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*Executive, 2006/2007*

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Contributions to the newsletter are welcome.

**Deadline for the next issue is**  
**November 12, 2007**

**PeGASus Editor**  
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## Coming Events

*To Volunteer to help run an event please contact Brian Battersby.*

**brianbattersby73@yahoo.ca**

**Phone: 561-8138 (day) 612-4623 (evening)**

<i>Date</i>	<i>Event</i>	<i>Time</i>	<i>Place</i>	<i>Volunteers</i>
Oct 15	TOUR: HOMESCHOOLERS	7:00 pm	Observatory	Brian B, Wayne S, Denise S
Oct. 18	TOUR: HEATHER PARK SCHOOL	7:00 pm	Observatory	Brian B, Wayne S, Denise S
Oct. 19	OPEN HOUSE	7:30 pm	Observatory	Blair S, Maurice S
Oct. 22	TOUR: HOMESCHOOLERS	7:00 pm	Observatory	Brian B, Keith E, Wayne S
Oct. 26	OPEN HOUSE	7:30 pm	Observatory	Blair S, **HELP**
Oct. 27	<b>A.G.M. &amp; CLUB SOCIAL NIGHT</b>	7:30 pm	Observatory	<i>all members welcome!</i>
Oct. 29	TOUR: SD #91	7:00 pm	Observatory	Brian B, Denise S
Oct. 30	TOUR: SD #91	7:00 pm	Observatory	**HELP**
Nov. 2	OPEN HOUSE	7:30 pm	Observatory	**HELP**, Al H
Nov. 9	OPEN HOUSE	7:30 pm	Observatory	**HELP**, Valerie Z
Nov. 14	BUSINESS MEETING	7:30 pm	Arctic Manufacturing, Hart Hwy.	<i>all members welcome!</i>
Nov. 16	OPEN HOUSE	7:30 pm	Observatory	Greg M, Al H
Nov. 17	OPEN HOUSE; LEONIDS	8:00 pm	Observatory	**HELP**
Nov. 23	OPEN HOUSE	7:30 pm	Observatory	**HELP**
Nov. 24	CLUB SOCIAL NIGHT	7:30 pm	Observatory	<i>all welcome!</i>
Nov. 30	OPEN HOUSE	7:30 pm	Observatory	**HELP**

*For an up to date list of the Volunteer Schedule visit our website in the MEMBERS AREA*  
**www.rasc.ca/princegeorge**

# EDITORIAL

by Brian Battersby

**W**hat kind of Centre do you envision?

The Prince George Astronomical Society has come a long way since it was founded back in 1979. Over the years we have grown from a small group of people interested in having a local observatory to a full fledged Centre of the Royal Astronomical Society of Canada with a group of eighty plus and a one of a kind observatory and teaching facility.

When the society was created the Society's Act required a constitution to be made. The second part of that constitution states the purposes of the society:

- (a) To establish, own, and maintain astronomical observation facilities.
- (b) To provide programs for amateur astronomers to develop their skills in the sciences and to increase the general level of knowledge of astronomy and allied sciences in the community and school system.
- (c) To produce and publish professionally acceptable research through the use of astronomical instruments.

To accomplish "Purpose a" the Tabor Mountain observatory was built however, that observatory ran into vandalism trouble and was not easily accessible to anyone. The observatory was moved and rebuilt at the current Tabor Road location in 1992 / 1993.

The new observatory was built with the intention of not only "owing and maintaining observation facilities" but to help us fulfill "Purpose b" of our constitution as well. The facility helps us fulfill this purpose by being accessible to members and the general public and by being equipped for running open house nights, hosting tours and running courses like NOVA. In my opinion we are fulfilling "Purpose b" quite admirably. Notice though that "Purpose b" can only be accomplished by "providing programs" which requires manpower. This is why we are always asking for volunteers to help run things. It is not only good fun to run these programs it is one of the reasons the Society exists and a big reason we receive monetary funding to keep the doors open. "Purpose b" is the "work" part of the Centre.

"Purpose c" is what I would call the "fun time"! This is where we could do some real observing. Unfortunately, this purpose is not currently being fulfilled as far as I can tell at least not in a coordinated Centre-wide way. I know in the past Bob Nelson has used the telescope quite a bit to observe variable stars, eclipsing binary systems to be more precise, but even then he was the only person using the observatory in this manner. It would be way more fun for everyone if more people were working on projects and using the telescopic equipment.

