

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

**The RASC-PG meets next at 7:30 pm
Wednesday November 26th
at The Observatory**

Map on Page 2

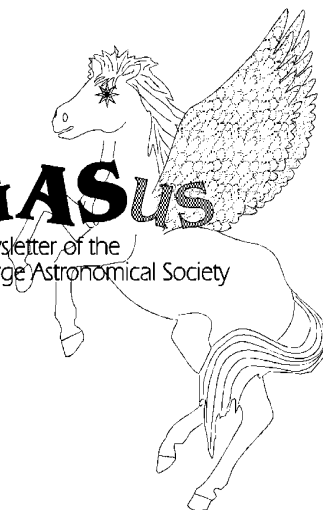
November 2003

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the

PeGASus
Newsletter of the
The Prince George Astronomical Society



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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.

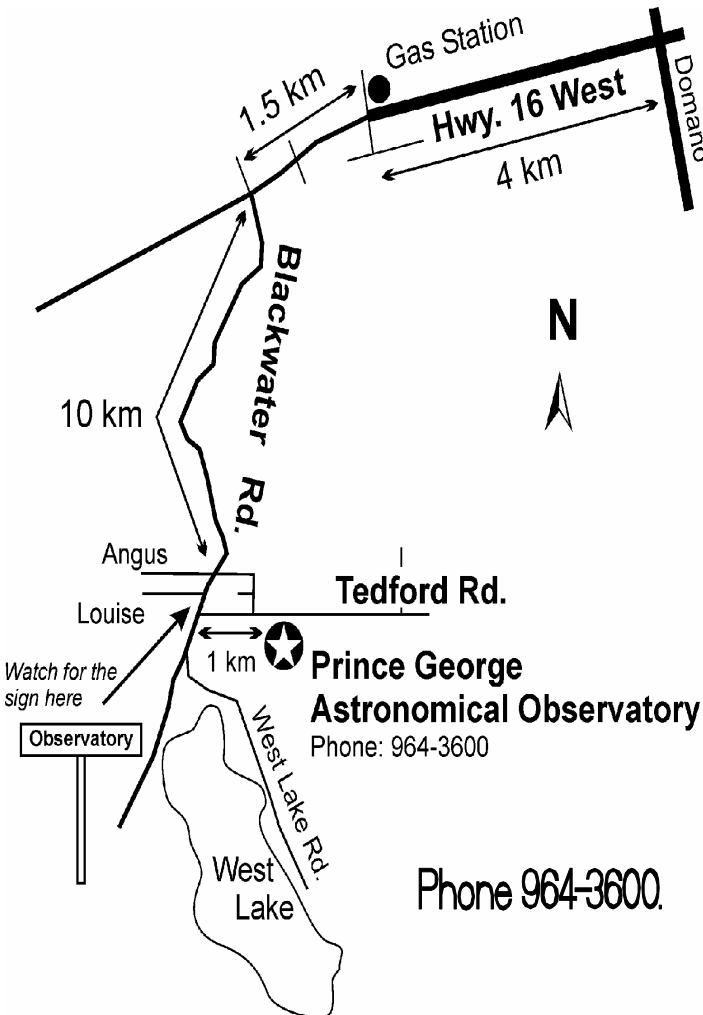
Deadline for the next issue
is

January 16

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Phone 964-3600.

Editorial

By Gil Self

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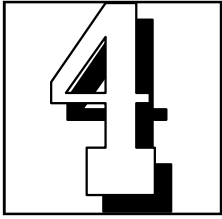
I wonder as we draw near the end of 2003 if everyone realizes what an incredible year we have had . Except for when the observatory was constructed , I don't think we have ever had such a fruitful year. We are now able to present a very polished image to the public. We offer many varied activities, it used to be if we had a cloudy night you might as well go home, but on several occasions this year we have been clouded out and sill entertained / educated our guests for an entire evening . Some of the new equipment open opportunities that just weren't possible a year ago. For example a recent series of e-mail regarding video taping the Leonids, we have real time video through the scope , a couple of patches at he patch bay and we are in business. And that just one example. One of the best parts of the new additions is everything is well thought out, well built and very flexible. I think as we finish up the last few loose ends we are going to find that more and more members are going to come up with innovative ways to use the equipment.

