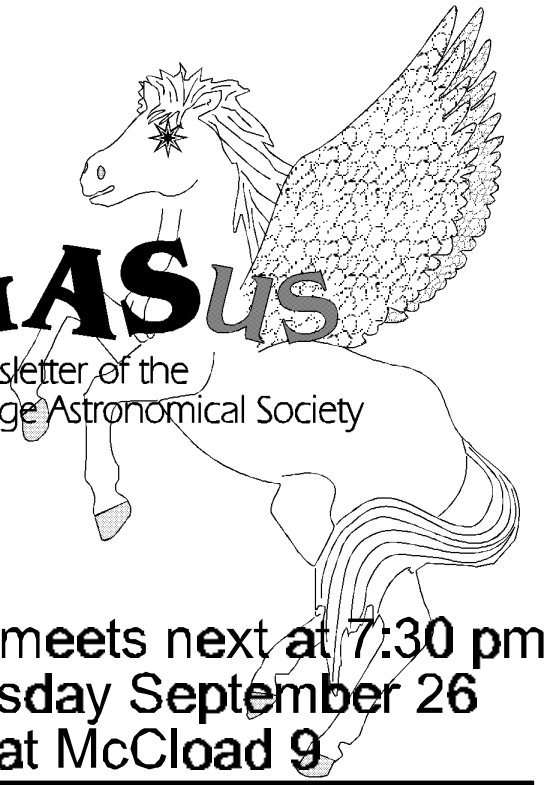
September 2001 ISSUE #114



the PeGASus

Newsletter of the
The Prince George Astronomical Society

The pgas meets next at 7:30 pm
Wednesday September 26
at McCload 9

INSIDE :

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

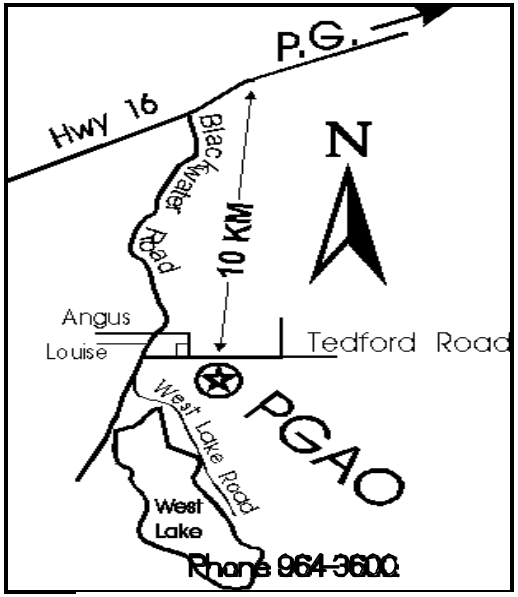
Our pursuits are out of this world.
Our activities are astronomical.
Our aim is the sky.

Contributions to the newsletter are welcome.

Deadline for the next issue is

October 19

Send correspondence to
The PGAS
3330 - 22nd Avenue
Prince George, BC, V2N 1P8
or



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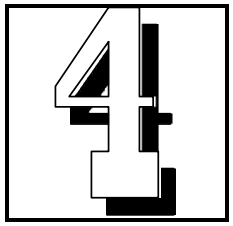


Coming Events

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

PGAS Meets next August 29
7:30 pm at McCload 9

The Night Sky for October 2001

by Bob Nelson, PhD
Hi Folks,

As I am writing this, my wife Lois and I are sitting in our flat on Moss Street in Victoria, near Beacon Hill Park. This is the start of my sabbatical leave, which I am spending at the University of Victoria, learning how to reduce and analyze spectra, do some more observing on the big 72" telescope (I hope), and working on other projects. It's a good life, here in Victoria - the scenic walks near the sea are numerous and wonderful, the neighbourhoods and downtown are interesting, and so far, the weather has been wonderful. I can only regret not having a telescope to use all these wonderful nights! I hope to join up with the Victoria Centre of the RASC and do a little visual observing, so that should help.

