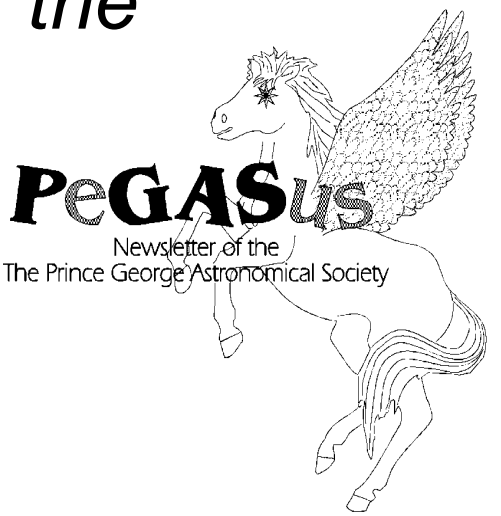
PeGASus
Newsletter of the
Royal Astronomical Society of Canada
Prince George Centre

The RASC-PG meets next at 7:30 pm Wednesday April 30th at The Observatory

Map on Page 2

April 2003

the



In Issue # 128

Also This Month;

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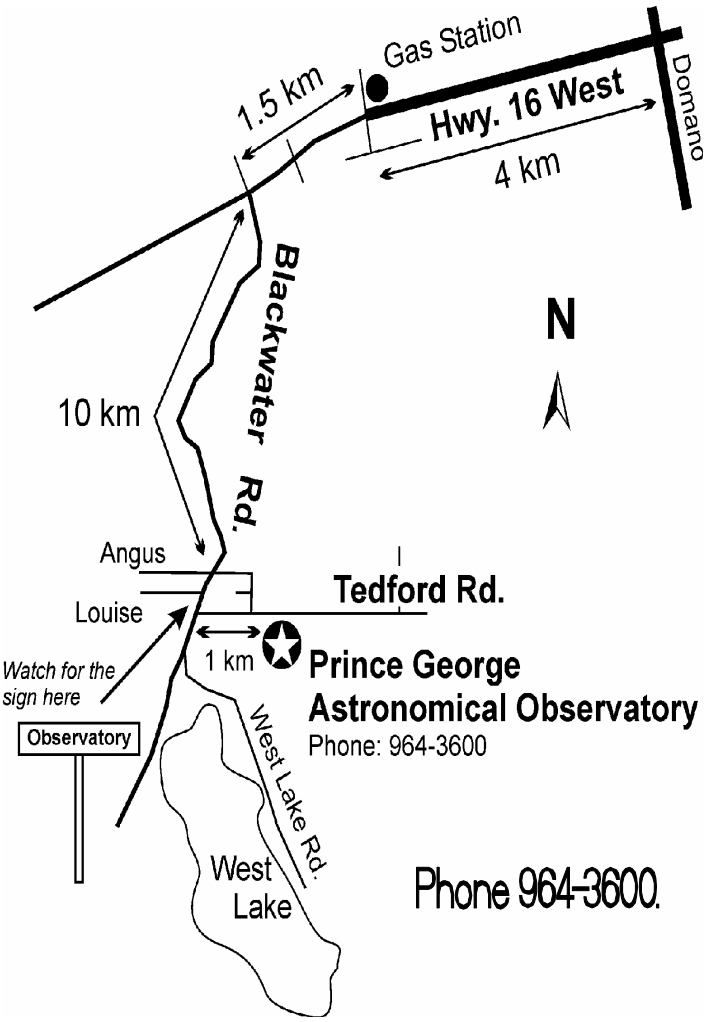
the PeGASus
is published monthly by the
Royal Astronomical Society Canada
Prince George Centre

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

May 16

PeGASus Editor
Gil Self

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you can renew your membership at
www.rasc.ca/princegeorge

Editorial (Ramble)

By Gil Self

I hope you can make it to the general meeting on April 30th. We are starting to plan for this summers observatory improvements. There may be some areas that you have some ideas you would like incorporated. We take our best guess at what members would like included in our budgets and planning. Generally we do pretty well , but if you have some ideas bring them along and lets see what can be done. We had a suggestion brought to a meeting to buy Barlows to allow planetary viewing. It was a well thought-out and presented proposal, we just hadn't thought of it. Barlows are now on the budget .

It's likely there are several other details that we could include in our planning or perhaps even build/ install right away.

Speaking of planning, I would like to resurrect something right here, and include it on our list of to do projects. Its an old idea (I think it was Bob's idea originally). One of the best , we should build a solar telescope! Built right into the building, projecting into the classroom. The classroom is ideal as it has no windows and the telescope if I understand would be mostly low cost optics. Sol is a large bright target it doesn't take expensive optics to produce an acceptable projected image.

Bob has demonstrated (page 13) that you don't need expensive reference plates to do super nova work. The DSS is quite up to the task. This might be a good time to "have a go". Right now there are lots of accessible galaxies overhead. I'm not sure if for our equipment that there would be enough bright galaxies but we should think about it . Keep in mind that it is going to be harder and harder to "get there first' due to the increasing number of automated telescope in operation. But wouldn't it be nice! I think we need 6 or 8 people interested in participating in this project– let me know if your in.

