



PeGASus

Newsletter of the

Royal Astronomical Society of Canada: Prince George Centre

Published: January to May & September to November.

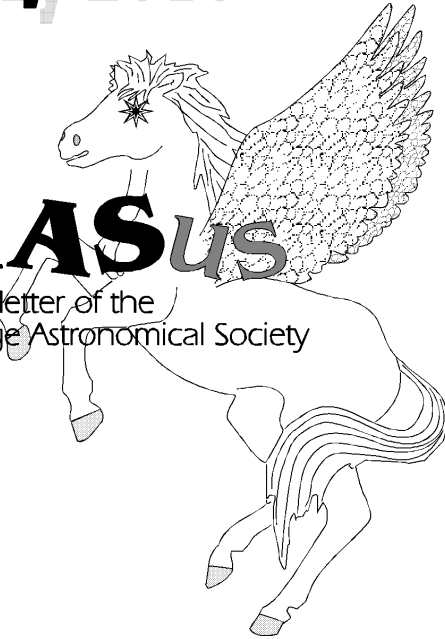
www/rasc.ca/princegeorge

January 2010

*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

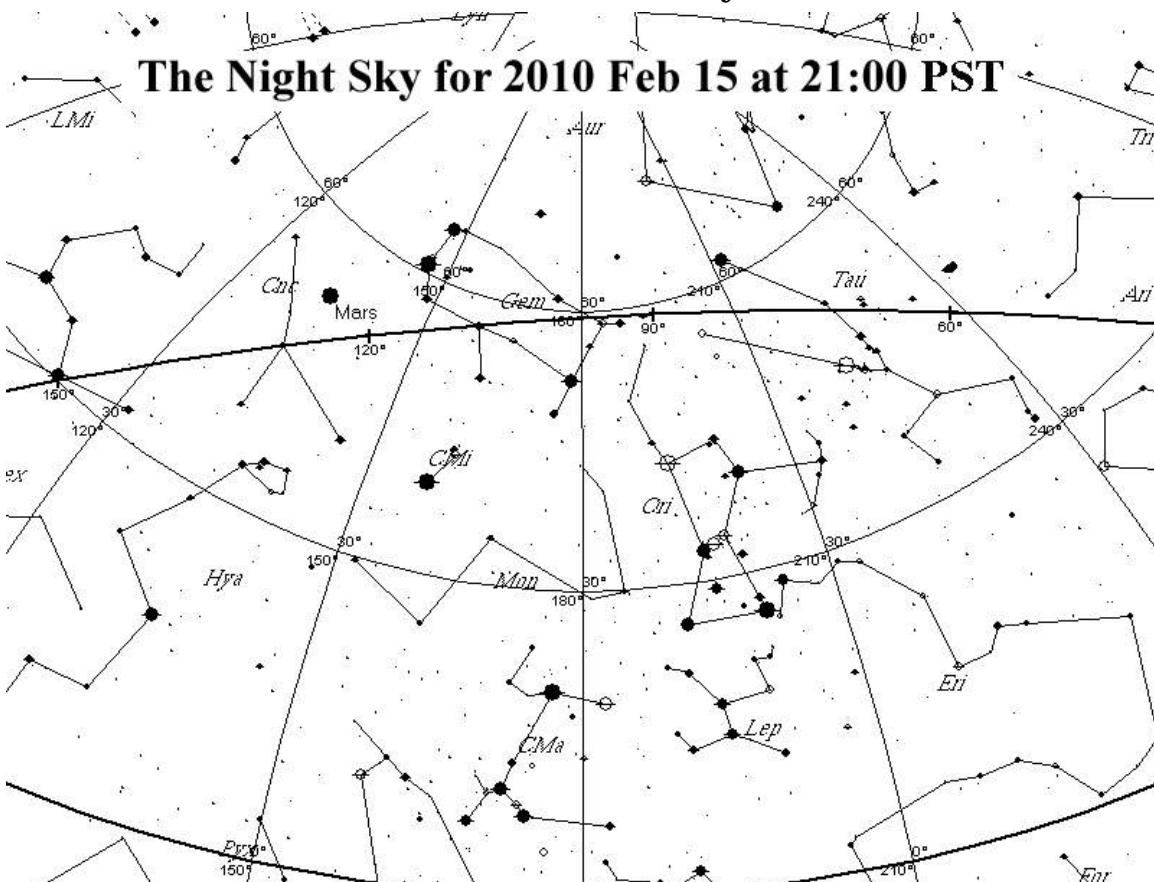


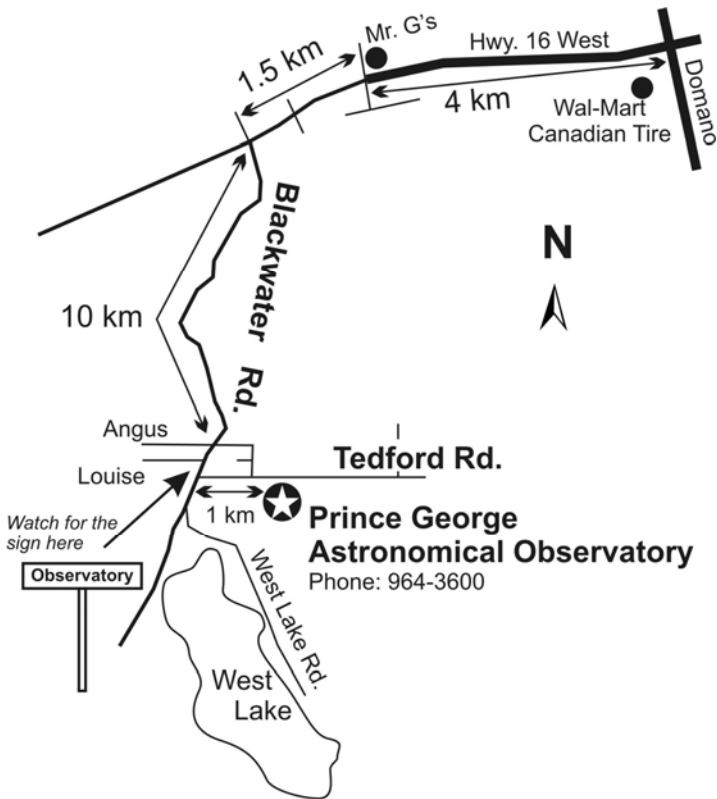
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The RASC: Prince George Centre meets next,
Saturday, February 13 th.
at the Observatory

The Night Sky for 2010 Feb 15 at 21:00 PST





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Contributions to the newsletter are welcome.

Deadline for the next issue is
March 19,2010

PeGASus Editor
Gil Self
selfpg@telus.net

Coming Events

To Volunteer to help run an event please contact Brian Battersby.
brianbattersby73@yahoo.ca
Phone: 614-3316 (cel) 612-4623 (home)

Date	Event	Time	Place	Volunteers	
Feb 13	Business meeting	6:00pm	Members meeting and viewing	7:00pm	All members welcome
Feb 19	Open House	7:00pm	Observatory		Everyone welcome

Additionally there will be 2 Nova classes in February (February , 6 and 20 th both at 7:00 pm) if your not signed up and you would like to take part just drop by the next class at the observatory.

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

Tired of viewing the same objects, we are adding a little wrinkle to the "Members Night" viewing on Saturday nights. Each month we will be targeting three constellations that will be in "prime" position during "reasonable" viewing hours.

The objects will range from naked eye to binoculars to small scopes to larger scopes and a couple of challenge objects for the hard core enthusiasts.

The observatory has a number of telescopes ranging from 4 1/5" to 8" for members use. So dig-out your winter clothes, fill your thermos and head-out.

Editorial

By Gil Self

The International Year of Astronomy was officially closed on December 17 2009. During this memorable year 148 countries were involved in what was the largest science event ever. Canada's contribution was the very successful "Galileo Moment". The objective was to have a million or more individual astronomy connections. Volunteer astronomers sharing knowledge and enthusiasm with the general public. In most instances these folks knew nothing more about astronomy than that they were curious. RASC National produced four free handouts. They were very well thought out and certainly added to the moment. One of the pamphlets was designed by our own Brian Battersby and was used across the country. Every exchange was documented and counted. By mid-way through the year I didn't think we were going to make we were only about a third of the way there. Our local members held tours and open house and astronomy at the mall and contributed 1950 Galileo Moments to the national total. By years end we made it with a total of more than 1,242,000 Galileo Moments. I hope they continue this program it was a very effective way to introduce people to astronomy. There are over a million people across Canada that know a little bit more about astronomy now. I very much doubt anyone went away disappointed, our national membership dollars at work, well done!

