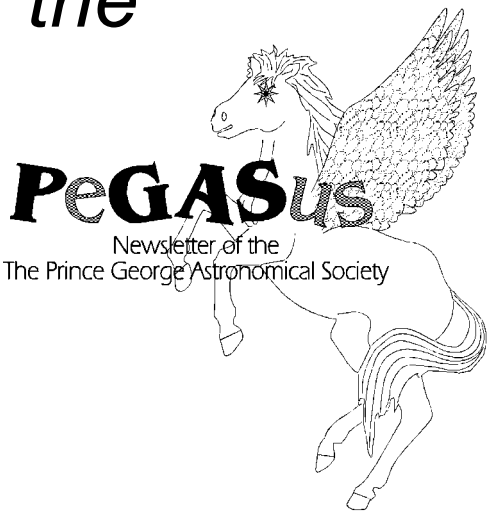
PeGASus
Newsletter of the
Royal Astronomical Society of Canada
Prince George Centre

The RASC-PG meets next at 7:30 pm Wednesday May 28th at The Observatory

Map on Page 2

MAY 2003

the



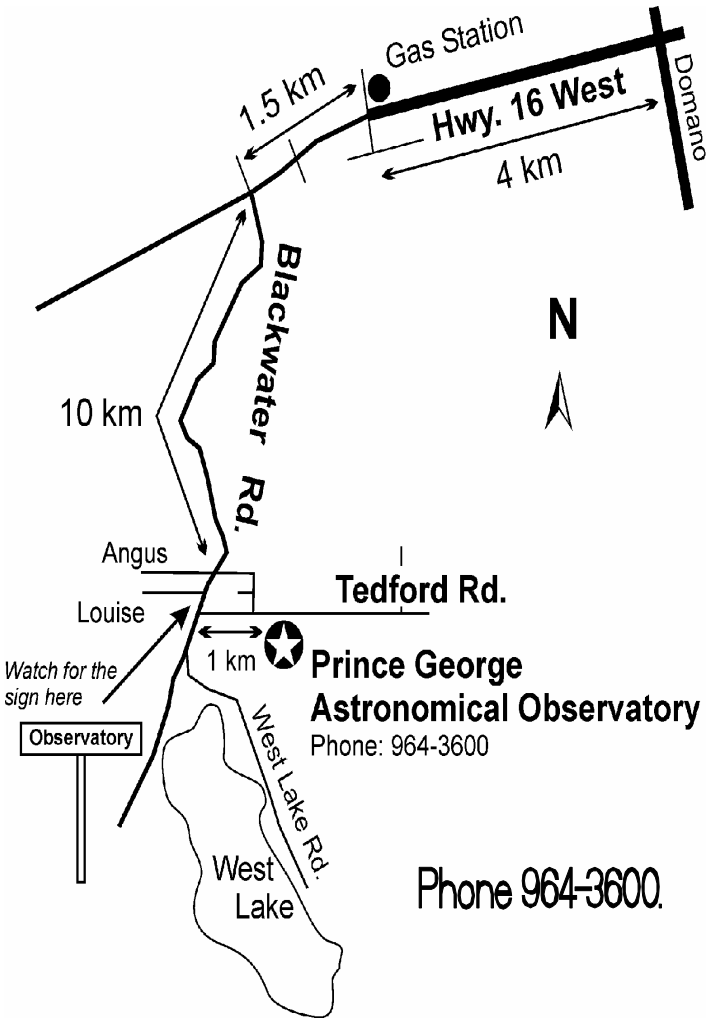
In Issue # 129

Also This Month;

2

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

August 15

PeGASus Editor
Gil Self

Send correspondence to
Prince George RASC
7365 Tedford Road
Prince George B.C.
V2N 6S2
or
gil-pg@shaw.ca
phone:964-3600

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

Editorial

By Gil Self

If you have not already read The RASC Annual Report I urge you to do so. Among the excellent articles describing the activities of the 26 centres across the country is without a doubt the best essay by our own Glen Harris. I may be a bit biased but I think Glen has done an excellent job, distilling our group into the limited space provided.

While your reading that take a quick look at the information regarding voting proxies for the general assembly in Vancouver this June. The items to be voted on do not sound particularly earth shaking, but large organizations like this change very slowly and great consideration is given to each step. Voting proxies gives each of us the opportunity to participate in this growth. Sign your proxy over to who ever you chose. I have complete confidence that Bob Nelson and Brian Batersby will use your vote only after careful consideration of the issues.

