PeGASus

Newsletter of the

Royal Astronomical Society of Canada: Prince George Centre

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November, 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

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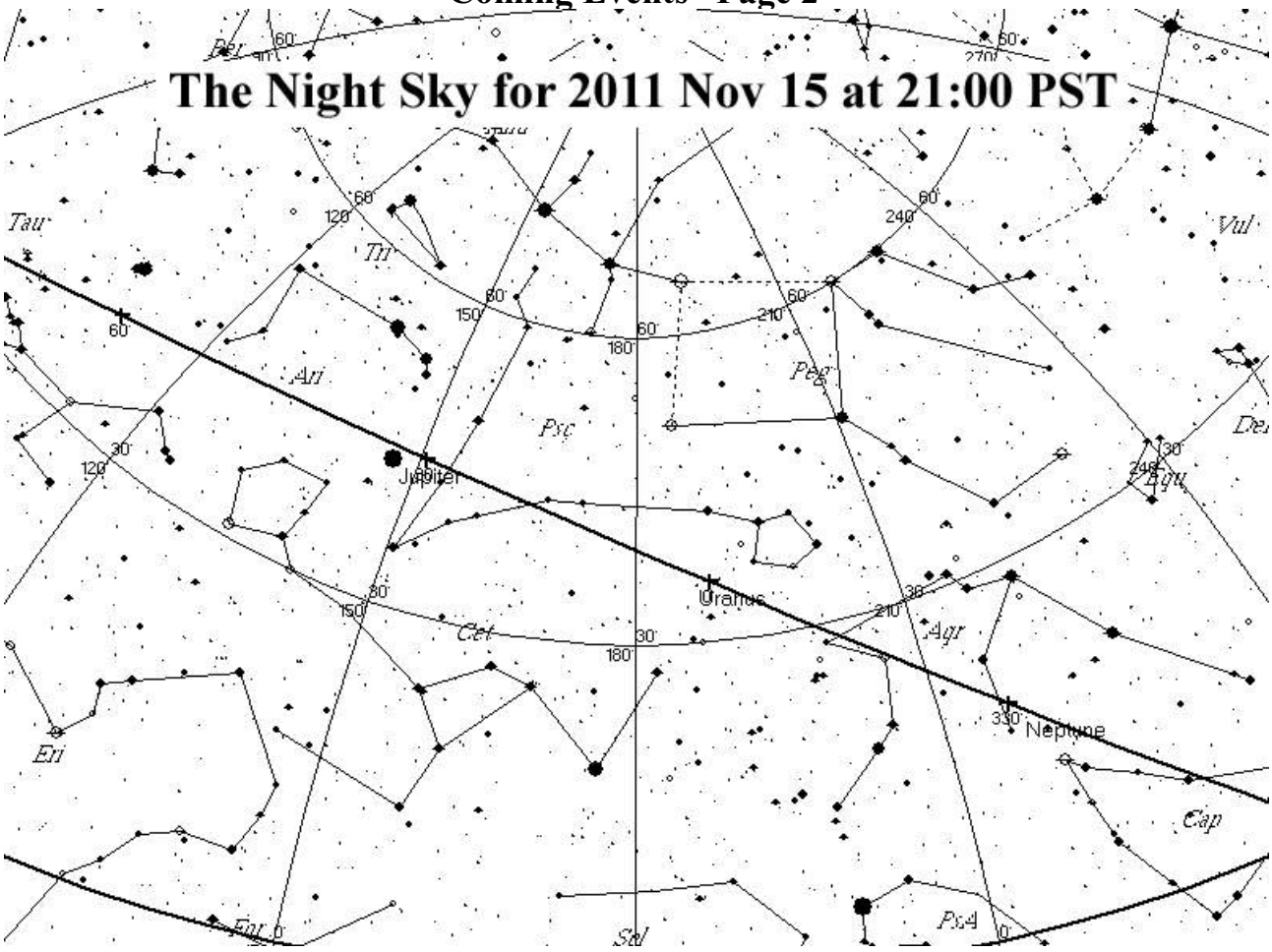