At the start of December, Lois and I will board a plane (we hope) to the Cook Islands for a week, then off to New Zealand for 7 months (mostly at the university in Christchurch). We'll keep you posted!

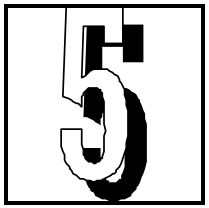
Here is what is happening in the sky this month:

PLANETARY ROUNDUP:

MERCURY is lost in the glare of the Sun for most of this month. However, at the end, it appears very low in the east just before sunrise. Thus begins, according to the Observer's Handbook (OH), the best morning apparition for northern observers this year. Again, according to the OH, Venus and Mercury lie withing 1 degree of each other for 11 days at the end of October and the beginning of November. Have a look for it (them) if you are up at that time then.

VENUS is a morning object all month. On the 15th, it rises in the southeast over two hours before the Sun, and will be a 11" disk (near full) of magnitude -3.9.

MARS, in Sagittarius, until October 26 when it passes into Capricornus, is low in



JUPITER, in Gemini for the rest of the year, rises at mid-month at about 10 PM. It's a 40" disk of magnitude -2.3.

SATURN, in Taurus all year, rises at mid-month about 30 minutes after sunset and is visible all night. It is a 20" disk of mag -0.1.

URANUS, in Capricornus all year, sets at mid-month at about 2 AM and therefore is visible in the southwest all evening. As usual, it's a 3.6" disk at about mag 5.7.

NEPTUNE, in Capricornus all year, rises at mid-month at about 12:30 AM and therefore is a very late-night object. As usual, it's a 2.3" disk at about magnitude 8.0.

PLUTO, in Ophiuchus all year, at mid-month sets in the southwest about three hours after sunset and is therefore a early-evening object. As usual, it's a 0.1" disk at magnitude 13.8

CONSTELLATIONS to look for in October (at 9:00 PM, PDT) are Pisces Austrinus, Capricornus, Aquarius, Delphinus, Vulpecula, Equuleus, and Pegasus.

Pisces Austrinus (PsA, "The Southern Fish"), visible only on the extreme southern horizon here in Prince George and lying as it does off the Milky Way, contains only a few galaxies and no star clusters or nebulae. It does contain the well-known star Formalhaut (= Alpha PsA = Al Rischa, "The Cord"), the 18th brightest star in the night sky. It is a fine binary star, discovered by William Herschel in 1779. The galaxies visible are NGC 7172 and 7154 but these are very, very close to the horizon when on the meridian and represent challenge objects from here.

Capricornus (Cap, "The Sea Goat"), lies on the Zodiac but lies out of the Milky Way (to the northwest of PsA) and contains only M30, a fine globular cluster. Of the brighter stars, Delta and Epsilon are both variable stars. Delta is an eclipsing binary of the Algol type (fully detached, with flat regions in the light curve between eclipses); its period of 1.023 days makes it hard to study. Epsilon is a variable of the Gamma Cassiopeia variety. These are young stars that are rapid rotators; in fact, they are rotating so fast that the star's gravity is only just strong enough to retain the stellar material. With instabilities, material gets ejected every once in a while, resulting in irregular light variations and emission lines in the spectra.

Aquarius (Aqr, "The Water Bearer"), to the north of Cap, lies on the Zodiac and contains a number of variable stars but no deep sky objects (!) -- at least as listed in Norton's Star Atlas.

Delphinus (Del, "The Porpoise"), to the northwest of Aqr, is another boring little constellation, containing only two globulars, NGGs 6394 and 7006.

Vulpecula (Vul, "The Fox), in the Milky Way just to the south of Cygnus (and the last constellation in the book), contains M27, the famous "Dumbbell" Nebula (disc'd by Messier in 1764 and lying close to 900 light years from us) -- it's a wonderful object worthy of close observation or CCD photography (just wait til we have colour filters available).