While we are on the topic of the General Assembly , did you know this is the 100th anniversary of the Royal Astronomical Society.

In 1903 members of the Toronto Society applied to King Edward VII to become The Royal Astronomical Society of Canada.
I suspect, this year the fun and partying will be a bit bigger and better than ever.

Plans include a visit to the liquid mirror telescope and a special show at the HR MacMillan planetarium. Those by themselves make the trip worthwhile. Add in a dinner harbour cruse and all the presentations available. Do the names Levy, Dyer, and Newton ring a bell?
Details at
http://ap.stmarys.ca:8080/rasc/index.jsp

Have a good summer
Clear Skies
Gil S.

Crossword Answers

Across Answers

1. Center
5. Apollo
6. North
8. Sun
9. NASA
11. Terra
12. Mars
13. Earth
15. Dec
16. Uranus

Down Answers

2. RA
3. Moon
4. Top
7. Rings
8. Saturn
10. Nader
12. Mercury
14. Venus
15. Dipper

Coming Events

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 June 2003

by Bob Nelson, PhD
Hi Folks,

As I write this, I am sitting in my basement den listening to CBC radio while rushing to complete this column before departing for Victoria tomorrow (by car) for my eight-day observing run at the Dominion Astrophysical Observatory (DAO). As usual, I'll use the 1.82 m telescope ("The Plaskett") to take spectra of eclipsing binary stars. It was supposed to be only seven days, but my friend and colleague, Russ Robb – from the University of Victoria – couldn't observe Thursday night, so I said I'll take it. Over the last few weeks, when we've had wonderful observing weather (17 nights in March, 12 in April, 7 for the first half of May and a total of 56 in 2003!) I have been lucky enough to complete two light curves of eclipsing binaries (V728 Her and CV Boo) using my backyard observatory. I'll take spectra of these two stars if possible so that complete analyses can be made.

I have been blessed. I can only hope for – but not expect - a few good nights in Victoria!

I'll give an illustrated talk on the observatory and my results sometime after I return.

Note added just before deadline: I am here in the dome of the 1.82 m telescope. I regret to tell you that I am 0 for 3 so far in getting any data. I have five nights left (Russ Robb donated Thursday night, but it wasn't any good). Tonight looks a lot better, and I hope that I am properly prepared and ready to have a full night.

In the meantime, here is what is happening in the sky next month.

MERCURY reaches greatest elongation west of the Sun, but owing to the geometry of the ecliptic and celestial equator, will be almost unobservable for us.

VENUS rises just an hour before sunrise and, according to the Observer's Handbook, is visible only with difficulty for us "northies".

MARS, passes from Capricornus to Aquarius on June 9, and rises at mid-month at about 1 AM (PDT).

Since there will not be another newsletter before the great opposition of 2003 (the best this century), promise me that you'll get out and see it late August when it will be a 24.5" disk of magnitude -2.7, the largest and brightest possible. There will be a wealth of observing tips in the Observer's Handbook, but briefly stated, observations will be best after midnight when the planet will be very high in the sky and the atmosphere has had a chance to settle down and give you the steadiest images. Make sure that the telescope optics have had plenty of time to cool down. People with closed tubes like mine might be well advised to mount small cooling fans to blow air across the mirror face to reduce air currents there. Let's try to get some good CCD images!!! Just take dozens of images, possibly with an off-centre aperture mask, and maybe one will be exceptional. A video camera is another good possibility. This is an event that should be planned for.

JUPITER passes from Cancer to Leo on June 30, is in the west at sunset and sets at about 12:30 AM (PDT).

SATURN, passes from Orion to Gemini on June 5, and sets at mid-month only 20 minutes after the Sun. Wait 'til next year.

URANUS, in Aquarius until 2009. rises at about 1 AM (PDT). Wait till fall, folks. As usual, it's a 3.6" disk at about magnitude 5.7.

NEPTUNE, Capricornus until 2010, rises at mid-month at about midnight and is therefore well placed for the bleary-eyed brigade of astronomers that stay up at night (nights which, however, are only a few hours long at these months and latitudes). As usual, it's a 2.3" disk at about magnitude 8.0.

PLUTO, in Ophiuchus until December, rises almost an hour before sunset and is well placed for late night observing. As usual, it's a 0.1" disk at magnitude 13.8

Summer Solstice (for northern observers) occurs on June 21st at 12:10 PM. Summer has begun!!