Perhaps "Purpose c" should be expanded to read: "To **involve the membership in observing projects** and to produce and publish professionally acceptable research through the use of astronomical instruments."

The Centre could be observing variable stars in an organized fashion and submitting those observations to the AAVSO. This wouldn't even require using the 0.6m telescope, binoculars could be used. The 0.6m telescope could also be used to find asteroids or run a supernova search. These types of projects could be set up to involve many club members observing for small periods of time.

Observing need not be overly complicated. It could simply be and encouraging members to work on one of the RASC Observing Certificates mentioned in the last newsletter in some kind of coordinated, inclusive manner. *[check out the article Glen Harris wrote in this newsletter on page 8]*

It all comes down to what kind of Centre do you envision? Come out to the AGM on October 27 and let us know. The more people get involved the better off we all are.

BB

## WHAT'S OUT THERE A New Season

by Fae Collins Mooney

**T**he Perseid Meteor Shower in mid-August, for me, has always marked summer's end. I don't like to think of summer ending so soon, but I do live in the North and it does seem that when I wake the morning after the Perseids peak there is a distinct change in the air and a stirring of the spirit... And I know it won't be long before I hear the honking of geese and perhaps be awed by the sight of that characteristic "V" transiting the shining face of a full Moon.

Fall, it's a time of new beginnings – the beginning of another school year, the beginning of another observing season as the sky darkens ever earlier... the marking of a new year and a new executive for our PG Centre. And with new beginnings come opportunities for new experiences – observational or instructional or experimental - or perhaps even scientific - and, inevitably, opportunities for change. It's a season of anticipation too – what surprises await our discovery? And possibilities - what might we spy, late one clear night, as we peer through the eyepiece?

It can describe a season in life – the autumn of life – as well, with a restlessness, and stirring of the spirit, a sense of change, a yearning for something as yet unknown and an urge to seek out a place other than where we are... something new, something different, something challenging, something stimulating... Something –

And so, I succumb to the stirring, not sure where it is I am going and only somewhat sure of what I am leaving. My passion for the night sky will not diminish, but evolve – into what I don't yet know.

I have enjoyed my season with the RASC, and appreciated my association with the PG Centre. Thank you.

See you around the galaxy – I'll be looking for you.

# The Night Sky for October 2007

by Bob Nelson, PhD

**H**i Folks,

Well, I am now writing for a new editor. Welcome Brian!! I hope that you will be patient with me, as sometimes I struggle to get this column in at the last minute. (Sometimes I'm early, Brian. Brian, are you still there, or are you killing yourself laughing?)

Seriously, I'd like to pay tribute to Gil, for all the work that he has done over the years cajoling folks like me to get their copy in, struggling to make things fit, and getting the result run off and distributed in a timely manner. The result has always been the same -- a newsletter of which we can all be proud.

I think that we all have to redouble our efforts to help Brian out and make the newsletter even better.

Anyway, here is what is going on in the sky this month:

**MERCURY** is a morning object this month. At month's start, it rises about 1.5 hours before the Sun, and at sunrise lies some  $7.5^\circ$  above the SE horizon. Then, it's an 8" disk of magnitude 0.6 and 25% illuminated. By month's end, however, it rises less than an hour before the Sun, lies less than  $6^\circ$  above the SE horizon and is 5" disk of magnitude -0.8. (It reaches superior conjunction on Dec 17.)

**VENUS**, at midmonth, it lies some  $32^\circ$  above the SSE horizon at sunrise. Another morning object, it rises at mid-month, at 03:00 PST, some 4.5 hours before the Sun. Then, it's a 20" gibbous disk (56% illuminated) of magnitude -4.3. The Observer's Handbook tells us that on Nov 5, Venus will be easy to spot during the day with the unaided eye because, on that date, Venus will lie some 3.5 degrees above the Moon in its waning crescent phase. Have a go, folks and report back as to how you make out.

**MARS**, in Gemini all month (it is stationary on Nov 15, after which it retrogrades), is well-placed for observations. At midmonth, it rises at about 18:40 and transits at 03:29 PST, and lies some  $35^\circ$  above the western horizon at sunrise. It's a 14" disk 93% illuminated, of magnitude -0.9. Earth is catching up to it, as it does every two years, and there will be an opposition next month, on December 24th. (For more information, read your Observer's Handbook, consult Sky and Telescope online, work one or more of your planetarium programs, or wait for next month's PeGASus.)