Equuleus (Equ, "The Little Horse"), a tiny constellation (the second smallest in the sky, after Crux) and contains NO deep sky objects at all. Delta Equulei, however, is a close visual binary. It was discovered by Otto Struve in 1852; it was for many years at period 5.7 years, the shortest known for any visible binary. According to Burnham, the system has made 19 revolutions in the last 112 years. It is, however (as you might expect) a difficult close binary, never separated by more than 0.35 arcseconds.

Pegasus (Peg, "The Winged Horse", "The Great Square" and our mascot), also lies off the Milky Way. It contains a few faint galaxies, an open cluster, and M15, a fine globular.

NEW BOOKS AT THE PUBLIC LIBRARY
by Yvonne Whebell.

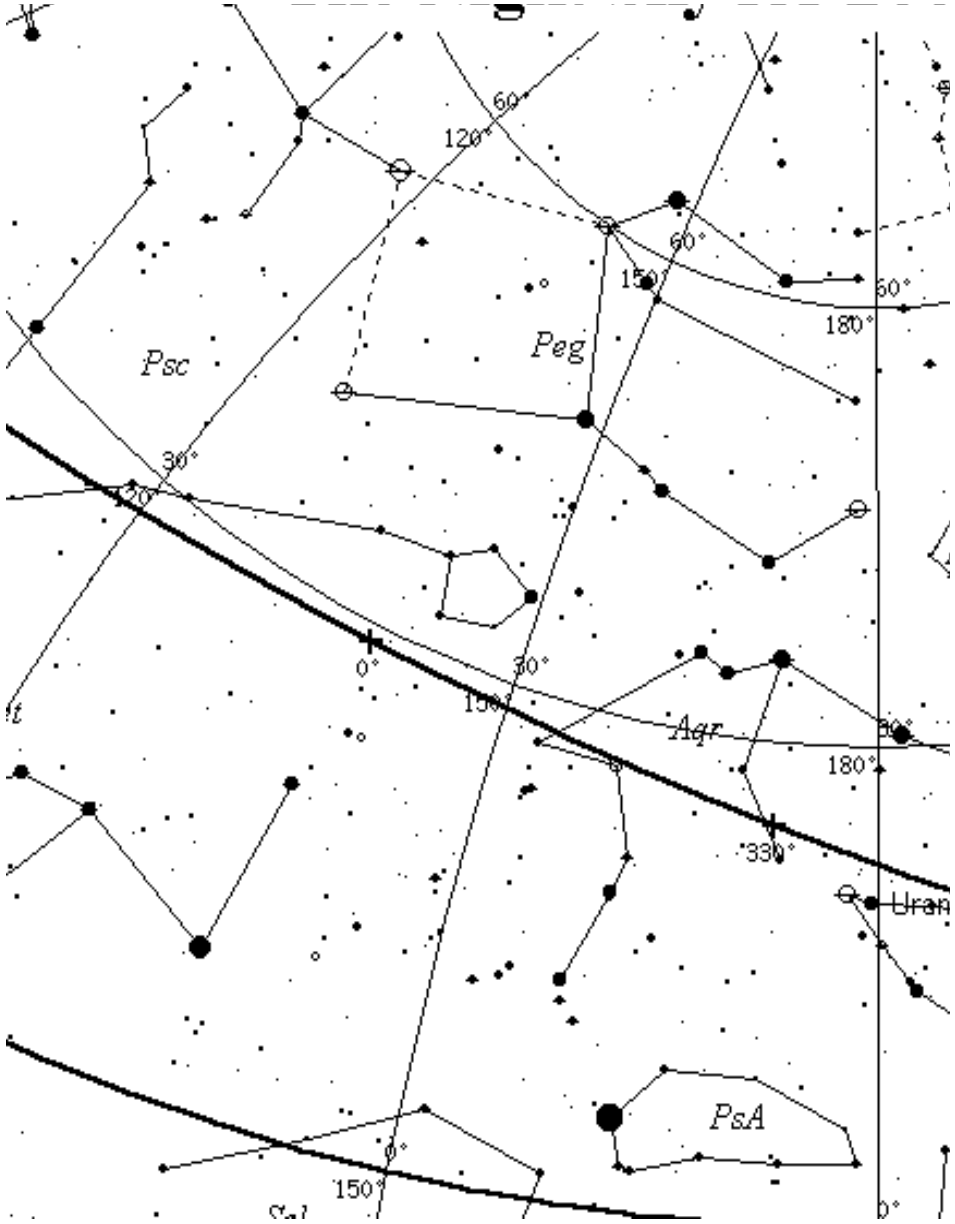
MARS: THE LURE OF THE RED PLANET. William Sheehan & Stephen James O'Meara. Prometheus Books, 2001.
Tells the story of our notions and explorations of Mars, long believed to be the most likely other planet in our solar system to harbour life.

