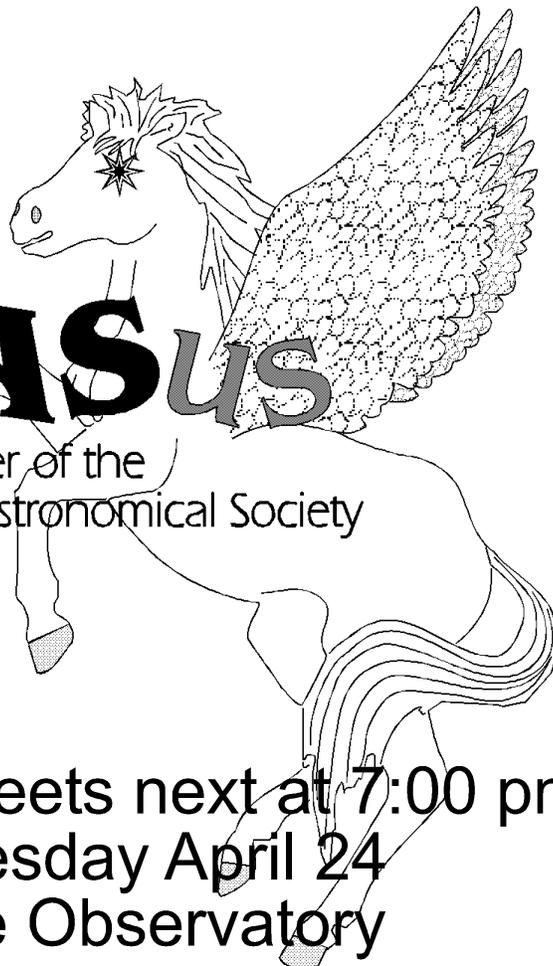


APRIL 2002 ISSUE #120

*the*

# PeGASus

Newsletter of the  
The Prince George Astronomical Society



The PGAS meets next at 7:00 pm  
Wednesday April 24  
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**

**May 17**

Send correspondence to  
Prince George Astronomical Society  
7365 Tedford Road  
Prince George B.C. V2N 6S2

or

**gil-pg@shaw.ca**  
phone:964-3600

**P.G.A.S.**  
**Executive, 2001/2002**  
**President**  
**Brian Battersby**

564-4789  
blbattersby@shaw.ca

**Vice President**  
**Gil Self**  
964-7279

**Secretary**  
**Glen Harris**

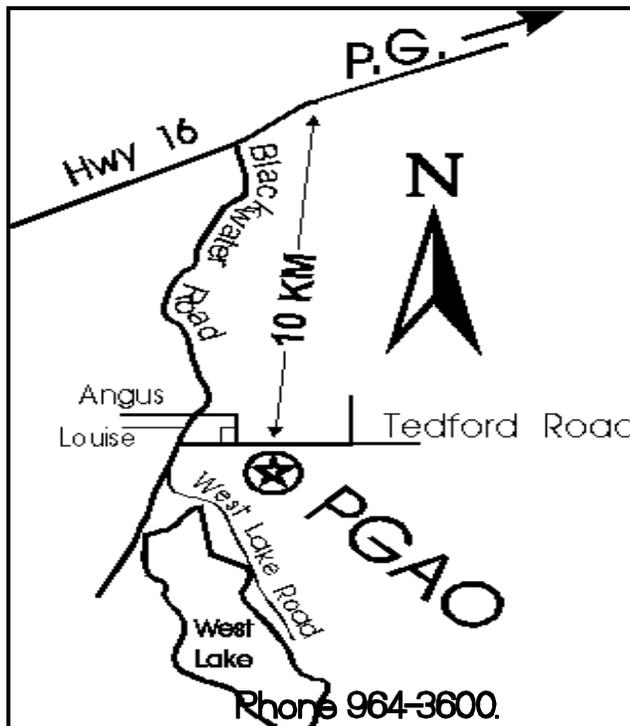
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**Rob Frith**  
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562-2131/563-6928

