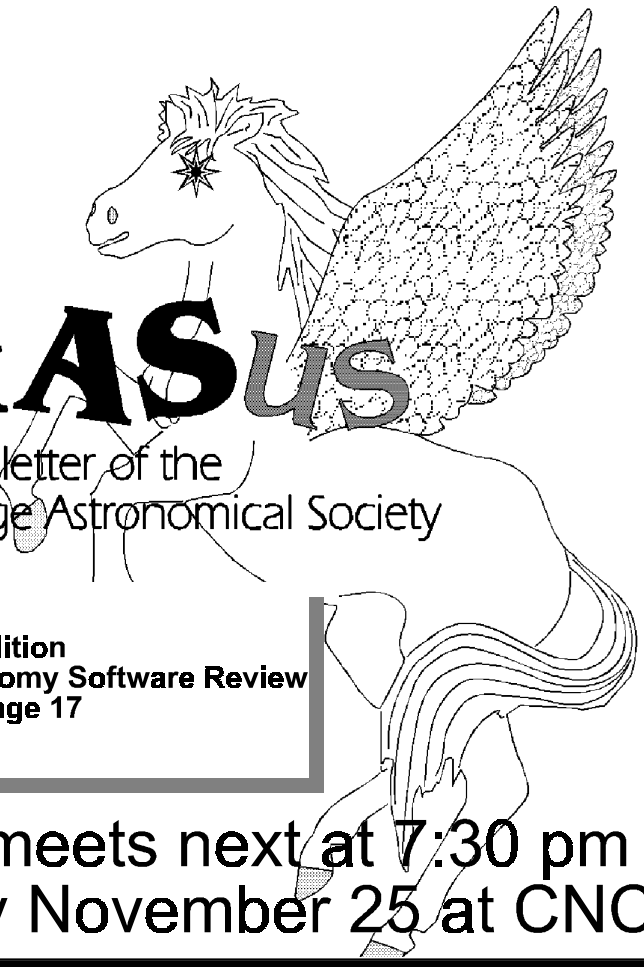
1998 NOVEMBER ISSUE #89



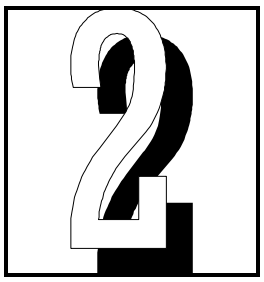
the PeGASus

Newsletter of the
The Prince George Astronomical Society

Special Edition
Complete text of the Astronomy Software Review starts on page 17

The pgas meets next at 7:30 pm Wednesday November 25 at CNC

INSIDE :



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

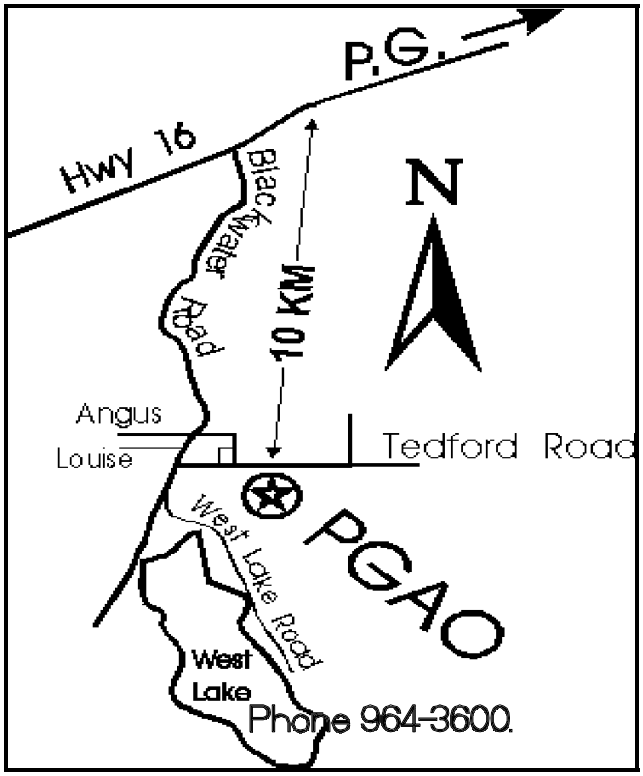
Our pursuits are out of this world.
Our activities are astronomical.
Our aim is the sky.

Contributions to the newsletter are welcome.

Deadline for the next issue is

Jan 15

Send correspondence to
The PGAS
3330 - 22nd Avenue
Prince George, BC, V2N 1P8
or
selfs@attcanada.net



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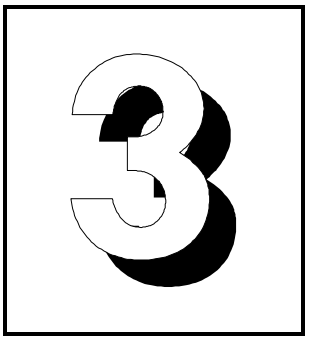


By Gil Self

Waiting For Orion

One of the things I have written about before is what I call front porch astronomy. To me this is still one of the best kinds of observing.

It is similar to the same level as when I took up golf, not too serious but just enough to still be enjoyable. But, caution is advised; you don't want to make anything overly complicated or get too serious. For example, one should never get up early to play a round of golf, it is strictly an afternoon activity. Front porch astronomy is never to be preformed much after midnight - unless you are on vacation and it's a warm summer evening and the bugs have settled down for the night. There are few rules, a mug of beer is optional but suggested. This is a memory exercise so, NO star charts please.

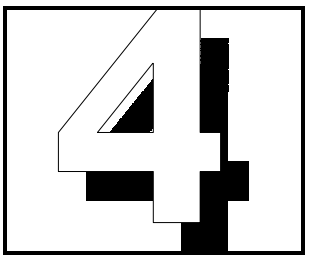
If you are like me you need to regularly calibrate yourself to the clockwork parade. You miss a few days and Vega and Lyra aren't at the zenith anymore. The summer triangle is dropping behind my trees bit by bit. Cygnus isn't where you left it. In the east, shinning through the sky-glow that is Prince George, you see the Pleiadies (gee it is a little cooler tonight).