Have you read the Observers Handbook, I mean really read it. I have certainly used it before, checked out times on charts , looked events up. But I decided to give this issue a real good going over. There is a reason this book has been published for so many years, it's really good. People that want to learn more about astronomy (where have I heard that :-)) hand them a copy. I think if someone knows this book inside out , there isn't much an amateur would be lacking.

Merry Christmas And Happy New Year

GS





Coming Events

Friday evenings: Open House night - (Done for the season!)
Saturday evenings: Members night (weather permitting)

The 3rd Annual Prince George Centre Christmas party will be held on December 10.
Start time is 6:00 pm

As usual this will be a potluck supper so if you could bring your favourite dish to share with everyone that would be terrific. If you could let me know what you are bringing that would also be appreciated as that way if there is anything obvious missing then I can arrange to have it brought out.

In the past some people have brought a few alcoholic beverages and there has been no problem. As long as people continue to use their heads and limit themselves to one or two drinks over the course of the evening this will be allowed to continue. Please do not drink and drive!

Since we started doing this the Christmas Party has become one of the best get togethers we do through out the year. So for all you people who haven't come to one yet please consider dropping by this year. It is always great to see all the faces behind the names on my membership list!

Any questions do not hesitate to call. Paper plates, cups, cutlery, napkins will be provided by the club.
Brian

The Night Sky for December 2003

by Bob Nelson, PhD

Hi Folks,

As I write this (late this month – sorry, Gil!!), I'm hunched as usual over my computer keyboard furiously typing away. It's about -10 deg C, the skies are clear, the roof of my observatory is open, the telescope is autoguiding on a star, and the CCD camera taking multiple images to be stored on the computer out there. I then transfer them to one of the computers in my den for batch processing of 10-20 (or more) at a time.

'Panty-waist!' I believe I hear you say? Well, for many years, I did winter observing standing in the snow, so it's nice to be warm for a change. (I must admit that I do miss sometimes actually looking through a telescope. That's when it's good to get out to the big observatory with 'the gang'.

Anyway, here's what is happening in PG skies in December:

MERCURY begins the month as a waning gibbous disk 5.8" in diameter, 79% illuminated and setting about 50 minutes after sunset. On the 12th, it has reached the greatest elongation east of the Sun (20 degrees) and is a half-illuminated disk of diameter 7.3" and magnitude -0.2. Like Venus, it will reach be brighter as it enters the crescent phase later on. Mercury reaches

inferior conjunction December 26 and is therefore not observable. After that, it becomes a morning object.

VENUS is an evening object in December. At mid-month, it sets about 2 hours after sunset and is a 12" gibbous disk (87" illuminated) at magnitude -3.9. Good stuff!

MARS, passes from Aquarius into Pisces on December 5 and on December 28, it just misses the corner of Cetus (which we recognize as not being on the zodiac). At mid-month, it transits at 18:53 PST. Still good for viewing, at mid-month, it's a 10.6" disk at magnitude -0.3

JUPITER, in Leo until 2004, rises

at mid-month at 23:16, PST and is therefore observable if you stay up late; however, you may wish to wait until after the New Year, when it will be closer and much better placed for evening viewing. It's a 38" disk of magnitude -2.0.

SATURN, in Taurus all month, transits at mid-month at 01:24, PST and is therefore well placed for late evening viewing. It's a 20" disk of magnitude -0.3. Look for one or more satellites and use Guide 7 to tell you which is which.

URANUS, in Aquarius until 2009, sets at mid-month at 21:35, and is therefore well placed for early evening viewing. Also look for satellites of this mighty planet. As usual, it's a 3.6" disk at about magnitude 5.7.

NEPTUNE, in Capricornus until 2010, at mid-month sets at 19:50, PST, about 4 hours after sunset. Therefore, it should be a good target in early evening using our big scope. Have you seen Neptune yet? As usual, it's a 2.3" disk at about magnitude 8.0.

PLUTO passes from Ophiuchus to Serpens on December 6. It is unobservable this month. As usual, it's a 0.1" disk at magnitude 13.8

Winter Solstice occurs on December 21 at 23:04 PST. Officially, this is the first day of winter in PG (but it's been with us for a while!!).

CONSTELLATIONS to look for in December (at 9:00 PM, PST) are Fornax, Eastern Cetus, Western Eridanus, Aries, Triangulum and Western Perseus.

Fornax (For, "The Furnace"), is another southern constellation with a number of faint galaxies.