G.S. .

Executive Meeting Summary for 2003/04/16

Treasurer's Report

Revenue: $ 3417.14

Net Income: $ 36.91

General Business

The first motor drive (RA) has been installed and is working well. The power supply modification has been done. Wayne is working towards integrating the RA and DEC controls onto one hand paddle.

Maurice provided detailed cost estimates to extend the sidewalk to the north ($520), construct an elevated observation deck ($11,032), add gravel to the existing driveway ($1429), add a new parking lot to the east of the existing parking area ($1959), paving costs for the existing driveway and parking lot ($4730), and paving costs for the new parking lot ($2198). Maurice will come up with a cost estimate to deaden the sound in the classroom.

Maurice presented a draft letter encouraging selected businesses associated with Dark Sky lighting products to have their website links on our web site. Wayne has expressed an interest in grinding mirrors.

Gil and Maurice have drawn up a 'To Do list' itemizing work to improve the appearance of the observatory. (see page 14)

Coming Events

April 26 Astronomy at the Mall (public event) 12:00 noon Parkwood Mall parking lot

April 30 General Meeting 7:30 pm Observatory

May 10 Year End BBQ / Members Night 5:00 pm Observatory

May 14 Executive Meeting 7:30 pm

May 15 Lunar Eclipse (public event) 7:30 pm Observatory

May 24 & 25 Garage Sale fundraiser start @ 9:00 am 4556 Bauch Ave

May 28 General Meeting 7:30 pm Observatory

May 30 & 31 End of Open Houses & Members Nights for the spring season

June 14 GUEST 2003 in the North, Girl Guides 9:30 pm Observatory

RASC GENERAL ASSEMBLY:
The 2003 General Assembly will be held in Vancouver on June 27 - 30, 2003 at the UBC campus.
Early registration, prior to May 15 - $110 after May 15 - $125.
Spousal/Companion attending events other than meals, prior to May 15 - $55 after May 15 - $60.
Spousal/Companion not attending Events other than Ruth Northcott Lecture (meals and rooms extra) - FREE
Check 2003 GA website at:
http://ap.stmarys.ca:8080/rasc/index.jsp

The Night Sky for May 2001

by Bob Nelson, PhD

Hi Folks,

Another month has rolled by and it's time to write another column. My, how time flies! Spring is here at last and there has been a lot of activity out at the observatory in terms of open houses and club nights. Also, Maurice and Gil have come up a myriad of small tasks that the observatory needs to give it a top-notch appearance. If the list does not appear in this issue, it will be presented at the next meeting. You will be asked to help out – in whatever task catches your fancy – and we'll have a work bee/gabfest/picnic extravaganza sometime soon. It should be mentioned that these are truly little things, like adding a bit of paneling here and there, touch up painting, etc. So please, draw near and get involved - it should be a lot of fun!

Anyway, here is what is happening in the sky next month:

PLANET ROUNDUP

MERCURY, as we are told in the Observer's Handbook, is in inferior conjunction with the Sun May 7 and makes a rare transit across the face. Unfortunately, we can't see it; Europe, all but western Africa and Asia are the places to be. We are also told that Mercury is in conjunction with Venus on May 28. Run your favourite planetarium event to preview the event, since it may be cloudy here. (But, on the other hand, it might be clear.) I get that the two are closest on May 27 at 20:00 hours (PDT) and are 2.4 degrees apart. I also get that Venus is almost occulted by the Moon on May 28th at about 21:30 when the two are 36' (Moon's diameter) apart, centre to centre.

VENUS rises mid-month about ½ hour before the Sun as it races ahead of the Earth in its orbit. Going, going, gone!

MARS, in Capricornus all month rises mid-month at about 2:30 (PDT) as we approach opposition in late August. In May, it will be a 10.7" disk of magnitude -0.3. (At opposition, the numbers will be 24.5" and -2.7 respectively which, as we have been told, will be the opposition of the century. The Observer's Handbook goes on to say that this will be the closet Mars and Earth have been for 100,000 years!!!!)

JUPITER, in Cancer until June, sets mid-month at about 2 AM (PDT) and therefore is high in the southwest at sunset. It's a 31" disk of magnitude -1.7. Still a good target.

SATURN passes from Taurus to Orion on May 15. At mid-month, it sets about 3 hours after sunset and is therefore reasonably high (22 deg elevation) in the west at sunset. It's a 16.6" disk of magnitude 0.0 and is still good to look at.

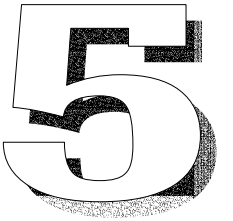
URANUS, in Aquarius until 2009, rises mid-month at about 3 AM (PDT). As usual, it's a 3.6" disk at about magnitude 5.7.

NEPTUNE, Capricornus until 2010, is a morning object all month, rising mid-month at about 2 AM. As usual, it's a 2.3" disk at about magnitude 8.0.

