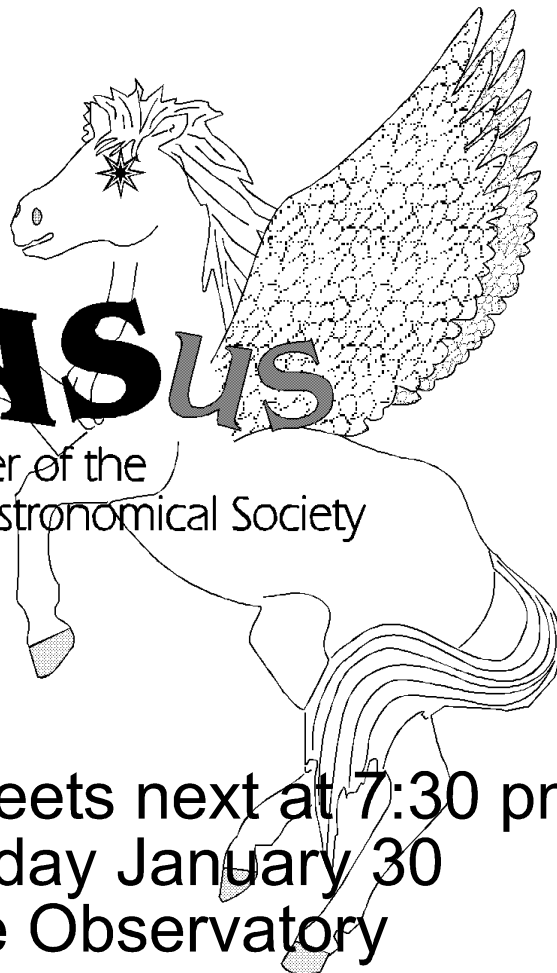


January 2002 ISSUE #117

the

PeGASus

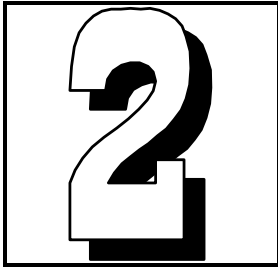
Newsletter of the
The Prince George Astronomical Society



The PGAS meets next at 7:30 pm
Wednesday January 30
at The Observatory

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the PeGASus
is published
monthly by the
*Prince George
Astronomical
Society.*

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

Contributions to the newsletter are
welcome.

Deadline for the next issue is

February 15

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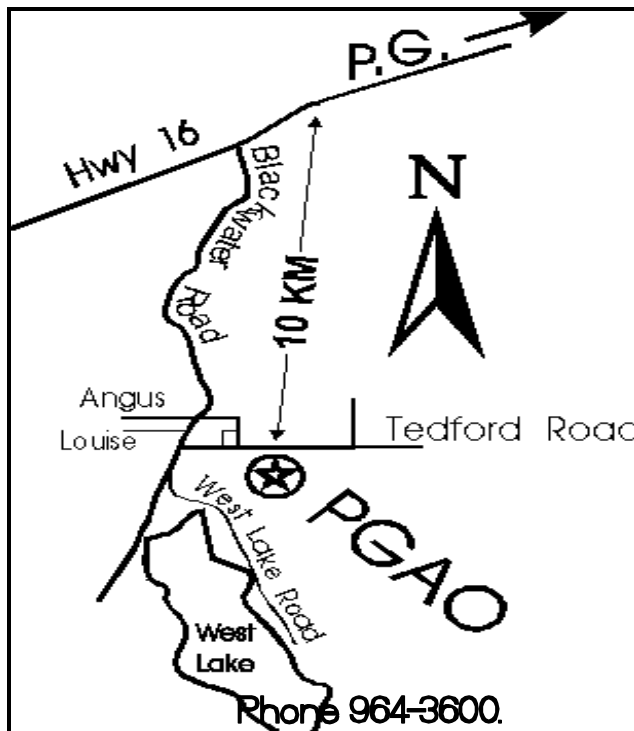
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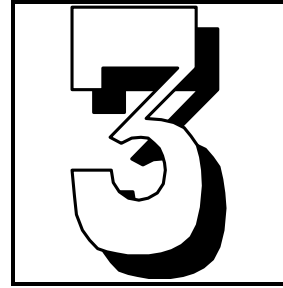
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Editorial

By Gil Self

True Grit

Two excellent letters to the editor of the Prince George Citizen , on January 15, 2002. Both commented on an article in an national newspaper referring to Prince George as a ‘gritty mill town’. Both, as is typically Canadian, put a positive spin on a less than complimentary article. I did not read the original article but as I understand, the reference was gritty as in dirty.