Eastern Cetus (Cet, "The Sea Monster"). Western Ceti was discussed last month, but in eastern Cetus, we see Omicron Ceti, or Mira ("The Wonderful"). Mira was the first of the long period variables discovered, and was discussed previously. Six or seven degrees northeast of Mira lies M77, a bright and compact spiral galaxy of 10th magnitude. According to Burnham, it's unusual in that it has three spiral arms. Also, this galaxy (together with the "Sombrero" Galaxy in Virgo) was the first to reveal a large recessional velocity. In November 1913, V.M. Slipher obtained spectra with exposures over 6.5 hours (!) using the 24" refractor at Lowell Observatory.

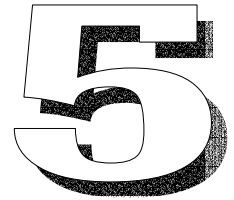
Western Eridanus (Eri, "The River"). is a large constellation out of the Milky Way; the southern part (which we cannot see from Prince George) zigzags its way south to -60 degrees where the bright star Achernar (Alpha Eri) resides. The triple star system Omicron 2 Eridani consists of a wide (82") AB pair making an orbit in some 7000-9000 years. (The "A" star is of spectral type K1 V with visual magnitude 4.5.) The inner BC pair is separated by some 9" at

the moment; the "B" star is a white dwarf (magnitude 9.7) and the

"C" star is a faint red dwarf (magnitude 10.8); and the orbital period is some 248 years. This white dwarf was the first to be recognized as such and is certainly the easiest to find with small telescopes. It is about equal to the Earth in size and a little less than half the mass of the Sun. Consequently, its density is some 90,000 the density of water (it's one big atom, folks!).

Aries (Ari, "The Ram"), is the first entry in the Zodiac and is a northern constellation out of the Milky Way. The brightest star, Alpha Ari is a red giant (sp. K2 III) and lies about 75 light years distant. The really good nebula, NGC 6188 lies, alas, at -48 degrees declination and is not visible from Prince George. [I'll look for it from NZ and get back to you.] NGC 6397, a fine globular, is also too far south for PG astronomers.

Triangulum (Tri, "The Triangle"), is a small constellation just south of Andromeda and contains the famous galaxy M33 ("The Pinwheel"), a member of the Local Group of galaxies. It also contains a number of double stars and variable stars, but little else.





(Cont. from page 5)

Western Perseus (Per, “The hero that saved Andromeda”), is a northern constellation (appearing overhead at times), is in the Milky Way and contains many wonderful objects familiar to many of us. One object is Beta Persei or Algol, the most famous of the eclipsing binaries. [I talked about it a couple of years ago in this column.] Also in this constellation, look

for the Double Cluster. It’s very prominent to the naked eye, lying as it does about halfway between Alpha Persei and Gamma Cassiopeia (the middle star of the big W in the sky). For what it’s worth, the official designation is the “h and X (chi)” Clusters, where the former is NGC 884 and the latter 869. References to the cluster go back as far as 150 BC - both Hipparchus and Ptolemy (early Greek astronomers) noted the clusters - but the actual nature of the clusters was not known until telescopic observations were possible. Today we know that the

clusters lie about 7400 light years distant; each has a diameter of about 70 light years and contains about 5000 solar masses. They are a striking view in binoculars, in finder scopes or in telescopes of any aperture.

Cheers,
Bob Nelson

Important notice to Clear Sky Clock Users

About 95% of users of Clear Sky Clocks can no longer reach them as of Friday October 24.

Because of confusion with y webhoster, I've lost the registration of the domain cleardarksky.com. An annoying advertising site has grabbed the domain name. So a lot of people's bookmarks and links no longer work.

However, I'm still updating clear sky clocks and my server its up. You can access them through:

<http://www.pobox.com/~clearskyclock/csk>

That link will continue to work even when I have a new domain set up (or when I'm lucky enough to recover the old one.)

If you have web pages that are displaying clear sky clocks or linking clock pages, your html is broken. To fix it, use text editor to do a bulk change to replace all instances of

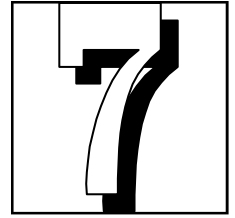
<http://cleardarksky.com> or <http://www.cleardarksky.com> or <http://www.pobox.com/~clearskyclock>

If you want to keep using the clocks and are having trouble fixing your links, please feel free to email me.

Please feel free to forward or post this to other Clear Sky Clock users who can no longer reach the clocks.