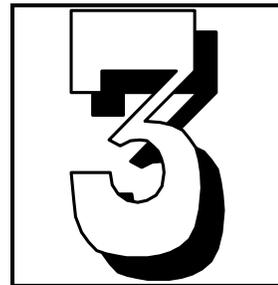
**PeGASus Editor**  
*Gil Self*



You can renew your membership at <http://www.pgweb.com/~astronomical/>

## Editorial

By Gil Self



How many times over the years I have looked at this blank page and wondered what to tell you about. My job is to share the pulse of our club with you, while trying not to sound too much like a cheerleader, or a party whip. I still need to try and generate interest in helping out with all the planned activities. We host approximately fifty planned public events each year. Throughout the year we have numerous work-bees at the observatory, and of course untold hours everyone spends at home working on projects. How do we get people to give all this time and effort? I don't think any amount of ra-ra here is going to do that. People give their time because they choose to, because they want to contribute to a common goal, because they enjoy companionship and because they want to share with others. In short, if you're not volunteering you're missing out on the very best part of this group. For example—

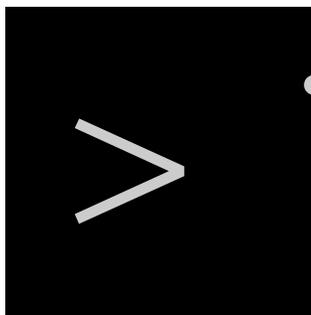
End of a busy week,, exhausted,, — a couch, a TV, a remote, aha! Phone call “ What time are you going to be at the observatory, its your open house”. Ops ! — I've always been the one who kind of keeps an eye on the open house schedule so that no one forgets. — I forgot. Ok, thank-you Wayne for the call, I'll be there at 7:30. Driving down the Blackwater, raining— ok I can spend a couple of hours wrap it up early get back to some serious veging. Pull into the parking lot, there's at least 20 cars here, second brain fart— there's a big tour. Ok Now hang on , I am going somewhere with this.

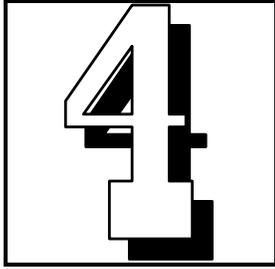
The very best part of the evening, what made it fun..... Nine members showed up to give their help. Thank-you all , Judy, Peter, Rod , Brian, Gerhard. Glen, Wayne, Doug. What a great group of people, all unexpected, just knew that they were needed and turned out. We had a terrific evening, I think all the guests and the members enjoyed themselves, my clue to that is nobody seemed in a hurry to rush off. Members and guests on a cloudy night, everyone just kind of hung around and visited. Its like a tonic after a busy week.

Remember earlier I said I was exhausted, well here comes the point, a new saying to write down in your “Little Red Book” ( *you will probably only get that if your over forty or a student twentieth century trivia* ).

“ Tired is what you are at the end of a busy day, and that's good,,  
Exhausted is a state of mind, and it's only in your head ”

**Astronomers Happy Face**  
(Give it a minute )  
*Clear Skies Gil*





## 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 April 24 th  
7:00 pm at The Observatory**

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The Night Sky for May 2002

by Bob Nelson, PhD

Hi Folks,

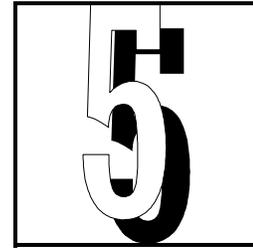
As I write this, I am in the dome of the Optical Craftsmen 24" telescope at Mt John Observatory on a cloudy night (for a change) hoping it will clear up. I've had five nights in a row (well, 4 and a half), so I really can't complain. "What are you doing?", I can hear you ask. Well, I'm glad you asked, because it gives me a chance to explain about my favourite topic – observing eclipsing binaries. [As I've mentioned before, these are systems consisting of two stars in orbit where one star – just by chance – is in such an orbit that it passes in front of the other, producing a dimming of the light. All you see is a dip in the light curve which enables you to derive interesting things about the system – orbital inclination, temperature, mass ratio, and – if you can analyze its spectrum – mass of each star. Good fun.]

Anyway, I completed the light curve for a star WY Horologium. [If, like other northern observers, you have to reach for a star atlas to find this constellation, you have a lot of company!!! It's at -65 degrees declination and near the end of Eridanus that snakes its way towards the south celestial pole.] This is a strange system; it has nothing published that I can find but yet, someone said, I believe, it's an eclipsing binary. Well, I don't think it is. The maxima are of different heights, the shape is wrong and the secondary minimum occurs 0.515 the way through the cycle, instead of 0.5, which is normal. There are sometimes reasons why one could have these anomalies, but with all of them, it doesn't stack up. Further, its light curve has changed since February – the second minimum and hump are both fading.