One of the letters reminded that most northern cities that receive significant snowfall and tend to their streets with sand end up with some gritty days during snow thaws. Both letters were examples of the “Special Grit” of this community. Over the years we have been “Hedy Fry’d” more than a couple of times, each time people just shook their heads and got on with the day. We don’t expect much from Victoria, Vancouver or Ottawa. In-fact, leave us alone and we will get things done, and probably done better – as evidenced by their numerous references in the letters to top-quality and world class faculties in Prince George. Thank you to the authors of those letters and I approve all you have said.

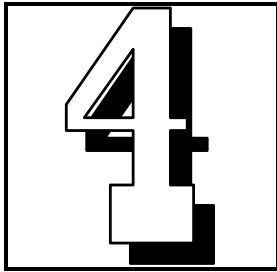
I would only like to comment on two small points. One letter suggests that folks who don’t realize Prince George is a great place to live should come and enjoy what we have to offer. While I realize we need growth to survive in today’s volatile economy, I certainly don’t want PG to become another Vancouver. I think we should keep our little secret to ourselves. Maybe not realistic, but I would prefer to keep our 15 minute rush hour. The 15 minute rush hour is not just about traffic but all the other small things that make this “town” just right!

The second comment I have is that, in referring to all the top quality and world class facilities in Prince George. They missed one!

The Prince George Astronomical Society (PGAS) operates a world class, research grade observatory just west of PG. This is a rare opportunity for residents of this community because the observatory is open to the public Friday evenings for 6 months of the year, and by appointment almost any other time. Observatories of this size and quality are usually behind locked fences or on mountain tops and not accessible to any but the blessed. The knowledgeable staff at the observatory demonstrate the many fine instruments we have when the weather co-operates. We offer various audio visual presentations depending on the audiences age and sometimes just answer questions, lots of questions. And generally support science in Northern BC. Its fun!

To volunteer to become a staff host just get in touch with any member of the executive. Clear Skies GS

Please be sure to renew your PGAS membership if you have not already done so. You can renew your membership at <http://www.pgweb.com/~astronomical/> Or with any member of the executive



Coming Events

If you are involved with any astronomical or otherwise scientific activity on behalf of the PGAS, please list the activity here.

**PGAS Meets next January 30
7:30 pm at The Observatory**

The Night Sky for February 2002

by Bob Nelson, PhD

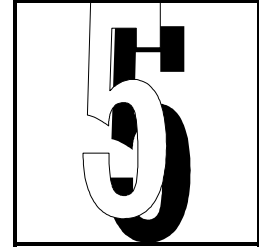
Hi Folks,

As I write this, my wife Lois and I are now settled in Christchurch (Chch), New Zealand where we'll be until the end of June. In case you haven't heard, we're here on my educational leave from CNC where I'm continuing my astronomical research, this time under southern skies.

Here are some brief notes to fill you in on our trip: We left Vancouver Dec. 1 for Los Angeles and then on to Rarotonga, Cook Islands and 5 days in the rain. We then went on to Auckland where we rented a car and headed north. We ended up at Paihia on the Bay of Islands (named by James Cook in 1769). It's a truly lovely spot; we went for a trip (in the sun) on a high-speed catamaran that took us through the famous 'hole in the wall' and let us see dolphins up close. Next day we travelled north in a 4x4 bus to Cape Reinga. (This is at the extreme north tip where the Tasman Sea meets the Pacific - a wild and beautiful place.) On the way, we drove up the 90 Mile Beach on the hardened sand and stopped at the end by some giant sand dunes to have some fun sliding down on boogy boards (yeehaw!). On the way back, we stopped at a factory/showroom where magnificent wood from ancient (40,000 year old) Kauri trees is made into furniture, kitchen utensils, etc. How can they get wood so old, you ask? Well, they dig it out of swamps with bull dozers and giant cranes. Living Kauri trees, protected by law, can be over a thousand years old, reach over 100 metres in height and be over 3 metres in diameter at the base! Truly amazing trees. We actually walked up a circular staircase that had been carved from one chunk 3.5 m in diameter and 5.1 m high!

