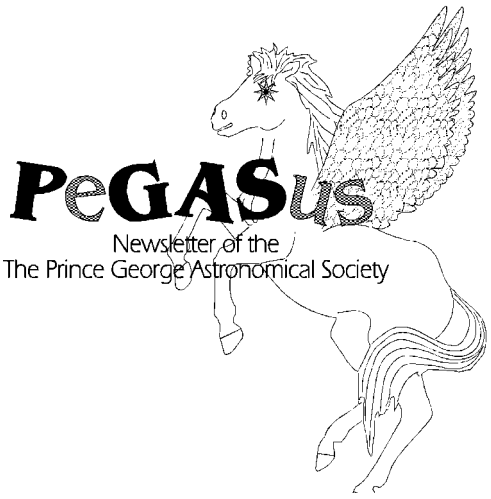
PeGASus
Newsletter of the
Royal Astronomical Society of Canada
Prince George Centre

January 2006



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

In Issue # 148

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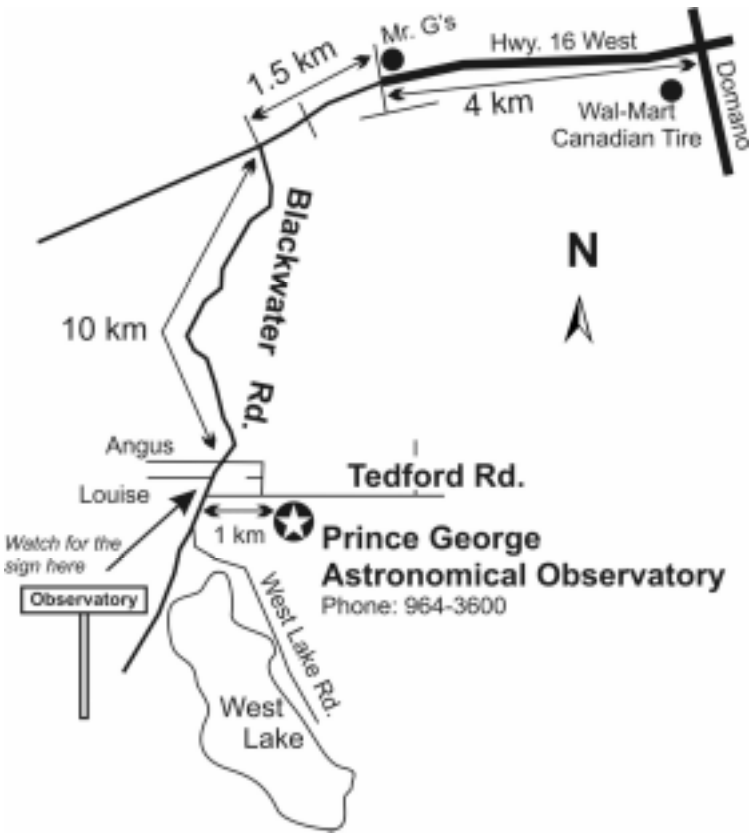
The RASC-PG meets next at 7:30 pm Wednesday January 25 at The Observatory



Contributions to the newsletter are welcome.

Deadline for the next issue is

February 10

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Coming Events

Open Houses run every Friday evening starting in March
Members Nights run every Saturday evening alternating with NOVA
Executive meeting 6:30 pm January 25
Followed by
PGAS General meeting 7:45pm at the observatory

Editorial

Gil Self

This is really neat, I have a blank page in front of me. There are people out there willing to read this page. The people that read this newsletter are the kind of people I like. They have similar interests as me, they are generally curious, inquisitive people. So what can I say on this blank page? I could talk about politics or the price of gas or for that matter any one of a number of things that I consider over-priced. But maybe I will leave all that alone since I suspect everyone out there agrees with me, we are paying way too much for just about everything! I could brag about my kids but that's not fair if your not standing in front of me to tell me about your kids. No , I think the thing that I like to talk about is the Astronomical Society.