CONSTELLATIONS to look for in June (at midnight, PDT) are Corona Borealis, Hercules, Serpens Caput, Scorpius, and Ophiuchus.

In **Corona Borealis**, there are no Messier objects; but there are two interesting stars: Corona Borealis (CrB), a 17 day eclipsing binary of the Algol type and R Coronae Borealis (R CrB) which is the prototype of a small but distinctive class of variable stars. R CrB is normally at maximum light of about magnitude 5.8 but will fade suddenly and without warning by up to eight magnitudes; the minimum may last from several weeks to up to several years. It's thought that plumes of carbon (soot!) which shoot out from the star (in the later phases of its life) are the cause of the drop in magnitude.

The northern part of **Hercules** contains the globular clusters M13, M92 and NGC 6229 and is fairly familiar to most of us, since it's visible for a good part of the year.

Serpens Caput contains the fabulous M5, one of the best globular clusters visible in the northern hemisphere (see my picture – taken in my backyard – in this issue). It's right up there with M3 and M13.

Scorpius contains numerous globular clusters: M80, about 4 degrees northwest of Antares (Alpha Scorpii), M4, just one degree west of Antares, M62, about 7 degrees southeast of Antares, and M6, near the tail of the beast (which will be very low in our northern skies) plus other NGC globulars.

Ophiuchus continues on with the following globulars: M9, M10, M12, M19, M107, plus numerous fainter NGC globulars. Check 'em out!

This will be the last "Night Sky" for the season, so you're on your own until the August issue! (The constellations are all covered, since August viewing, although two months later, will normally occur earlier in the evening; you are therefore looking very conveniently at the next segment of sky. It all works out!)

Clear skies,
-Bob

A hard days work & good food.

Last Saturday, May 10, we had our year-end barbecue and work-bee. It was a complete success! James A, Maurice S, Greg M and I arrived at the observatory at 9:00 am and got to work hauling gravel. Maurice had phoned the Yellowhead Bridge & Road crew and obtained permission to shovel gravel from one of their discontinued gravel pits about 6 km from the observatory, down west lake road. We all enjoyed the hard, but thankfully short, work of tossing the gravel into the truck bed and James' children really had a great time running amok on the hill. We made three trips and spread the gravel in the worst areas of the observatory parking lot. We finished up at about noon and headed home.

The second crew, Bob N, Wayne S, Doug W, Gerhard B, John A, Art B and probably some others that I am forgetting (I wasn't actually at this part of the work-bee) arrived at 1:00 pm and got to work doing all the little things that we have been talking about getting done for some time but had never got around to. When I arrived for the barbecue at 5:00 pm I found that the floor had been mopped, tiles replaced in the dome, the junk had been cleared from all the little rooms, some tables and the door had been painted a very nice shade of blue and the junk around the outside of the building had been cleared.

After all that hard work, everyone was starving so we set up the barbecues and set out to cook an amazing feast of food. Soon the air was filled with the smell of steaks, chicken and sausages cooking. There were also some wonderful salads and home-made cherry pies for dessert that everyone enjoyed immensely. After we had all been feed we simply lazed around enjoying the beautiful evening skies conversing in small groups. A few people set up the big scope and had a look at the 1st quarter moon hanging in a deepening blue sky. John A. had brought out his trailer and spent the night observing I have not heard from him at this point as to how it went but the sky was quite clear when I left so I am sure he had a good time hunting down his favourite spring sky objects.

All in all it was a pleasant day spent with good people and made me realize once again how great we have it here at the Prince George Centre. See you at the next "work-b-que"!
Brian B.

The best view of Mars in how long?

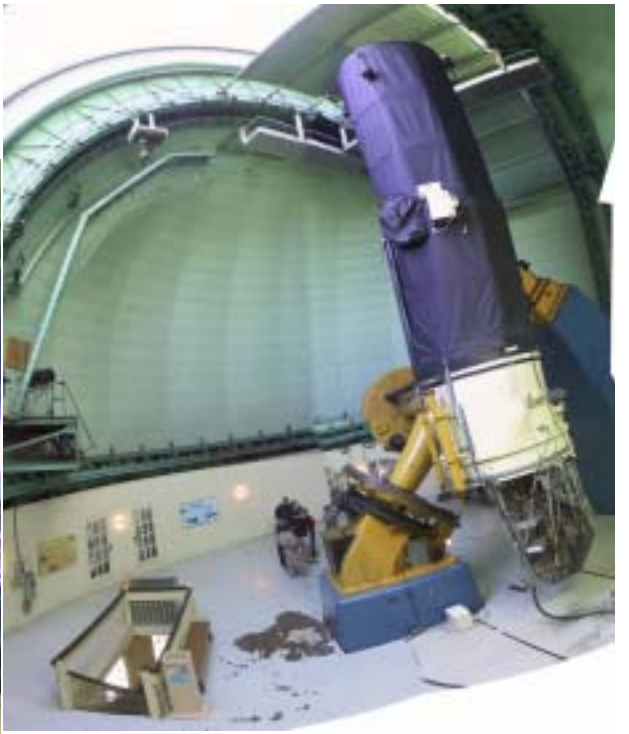
(for more detail check out <http://www.vts.bc.ca/pgrasc/