We then travelled to the south island, taking the ferry across Cook Strait and Queen Charlotte Sound in the rain. We called in at Chch, and headed down to Queenstown on Lake Wakatupi, which is New Zealand's answer to Banff (only nicer). We went for a day trip on the SS Earnslaw, which dates from 1912 and features a triple-expansion steam engine fired by coal. The day featured a stop at a sheep farm where we could get up close to various animals (I was able to hold a 5-day old lamb!) and watch a sheep shearing demo. We then went to Te Anau and up for a cruise down famous Milford Sound, where the 4000' mountains

drop straight into the fjord. We then stopped in Invercargill (at the extreme south end of the south island) for a great sea walk, and then on to historic Dunedin, which was originally settled by the Scots. Near there, we visited an albatross exhibit (the great birds nest there) and watched these amazing birds soar (they have a 3 metre wingspan and can fly 500 - 1000 km a day in the southern winds). After that, we visited 'The Penguin Place', the home of the only blue penguins to nest on a mainland anywhere. We crept through covered trenches and blinds, and were able to approach within a metre or so of two of them (I got some superb pics). After that, we made our way back to Chch and took a day trip on a square-rigged ship, The Spirit of New Zealand (it's a barquentine for those who know sailing ships), and were greatly entertained.



But now, it's back to work. I have met my colleagues in the Dept of Physics and Astronomy and am getting along famously already. I hope to do some observing at Mt John Observatory, near Lake Tekapo which is a three hour drive from Chch (we have it soft in PG!!). You have to go down for a week, sleep in the dorms and hope that it clears sometime in that period. I'll relate more next month.

Anyway, here is what is happening in YOUR skies next month.

PLANET ROUNDUP

MERCURY, is a 7.7" disk of magnitude 0.1. According to The Observer's Handbook (OH), it reaches greatest elongation west on Feb 21 (that is, it's to the right of the Moon for northern hemisphere observers). It's therefore a morning object, best seen low in the ESE before sunrise before midmonth.

VENUS, is lost in the glare of the Sun this month.

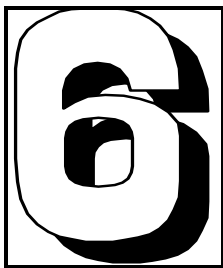
MARS, in Pisces, until February 27 when it passes into Aries, at mid month sets at about 10:30 PM (about 5 hours after sunset). It's a 5.1" disk of magnitude 1.1, and therefore not very spectacular (owing to its great distance from us -- 1.8 Astronomical units).

JUPITER, in Gemini all year, sets at mid month at about 5:30 AM. It's a 43.7" disk of magnitude -2.5 and should be a glorious object easily seen. The OH tells us that there's to be an occultation by the Moon on Feb 23, visible in a swath from Alaska, Northern Canada, Greenland, Europe, Russia. Well, I fired up Guide 7 and found that, at PG's longitude, you need to be at latitude 58 deg (Fort Nelson?) for a graze to occur. In PG, it will be a miss; the closest being on Feb 22 at 17:31 (5:30 PM, PST) when it is some 2 arcminutes away from the edge of the Moon. At the time, the two objects will be high in the SE with the Sun just setting. Worth a look.

SATURN, in Taurus until the end of August, sets at mid month at about 3 AM. It's a 18.8" disk mag 0.0. Saturn too is occulted by the Moon this month. The OH says that it will be on Feb 21 visible in the southern USA, Europe, etc. For you in PG, the closest approach will be on Feb 20 at 1555 (3:55 PM) PST when it will be 27' away.