I really don't have any idea what the system is (and neither does any other astronomer that I've talked to), but I will have to do some further reading – maybe that will turn up something.

Currently, I can't see any stars at all; maybe I'll close the dome, have a mid-night supper and go to bed early (it was 7 AM last night – I rose at about 4 PM this afternoon).

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



## PLANET ROUNDUP

**MERCURY** It's a 10.7( disk of magnitude 2.4. It's an evening object in May; on the 14th, when it reaches greatest western elongation (distance from the Sun), it sets an hour and a half after sunset. By May 27th, however, fast-moving Mercury has reached inferior conjunction (between us and the Sun). Get it while it's hot, folks.

**VENUS** sets at mid month at about 10:30 PM - about 2.5 hours after the Sun. It's a 12( disk of magnitude -3.9.

**MARS**, in Gemini from May 2 on, sets at mid month at about 10:20 PM. It's a 3.9 ( disk of magnitude 1.6.

**JUPITER**, in Gemini all year, sets at mid month at about midnight. It's a 33.8( disk of magnitude -1.9.

**SATURN**, in Taurus until the end of August, sets at mid month at about 9:40 PM. It's a 16.6" disk, magnitude 0.0.

**URANUS**, in Capricornus all month, sets at mid-month at about 1:00 AM. As usual, it's a 3.6( disk at about magnitude 5.7.

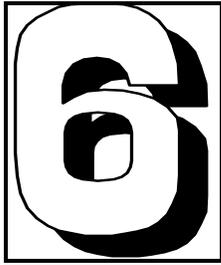
**NEPTUNE**, in Capricornus all year, sets at mid month at about 11:20 PM. As usual, it's a 2.3( disk at about magnitude 8.0.

**PLUTO**, in Ophiuchus all year, rises at mid month at about 9:15 AM. 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 towards Spica to the northeast). It contains NGC 4782, a galaxy located halfway towards Spica and NGC 4361, a planetary nebula inside the figure, and NGC 4027 another galaxy. Messier 104 is just over the north boundary in Virgo.

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 left corner of Corvus), and several galaxies, M83, NGCs 5061, 3923, 5694, and 3821. Messier 83, discovered by La-



6caille in 1752, is a large spiral galaxy, one of the brightest in the southern sky (at declination -29 deg). Burnham calls it (a magnificent system whose dynamic appearance conveys a strong impression of whirling motion.. The two principal arms of the spiral pattern form a reversed letter S, and there is a third fainter arm segment starting from the south side of the nucleus and sweeping out towards the southwest. M83 is sometimes described as a (three-branch spiral, while others suggest a barred classification.) The distance, undoubtedly determined by Cepheids (by and other methods), is about 10 million light years. Over the last 80 years, it has had a remarkable number of supernovae 1923, 1950, 1957, 1968 (and no information since).

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 of galaxies lying some 20 megaparsecs (65 million light years) from Earth. This contains some 1000 galaxies and shines with the light of 10<sup>14</sup> suns. It is thought that the local group (containing the Milky Way Galaxy, M31, M33 and others) may be falling towards the Virgo 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<sup>15</sup> suns.

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. It contains at least 45,000 stars and has a total mass of around 140,000 solar masses. It's very old, about 10 billion years young.

Clear skies,  
-Bob

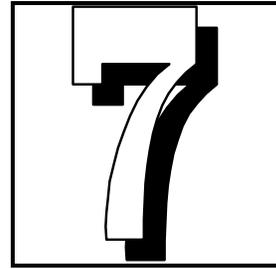


Image of Omega Centauri in colour. At the end of last night (just before dawn), I took 6 images (each 60 seconds) in V (green), 5 in R (red) and 3 in B (blue). The fourth B image was wiped out by