This August 27, 2003 we will get the best view of mars in recorded history (over 100,000 years!) and Mars will not be closer to earth until 2287 (when it will be 70,000KM closer). This is good news for Amateur astronomers because we are likely to get the best view of Mars in our lives. If you are new to astronomy this summer will be a good time to jump in and start observing. Mars will be an easy target shining brightly in the southern sky with a pale orange-red color, you can't miss it! Try following the red plant's progress July to September.

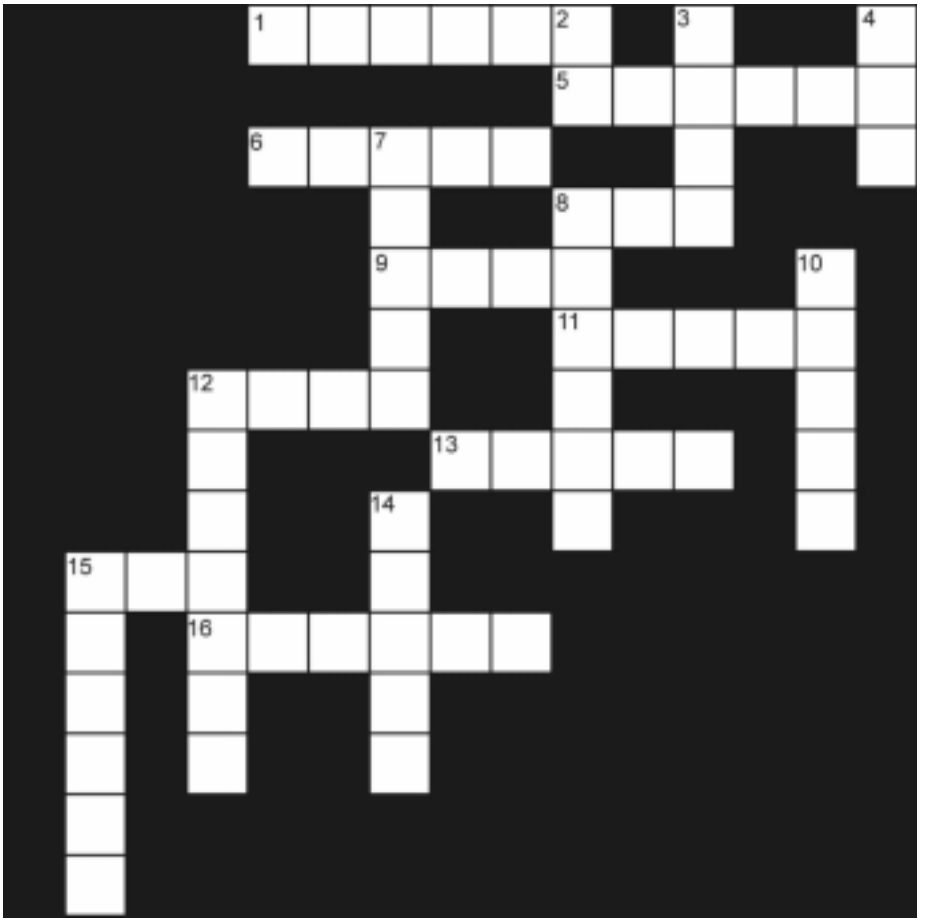
(continued on page 12)

Bob N. has been busy these last few days., but his observing run at the DAO has been disappointing thus far. At this time he has had one good night out of five. I hope that spring Days in Victoria somewhat compensate for it.

Below are two views of the Plaskett 1.82 m telescope at the Dominion Astrophysical Observatory.