**JUPITER**, in Ophiuchus until Dec 1, is an evening object this month. At mid-month, it lies some  $7\frac{1}{2}^\circ$  above the SSW horizon at sunset; it sets an hour and a half later.

Going, going, ...

**SATURN**, in Leo until 2009 (Sept), is a morning object this month. At midmonth, rises at about midnight; it transits just before dawn, when it lies some  $46^\circ$  above the southern horizon.

**URANUS**, in Aquarius until 2009 (March), is an evening object this month. At midmonth, it lies some  $15^\circ$  above the SE horizon at sunset; it sets at around 01:00 (PST). As usual, it's a 3.6" disk at about magnitude 5.7.

**NEPTUNE**, in Capricornus until 2010 (March), is an evening object this month. At midmonth, it lies some  $17^\circ$  above the SSE horizon at sunset; it sets around 22:40 (PST). As usual, it's a 2.3" disk at about magnitude 8.0.

Standard Time returns Nov 4 at 02:00 (yeah!!)

**CONSTELLATIONS** to look for in November (at 21:00 PST) are Sculptor, Western Cetus, Pisces and Andromeda.

Sculptor (Scl, "The Sculptor's Tools"), another southern constellation at the limit of our visibility here in Prince George lies out of the Milky Way. It contains NGC 253, a spectacular spiral galaxy, a number of fainter galaxies, a faint globular (NGC 288) and, near the latter, the south galactic pole which, at declination 27.5 degrees south, is just visible from Prince George. The brightest star, Alpha Sculptoris, is a B7 giant radiating 1700 times solar, has a radius of 7 times solar, and a mass of 5.5 solar. The reason it is so dim (at 4.3 mags) is that it lies at a distance of 670 lightyears. Its claim to fame – and the reason I am telling you all this – is that at an age of 81 million years, it is at the end of its hydrogen-fusing cycle. The core, which is comprised almost entirely of helium, will ignite after the star expands, the surface cools, and the star becomes a red giant. The star is presently classified as a slow rotator; this relative stillness results in a lower than solar surface helium abundance (no mixing) and an enhanced abundance of heavier elements such as silicon, titanium and manganese. The magnetic field generates star spots, enabling astronomers to measure its rotation period. The magnetic field occasionally flips and controls the behaviour of a close-in cloud of circumstellar gas. [Taken in part from <http://www.astro.uiuc.edu/~kaler/sow/fomalhaut.html>.]

Western Cetus (Cet, "The Sea Monster"), contains a number of galaxies, including M77, which is a bright and compact spiral galaxy, contains three distinct sets of spiral arms and lies about 60 million light years distant. According to Burnham, this and NGC 4594 in Virgo (The

“Sombrero”) were the first two systems in which very large redshifts were discovered, leading to the discovery of the expanding universe.

Pisces (Psc, “The Fishes”), lies on the Zodiac. It contains M74, according to Burnham, one of the faintest and most elusive of the Messier objects requiring a dark sky and suitable eyepiece. Pisces also contains, according to Norton’s 2000.0 Star Atlas, the galaxies NGC 487 and 524.

Andromeda (And, “The Princess of Ethiopia”), is familiar to most of us; it contains the “Great Andromeda Galaxy” M31 along with its satellite ellipticals, M32 and NGC 205 (a.k.a. M110 -- but not really on Messier’s list). According to Burnham (and the references therein), M31 has been known at least as far back as 905 AD; it was known as “The Little Cloud” and appeared on star charts long before the discovery of the telescope in 1609. Simon Marius is usually credited with the first telescopic observation in 1611 or 1612. Early observers thought the “nebula” consisted of glowing gases but long photographic exposures early in this century revealed it to be a vast star system. Edwin Hubble, observing Cepheid variables with the 100” Mt Wilson telescope, established the distance as around 90,000 light years, well out of this galaxy. Later, corrected calculations in 1953 extended the distance out to 2.2 million light years. We now know that M31, along with M33 and our galaxy, are the three largest members of the “Local Group”, gravitationally bound and holding numerous smaller galaxies, including the Large and Small Magellanic Clouds. Needless to say, M31 has been the subject of many studies by professionals using the largest telescopes and is also a fine object for amateur study and photography.