MISSION JUPITER: THE SPECTACULAR JOURNEY OF THE GALILEO SPACECRAFT.
Daniel Fischer. Copernicus Books, 2001.
The title describes the book. Included are explorations of asteroids and moons, nice photography, and some discussion of the Cassini mission.

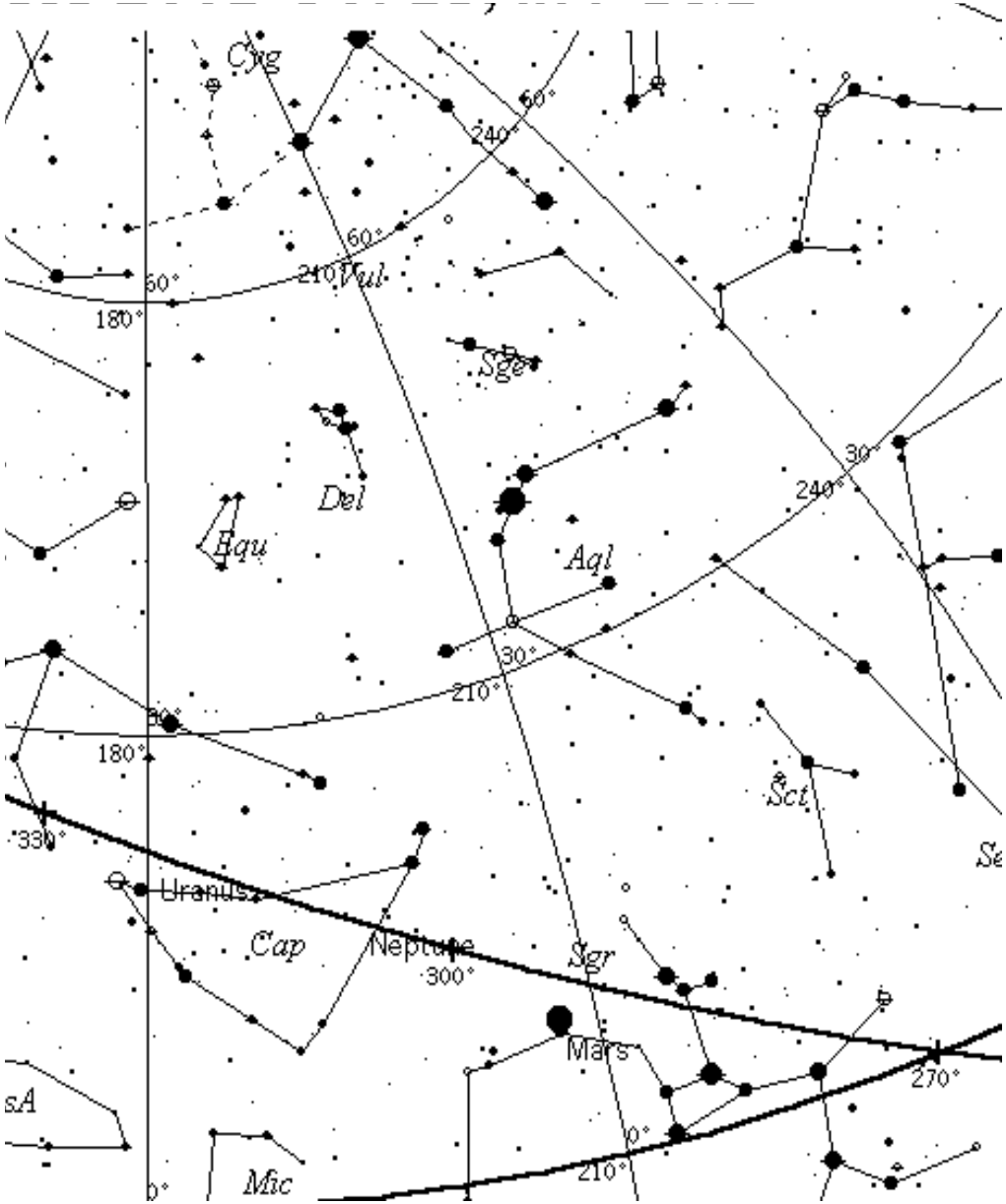
Yvonne Whebell,
Acquisitions Coordinator
Prince George Public Library
887 Dominion Street
Prince George, B.C. V2L 5L1
Tel: 250-563-9251