URANUS, in Capricornus until the end of March, is lost in the glare of the Sun this month.

NEPTUNE, in Capricornus all year, is lost in the glare of the Sun this month. (It actually rises at mid month about a half hour before the Sun, but good luck in



finding it!!!)

PLUTO, in Ophiuchus all year, rises at mid month at about 2:40 AM. As usual, it's a 0.1" disk at magnitude 13.8

CONSTELLATIONS to look for in February (at 9:00 PM, PST)

Taurus (the Bull) contains two well-known clusters: the Hyades (the horns of the bull) and the Pleiades (M45). Both were

discussed last year. Look also for the Crab Nebula, M1, located about a third of the way from Beta Aurigae to Betelgeuse. This is a celebrated nebula, the remnant of a supernova (SN) explosion in 1054 July 4 (according to one account by Chinese observers), and the remnant was discovered in Europe by John Bevis in 1731 (just before Messier did). As you might imagine, Burnham's is full of lore; consult the observatory's copy for more details. Scientifically, this nebula is almost certainly the best studied. Photographic records date from 1921 and it is possible to measure fairly precisely the expansion rate over some 80 years now which confirms the association with the SN. From many studies, an average distance of 6300 light years is found. Now in the 1930s, several theoreticians (Landau, Zwicky, Gamow, Baade) suggested that the final product of a SN explosion might be an incredibly compressed 'core' hundreds of millions of times more compressed than a white dwarf. Observationally, William Baade, about 1950, associated the SN remnant with a 16th magnitude hot blue dwarf. This was discovered in 1967 by J. Bell and A. Hewitt to emit vast amounts of radio energy in the form of pulses, at intervals of precisely 1.337301 seconds. Soon afterwards, it was announced as the first pulsar or neutron star. Since then, periods as short as a few thousandths of a second have been discovered! See if you can a CCD image of it - it's called CM Tau.

Auriga (the Charioteer) contains the open clusters M36, 37 and 38 which are quite nice and easily found in binoculars or a finder scope. Much more remains to be said, but maybe next year!

Orion (the Hunter) contains (need we say?) the famous Orion Nebula, M42, which is probably the most spectacular object you can look at in the 24" telescope. Quite neglected is M78, a "featureless reflection nebula" on the other side of Orion's belt, but probably worth a look.

Lepus (the Hare) is a strange little constellation with little to see except M79, a fine globular cluster.

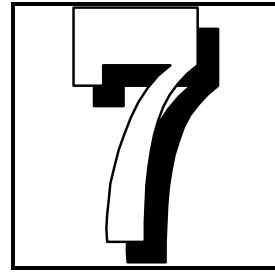
Canis Major (the Big Dog) contains of course Sirius, the brightest star in the night sky (at -1.46 mags). It's quite close, at 9 light years, and has a white dwarf companion that we can't see right now.

Monoceros (the Unicorn) lies in the Milky Way but has little of note except M50 and a few other open clusters.

Clear skies,
-Bob

Letters to the Editor (sort of)

I read an item in the newspaper a short while back. I am just itching to pass along my “comments”, but try as hard as I can, I just can’t come up with an astronomy connection. I feel like Letterman or Leno , a news item that just needs commentary. Wait a minute Leno and Letterman are stars, right. :-)



The item , in short, suggested that an older lady walking her dog on a park path, who failed to come to a complete stop at a stop sign when leaving the path and crossing the street was committing a heinous crime. He even managed to compare this to the roots of terrorism. He was suggesting that a Mountie be stationed hiding nearby to catch offenders. The lady was walking her dog along the path, blew by the stop sign, paused at the curb and crossed the street. I hope he was sending in his comments “tongue-in-cheek”, as are my comments below.

So many questions, so little space.

Could it have been a seeing eye dog, and as such should the dog be charged? Are blind people responsible for what their seeing eye dog does?