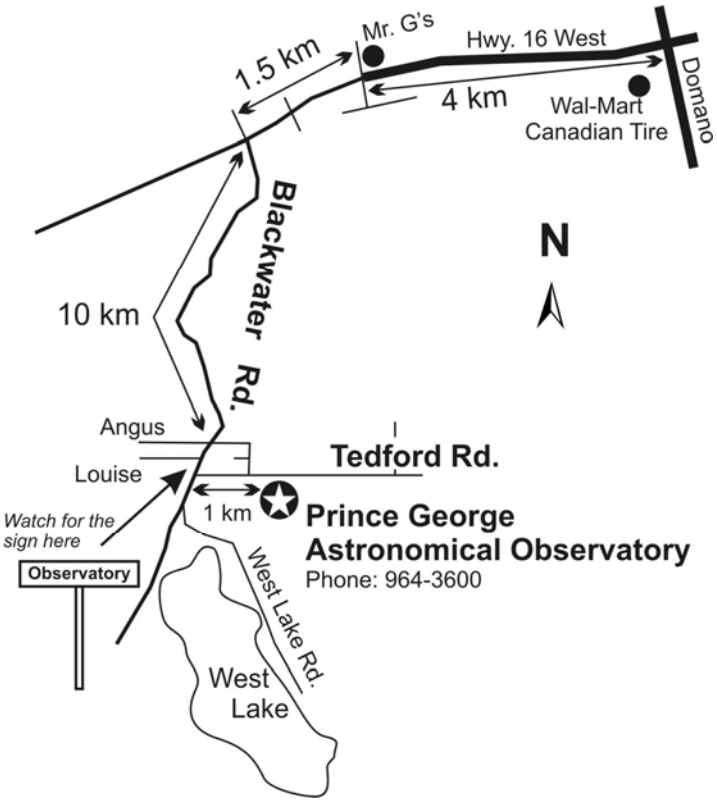

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Contributions to the newsletter are welcome.

Deadline for the next issue is
December 16. 2011

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Coming Events

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

Date	*Event*	*Time*	*Place*	*Volunteers*
Every Friday	Open house until the end of November	7:30 pm	Observatory	Members welcome
November 26	Binocular Marathon	check website	observatory	Members welcome
December 10	Lunar Eclipse	3:30 AM	observatory	Members welcome

Christmas Potluck Saturday December 3 open at 5:30 dinner at 6:00pm, Bring something to share, Members and family's welcome

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

The Night Sky for November 2011

by Bob Nelson, PhD

Hi Folks,

By the time you read this, my wife and I will be relaxing in the French Riviera (for 4 weeks!). (I know, someone's gotta do it …) This was one of Claire Newall's specials (on BCTV) that was just too good to pass up. We will be staying in a condo in Juan les Pins, just 20 km SE of Nice and only 8 km east of Cannes. We will have a car, of course, and hope to make day trips all over, as Italy, Switzerland and the Alps are quite close. It's the off season, but the temperatures should be in the teens or even 20°C. Sadly, we will not have internet in the suite and will have to hit an internet café to keep up on all the news from home. Hopefully, I'll be able to improve my French. (I can speak it OK, but can't understand what they say worth a bean. Perhaps my brain is just too slow.) Hopefully, we won't return to a blizzard (as happened last time), but there should be lots of cold weather. Maybe the mirrors will have arrived back by then …

Anyway, here is what is going on in the sky this month. Note that all times, except where noted, are PST.

MERCURY is an evening object in November (it reaches inferior conjunction on or about Dec 3). At month's start, it lies a paltry 2° above the SW horizon at sunset. (Then, it is a 5" gibbous disk of magnitude -0.3.) By mid-month; however, the altitude has improved to 3°45' (and the planet is a 7" disk, half illuminated at magnitude -0.2). By month's end, the tiny planet is less visible, again lying only 2° above the SW (and this time is a 10" thin crescent of magnitude only 3.0). Note: All of the evening objects present unfavourable apparitions, owing to the inclination of the ecliptic at this time of year.

VENUS, is an evening object all month. At mid-month, it lies a scant 8° above the SSW horizon at sunset, setting about 75 minutes after the Sun. It's a 12" gibbous blob, around 90% illuminated, and at magnitude -3.9 (its usual bright self). However, in the coming months, as it again catches up to the Earth, it will become larger, half and then crescent in shape, and brighter. Inferior conjunction is in June next year, so it will be our "evening star" for many weeks to come!