Once I have seen the Pleiades, I find myself checking the night sky a little later over the next two or three weeks. If you are lucky you will catch the lazy Orion . The entire constellation laid out on the eastern horizon . Betelgeuse just up, the belt stars perpendicular to the horizon . A sure sign that winter is on it's way. Now don't take me wrong - I do prefer the spring, summer and fall evenings. But, about the same time I have to give up sitting on the porch because it's a little chilly is about the same time we begin to see the rewards of the winter sky. Of course ,at the top of that list is Orion and M42. Now ,since it is too cold for front porch astronomy we can start looking at targets in the club 24 inch. Our scope does such a nice job on the Orion nebula. If you haven't seen it, you should make sure you do. Nearby Auriga and all it's clusters is well placed , as well as the Crab nebula. There is also probably no better time of year if you have a visitor at the observatory to show them Andromeda naked ..... eye, that will impress them.

Some people keep excellent logs of all there viewing sessions,. I wish I was that disciplined. Instead, I remember that I was either very cold when I saw __ or I was comfortable or I was being eaten alive by bugs . One of the two times I have seen M-51 almost jump out of the eyepiece at me it was very cold, so this must be a time of year to check M51 fairly regularly. If just once you catch it on one of those good nights it will be worth the effort.

We are about to have the 24 inch re-coated, so it will be down for maybe a couple of weeks. There are still two 8 inch scopes that are easy to use, perhaps to some extent easier, because there is no dome to get in your way. Dress warm, and check out some of these winter sites— so we can get back to front porch astronomy when the weather gets nicer.

Clear Skies
Gil



Coming Events

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

General meeting PGAS November 25 @ 7:30 pm at CNC Physic lab

Astronomy course

The College (and that means this writer, Bob Nelson) will be offering an astronomy course in the new year that should be of interest to PGAS members. It will be Astronomy 102 (or possibly the lower level Astronomy 105). The calendar description follows:

ASTR 102 Introductory Astronomy II 3 CR
An introductory course for science credit to follow ASTR 101. The emphasis will be on stars (stellar parallax and motions, the HR diagram, star clusters, stellar models, stellar evolution, exotic objects) and galaxies (the Milky Way Galaxy, external galaxies, cosmology).
Prerequisite: ASTR l0l or permission of the instructor (3,3)

Qualified students may take it for credit (it is a university credit course), but club members may want to audit it (you pretend you're a regular student but don't have to write exams, etc.). It will have a weekly lab that will either be indoor (pencil and paper) or observing. It will also likely be offered in the evening.

If you'd like to learn more about astronomy, I highly recommend it. The difficulty level should be reasonable. What I really need is a list of interested people in order for the course to be offered (we typically need 10 students). So if you're at all interested, drop me a line (with no obligation).

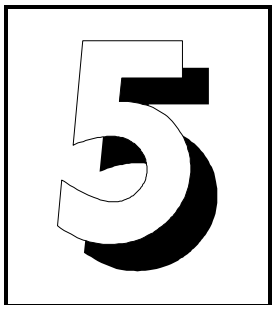
The Night Sky for December '98

by Bob Nelson, PhD

Hi Folks,

By the time you read this, Lois and I should be back from the second half of our great journey (either to Arizona or Hawaii, we're not sure). Winter will be here in Prince George (what a shock!!!!) and temperatures will be either moderate for this time of year or super cold (brrrr!). (As I write this in early July, I'm really in a time warp since summer is in full force and it's quite hot out during the day. I've been doing quite a bit of observing lately and my schedule is all messed up, going to bed around 4 AM and rising around noon!)

But now, it will back to our usual routine of work and other activities. I know I'll look forward to seeing all of you again and taking part in the normal activities of our fine club. And by the way, Merry Christmas (Happy Hanukkah, Season's Greetings, etc.) to all of you! (Another time warp!)



(Unless otherwise noted, all events are for the 15th of the month.)

PLANET ROUNDUP

MERCURY, a morning object in December, rises about two hours (!!) before the Sun on the 15th and drops back to an hour and thirty-five minutes on the 31st. A fine object for the early birds (not me!). It reaches inferior conjunction on the 1st.

VENUS is lost in the glare of the Sun.

MARS, in Virgo, rises at about 1 A.M. and is in the south at dawn. It's a 5.7" disk of magnitude 1.22.

JUPITER, in Aquarius, is in the southeast at sunset and sets around 11:30 P.M. It's a 39.9" disk of magnitude -2.4.

SATURN, in Pisces, is in the southeast at sunset and sets around 3 A.M. It's a 19.0" disk of magnitude -0.03.

URANUS, in Capricornus, is low in the southwest at sunset and sets around 8 P.M. It's a 3.5" disk of magnitude 5.8.

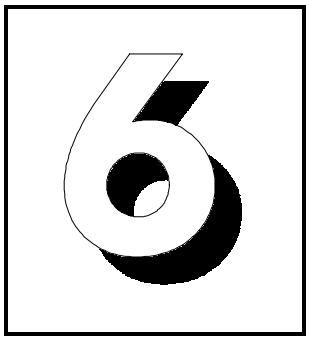
NEPTUNE, in Capricornus, rises at about 10:40 AM and sets at about 6:50 PM. As usual, it's a 2.3" disk at about magnitude 8.0.

PLUTO, in Ophiuchus, rises at about 6 AM and sets at about 4:15 PM. As usual, it's a 0.1" disk at magnitude 13.8.
Winter Solstice occurs on December 21 at 17:55 PST. Aldebaran is occulted by the Moon on the 3rd, at 5 AM, visible in our area. Watch for the Geminid meteor shower on the 14th.

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" -- it is!). Mira was the first of the long period variables discovered, by the Dutch astronomer David Fabricus, in 1596, August 13. It varies in brightness from a minimum of 9th magnitude up to 3rd or 4th magnitude



(Continued from page 5)

(once it went to nearly mag 1). The period averages 331 days, but both period and brightness limits often display irregularities. Observations of Mira's maxima actually go back to 1638; since that date, not a single maximum has been missed. In this century, it and hundreds of other "Miras" and other stars are monitored by members of the American Association of Variable Star Observers (AAVSO), founded in 1911. The AAVSO possesses the largest data base in astronomy -- over 7 million observations soon to be accessible on the web and eagerly used by astronomers studying long period and cataclysmic variables.

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. Its spectral type is B5 V, meaning that it's a hot star (surface temperature around 14,000 K) lying on the main sequence (hydrogen burning like the Sun).