If the Mountie springs out to catch the offender and they split in two direction's , does he chase the dog or the blind person and if he doesn't chase the blind person and that person in her blind escape blunders into the path of a car and is killed, who is responsible– the Mountie or the dog. Perhaps it would be the dead lady since she was committing a heinous crime, but who is going to fix the dented car? Not the dog (her only surviving heir) because he's not responsible. Certainly not the Mountie, he was just doing his job– keeping the woodland paths safe. Ok so maybe it wasn't a seeing eye dog. But

If a lady is walking her dog down a path in the woods and comes upon a stop sign. Will anybody hear?

What constitutes a stop? Do you need to pause for specific time? What if your feet stop but you are still swinging your arms? What if you stop and the dog doesn't ? Does the Mountie write up a ticket for the dog?

Maybe they could save money by installing cameras instead of calling on the already stretched resources of the RCMP. I can just “picture” it, armored boxes in the woods with signs and little flashing lights to warn you that the intersection is patrolled by cameras. Your dog is enjoying his walk and not minding you well, a bright light goes off . You better be beamed up by aliens because otherwise in a couple of days you will be receiving a lovely picture of you and your pet. Hey there's another question, some people walk some strange things in the woods. Does this rule/law only apply to people walking dogs? Would there be sub-categories for different pets? Different fines? Would I be fined more or less for failing to stop while walking my Yak. If it's less, that's not fair, sounds like a constitutional challenge to me.

My head hurts!

G S

(you do realize this is not truly a letter to the editor, but rather, humorous comment)

I think Bob and Lois are having fun under southern skies!



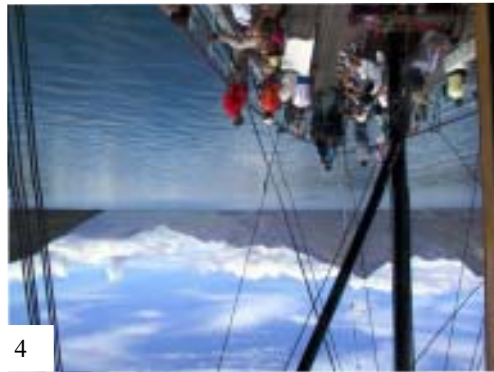
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8



9

1. Goat Island, on the east coast north of Auckland ;
2. in the village of Paihia in the Bay of Islands (named by James Cook in 1769;
3. also in Paihia;
4. Lake Waikatuipi, near Queenstown on a trip on the SS Earnslaw, a 1912 vintage steamer with a triple-expansion steam engine
5. holding a 5-day old lamb!

6. Tutukaka, just north of Waingarai, immediately to the north of Auckland
7. me on Christmas Day just before our cruise on Milford Sound
8. Milford Sound from the cruise vessel (look close-a brontosaurus!)
9. my "ultimate seagull picture" taken on the east coast of the south island, north of Kaikoura (north of Christchurch)

10

Saturn Graze.



Hello Club Members,

I hope some of you saw that this was going to happen and went outside to view it, as it was noted on the space calendar in our web site. The weather all day on Thursday the 27th wasn't good and the predictions for that evening were for overcast skies so I didn't hold out much hope for seeing this graze. But as the predicted graze time of 39 minutes after midnight approached I was delighted to see the sky begin to clear. About 3 hours ahead, so it would have time to cool, I set up my Meade LX 10 scope at a good vantage point on my driveway.

After the scope had cooled to the outside air temperature, which was about -15 C, I noticed that the seeing was poor. The images of Saturn and the moon were swimming around a fair amount due to unsteadiness in the atmosphere, but it didn't take away from the beauty of this scene.

Some thin cloud kept coming and going, but you could always see the moon and Saturn as they approached one another. When they were very close I was able to take several photos. I used Kodak Max 400 in my Canon FTb camera. The camera was attached to the back of my scope with a variable projection adapter. I used my 26mm eyepiece to do eyepiece projection to f/38. I took a roll of 24 pictures in an hour during the event. I scanned three prints representing the main parts of the event in gray scale and adjusted the brightness and contrast a little in photo impression and saved them to jpeg files. The original prints look a little better than these scans I did for you. Also the view in the eyepiece was much more impressive than these pictures. Saturn was easy to see as it approached and left the moon. At mid point of the graze Saturn was very hard to see against the bright limb of the moon, but if you kept your eye on it you could always see at least a part of the ring system sticking out from behind the moon. I think that from a little farther south of P.G., even 10 km, Saturn would have totally disappeared for a few minutes.