Atilla Danko
danko@pobox.com
danko@magma.ca

(I think most of the links have been fixed but just in case you have had some trouble) GS



Total Lunar Eclipse

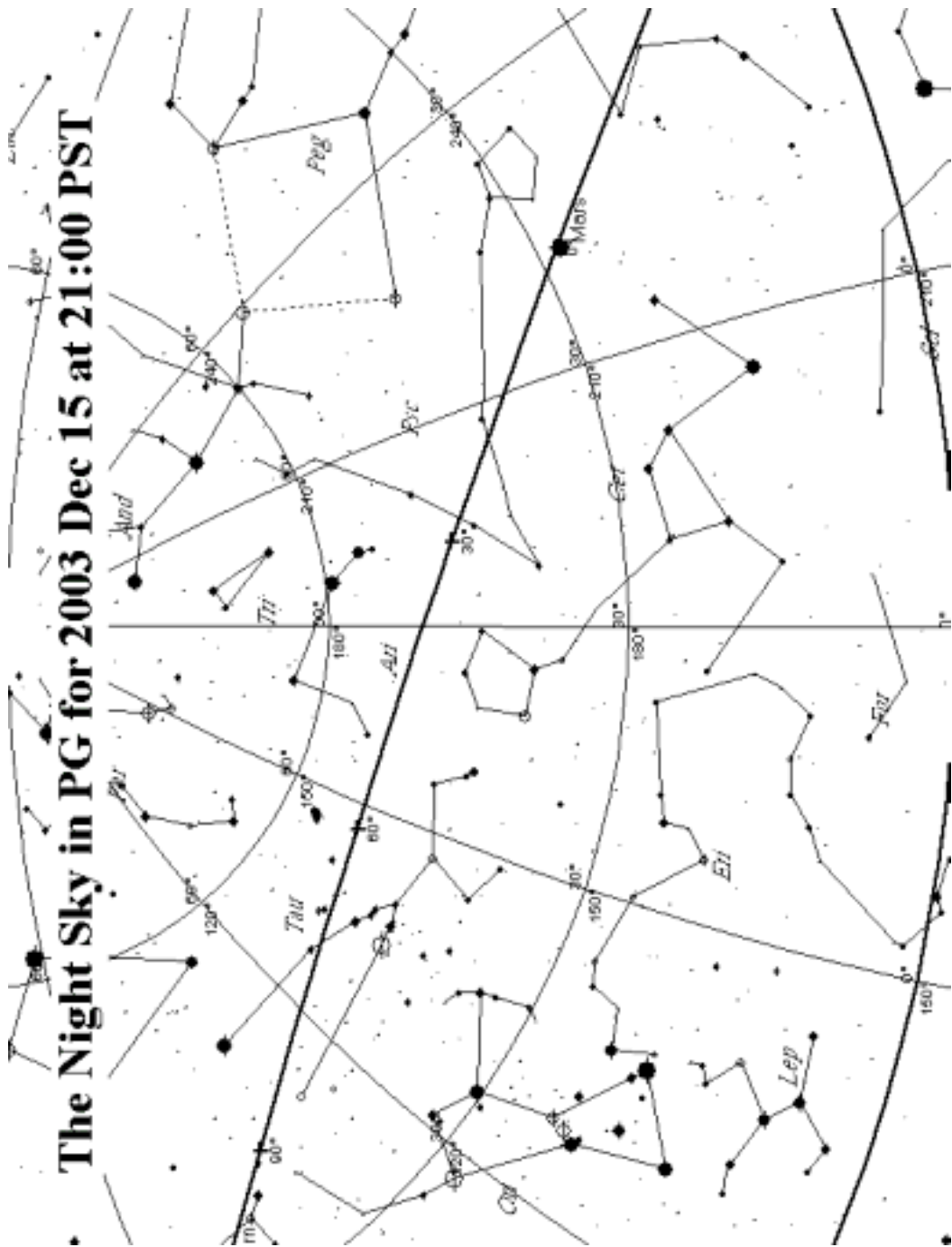
November 8, 2003

Photos By Doug Wayland

Front Page Prince George Citizen!

