



# PeGASus

Newsletter of the

Royal Astronomical Society of Canada: Prince George Centre

Published: January to May & September to November.

[www.rasc.ca/princegeorge](http://www.rasc.ca/princegeorge)

## December, 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

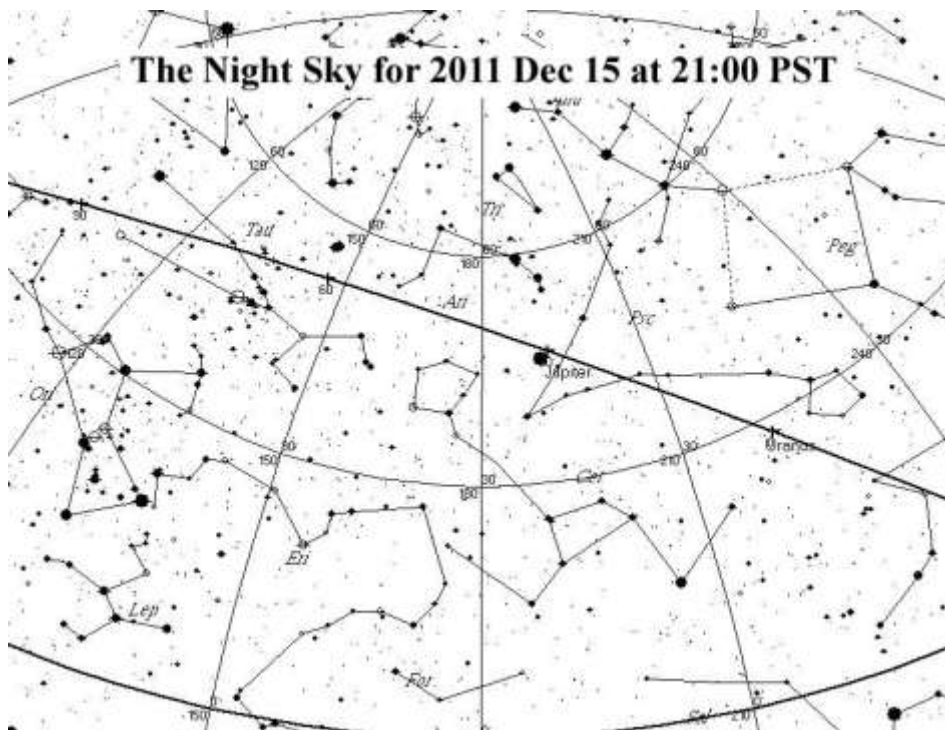


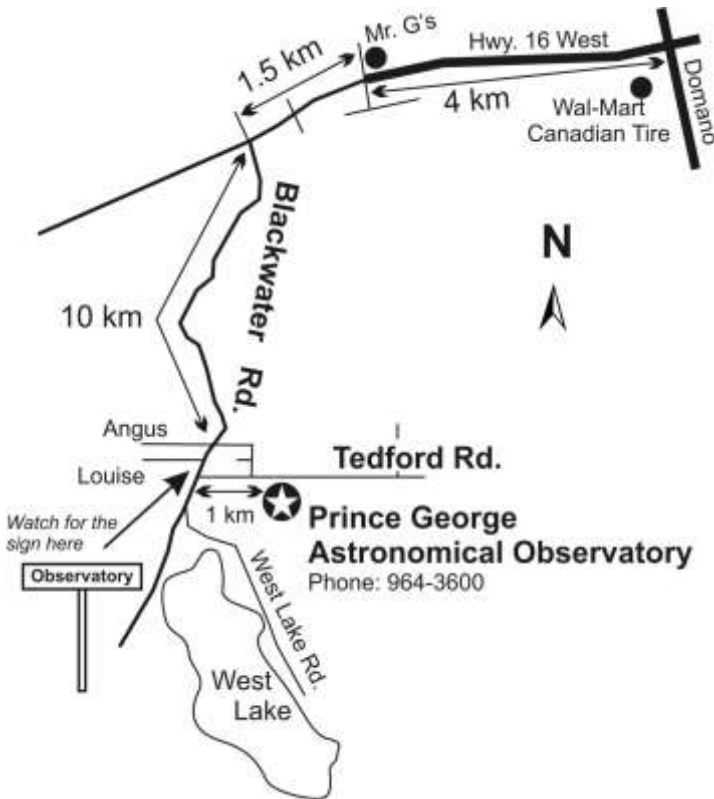
### In Issue # 186

P.G. Centre Executive	2
Editorial	3
The Night Sky	4
<b>What's the Point?</b>	<b>6</b>
Thanks Guys	10

### Coming Events

Next Business Meeting at Arctic Manufacturing  
3323 Hart Highway  
January 11, 2012 at 7:30 pm  
Members Welcome





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Contributions to the newsletter are welcome.

