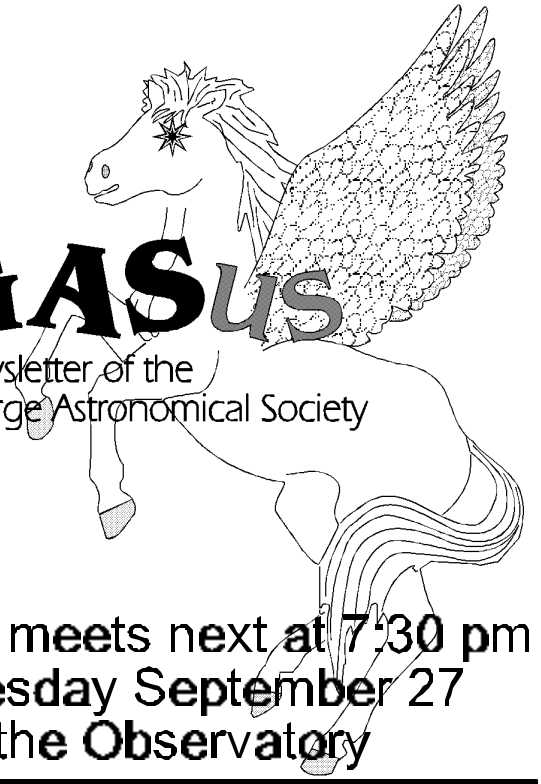
SEPTEMBER 2000 ISSUE #105

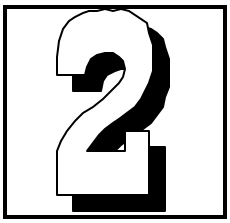
the PeGASus

Newsletter of the
The Prince George Astronomical Society



The pgas meets next at 7:30 pm Wednesday September 27 at the Observatory

INSIDE :



the PeGASus is published monthly by the *Prince George Astronomical Society*.

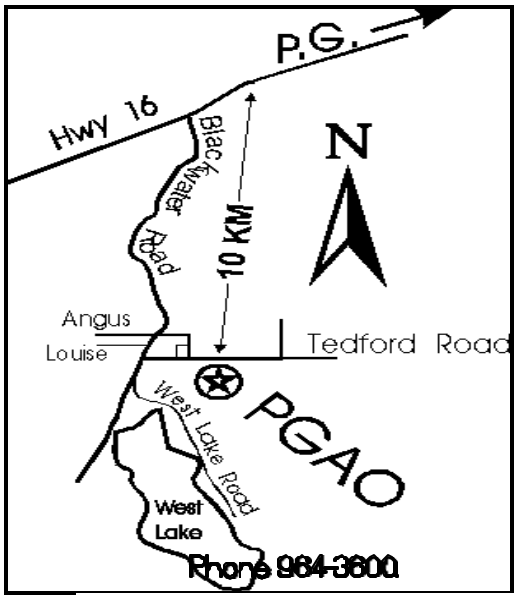
Our pursuits are out of this world.
Our activities are astronomical.
Our aim is the sky.

Contributions to the newsletter are welcome.

Deadline for the next issue is

October 13

Send correspondence to
The PGAS
3330 - 22nd Avenue
Prince George, BC, V2N 1P8
or



http://www.pgweb.com/astronomical/

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PeGASus Editor

Editorial

As is sometimes the case we are pressed for room in this issue, the articles were just too good to cut up, so I turn this space over to announcements. Gil

From Brian Battersby , Promotion Director PGAS
lfaux@bcgroup.net 564-4789

"On clear Saturday nights I will be out at the Observatory for members nights. I will send out an email either on Friday night if the long range forecast looks good or just before I go on Saturday night if the satellite shows a good size hole opening up. If I don't send an email I'm NOT going! and/ or I could phone people early Saturday night if they don't have email."

Please advise me: if you do NOT want this notice sent to the email
1) what account you would like this notice sent to.
2) If you would rather have me phone you (phone #?)

.The order forms are here for the 2001 Observers Handbook $14.45, The Beginner's Observing Guide $14.00, The Observers Calendar $11.00 prices are of course for the bulk orders... about 10. I would like to put the order in by the end of October so we can get them before 2001.

