

APRIL 2004 ISSUE #136

PeGASus
Newsletter of the

Royal Astronomical Society of Canada
Prince George Centre

the

PeGASus

Newsletter of the
The Prince George Astronomical Society



The pgas meets next at 7:30 pm
WEDNESDAY April 28
at the Observatory

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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.

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Contributions to the newsletter
are welcome.

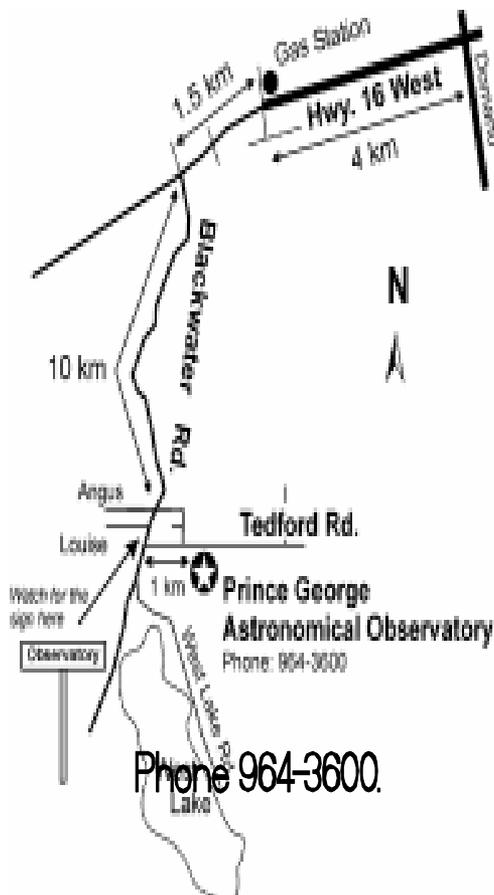
**Deadline for the next
issue is**

May 7

PeGASus Editor
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www.rasc.ca/princegeorge



Editorial

by Gil Self



Boy am I on a deadline. You don't want to know what time it is Wednesday night, and I have a meeting in the morning. Probably best to attend at least somewhat awake. I am pushing the envelope of getting this printed in time to be mailed out before the meeting. Brian should have this Monday morning, but he manages to push it through even when I deliver it late. But this is about as far as I dare stretch it. Thank you Brian. You should note that I am trying something a little different, the deadline for submissions has been moved a week earlier. I hope this will allow me a bit more time to assemble a newsletter we can all be happy with. I also hope that being closer to the last publication it might be easier to remember for folks who have a good idea for an article. The Deadline for the next issue (and last for this season) is May 7 .

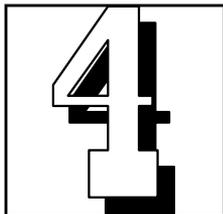
Last month I was awfully short on material to fill a lot of blank pages. I don't know if it's obvious or not but I really don't like using outside material, and I have pretty much managed to stick to that. If there is something worthwhile on a web page or already printed somewhere else, you can read it there. This is our publication and lets keep it local. Well, with that in mind and pages to fill I went digging in our old newsletters and snagged an interesting bit from ten years ago. I thought it was great, reminding us of where we have been, so I did the same thing this month— and struck gold! Do you remember the spring of 1994,

The first images of the comet that was going to impact Jupiter were coming on line. They where rough and raw but absolutely amazing when you realized what was happening. What a thrill it must have been for Shoemaker-Levy when they realized what they had found.

Mathew Burke (wrote the article on page 15) took the lead at PGAS and insured we all knew all there was to know about Comet P/Shoemaker-Levy 9. Mathew suggest we attempt to photograph the post impact of one of the larger chunks. I don't specifically remember which impact or what date but I do remember the effort. There was to be a large impact just over Jupiter's horizon . It would occur when Jupiter was less than ideal in our sky, but if I recall about 20 deg elevation — doable! We set up all the equipment on the roof to improve our horizon. We carted the C-8 , the tripod , the computer , the camera etc up on the roof,, just to test it. Everything worked well, we where ready for the event . We put everything away and a couple of nights later set it all up again, ready for the big event. The sky was almost completely clear, the sun went down and the time of the impact drew near. I don't think it would have been quite so bad if the sky had been overcast and there was no chance, but it was clear—except for that little bit of cloud in the SW. That little bit of cloud that parked itself right in front of Jupiter throughout the impact. I think we where probably the only telescope on or off the earth that didn't catch the big one. That was the day astronomy changed, people where interested. The Jupiter impacts where followed by two great comets and so began a enormous increase in public interest in what we already knew, Astronomy is a great hobby!