***Deadline for the next issue is***  
***January 20, 2012***

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## Coming Events

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

*The Observatory is closed for the winter break so there isn't much to report in coming events. Remember even when there are no public events scheduled, key holders often use the observatory. If you are not on our viewers list please contact Blair Stunder and he will make sure your name is added. If a member is planning a visit to the observatory he will send out an e-mail to the viewing group, you can than contact him directly and arrange times. Members visiting the observatory are happy to have company, and it's a great way for you to pick tips and learn about the observatory. G.S.*

*For an up to date list of the Volunteer Schedule / meetings / classes visit our website in the MEMBERS AREA*

[www.rasc.ca/princegeorge](http://www.rasc.ca/princegeorge)

# Editorial

By Blair Stunder

Has technology finally spelled the end of PeGASus? Has the ability to reach all the members with a simple single e-mail about an upcoming event or article of interest spelled the end of the long running newsletter?

The archives show the newsletter was started sometime in November, 1986. The starting line, “something that has been needed for a long time to keep us in touch -- sending out a newsletter” states its birth and possible demise. As technology eases the ability to contact our members through; e-mail, facebook or our website, traditional forms of keeping in touch seem to fall by the wayside. One only needs to walk around the Observatory to witness the changes, a storage closet that was designed as a darkroom and never finished as CCD equipment made film obsolete, upgrades to the 0.6m telescope to be fully computerized made setting circles on the telescope obsolete.

Each month, the request for articles seems to go unheeded and the newsletter seems thinner each month. The direct costs to the society for postage and printing are minimal, in the long term it could mean the demise of the newsletter.

Articles are greatly required; they can be as simple as a picture of you and your equipment, a brief paragraph of viewing event. A personal testing/evaluation of astronomical equipment that you have tried or are using, its advantages or shortcomings would be welcome. Shared knowledge is the greatest tool. Without the response from our members, the newsletter may follow the same path.

President  
Blair Stunder

## PG Skies for 2011 December

By Bob Nelson, PhD

Hi Folks,

As I write this (on Oct 25), I am sitting in our condo in Juan Les Pins, a small town in the French Riviera, roughly halfway between Cannes and Nice. As I wrote last month, we took advantage of one of the “Travel Best Bets” on Global BC. We have 4 weeks and a car, so we try to make the most of the attractions in this part of Europe. Right now, it is raining very hard and we are having a slow day today. Luckily, there is free internet at McDonald’s, just on the other side of the roundabout near our condo complex.

Driving in France is not so bad, but one does need to be sharp about it and alert at all times, because there are narrow driving lanes, crowded streets, fast drivers and much going on at all times. I am totally dependent on my wife to do the navigation, but we have a GPS unit loaded with maps, and some good paper maps. Sadly, the goto function on the GPS unit is not working, for some reason; however, we will manage, even though it may pose a stress on our marriage!

So far we have had a great coastal walk on a stormy day. There were a number of sailboats around with some pretty competent crews, I would say. I got some great video with my new camera (100 MB for 3 minutes of VGA!)

Anyway, here is what is happening in our skies this month:

MERCURY starts out the month as an evening object (but dang near impossible to see, lying only  $3.5^\circ$  above the WSW horizon at sunset. For what it is worth, it is a 10” crescent of magnitude 3.7. The tiny planet reaches inferior conjunction on December 4th. At mid-month, it rises at 05:36 (almost 2 hours before the Sun) and lies  $15.5^\circ$  above the SE horizon at sunrise. Then, it’s a 12” half-illuminated disk of magnitude 0.1. By month’s end, it rises at 05:51 and lies  $14^\circ$  above the SE horizon at sunrise. Then, it is a 6” gibbous disk 80% illuminated at magnitude -0.4. (It’s moving away from Earth, and although smaller in angular size, is brighter on December 31st because more of it is illuminated.)

VENUS is an evening object this month. At mid-month it is  $19^\circ$  above the SW horizon at sunset and sets a little more than 2 hours after sunset. All month it is a gibbous disk of magnitude -4. At the beginning of the month, it is a bit lower at sunset, fainter and nearer fully illuminated. At the end of the month, the situations are—of course—reversed. It is a fine naked eye object, as always (but of course featureless in the telescope). It will not reach inferior conjunction until early June.

MARS, in Leo all month, is visible for most of the evening in December. At mid-month, it rises at 23:02, transits at 05:35 and, at sunset, lies  $51^\circ$  above the SW horizon. It’s a 8” gibbous disk of magnitude 0.5.