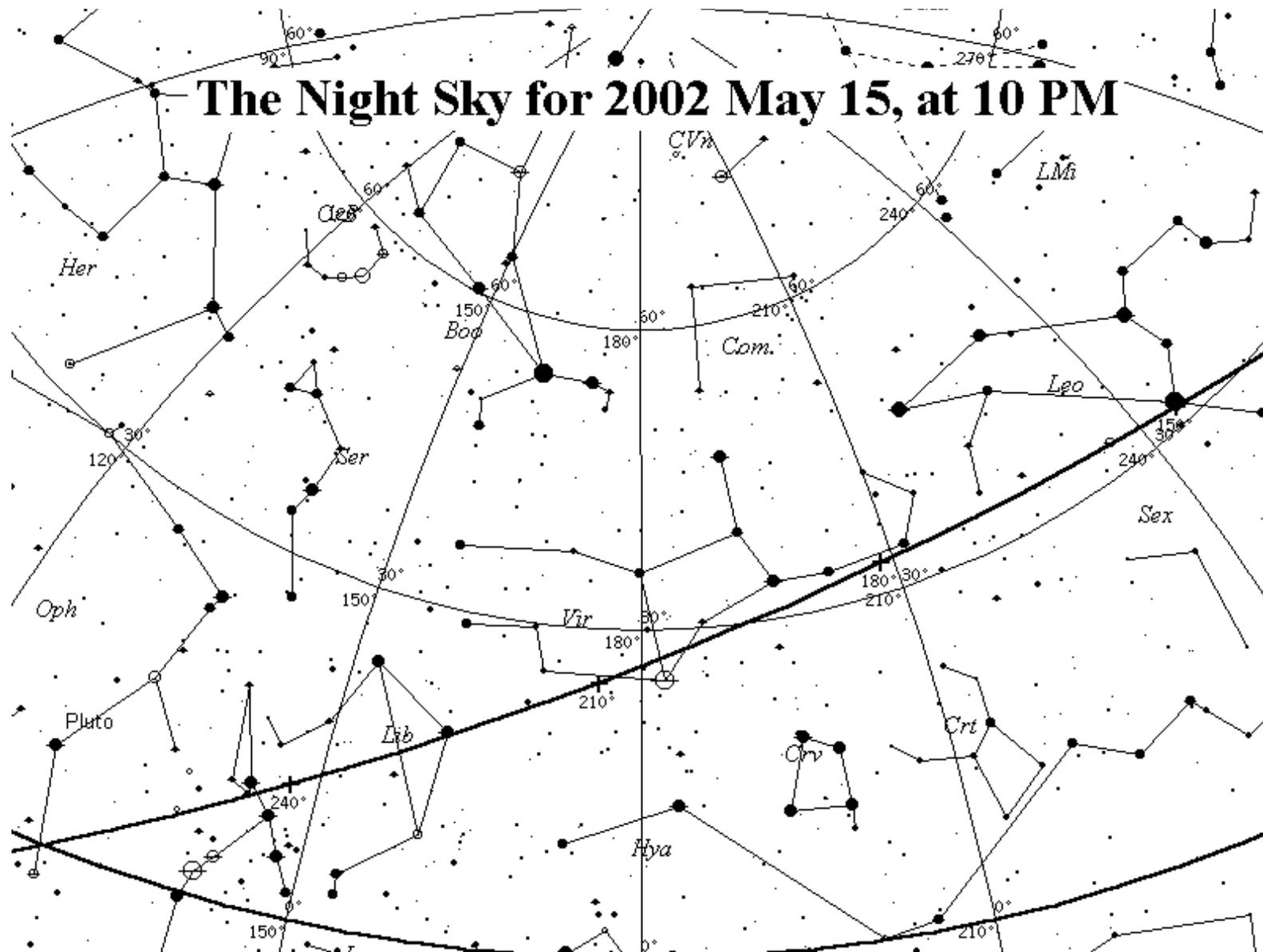
the dawn light - you could read a newspaper then! The blue images were fuzzy, but somehow it worked out.

MIRA, good old MIRA, did a good job of combining the images (stack each, register, RGB combine). The seeing, BTW, was around 4.3" and that was because it was low in the sky. It was a lot better (around 2.5" earlier) but I was reluctant to break my data gathering for fear of not finding my star (TU Mus) again. If anyone would like to practice image processing in MIRA, I could send along the original flat-fielded fits images (or the raw ones for that matter). Bob



Here are some pictures I took; Ikeya-Zhang and Orions belt and sword ( page 10) were taken April 1st. The exposures were about 4 minutes each with my Canon FTb with 200 mm lens piggy backed on and hand guided through my LX 10. The prints were developed at Costco by Bobs daughter Jen. She did an excellent job, prints are better than the scanned images. Doug Wayland ( see Alan Whitmans article on Ikeya-Zhang, page 13 )

# The Night Sky for 2022 May 15, at 10 PM



# The Motions of the Stars

by Art Beaumont

Questions asked at open houses of the astronomy club show that the public in general do not clearly understand the motions of the stars. Questions such as "Do the stars change position? Or Why can't we see the Milky Way tonight?"