There is now a sky chart book at the observatory... It has every Friday night's (from now until the end of November) constellation positions, Messier Objects, planet positions, and moon position & phase. . I also printed out finder charts for Uranus and Neptune. I will be doing one up for all of 2001 soon. I plan on having on or two in the non-open house months and then weekly for open house months. The charts should work quite well when coupled with Bob's book of detailed finder charts for the messier objects. Just glance at the sky chart to see what's up and then use the
setting circles to roughly locate it, then use Bob's finder charts to nail it down!

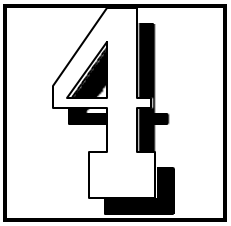
From Bob Nelson , President PGAS

Well, this is the start of yet another year for our club. I've lost count -- is it our twenty-first or our twenty-second? Whatever it is, we continue to try to improve our club and our observatory. As far as the observatory is concerned, we hope to install a Newtonian focus for the 24" telescope that will permit wide-angle CCD images of the heavens, improve the digital readout for the telescope position, and motorize various functions. We also hope -- finally -- to install holding tanks, a fresh-water system, and toilets. We will have our work cut out for ourselves. Needless to say, any help is greatly welcome! BN

From Gil Self, Director PGAS

We remind you that there will be several important issues discussed and voted on at the next meeting., we will be deciding the timing and frequency of elections . As well we have had several suggestions for how the club operates, as well as plans for upcoming work bees. We would like your help making decisions that work for everybody.

Apologies to Rob, I misplaced his excellent eclipse photo , next month. G.S.



Coming Events

If you are involved with any astronomical or otherwise scientific activity on behalf of the PGAS, please list the activity here.

The PGAS.
meets next September 27, 7:30pm at the observatory
This months preliminary agenda is on page 15

The Night Sky for October 2000

by Bob Nelson, PhD
Hi Folks,

Well, it's hard to believe that summer is over so soon, but when I look outside at the unseasonably cool weather and continual rain, I'm convinced. So much rain! So many cloudy nights! I was hoping for an Indian summer, but I guess that it's not to be.
Here is what is happening in the sky this month:

PLANETARY ROUNDUP:

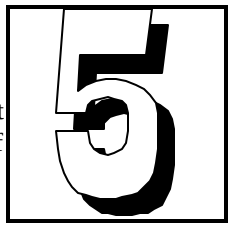
MERCURY is theoretically an evening object in October, but is unobservable for northern observers being barely above the horizon at sunset. Forget it for a while.

VENUS is an evening object all month but is relatively low in the sky at sunset owing to the fact that it lies on the ecliptic and the latter is inclined at a lower angle than the celestial equator to the horizon (for northern observers) at this time of the year. Therefore, although on the 15th it sets about an hour after the Sun, it's very low in the southwest then. (For example, on the 15th at 6:30 PM, just as it's starting to get dark, Venus will be only 4 degrees above the horizon.) Regard it as a challenge object!

MARS, in Leo until Oct 23 when it passes into Virgo, is a morning object all month. On the 15th, it rises at 4:15 AM (3 1/2 hours before the Sun) and is a tiny 4" disk of magnitude +1.8. You'd be lucky to make it out as a disk.

JUPITER, in Taurus for the rest of the year, rises on the 15th at about 8:00 PM and is up for the rest of the night. It's a 46" disk of magnitude -2.7. As usual, it's a fine sight, especially in our 24" telescope.

SATURN, in Taurus for the rest of the year, rises on the 15th at about 8:00 PM and is up all night. It's a 20" disk of magnitude -0.2. Again, our 24" telescope gives excellent views.



URANUS, in Capricornus all year, is low in the south-southeast at sunset and sets on the 15th at about 1:23 AM; it's a 4" disk of magnitude 5.8.

NEPTUNE, in Capricornus all year, is low in the south-southeast at sunset and sets just after midnight. As usual, it's a 2.3" disk at about magnitude 8.0.

PLUTO, in Ophiuchus all year, is low in the southwest at sunset and sets at about 9:15 PM. As usual, it's a 0.1" disk at magnitude 13.8.

CONSTELLATIONS to look for in October (at 9:00 PM, PDT) are Pisces Austrinus, Aquarius, Capricornus, Equuleus, Delphinus, Pegasus and Vulpecula.

Pisces Austrinus (PsA, "The Southern Fish"), visible only on the extreme southern horizon here in Prince George and lying as it does off the Milky Way, contains only a few galaxies and no star clusters or nebulae. It does contain the well-known star Formalhaut the 18th brightest star in the night sky.