JUPITER skims along the southern border that Arries makes with Pisces for most of December. Following opposition last month, it is now drifting along to the west as Earth leaves it behind once again. It is still visible for much of the night, however. At mid-month, it lies  $32^\circ$  above the ESE horizon at sunset, transits at 20:19 and sets at 03:00. It’s a 46” disk of magnitude -2.7.

SATURN, in Virgo all month, is a morning object this month. At mid-month, it rises at 02:35, and lies some  $40^\circ$  above the SSE horizon at sunrise. It’s a 16” disk of magnitude 0.7.

URANUS, in Pisces all month, is an evening object this month. At mid-month, it lies  $42^\circ$  above the SE horizon at sunset, transits at 18:27 and sets at 00:32. As usual, it’s a 4” disk of magnitude 5.8.

NEPTUNE, in Aquarius all month, is an evening object this month. At mid-month, it lies almost  $38^\circ$  above the southern horizon at sunset and sets over 5 hours later (at 21:47). As usual, it’s a 2” disk of magnitude 7.9.

CONSTELLATIONS to look for in December (at 21:00) are Fornax, Eastern Cetus, Western Eridanus, Aries, Triangulum and Western Perseus.

Fornax (For, “The Furnace”), is another southern constellation with a number of faint galaxies.

Eastern Cetus (Cet, “The Sea Monster”). In eastern

Cetus, we see Omicron Ceti, or Mira (“The Wonderful”). Mira was the first of the long period variables discovered; I’ve discussed this star before. Six or seven degrees northeast of Mira lies M77, a bright and compact spiral galaxy of 10th magnitude. According to Burnham, it’s unusual in that it has three spiral arms. Also, this galaxy (together with the “Sombrero” Galaxy in Virgo) was the first to reveal a large recessional velocity. In November 1913, V.M. Slipher obtained spectra with exposures over 6.5 hours (!) using the 24" refractor at Lowell Observatory.

Western Eridanus (Eri, “The River”) is a large constellation out of the Milky Way; the southern part (which we cannot see from Prince George) zigzags its way south to -60 degrees where the bright star Achernar (Alpha Eri) resides. The triple star system Omicron 2 Eridani consists of a wide (82") AB pair making an orbit in some 7000-9000 years. (The ‘A’ star is of spectral type K1 V with visual magnitude 4.5.) The inner BC pair is separated by some 9" at the moment; the ‘B’ star is a white dwarf (magnitude 9.7) and the ‘C’ star is a faint red dwarf (magnitude 10.8); and the orbital period is some 248 years. This white dwarf was the first to be recognized as such and is certainly the easiest to find with small telescopes. It is about equal to the Earth in size and a little less than half the mass of the Sun. Consequently, its density is some 90,000 the density of water (it’s one big atom, folks!).

Aries (Ari, “The Ram”), is the first entry in the Zodiac and is a northern constellation out of the Milky Way. The brightest star, Alpha Ari is a red giant (sp. K2 III) and lies about 75 light years distant. The really good nebula, NGC 6188 lies, alas, at -48 degrees declination and is not visible from Prince George. NGC 6397, a fine globular, is also too far south for PG astronomers.

Triangulum (Tri, “The Triangle”), is a small constellation just south of Andromeda and contains the famous galaxy M33 (“The Pinwheel”), discovered by Messier in August 1764, and a member of the Local Group of galaxies. As most visual astronomer know, it is a surprisingly difficult target, owing to its large size and low surface brightness. Burnham reports that individual experiences vary – some find it easily in binoculars (or even with the naked eye), whereas others cannot find it at all and conclude that the posi-

tion must be in error! [My own experiences lie between these two extremes!] And it is truly large! Burnham says that in the best photographs the nearby galaxy measures some 60' x 35'. With truly large telescopes (or a CCD camera on a backyard telescope), M33 is revealed as a huge double spiral with a small nucleus (Hubble type Sc). It was first studied by Hubble himself who found many high luminosity O and B stars, open and globular clusters, Cepheids, irregular variables and novae. (Today we know that the arms are the location of active star formation.) Owing to the many hot stars, M33 is bluer than most galaxies, as would be revealed in a long CCD exposure (that I hope to take next period of clear, steady air). In the early 1900s, the distance was set at 750,000 light years; in the 1950s (when the Cepheid zero point was recalibrated), this distance was more than doubled. It is interesting to note that M33 is practically stationary with respect to our galaxy: it is approaching at a mere 7 km/s. Another fact is that M31 and M33 lie only about 570,000 light years from each other – about 4x closer than we are to either. All three galaxies contain roughly the same mass – about 2 billion solar masses.