The short answer is that the earth travels in its orbit about the sun in the same rotational direction as the earth spins on its axis. Therefore in one year when the sun and stars return to their original position for the same time of night, the stars will have apparently gained one extra day during the year. This means that the stars appear to travel faster than the sun and that each night they are found about 1 degree further west than the previous night. One day per year is  $24 - 365 \times 24 / 366 = 3 \text{ m } 56 \text{ s}$  fast. Old time watch makers would check their chronometers by sighting a known star from given points and next night check for this difference in time.

There are several methods of determining time from the sun such as compass and sun dial combined. sunrise and sunset etc. About the only way to tell time from the stars without astronomic tables is to rely on sidereal (star) motion to arrive at local time. For the northern hemisphere most people can locate the

Big Dipper (Ursa Major). Locate the pointers on the Dipper and follow the pointers to the pole star (Polaris). Estimate what time the pointers would make on a 12 hour clock with only the small hand of the clock and keeping in mind that 12 o'clock is straight up and 6 o'clock straight down and Polaris is in the center.

To this time add the number of months and fractions of month from January 1. Double this and subtract from 17.25 or 41.25 to suit. The number resulting is the number of hours past local noon.

For example on March 28, 2002 at Prince George, B.C. the pointers on the dipper read about 1 h 45 min (1.75). Add to this 3 months from Jan 1 to get 4.75. Double to get 9.5. Subtracting this from 17.25 gives 7.75 (7 h 45 m). Actual PST was 8 00 pm. There would be a slight improvement if we had used 2.9 months from Jan 1. The disadvantage of this method is in estimating the position of the pointers more accurately than 1 hour. A half hour error would produce a error of 1 hour. The year is not needed in this calculation.

This could be a survival method when stranded in the wilderness without a watch wondering how long it will be before rescue starts at dawn. While waiting you could watch the pointers on the dippers slowly rotate about the pole in a counter-clockwise direction.

Art Beaumont March 29, 2002.

**10**

**SN 2002 bo G. Harris**



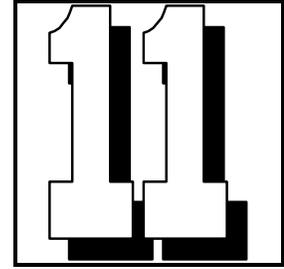
**M-65  
G. Harris**



**See page 7 D. Wayland**



## A Super Night



A few days ago I was scanning through my Astro alert messages and came across a notice about a super nova that was discovered in galaxy NGC 3190 in Leo. It was SN 2002bo at mag 13.9 so at first I didn't think too much about it because it would be a tough target in my LX 10 and besides there are numerous faint super novas in distant galaxies that I don't try to find. But there was something about NGC 3190 that perked my interest. Then it came to me, NGC 3190 was a galaxy which Brian had included in his monthly star hop. In the March 2002 issue of PeGASus it was in hop # 3 of the April Star Hop in Leo on page 14. I remember it because when I checked out the star hop galaxies in my Night Sky Observers Guide, I realized that NGC 3190 was mislabeled as NGC 3189. I thought what the heck, the next time I'm out observing I'll have to check out SN 2002bo.

April 1 was a beautiful clear day so I sent an e-mail to the club members that I have addresses for, saying I wanted to go out to take advantage of one of the last evenings that darkness comes relatively early, before daylight saving time comes into effect. I was out at the observatory by 1900 and set up my scope to cool. Glen Harris, Rob Frith and John Ascah also arrived a little later.

As it got dark, comet Ikeya-Zhang made a nice apparition low in the northwest in a binocular field of M 31. I tried a few photos of it with my Canon FTb camera and 200 mm lens, piggy backed on my LX 10. I used my reticle eyepiece to manually guide the shots for 4 to 5 minutes. This was my first attempt at guided photography. I was aimed low over the road that goes by the observatory and of course a car went by forcing me to cut short a couple exposures. Since I was all set up and on a roll, I decided to take a couple more piggy back photos of Orions belt and sword and Berenices hair. John was also taking some photos of the comet with his camera on a tripod.