PLUTO, passes from Serpens back to Ophiuchus on May 6. At mid-month, it rises about an hour after sunset and is up all night. As usual, it's a 0.1" disk at magnitude 13.8

CONSTELLATIONS to look for in May (at 11:00 PM PDT) are Eastern Hydra, Corvus, Virgo, Coma Berenices, Bootes and Canes Venetici.

Corvus (The Crow) is the small lectern-shaped constellation southeast of Leo (the top two stars point up and left towards Spica to the northeast). It contains NGC 4782, a galaxy located halfway towards Spica and NGC 4361, a planetary nebula inside the figure. Messier 104 is just over the north boundary in Virgo. It also contains NGC 4038 - the Ring-Tail Galaxy about 3.7° WSW from Gamma Corvi. (Follow the top two pointer stars for about the same distance down and to the right.) According to Burnham's Celestial Handbook, it's sometimes regarded as a gravitationally interacting (or actually colliding) pair of galaxies. (Today, I think there's no doubt that they are colliding galaxies.) Deep images (and RealSky does a good job) show a kidney- shaped object with two curved tails extending north and south. Radial velocity measurements show that the system lies about 90 million light years distant, giving it a diameter of 100,000 light years and total luminosity of 20 billion suns. There is also another galaxy (NGC 4027) lying 0.7 degrees away that is almost certainly gravitationally linked. This should be an easy target, next time you are out at the observatory.



Hydra (The Sea Serpent) is a sprawling constellation running from 8 hours to 15 hours right ascension and from -35 to +5 degrees declination. In this month's region of interest, there is globular cluster M68, lying 3.8 degrees southeast of **Beta Corvi** (the star at the lower

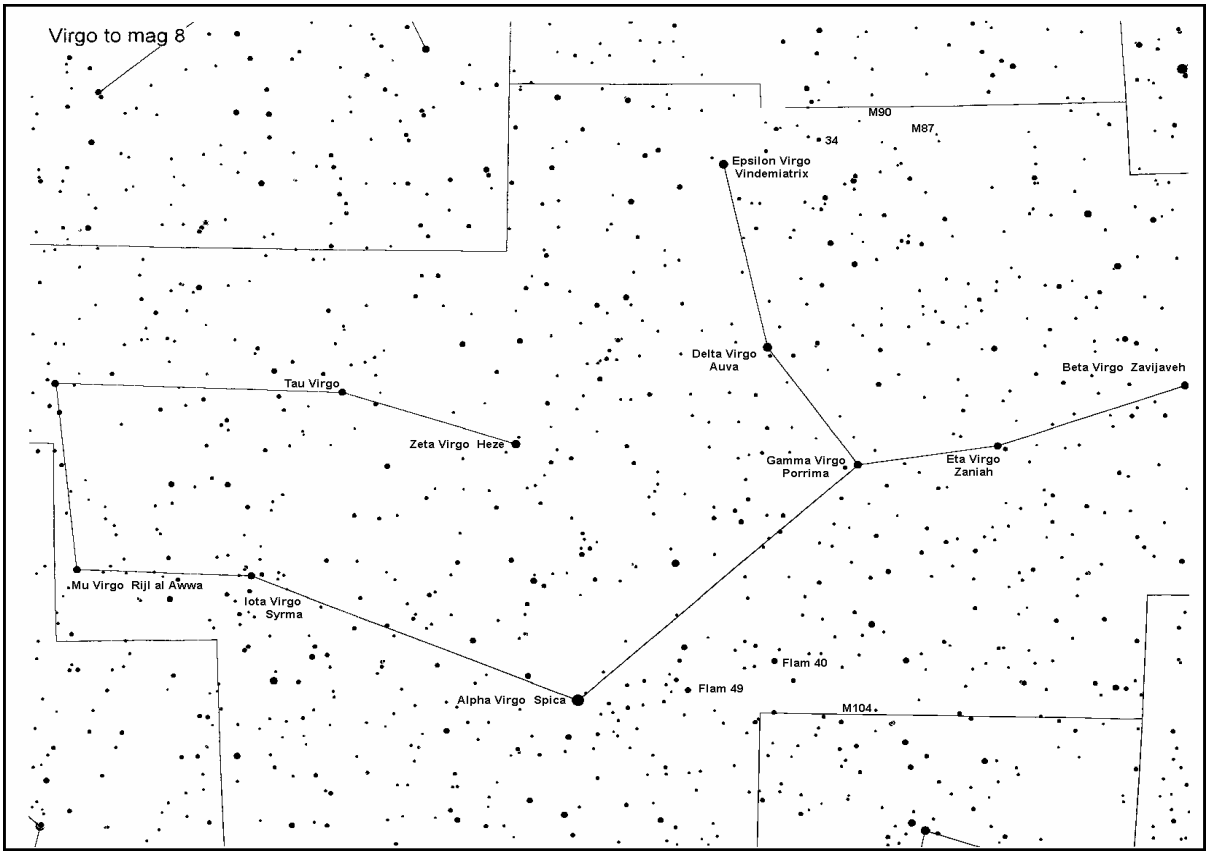
(Continued from page 5)