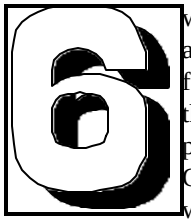
Aquarius (Aqr, "The Water Bearer"), to the north of Cap, lies on the Zodiac and contains a number of variable stars. Messier objects include M2 (a nice globular cluster), M72 (an open cluster), and M73 (a mistake by Messier -- it's just 4 stars!). Other deep sky objects include NGC 7009 (a small bright planetary nebula) and NGC 7293 (the "Helical Nebula").

Capricornus (Cap, "The Sea Goat"), lies on the Zodiac but it too lies out of the Milky Way (to the northwest of PsA) and contains only M30, a fine globular cluster. Of the brighter stars, Delta and Epsilon are both variable stars.

Equuleus (Equ, "The Little Horse"), a tiny constellation (the second smallest in the sky, after Crux) and contains NO deep sky objects at all. Delta Equulei, however, is a close visual binary. It was discovered by Otto Struve in 1852; it was for many years at period 5.7 years, the shortest known for any visual binary. Epsilon Equulei is also a close visual binary, discovered by F. Struve in 1835, and having a period of 101 years. The orbit is very tight - the maximum separation is 1.1" and the eccentricity is 0.70 (fairly highly elongated orbit). The estimated distance is about 200 light years.

Delphinus (Del, "The Porpoise"), to the northwest of Aqr, is a little constellation, containing only, for deep sky objects, two globular clusters: NGGs 6394 and 7006.

Pegasus (Peg, "The Winged Horse", "The Great Square" and our mascot), also lies off the Milky Way. It contains a few faint galaxies, an open cluster, and M15, a fine globular cluster. The latter was discovered by Maraldi in September of 1746 and rediscovered by Messier in 1764. According to Burnham, M15 is one of the richer and more compact globulars, remarkable for its bright core. The cluster contains a large number of RR Lyrae variable stars, all close to about magnitude 16. RR Lyrae stars are pulsating variable stars



whose light curve resemble the famous Cepheid variables but are all of shorter periods, less than one day. The stars have been found to be spectral type A to F (brighter and more massive than the Sun) and of Population II (older and having way smaller percentage of atoms heavier than helium than the Sun). Calibration of the absolute brightness of the light curves coupled with identification and measurement of similar light curves in nearby clusters of stars (like the Megellanic Clouds) yields independent distance estimates.

Vulpecula (Vul, "The Fox), in the Milky Way just to the south of Cygnus (and the last constellation in the book), contains M27, the famous "Dumbbell" Nebula (disc'd by Messier in 1764 and lying close to 900 light years from us) -- it's a wonderful object worthy of close observation or photography.

Clear skies to all,

NEW BOOKS AT THE PUBLIC LIBRARY.
by Yvonne Whebell.