Clear skies to all,  
Bob

## The Final Frontier

Prince George Centre ~ Prince George  
Symphony Orchestra Collaboration

by Blair Stunder

**S**aturday, September 29, the Prince George Symphony played Gustav Holst’s “The Planets Op. 32” with visual accompaniment supplied by Gil Self of the Prince George Astronomical Society. The combination was a hit that started the symphonies concert season. It was nice to see a number of members in attendance as well.

We had an information booth at the front entrance that keep a number of members busy answering ques-

tions about the society and facility. A small mistake was made by the PGSO in stating the pictures were taken by us, rather than supplied by us.

Gil found some spectacular pictures of the planets, no pictures of Pluto, as it was not discovered until after Holst wrote the suite. Gil managed to find some spectacular pictures of Saturn that surely must have been taken by Cassini. The total solar eclipse using Saturn with the rings being back light was one that is a must have.

Since the PGSO organized the pictures themselves and controlled the visual presentation we can’t be blamed for the shameless advertising (our Logo and Letterhead) that appeared on the screen a number of times to be quickly replaced with an astronomical picture.

I have found a great and concise document about Gustav Holst and the “The Planets Op. 32” at: <http://www.gustavholst.info/compositions/listing.php?work=18>

Blair Stunder  
PGAS Exec.

## Thin Crescent Moon

by Doug Wayland

**I** thought you might be interested in this photo I took the morning of Oct 8, 2007 at 06:15. This was 35 mm camera at prime focus of ETX 90, Kodak Ultra Max 400 film. It was about 10 sec exposure, which was too short, I had to have the photo lab brighten it up. I tried some longer exposures to about 30 sec, which was right, but the ETX’s imperfect tracking caused the image to be blurred, so I took this shorter exposure and had it brightened.

Clouds prevented me from getting a photo of the close conjunction of the Moon, Venus and Saturn the morning before.



Doug

View it on our website!  
[http://www.vts.bc.ca/pgasc/photo\\_month/photo\\_of\\_month.htm](http://www.vts.bc.ca/pgasc/photo_month/photo_of_month.htm)

## Slash Burning

by Glen Harris

**D**oug, Jim Arnold, and I played pyromaniacs today [October 6] and burned several piles at the back including the huge one south of the viewing deck and several smaller ones scattered throughout the western bush. We also dropped the poplar tree that was too close to the power line for the PGYCC crew to deal with. Additionally, we consolidated a couple of piles at the east front of the property in preparation for burning next Saturday, if conditions permit. Our goal is to burn all the piles at the front next weekend so that the observatory sign is no longer obstructed, and also allow work to progress on the parking lot expansion.

Today was quite pleasurable, with a stiff sou' wester evaporating our sweat as it appeared, and the unforgettable aroma of smoke and burning flesh if we got closer than 15 meters to the burning piles was pungent. As proof of our endeavours, Doug took some candid before and after photos of the activities.

Glen

## News Flashes

by Brian Battersby

Congratulations to Gregory Mohammed for successfully completing the Explore the Universe Certificate. Greg completed the certificate in about two years and saw 57 of the 110 objects. Good work Greg!

\* \* \*

The exclusive sounding "Executive" meetings will now be replaced by the aptly named "Business" meetings. Everyone interested in the inner workings of the society is welcome! Watch the website for current times and locations. [www.rasc.ca/princgeorge](http://www.rasc.ca/princgeorge) In general they will be held on the second Wednesday of each month at Artic Manufacturing Ltd., 3323 Hart Hwy.

\* \* \*

A membership survey was sent out via email on October third. Thanks to all who responded. If you haven't responded please do so soon. We look forward to trying to improve the club! Contact Blair Stunder at [blair.s@shaw.ca](mailto:blair.s@shaw.ca) if you need another copy of the survey. The survey results are anonymous.



Here are a few of the slash burning photos I took last Saturday, Oct 6 of Glen, Jim A. and I burning and having a wiener roast. The bottom two images above show the same angle before and after the pile disappeared. ~ Doug W.