left corner of Corvus), and several galaxies, M83, NGCs 5061, 3923, and 3821. M83 is a large spiral galaxy discovered by Lacille in 1752; it is one of the brightest galaxies in the southern sky, with two strongly swirling arms, in a reversed 'S' (there is also a third arm). The distance appears to be well-determined – about 10 million light years. M83 appears to have had a remarkable number of supernovae in the last 100 years (1923, 1950, 1957, 1968 and I don't know after that, because Burnham's – my principal reference – is dated 1978). We are told that the average production rate is about one per 300 years for a given galaxy. It also contains NGC 5694, one of the more remote globular clusters that are still part of our galaxy. It lies at the eastern end of the tail. It was discovered by Sir William Herschel in 1784, recognized as a globular by Clyde Tombaugh and friend at Lowell Observatory in 1932.

Virgo (The Virgin) and Coma Berenices (Bernice's Hair), lying to the east of Leo, are the regions of the sky rich in galaxies. Virgo contains 11 Messier objects, all galaxies and many NGC objects too numerous to mention. These are part of the giant Virgo cluster

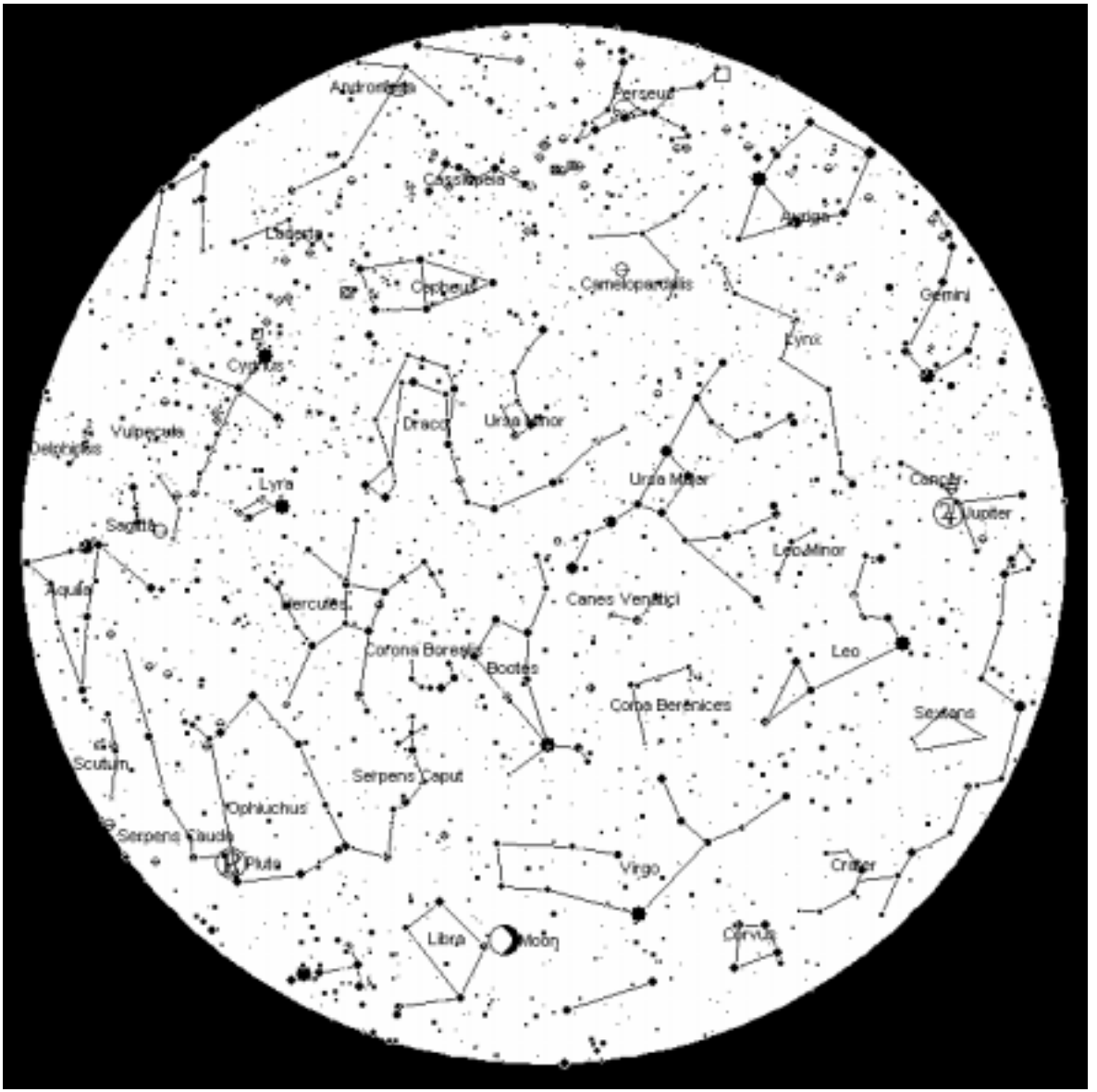
(Continued on page 14))