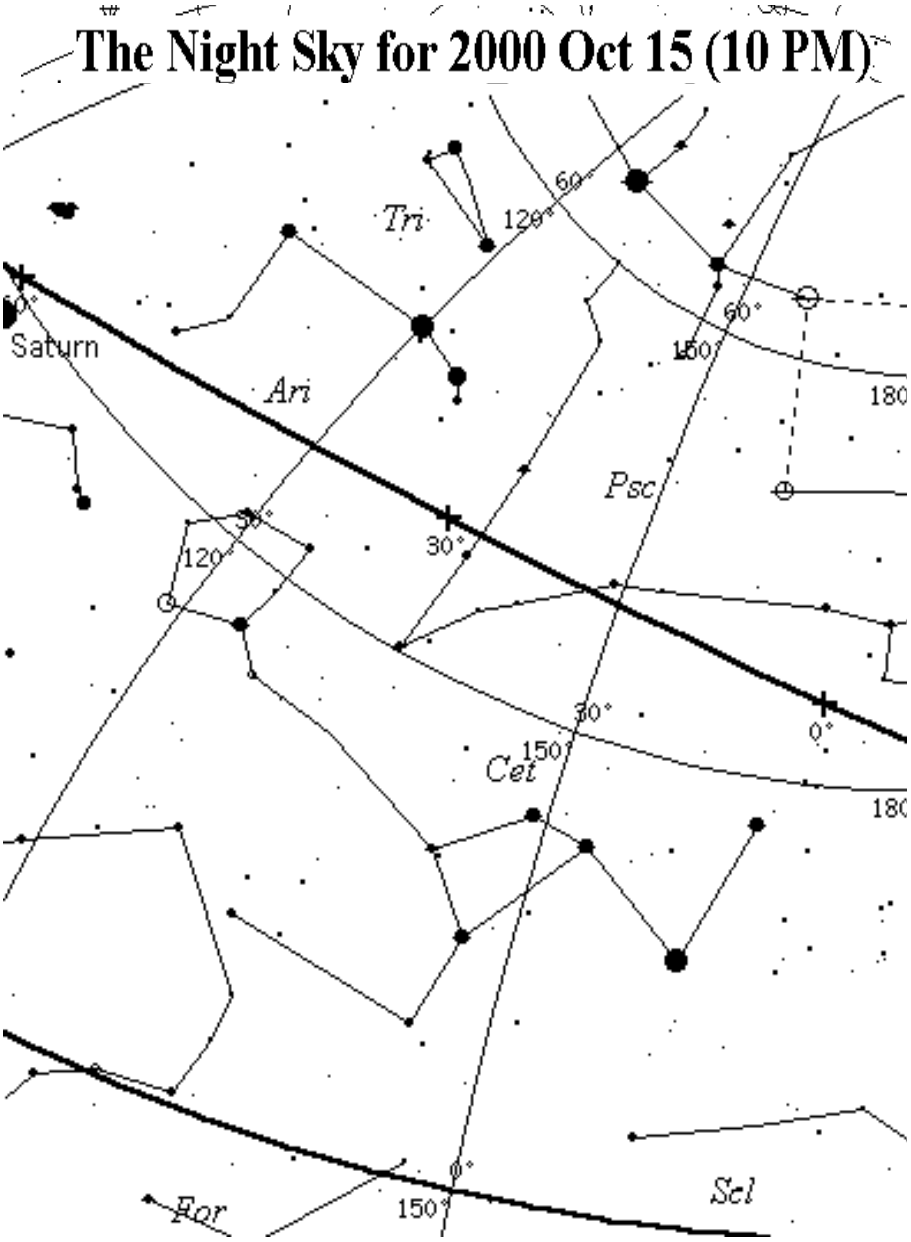
THE DREAM OF SPACEFLIGHT. by Wyn Wachhorst.
This book explores the dream of space flight from historical, philosophical, and psychological perspectives, and is written by a historian. In some places the writing is poetically beautiful, and seeks to describe the visions and motives of people who dreamed of and developed space flight.

THE BOOK OF THE COSMOS: IMAGINING THE UNIVERSE FROM HERACLITUS TO HAWKING. Edited by Dennis Richard Danielson.
Inside the dust jacket reads "What is the Cosmos? How did it come into being? How are we related to it, and what is our place in it?" These ar the big questions this book examines from many perspectives, by everyone from Edgar Allan Poe, Maria Mitchell (the first American female astronomer), John Archibald Wheeler (who coined the term 'black hole', Arthur C. Clarke, George Bernard Shaw, Richard Feynman, and many more very interesting people with very interesting ideas.

OTHER WORLDS: IMAGES OF THE COSMOS FROM EARTH AND SPACE.
By James Trefil. National Geographic, 1999.
A collection of absolutely gorgeous images from various observatories and missions, with well-written text to support them. A feast for the eyes.