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 (a.k.a. Hamal) is a red giant (sp. K2 III) and lies about 75 light years distant.

Triangulum (Tri, "The Triangle"), is a small constellation just south of Andromeda and contains the famous galaxy M33 ("The Pinwheel"), mentioned last month as a member of the Local Group of galaxies It was discovered by Messier, in August of 1764. If you've ever observed M33, you'll marvel at how Messier saw it since it's a diffuse, low-surface brightness object which can be a challenge in a small telescope. Try using moderate power in a telescope with clean, well collimated optics on a very dark night with good clarity. (CCD images taken then should turn out well.) Like M31, it has been the subject of intense study by professionals with large telescopes; many variable, novae, planetary nebulae, etc have been discovered.

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. Look for the Double Cluster, if you haven't seen it before.

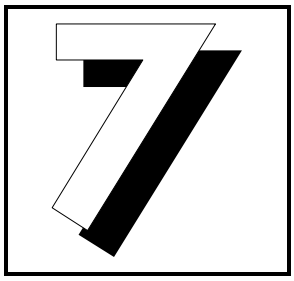
Clear skies (from afar),
-Bob

==========

Two quick notes

1. The constellation of the month at the November 25 th meeting will be Andromeda.
2. Club dues are overdue please send them to Steve Senger or bring to the next meeting,,,Thanks Gil

NEW BOOKS AT THE PUBLIC LIBRARY
Yvonne Whebell.



LOOKING FOR EARTHS: THE RACE TO FIND NEW SOLAR SYSTEMS.
By Alan Boss
John Wiley & Sons, Inc.

The author, a NASA research scientist, traces the search for planets outside our solar system, from the measurement of stellar wobbles to the discovery of gas giants and brown dwarf stars in the last couple of years. He takes you behind the scenes to meetings that determined many of today's research efforts, and tells of the processes, the triumphs and disappointments along the way.

DESTINY OR CHANCE: OUR SOLAR SYSTEM AND ITS PLACE IN THE COSMOS.
By Stuart Ross Taylor.
Cambridge University Press.

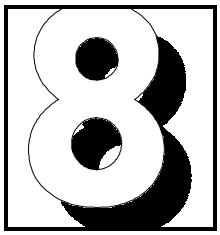
This book examines the state of our own solar system, and how it got that way - why planets tilt, why asteroids exist, how rings form around planets, why Jupiter dominates our solar system, what accidents have produced the solar system as we know it. Beyond a history of the solar system, the author also examines what made life possible on earth, and the possibility of life elsewhere.

HEAVEN'S MIRROR: QUEST FOR THE LOST CIVILIZATION.
By Graham Hancock Santha Faiia

Not strictly an astonomy book, but intriguing. Hancock takes us to a number of archeological sites around the world, built by people that lived around 10,500 years ago, that appear to mirror the positions of the stars in various constellations at that time, and hypothesizes that a forgotten civilization existed over much of the earth.

Y.W.

"Somewhere, something incredible is waiting to be known."
-Carl Sagan



Life Without Microsoft

by Orla Aaquist

This is to let you know that there is computer life on an IBM PC without Microsoft. Read this Bill Gates! This article is beingwritten as I write (Oh, that's clever!) using Corel WordPerfect running in X-windows on a Linux platform. If you read this, then it also means that I was able to send it to Darlene/Gil using Netscape, and that they were able to translate the file. Supposedly, this version of WordPerfect can readn and write files written with Microsoft Office 97. What more could you ask for out of a PC? OK, so you can ask for more. For example, I haven't managed to publish a newsletter, nor download a spreadsheet or database, but I am told that 'they are out there'. And, for the most part they are free. Linux can read and write from/to Dos formatted partitions and diskettes, so Bill is just on the other side of the partition if you need his help.
But, I am sure that you do not want to hear about computer operating systems.
Gee, that's too bad. Working on Linux is a lonely experience, however.
Ok! I'll stop.

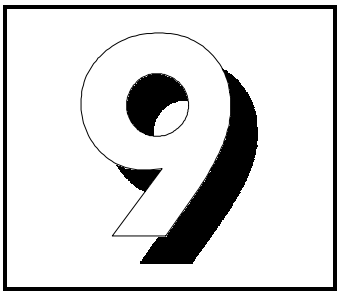
On December 14 I plan to attend an RASC meeting in Edmonton. The term will be over, and I have to take a trip down to try and straighten out our transfer agreement with U. of A. for our Physics 102 course. (Are you sure you wouldn't rather hear about Linux?) It turns out that I have been teaching a course for two years that does not transfer to University of Alberta. Lucky for Keyano is that we didn't have any students in the course, so no one was affected.

Don't ask! This is just the way that life is in the north.

In any case, while I am down there, I plan to attend an RASC meeting. Apparently, on that night they are having poetry reading and painting lessons.

Like I said, this is just the way that life is in the north. As soon as I moved back to Alberta, I realized that British Columbia was not west, but south of Alberta. To non-BCers, British Columbia is Canada's southern vacation spot. It doesn't matter if you are in Vancouver or beyond Hope (that's you), you are still perceived as being 'south'.

So, back to the RASC meeting. I gathered that they are as hard up for speakers as the PGAS. Since poetry reading is just around the corner from guitar playing, and since some of my songs contain the word 'star', I figured that I would volunteer to participate. Their president asked for more information, so I sent him my resume. Subsequently, I have been nominated for president. Just kidding, of course. But, I am planning to attend the meeting.



I still haven't managed to make contact with the local astronomy club. This is mainly because of a lack of trying. When I came to Prince George in 1993 (or was it 1992), I wasn't planning to get involved with the PGAS, either. It was Bob Nelson's invitation that brought me out, and it was the groups' interest that kept me active. In contrast, the club here seems pretty isolated. In all the years I have been here (that would be two), I haven't heard of one single activity put on by the astronomy club. That's pretty sad. Perhaps it is time for me to challenge them a little.