This was a nice, pretty eclipse. It was more impressive than I thought it would be from our location. I was expecting it to be pretty much finished by the time I could see it but I was pleasantly wrong. ~ Brian

The Night Sky in PG for 2003 Dec 15 at 21:00 PST

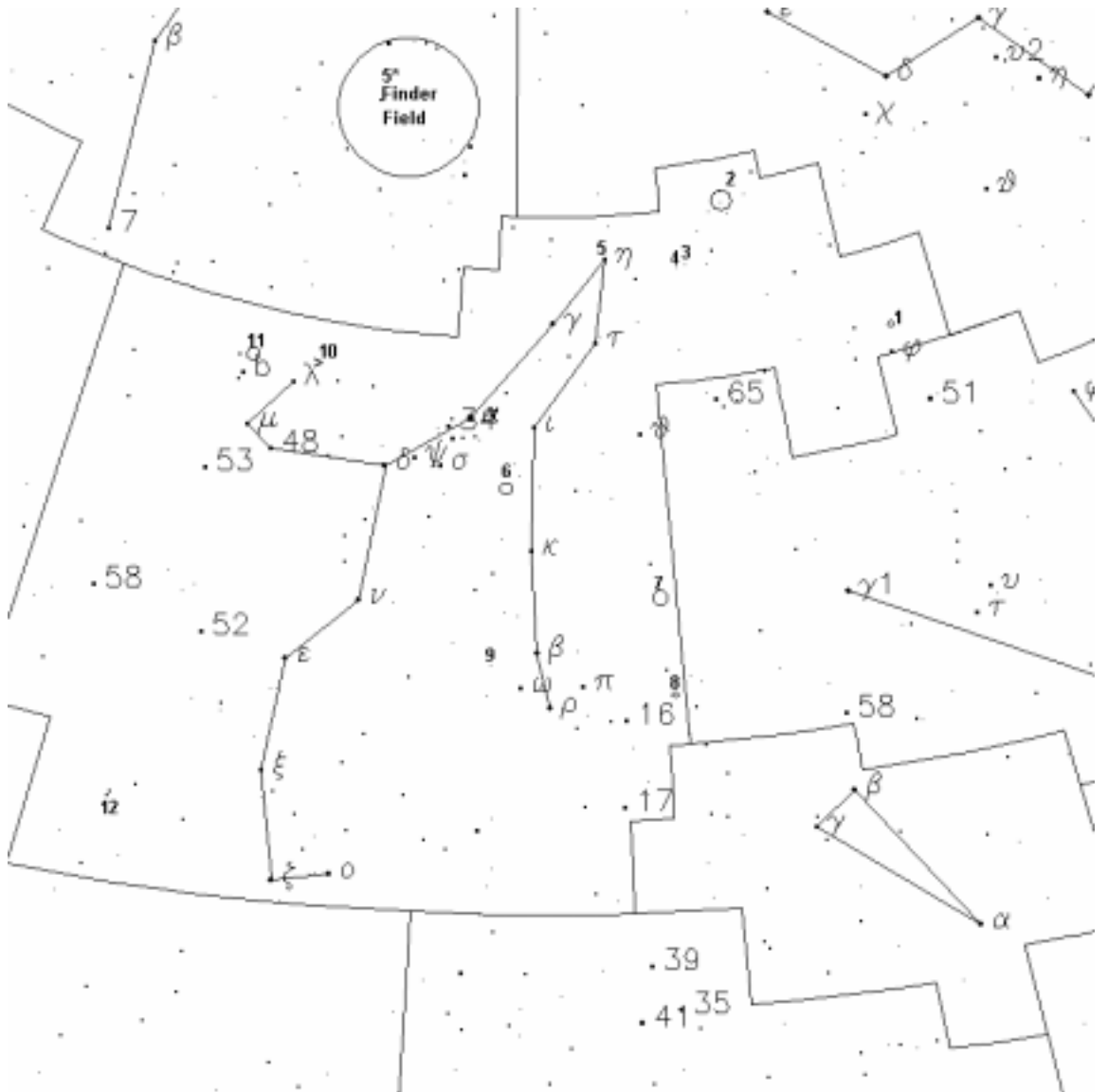


Sky Map courtesy Dr Bob Nelson

December Star Hop in Perseus

North is Up, West to the Right

Text on page 14



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Wayne Sanders has started a mirror grinding work group. The aim of the group is to teach members how to grind their own mirrors and hopefully build a telescope. The group has started working on 6" blanks donated by Wayne and the club.

Pictured here are Jim Verth, Brian Battersby and Gerhard Beirman.

Jim has just finished beveling the edges of his mirror the first step in grinding a mirror.