Astronomy in The Park—
yes, we had fun!

We where also in attendance at the annual Prince George Fall Recreation Mart. Lots of members helped out , thanks to eve-



Sky map courtesy Dr. Bob Nelson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Neptune
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Mars
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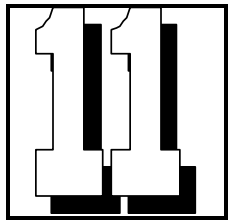
10

Shushwap Sunrise

I took this photo during my holidays this summer. The photo was taken form the dock of our rental house at Little Shushwap July 20th at around 3:00AM. I used a Kodak digital camera with an exposure time of 16 seconds. Lower left in the photo near the tree line is Jupiter, the brightest object middle right is Venus and the 3rd brightest object upper right of Venus is Saturn.

My Holiday started on July 14th at the Lake, but it was not until the 20th that I finally got some good weather. This was the best night of observing I had this year. The milky way was out and Mars was still pretty good and the Comet LINEAR (C/2001 A2) was visible. My original plans during my holiday called for watching the Moon occult Venus on July 17th. But this was not to be because of poor weather. So when I finally did get a clear night I was out until 4:00AM! I had a great time taking photos, and observing numerous deep sky objects with my 6" scope and 60m binoculars. I had the best most stable views of Saturn I have ever had with my new scope! I think the lake had a stabilizing effect on the air.

My entire family thought that I was a bit crazy staying up so late and I received some really strange looks from them when at 10:30PM I told them that I was waiting for it to get really dark before I setup my telescope (some times I forget the not every one appreciates astronomy). However they all changed their tune when they saw this beautiful sunrise photo with three planets! My mom even



A Memorable Saturn Graze

For eleven entrancing minutes this morning the dark limb of the last-quarter moon slipped diagonally over Saturn at Dry Falls State Park in eastern Washington. We four British Columbia observers (Jim Failes, Ron Scherer, Rod Stuart, and Alan Whitman) had positioned ourselves two-thirds of the way southwards into the 44km-wide occultation graze zone from the northern limit, so that we would experience a lengthy partial eclipse of Saturn without the planet ever disappearing. There was time for comparing views through the two 8-inch Dobsonians and the two 60-mm refractors in use, time for photographs, time to savour this rare experience. It was calm at the surface, but the "mare's tail" and transversely-banded cirrus which moved in after the occultation, characteristic of high altitude turbulence, explained the wildly variable seeing experienced -- at times Cassini's Division and one belt on the planet's disk could be seen while at other (fortunately brief) moments the planet became a boiling ringless blob worse than Galileo's views of Saturn were. All observers were thankful that the very long duration of the graze allowed many periods of acceptable seeing, if slightly disappointed that no peaks or crater rims were seen in silhouette against the ringed planet. Many thanks to the International Occultation Timing Association for providing the northern and southern limits of the wide graze path on their website.