Rob and I had a look for Comet OG 10 Loneos which was about a mag 9 comet situated in Cepheus this night. With my Sky Tools chart I was able, with some difficulty, to confirm the star field in which the comet lay. With my 35 ultima eyepiece Rob and I could just barely make out a glow in the area where it should have been. Had we not known it was there, we certainly would not have seen it. Because we were looking in the north part of the sky, the glow from PG likely washed out our view of the comet.

Next I tracked down a nova (V838 Monocerotis) which I learned about from astro alert as well. It is star GSC 4822-0039, which is normally mag 15.4. It has gone nova and is currently about mag 7.4. I first looked at it on Feb. 10. Even in my finder I could see a fairly bright star that did not belong in the field. I easily identified it and compared it to a mag 7.4 star nearby. This night I found it again, Rob and I both noticed that it was very orange in colour. It still appeared to be as bright as the mag



Now it was time to go for the super nova in NGC 3190. I put the cross hairs of my finder scope halfway between Gamma and Zeta Leo just as the star hop says and looked in the 35 mm eyepiece. There were a couple galaxies in the field. Rob and I were able to confirm which one was 3190 by referring to a photo of the field I found in my Night Sky Observers Guide.

The galaxy wasn't real bright to begin with, the core kind of looked stellar with a faint glow around it. With averted vision I was able to see another point of light just below the core. Rob could see it as well. Glen came outside from his observing with the big scope in the dome. We told him about the super nova we could barely see in my scope. We decided we should go in and find it with the 24". Glen got the big scope lined up fairly close with the digital setting circles. Then I peered through the 3" finder and with the paddle, steered it to the correct field while Rob was looking in the main eyepiece. Rob stopped me when he saw NGC 3190 slide into view. Right away we could see the super nova on the bottom edge of the galaxy, wow does aperture make a difference. My Sky Tools chart showed a mag 14 star just to the west of the galaxy. The NSOG photo showed that star also, but did not show a star on the edge of the galaxy, confirming that indeed we did see a super nova. The super nova was barely brighter than the mag 14 star confirming its brightness at about 13.9 just as the astro alert had said it was. We all were thrilled to be looking at a SN. It was the first one I had ever seen and I think Glens first one as well. Rob said he had seen one once before. Glen set about taking some CCD images of it while I went back outside to take another look through my LX 10. This time I could see it much easier after knowing what it looked like in the 24". Glens images were excellent despite a slight tracking error in the big scopes drive. He took three around the 60 second duration. It was now 2200, three hours sure goes by quick in this hobby, time to pack up as 0500 comes early. A great evening it was. If it wasn't for Brians star hop column, we wouldn't have even noticed the Super Nova in Leo.

Doug Wayland

## **NEW BOOKS AT THE PUBLIC LIBRARY**

by Yvonne Whebell

**FALLING STARS: A GUIDE TO METEORS AND METEORITES.**

By Mike D. Reynolds. Stackpole Books 2001.

The book discusses meteor showers, meteor crater sites, collecting meteorites, tektites, classification, preserving and recording. Black and white photos.

Yvonne Whebell,

## Comet Ikeya-Zhang

Alan Whitman

April 1/02 2000-2050 PST



Comet Ikeya-Zhang is obvious to the unaided eye at magnitude 3.0 and sports a 3-degree tail. In 7x50 binoculars the tail is obvious to 4 degrees, faint to 7 degrees, and suspected to 9 degrees. (I went well above the comet and swept back and forth descending until I suspected a contrast feature. This was 9 degrees above the coma.) The comet looks a lot better than it did in Arizona two weeks ago when it was in the middle of the bright zodiacal light.

My 8-inch f/6 Dobsonian at 30x shows the innermost coma as a strong blue-green (the same striking colour as Comet Hyakutake displayed) with a small, but non-stellar white pseudo-nucleus. The blue-green colour of the innermost coma is noticeable in the binoculars and most marked at 30x in the telescope. At this power the tail shows a definite curvature in the first degree of its length, bowing outwards towards the preceding side. At 30x and especially at 64x there is a narrow sharper ray within the tail about one degree back from the coma, presumably a gas-tail feature. Within the coma at 135x there appears to be a very slightly brighter broad arc (a very broad jet?) from the pseudo-nucleus towards the following side of the coma. [Once objects get near the pole, I have a great deal of difficulty trying to figure out directions. When an object is already around to the NNW and moving eastwards below the pole, what direction is the preceding side called?]