I received a couple of e-mails this month that I would like to share with you.

I received a note from my very good friend Orla Aaquist. An early member of the club, past president, newsletter designer and editor. In fact you can see him in some of those pictures of the construction of the observatory. Orla has many great stories to tell and a visit with him will always be fun and interesting. One of the unique things that Orla does is write and perform songs about astronomy. I have a CD I will bring and play at one of our meetings. When I attended the Edmonton centre meeting, I was the only smoker in the room so I was the only one holding up my Bic at the end of his song (anyone younger than 40 won't get it).

Orla is creating a website focusing on "arts in science". I think that's the only criteria, he is trying to develop a cross-section of material before he promotes the site. For now he asks if I can see if anyone in our membership would be interested? If you are send me an e-mail < selfpg@telus.net > and I will send you his address and the url for his beta site.

And lastly a note from our dear friend Art Beaumont. Art has been a member of our centre for as long as I can remember and we will miss him as a regular at our meetings and events. Art was never afraid to roll up his sleeves and get to work and he had an often "slightly off-center" approach to explaining the world around us. (see pps and ppps)
I wish him many happy years with his new club,
Gil

My End of Life Experiences

Readers will please excuse me for injecting my personal experiences into the PGAS newsletter. I moved to Kamloops after 50 years in Prince George and several years in the club. My age, eyes and other interests led me into other directions and my wife and I moved to Kamloops last year where she passed away in June. It was comforting to see some club member at her memorial in Prince George.

In Kamloops I joined the local club and found it interesting in that it seems to be having a genesis similar to that of the Prince George club. I only attended one meeting so far so know little of it except it seems that they are in the same position as the Prince George club was 15 years ago. They have no observatory of their own but working on a dome and must travel to Ashcroft an hour away for observing. It seems that light pollution is perhaps more severe here than Prince George. Their meetings are at TRU.