Interest usually dies off quickly in the waning stages of such events, but that was not the case this morning because Saturn became visible to the unaided eye just off of the northern tip of the lunar terminator, holding our delighted attention and setting shutters clicking again.

Our observing site, Dry Falls, is a geological wonder which deserves to be a National Monument rather than a mere state park. During the last Ice Age a glacier temporarily diverted the Columbia River into a new bed, creating The Grand Coulee which includes Dry Falls, a series of horseshoe-shaped cliffs 400 feet high and 31/2 miles wide. Mountain tributaries of the Columbia were repeatedly damned by glaciers about 13,000 years ago, creating deep temporary lakes. When the ice dams broke there were catastrophic floods which created the deeply eroded scablands of eastern Washington. During these catastrophic floods this was the greatest waterfall in the world with a flow over it temporarily exceeding that of the rest of the world's rivers combined. Dry Falls is still perfectly preserved today -- just mentally add the surging waters.

Best,
Alan Whitman
(anticipating August, 2017)

SPELLBOUND: Walking to the Stars

"All we need to see a myriad of wonders that others miss is the two eyes with which we were born." - Fred Schaaf

Has the dazzling display of HST images spoiled us forever? Will we ever again be satisfied to just look up into a clear black sky at those tiny specks of light? Or look through the amateur's (comparatively) inferior Earth-bound scope?

Well, perhaps not us - but what about the general public, those we try to encourage to join us in our passion? After all, how can we possibly compete with the beautiful, and very colourful, sights revealed by Hubble?

You probably read Bob Berman's column, "Strange Universe", in last month's issue of Astronomy magazine. He presented a scenario where: "A friend peers at Jupiter through your scope, but seems puzzled, 'Where's the Red Spot? And isn't Jupiter supposed to have orange belts?' Your picky guest may think your instrument suffers some bizarre defect, but lack of vibrant color
is a common complaint at the eyepiece..."

Fred Schaaf suggests in his 1989 book, The Starry Room, that what we need first, before scopes, computers, and other high-tech toys, even before knowledge or expertise, is eyes, feet, and imagination.

Eyes: to first take in the images, The Great Panorama, before taking a closer, more detailed look through binoculars or telescope. Only then can we begin to truly appreciate and comprehend the incredible magnitude of what we see magnified through a lens.

You may call mere naked eye observing a poor person's astronomy, but it does have its merits. Fred Schaaf believes that you can really only fully appreciate the starry sky "if you have first used your eyes." Your own two eyes are "the first and only things you need to get started in astronomy," he says.

But then, he adds, perhaps there is something else we need even before we start using our eyes - our feet!

Feet: to take us away from manmade night lights to where we can have a clear view of those heavenly lights and celestial vistas, to acknowledge the majesty of our Universe. And then -

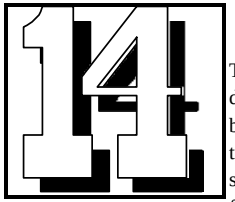
Imagination: to appreciate the magnitude of it all. "Science-fiction writers have long imagined spaceships that would take us to the stars," Mr. Schaaf continues, "but the Einsteinian ultimate speed limit of light scorns their fancies about breaking it, and otherwise the journey takes too long - more than four years at light-speed even to reach the nearest star! Yet I say that the first, and in one key respect best, way we can reach the stars is not with hyperspace-drive, warp engines, or hydrogen-scoop time-dilation space-craft...

"Now I am certainly not belittling the ability of the eyes, nor the goal of a working starship (which I not only hope but believe we will some-century build to carry us bodily and gloriously to the stars)...