# Abbey Ridge Observatory

Taken with permission from the website of Dave Lane

<http://www.davelane.ca/aro/>

**A**bbey Ridge Observatory (ARO) is named for the granite ridge that rises up above Elbow Lake and along Abbey Road. ARO sits on bedrock on the edge of this ridge giving spectacular views from the south through to northwest. The site is quite dark, considering that it is only about 23 kilometres to the west of Halifax (population ~350,000). The Milky Way is easily visible on moonless nights and the MVM is about 5.8.



The observatory is based on a Technical Innovations 10-foot Home-Dome and houses a Celestron C11 SCT and either a TeleVue Genesis or Pronto refractor mounted on a Losmandy HGM-Titan german equatorial mount. An SBIG ST9 CCD camera with Optec IFW filter wheel and TCF focuser are used to image the heavens.

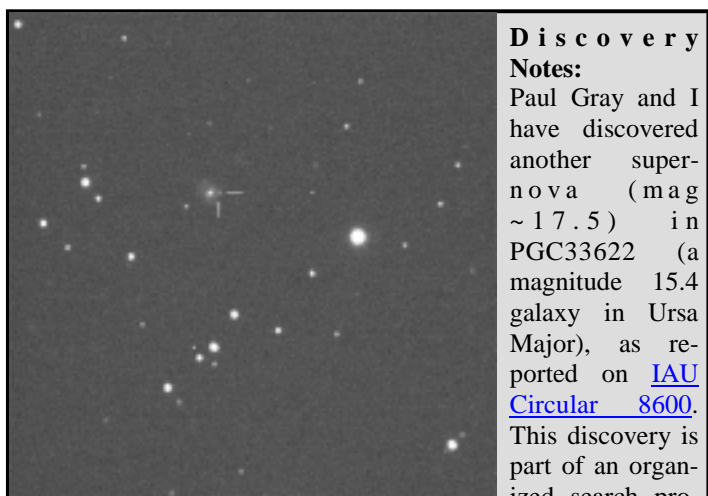
The observatory, telescope, and CCD camera are remote-controlled from my home office (or from anywhere in the world over the internet), which overlooks the observatory, and can "robotically" perform observations on its own. The primary use of the observatory is supernova hunting, observing variable stars *and* general CCD imaging of interesting objects. The observatory is also a registered observing site of the International Astronomical Union's Minor Planet Centre (site I22).



## Research Projects:

**Supernova Hunting:** As of August 2006 the ARO has joined the Puckett Observatory World Supernova Search (POWSS). ARO is imaging galaxies from the POSS program as directed by Principal Investigator Tim Puckett. Paul Gray has also joined this search team. For information about the supervova discoveries made by Dave Lane and Paul Gray visit our supernova page.

**Variable Star Observing:** The ARO observes variable stars, mainly Cepheids and suspected Cepheids. This work is being done with Daniel Majaess and David Turner of Saint Mary's University Astronomy and Physics. ARO devotes about 2 hours of observing time each clear night for this project. All observing is done automatically based on observing lists provided by Daniel.



It was detected in the evening of September 12, 2005 by Paul (located in Fredericton, NB) while he was studying images taken nearly a week earlier at the semi-automated [Abbey Ridge Observatory](#) (located at Stillwater Lake, Nova Scotia). It was verified immediately and reported late the same evening to the IAU's [Central Bureau for Astronomical Telegrams](#). It was confirmed overnight by Ajai Sehgal.

**LEFT:** September 23/24,2005: Here are two images taken about a day apart of Asteroid 2005 UB313, the so-called 10th planet (although lots of controversy surrounds that claim). It was an amazing 95 astronomical units from the Sun when these images were taken and it is nearly 19th magnitude. The exposure times were about 5 minutes (7x45 seconds combined).

# Isabel Williamson Lunar Observing Program Viewing Suggestions

by Glen Harris

The Royal Astronomical Society of Canada offers several observing programs, one of which is the Isabel Williamson Lunar Observing Program. Instructions on how to obtain the Lunar Program Guide and Observing forms can be found in the Observing section on the RASC website ([www.rasc.ca/](http://www.rasc.ca/)). The program is divided into Required and Challenge objects, of which only the Required objects need to be viewed in order to earn the certificate. I decided to try and observe as many objects as possible. The following text outlines the method and tools I have used to work my way through the certificate requirements.