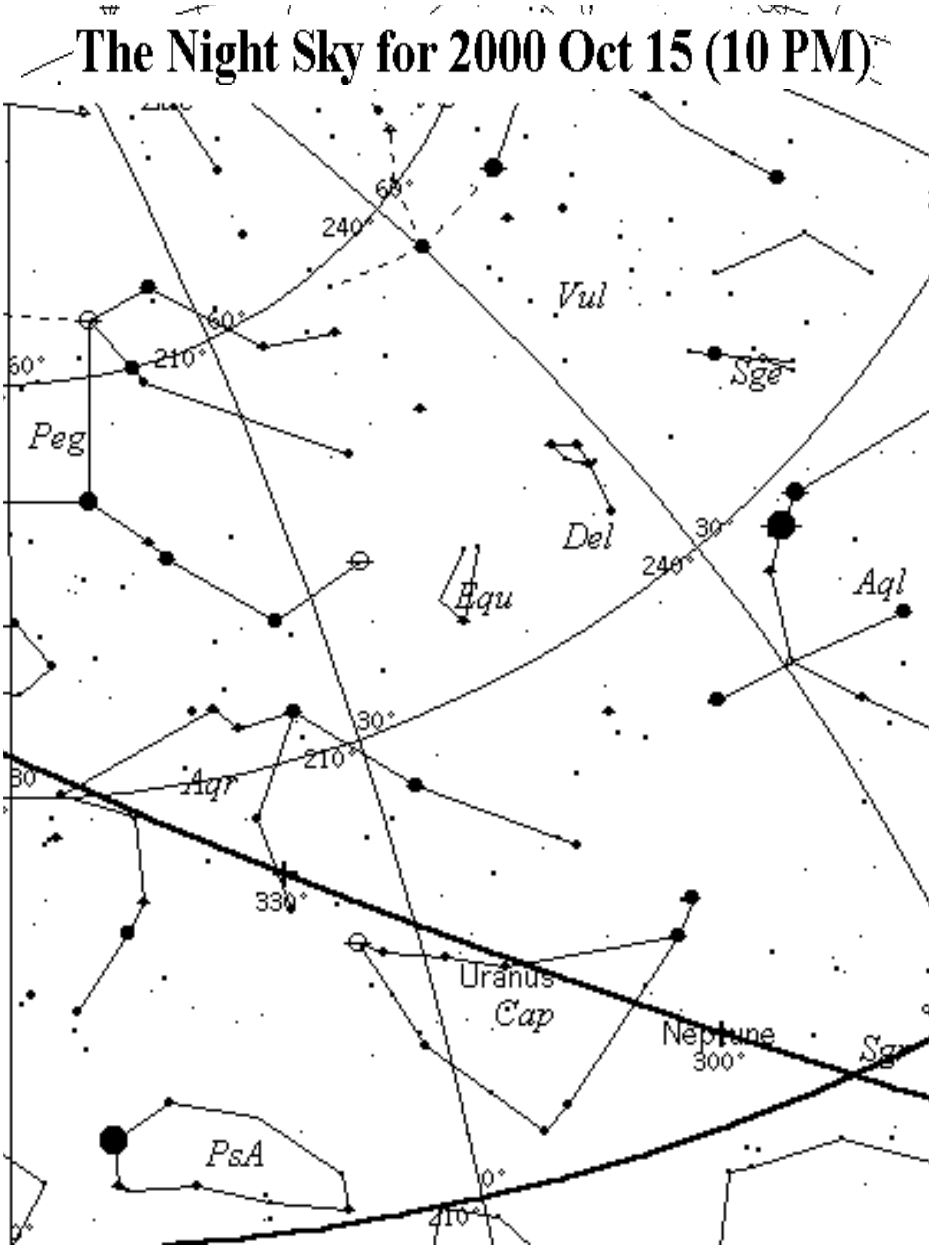
Yvonne Whebell,
Acquisitions Coordinator, Prince George Public Library
l: ywhebell@lib.pg.bc.ca

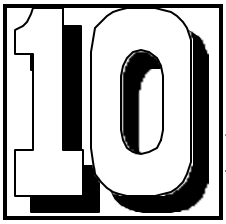
Owen's " Prize winning" Light Bucket



Night Sky for October, courtesy Dr. Bob Nelson

The Night Sky for 2000 Oct 15 (10 PM)





Mount Kobau Star Party 2000

by Owen Salava

This August, I once again made the 10-hour drive to the top of Mt. Kobau outside Osoyoos. Unlike previous years, I had my newly constructed 12½" Dobsonian telescope along for the ride. Unfortunately, the mounting for my finder scope died an early death, still requiring a proper fix. I did manage to Boy Scout together a fix that worked for the duration.

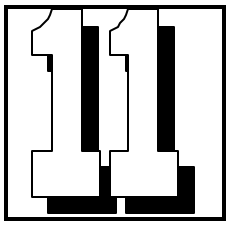
If last year was the year of the torrential downpour, this year was the year for wind. The weather was hot during the day, with temperatures reaching upper 20's on the mountaintop (6200') while in Osoyoos it reached 39C on at least one day of the week. The nights were great, especially compared to multiple beer nights last year.

The seeing (air steadiness) was decent most nights, with two nights of excellent seeing with stars low in the sky exhibiting very little twinkle, and none at the zenith. Transparency was somewhat messy near the horizon due to the plethora of forest fires in southern BC and into Washington State. Overhead there was noticeable airglow and aurora most nights. Both can be attributed to the solar maximum this year.

