend a little of this mystery each day."*

A worthy quest for IYA, I decided. And so, this summer, I sat in a shady spot to tackle a book called *Faster than the Speed of Light: the story of a scientific speculation*, by Joao Magueijo, who has a doctorate in Theoretical Physics. He has had me contemplating some of these mysteries and how we attempt to comprehend them as part of our reality... However, the more I contemplate, the more incomprehensible it all seems to become. Consider cosmic strings, and the implications of Dr. Magueijo's theory of the varying speed of light (VSL).

The concept of light speed being variable is not new; even Einstein himself proposed a varying speed of light theory almost a hundred years ago. We have been taught, and have believed, that the speed of light is constant, invariable. But, what if it isn't?

When paired with cosmic string theory some interesting things happen. Cosmic strings, predicted by some particle physics theories and as yet have not been observed in nature, are speculated to be line-like threads of concentrated energy that extend across the universe. Dr. Magueijo found that when he "plugged cosmic strings into the equations of this VSL theory... the speed of light could become much larger in the immediate vicinity of the string, as if a 'coating' of high light-speed enveloped it." How fast? And – how far?

This theoretical physicist believes that a corridor with an extremely high speed limit would be created, and it would extend across the universe! We could cross – not just our galaxy, but – the universe, in the blink of an eye!

Just what space travel is begging for, he says – "a fast lane."

But, wait a minute – what about time dilation and the twin paradox? He admits that Einstein's time dilation effect does create a

predicament for space travel. As he explains it: "Even if we found a way to travel close to the speed of light, although it might become possible to make a return trip to distant stars within a single lifetime, when the spaceship returned, its occupants would find their civilization gone..." That's because for the space travellers only a few years would have passed, while on Earth "millennia would have flown by." And that understanding of how time passes when one twin is accelerated to near to the speed of light and the other remains on Earth has left travelling great distances through space in the realm of science fiction.

Not with VSL theory: Even though a time dilation effect would remain, "along a VSL cosmic string no such annoyances would hinder the space traveler" because "this effect only becomes significant if the speed of the traveler is comparable to that of light."

What's he saying??? The speed of light, expressed as being variable in this theory, "means the *local* value of *c*" [*c* representing the speed of light, as in $e=mc^2$].

The *local* value of *c*... Okay, so what does that mean? "Since along a VSL cosmic string the value of *c* may be much higher, we could move at very high speeds indeed and still be traveling much more slowly than the local value of *c*, so that time dilation would be negligible. The enterprising astronaut could then move speedily along fast-tracks..."

Whoa... wait a minute – "fast-tracks"??? "Objects that occur in some VSL field theories, taking the form of cosmic strings along which the speed of light is much higher." Okay, so our astronaut is whizzing along this fast-track and... "exploring the most distant corners of the universe but still moving much more slowly than the local speed of light." And that is how he can avoid the twin paradox effect; when he returned from the far reaches of the universe he would still be about the same age as his twin, thus being able to visit distant galaxies within a human lifetime and return to tell his contemporaries of his great adventure.

If this amazing theory should be proven to be true, "it will dramatically change the way we perceive ourselves in the universe," observes Dr. Magueijo, "as well as our prospects of contact with alien life..."

Contact with alien life... Hmmm... UFOs... little green men... Maybe we have already been visited by enterprising alien races that figured all this out a long, long time ago...

Sometimes fact can imitate fiction, and sometimes scientific fact can originate from scientific – or speculative – fiction, just by asking - "What if?"

Beam me up, Scotty. I want to go home...