The observing forms provided by the RASC are adequate for most observations, but I occasionally use the blank side of the preceding page of my logbook to sketch images. The Nectaris basin, Montes Apenninus and Bench area, Montes Carpatus, Sinus Iridum, and Palus Epidemia-rum are some examples.

One of the advantages of viewing the moon is that a dark location is not a prerequisite. I live in the Prince George bowl area that is subject to much light pollution, but the only issues that hinder me in my quest to complete the Lunar Certificate requirements are the neighbour's trees to the east and the size of my telescope mirror.

The most dramatic lunar views are found within several degrees of the terminator, that area of the moon where dark meets light. Objects in this area are not flooded with sunlight, and because of the shading, stunning views of the moon's features can be observed.

The most important thing to carry out when taking on this challenge, along with being appropriately attired, is to plan your viewing session in advance. The resources I use are Antonin Rukl's book 'Atlas of the Moon' (RUKL), the free Virtual Moon Atlas (VMA) program, a couple of spreadsheets I have developed, the Lunar Program Guide spiral bound booklet, which is actually entitled 'The Isabel Williamson Lunar Observing Program', and Attila Danko's Clear Sky Clock. Other resources suggested by the RASC are Paul D. Spudis' book 'The Once and Future Moon', Charles A. Wood's 'The Modern Moon - A Personal View', and the RASC's Observer's Handbook. What I typically do is plan a week's viewing about a week ahead of time. This means that when, according to the Clear Sky Clock a clear night will occur, one only has to set up the telescope and you're ready to view.

One detail you should be aware of when estimating Transparency and Seeing is that Clear Sky Clock rates these conditions on a scale of 0 - 5 for Seeing, and 0 - 10 for Transparency with 0 being poor and 5 or 10 being excellent, whereas the Lunar Certificate requires that the Antoniadi scale of 1 - 5 be used, where 1 is best and 5 is poor. Circle the appropriate number on the log sheet accordingly.

Session planning is especially important when

you're attempting to observe some of the more difficult wrinkle ridges (Dorsa Aldovandri), elusive faults or rifts (Rupes Recta, Vallis Alpes), obscure domes (Arago) and rilles (Rimae Triesnecker, Rima Furnerius). Timing is crucial, as some of these objects are visible for only a few hours before becoming completely obliterated by sunlight. I've only seen Rimae Triesnecker once, which was the first time I tried, and that was more by luck than skill. Many other objects were attempted several times before success was achieved.

The Lunar Program Guide is organized by Longitude commencing in the east and working west. The guide works fairly well, but I found it to be too general in nature, and difficult from which to prepare a viewing session. As a result, I built an Excel spreadsheet based on Longitude, specific days of lunation, and objective number. The RUKL map is included for reference as well. Of course no lunation day is exactly the same in the next lunar cycle, but I find the spreadsheet entitled 'Lunar Observation Spread Sheet', which can be downloaded from the PG Centre website ([www.vts.bc.ca/pgasc/](http://www.vts.bc.ca/pgasc/)), is quite useful. Look under Resources - Observing/Weather.

The free Virtual Moon Atlas (VMA) program is another valuable asset when planning a viewing session. Enter your location (Configuration/General tab), adjust the date and time (Ephemeris) for when you want to start viewing and position your mouse cursor on the terminator. The resulting Longitude can be seen in the lower left hand corner of your screen. Reference the spreadsheet and find the Longitude. Depending on whether the moon is waxing or waning will determine where in the spreadsheet you look. You now have a list of objectives that can be viewed. Refer to the Lunar Program Guide objective to uncover what specifically needs to be found. I usually type the object into the Information field of VMA to ensure that it will be visible at some point during the viewing session. Sometimes I might have to wait for the terminator to clear the object or view the object before the terminator overtakes it. Occasionally the opportunity will not present itself. When I've viewed, sketched, and logged an object, I simply change the colour of the objective number in the spreadsheet, or cross it off my paper copy. If I've viewed it during the waxing phase, I'll mark it off in the waning phase as well, and vice versa.

Coincidentally, I've produced another Excel spreadsheet containing all the RUKL objects, and I've been using it to log my progress. It can be sorted just about any way you'd like, could also be used for planning viewing sessions, and would certainly help to keep track of objects viewed if you were inclined to tackle the 1000 Named Lunar Objects challenge mentioned later on in this document. As soon as all the errors are eliminated, this spreadsheet will be available for download on the PG Centre website.