Dues are only \$20 but of course there is no Observer's Handbook etc. Two club members seemed unaware of the Handbook. Of course they have the internet but it may not be the complete answer. For example I checked the source of earthquakes last year and found two entries. One was the lunar influence and the other cause was homosexuality!

I sincerely wish that the Prince George Astronomical Society will continue to flourish with new membership in the coming years.

Art Beaumont

PS I am still searching for a companion. There are many ladies of my age here but they are too old for me!

PPS Awhile ago I suggested in the bulletin that life originated to produce motion and that getting up off the couch will extend our lives.

PPPS An ex-NASA friend and I came up with the thought that our bodies give off infra red radiation which escapes into space where it will travel forever giving us our only chance at immortality.

The Night Sky for February 2010

by Bob Nelson, PhD

Hi Folks,

Having forgotten to write this before I left home (or maybe I was too busy), I am writing this piece from our condo in Maui. Lois is off at a quilt-weaving class with a friend and I went for a snorkel at Olowalu (mile 14) this morning which was not too bad. Most of the water at the south end of the island – usually clear – has been mucked up by a large SW swell, resulting, I am sure, from storms far away. Even the Molokini Crater – usually the location of world-class diving at 150' visibility – was bad. Yesterday, surf was up in Kihei (!) and the surfers were having a great time. Oh, well – maybe conditions will return to normal soon. Life is tough!

Our condo lies on S. Kihei Road (with lots of traffic noise, but my Bose QC15 headphones kill ALL the noise). We have a nice view of the ocean with the beach only 200 m away.

Many of you are wondering perhaps if I look up at the sky, lying as I am, some 40 degrees further south. Well, the truth is that – when I am in a proper time schedule for Hawai'i (rising at 06:00, etc.) -- I am just too tired to stay up in the evening. Usually there is cloud anyway, although these nights have been clear. I have a clear conscience. So there.

Anyway, here is what is happening in YOUR sky next month (well, alright; I should be back by Feb 11.). All times are PST. Starlight wasting time does not arrive until March.

MERCURY is a morning object this month, rising at mid-month about an hour before the Sun. At sunrise, it lies about 13° above the SE horizon at sunrise. It's a 5" disk of magnitude -0.2.

VENUS is an evening object this month. At mid-month, it lies some 8° above the WSW horizon at sunset, setting around 40 minutes later. The Sky 6 tells me that it is a 10" gibbous disk of magnitude -3.9. It will get larger and brighter as the weeks roll on.

MARS, in Cancer all month is an evening object in February. On the 15th, it lies some 24° above the ENE horizon at sunset. Making a transit at 23:04, it sets about an hour before sunrise. Earth is racing ahead in its orbital race with Mars, you see. (Earth always wins!) This month, for your viewing pleasure, it's a 13" disk of magnitude -1.0.

JUPITER, in Aquarius until May, is an evening object this

month. At sunset, it lies some 8.5° above the WSW, and sets a little over half an hour later. It's a 33" disk of magnitude -2.0. There is a wonderful conjunction on the 16th, when the two planets at sunset will be within ½° of each other. Both will be at about 5.5° above the horizon, lying between WSW and west. Venus – much brighter of course – will lie to the left of Jupiter. (The night before, Venus will lie below and to the left, about one degree away.)

SATURN, in Virgo until 2012, is visible most of the night this month. At mid-month, it rises at 20:51, about 2.5 hours after sunset, but is visible for the rest of the night. At sunrise, it lies 29° above the WSW horizon. These nights, it's a 19" disk of magnitude 0.7.

URANUS, in Pisces until 2012 (May), is an evening object this month. On the 15th, it lies 24° above the WSW horizon at sunset and sets itself about 2 hours later. As usual, it's a 3" disk of magnitude 5.9.

NEPTUNE, in Capricornus until March, is lost in the glare of the Sun this month (lying at mid-month only some 40' away from the golden globe!).

CONSTELLATIONS to look for in February (at 21:00) are Eastern Eridanus, Taurus, Canis Major, Lepus, Monoceros, Orion, and Gemini.

Taurus (Tau, "The Bull"), contains The Hyades, the well-known V-shaped open cluster which represents the head of the bull. For astronomers, it's the closest open cluster (after the Ursa Major Group), lying at about 40 parsecs (=130 light years) distant and probably containing several hundred members. It's important because the distance is too great to be measured by normal stellar parallax, but can be determined by a method known as the "moving cluster method". After that, its Hertzsprung-Russell (HR) or colour-magnitude diagram can then be used to determine the distance to clusters lying further away. This cluster is thus an important rung in the cosmic distance scale.

Taurus also contains M45, the Pleiades star cluster (the 'Seven Sisters') which lies about 3 times further away -- 126 pc (= 410 light years). On deep exposures, many of the stars exhibit circumstellar nebulosity which is the tip-off that these are young stars. Another attraction in Taurus is M1, the well-known Crab Nebula. The subject of much study, the Crab is thought to be the result of a star that exploded in 1054 (on July 4th, of all days!). It's not too hard to find -- give it a try -- but the image is just an

amorphous blob in the sky. Better views are obtained with a CCD camera (hint, hint).