Brian is applying the tiles to his grinding "tool". The tool is used to shape the mirror in place of using another mirror blank.

Gerhard is checking his mirror after grinding to make sure he is grinding correctly.

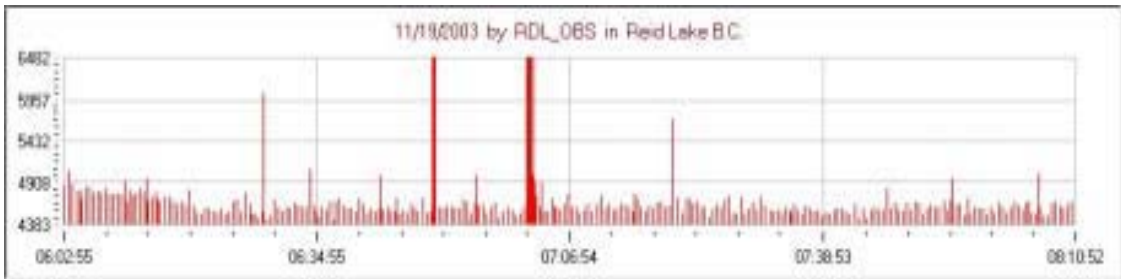
Leonids 2003

11

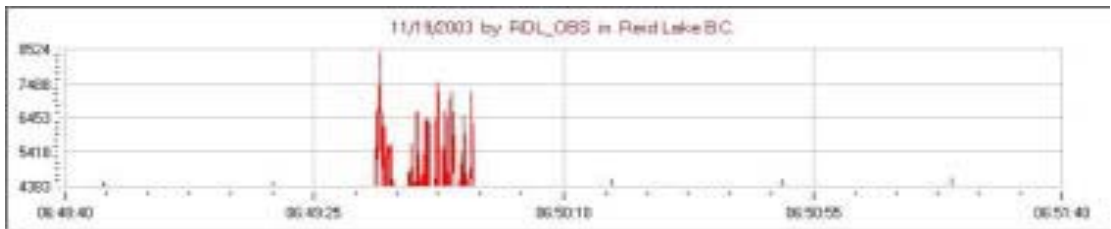
A recent discussion by Brian along with a URL sent me on a frenzied work bee at the beginning of the week. Check the existing antenna to see if it would work at a new frequency. Yes it will work with just a slight degrading. Find a used auto radio, do the modifications to it. Hook up the sound card to the radio; install the free software onto the computer. Check it all out does it work?

Well

Follows are images of the electronic results of the meteor count for the evening of November 18 and morning of the 19th.

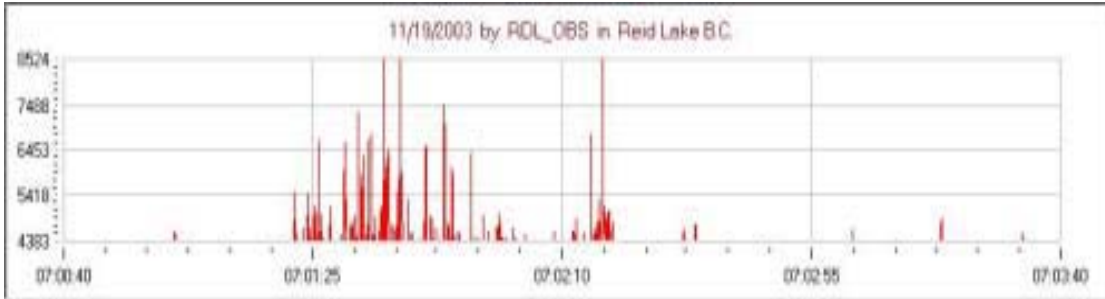


shows 483 events that were likely meteor strikes at about 161 strikes a hour.
Time frame 05.21.19 till 08.10.5



at
6.49 there was a small sustained event lasting about 60 sec, recording 34 strikes

12



at

7.01 a larger event recording 73 strikes again lasting about 60 sec.

The electronic count is based on the enhanced reception of far sited FM stations
Caused by the ionized tails left by the meteor as it strikes earth's atmosphere. As the ionized trails are high above the local weather there is no need to see the meteor strikes
And one then can recorded the number of enhancements and count them. Using software that is available free on the Internet.

Equipment needed

Antenna that will respond to signals in the FM band, some gain and directivity is an asset.



FM radio tuned to a unused channel. When a signal appears on the channel there has been an enhancement or a meteor strike. One then counts the enhancements. They may be less than ½ sec. Long.