Astro Crossword

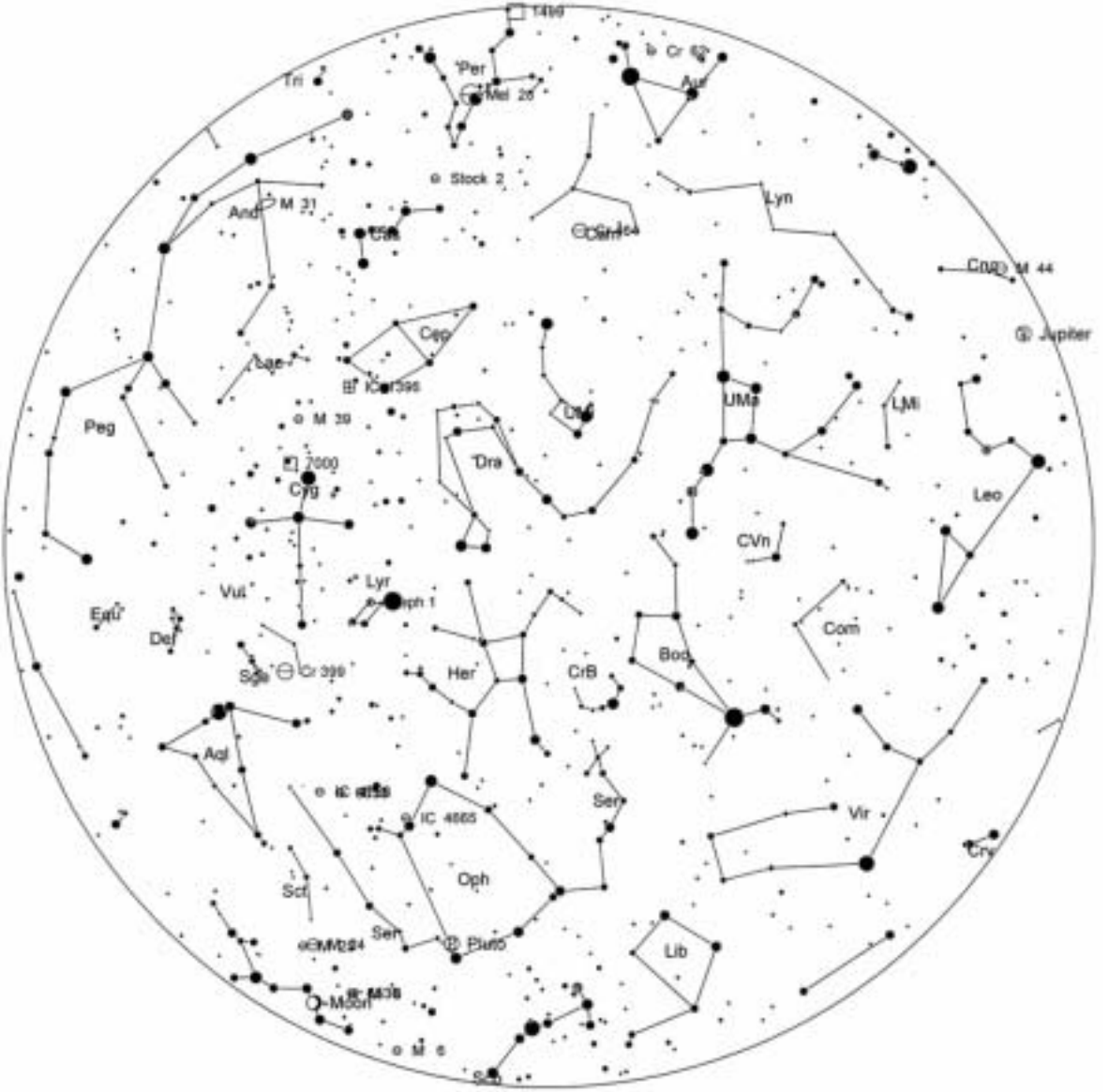


Across Clues

1. Ecliptic (6)
5. One of many (6)
6. Direction of pole star (5)
8. Earth orbits (3)
9. Space agency (4)
11. Earth (5)
12. 4th in line (4)
13. Third in line (5)
15. Elevation (3)
16. Small Planet (6)

Down Clues

2. Right Ascension (2)
3. Orbits Earth (4)
4. Above (3)
7. Saturn (5)
8. Gas giant (6)
10. Below (5)
12. Recently passed in front of Sun (7)
14. Bright (5)
15. Part of pole finder (6)