I hope you all had a good Christmas and I wish you the very best in the New Year. I look forward to doing some observing with you in 2002.

Doug

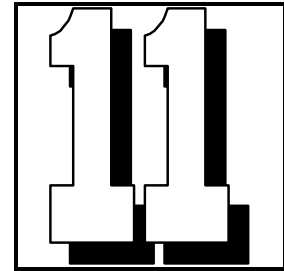
If you get a chance to go observing with Doug don't miss the opportunity. He is very organized and he seems to attract good weather. An evening out with him means good company, good music and not losing stuff in the dark (he has at least three flashlights). Besides who else do you know that finds good observing sites with a helicopter. GS

NEW BOOKS AT THE PUBLIC LIBRARY.

HEAVENLY ERRORS: MISCONCEPTIONS ABOUT THE REAL NATURE OF THE UNIVERSE. By Neil F. Comins. Columbia University Press, 2001.

As you may have guessed, this book, while about astronomical misconceptions, is also about how we think and ways to avoid making errors in our thinking. The author has delightful headings for his discussions – "Fun in the Sun: Some Misconceptions Close to Home" - "The Sage on the Stage or the Guide by Your Side: A Peek Behind the Effort to Help You Unlearn Misconceptions"; or how about "Loosen Your Asteroid Belt"! The author is a professor of physics and astronomy and has interesting insights about the way we learn gleaned from his years of teaching.

Yvonne Whebell,





Astronomy Exam *With Students' Answers*

Below are some of the more creative short answers written by my astronomy students on this year's final exam.

1. What characteristics of meteor showers reveal that comets are the source of meteors?

Comets and meteors are alike in size, shape, and chemical composition.

Meteors entering the atmosphere possess tails.

When meteor showers occur the tails will always have a focal point because their plasma tail always face away from the sun
2. Planets and their moons are spherical, but asteroids are very irregular in shape. Explain why.

This is because they are made of hard and soft materials and the soft materials are eaten away while the hard material is not.

Asteroids are underdeveloped. They didn't get to become planetesimals. That is why they are irregularly shaped.

Because planets and moons rotate around the sun and each other, gravity pulls them into a spherical shape. Asteroids, on the other hand, have no orbit and are just chunks of rock.

Planets and moons have been around a lot longer and have been rotating, which smooths the surfaces to spheres, while asteroids must spin around in orbits for a longer time in order for them to erode into spheres.
3. On the SC001/2 star chart, the path of the sun is shown. Why isn't the path of the moon shown?

Because it is a **star** chart, only consisting of stars.

Because the moon orbits Earth, we don't orbit the moon.

The path of the moon is not shown because we do not need its path to find anything in the constellation charts. Basically there is no use for this path to be shown on the chart.

The moon's path is opposite of the sun's path. Therefore, it doesn't need to be shown in the chart.

The sun affect seasonal changes, the moon doesn't.

The position of the moon does not affect the position of the constellations on the star chart whereas the sun does.

Because the moon follows the earth, therefore it is in the same constellation as the sun for a given date or time.

It cannot be shown because its path is not within the boundaries of +60 to -60 degrees.

Because this is showing the path the sun takes during the day, and you cannot see the moon during this time.

The moon's orbital period keeps it in the same part of the sky all the time.

Because the moon doesn't orbit anything on the chart.



4. Our solar system contains small terrestrial planets near the sun. On the other hand, astronomer in their search for extra-solar planets, find only large Jupiter-sized planets orbiting close to the star. Why is this happening?

Most of the small planets crash to the star or crash to the Jupiter sized planets. Therefore, astronomers only find large size planets orbiting close to the star.

This means that our solar system was formed over a long period of time, whereas those other extra-solar planets were probably formed instantly.

Because the star is still young. Therefore, not enough collisions are occurring to disperse over the plane of extra-solar systems to create small terrestrial planets near the sun.