(Star Hop on page 10)



Transit of Ganymede, captured last night (*04/18/03*) at about 23:00 on the double arm drive, one minute exposure, pure blind luck.
Taken with the Nikon digital camera with no telescope. This is at maximum zoom, optical and digital. I am Amazed. Evan Williams

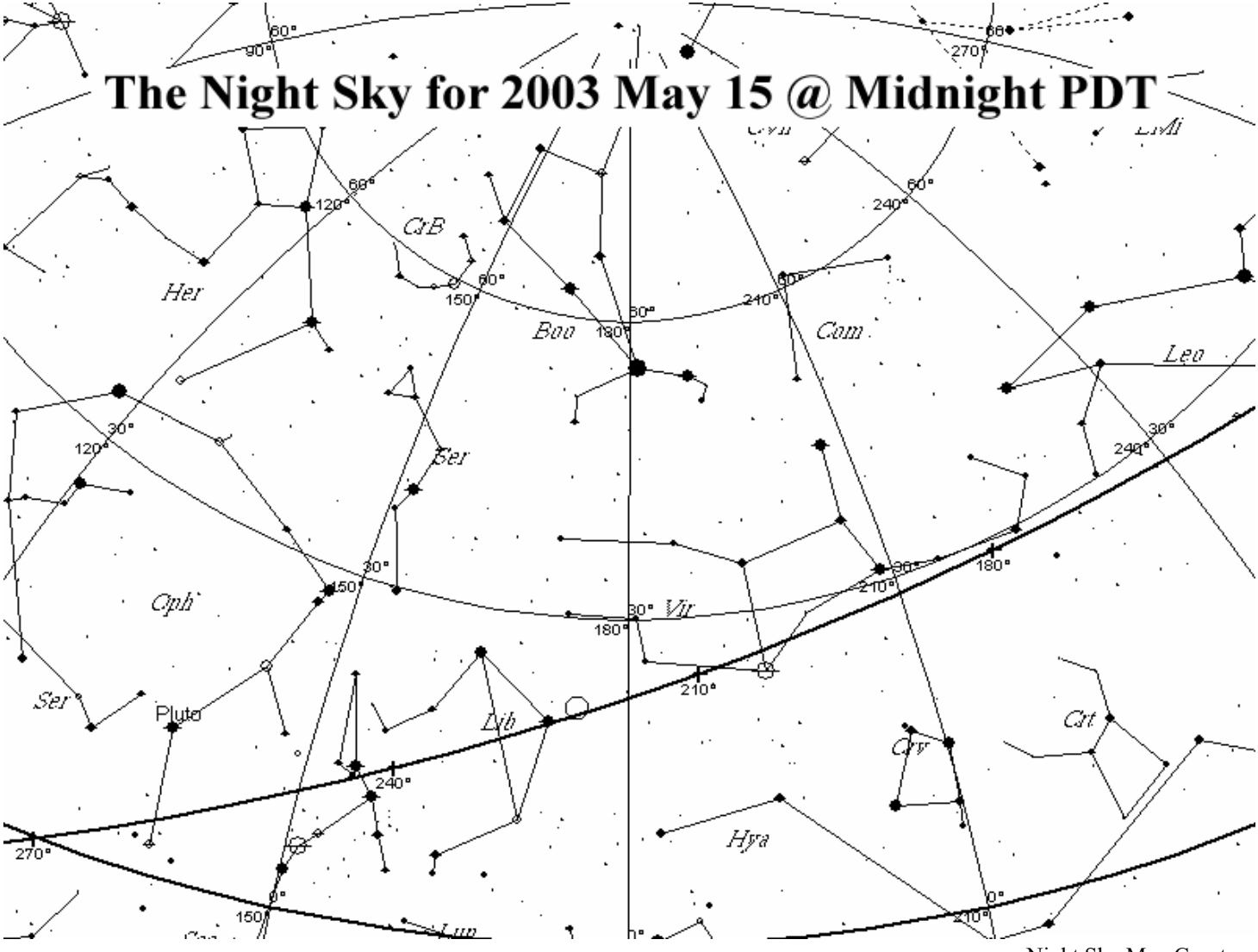
I have included a screen shot from Cartes du Ciel
(Williams Lake BC 53’42’ N +123”05’W 04/18/03 21:15 local)



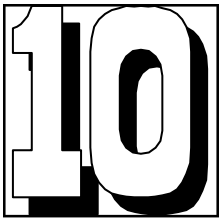
SOUTH

View from PGAO on May 15, 2003
Midnight PDT

The Night Sky for 2003 May 15 @ Midnight PDT



Night Sky Map Courtesy
Dr Bob Nelson



May Star Hop in Virgo

(Map on page 6)

Welcome to the realm of galaxies! Virgo contains hundreds of galaxies eleven of which made Messier's catalogue. According to an ancient Babylonian legend Virgo was the goddess Istar. Istar's lover was Tammuz, the god of corn, he was killed at the prime of his life in the autumn. Each fall Virgo travels to the underworld to rescue him, while she is gone winter reigns and when she returns with Tammuz in the spring the season renews.