SOUTH

View from PGAO on June 15, 2003
Midnight PDT

M-5

Right Ascension 15 : 18.6 (h:m)
Declination +02 : 05 (deg:m)
Distance 24.5 (kly)
Visual Brightness 5.6 (mag)
Apparent Dimension 17.4 (arc min)

M-27

Right Ascension 19 : 59.6 (h:m)
Declination +22 : 43 (deg:m)
Distance 1.25 (kly)
Visual Brightness 7.4 (mag)
Apparent Dimension 8.0x5.7 (arc min)

All images by
Dr. Bob Nelson

They just keep getting better and better! GS

M-57

Right Ascension 18 : 53.6 (h:m)
Declination +33 : 02 (deg:m)
Distance 2.3 (kly)
Visual Brightness 8.8 (mag)
Apparent Dimension 1.4x1.0 (arc min)

RASC General Assembly – Proxy

The RASC General Assembly is almost here. I will be attending it for certain and I am reasonably sure that Bob Nelson will also be attending (although I am not 100% sure at this point.) Hopefully, as the date draws nearer and everyone's schedules becomes clearer a few more of us will get a chance to attend the first RASC General Assembly that is close to Prince George since we officially joined the Royal Astronomical Society.

Whether or not you attend the GA in person every member is entitled to vote on the proposed By-Law Amendments. The amendments are; Motion 1 – Establishment of Standing Observing Committee, Motion 2 – Establishment of Standing Education Committee, Motion 3 – Change in Status of Chairs of Standing Committees and Appointed Officers. These motions are outlined in detail in the handout that was included with you Annual Report that you should have received a couple of weeks ago. If you have lost you handout please contact me at blbattersby@shaw.ca and I will mail you a copy.

If you will not be attending the GA to vote in person you may vote by Proxy. The form was part of the handout mentioned above. Please fill out all the information on the form and get it in the mail it to me (to the address below) by Jun 18th or bring it to the May General Meeting at the Observatory.

In the third box from the top it asks you to appoint a proxy holder please put Robert H. Nelson as the first proxy holder as he is our National Representative and Brian S. Battersby as the second proxy holder in the fourth box.

Thank you for taking the time to participate in the national side of things and I hope to see some of you at the General assembly.

Brian Battersby
4556 Bauch Ave
Prince George, BC
V2M 5X4.

The Secret behind the Numbers.

by Gregory Mohammed

What are numbers? Numbers are abstract entities created by humans to quantify its environment in as unbiased a way as possible. But is this really unbiased? In this short essay, I hope to accurately convey a new philosophy I am currently trying to prove mathematically.

Complex numbers are numbers with a real and imaginary part. Dealing with complex numbers introduce new planes, or dimensions, into our current mathematics. The trouble is that we three dimensional entities cannot percieve of more than three dimensions (3D). So what do we do, as physicists, with answers involving complex roots and/or conjugates? Why, we throw them away!

Well, this is my dilemma; are we justified in throwing out the "imaginary" answers, or are we justified in keeping the "real" ones? After much thought, I have come to the "unshakable conclusion" that neither option is right. There is a third which must be true: that we realise that ALL numbers are imaginary/abstract enitities with no natural basis except in human thought. Thus, "imaginary" answers must be indicating something which is just beyond human perception.

This is inlaid in the Second Law of Thermodynamics. This law states that in an isolated system, the system's entropy is constant or increasing. An isolated system is a mathematical construct; there are none in observable nature. The best is a closed system (one which exchanges energy but not matter with its surroundings). So if the universe is at best a closed system, there must be other systems with which it exchanges energy. Since our system cannot exist without these systems, by the second law, then our system must exist if and only if these other systems exist.

Thus, our existence is due in part to these "complementary" systems, and our system thus contains some of these complements, and vice-versa. I propose that this is where our "imaginary" answers derive. Since current mathematics is limited to our perceptive abilities, then to prove or disprove this proposal, we need a new mathematics, one that pushes our perceptive abilities harder outward.

How to do this? I don't know yet! This is my personal challenge, and hopefully others can take it up as well. String theory follows along similar lines, but its basis is totally different from mine. Another group has proposed five dimensions, and their basis is closer to mine. However, I deviate by not asserting that the other systems should follow our ideas of cosmological structure. This is unknown territory, and as such, we need new equipment. I am very excited.

(continued from page 6)

Needles to say this will be a once in a lifetime opportunity. If you do not own a telescope now is a good time to purchase one. If you can't afford a telescope come out and observe Mars with the Royal Astronomical Society Club members! In fact if you do own a telescope we would love to see you (and your scope).