Because these other stars or suns have captured this larger planet which astronomers believe will not last long until its star consumes it.

5. What reason do astronomers give to explain the fact that the Jovian planets formed far from the sun while the terrestrial planets formed closer to the sun?

The smaller mass of the terrestrial planets better suit the smaller orbits.

The terrestrial planets formed first, then the Jovian planets formed and being gas giants are larger.

The Jovian planets are formed from a 'blast' of the sun, which took or moved a lot of the gasses from the 4 terrestrial planets outward to the Jovians.

The gravity from the sun took some planetesimals from the formation of the terrestrial planets. The sun's gravity was much stronger than the terrestrial planets' gravity, like a tug-of-war for chunks of rocks. The Jovian planets were far away enough to beat the sun's gravity, grabbing the planetesimals for themselves.

The terrestrial planets formed where gravity was high (close to the sun) thus the rocky surfaces. Whereas, the Jovian planets formed farther away from the powerful force of the sun's gravity, thus gas giants.

The gravitational forces from the sun kept the four terrestrial planets small.

The density of the planets is greater in that they are not gaseous.

The solar system rotated and as it did pieces in the outer layers started to clump together first giving them more mass and enough velocity not to be caught by the sun's gravity while smaller ones were pulled towards the sun and as they did eventually gained enough mass to become stable.

Terrestrial planets formed closer to the sun because the gravity of the sun pulled proto-planets with mass closer to it because of the gravitational pull it has on mass.



February Star Hop in Gemini

Gemini, JEM-eh-nye, is home to “The Twins” Castor and Pollux they are the 24th and 18th brightest stars visible from Earth. Castor and Pollux have been featured in myths around the world and have been recognised by one name or another dating back into prehistory. In classical mythology the stars are known as Castor and Pollux sons of Zeus and Leda. They were hatched from an egg borne by Leda after Zeus transformed himself into a swan and seduced her. The twins are most well known for helping Jason and the Argonauts in the quest for the Golden Fleece.

Hop #1: M35 – Open Cluster.

M35 is an open cluster measuring about 28.0' x 28.0' (arcminutes) and containing over 200 stars about 120 of which are 13th magnitude or brighter. To find it start by locating Alpha GEM, Castor (the dimmer of the twins and currently higher in the sky than Pollux) then move to the SW and locate Eps GEM (marked on the map) You may notice that mag 3.0 Epsilon GEM is a double star with a 110” (arc second) separation from its mag 9.0 companion. Continuing to the SW you will notice three stars arcing away from the line you followed to connect Castor and Eps GEM. M35 is located about 1.28° to the NE of the star at the top of the arc (1 Gem) at mag 4.16 it is the dimmest of the three. While you are admiring M35 you might notice another small open cluster just off the SW edge of it. NGC2158 is only 5' x 5' so you will need a mid size scope to see it.

Hop #2: IC444 – Diffuse Nebula.

You can find IC444 by backtracking to Mu GEM this is the first star in the above mentioned arc of stars to the SW of Eps Gem. IC444 is located about 0.5° NW of Mu Gem. The nebula surrounds a 7th mag star.

Hop #3: NGC2392 – Planetary Nebula.