Gemini (Gem, “The Twins”), is a well-known northern constellation that lies just to the east of Auriga. Just missing the Milky Way as it does, it lacks a lot of deep sky objects. (It does have open clusters M35, and NGCs 2158 and 2392 however.) Some of the stars are quite interesting. Alpha Geminorum, better known as Castor (one of the twins), lies about 45 light years from us and has a total luminosity of about 36 Suns. It is a multiple system: Castor A and B form a visual binary making an orbit of about 6 arcseconds in radius (corresponding to a real distance of about 90 astronomical units) and a period of about 400 years. There is a third star, Castor C, which orbits the other two at a distance of about 72". The fascinating thing about Castor is that each of the three stars (A, B, and C), as revealed by the spectrograph, is also a binary system.

Gemini also contains U Geminorum - discovered variable by J.R. Hind in 1855 - which is a typical example of a rare class of objects called “dwarf novae”. Normally quite faint at magnitude 14.9, every 17 days or so, it suddenly flares up to magnitude 8 or so staying at that brightness for a week or two. (Needless to say, these figures are averages; on occasion this system has gone 200 days between eruptions). Today we know that stars of this class (SS Cyg is another) consist of a white dwarf primary (the hotter star) with a red dwarf main sequence (cooler) secondary star. Now white dwarf stars are remnants of stars that have gone through the nova stage - exploding as they reach the end of their lives, settling down to an electron-degenerate compact object (sorry about that mouthful). What the term means is that it behaves like a giant atom, prevented from collapsing further by the laws of quantum mechanics. Anyway, there are rules for the mass and temperature of this object. Now usually, at a slow rate, mass spills over from the secondary to the primary star. Owing to rotation, this material does not fall to the white dwarf directly but enters a disk surrounding the latter. Periodically (and we are not sure what initiates the process), some of this material - which is mostly hydrogen - falls to the white dwarf, breaks the rules and ignites into a thermonuclear explosion. Much material is expelled in a large hot shell, and that is what produces the extra luminosity. The total light output increases by a factor of 100 or more in these outbursts. In a few weeks or months, the whole process repeats. Studies of these objects continue using the latest space telescopes. In order to coordinate these observations, NASA relies on the many amateur astronomers in the AAVSO (American Association of Variable Star Observers) to send the professional astronomers timely outburst notices.

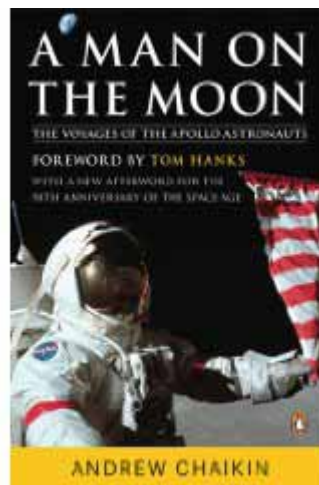
Clear skies,

-Bob

Book review:

'Man on the Moon - The Voyages of Apollo'

by Andrew Chakin



This is an amazing book that puts one in the boots of the astronauts that walked on the Moon, the greatest technical achievement of the 20th century. I found it effortless to read and it shares the discoveries and emotions of the those explorers, in their words, and is a gripping tale.

It can be enjoyed and appreciated by everyone, who has ever looked at the moon in wonder of what it must be like.

It shows what a society can attain when the will is focused on an objective and a timeline. What we should learn from Apollo is that we can achieve great things, and not to abandon those achievements and abilities.

Overall, a thrilling read. Everyone should be aware of Apollo and its achievements, this would make a great history textbook.

Write a Book Review for this space
next month

Deadline March 19 2010

Send to:

selfpg@telus.net

Local Activity for the 2009 Geminids Meteor Shower

The Geminid shower was first observed in 1862, and a century long search to identify the parent comet was not successful. Then, in 1983, a NASA satellite discovered an asteroid whose orbit matched that of the Geminid stream. This asteroid, named Phaethon is thought to be an extinct comet that sheds dust grains from its crust as it approaches the sun.

Phaethon is an Apollo class asteroid, one that crosses earth's orbit, and it actually passes very near the sun. It is named for Phaeton, whose parents were Helios the sun god and a mortal woman. Granted a wish by his father, Phaeton unwisely insisted on being allowed to drive the sun chariot across the sky. The mortal youth could not control the fiery steeds, however, and they ran rampant, first singeing the sky and then plunging to nearly destroy the earth. At the urging of Gaia, Jupiter put an end to the destruction by killing Phaeton with a lightning bolt. The damage can still be seen today as the Milky Way and the Sahara desert.

Ok enough history on to happenings for the year 2009

Notice a upwards count starting giving a distinct increase in radio count of meteors associated with the Geminids meteor shower anticipated to peak Dec 13 /14. This shower was anticipated to start Dec 7. Which is clearly shown.

Dec 07 = 175 at 09 hours GMT

Dec 08 = 250 at 07 hours GMT

Dec 09 = 273 at 09 hours GMT

Dec 10 = 278 at 10 hours GMT

Dec 11 = 290 at 09 hours GMT

Dec 12 = 271 at 08 hours GMT

Dec 13 = 265 at 09 hours GMT

Dec 14 = 336 at 07 hours GMT

Dec 15 = 193 at 07 hours GMT a drop then a peak of 199 at 11 hours GMT

Figure1

To use the following chart the time of day is on the vertical axis and the day of month on the horizontal axis with the count total for that hour as a color going from Blue to red. Blue= a number lower than 20 and red = greater than 330.