More at <http://www2.jpl.nasa.gov/sl9/>

GS



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 28
7:30 pm at the observatory**

Regular Open house and members nights every Friday and Saturday night through the end of May

The Night Sky for May 2004

by Bob Nelson, PhD

Hi Folks,

Here it is, the 20th already and I am late again for this month's column! Things have been so hectic of late. I guess it started with my 12-day observing run April 1-12 on the big telescope in Victoria (the 1.82 m Plaskett telescope). This time, however, I had clear skies!!! Ten nights were clear or partly so, and I cleaned up. I have more or less complete radial velocity curves of two or three stars. [Radial velocities are velocities in the line of sight – plus for receding and minus for approaching. These are measured by taking spectra of the target object, comparing them with spectra of standard objects, and deducing velocity by means of the Doppler shift. The Doppler shift, in turn, is the change in frequency (and wavelength) of moving sources just by the properties of waves. A familiar example is the shift in frequency as a noise source – car or train -- passes by us.] I shall have much to talk about at our next meeting!

Anyway, the late nights (I became totally nocturnal, getting to bed at 0700 and arising at 1500 or later), the long drive back during the middle of the night, and the slow adjustment back to “normal” times have taken their toll. I am only now totally back to speed. (But it's fun!!)

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

MERCURY is a morning object in May, reaching greatest western elongation (26 deg) on May 14th. Owing to the inclination of the ecliptic, it is an unfavourable elongation (read ‘hard to see’) for us northern folk. The planet at sunrise, although appreciably far from the Sun is much closer to the horizon than it would be were on a date six months later. You had your chance last month!

VENUS sets at mid-month at 0:18 PDT, now only three hours after the Sun. It's now a 14% illuminated 47” crescent at magnitude -4.4. It will be very spectacular

to look at, especially before sunset, when it is higher in the sky. Have a go at it with binoculars or telescope; you won't be disappointed!

MARS passes from Taurus to Gemini on May 7, sets at mid-month at about 01:00 PDT. It's now a 4.3" disk of magnitude 1.6. Not much to look at.



JUPITER, in Leo until August, transits at mid-month at 20:19 PDT, about an hour before sunset. It's still a good target for public observing (hint, hint). It's a somewhat smaller 39" disk of magnitude -2.1.

SATURN, in Gemini until 2005, sets at mid-month at 00:24, PDT. Still there, folks! Fading a bit, it's a 17" disk of magnitude 0.1.

URANUS, in Aquarius until 2009, rises at mid-month at about 03:00, PDT, for the astronomers that stay up all night. As usual, it's a 3.6 disk at about magnitude 5.7.

NEPTUNE, in Capricornus until 2010, rises at mid-month at 2:18 PDT. A little late for most. As usual, it's a 2.3" disk at about magnitude 8.0.

PLUTO, in Serpens until August, rises at mid-month at 22:21 PDT. The night owls may elect to go after it. As usual, it's a 0.1" disk at magnitude 13.8

CONSTELLATIONS to look for in May (at 23:00 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 Lacaille 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

(continued on next page)



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^{14} 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^{15} 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

An E-Mail from Maurice

Hi Everyone,

I just spoke to Mr. Don Schaffer the City Clerk for the City of Prince George, he recommends we write letters on light pollution to Mr. Bob Radloff the Director of Development Services and a copy to city clerk. The Development Services department sets the guidelines for the city. Then if we do not get the response we hope to get, then we can write to city counsel.

I am optimistic that we will be heard and the issue given consideration.