"But we must walk to the stars before going there any other way. What I mean by this jesting yet profoundly serious statement is essentially what C. S. Lewis meant by one of his comments in an essay on science fiction. No man could find an abiding strangeness even on the moon, Lewis wrote, if he could not also find an abiding strangeness in his back garden. My point is just that: it will not do the human spirit any good to visit the stars by spacecraft [or even by those grand Hubble images] if that spirit has not first had the experience of a walk away from buildings and manmade lights to the stars - and," Mr. Schaaf exclaims, imaginatively "right out among them. The future space traveler [and, yes, even the present awe-struck viewer of those exceptionally detailed images of the cosmos] who has not first made the simple walk of wonder [out under the canopy of twinkling celestial lights] will find his journey beyond our solar system ultimately a disappointment..." We must do these things first.

Preparation: One more thing I would add to Mr. Schaaf's list - a comfortable chaise longue. Call it the captain's chair if you like. There is nothing more you will need for your journey, except perhaps a warm comforter and a thermos of hot chocolate. The course has been laid in, so stretch out and enjoy -

The Journey: You look eastward, says our guide (Mr. Schaaf), "and see that the Earth is rolling you toward a bold new headland of stars. You are on your way to them. Without leaving your feet, without leaving the dear Earth... you are departing to the heavens. You are walking to the stars. Somehow you seem to know not only that you are traveling, but also that you are traveling to what is wonderful..."



October Star Hop in Andromeda

This month we will turn our attention to Andromeda. Andromeda was the beautiful daughter of King Cepheus and Queen Cassiopeia. She angered Posedin for claiming to be more beautiful than the sea nymphs. As punishment he sent the sea monster Cetus to ravage the King and Queen's kingdom. To save themselves they decided to sacrifice Andromeda to the creature. Luckily for her Perseus was on his way back from slaying Medusa. Flying on the winged horse Pegasus he swooped down and rescued her. Taking Medusa's head out of his trophy bag he turned Cetus to stone.

Hop #1: Gamma Andromeda – Double Star.

Start by locating the Great Square of Pegasus in the southeastern sky. The northeastern most corner star of the square is the 2nd magnitude star Alpha AND, Alpheratz. This star forms the tip of a '>' shaped group of stars extending from Alpha AND to the east, this is the constellation Andromeda. Follow the lower part of the '>' shape to its end 3 stars from Alpha AND. The last star in this line is Gamma AND. Gam AND's name is Almaak it is magnitude 2.3 Under magnification you can see a companion star of mag 4.3. The two stars are separated by 10" (arc seconds). Almaak is a golden-yellow colour and Gam2 AND is blue. Gam2 AND also has another star orbiting it although without a large telescope you will be unable to see it because the two stars are only 0.4" apart.

Hop #2: NGC752 – Open Cluster.

To locate this open cluster look SE from Gamma AND towards the tip of the constellation Triangulum, imagine a line connecting the two stars. NGC752 should be visible to the naked eye as a faint smudge about 5 degrees from Gam AND along this line. The cluster is 50' x 50' (arc minutes) and has 70+ stars of mag 10 or fainter. As a bonus if you look off the SW edge of the cluster you will see a yellowish pair of magnitude 5.7 stars.

Hop #3: NGC404 (Mirach's Ghost) – Galaxy.

To find this 10.3 magnitude galaxy we will start by going back to Gamma AND. From there move one star over towards Alpha Andromeda along the bottom of the '>" shape. You are now looking at Beta AND, Mirach. All that is left to do is crank up the magnification of you telescope and continue to look at Beta AND. If you can't see the small, compact galaxy try moving your field of view northwest until Beta AND is just off the edge if it is possible to see NGC404 in your telescope and under the current weather conditions you should see it now.

Hop #4: M31, M110 & M32 – Galaxies.