A distinct null between Dec 3 and Dec 7 is shown the hourly level is at a background level indicating no shower activity. This is a lowering in the daily count level between of vary minor shower lasting for ~ 48 hours. And the beginning of the Geminids

My detection algorithm is tuned to attempt to detect the local peak of the meteor shower over a number of days. I see a distinct peak at 07 hr. GMT on December 14 or in local time mid-night Sunday December 13 2009.

On December 15 a very distinct drop off of counts indicate that we have passed through the debris of asteroid/ comet Phaethon what I do see is a case of two minor peaks one at 07hrs. Another at 11hrs. I will continue to watch this abnormality with interest.

In figure 4 I see a very pronounced splitting of count levels as I see in figure 1.

This is a indication that Jeff is looking for a more detailed view of local events and is using a more aggressive algorism than any of the local systems.

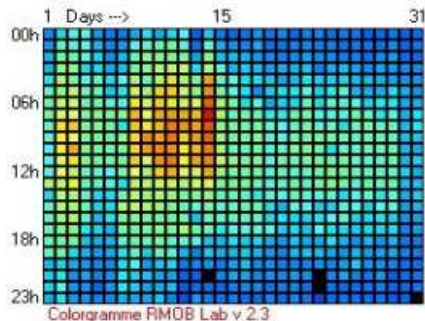


Figure 1

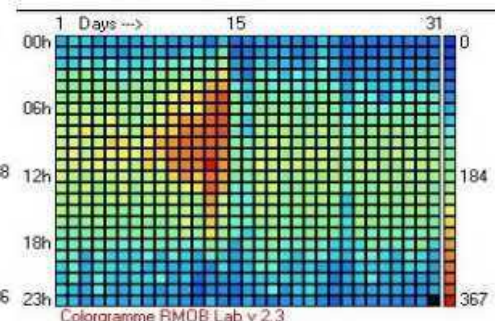


Figure 2

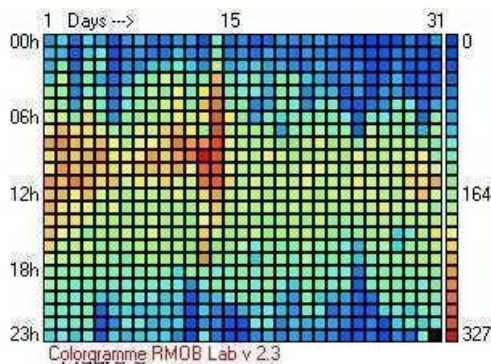


Figure 1 RDL-OBS (wayne Sanders)
Figure 2 Prince George Centre
Figure3 Shane OBS (glen harris)

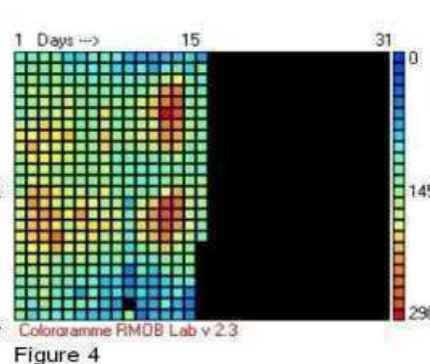


Figure 4

Visual Confirmations of Geminid meteor shower December 7-14 2009

The Cloud cover until the night of Dec 12 has been vary heavy with snow almost every night until Saturday evening and onward. On Dec 13 my allsky camera reported a total of 31 meteors, 28 that are associated with the Geminids the remaining 3 are sporadic captures did not show any fireball type and all in the mag 2 level as well.

Then on December 14 a total of 107 were observed 6 of which were sporadic's, the remainder being Geminid meteors. Only one fireball was seen at 09:41.04 GMT

Total duration about 3 seconds, at a azimuth of 30 degrees Very slow moving typical for a Geminid and appears to be coming from the correct sky location.



Figure 5

Fireball is upper left. This is a composite image of several hours so point source appears to be moving Large x is the Zenith.

If you would like further articles on the goings on the local Meteor detections system in place in the Prince George Area E-Mail Wsanders@xplornet.com

Camaraderie in the Cold – The 2009 Geminid Meteor Shower

The 2009 Geminid Meteor Shower here in Prince George was a great success!

There were 20 of us gathered at the observatory from 7:30pm until after 11:00 to watch the Geminid Meteor Shower.

We were all well dressed and sitting in our reclining deck chairs on the snow & ice, and toasted each other with hot chocolate & tea, saying "**THIS IS THE LIFE!**" with muffled voices, through our mufflers, in the -34C (239 Kelvin) temperature.

The sky was incredibly clear with great seeing, there were bright stars piercing the sky down to the horizon and into the trees, which were snapping in the cold.

We observed over 100 meteors streaking out of the eastern sky, most with a bright yellow-orange colour and some with a glowing tail lasting for a fraction of a second.

The temperature was -34C (239 Kelvin) when we started and -38C (235 Kelvin) when we ended after 11:00pm, when our eyelashes were starting to freeze together.

It was a good time and honestly the temperature was quite tolerable, if one is well dressed with -80C rated boots, heavy parkas, chemical hand warmers in gloves, layers of fleece, toques, and only the area around our eyes exposed to the cold.

Interestingly the maximum surface temperature of dwarf planet Ceres (between Mars and Jupiter) is 239 Kelvin (-34C), so we experienced the same temperatures as a balmy summer day on Ceres.