I am in a somewhat unique position, in that my job allows me contact with a very broad variety of people. A service visit to one of my customers can sometimes involve spending significant time in their office, there are some of these folks I have known for several years. They often ask about the observatory. Over the years there has been lots of good press and radio coverage, people are really interested in what we do. But it is very surprising how often I come across people that have never heard of us. Generally they are absolutely "blown away" by what we have to offer. Talking up the observatory and the Friday night open house is helping us out, Friday open house donations are very important to our budget. If you get a chance to brag about the observatory, folks are generally very keen on finding out more. We have some great tools to help you, if someone is interested, direct them to our web page. Our web page is absolutely one of the very best astronomical web pages anywhere. It highlights a wide variety of what we do and what we can offer a visitor, a rank amateur or a seasoned pro will find our web site useful. Even someone with no astronomy background at all will find simple directions on how get a start in this pursuit.

Don't miss an opportunity to help someone, even a glimmer of interest could be someone who hasn't yet realized how very engaging astronomy can be.

The Night Sky for February 2006

by Bob Nelson, PhD

Hi Folks,

By the time you read this, my wife Lois and I will be somewhere in southern Chile or Argentina (Patagonia) in their austral summer doing some hiking and sightseeing. Lying as it does at around latitude 50° south latitude, Patagonia has only moderate summer temperatures and is subject to intense wind and generally stormy conditions. The very spectacular saw-tooth peaks are much coveted by mountaineers but seldom fit to be climbed. We should have wonderful hiking. We also hope to visit Tierra del Fuego and Ushuaia, an Argentine naval base on Beagle Channel which advertises itself as the most southerly city in the world. I'd love to visit Cape Horn as well, but I don't think it will happen.

After that, we'll fly back to Santiago where we hope to tour around, cross a couple of high mountain passes (Mt Aconcagua, near there at 6959 m, is the highest mountain in the western and southern hemispheres), and visit one or two observatories (and Lois wants her beaches!). Hopefully I should have a few good images to show when I get back to PG and winter.

Anyway, here is what is happening in YOUR sky next month. All times are PST.

MERCURY is an evening object all month. It reaches greatest eastern elongation (angle from the Sun) on February 23, when the angle is 18.1°. (It will be a 6" disk of magnitude -1.0) For northern hemisphere observers, this is a favourable apparition – the best of the year (owing to the inclination of the ecliptic); at sunset on that great day, Mercury stands some 15° above the western horizon and should be an easy target in binoculars. Some pictures might be appropriate (hint, hint).

VENUS is a morning object (and will be until 2006 October); at mid-month it rises at about 05:00; at sunrise, it will be low in the southeast (14° up). Have a look, you early birds! It's a 42" gibbous disk of magnitude -4.6 and will reach greatest brightness Feb 17.

MARS, in Aries until February 7, when it passes into Taurus is an evening object all month but it's fading. At mid-month, it is some 56° above the southern horizon at sunset; it sets at about 02:20. It's an 8" disk of magnitude 0.5.

JUPITER, in Libra until December, is a morning object, rising at mid-month at around 01:00. At sunrise, it is only 15° above the SSW horizon. Wait a month or so for more convenient viewing.

SATURN, in Cancer until August, is visible all month. At mid-month, is low (17° elev.) in the east at sunset; it transits at around 23:00. It's a 20" disk of magnitude -0.4.

URANUS, in Aquarius until 2009 (March), is pretty well lost in the glare of the Sun this month. At mid-month, it is only 9° above the WSW horizon at sunset, so good luck! (It's a 3" disk of mag 5.9)

NEPTUNE, in Capricornus until 2010 (March), reaches conjunction (is on the opposite side of the Sun) on Nov 6 and is largely lost in the glare of the Sun all month (oh, all right – by month's end, it rises an hour before sunrise). As usual, it's a 2.3" disk at about magnitude 8.0.

PLUTO, in Serpens until September, is a morning object all month, rising at mid-month about 4 hours before the Sun – not too convenient for most folks. As usual, it's a 0.1" disk at magnitude 13.8.

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 images are obtained with a CCD camera (yeah!!).

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

WHY THE RASC?