VMA also gives you rise, transit, and moonset times, as well as the transit altitude. The higher the altitude is, the less atmosphere you have to look through, and the steadier the image will be. I haven't had much success trying to view objects clearly when the moon is lower than 10 degrees.

I've been working on the Lunar certificate for nearly two years now, and have marked several viewing locations in my yard to take advantage of spaces between trees based on the how high the moon is in the sky on any given evening. Some evenings I have to wait up to 2 1/2 hours for the moon to appear, but I've built that factor into my evening viewing parameters. I suppose I could find a location that has better horizons, or even haul my equipment out to the observatory, but I enjoy the convenience of pulling my scope out of the garage and being fully set up in minutes. Another reason I prefer my back yard is because the white light required to sketch the objects won't disturb anyone.

Although my skill as a sketcher is laughable to say the least, (there is a definite abyss between my eyes and my fingers), I have viewed and sketched every required objective and all but 4 or 5 of the challenge objects with my telescope from the back yard. Viewing the remaining objects, which require higher magnification and brightness than my 8" (200 mm) Meade Schmidt Cassegrain telescope can provide, will be attempted using the observatory's 24" telescope when it isn't being used for other Centre activities. The higher the magnification, the lower the light level is. Consequently, the larger mirror is required.

Virtual Moon Atlas comes in several versions, based on the capabilities of your computer. I use the VMA Pro version on my desktop and VMA basic on my laptop. I don't think I'm breaking any rules when I use the laptop to verify the appearance or location of the object I'm looking at in the eyepiece. One of the many advantages of VMA is its ability to flip the image horizontally and/or vertically. My telescope flips the image horizontally and I have a real problem looking at the RUKL Atlas, which shows the moon's surface as you would see it naked eye or through binoculars, and trying to reverse it mentally. A person can get quickly lost and confused when trying to navigate through the many craters in the moon's southern highlands.

You may experience frustration at times, especially if you're trying to complete the libration objects, those elusive limb objects that are invariably in the dark area of the moon, too early or late in the lunation cycle, or so flooded with sunlight that no details can be seen, no matter how many neutral density filters you add to your eyepiece. Another frustration you may encounter as you near the end of the requirements is that of requiring a specific period of lunation. The weather doesn't always cooperate, and you may have to wait up to a month for another viewing opportunity.

One of the most difficult objectives for me to achieve is to view the moon within 24 hours of new. There are only a few occasions in the year when the moon sets long enough after sunset or rises early enough before sunrise to be viewed, and also meets the 24 hour or less requirement. Of course, weather becomes a huge factor in the equation. A list of current viewing opportunities accompanies this document.

Once you've earned the Isabel Williamson Lunar Certificate, you may want to take on the challenge of viewing 1000 named lunar objects. The RUKL Atlas features about 1200 objects, of which 100 are pretty well impossible libration objects. Others require a +500 mm mirror. This doesn't sound as impossible as it seems. I've managed to view, sketch, and log about 580 objects while working my way through the Lunar certificate. There aren't nearly that many objects listed in the Lunar Program Guide, but I usually sketch more objects than required. For those objectives requiring a +500 mm mirror, the observatory's 600 mm scope fits the bill. As a PG Centre member, you can be trained to utilize this resource.

I have experienced a great deal of enjoyment and satisfaction working on the Isabel Williamson Lunar Certificate, and am certainly more familiar with Earth's closest neighbour than I was two years ago. If you take on the challenge, I hope that you enjoy the experience as much as I have done.

Glen Harris

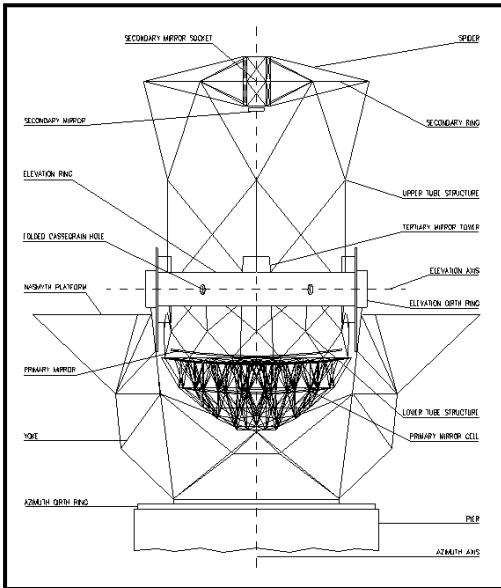
### New Moon Viewing Opportunities for 2008