Comet Ikeya-Zhang is my eleventh naked-eye comet. (My first two naked-eye comets were Comet Ikeya in 1963 and Great Comet Ikeya-Seki. Ikeya only discovers high quality comets!!)

The telescope is in perfect collimation which is amazing as this scope just rode back from Arizona on my car's roofrack on a inch of foam padding. The paved roads in the Navaho and Hopi reservations in northern Arizona are NOT smooth.

Best,

Alan Whitman

( see Doug Wayland's photo on page 7 )



## May Star Hop in Virgo

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  $28^\circ$  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  $4^\circ$  to Flamsteed 34 from there M90 is about  $2.5^\circ$  to the northwest. There is a 8.8 mag. star  $15'$  from it.

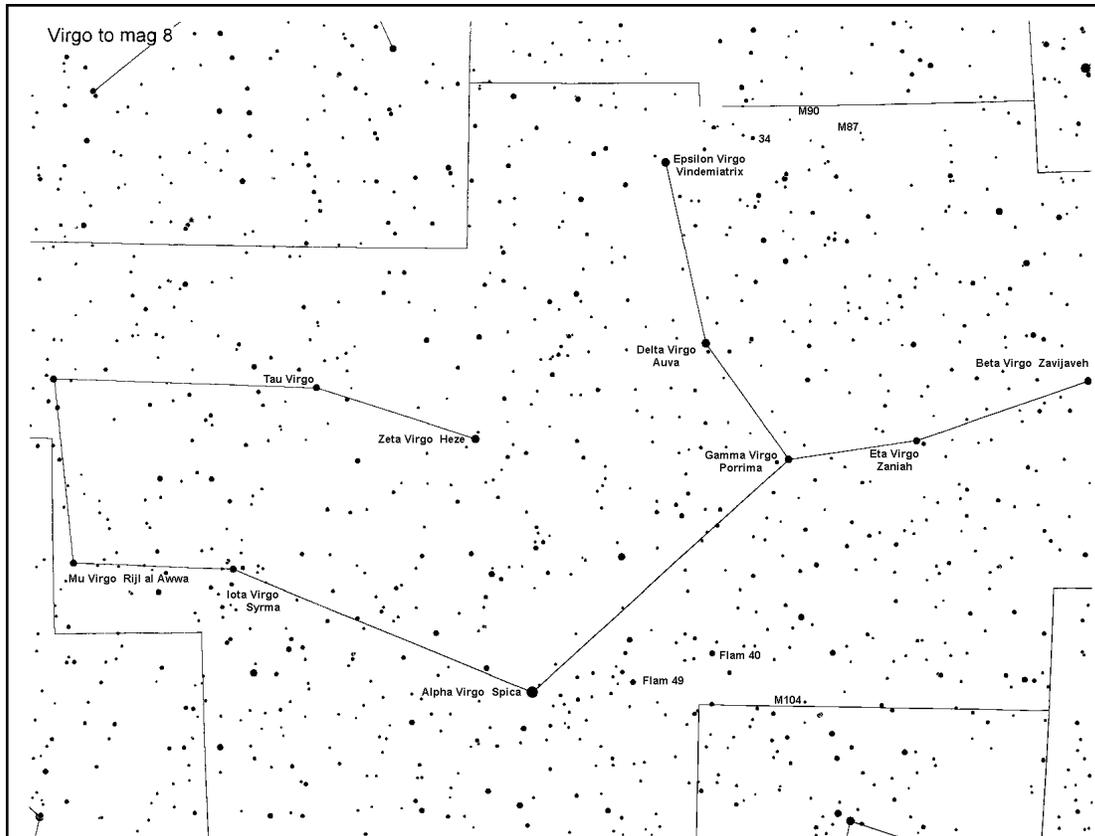
### Hop #3: M87 – Elliptical Galaxy.

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

### Hop #4: M104 – Spiral Galaxy.

M104 is most known by its 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  $4^\circ$  to the west to Flamsteed 49 (mag 5) from there move west again another  $4^\circ$  to Flamsteed 40 (mag 4.8) M104 is now  $4^\circ$  to the southwest. The nearest bright marker star is a mag 6 star high in Corvus (near the southern border of Virgo) about  $1.27^\circ$  to the south of M104.

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.*