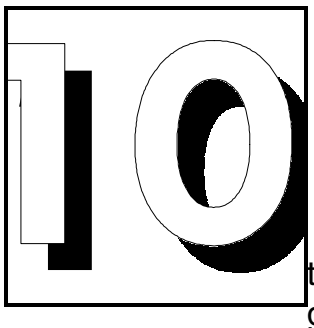
I am going to start by creating a little competition. My plan is to create an astronomy course that has appeal to both college students and to the general public. Fort McMurray is a small community, and there is not enough interest for two astronomy courses. My plan is to start with U of A's first year astronomy course and arrange the topics to alternate between general interest 'fun' stuff and more theoretical/mathematical/physics stuff. The general public can attend the general interest 'fun' stuff, while the students taking the course for credit must attend all of the lessons. One of the reasons for going down to U of A after the term is to discuss the idea with Doug Hube, who teaches their astronomy courses. I think the idea has merit, and it could be made to work in a small community. If the course is successful, then I will be able to gather disciples around me and start an astronomy society in Fort McMurray. I'll call it Orla's Club. Excuse me while I go and vomit.

The next step is to ask the oil companies up here to build an observatory. They have an excellent Oil Sands Interpretive Centre, and an observatory would be an excellent addition to this facility. It is not apparently relevant to oil sands interpretation, of course, but I am working on that aspect. It seems that astronomers find astronomical relevance in everything.

Let's see how the connection may be drawn. When we look through a telescope, we are looking back in time. Back to the age of the dinosaurs ... when oil was formed! Or was it coal? ... I'll keep working on that angle.
But it's now time to see if this article will fly to Prince George.

Miss you all. -- Orla.

(*Or how about —astronomers need fuel to drive to observatories!) —-G.S.*



Club Update

by Gil Self

If you missed the last meeting, you might not know that we have a new president. Bob Nelson, an old hand at guiding our group and already a "busy guy" has been elected president. Jon Bowen will assume the responsibilities of vice-president. The rest of the executive remains unchanged.

Brian Potts is our secretary and observing director, Steve Senger continues in the tough job as treasurer (I'm glad he's doing it and not me!). Owen Salava and I were elected as members at large. Owen resumes the position as building manager and I will continue to look after special projects. I am sure I speak for everyone when I say we are happy to take these positions, in fact it would feel odd to not to be involved. Still, we always welcome your help. Anyone is welcome at the executive meetings or to just give anyone on the executive a call if you would like to be involved.

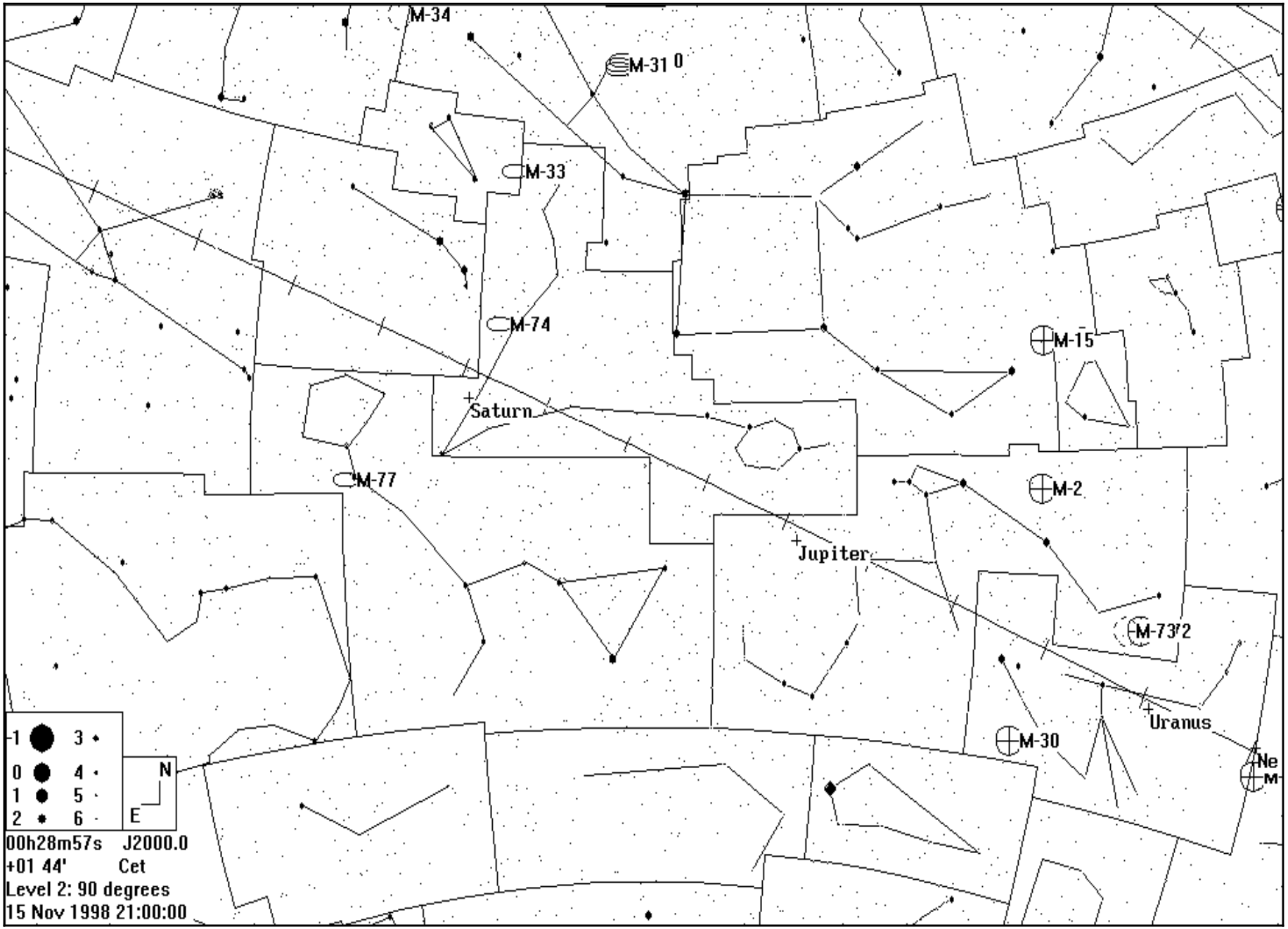
Also, at the last meeting Bob reviewed his recent trip to the British Isles with particular focus on scientific locations (other than the pubs - why else would you go to Britain?) Illustrated with numerous slides and insightful observation it was a very interesting look at Bob's vacation. The constellation of the month was Orion. Jon Bowen lead us through the many sights in Orion with slides and maps. Two new members later told me they went home after the meeting and dug out their binoculars and explored the sights in Orion —- that's exactly why we have constellation of the month, it's nice when a plan works!