To put the excellent skies of Kobau into perspective, consider the following. From the bowl of PG, if you're lucky, you can make out the lesser stars of the Little Dipper (around mag 4). From our observatory, on a good night, you can see the band of the Milky Way stretching across the sky as a light milky smear against the sky. From the top of Mt. Kobau, you can see well enough to walk in confidence around the top of the mountain without a flashlight, there is enough light from the Milky Way alone! This of course assumes good dark adaptation. Stepping from a white light environment you are effectively blind for the first few minutes, no matter your location. For those who know the North American Nebula, you know that it takes a good exposure on film to pick it up well. This was a naked eye object for me! The area of Cygnus was spectacular, residing directly overhead in the early night sky. Touring the area in my Nikon 10x50 binoculars, I was amazed to see that not only did I see the NA Nebula nicely, but also the eastern section of the Veil! 52 Cyg overpowered the western side, but the eastern was plainly visible.

I had no observing plan other than to cruise the summer skies, with particular attention to the areas around Sagittarius and Scutum. The first night I spent a few hours hunting down globular clusters in this area, as well as the multitude of amazing nebulosities and open clusters along the Milky Way near here. The Lagoon, Trifid and Swan were all easy and spectacular targets for my scope. The eyepiece danced with stars when I observed the globular cluster M22.

Other observations of note that come to mind: watching the partial



eclipse through an 8" scope (my first solar eclipse of any sort); watching an occultation of Venus by an invisible crescent moon (first occultation); watching a double shadow transit on Jupiter, then watching one of the moons cross in front of the planet's disk; observing the *entire* Veil nebula through a heck of a combination – a 5" f/6 Astrophysics refractor with the new 31mm type 5 Nagler with a 2" OIII filter (quite expensive!!!); cruising the Veil many times on my own scope with my own OIII filter; observing G1 – a extragalactic globular cluster in orbit around M31… the list is long, but these stick in my mind.

One great aspect of visiting a star party is the chance to talk with very knowledgeable people, and to try otherwise hard to find or afford eyepieces in one's own scope. This was the case for me. I was camped next to both Ken Hewitt-White (of Cosmic Highway fame) and Gary Seronik (associate editor, Sky & Telescope). Wait until you see Gary's portable scope in an upcoming edition of S&T! Very cool. Thanks to a neighbor from Calgary, I had an awesome view of the nebula NGC 6888 (Van Gogh's Ear). First I went there with a borrowed 35mm Panoptic with OIII filter, and then popped in a 13mm Nagler, also with OIII filter. Extremely impressive! (If you have the 2000 RASC Observer's Calendar, look in the bottom right corner of the September photograph to see 6888)

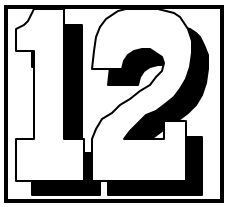
For anyone who enjoys visual astronomy (i.e. using one's eyes at an eyepiece) Mt. Kobau is an excellent adventure in astronomy. I observed through scopes ranging from an ETX-90 up to a 20" Cassegrain. This year the weather co-operated to provide many, many sleepless nights and excellent memories. The judges co-operated so that I could leave with the awards for Mechanical Excellence for my telescope, and Outstanding Astrophoto for one of my shots. It was a great year's star party in all respects! O.S.

FOR SALE:

a/ 80mm f/7 Rich Field Refractor with 1.25" Rack&Pinion Focuser and Mirror Diagonal. Neither mount nor eyepiece included. Field of View 3.0 degrees at 14 power. Makes a great giant finder for a big scope or could be used as a portable scope for wide-field low power views of the Milky Way. At 14x with an OIII filter all three parts of the Veil Nebula are visible simultaneously, including the delta-shaped section between the two main arcs! Stars are sharp to the edge of the field. However, this low-resolution achromat is NOT suitable for planetary and lunar observing. Price $190 firm.

b/ The Jim Kendrick Dew Remover System 14"/16" Heater. (DC Power required.) As advertised in Sky&Telescope. Never used. Price $110.00 firm.

c/ Beautifully machined DAR 1.25" Helical Focuser. Has fast focus threads and fine focus threads. Superb craftsmanship. Won as door prize and not needed. Price $80 firm.