Do you ever wonder why we are called the RASC: Prince George Centre? Obviously the name says where we are but, it also implies we are one of many Centres. In fact there are currently 27 Centres of the Royal Astronomical Society of Canada and over 4,900 members.

So what you say, how does this benefit me? The short answer is it connects you with 4,899 other members interested in the same thing you are – astronomy. It allows resources and information to be shared across the country. In effect it makes the Prince George Centre a whole lot bigger.

The trouble is you might not know how to make the most of the National experience. Take a look at the National website at www.rasc.ca Here you can find links to other Centre's websites, sign up for the RASC email discussion group, purchase memberships, coffee cups, publications and other items from the e-store, read up on how to observe different objects in the Observing Sections page, find observing Certificates to keep you actively observing and last but not least venture into the "Members" area to read all the National Council reports you would ever want to read.

Signing up for the National email discussion group will really get you feeling connected in a hurry. It is a few emails a day however so you might want to load the "digest" format. Here is the link to go direct to the sign up page http://www.rasc.ca/computer/rasclist.htm
Some of the chatter is a little mundane but it is very exciting to hear about the new supernovas being discovered across the country by the RASC members hunting for them, or see the images being posted by some of the truly gifted astrophotographers across the country. You can also ask questions to the list….if you are lucky you will even get a response!

My personal favourite national thing to do is attend the annual General Assembly. Here you get to meet lots of new people, rub elbows with the big wigs (like David Levy Jack Newton) and generally talk to a lot of people doing a lot of different things. You can really pick up a lot of new observing tricks and projects to try out in a hurry. If you like politics you can attend all the National Council meetings too – loads of fun!

I do hope you will explore the RASC outside of Prince George a bit it really can be very rewarding. Who knows maybe someday the National President will be from the Prince George Centre!

Brian Battersby
Past President

Snowstorm on Pluto

by Dr. Tony Phillips

There's a nip in the air. Outside it's beginning to snow, the first fall of winter. A few delicate flakes tumble from the sky, innocently enough, but this is no mere flurry.

Soon the air is choked with snow, falling so fast and hard it seems to pull the sky down with it. Indeed, that's what happens. Weeks later when the storm finally ends the entire atmosphere is gone. Every molecule of air on your planet has frozen and fallen to the ground.

That was a snowstorm—on Pluto.

Once every year on Pluto (1 Pluto-year = 248 Earth-years), around the beginning of winter, it gets so cold that the atmosphere freezes. Air on Pluto is made mainly of nitrogen with a smattering of methane and other compounds. When the temperature dips to about 32 K (-240 C), these molecules crystallize and the atmosphere comes down.

"The collapse can happen quite suddenly," says Alan Stern of the Southwest Research Institute. "Snow begins to fall, the surface reflects more sunlight, forcing quicker cooling, accelerating the snowfall. It can all be over in a few weeks or months."

Researchers believe this will happen sometime during the next 10 to 20 years. Pluto is receding from the warmth of the Sun, carried outward by its 25% elliptical orbit. Winter is coming.

So is New Horizons. Stern is lead scientist for the robotic probe, which left Earth in January bound for Pluto. In 2015 New Horizons will become the first spacecraft to visit that distant planet. The question is, will it arrive before the snowstorm?

"We hope so," says Stern. The spacecraft is bristling with instruments designed to study Pluto's atmosphere and surface. "But we can't study the atmosphere if it's not there." Furthermore, a layer of snow on the ground ("probably a few centimeters deep," estimates Stern) could hide the underlying surface from New Horizon's remote sensors.

Stern isn't too concerned: "Pluto's atmosphere was discovered in 1988 when astronomers watched the planet pass in front of a distant star—a stellar occultation." The star, instead of vanishing abruptly at Pluto's solid edge, faded slowly. Pluto was "fuzzy;" it had air. "Similar occultations observed since then (most recently in 2002) reveal no sign of [impending] collapse," says Stern. On the contrary, the atmosphere appears to be expanding, puffed up by lingering heat from Pluto's waning summer.

Nevertheless, it's a good thing New Horizons is fast, hurtling toward Pluto at 30,000 mph. Winter. New Horizons. Only one can be first. The race is on….