Speaking of new members, one of the new members, Brian Battersby, has agreed to take on the Promotional position. This is a position that none of us seem to have the knack for, but I think that Brian's blend of knowledge and personality are just what we need. Jon and I have known Brian through work for some time. He has already put together a thank-you note for us to send out to our supporters. On the front is Steve Senger's Hale-Bopp photo. See page 11

Another opportunity presented itself earlier this month. First the DAO had agreed to re-surface our mirror for no charge. This was great news since we were expecting it to cost several hundred dollars, but we still needed to get it there. One evening while having a coffee with Owen he mentioned he was driving down to Victoria to visit his brother. Well! two and two quickly became four. We checked with a supplier and determined the replacement cost (about 12,000 dollars) and arranged for insurance for the trip. I built a crate and Steve and I carefully packed it up. It left for Victoria November 10 and arrived safely. Owen called and said they had some trouble removing the old coating, but, properly cleaned up it is at least 95 % of a new coating, but they were going to have another go at removing the coating the next day. At this point I am not sure if we are going to have a new coating or at least 95% as good, either way viewing by the date of the next meeting should be outstanding. Gil Self

On the November 7th weekend Steve and Gil carefully packed up the 24 inch mirror for it's trip with Owen to the DAO in Victoria. The telescope should be back in service by November 25.

Brian's thankyou



December 15 sky map courtesy of Dr. Bob Nelson

Photo Gallery

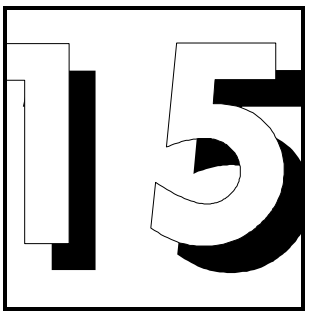
Although a night with aurora is a night of poor viewing these shots from club member Frank Badet worth seeing G.S.

October 20

September 24

Hello……? Is there anybody out there…..?

by Owen Salava



It's the age-old question that has plagued mankind. Are we Alone? Is our civilization unique in the universe, or are we one of many intelligent beings inhabiting this positively enormous universe of ours?

For the majority of us, excluding those scientists doing radio astronomy associated with SETI (Search for Extra-Terrestrial Intelligence), this is a question that can only be addressed in a philosophical light, as there is nothing that we can do personally to assist in the quest for contact with beings whose origins are extra-terrestrial, extra-heliospheric, or extra-galactic. This of course, excludes those people who believe that we are either a) being contacted regularly with visits, abductions, cattle mutilations and crop circles, b) already in contact with aliens who landed at Roswell and who have shared technology with humankind, or c) already living co-existent with aliens disguised as humans. This whole category belongs in that file folder which I lost long ago. Let's talk a little more realistically for a moment.

Situation: You're talking to a friend / co-worker / significant other about your hobby / obsession, and they ask what you as an amateur astronomer do with your time. You can mention that once in a while you go out to the dome and check out some cool galaxies, globulars, nebulas with the big scope. Conversely, you can mention freezing your fingers while taking cool photographs of the same very cool objects. Or (excluding Bob's AAVSO work and trips to professional observatories for kicks) you can tell them that in your spare time, you are contributing to the scientific reduction of radio astronomy data in direct assistance to SETI.

Far-fetched? Well, those of you who have purchased the latest edition of Sky & Telescope know that I have not completely lost my mind – assuming you've read the articles.

A couple of years ago, an idea was proposed to a conference to make up for the lack of computing power available to scientists to reduce (i.e. process and sift through for clues) the reams and reams of data coming out of the radio data being acquired in the SETI program. With the power of the internet now linking millions of computers, it is possible that many thousands of people could be recruited to let their computers help in analyzing radio data. As many people, myself included, simply let their computers run idle with a screen saver preventing screen burn when not in use, why not ask people to use this idle time for good, scientific application?

The program is called SETI@home. I first learned of it on the program @discovery.ca on the Discovery network about in September 1997. When the software is released as scheduled, in April 1999, you will be able to download data packets from the net, analyze them while a three dimensional animation runs as a screen saver to show the progress of the reduction, and then return your results to SETI@home and repeat the process. It will operate just like any other screen saver, operating only when your computer has been inactive for a period of time. As well, to pique your curiosity, a running coverage to date for the entire program and the worldwide participant distribution will be displayed.

The web site for further information, and to get tacked onto their mailing list for u dates and information when the software finally is released for public use (it's in beta test at the moment) is http://setiathome.ssl.berkeley.edu/

Not only does this program give you something much more interesting than "Flying Windows" as a screen saver, nor is it "just" contributing to a major scientific effort, it gives you a great conversation piece: "What do you do with your computer?" The normal, boring answer "Oh, I do some personal finance, surf the web, email, play games,

you know, the usual." Your new, improved answer "Oh, the usual, games, internet, contributing to the advancement of human knowledge by directly assisting SETI with their data analysis."

Also from Owen

Owen's Light Bucket – Part 1

Well, it's finally arrived. No, not a new telescope. Rather, a determination to go out and built myself a telescope. With this comes the realization that I have tons of work ahead of me.

Since I have been taken by this bug, I decided to share the fun with our members. After attending the most excellent Mt. Kobau Star Party this past August, where a large percentage of the scopes are home-builts and where people are all too happy to convince me that I need my own such deep-sky explorer, I've come to the decision to go for it.

Wow… that was fun. Now what?!? I know absolutely squat about building a scope. Sure, I can point a scope, even find some cool stuff to look at, but design and build one? Whoa boy… Part of the problem is self-imposed, as such problems usually are. I don't want a simple, cheap scope that is simple, or cheap. Not cheap monetarily, but cheap in construction. I want to be able to say to myself "Self, you made a nice piece of equipment. Heck, it even works reasonably well!"