Owen's Light Bucket , (a continuing saga)

By Owen Salava photo page 7

It all started when I attended my first Mt Kobau Star Party in August of 1998. I had never been to any organized astronomical event like it, having only gotten into astronomy just before Hale-Bopp came around. I had no scope, only a nice pair of 10x50 Nikons to sweep the skies with. I spent a lot of time on different scopes over the course of the week on the mountain. Not only was I daunted by the seemingly infinite knowledge of the people there – you know, countless years of experience observing compared to my short introduction – but also by the predominance of home-built scopes on the summit. Although there were a number of commercial scopes present, homebuilt ruled the roost and the sky. It was after my first appearance that I discovered the reputation of Kobau as a gathering for the amateur telescope maker.

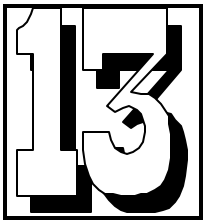
I left the mountain with the goal of building my own scope. How to get there I had no idea, but I was determined to build my own Dob. I purchased the book "The Dobsonian Telescope" by Kriege and Berry – a book that is now well dog-eared! After much deliberation and consultation with this and other reference materials I decided on a truss-tube Dobsonian reflector.

Factors in the decision which weighed most heavily:

1) Cost – the most aperture for the dollar.
2) Portability – it needs to fit into a small vehicle for transport.
3) Assembly – it must assemble easily without tools, under red light.
4) Zenith Height – as I'm 5'-8" tall, the eyepiece needs to be no higher than my eye level when at the zenith (straight up) as I hate ladders and stools under the night sky.

After all of this research, I finally decided on an f/5, 12½" primary with a 2½" secondary. This gives me a good eyepiece height, is portable for one person, and doesn't break the bank. It's a highly capable size of scope, big enough to get pretty deep, still worthy of planetary and lunar observing. My prime focus is on deep sky observing, and with this the maximum illumination across the focal plane. My secondary gives a 20% obstruction. Though not "ideal" for planetary viewing, this still falls within the acceptable range for such observing. The advantage of as 12.5 over say, a 17.5, is that I can observe full aperture on the planets without searing my retina in the process.

As mentioned above, cost was an issue, but I still wanted to go for the best that I could afford in all respects. This attitude is reflected in the design philosophy of Kriege and Berry. Since this scope will likely last me a long, long time, I wanted to be sure that the quality of components was commensurate with this timeline. Since I'm only 27, this time could extend for 50 years or more!



First I ordered my mirror set. After looking at my options commercially, and from talking with many people at the star party, I decided to stay Canadian. I ordered my mirror set from Arnold Optics of Sherwood Park, Alberta.

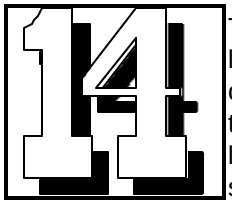
Once the hard part of committing to my optics was past, I got to work on the construction. Or so I thought. I encountered exterior difficulties in getting going and hence needed to delay construction commencement. In the meantime, I purchased some high quality Baltic Birch plywood, made in Russia. This is a hardwood veneer, hardwood core plywood. It is expensive at $60 for a 4x8 sheet of half inch. The benefit is that it is both very good-looking wood and is very stiff. "The Dobsonian Telescope" has tons of information on plywood and highly recommends using a high quality hardwood plywood instead of the much cheap softwood stuff.

First I started making the secondary cage. Sounds simple: two plywood rings, a focuser board, some tubing. What's difficult? Cutting large diameter circles in plywood. They don't call it *hard*wood for nothing you know. Well, first one router (borrowed from a friend – thanks Don!) decided not to work after two inches of cut. Good thing it had a quality warrantee for the $170 repair. Then the second borrowed router (thanks Mike) decided to self-destruct – literally. Little pieces of plastic and cooling fan on my workpiece as the armature packed it in! ("Here's your new router Mike.") Finally get my hands on a working router and go to town cutting. Next to find some aluminum tubing. I found a single place in Prince George where I could buy 1" OD tubing… only $3.50 per linear foot! I needed a total of 28 feet, plus extra for flub-ups. More costs start adding up. But hey, it's fun doing woodwork!

Kriege and Berry have a method using tube connectors a.k.a. star nuts to connect the rings to the tubing. Works amazingly well. Again, only one single supplier in town that I could find, special order from Ontario! I needed 8, minimum order 20. Dollar signs go flitting past my eyes.