Hop #1: Beta Virgo – Double Star.

Beta Virgo is famous for being the star used by Einstein during the solar eclipse of September 21, 1922 to determine the speed of light in space. The star is called Zavijaveh which means "the gloriously beautiful". Beta Virgo is a mag 3.8 star while the companion is mag 8.8. It is located at the end of the "Y" part of Virgo of the side farthest away from the rest of the constellation roughly 28° to the northwest of Spica.

Hop #2: M90 – Spiral Galaxy.

M90 is one of the brighter spiral galaxies in Virgo at mag 9.5. Its spiral arms are tightly wound to the core. M90 appears to be "fossil" meaning that it currently lacks any new star formation, with the exception of the inner disk region near the dark dust lanes. To locate it start your star-hop at Epsilon Virgo then go west about 4° to Flamsteed 34 from there M90 is about 2.5° to the northwest. There is a 8.8 mag. star 15' from it.

Hop #3: M87 – Elliptical Galaxy.

M87 is a very bright galaxy but, because it is elliptical it is shows no spiral arms. It is about 4' in diameter with a large core. To find it look about 1.4° to the southwest of M90. You might notice another smaller galaxy between M90 and M87 this the elliptical galaxy M89. M89 seems to have been discovered by Charles Messier himself.

Hop #4: M104 – Spiral Galaxy.

M104 is most known by it's popular name the Sombrero galaxy. It is one of the showpieces of the sky due to the nearly edge on view we have of it. The dark dust lanes nicely split the large central bulge giving M104 its "sombrero" look. To find the Sombrero galaxy start at Spica then move 4° to the west to Flamsteed 49 (mag 5) from there move west again another 4° to Flamsteed 40 (mag 4.8) M104 is now 4° to the southwest. The nearest bright marker star is a mag 6 star high in Corvus (near the southern border of Virgo) about 1.27° to the south of M104.

Good viewing and good luck!,
Brian Battersby

Echo Hills Observatory: A Visit

John Ascah

My parents live in the Muskoka Area of Ontario and I was interested to hear from them that an observatory had been built near Huntsville, the town I had grown up in. I had seen the advertisements for Echo Hills Observatory in SkyNews and visited their web site at www.naturetrails.on.ca . Last summer I made my yearly trip to Ontario and a trip to Echo Hills Observatory was a must. Not only would my own curiosity be fulfilled it would provide a high impact event to convince my wife that there is a reason to look at the sky and she could understand my new passion for astronomy. In addition I could compare this experience to that provided by the Prince George Observatory.

The Delta Grandview Inn is an upscale resort on Fairy Lake. I remember picking mushrooms there with my grandfather when it was just a small farm on the lake and the area was mostly forested. Now the area is full of resorts and golf courses. Grandview Inn offers nature adventures as one its activities for its quests. The Echo Hills Observatory was built as one of the nature adventures. I phoned ahead for reservations and was surprised to hear they were booked ahead for many weeks but fortunately there were cancellations. We met our group of twenty or so star gazers in the lobby of the Grandview Inn at about eight thirty. The sky was dark and the air was clear with no clouds. There was excitement in the air as one of the "naturalists" explained how we were to get to the observatory. It sounded like a trip into the deepest jungle. We traveled as a convoy with a lead van followed by about ten cars. We had been instructed not to fall of the path as we drove up the gravel road to Millar Hill one of the highest points in the area. I couldn't help but remember the last time I was on Millar Hill when I was eighteen. I was with friends in a 1964 Valiant at three in the morning and we went up the hill as a lark. A rock hit the radiator and we limped home constantly filling the radiator from streams along the side of the road. I digress. We followed in the dust of the convoy and took a smaller road to the observatory.

It was dark and difficult to see the observatory but it is an impressive structure as it juts out from the rocks to above the mature hardwood forest. We gathered in the lobby and then climbed the spiral staircase up to the dome area, which was large enough to accommodate our group of about twenty. We were split into two groups. My wife and I went out on the outdoor observation deck and we are given binoculars and a tour of the sky by one of the "naturalists" using a green laser pointer. The sky was dark and the Milky Way was easily seen. It was obvious that most of the quests had never seen anything like this before and there were lots of oohs and ahhs. We then had our turn in the dome with the Meade 16 inch LX200 GoTo mounted on a pier. We were fortunate to have Robin Tapley manning the scope, as it was his enthusiasm for astronomy that led to the creation of this observatory. We were shown two deep sky objects and lined up for our views. Mr Tapley was well informed and personable. It was apparent that this was a job and he had good answers to the questions that likely were asked night after night. There was not much time for idle or informal chatting.. Before I knew it our time was up and we were led back to their outbuilding, which contains a small classroom,

(continued on page 12)

, which they use if the weather does not cooperate, and to warm up in the winter. We were guided out of the parking lot and I was back at my parents before midnight. All in all an interesting evening and worth the twenty dollars.