So the first stage was crossed, on to the second, how big and what kind of construction. Well, size is a definite factor. My Rav4 isn't exactly built to haul around huge optics. With large scopes having focal lengths measured in meters and masses reaching into the hundreds of kilograms, with an appropriately large sticker price, time to think smaller. Rob Frith has a great 10" Dobsonian scope that he made. Works like a hot damn…. Problem for me, it uses a sonotube. Now, with a pickup this is not a problem, with my small vehicle… back to the drawing board (one aspect I have covered nicely, as I draft for my profession.) So not a sonotube, but I want a scope with good light grasp. A scope in the 6 to 8 rangeTwelve inches would make a nice compromise of size and light collection. So, here we go for a truss-tube design Dobsonian, much in common with Bob's beast. The difference being, mine will be collapsible into a box to fit the transport.

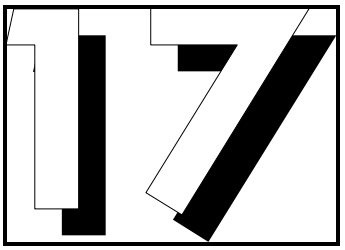
Another benefit of having attended Kobau, I have a Canadian mirror making contact, highly recommended by all comers. From some accounts, his mirrors beat any commercially produced product. With that kind of reputation, how could I go elsewhere? First stumble, a set of 12½" mirrors runs $1300. So from the outset, this project will take a while, from the funding side alone. Luckily for Gil, this means a bevy of articles as I write this soon to be serial.

Onto the research and design phases, gotta do some reading and talking to those who've been there before. Until next time and the next update.

Owen Salava

Planetarium Software Review

by Bob Nelson, PhD



Some time ago, Gil suggested that, since I have a number of planetarium-type (sky simulation) programs on my computer, I might like to do a review of these for the benefit of readers who might be contemplating buying one or more of these. So here I am!! Reviewed are the following: Guide 6 (by Pluto software), The Sky vers 4 (level 4, by Bisque Software), Redshift 3 (by Piranha Software) and Starry Night 2.17 (by Sienna Software, of Canada). Not considered were Deep Space (by David Chandler), Epoch 2000sk (by Meade, and therefore suspect), Atlas-Prism98 (by Pises Observatory in France), the U.S. Naval Observatory Multi-Year Computer Almanac (super accurate but highly specialized), Sky Chart III (by Southern Stars Software), SkyMap Pro (by Skymap Software, of Britain) -- mostly because I don't have any of them!

The programs tested all have a bewildering array of features, all look different, and it wasn't clear at first how to proceed. Then I realized that they were all trying to do many things and that I should subdivide the review into a number of goals or type of task. Accordingly, I've come up with eight categories which will be analyzed in detail. General discussion will be throughout and a conclusion will follow at the end. Needless to say, this whole analysis is coloured by my prejudices and personal likes and dislikes; other people may well have different views. Another disclaimer should be made is that while I am fairly expert in the use of Guide 6, I am less familiar with the other programs and may well have missed a feature or two. However, nonetheless, the reader should be able to get a good idea of the general features of each program and make some intelligent choices.

1. **Making star charts**

This is a feature that I use a lot, since I am in the business (so to speak) of studying variable stars (and possibly other things like asteroids) and I need to print out star charts, of various scales and orientations, to take to the telescope. I need information displayed on the chart to identify fully the identification of brighter stars, variables, etc.

Table 1.	Guide 6	The Sky 4	Redshift 3	Starry Nt 2.17
Chart mode (black stars on white)?	YES	YES	no	YES
Set star sizes?	YES	YES	no	no
Reversed/inverted chart capability?	YES	YES	no	YES
Ticks and grids?	YES	YES	YES	YES
Compass direction on legend?	YES	no	no	no
Chart size on legend?	YES	YES	YES	no
Magnitude scale on legend?	YES	no	YES	no
RA / Dec displayed on legend?	YES	YES	YES	no
Date displayed on legend?	YES	no	YES	no
Zoom levels?	180° - 1"	235° - 1'	fixed values	100° - 2"
Telescope/CCD field of view indicator?	YES	YES	no	YES
Variable stars displayed?	YES	YES	no	some
Asteroids displayed?	YES	100 only	YES	some
Animation trails?	YES	YES	no	no
Messier, NGC catalogues?	YES	YES	YES	YES
Object labelling versatility / quality?	GREAT	good	limited	good
Directly printable?	YES	YES	yes	problems
Print preview?	YES	YES	YES	no
Save images? (.BMP, .GIF, etc.)	YES	no	desktop	YES

Upon reviewing the table, one should see clearly that, for making charts, Guide 6 really shines. The user has full control of all the features -- orientation (south up, etc.), reversal (or not), chart field of view, star size, and so on. One can preview the image, choose portrait or landscape mode, and print to a variety of printers. Printing is fast and efficient. The Sky can do some of these tasks too, but I find it harder to use, with fewer features. Redshift and Starry Night are completely unsuitable.

2. Accessing Catalogues; Ease of Use

Astronomy has numerous catalogues filled with data that are needed in dealing with celestial coordinates, stellar magnitudes and spectral types, stellar parallaxes, variable star information, different star designations, and so on. One doing research often needs this information and it should be easy to call up.

Table 2.	Guide 6	The Sky 4	Redshift 3	Starry Nt 2.17
Finding objects easy?	YES	YES	YES	fair
Asteroid catalogue?	YES	100 only	by name!	limited
Add new asteroids / comets?	YES	YES	YES	no
Variable Star Catalogue (GCVS 4)?	YES	YES	no	partial
Catalog of Suspected Variables (NSV)?	YES	YES	no	no
Guide Star Catalogue (GSC)?	YES	YES	no	no
Hipparcis/Tycho data?	YES	supposedly	sparse	??
Oth. catalogs (BD, HD, HR, SAO, PPM)?	YES	limited	no	are U kidding?
Messier, NGC Catalogues?	YES	YES	yes	yes
Full info available?	YES	no	no	no

Again, on consulting Table 2, it is clear that Guide 6 again shines. It has ALL the star catalogues that I know of and it's extremely easy to use -- just go to the object (ALL the categories I can think of are listed), right click on it and a window appears with information that goes on and on and on. I just can't think of anything that's not there (with one small exception). The Sky is *supposed* to have all this information too, but it's on another disk that I haven't figured how to use yet; consequently, only partial information is available. Both Redshift and Starry Night give far less information in dorky little windows.