For my secondary spider, I again kept it Canuck – I ordered the offset design of Gary Wolanski from Vancouver, B.C. It is a simple, robust design that works great! My focuser was the first departure from Canadian made products. I went with the JMI NGF-DX2 Crayford. A fine piece of work, with smooth focus motion, plus it supports both 1¼" and 2" eyepieces. A must for the 35mm Panoptic that I'm lusting after!

With the secondary cage almost done, time to start on the real meat and potatoes of the issue, the mirror box and rocker box. I had a machinist friend make my mirror cell components and the metal tailgate frame following the design in the book. Unfortunately, I had to come up with my own dimensions as they started at a 15" scope and only went up! Once the frame was done, I built the mirror box from half-inch plywood, mitered and reinforced at the corners.



The altitude bearings are made of two 5/8" plywood sheets laminated together (glued and left to set – under the front tire of my truck overnight) and cut to arcs. These are matched to the seats in the rocker box. The rocker box is made up of laminated ½" plywood sheets giving 1" thick plywood for the sides and bottom.

One of the greater challenges came from the blocks to clamp the truss tubes. These were made according to specification. The challenge came in making them all the same, and them making them slant in slightly to accommodate the tapered effect of the Kriege/Berry design. Thank goodness for a drill press, a band saw, and a disc sander. The best thing about the blocks however, is that they allow me to insert the tubes, twist a hand knob, and secure my truss tubes in no time at all.

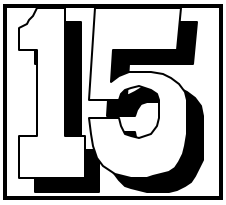
Three points define a plane, and hence three feet support the ground board. Directly over these feet are three Teflon pads that slide on Ebony Star Formica. The same combination is used for the altitude bearings, with the Formica on the altitude bearing arcs. The result is a butter smooth action, allowing me to maneuver my scope with fingertip pressure, and no backlash from sticky bearings.I worked steadily on this project from December 1999 through to May 2000. . Many, many hours of labour went into the execution, but the end result is both visually appealing and structurally sound.

The final scope weighs in at approximately 35 kilos total (just shy of 80lbs). To setup the scope takes less than five minutes, plus quick collimation check. The whole process needs no tools as I have knobs at the tube bases, cam levers at the top, and hand knobs for my collimation bolts. My finder scope is a Skywatcher f/5 80mm short-tube refractor with a 27mm reticule eyepiece, giving an effective 15x80 finder. It also doubles as a wide field scope with other eyepieces inserted. To point the scope I find my unit power finder especially useful. The Rigel Quik Point makes for an excellent alternate to the ever-popular Telrad in the department.

First light came May 25th with a quick tour through the Double Double (easily split from my backyard, Vega (to star test the mirror and line up finder), M57 and M13. I was thrilled! Then I didn't get to use it until this year's Mt. Kobau Star Party due to lack of night, weather and work.

My scope survived the daylong trek down to Osoyoos for the star party. Unlike the second coming of Noah's flood last year, the weather co-operated in a most satisfying manner this year! Clear nights abounded. However, I was sure happy for the open tube with the high winds that also abounded. The scope worked excellently for all the splendors that I chose to point at. I entered it into the yearly ATM competition on the mountain. I knew my scope was good, but the competition and competency of telescope makers at the MKSP is high. Imagine my pleasant surprise to be awarded the award for Mechanical Excellence!

Overall I'm extremely happy with the fruits of my labour. I believe I've built



Preliminary

Agenda PGAS Meeting September, 27 2000

Brief review of old business
Reports from Directors
Summer news
Discussion re: elections and other new business

BREAK

Constellation of the Month
Collimating
(bring your telescope)
If time and sky permit we might even get some time on the 24 inch or our refurbished C-8.

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	

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

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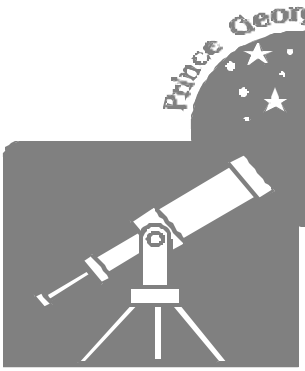
Prince George Astronomical Society



The P.G.A.S Would like to thank
BISQUE SOFTWARE
for their donation of
THE SKY (Level 4 software)
To The Prince George Observatory

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