If you are in the area I would recommend you visit the facility if only just to see the observatory and what can be done if there is money to spend. Please review their web site for some pictures of the facility. Comparing the Echo Hills facility to the Prince George Observatory is like comparing apples and oranges. One is a private for profit facility and the other is a non-profit facility with a mission to teach astronomy to the public. There is much more to learn from an evening at the Prince George Facility when one of the presentations is given or members are around to show visitors the sky or how astronomy can be done. I prefer Prince George over Echo Hills. Now we just have to convince one of the local hotels to sponsor a new observatory. But then we would be obliged to man the observatory night after night. That sounds like a job rather than a passion.

J.A.

Supernova 2003cg

Bob Nelson

Here are three images:

NGC3169.gif - taken fro
m the Digital Sky Survey (DSS) - before the SN erupted
sn2003cg.gif - from the internet, and
sn2003cg-Nelson.gif - one that I took March 26 at 0840 UT.

The latter is comprised of 5 one-minute images, each taken with a red filter and added together. As you can see, this combined image only hints at the nebulosity of the galaxy. (The latter cannot be expected to show up well in a red image since the nucleus is red and the arms are largely blue.)

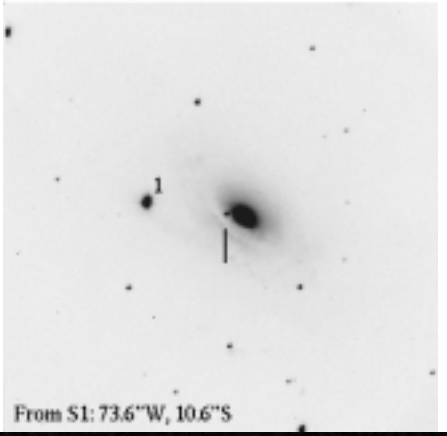
Supernova 2003cg (in NGC 3169, in Sextans) was discovered by Koichi Itagaki (of Yamagata Japan) and R. Arbour (of Hampshire, England) on March 21 at magnitude 16.3, four days before it reached maximum at magnitude 14.5!

Supernovae are divided into two groups - type I and II. The former have no hydrogen in their spectra, whereas the latter are abundant in hydrogen. There are subgroups: In particular, Type I SN that have a strong Silicon II line at 615.0 nm in their spectra are called Ia -which is the classification of SN2003cg. This group declines faster than the others (at about 0.015 magnitude per day after 50 days, as opposed to 0.01 for the others). The best modelling suggests that these are caused by the explosion of a carbon-oxygen white dwarf in a binary system (note that all type I are binary systems). These systems are thought to be so similar that they have become important as standard candles. (You know the intrinsic brightness of a Type Ia SN, therefore, for more distant one, you can measure the apparent brightness and calculate the distance using simple equations.)

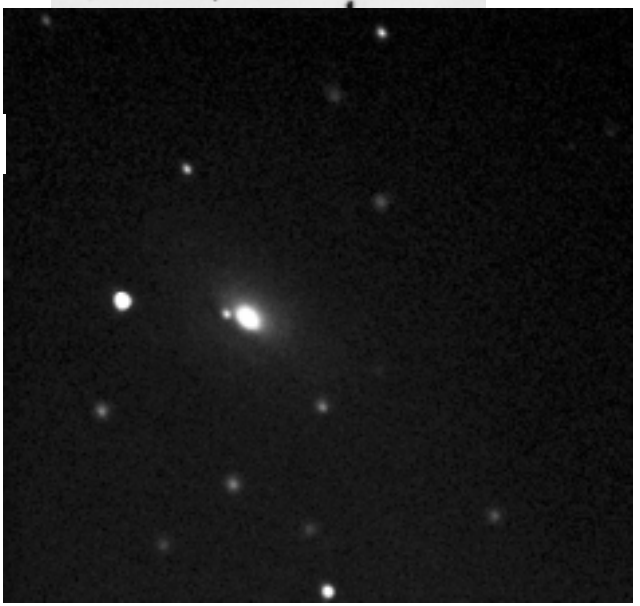
In contrast, a Type II supernova is instead the explosion of a single, very massive star at the end of its life.

NGC3169.gif

sn2003cg.gif



sn2003cg-Nelson.gif



Although I have checked many sources, I cannot find a value for the distance to NGC 3169. However, SIMBAD (http://simbad.u-strasbg.fr/sim-fid.pl) tells me that the redshift of NGC 3169 is v/c = 0.004180 (where c = 300,000 km/s = the speed of light).
Therefore, NGC is receding from us at (0.004180) x (300,000) = 1254 km/s.
If the Hubble constant is 72 km/s/Mpc, then the distance works out to about 1254/72 = 17 megaparsec (Mpc) = **57 million lightyears**.

B.N.

A check of SIMBAD also indicates that the expansion velocity of the shell on Mar 25.23 was 11,500 km/s (over 1/30 the speed of light!).
Neat stuff.