3. Displaying the Night Sky from Your Location

An observer (possibly also a beginner) sitting in his/her home might like to call up an image of the night sky from his/her location to see what's there, plan an observing session, etc. It's important to display the horizon view (complete with compass directions labelled), indicate the constellations and other features, etc.

Table 3.	Guide 6	The Sky 4	Redshift 3	Starry Nt 2.17
Horizon?	line	line/opaque	opaque	opaque
Horizon compass directions?	no	YES	YES	YES
Constellation lines?	YES	YES	YES	YES
Constellation boundaries?	YES	YES	YES	no
Ecliptic?	YES	YES	YES	YES
Milky Way Isophotes?	YES	no	YES	YES
Mouse display (of RA / Dec, etc)?	YES	YES	YES	YES
# of geographical locations savable?	1	1	1	many (defective)

Here we see the other programs catching up. You could use Guide 6, but we see that the other programs do as good or better job. Your choice. In terms of realism, Starry Night soars far above the others with its beautiful sky colours, Moon images, etc.

4. Finding Visibility of Objects

An observer planning in detail his/her observing would like to know when certain objects rise, search for lunar or solar eclipses, possible search for rare conjunctions, etc.

Table 4.	Guide 6	The Sky 4	Redshift 3	Starry Nt 2.17
Planetary rise / set times?	TABLE	indiv	indiv table	Single
Lunar rise / set / phases?	TABLE	indiv	indiv table	no
Lunar eclipse finder?	TABLE	YES	YES	no
Solar eclipse finder?	no	YES	YES	no
Conjunction finder?	no	strange	YES	no
Current comets?	TABLE	no	no	no
Current asteroids?	TABLE	no	no	no
Jupiter events?	TABLE	no	no	no
Great Red Spot?	TABLE	no	no	no
# of planets whose moons calculated?	5	1	All 7	1

Here we see that Guide 6 can generate nice tables of planet rise/set times, etc. Other programs require you to find the object, select it, *then* generate a table (or a single set of values) for that one object. In addition, it can generate tables of asteroids that are 'up', lie within certain magnitude limits, and are observable. On the other hand Redshift 3 has some fine search engines for eclipses and conjunctions that are far superior to the others. (Once you find an event, you can click on display and that event -- complete with correct geographical location -- is set.) Starry Night is the big loser here -- it generates nothing and only keeps track of our own moon (as far as I can see). The Sky does have some search engines, but one of them is weird. Guide 6 and Redshift are the clear winners here.

5. Simulating Celestial Events

Suppose it's -40° out and you'd like to simulate some celestial events rather than go outside. Maybe you are a teacher and would like to record these for playback later. Modern computers can do a terrific job of celestial simulations -- many, many things are possible. You can, for example view a solar or lunar eclipse from Earth at any time in history, watch the same eclipse from space and see the Moon's shadow creep over the Earth's surface, watch the Earth rise from the Moon, watch an annular eclipse from Mars as Phobos traversed the Solar disk, plot comet orbits from space, look at spacecraft trajectories, and so on. You should also be able to save the settings so you can go back later; all four permit this.

Here we see that Guide 6 is not really designed to do this task (it *can* do some simulations like transits); The Sky also has limited features in this area (that I can see). Both Redshift and Starry Night really shine here. Redshift has superb features that go on and on; and in terms of realism, no one can beat Starry Night which really is beautiful. Redshift is a clear winner with Starry Night second.

6. Learning Tools for Beginners

Table 5.	Guide 6	The Sky 4	Redshift 3	Starry Nt 2.17
Natural sky colours?	no	no	yes, sort of	YES
Natural images of Solar System objects?	no	no	YES	YES
Select solar system viewing locations?	YES	no	YES	YES
Search engine for eclipses?	no	YES	YES	no
Time step -- single / continuous?	YES	YES	YES	YES
Movies?	no	no	YES	YES
Lock on targets	no	limited	YES	YES
Save settings	YES	YES	YES	YES

The beginner, young person or anyone wanting to learn more about astronomy might like to run the planetarium program and follow his or her interests. It should be possible to click on a term and see a definition or explanation. Also, tutorials and in-depth features are also possible. In addition, many incredible images of the planets and deep sky are available today; some modern programs have integrated these features.

Table 6.	Guide 6	The Sky 4	Redshift 3	Starry Nt 2.17
Glossary of terms?	YES	no	YES	no
Photo gallery / HST images?	no	limited	YES	no
Astronomy tours	no	no	YES!!	no
Background multimedia topics	no	no	YES!!	no
Astronomical records?	no	no	YES!!	no

Here we see that Redshift rises far above the rest in this regard -- in fact, it blows away the competition (the others are not in the game). In fact, many of its 50 multimedia tours and other features will absolutely blow your socks off. The beginner (and to a lesser extent, the expert) will want to go through the many excellent features. A novel item, available only in Redshift, is astronomical records in which one can look for extremes like the nearest star, the smallest constellation, the largest galaxy and much much, more. (In the Prince George Astronomical Society, we will certainly want to have a copy at the observatory for tours -- great for rainy nights and to keep young minds occupied.)

7. Scope Control

Modern computers can accept a signal from the shaft encoders on a telescope and link that information with a planetarium program to display an image on the screen where the telescope is pointing. In addition, if the telescope has drive motors that can slew, some programs can actually drive the telescope to a desired location -- just point and click.

Here we see that The Sky really comes into its own -- in fact, it has no competition for running a telescope (that I can see). The feature TPOINT (an add-on that you have to pay

extra for) is a sophisticated routine (used in major observatories) that analyzes the pointing errors in your system and automatically makes corrections, resulting in astonishingly accurate pointing accuracy.
(It can allow for non-orthogonality of the two axes, flexure, and much more.) No other program has it.

8. Miscellaneous

A number of miscellaneous features are listed here. Night vision mode is nice at the telescope to dim the bright display. The Sky is great here but Guide 6 too allows red stars to be displayed (although

7. Scope control	Guide 6	The Sky 4	Redshift 3	Starry Nt 2.17
LX-200 control?	YES	YES	no	no
TPOINT?	no	YES!!	no	no
Integrate with CCD acquisition software?	no	YES!!	no	no

you have to fix the Windows colour scheme yourself). Redshift 3 has a wonderful internet feature (I haven't tried it yet) that allows you to find the latest news in astronomy. You click on some item and it dials up your internet supplier and accesses some web site to dig up the latest. This is the way of the future (I suppose). All but Guide 6 were written for Windows 95 and will therefore crash slightly less often than 16-bit programs like Guide 6 (one supposes). And lastly, price: all except The Sky are priced at less than $100 US.