RASC Prince George member in Florida enjoys the shower also

Our member Margaret Mannchen in Miami, Florida sent us her observing report:

"I was sitting in my reclining chair from about 9:00 to 12:15 am (EST), sweating and swatting mosquitoes, sipping on a cold Dr. Pepper. I only saw 15 meteors, but that's pretty good considering I live only a couple of blocks off a major thoroughfare lined with car dealerships, and also there is almost no spot in my backyard where I can see more than about 50% of the sky due to trees and houses. It was one of those Miami nights when the air is so steady the stars don't twinkle at all! Most of the meteors I saw were whitish, a few orange, and three bright greenish fireballs! A wonderful evening!"

It was approx. 27C (80F), and the humidity was 75%, which made it extra nice!"

Lets hope next year is even better.

Maurice

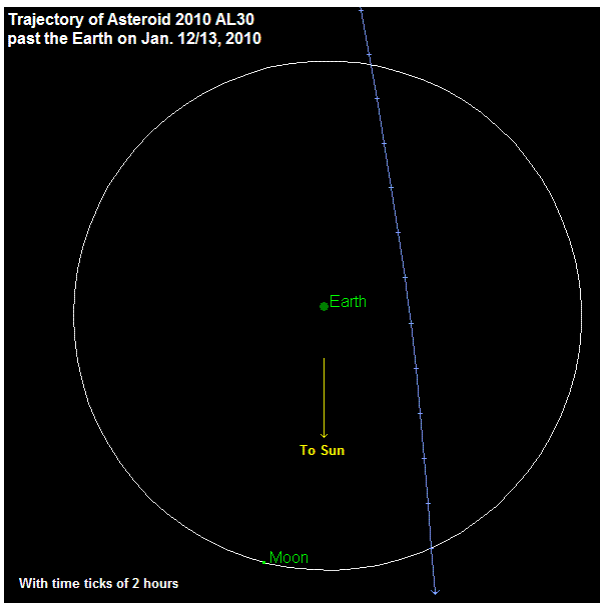
Asteroid 2010 AL30 and Deflection Strategies

This Last January 13th there was another near miss of an asteroid discovered only 3 days prior. It passed earth at 04:46 pacific time at a distance of 130,000 km (80,000 miles) or 1/3 the distance to the moon. In astronomical distances, this was very close shave.

NASA's Jet Propulsion Laboratory's Small Body Database classifies 2010 AL30. This object an Apollo class Near Earth Asteroid (which cross Earth's orbit at a greater distance from the Sun), and is estimated to be 10 to 15 meters in diameter. According to NASA "One would expect a near-Earth asteroid of this size to pass within the moon's distance about once every week on average, and that there are approximately 2 million such objects in near-Earth space".

The brightness of the asteroid was 14th magnitude, similar to Pluto, so it would have only been seen visually with scope of nearly 14" or larger. So only a few of our members telescopes and the 24" could have observed it.

The tracking of Near Earth Asteroids (NEOs) is something we can contribute to as amateur astronomers. This includes discovery and tracking known asteroids to increase the accuracy of the orbit and determine the threat level.

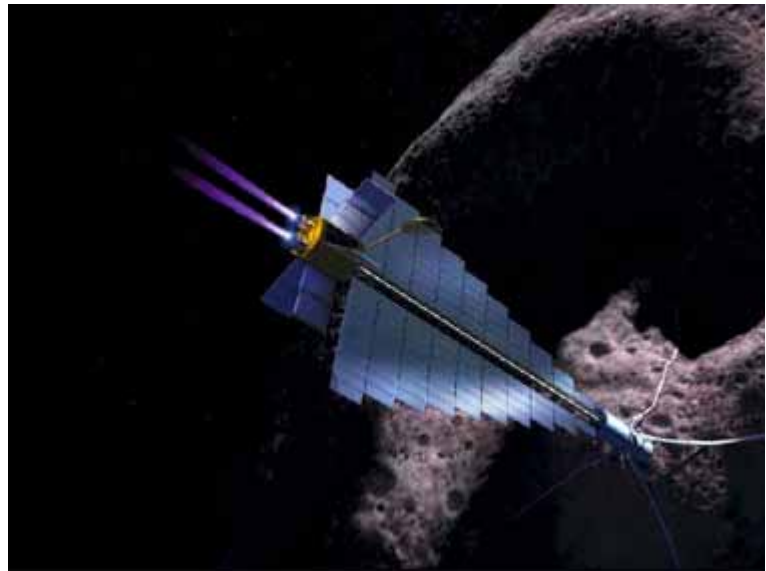


Trajectory of Asteroid 2010 AL30 Past Earth on January 12/13, 2010 (credit NASA)

If something like 2010 AL30 did hit earth it would be expected to explode at high altitude in the earth's atmosphere with the energy of a small nuclear bomb, and little effect noticed on the surface. I have read that impacts in the upper atmosphere happen several times a year. Asteroids over 50 meters can explode in the air and could devastate an area of a large city, and asteroids of 100 meters pose greater risk because they penetrate deeper in the atmosphere or hit the surface.

The orbit of 2010 AL30 is elliptical with a period similar to Earth's, so it may be a derelict spacecraft. It could be a Saturn third stage (SIV-B 17.8m long x 6.6m diameter) from one of the moon missions. If the spectrum of the light from the pass can be analysed, it could be compared with spectrum of the paint of the Saturn's third stage.