Observatory Improvements

Maurice Sluka

I was talking with Gil after the one of the open houses, and I think we could make a number of small improvements to the Observatory. Our presentations to the public are very good, but our facility could be improved.

I think we can express a more organized and professional impression to the public and make the observatory operate better. A few small changes would not cost much money; most are just spit and polish.

The philosophy of the improvements we make should be: functional, practical, while improving safety, operation, security, reducing maintenance, all with a harmony of design.

Here are a few ideas that we could do for very little cost. If you think can help with materials or time let the club know, also if have some ideas. If we put our heads together we should be able to reach some good ideas.

The Dome

The dome rotation handle should be about 2" longer, making much easier on the hand, all we need is a longer bolt and piece of pipe, a new bent flat iron arm could be made and the new handle so it would not extend any further than the old one. We could also see to fitting a motor for rotation.

This summer, when the light is good, we should check and see where the dome sticks when in rotation.

The batt insulation that is stuck up around the south side of the dome should be replaced with a more finished looking sealing system.

The shutter steering wheel could be far better (I rapped my knuckles more than few times), how it is attached could also be improved. I think we should find large valve shut-off wheel, around 16" to 20" in diameter with a smooth rim approximately 1" dia. (maybe someone in the club could get a used one from one of the pulp mills). We should also install a steering wheel "speed ball" (used on large trucks) that we could install on one of the wheel spokes, it would far easier to turn.

The lower shutter works well, but the cable can easily jump off its pulley (it has groove only 5/8" deep) if we could get on that has a 1" to 1 ½" deep, the cable would stay in the groove.

The scope should be repainted, in any other colour than yellow; I would suggest medium dark blue.

We should build a wooden box to cover the tracking motor, to reduce noise and provide protection.

The scope covers need to be replaced with ones that fitted to seal to keep the dust out better. I think a washable material would work well; also a drawstring would work better than elastic to tighten over the bulky parts and would easier to fit.

The scope counter weights could be covered with upholstery foam with a light coloured fabric, then they would still easy to see and guests and members would not bump their heads.

The main mirror could be kept cleaner when not in use with pressurized filtered air, we have an electric motor that could be attached to a fan with filter intake, connected to the mirror cover at a high level with a dryer vent duct, and smaller outlet hole at low level.

Dome corridor

The east wall of the dome corridor (where the electrical panels are located) should be covered with ½" plywood and painted, so it can be removed for maintenance.

Darkroom

It is becoming less likely to be used since digital photography is replacing film. The darkroom could be used as a secure storage room for

member's telescopes and equipment. This would be very convenient for members that do most of their observing at the observatory. A member could get up to one extra hour of observe ring in an evening. The darkroom would have to be fitted with a more secure door and lock, and shelves for small items and the heating vent could be blocked off to keep the telescopes closer to outside temperature.

Small storage room

The small storage next to the darkroom is now used for storing construction materials. This room could be made into a repair room. If a piece of equipment needs a small repair it could be done on site. It could be fitted with a bench counter across the east wall, with abourite surface, with a raised edge so small parts cannot roll off. Some of the features I would suggest are: two lights on flexible arms for detail work, one with a built in magnifying glass, a couple power receptacles, soldering gun or pen, a selection of small tools.

Classroom

The sound system for the computer could be improved. I suggest a pair of speakers could be installed on the east wall, one in each side of the projection screen.

It would be useful to have a podium (on wheels so it can moved) to place notes when doing presentations, also a cordless mouse for the computer. A stool would also be nice.

Building exterior

We should complete the soffit around the dome roof. I have also found good light fixture (full cut-off) to install over the entrance door on the soffit.

Driveway and parking lot

We should haul a few truckloads of gravel to fill in the muddy areas and low spots, from a gravel pit 2km down the west lake road.

We could also get a few truckloads of topsoil and some grass seed to finish some of the dirt areas around the building**.**

The basic idea here is to provide an ongoing list of small to medium sized projects that need to be done. We are guessing that people would be willing to take on small jobs either individually or in small groups. The problem is knowing what needs to be done.

What do you think?

(Continued from page 6).

of galaxies lying some 20 megapasecs (65 million light years) from Earth and is some 500 million light years in diameter. It contains some 1000 galaxies and shines with the light of 10^14 suns. It is thought that the local group (containing the Milky Way Galaxy, M31, M33 and others) may be falling towards the Vigo Cluster. Nearby in the sky, but much more distant is the even larger Coma cluster which lies some 150 megaparsecs (500 million light years) away. It contains some 10,000 galaxies and shines with the light of 10^15 suns. There is a similar cluster in Corona Borealis, about 700 million years distant.

Also in western Coma Berenices lie the globular clusters M53 and NGC 5053, about 1 degree apart. In Canes Venatici, about 15 degrees to the northeast, lies M3, one of the three finest globular clusters in the northern sky, (the others are M13 and M5). Discovered by Messier in 1764, it glows with the apparent magnitude of a 6th magnitude star and lies about 35,000 light years distant.

Clear skies,
-Bob

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

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Website: www.rasc.ca/princegeorge

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