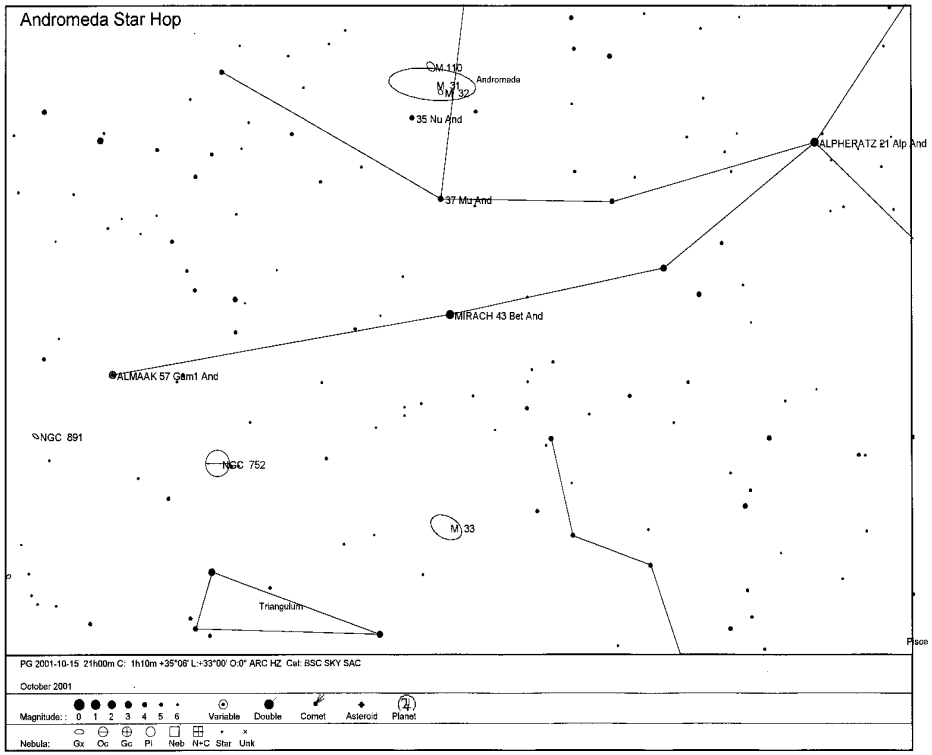
M31 has the distinction of being the closest spiral galaxy to ours. It is mag. 3.4 and measures 189.1' x 61.7'. Like the Milky Way it is part of the Local Group of galaxies. From Beta AND (Mirach) look northwards to the 3.9 mag. star directly opposite it on the '>' shape. This star is Mu AND. Follow the imaginary line made by these two stars about the same distance northwards again to the 4.5 mag. star, Nu AND. Once at Nu AND M31 is only about 1 deg to the west and should be visible as a hazy patch to the naked eye. M32 is just to the south of M31 while M110 is just to the north. They are practically right on top of the Andromeda Galaxy so just pan around in these directions and you should find them. **M32** – Elliptical Galaxy - mag. 8.1 – 8.5' x 6.5' and **M110** – Elliptical Galaxy - mag. 8.1 – 19.5' x 11.5'

I'm out of room so I'll just list the other two objects I had planned on talking about.

NGC891 – Edge on Spiral Galaxy – 9.9 m – Size: 13.1'x 2.8' (3 deg. east of Gam AND)

NGC7662 – Planetary Nebula – 8.6 m – Blue Snowball – n-filter shows void in centre at 300X – Size: 18"x12"

To find them consult your planetarium software or some decent star charts. Good luck and good viewing!



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

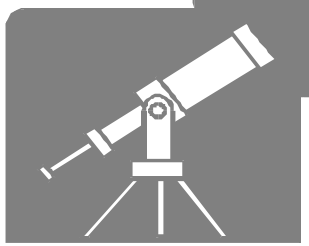
The greatest contributors to the construction and operation of the observatory are from PGAS members who have generously contributed their time to this project. The value of their contribution surpasses all external contributions.

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.

Support Community Science

Join the PGAS

Prince George Astronomical Society



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BISQUE SOFTWARE
for their donation of
THE SKY (Level 4 software)

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We thank you for your support.