Those that do decide to write letters, we should try to co-ordinate our efforts. If anyone has any questions I do my best to get them an answers. A short letter is all that is needed, even three or four sentences will get the message across.

We have a valid points to make to:

- reduce power consumption,
- increase safety by reducing glare,
- reducing light trespass,
- and preserving the night sky

If we can get enough attention, then the city will not ignore the issue and we can get some guidelines established or even a bylaw.

Maurice S.

Maurice

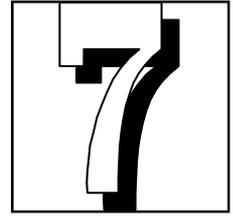


Photo by Wayne Sanders

RASC National President Visits PG Centre



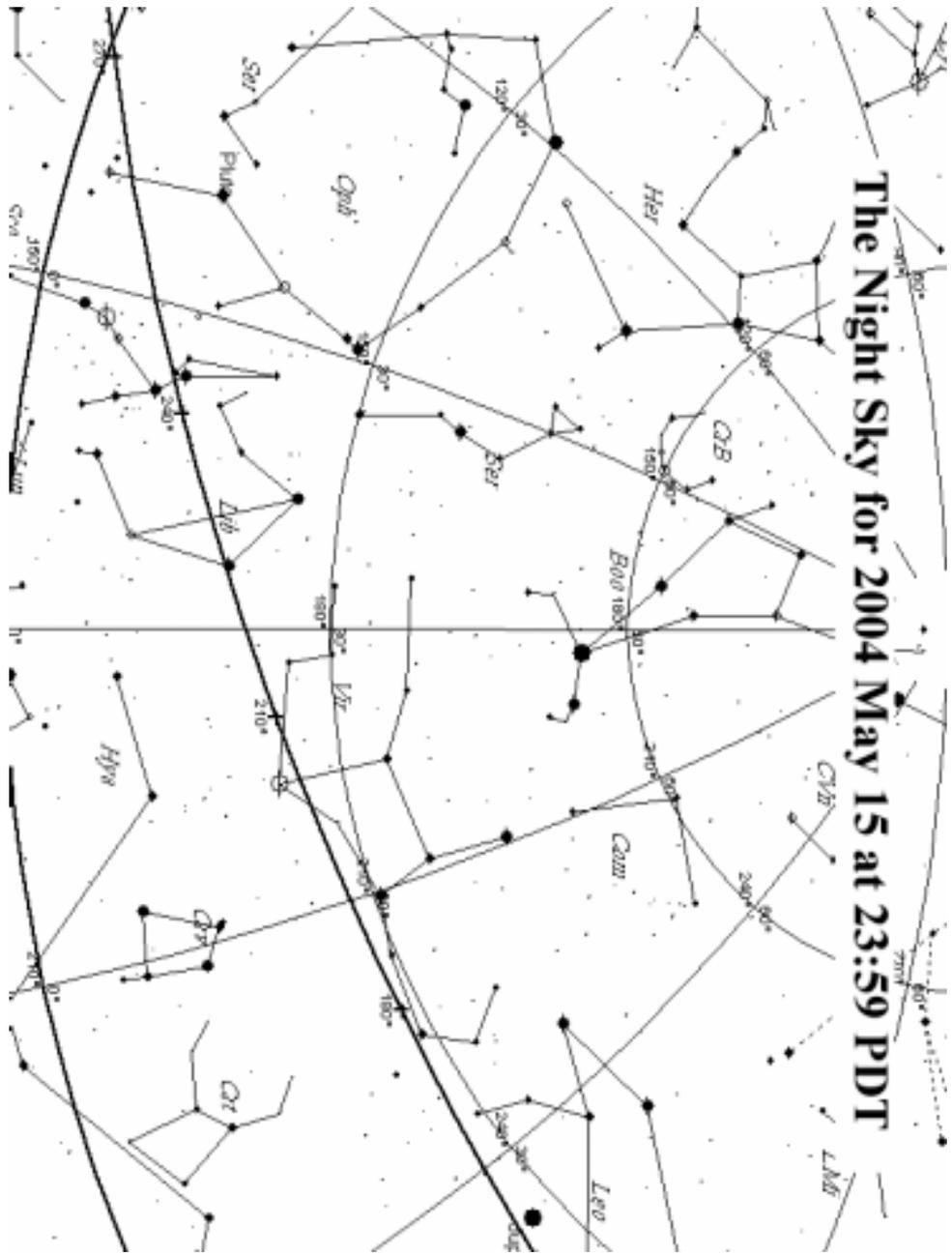
An excellent lecture held at UNBC , demonstrating some amazing advances in astrophotography and some equally inspiring photo processing software