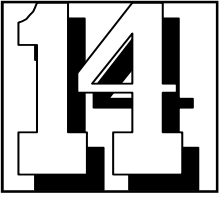
Computer
with a sound
card installed.
Software

Submitted by Wayne Sanders

Another Local project , video taping Lunar Leonid impacts, but I haven't enough room here to go into detail, check with Glen H. for more information.

Why study lunar meteoroid impacts? Go out in your backyard and look up, You can see about 11,000 square kilometers [of Earth's atmosphere]. Now look at the Moon. Depending on its phase you could be looking at as much as 19 million square kilometers of dark terrain." The Moon is a huge meteoroid detector! The systematic observation of lunar meteoroid impacts might reveal new information about the largest fragments in comet debris streams.

How efficient are lunar Leonid explosions? "About 0.1% of the kinetic energy in a lunar Leonid impact is converted to visible light," That's a small fraction, but enough for a brilliant explosion.



December Star Hop in Perseus

by Doug Wayland
Stars to mag 6.5

Map On Page 8

This month we will continue from close to where we left off last month and move into Perseus. Just look for the small bold numbers on the map and match them to the corresponding numbers in the text. I decided to take the deep sky labels off the map to reduce clutter. My symbols for the objects are not standard due to the limitations of my software, but they are in the correct locations anyway. It is very important that you know the directions in both your finderscope and your telescope 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.

1) M 76. Start by finding the naked eye star 51 Andromedae which is about 8 degrees NW of the beautiful double Gamma Andromedae. You can also see the naked eye star Phi Persei about 2 1/2 degrees to the NNE of 51. Put your finder scope on Phi and you will see the pattern of stars that show on the map near Phi. There is a yellow-orange star in the position near

where the 1 is on the map. Put your finder cross hair on that one and in the telescope eyepiece you should see the planetary nebula M76 about 10' west of that star. It was easy for me to see at 77x in my LX 10 despite the bright first quarter moon that lit up the sky. Night Sky Observers Guide (NSOG) indicates that it is visible in a 4" scope. It is a nice tight, elongated nebulosity oriented in a NE-SW direction. In my LX 10, I could see that M76 was situated inside a narrow triangle of dim stars. M76 is known as the "little dumbbell nebula" because of its resemblance to M27, the dumbbell nebula. M76 is about 3 ly wide and is 8200 ly away from us.

2) Double Cluster. Because we are in the neighborhood have a look at the double cluster, NGC 869 and NGC 884. In a dark sky it is visible as a misty patch to the naked eye, located about halfway on a line extended from Gamma Cassiopeiae through Delta Cassiopeiae to the first naked eye stars of Perseus. This is a fine sight in binoculars. You need a fairly wide field eyepiece in a telescope to get both clusters in. I won't say much, but just admire the view. Note the colorful red-orange star located between the clusters. 869 is the west cluster and is about 60 ly wide and 7200 ly away from us. It is about 5.6 million years old. 884 is the east cluster and is about 70 ly wide and 7500 ly away. It is about 3.2 million years old.

3) Struve 268. Next we will move just a little SE of the double cluster to a couple double stars. If you move a finder field SE from the

double cluster you will see the two brighter stars on either side of the 4 and 3 on the map and in between them you will see a row of three dimmer stars. Put your cross hairs on the western one of the three and that will be Struve 268. It is a challenging double with a fairly bright (mag 6.8) whitish primary and a dim (mag 8.1) secondary tucked in only 2.7 arc seconds on the SE side. I had to use 143x to split the pair. I find it satisfying just to be able to see them.

4) Struve 270. The next double, Struve 270, is visible in the same eyepiece field as Struve 268. It is the next noticeable star 10' to the E. This one is easier with a yellowish mag 7.4 primary and a dim mag 9.2 secondary 21 arc seconds away at a position angle of 303 degrees (NW). I find that 77x gives a pleasing view of this one.

5) Eta Persei. Now we can look at a more spectacular double star, Eta Persei. It is only about 3 degrees E of the last target, so is visible in the same finder field. It is also an easy naked eye star. Eta Persei is a beautiful yellow and blue double like Alberio, except the secondary is much dimmer than the secondary of Alberio. The primary is a yellow mag 3.8 and the secondary is a blue mag 8.5, 28 arc seconds to the NW. Looks best at low power I think.