MARS, in Leo until January, is a morning object all month (it will not reach opposition until March 1 of next year). At midmonth, it rises just before midnight and, at sunrise, lies some 47.5° above the southern horizon. Then, it is a 6" disk of magnitude 0.9. Not too much to see, I suppose.

JUPITER, in Aries until December 1, is an evening object all month. At mid-month, it lies low in the east at sunset. It makes a transit at 22:36 and sets at 05:46. It's a 49" disk of magnitude -2.9. Having been at opposition on around Oct 27th, it is now slipping slowly around to the west.

SATURN, in Virgo until late 2012, is a morning object all month. However, it is close to the Sun in the sky. On the first, it rises at 05:12 (PDT), about 3 hours before the Sun, and is only 17° above the eastern horizon at sunrise. By month's end, it will still rise about 3 hours before sunrise, but will be almost 27° above the SSE horizon at sunrise. All month it will be a 16" disk of magnitude 0.7.

URANUS, in Pisces until next March, is an evening object all month. At mid-month, at sunset, it lies 13° above the ESE horizon at sunset, transits at 20:36 and sets at 02:41 next morning. As usual, it's a 3.6" disk at about magnitude 5.7.

NEPTUNE, in Aquarius all decade, is an evening object all month. At mid-month, it lies some 17° above the SE horizon at sunset, and

sets over 7 hours later (at 23:26). As usual, it's a 2.3" disk at about magnitude 8.0.

Standard time returns on Sunday morning, November 6 at 02:00. (Spring ahead, fall back.)

CONSTELLATIONS to look for in November (at 21:00 PST) are Sculptor, Western Cetus, Pisces and Andromeda.

Sculptor (Scl, "The Sculptor's Tools"), another southern constellation at the limit of our visibility here in Prince George lies out of the Milky Way. It contains NGC 253, a spectacular spiral galaxy, a number of fainter galaxies, a faint globular (NGC 288) and, near the latter, the south galactic pole which, at declination 27.5 degrees south, is just visible from Prince George. The brightest star, Alpha Sculptoris, is a B7 giant radiating 1700 times solar, has a radius of 7 times solar, and a mass of 5.5 solar. The reason it is so dim (at 4.3 mags) is that it lies at a distance of 670 lightyears. Its claim to fame – and the reason I am telling you all this – is that at an age of 81 million years, it is at the end of its hydrogen-fusing cycle. The core, which is comprised almost entirely of helium, will ignite after the star expands, the surface cools, and the star becomes a red giant. The star is presently classified as a slow rotator; this relative stillness results in a lower than solar surface helium abundance (no mixing) and an enhanced abundance of heavier elements such as silicon, titanium and manganese. The magnetic field generates star spots, enabling astronomers to measure its rotation period. The magnetic field occasionally flips and controls the behaviour of a close-in cloud of circumstellar gas. [Taken in part from http://www.astro.uiuc.edu/~kaler/sow/fomalhaut.html.]

Western Cetus (Cet, "The Sea Monster"), contains a number of galaxies, including M77, which is a bright and compact spiral galaxy, contains three distinct sets of spiral arms and lies about 60 million light years distant. According to Burnham, this and NGC 4594 in Virgo (The "Sombrero") were the first two systems in which very large redshifts were discovered, leading to the discovery of the expanding universe.

Pisces (Psc, "The Fishes"), lies on the Zodiac. It contains M74, according to Burnham, one of the faintest and most elusive of the Messier objects requiring a dark sky and suitable eyepiece. Pisces also contains, according to Norton's 2000.0 Star Atlas, the galaxies NGC 487 and 524.