Followed by a tour of the Prince George facility, I think it was our turn to amaze Dr. Gupta. Followed by an interesting and lively round table discussion. Please note the absence of the table :-)

Welcome to Jim Toews as a key holder.

The Night Sky for 2004 May 15 at 23:59 PDT



Sky Map courtesy Dr Bob Nelson



SOUTH

View from P.G.A.O.
May 15, 2004
10:00 pm

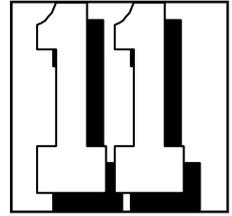
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Above , local cadet corp tour Feb 28 2004
Below, Doug was flying by the observatory , and
photographed the latest improvements
All photos on this page by Doug Wayland



Royal Astronomical Society of Canada
Prince George Centre
7365 Tedford Road
Prince George, BC



Executive Meeting Minutes

April 14, 2004

Chairperson: Brian Battersby Recording Secretary: Glen Harris
Executives Present: Glen, Gil, Brian, Rod
Members Present: Maurice, Wayne, Bob, Jim Toews

The minutes from the February 11, 2004 executive meeting were circulated.

2. Treasurer's Report

Club Account		Gaming Account	
Total Income	\$3298.23	Total Income	\$261.02
Total Expenses	\$3061.27	Total Expenses	\$1956.31
Total Income/Expenses	\$236.96	Total Income/Expenses	(\$1695.29)
Total Net Worth	\$3027.35	Total Net Worth	\$2566.00

Motion to accept Treasurer's report. Moved: Rod Seconded: Glen, Carried
General Business

-Jim Toews was given a key to the building.

-Jim will fabricate a light shield based on dimensions to be taken at his convenience.

-Glen will purchase a can of concrete paint to touch up the exterior of the building.

-There has been no progress regarding the corporate fund raising drive. An update will be given at the next executive meeting.

-The Gaming Commission sent the club an additional \$1000 as an adjustment to the original request. No reason was given for the adjustment. Gil will email the Commission asking for an extension of the spending timeline to the end of July.

-An inventory of the club equipment will be made on Saturday, April 17, 2004 to comply with insurance requirements. Wayne, Bob, Maurice and possibly Rod will perform the inventory.

-The exterior door access into the attic area of the classroom is to be upgraded/reinforced ASAP.

General Business (continued)

-An extruded metal cage is to be placed around the ceiling projector to discourage theft.

-Wayne suggested that the club encourage young people in the science of Astronomy by offering a 1 year paid junior membership in the RASC Prince George Centre.

- A decision regarding the remaining gaming account balance was reached. Research into the cost of a Binoviewer with it's associated eyepieces, as well as several new eyepieces for the main scope will be done. An evaluation on how well Jim's Bino-viewer and 2" eyepieces perform on the main scope will be taken into consideration, and will influence the final decision on what is to be purchased.

Meeting adjourned at 9:15 p.m.



May Star Hop in Bootes

by Doug Wayland

Technical information from Night Sky Observers Guide by George Robert Kepple and Glen W. Sanner and from Sky Atlas 2000 Companion by Robert A. Strong and Roger W. Sinnott.

Just look for the small bold numbers on the map and match them to the corresponding numbers in the text. It is very important that you know the directions in your eyepiece. You can do this by nudging your scope in a known direction while looking in the eyepiece, note which part of the field the stars are appearing, that is the direction in which you were pushing the scope. You may have to do this for both finder and telescope.