Find out more about the New Horizons mission at http://pluto.jhuapl.edu . Kids can learn amazing facts about Pluto at spaceplace.nasa.gov/en/kids/pluto.

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

image may be found at spaceplace.nasa.gov/astro_clubs/pluto_3moons_art.jpg.

Looking Back 2005

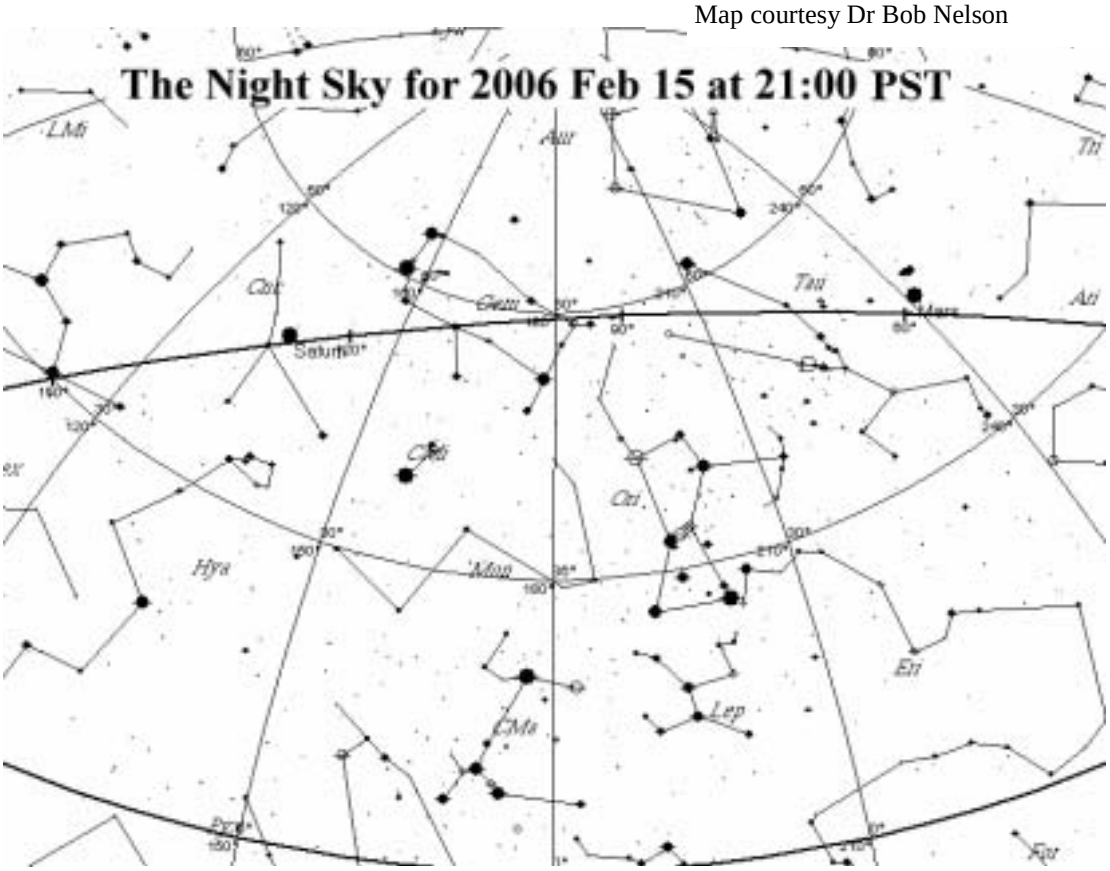
On the evening of January 22 Sterling proposed to Shar at the observatory. I am happy to say she said "yes!" Robin and I meet Sterling at the observatory at about 6:45 pm. I added a picture of Sterling and Shar along with the caption "Shar... will you marry me?" to the end of Gils' PowerPoint presentation. Sterling hid in the back room and waited for Shar and their friends to arrive. Sterling's story to get Shar out to the observatory without suspicion was that there was to be a public presentation at 7:00 pm. He then told her he would be a bit late due to work and he would meet her and their friends out there. When they came in Robin and I pretended like they had got the wrong night for the presentation (to explain why no one was there but us) but, we got them to stay and we would show them a presentation anyway. We played Gil's presentation, which they enjoyed, and then, after the Hubble Deep Field shot faded from the screen their picture popped up. She was totally surprised and Sterling came out of the backroom with the ring and proposed. It was all very romantic. Robin and I were happy to be a part of it. We wish Shar and Sterling all the best. Brian