Opposition occurs when a planet is "opposite" to the sun as viewed from earth. The planet and the sun are separated by 180 degrees. When a planet is at opposition it rises as the sun sets and is at its brightest and closest to earth. Mars will be at opposition late August 2003. Not all Mars oppositions are created equal however. Because Mars and Earth orbits are basically elliptical the distance the two plants during different oppositions varies. Sometimes they are closer together and some times they are farther apart. Mars oppositions occur about once every 26 months.

Mars opposition occurs on August 27, 2003 at 9:52 Universal Time (August 27, 2003 2:52 AM local time in Prince George), when the distance between the two planets will be 55,758,006 KM. The Martian disk will be 25" at a magnitude of -2.9.

Mathew B.

My First Lessons in Magnification

John Ascah

When my new telescope arrived last spring I was excited to use it as soon as possible and as the sun was bright and the sky blue I had to resort to terrestrial viewing. I unpacked it at noon and set it up in the backyard with the help of our 21 year old. I have a view that looks across the Nechako River and much to our surprise we discovered a bald headed eagles nest far in the distance and at the same level as our viewing spot.

My telescope has a focal length of 600 mm. With a naked eye view I could make out a very small white spot which I would not have had any impact if I had not know there was a nest there. With a pair 12X50 of binoculars, giving a 12 times magnification, the nest was just barely visible with a white spot on top of it. Using my imagination I could say this was an eagles nest.

Using a 35 mm eyepiece in the scope, giving a magnification of 17, revealed an obvious eagles nest with a bobbing white head. Next came the 20 mm eyepiece giving a 30 times magnification and the eyes of the eagle and its beak could now be made out.. With the 6 mm eyepiece the magnification is 100 times. Now it became apparent that there were two little eaglets in the nest and the nest filled about 50% of the view. This was exciting. Before this it not occurred to me that I might use my new scope for viewing anything other than the sky.

My next lesson was my second night at the observatory with my new scope. I was given a little help in finding Alberio, a double star. The 35 mm eyepiece showed it as a single star without any special characteristics. The 20 mm resolved the two stars but with very little separation. The 6mm eyepiece with its magnification of 100 split the stars so that they occupied about 25% of the field. This was a very exciting night for me as I was also given help in finding the Coat hanger asterism, which isn't far from Alberio. Then with my newfound confidence I was able to find Mizar in Ursa major and then using the 6 mm I was able to split Mizar into two stars and just include Alcor in the same view. I now felt that I had truly become an observer but with my experience with the eagle's nest I better understood magnification. The eagles are back again this year and I continue to watch the next pair of eaglets grow up.

John A.

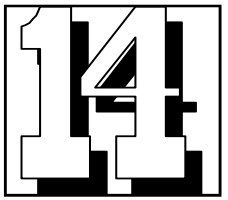
SECRET DOCUMENTS REWRITE THE DISCOVERY OF NEPTUNE

Newly discovered documents from the 1840s, suppressed to prevent an international scandal between England and France, are forcing a rewrite of one of the best-known stories in the history of astronomy.

The discovery of the planet Neptune on September 23, 1846, is justly famed as a triumph of reason, hard work, and the brilliant application of celestial mechanics. The French astronomer Urbain Jean Joseph Le Verrier recognized that slight perturbations in the observed motion of Uranus indicated that a new, unknown planet was exerting a gravitational influence. Le Verrier calculated where the planet should be -- an extraordinary feat when computing was done with pencil and paper; Johann Galle at Berlin Observatory pointed a telescope at the right spot, and there was Neptune.

The tale also goes that John Couch Adams, a young English mathematician at Cambridge, had tackled the same problem independently and predicted the planet's position to within half a degree of Le Verrier's position as early as September 1845. But, according to the story, the English astronomy establishment ignored the young Adams, letting the discovery slip away to the French. After the discovery, a consensus seemed to emerge that both Adams and Le Verrier deserved equal credit for the roles they had played That story, however, conceals a fierce priority dispute that for a while threatened to become a major international incident. Few realized that the consensus story was actually a carefully crafted compromise based on selective use of documents....

From S.& T 's newsletter
Do I not recall that Art Beaumont had this all figured out about five years ago —— G.S.



What's Up Doc?