By May, the skies don't get dark until very late in the evening if at all at these latitudes, so double stars may be the best targets for which astronomically dark skies may not be necessary. I have thrown in a couple galaxies and a dim globular in case you do get some dark, clear skies.

1) We'll start at the North end of the constellation Bootes, about 5 degrees NE of the end of the Big Dipper's handle. You can follow the outline of Bootes as the map shows up to this point. Our targets are the double stars **17 and 21 Bootis**, which can be seen with the naked eye. 17 is the star indicated just above and slightly left of the **1** on the map and 21 is the one directly left of the **1** that looks like a naked eye double. In a low power, wide field eyepiece, both doubles can be viewed at the same time, however, I like to view each one at a higher power. 17 is a beautiful close double of a bright white, mag 4.6 primary and a bluish, mag 6.6 secondary spaced 13" away at a PA of 236 degrees. Now looking at 21 Bootis in the eyepiece, there looks like a wide E-W pair of stars, but the double we are after is the closer pair on the west. This is a nice double, with a bright yellow mag 4.9 primary and a bluish mag 7.5 secondary 38 arc seconds away at a PA of 33 degrees. I like the view with the other bright star to the East.

2) Our next stop is two galaxies, not too far away, but very dim. In dark, clear skies I could just make them out at 57x in my 8" LX 10. With 21 Bootis in the NW part of your finder field, you will see a wide NW-SE pair of bright stars in the SE part of the same field. Put your cross hairs about 1/3 of the way from the SE one to the NW one. **NGC 5676** should appear in the eyepiece as a small, dim oval glow that is tilted slightly NE-SW. Now stay at the eyepiece and center the bright star just to the E, that you positioned from to find 5676. Slide slowly S about 3/4 of a degree and you should see the small, dim E-W thin line of galaxy **NGC 5689** come into view. I found these challenging, but very satisfying to find. NGC 5676 and 5689 are about 100 million ly away.

3) Our next target is **51 or Mu Bootis**, a naked eye star easily found by seeing it at the point of a triangle formed with Beta and Delta Bootis. This is a triple star that needs a 100x or more to split the secondary double. The primary is a bright mag 4.3 yellow star with the secondary being a yellow mag 7, spaced 108" away at a PA of 171 degrees. This secondary is also a very close double that you need the high power for. It's double is an orangish star 2.3" away at a PA of 8 degrees. These three stars are a very nice scene on a night of steady air.



4) The next target is a challenging double, the easy to find star **Epsilon Bootis**. The separation is a tight 2.8 arc seconds, which isn't tough normally at high power, but the magnitude 2.5 primary, in this case, overwhelms the mag 4.9 secondary. The greenish secondary is almost N of the yellow primary and sits in the glare of the latter. The few times I tried to view this, the air was unsteady and I could detect a second star, but not very well. On a night of good seeing, this pair would be very pretty.

5) The next hop allows us to compare two very different globular clusters that are nearby each other. You will need at least a six inch scope and dark skies to find the first globular, **NGC 5466**, but if you want to view **M 3** nearby, binoculars will do. Start with your finder on Rho Bootis, the one that looks like a p on the map. Rho is at the ENE end of a three degree long diamond shape of stars. You can see it on the map and it is easy to see in your finder. Now move your crosshairs about 1/2 the length of that diamond to the W, to the star that is indicated just below the **5** on the map. Look in your low power eyepiece and you will see that star appearing quite bright. About 1/4 of a degree to the W of that star, you should see the very dim and quite large glow of globular NGC 5466. It is too dim to resolve into individual stars. Now for the fun comparison part. Put 5466 or if you can't see it, the bright star, in the top third of your eyepiece field and while continuing to look in the eyepiece, slowly move the scope in RA only, 5 degrees to the west. Suddenly you will see the very bright, partially resolved globular star cluster, **M 3** take a commanding presence in the view. This works best with an equatorially mounted scope because you only have to move one axis, but if you are sure of your directions, you could shove an alt-az mount the same way to get the effect. You can use your finder to hop to M 3 as well. Put the star that is beside NGC 5466 on the E edge of the field and you will see the fairly bright glow of M 3 sitting at the W edge of the field. NGC 5466 is about 47,000 ly away and M 3 is perhaps 27,000 ly away.