MOONSET	MOONSET AZIMUTH	AGE OF MOON AT MOONSET/RISE	MOONRISE	MOONRISE AZIMUTH	SUNRISE	TIME BETWEEN SUNRISE/SUNSET
2/7/2008 18:06	245	22:22 after new moon				1:01
5/5/2008 22:13	307	16:54 after new moon				1:22
		15:41 before new moon	7/2/2008 3:39	39	7/2/2008 4:46	1:07
		22:52 before new moon	7/31/2008 4:05	47	7/31/2008 5:25	1:20

# Keck, Ready to Lose Its Crown

by Blair Stunder

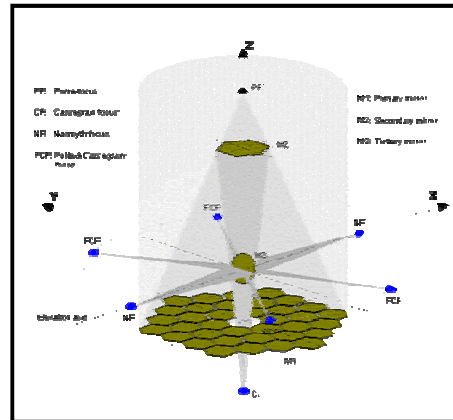
On July 13<sup>th</sup> engineers aimed the “Gran Telescopio Canarias” at Polaris and a couple of distant starburst galaxies. The GTC is a consortium of Spain (90%), three Mexican institutes and the University of Florida (Gainesville). The telescope is located on Spanish soil, just below the rim of the Caldera de Taburiente on the island of La Palma, just of the coast of Morocco.



The GTC is the equivalent of a 10.4 meter telescope. It will consist of 36 hexagonal segments when fully completed. This will give it a 4% increase over the combined Keck. Since the GTC is a single instrument it lacks interferometric capabilities of Keck's duo or Europe's “Vary Large Telescope” in Chile.

passage to the Cassegrain focal at CF. The tertiary mirror M3 can be rotated to any of the folded Cassegrain focal points FCF or Nasmyth focal points NF.

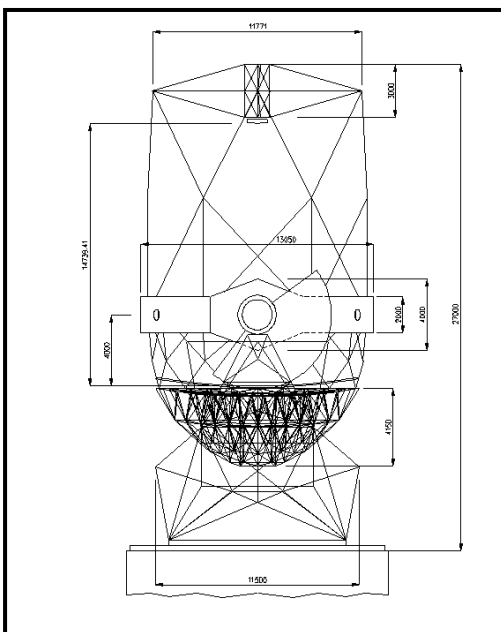
The primary features active alignment of the individual segments in real time by the means of three positioners. Additionally the location of each segment to each other can be measured by the means of sensors in the adjacent edges between the segments.



There is an active deformation of the segments. It will be possible to allow partial correction of the segment figure errors which may have occurred during manufacture, thermal as well as dimensional instability of the optical or optomechanical components. Each mirror segment side is 936mm and has a 3mm segment gap.



At a cost of 130 million Euros and seven years, planning problems and delays along with the problems associated with reaching its 2,400m altitude site make it the most expensive telescope to date.



The telescope basic construction is a Alt-Az design requiring the x-y drive system to track rather than a clock drive system.

Currently there are plans for the TMT “Thirty Meter Telescope”. The planned start date is 2009 with a completed date of 2016.

by the primary mirror M1 to the secondary M2 to the traditional focal point CF. The tertiary mirror M3 (elliptical flat mirror) can be folded to allow light

Blair Stunder



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