This once again highlights the need for further vigilance of the night sky, and preparation and developing asteroid deflection systems. One organisation dedicated to addressing this problem is the 'B612 Foundation' who's goal is "to significantly alter the orbit of an asteroid, in a controlled manner, by 2015". The name B612 is the asteroid home of the Little Prince in Antoine de Saint-Exupery's child's story 'The Little Prince'. There are different methods of deflection, such as light-sail, a gravitational tractor, kinetic impact, mass driver, focused solar energy vaporizing surface material, conventional rocket motors, and nuclear blasting (the most unpredictable method).



B612's Asteroid Tugboat Design (credit: B612 Foundation)

The gravitational tractor method can provide a controlled gentle push the asteroid to a safer orbit looks very promising. The best propulsion system to achieve this I have read about is the 'Variable Specific Impulse Magnetoplasma Rocket' or VASIMR. This engine is more efficient than previous ion engine designs. This design can use hydrogen, helium or deuterium gas as the propellant fuel and an electric power source is used to ionize fuel into plasma. The engine has the ability to be throttled allowing to acceleration to be increased or decreased. The advantage of using hydrogen as the propellant is that it can be re-fuelled at its destination from ice found in the solar system, without needing to carry all the fuel for a round trip. The engine also has an 'afterburner' mode that sacrifices fuel efficiency for speed. Plans are for early engines are to power the microwaves and magnetic field with solar panels generating 1 mega watt. The VASIMR engine would only be suitable for use in from earth orbit and transportation beyond since does not have the power to launch from the surface. In 2013 the International Space Station will have a 200-kilowatt booster installed for testing, and then used to maintain the orbit.

Business Meeting Minutes
January 16, 2010

Date: January 16, 2010
Location: 7365 Tedford Road
Chairperson: Maurice Sluka
Recording Secretary: Denise Stoltz
Executives Present: Maurice, Denise, Blair, Brian, Glen, Jim V,
Wayne, Rusty, Gil, Doug
Members Present:
Meeting Called to Order at 6:14 pm.

1. Previous Meeting Minutes

Minutes of November 21, 2009 meeting were circulated.
Motion to accept minutes as circulated. Moved: Wayne Seconded:
Blair Carried

2. Treasurer's Report

Club Account: \$6,470.29
Gaming: \$ 44.46
There are approximately 10 calendars left to sell.
Motion to accept treasurer's report as circulated. Moved: Gil Sec-
onded: Jim V. Carried
Details on file

3. Correspondence, Secretary's Report

Various bills, statements, Calgary Centre newsletters, IDA Correspondence

4. Old Business

- The telescope has been recollimated but there are still some issues to attend to, telescope balance being one of them. Work on the telescopes known issues will continue.
- Lighting Seminar to be held in March. Go to mypg.com and fill out form!!!
- Blair is contacting YRB to resolve snow clearing issue and/or getting quotes from other snow removal companies.
- Glen is building two All-Sky cameras, one for the observatory, to be installed on building when complete
- Bob & Jim V installed a spring on the RA drive assembly
- Volunteer PG
- Maurice to contact Christina at Falcon Contracting, she wants to volunteer for administrative work
- Brian will make business cards for Maurice and Blair.
- Telescope engineer search to be put on hold pending exhaustion of items we can fix ourselves. Will see how the changes Bob & Jim V. made affect the telescopes performance and go from there.

5. New Business

- Discussed promoting NOVA course. More posters and maybe radio ads.
- Get Well card for Rod was signed by members. Maurice will get it to him.
- Blair to get a quote for truss for fall Gaming account application.
- New eBilling for RASC Membership is taken care of. Thanks Blair!
- Tour presenters needed for upcoming tours and NOVA course.
- Tour donation amounts to be kept the same; \$2 per person \$5 per family
Motion: Rusty
Seconded: Jim, Maurice, Doug, Wayne
- Members mileage to be paid for by club starting January 1st 2010
Motion: Blair
Seconded: Wayne Carried
- Road Trip to Fort St. James in April or August; Maurice to contact Pat Short

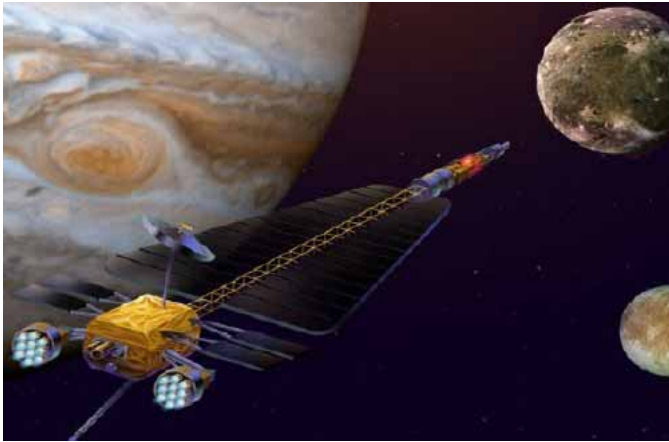
6. Miscellaneous

- National Rep position still available pending hearing a firm "yes" or "no" from Bob N.

The next business meeting will be held on Saturday, February 13,

It is estimated that a 20-megawatt class VASIMR engine could propel human missions to Mars, in less than 40 days, where conventional rockets would take six months. To have enough electrical power to run the VASIMR engine with 20-megawatts, an onboard nuclear reactor is required. This would be similar to a military submarine reactor. With less travel time the exposure to the radiation of outer space, reduces the health risks to the astronauts. With greater energy levels the trip to Mars could be reduced further.