Western Perseus (Per, “The hero that saved Andromeda”), is a northern constellation (appearing overhead at times), is in the Milky Way and contains many wonderful objects familiar to many of us. One object is Beta Persei or Algol, the most famous of the eclipsing binaries. Also in this constellation, look for the Double Cluster. It’s very prominent to the naked eye, lying as it does about halfway between Alpha Persei and Gamma Cassiopeia (the middle star of the big W in the sky). For what it’s worth, the official designation is the “h and X (chi)” Clusters, where the former is NGC 884 and the latter 869. References to the cluster go back as far as 150 BC - both Hipparchus and Ptolemy (early Greek astronomers) noted the clusters - but the actual nature of the clusters was not known until telescopic observations were possible. Today we know that the clusters lie about 7400 light years distant; each has a diameter of about 70 light years and contains about 5000 solar masses. They are a striking view in binoculars, in finder scopes or in telescopes of any aperture.

## What's the point?

I read a lot of personal development books. They all seem to follow a basic formula you must do to be successful.

- 1) Know yourself. Understand what makes you tick. Your strengths and weaknesses.
- 2) Develop a vision for your life. What do you want it to look like? Be big and bold here.
- 3) Set a realistic time frame for when you want this vision to be in effect.
- 4) Break your vision down into goals. Build them so that once all the goals are reached you will be living your vision.
- 5) Break your goals down further into action steps. Build them so that by doing these actions you will reach your goals.
- 6) Take action. Do the steps! Don't hope they get done. Do them. No one else will do them for you.
- 7) Don't quit. Keep doing small things everyday to reach your goals. Some days will be good, some will be bad but the only way to for sure never reach your vision is to quit or to die. There might not be much you can do about the later but you never have to quit. Ever.

I've been wondering as I write this what this has to do with astronomy. Have you?

Here is an example I came up with. The race for the moon.

Let's break it down.

### Know yourself.

The USA. What made them tick? At they time they were at the top of the world right? They had just had a major technological upswing that started from WWII. They could create plastics and new chemicals. They could control their environment like never before. They could split the atom for crying out loud! They were the BEST. Then along came the Soviets. They put a satellite in space. They went right out of this world. Where no man had gone before! Holy cow. Suddenly the USA finds itself in second place and a bit scared. They are thinking "If the Soviets can get this little satellite in orbit around the earth today what will they be able to do tomorrow?"

### Develop a vision

So what was the vision? Easy, be the BEST country... ever.

### Time frame.

Before the decade was out.

### Develop goals to achieve your vision.

The goal was simple, big and bold. Put a man on the Moon. Wow. Again, holy cow. "If we could do that we would be the BEST again", they thought. No one would be able to top that. A freakin' MAN ON THE MOON. Awesome. It'd be like "Hey, Mr. Soviet what can you do?" "Oh, I can put this little silver ball that beeps in orbit around the earth. Pretty cool, eh?" and then the same question to Mr. USA. "Hey, Mr. USA what can you do?" "Oh, I can put a MAN ON THE MOON, nothing major."

Break down your goal.

What did they need to do to be able to get a man on the Moon? This launched a LOT of steps and programs to complete them. They needed to learn about the nature of the moon, more about space, rockets, how to communicate over vast distances, how to protect the astronauts, build the capsule, lander and other equipment, train astronauts. If you think about it for a minute you will find the list just goes on and on and none of it is easy. Hence the phrase about “rocket science”. If it is not THAT hard it's not a big deal.

Take action.

Did they stop at J.F.K.'s speech? No they did it. They spent the money. They trained the people. They developed the technology. They created the programs.

Don't quit.

Did they quit when the going got tough? When they lost their astronauts in the Mercury accident? When the political pressure to quit mounted from setbacks and the vast amount of money the project was consuming. No. They did not quit and they reaped the many, many rewards. They became the number one nation.

So where am I going with all this? I'm not sure. I guess, it's sort of up to each of you to figure out.

I'll leave you all with a question though, a homework assignment if you will. A question that I think needs answering.

How does this translate into our astronomical society. What makes it tick? What's its vision? What are the goals it needs to achieve its vision? What actions are you, the members, going to take to get it there? Most importantly, do we quit or not





A general work-bee was planned for Saturday September 17, Blair Stunder, Doug Wayland, Maurice Saluka, Rusty Hoff arrived bright and early. There was a long list of important repairs needed and these guys got to it and accomplished a lot.

Thanks Rusty  
Thanks Maurice  
Thanks Doug  
Thanks Blair







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

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