6) The last two targets are pretty double stars viewable in less than ideal skies. Start at Zeta Bootis, the one at the end of the leg extending SE from Arcturus. In your finder, follow the star patterns N to the group around the **6** as indicated on the map. Center on the one directly below the **6**, which is **37 or Xi Bootis**. This is a naked eye star which you can probably just put your finder on, instead of hopping there. In the eyepiece you will see a nice tight pair best viewed at about 100x. The primary is a bright mag 4.7 yellow star and the secondary is a pretty orange mag 7 star 6.6" away at a PA of 318 degrees or NW. Accenting this view are three widely spaced stars in a N-S line in the East side of the field.

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7) Now shift back to the Naked eye star, **29 Bootis**, indicated just below the 7 on the map. Start with about 57x and you will see a striking, tight pair of bright stars. Double your power for a better view of the bright white mag 4.9 primary and a little dimmer white mag 5.7 secondary 5.6" away to the SE.

Thats all for this month, if the skies aren't dark enough for all the objects, you can still go for the doubles and M 3, which by the way is out of Bootes and in the constellation Canes Venatici.

Doug Wayland, e-mail: djwayland@hotmail.com



**North is Up, West to the Right
Stars to mag 8.0**

Map Courtesy Your Sky
web: www.fourmilab.ch/yoursky/

Ten Years Ago in PeGASus



Comet Crash Predictions by Matthew Burke

During July 16-21 of this year the fragments of the Comet Shoemaker-Levy 9 will collide on the dark side of Jupiter. The burning question on everyone's mind is, "What will we be able to see at the Prince George Observatory?". For seeing direct impacts, the answer unfortunately is, "Nothing". The only fragment crashes during which Jupiter will be visible from Prince George are "C", "M", "R", and "V". They are minor fragments, which greatly diminishes our chances of seeing light echoes on Jovian Moons, or fireballs rising above the cloud tops. However it is my opinion that the energy released by the collision of Shoemaker-Levy 9, equivalent to millions of megatons of TNT (enough energy to destroy a planet) won't go entirely unnoticed.

Despite our poor observing location (Earth) we still can watch for a variety of crash predictions. We can use the CCD Camera in conjunction with our 24" Telescope to log the time during the "Great Comet Crash" and then compare each image for changes in the Jovian atmosphere. The crashes will be spread out over a weeks time (See Collision Chart). All the impact sights will be around -44 degrees latitude. Given that the Jovian day is about 10 hours, the impact sights should be strung around this latitude, possibly creating a new belt or series of storms.

During the first fragment crash on July 16, the Moon will be located 9 degrees directly below Jupiter in its First Quarter phase. During the successive days the moon will continue to drift at a rate of 1 hour in ascension per day. The brightness of the Moon and its location may hinder our observing attempts.

As the comet nears Jupiter, gravity will cause the fragments to accelerate away from each other. The nearest fragment to Jupiter will reach its top speed of 60 Km/sec. one week before the final fragment. Currently the "Comet Train" is approximately 893,000 Km long, with an arclength of 255 arc. sec. (see Comet Train Length Table). Just before the crashes the Comet Train length will be 4,907,000 Km. During the months leading to the crash, we can photograph the comet to track its separation.

A 2 Km object colliding with Jupiter would penetrate to a depth of 350 Km in 10 seconds, creating an atmospheric hole 200 Km wide at the cloud deck. Portions of Jupiter's lower atmosphere (equal to the mass of each impactor) and disintegrated comet, could eject into Jupiter's stratosphere changing its chemistry and possibly hazing over the lower hemisphere. Some dust could eject escape into the Jovian magnetic field, forming a glowing halo around the planet. Any fragments and cometary dust that miss Jupiter could create a faint ring around the planet.

Even though we will not see direct impacts of Shoemaker-Levy, we still will have many unusual phenomenon to look for

MB.

(This was an exciting time to be involved in astronomy, turn to this months editorial for more. — Gil)