A 20-megawatt or greater operational VASIMR drive system would be well suited to pushing a threatening asteroid effectively. With its speed and efficiency it could get to asteroid within months and push it for a longer time. This would increase the ability to deflect an asteroid on short notice, maybe under a year. Such technology needs time for development, but the Apollo / Saturn program proves it can be done with determination and diligence. Currently we would need a decade or more to implement a deflection strategy.



Artist's impression of the Jupiter Icy Moons Orbiter (JIMO). Courtesy NASA/JPL. This design would most likely use the VASIMR drive, part of Project Prometheus started in 2003, but it was cancelled in 2006.

Such technology would empower our civilization to protect ourselves from devastating destruction and extinction level events. Another benefit would be unlocking the outer solar system for exploration. Imagine Cassini class or larger probes being sent to Jupiter, Uranus, and Neptune where solar power is not practical, and with a travel times of months instead years. With a proven nuclear VASIMR propulsion system it would energy for experiments and life support systems and electromagnetic shielding for manned missions also. We could also send larger space telescopes into deep space, like the upcoming James Webb Space Telescope (launch date 2014), to detect all the near earth objects and further enhance our understanding solar system and beyond.

Using nuclear reactor requires great caution of delivery of the fuel into orbit, but being unprepared or doing nothing would be far more risky. This technology could prevent the devastation and even extinction level event. What we need is an attitude to say we have the means to learn what threatens our planet, and that we are prepared and determination to protect it, or in other words LIVE BRAVELY.

Maurice

WHAT'S OUT THERE

by

Fae Collins Mooney

INTRODUCING OUR MEMBERS-AT-LARGE

In the last issue of PeGASus our senior executive members for 2009-10 shared with us their IYA experiences and astronomy interests, their insights, and their hopes for the PG Centre this coming year.

This month we introduce our Members-at-Large, two of whom have offered to share their thoughts with us. The seven executive members are: Jim Van Doren, Glen Harris, Fae Mooney, Bob Nelson, Doug Wayland, Wayne Sanders, and Rusty Hoff.

GLEN HARRIS: Glen has been a member for nine years; 8.5 of those years, he says, have been spent serving on the executive - as secretary, and this year as a member-at-large. What prompted Glen to join the society was "the enthusiasm of the club members," he shares, while "attending a solar viewing event at Parkwood Place." That "was the catalyst that motivated me to join." Glen's astronomical interests include "Radio Astronomy that involves the detection of meteors," stating that the data "is being used globally in the study of meteor showers." His current project is the "implementation of AllSky cameras to detect meteors. The information obtained will augment the data collected from the Radio Astronomy equipment. Ultimately, the combined data will help to pinpoint the impact area of meteors or fireballs that survive their plunge through the atmosphere."

Glen's interest in astronomy dates back to the late 1970s "when my children were young. I would point out the constellations to them on dark nights."

The International Year of Astronomy has drawn to a close and for Glen his Galileo Moment was "sharing the awe, joy, and excitement of people experiencing their first Galileo Moment." Glen's hopes for the PG Centre this year are to "attract new members and retain existing members."

Given a "Soap Box Moment" this is what Glen offers: "Get involved in the society's activities and events. There are several enthusiastic members that offer their expertise."

DOUG WAYLAND: Doug has been a member of the PGAS/RASC-PG Centre "since 1999. I think I have been a member-at-large for about 7 or 8 years. I joined the society to be around like-minded people who enjoy astronomy," he relates. "I personally enjoy all aspects of visual astronomy, be it planetary or deep sky observing. I especially like viewing current happenings, such as eclipses, near earth asteroids where you can actually see them moving in the eyepiece, novae and meteor showers. I also just like logging many deep sky objects that I have never seen before. In this respect, I am currently working on the Finest NGC list and keeping track of which ones are Herschel 400 objects, for that will be my next list."

Asked about when he got the astronomy bug he says, "I first became interested in astronomy as a kid, but didn't get serious about it until 1996 or so after seeing comet Hyakutaki that year and comet Hale-Bop the next. Christmas 1998 I received the book *Nightwatch* by Terence Dickinson from my son. That was my main springboard into this wonderful hobby. Through that book I learned all about the night sky and followed the useful tips in obtaining my first telescope, avoiding rushing in and buying one of those flimsy Christmas trash scopes that so many end up with."

Doug's Galileo Moment this past IYA "was the upgrade of my telescope. After 10 years using my Meade 8" SCT, I had the opportunity to purchase a Celestron 14" SCT. The feeling I had was like when I bought the Meade brand new; it opened up the deep cosmos so much more to me."

In conclusion, Doug says, "I am not much for Soap Boxes, but I would like to thank the other members of our club who work so hard to make it the great facility it is today." In the next year Doug "would like to see more club members taking an active participation in just general observing and enjoying the night sky."

Astronomy interests are as unique as the members themselves. And the opportunities to learn and experience what's out there are as near to us as one of our enthusiastic fellow members. What is available to us is vast and varied, astounding and amazing, and when we are indulging our astronomical passion every moment can be a Galileo Moment, no matter what year it is.

Clear skies! And many memorable moments observing what's out there -