Andromeda (And, "The Princess of Ethiopia"), is familiar to most of us; it contains the "Great Andromeda Galaxy" M31 along with its satellite ellipticals, M32 and NGC 205 (a.k.a. M110 -- but not really on Messier's list). According to Burnham (and the references therein), M31 has been known at least as far back as 905 AD; it was known as "The Little Cloud" and appeared on star charts long before the discovery of the telescope in 1609. Simon Marius is usually credited with the first telescopic observation in 1611 or 1612. Early observers thought the "nebula" consisted of glowing gases but long photographic exposures early in this century revealed it to be a vast star system. Edwin Hubble, observing Cepheid variables with the 100" Mt Wilson telescope, established the distance as around 90,000 light years, well out of this galaxy. Later, corrected calculations in 1953 extended the distance out to 2.2 million light years. We now know that M31, along with M33 and our galaxy, are the three largest members of the "Local Group", gravitationally bound and holding numerous smaller galaxies, including the Large and Small Megallanic Clouds. Needless to say, M31 has been the subject of many studies by professionals using the largest telescopes and is also a fine object for amateur study and photography.

Clear skies to all,
Bob

Dear Diary

Sometime in the late 90's when I still lived in PG we were on a family holiday in the lower mainland, when I got a call telling me that our house had been broken into and some of our things stolen. I'm almost embarrassed to admit this, but the first idea that popped into my head was "I hope they didn't get my astronomy diary." That was of course a completely ludicrous idea. What juvenile delinquent getting money together for some video games or some crack addict trying to finance his next fix was going to think "*Here is a detailed drawing of the night sky on April 10, 1997 with Comet Hale-Bopp near Algol in Persus. I better take this*." I was actually shocked when this idea popped up, but I had the good sense not to bring this to the attention of my wife, as she was a bit perturbed about the news that her entire CD collection was gone. Still it illustrated to me how much fun, and pleasure, that astronomy has given me.

Recently I was called by someone who wants to get a telescope so that he can take up astrophotography. As I am perpetually stranded, at least in my opinion, at the level of a novice astronomer, --I prefer the more dignified 19th century term *gentleman astronomer*-- I find I am particularly well suited to advising beginners. I gave him my standard speech about going to the local Okanagan Centre, go observing with some of the members, look through their telescopes, get a couple of good books on topics that interest you etc. (As he has been a serious photographer for many years I think he is likely to really get into astronomy.) He was kind of surprised when I told him to keep a journal and to do some sketches of what he had seen to supplement his pictures. That idea had not occurred to him, but for me keeping an observing diary has been one of the most satisfying aspects of recreational astronomy.

Luckily one of the first books I ever looked at about observational astronomy was the classic *Backyard Astronomers Guide* by Dickenson and Dyer. They had a brief piece by an astronomy educator about the pleasures of drawing, and setting down your observations for later review. That inspired me to keep a written journal, periodically illustrated in pencil in a rough hand. It has given me an immense amount of pleasure to look back from time to time. I have notations about hanging around observing with Bob Nelson, or taking his astronomy course at CNC, about the first time I saw Jupiter and its moons rising through the trees to the east of the observatory through a large telescope, and the nights I have gone out to search for and find a comet that *Sky News* has alerted me to. My drawings of star clusters and galaxies are as new as when I first made them—it's amazing how lifelike my drawings appear when I take off my glasses and stare at them. They are as fuzzy as real dark sky objects! (If I really want to replicate the night sky experience I stare at them through a toilet paper tube—it's really satisfying, just don't let anyone catch you doing it!)

Recently one of my adult sons, who is married and has children of his own, was explaining to some of his friends how when he was fifteen I had shown him a cluster of stars, named *The Beehive*, and how he remembered me taking him out to show him the night sky from time to time. As my son had acted like a typical teenager at that time, and appeared totally indifferent to what I was droning on about, this recollection almost knocked me over. I went and looked it up in my diary, where I had noted our observation at the time, and it has become a very touching family moment for me. I'm glad that B & E artist didn't get my diary!
Vince

Who Discovered

Cradled in a nook of my brain, a place unseen, a place unknown, is a secret. A secret that is not mine alone. A secret so wonderful that it is all of ours to share, to hide, and for all of us to enjoy in the constantly passing moments of our lives.

But still a secret.

Where am I going with this...