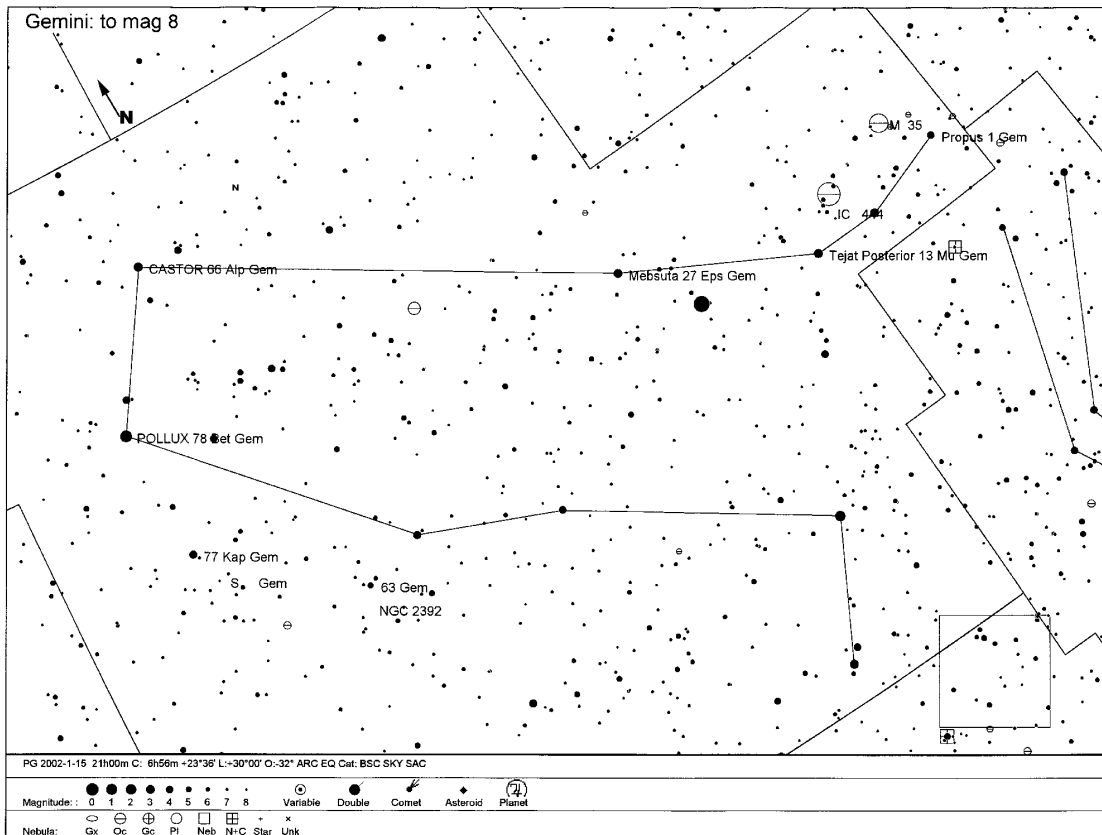
At mag 8.6 the Eskimo/ Clown Face nebula is the brightest planetary nebula in Gemini. Starting at Delta GEM move about 1.5° to the SE to a pair of stars. The brighter of the two is mag 5 and the other is mag 6.5. The Eskimo is located 0.4° to the South of 63 GEM, the mag 5 star.

Hop #4: S Geminorum – Variable Star.

For you variable star lovers out there Gemini holds the Mira type star S Geminorum. A Mira class variable star is a pulsating red giant star. S Gem varies from about mag 8 to 14.7 over a period of 293.23 days. To locate it start at Kappa GEM and move about 1° to the South. If you are interested in observing S GEM I highly recommend going to the AAVSO website (<http://www.aavso.org/>) and downloading their finder charts for it and reading their online manual for observing variable stars.

Good viewing and good luck!

Brian Battersby



PGAS CONTRIBUTORS

The PGAS would like to thank the following individuals, corporations and government agencies who, since 1991, have donated money, goods or services to the construction and operation of the Prince George Astronomical Observatory.

Ministry of Adv. Ed. Training and Tech.	\$25,000
BC Science Council	16,000
BC Lotteries	3,900
Helmar Kotsch (Acme Mas.)	1,932
Northwood Pulp and Timber	1,665
Electrical Services Ltd.	1,583
Royal Bank of Canada	1,500
Xerox Canada	1,300
Regional District of Fraser-Fort George	1,000
Prince George Rotary Club	1,000
The Pas Lumber Co	750
Rustad Broth & Co Ltd	750
Canfor Polar Division	744
Bisque Software	500
Canfor Clear Lake	500

The greatest contributors to the construction and operation of the observatory are from PGAS members who have generously contributed their time to this project. The value of their contribution surpasses all external contributions.

The PGAS is a non-profit organization dedicated to the advancement of astronomy and science in general in Prince George and the neighboring northern communities. Donations of money or materials to the society are greatly appreciated and tax deductible.