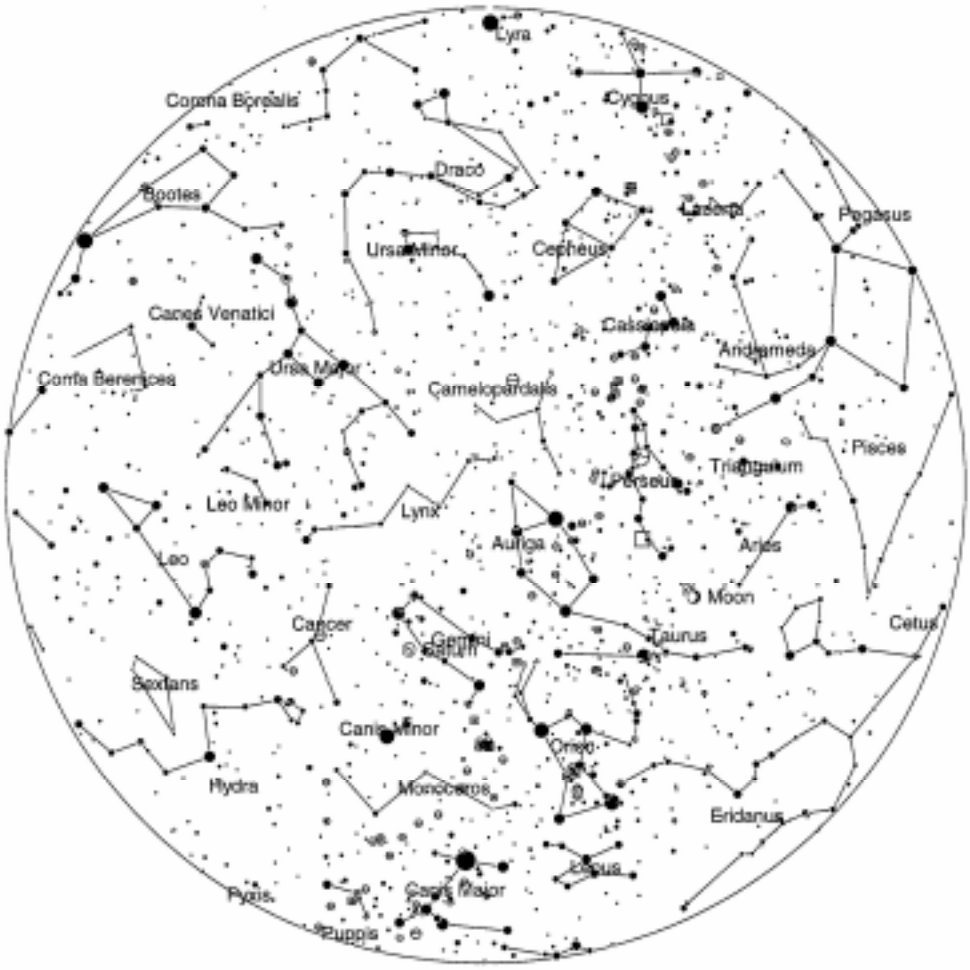
Doug came face to face with a moose while out at the observatory taking some awesome astro-photos, in January.

On June 4th 2005 the annual year end Barbeque takes place. Glen, Jim and I will get our certificates. A wonderful accomplishment in a new interest and one I can see lasting a lifetime Hugh.

Bob N. is turning into a real pro photographer. Mind you subject and location help a wee bit!

Map courtesy Dr Bob Nelson





Royal Astronomical Society of Canada
Prince George Centre
AKA the ***Prince George Astronomical Society***

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