All this started with a call to arms for my mighty laptop to search the collective global astronomical knowledge of the internet with the hopes that it would spit out something that would inspire me. I egged it on, used words both technical and lay, and finally after time-immortal without anything, rendered myself aiming at a target not there. It failed. I failed. Nothing sparked a witty or quirky response in me. I had nothing to write. So, I visited my recent haunts, those that I have written about many times in this newsletter. I visited websites, reviewed podcasts and tried to find inspiration in the known. The wheels spun and spun, and the vehicle of inspiration stood still. A tired mule in the summer sun, effortlessly going nowhere.

Then I had a novel thought. Ask for something that can't be answered:

Who discovered....

...Earth.

It seemed sensible, in light of the somewhat recent Pluto demotion, the ongoing beauty of Saturn being sent back by the Cassini mission, new missions making the news, James Web finally being back on track to help us discover more. We are amazed – rightly so – by our comrades in the universe gently and poetically revealing themselves to us. But what about *us*. Obviously nobody *discovered* Earth, really? If anything, we could source the first single celled...no, no we can't. They weren't the first. We could source the first self-replicating molecules....no, no....not them either. If we go back all those 4.6 billion years and go through anything we would retrospectively dub "life", we could safely suggest that it never was discovered. And that is what I am suggesting. Nobody knows Earth, or Mercury or Venus or...and that is my secret. It is your secret, too. You'll see soon that you know it. You do know it. To discover is to know...and we don't know. But that's the beauty.

Be it orbiting satellites, ground tramping geologists, tropic heat enduring herpetologists, Arctic glacier researchers, enzyme replicating molecular biologists, or bird-watching ornithologists....we are discover*ing* Earth. It is not discovered. We are watching the discover*y* of Earth, one orbit, one dig, one frog, one core, one pipette and one nest at a time. Each pencil stroke in the books of science paint the picture of our home deeper shades of every colour imaginable. We sit, eat, work and, hopefully, love our chunk of rock. We are planetary patriots. And look at how much we know about it already...but realize how much there is to go. The Nobel Prizes keep making victors of those who unleash one more unknown in our process of discovery. Amateurs keep getting noticed for their endless work.

Now, the Universe. Ok, back up a little. The *known* universe. Back up further. Our gravity well…the Solar system. We have discovered it, yes. But we don't know it. Imagine we knew only that Earth was solid rock and had, at least part of the year, ice or some sort of ice like feature, at its poles. Would we say we know it? I would argue not. So, what is this word 'discover', really. To discover is one thing. To know is another. And to know, we need to look. Ornithologists with nets and feather samples do a fine job here on Earth, but we want to *discover* those specks of light out *there*. We need to keep looking. We have found the answer, perhaps, to "where?" but we cannot and will not stop there. I have pointed a telescope at the same stars countless times not because I wanted to see them again, but rather because I wanted to dig deeper. Maybe I missed something. Maybe there is something more to see…to discover.

Discovery is an ongoing process, and that is, I presume, why you are reading this newsletter, egging the sun to dip below the horizon so you can see the stars one more time, sticking your eye to an eyepiece…because you want to discover. The secret I have trapped in my head is just that. We don't know our own home planet, we are getting to know it. After 4.6 billion years, we are still learning. Lets not assume that one probe and a few moments of time lapse, a couple of measurements and a 'job well done' hat tip from the public is enough to say we discovered something. We have to keep looking, keep going…keep going.

And, closer to home, all the things that we know – the accumulation of years, decades, of interest and looking up – are only known to us. The generations to come, the kids in school right now, don't know what you know. Don't know what is obvious. They are still discovering. Their secret is yet to be unleashed – when they are experienced enough to realize that they know so much yet don't know anything, they will be the ones to help the generation following them realize the same thing.

I have no shortage of praise for those in our history and our present who are discovering. I hold no contempt for those who push those boundaries…quite the opposite. I revere them. But the job is not done.

So, remember that each young head that bounds into the club classroom, each questioning parent, each scientist on the radio, each time you clarify a misconception at work, each time you take a part in helping others discover, you are one of them. The "them" that makes the far away make more sense, as we all discover it together. We may not yet know Earth, but how we are trying. Let's never give up on the other direction. Let's keep discovering those places we thought we knew.

Trevor

Royal Astronomical Society of Canada

Prince George Centre

AKA the ***Prince George Astronomical Society***

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