6) NGC 1245. Next on the list is an open cluster, NGC 1245. Put Iota Persei in your finder and just south of it you will see the three dim stars that are shown on the

map. Put your cross hairs on the appropriate location and have a look in your low power eyepiece. The cluster is a fairly large sprinkle of dim stars with the brightest being about mag 11. Even on a moonlit night I could just make out the cluster in my LX 10. The cool thing about this one is that it is framed by a slightly askew pentagon of brighter stars, very neat. NGC 1245 is over a billion years old and about 7500 ly away from us.

7) M 34. A Messier object, M 34 is next. Move your finder S to Kappa Persei and to the W about 4 degrees you will see the star just above the 7 on the map. Below it you will see a fuzzy in your finderscope, put the crosshairs there. In a low power eyepiece you will see an impressive, large cluster of bright stars. What caught my eye was that there appeared to be several doubles of varying separations. This cluster is impressive in all sizes of scopes. If you only have a red dot finder, put the dot on the west end of the triangle formed with Kappa and Beta Persei, as on the map. A little fishing around and you should pick up this gem. M 34 is about 14 ly wide and about 1400 ly away from us.

8) NGC 1023. Now for a different object we will look for a galaxy, NGC 1023. Move your finder S, about 3 degrees, to the next bright star located just above the 8 on the map. About 2 degrees SW you will see another fairly bright star. Put your crosshairs about 2/3 of the way to that star and just E of that line. You should be very close to 1023s location. In a low power eyepiece you should be able to see the concentrated glow of this galaxy. It is fairly bright for an NGC galaxy. In my LX 10 I could see it

even with a gibbous moon brightening the scene. It is located inside a triangle of stars with the S point of that triangle being an apparent wide double. Cool scene. I was even able to pick it up with averted vision in my ETX, a little tougher to find with red dot finder though. NGC 1023 is about 34 million ly away.

9) Struve 369. This is a close double star. Start at Algol or Beta Persei, put your finderscope there and you will see Omega Persei about 1 1/2 degrees SSE, the one that is labelled like a written w on the map. Our target forms a neat triangle with those two stars, its the little point under the 9 on the map. Put your finder cross or red dot at the appropriate spot and look for Struve 369 with a low power eyepiece, then confirm it with a higher power, say 120x or more. The primary is a white mag 6.7 and the secondary is a dim mag 8 blue star tucked 3.5 arc seconds to the NNE (PA 28 degrees).

10) NGC 1491. Our next target is an emission nebula. The field is easily located by imagining a line from Mu Persei to Lambda Persei and going a third that distance again on the same line extension. This object is a little tougher to see in the eyepiece. I was using my LX 10, 35mm ep and UHC filter to detect it, but once found it was definite. The moon was a bright gibbous phase which hampered the view a lot, I wouldn't be surprised if it was visible without a filter on a dark night. NGC 1491 is 2500 ly distant.

11) NGC 1528. This open cluster is easy to find as well, just move your scope 2 1/2 degrees due east from NGC 1491 or put your finder in the appropriate place in relation to the

stars shown on the map and voila, in a low power eyepiece you will see a moderately bright loose concentration of stars. This is good for small and large scopes. This cluster is about 270 million years old and is 26,000 ly away.

12) 56 Persei and Struve 533. We'll finish this months star hop on a couple of double stars, one easy and one hard. Start by putting your finderscope on Xi Persei, the fancy E to the right of 12 on the map. About 3 degrees to the SE you will see the star as indicated on the map. Go there and then to the star about 2 1/2 degrees NE and to the final destination another degree SE. When you are there it will be obvious as there is a straight N-S line of three stars about a degree long. Center on the S star, it will appear as a single at low power, so increase the power to about 140x or more to see the double. When I viewed it, the seeing was very unsteady and moon was bright, so I had difficulty. The mag 5.9 primary overwhelms the mag 8.7 secondary tucked a close 4.2 arc seconds to the NNE. They are uneven yellow stars that are satisfying to be able to see. They should be easier to split on a calm dark night. Go back to low power and shift your eyepiece view to center on the N star of the line of three. You will see a wider pair of more even brightness mag 7.2 and 8.7 stars separated by 20 arc seconds at a position angle of 61 degrees. This also confirms that you were in the right location for 56 Persei.

I hope you enjoy this months tour. You may have to use a more detailed star map for some of the objects. Let me know how you make out.

Doug Wayland e-mail: djwayland@hotmail.com