Conclusion

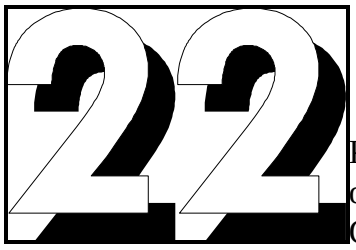
It should be clear from the above that no one program will do it all. The first two programs (Guide 6 and The Sky) were clearly written for the active observer and the latter two (Redshift and Starry Night), largely for armchair astronomers. While there is

8. Miscellaneous	Guide 6	The Sky 4	Redshift 3	Starry Nt 2.17
Night vision mode?	yes	YES	no	no
Internet news update?	no	no	YES!!	no
Windows version	3.1	95	95	95
Price (USD)	$70	$250	$50	$80

some overlap, some tasks are better done by programs within the first group, and the others, by the second. It also seems clear to me that, for the observer, Guide 6 is the clear winner (especially in terms of price). However, The Sky is better at telescope control. Since we have a copy of The Sky so generously donated by Bisque Software, we'll certainly want to get it installed at PGAO and put to work (Guide 6 can be on the *other* computer). In terms of sky simulations, and for learning, it is also clear that Redshift 3 is a 'must have'. It is so clearly better than Starry Night for learning tools and multimedia; it also holds its own in simulations (although Starry Night is the champion for realism and beauty).

So there you have it. If you can only afford two programs, buy Guide 6 and Redshift 3 -- they're reasonably priced and together will only set you back about $200 Canadian (at time of writing !!!!!)

B.N.



Observing South of Fomalhaut

by Alan Whitman

October 13th through 17th I enjoyed a fine star party in Kentucky at latitude 37. At the Twin Lakes Star Party I picked off six southern NGC globulars that I hadn't seen before in Corona Australis, Sagittarius, Columba, and Puppis. This was part of an ongoing project to observe all of the globular clusters plotted north of declination -40 in Wil Tirion's SKY ATLAS 2000.0. There are now only nine left that I haven't seen, eight of them springtime targets situated between declinations -21 and -39.

Most of the globulars were fuzzies ranging from magnitude 8.3 down to 9.4. A significant globular was NGC 1851 in Columba (11' diameter, magnitude 7.3) at dec -40. At 64x in the Astroscan it had a very bright, tiny centre like M15.

The southernmost globular was NGC 6541 (23' diam, mag 7.5) at dec -44 in Corona Australis, south-east of the tail of Scorpius. This one is four degrees south of my nominal target area, but I went after it because it is a fairly bright object. Since October new moon isn't primetime for the Scorpius area I starhopped to it 15 minutes before the end of AT (astronomical twilight) with the Astroscan at 16x, finding it only one degree above the low treeline. At 64x it was large, with a bright centre, with perhaps five stars on the edge of vision even at this very low altitude as it is one of the nearest globulars, only 13,000 LY distant. It set before the end of AT! This was my biggest quarry of the trip.

The Corona Australis emission nebula NGC 6726-27 at dec -37 was just a diffuse glow around two stars (looked like a reflection nebula) at 64x.

Another first was the famous Sculptor mag 8.2 G-Sc NGC 55 at dec -39. The long, diffuse splinter was easily seen at 16x and 64x in the 4" RFT (Astroscan), but without definite edges; it had a slightly brighter middle. I borrowed a Celestron-11 the next night for another view of NGC 55: some mottling was visible but the overall view wasn't much different than in the Astroscan.

The Astroscan was all that would fit in the car for the trip east. I mostly used this 4" RFT because I was only interested in the low southern sky and I seemed to be the only person observing there. The Southerners all seemed to be looking at Cygnus and such near the zenith. While the sky was decent (I saw the Gegenschien one night) it was no match for rural B.C. So, while the owners of 10" to 18" telescopes (including several 15" to 18" Obsessions) were generous with eyepiece views, as at all star parties, they weren't aimed at what I'd come south to see.

I spent a lot of time picking out stars in constellations like Microscopium, Phoenix, Pictor, Columba, Eridanus, Puppis, Pyxis, and Vela with 7x50s. There were nine naked-eye stars in Grus and six in Phoenix, including Delta Phe at dec -49. Indus was a new constellation for me and 3rd mag Alpha Indi was suspected naked-eye at dec -47. (The transparency low in the south was not great).

Picking up Indus gives me 79 of the 88 constellations -- the missing 9 are all south polar ones. I never hear about any of you seeking out new constellations. Don't you seek out Equuleus, Crater, etc. from Canada and southern ones from the States and further south?

Alan Whitman
"Have Astroscan, Will Travel"

In the coming year, there are a great number of things to be done around the observatory to both improve it for the use of the members and to present a great face to the community. Donations of time and materials in the coming year will be highly appreciated as we work as a society to improve the capabilities of the equipment, and increase the comfort and usability of the building over-

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.

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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.

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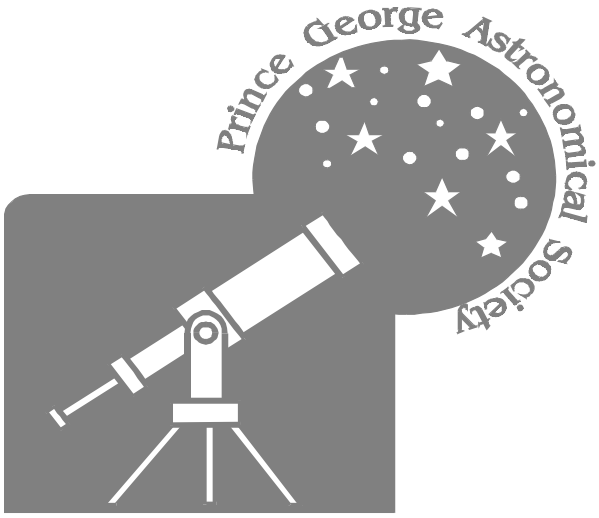

The P.G.A.S Would like to thank

BISQUE SOFTWARE

for their donation of

THE SKY (Level 4 software)

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