I am having a hard time coming up with a star hop this month. Mainly because all the "good" stuff in June will be obscured by the Sun that just won't go away and leave us alone at this time of year. So I have been scratching my head thinking "just what can be observed at this time of year?" The answer was so obvious it nearly hit me upside the head, the Sun of course. If you can't beat 'em join 'em is the name of this game. If the Sun won't go away you will just have to look at it. Observing the Sun has its advantages; it is visible more than any other celestial object at this time of year, it's easy to locate and it can be quite interesting.

First though I feel compelled to state the obvious never, NEVER look directly at the Sun through a telescope or other instrument (not even you naked eye) without using the proper filters.

One of the easiest and safest methods to observe the Sun, especially if you have no money or equipment, is the projection method using a pinhole camera. For this technique you will require the following materials; two sheets of white paper preferably fairly stiff, a pin and a sunny day. Use the pin to poke a small hole in the centre of one of your pieces of paper. Hold the paper with the hole in one hand and aim it at the Sun. Don't look through the hole to do this, just move it around until you get strong light shining through. Now hold the other piece of paper in your other hand and move it so that the light falls on it. Move the "screen" back and forth until you get a sharp image. Once it is focused you will hopefully be able to see some Sunspots. You will only be able to see the largest of sunspots with this method. Aiming Hint: Hold the two pieces of paper parallel to each other about 8 inches apart so that the shadow of the first piece of paper falls on and completely covers the second. Also, stand with your back to the Sun so that its light is falling over your shoulder.

If you can devise a way to hold your camera "hands free" then you will be able to try and sketch the sunspots. If you record the spots position each day over the course of about a week you will be able to see the movement of the spots across the Sun.

A better method of observing the Sun and still safe as long as you are careful, especially if there are other people nearby, is to use a pair of binoculars mounted on a tripod to project the image of the Sun onto a sheet of stiff, white paper. This will allow you to observe much smaller Sunspots and in greater detail. This is the method I prefer, as it is quick to set up and produces good results. To set it up, first put the lens covers one on side of the binoculars and place some tape on the caps to be sure they won't fall off. This is because you will not be looking through the binoculars so you will only want one image. Stand beside the tripod mounted binoculars and aim them by watching for the Sun to flash in the shadow of the binoculars. Once you get it lined up lock down your tripod, **NEVER** look through or along the binoculars to line it up this could result in getting a flash of magnified sunlight in your eye. All you have to do now is focus the image using the normal method for your binoculars. **Note:** You can make do without a tripod for this method but it is much harder to get it lined up and focused.

There is one more even safer method to look at the Sun and you can see even better detail: on the web! The best site that I know of is the SOHO satellite site. It shows the Sun in several different wavelengths of light. Some enable you to see the flares and some the sunspots. I don't know all the technical stuff about it, just that it looks cool! A couple of the cameras have very wide fields of view with the Sun masked out. On

these ones, especially LASCO C3, you can see the planets as they pass in front and behind of the Sun in their orbits as well as the occasional comet like the spectacular C/2002 V1 (NEAT) a couple of months ago. In fact the satellite caught the Mercury transit earlier this month on May 7, 2003 producing some spectacular images. URL to the SOHO website.

http://sohowww.nascom.nasa.gov/

Here is the URL of an excellent website discussing different methods and techniques for observing the Sun.
http://solarcenter.stanford.edu/observe/observe.html#section1
So don't let the long days get you down, use your imagination and think up other things to observe. Beside the Sun other possibilities include, the Moon, variable stars, double stars, open clusters and globular clusters, asteroids and the planets.

Good viewing and good luck!
Brian Battersby

A Word From Wayne

Well done. The work bee on the 10th did a fine job on many things out there, if you haven't been out since take a drive and have a look. It will renew your sense of pride in the local group.

I have had a go ahead from the executive to put into operation a one or two station mirror grinding workshop in the lower level of the observatory. It has started. On May 17 I moved a large amount of cardboard box's to under the half floor, resorted stuff and generally did a clean up. I was able to make room for a two station grinding room. There are enough two by fours to frame a room up that will be covered with builders plastic to control the dust in the room. This framing will only get done if there is further interest by the general membership. There are several free mirror blanks there of 6 and 3 inch sizes. How about it are there others interested?

Advise Wayne via E-mail

wsanders@telus.net and CC Brian at Speedee printers copycentre@speedee.ca.

What I am thinking is every secound week, say on Tuesday night from 7.30 till 10 a mirror grinding group get together. The Idea being that we will get more telescopes about and for those that already own them they can build for the observatory. This group would start in the fall.

Have a great summer time, great gardens,
and better fishing.
Wayne S.