

## Editorial

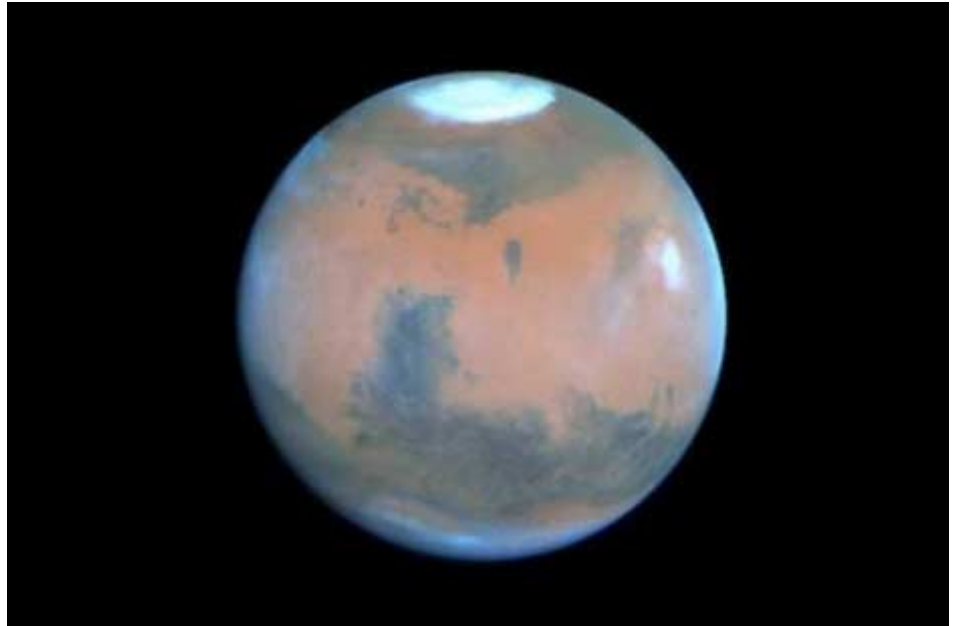
Summertime is finally here, although the good weather normally associated with May and June has not materialized. In fact it ranks as one of the worst May-June observing weather that I remember. Even when it was “clear”, the sky has had a hazy appearance. I hope we get some better weather soon, or my scope will be going to grow cob-webs.

As usual, I will be taking a break from producing the newsletter until September. This should give you lots of time to write some articles. I would like to thank the following who contributed to the newsletter this past year, in particular: John Crossen, Rick Stankiewicz, Will Juodvalkis, Anton Jopko, and Rob Fisher. I also would like to thank those people who let me “lift” their articles from other astronomy club newsletters.

As it stands, we will be having our annual **star party** at the Buckhorn Observatory on the Civic Holiday weekend (Aug 2-3). Stay tuned for details as we approach this date.

This year, **Starfest** will be held from Aug 21-24. This star party is held by the NYAA and is located in Mount Forest (1 hour north of Guelph on Hwy # 6). I would highly recommend attending this one. It boasts magnitude 6 skies and provides an opportunity to view the night sky through almost any type of telescope. See [www.nyaa-starfest.com](http://www.nyaa-starfest.com) for more information.

If you do nothing else this summer—make sure that you take a look at Mars. It will be the closest to Earth (and hence largest) on August 27, 2003. With the red planet well situated for viewing, one



Watch for Mars this August as it gets real close!

should be able to see lots of detail that is not normally easy to see. At this year’s opposition it will only be some 55.8 million-km away. At that time, the planet will attain an apparent diameter of 25.1” and a magnitude of -2.9. It will be closer to Earth than it was in the 1924 when Percival Lowell looked at it and saw the “canals” that he thought were evidence of life on the red planet. In fact it will be the **closest that Mars has come to Earth** in about 73,000 years. At this distance, even

small telescopes should be able to show you the Martian polar caps and dark surface markings on the planet's reddish surface. This opposition also is favorable for trying to spot Mar’s illusive moons Phobos and Deimos (see article in this issue). The next favorable opposition will not occur for 16 years.

Clear Skies

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### Inside This Issue

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## Meet PAA Member: Sandy Johnston

Sandy has always been interested in science, the stars, and nature in general. But, as is the case with many of us, family and job obligations took up most of her time. Now that Sandy's family has grown up and she is only working part-time, her interests are coming to the forefront.

Mind you, she's always been quite happy to stretch out in the backyard on a summer night and soak up the stars. And she enthusiastically recalls the Leonid meteor shower of a couple years back – not to forget the incredible fireball she once saw over Lake Chemong. Plus, she and her husband, have been to the Kennedy Space Centre four times.

Add to all that the fact that she loves to poke her head out and look at the sky anytime she wakes up at night and you have the makings for a five-star astronaut. So perhaps it wasn't surprising that she received a telescope last year on her birthday.

Unfortunately for Sandy it was one of those spindly-legged, computerized models that sounds great, but isn't. Fortunately for us, "department store scope let down" was one of the reasons she first appeared at one of our meetings.

A little friendly advice from the assembled troops still couldn't compensate for the scope's shortcomings. So Sandy switched scopes and went from high-tech to no-tech in the form of a 10-inch SkyWatcher Dob. No buttons to push. No wiggley, jiggley images. Just aim and look. She calls it her "scope for dummies". Then again, having a scope that's easy to use is a very smart move – especially for someone just getting started in the hobby.

Speaking of which, now that Sandy has more time for her hobbies, she spends as much time as possible stargazing with her trusty *Audubon Society Field Guide* by her side. On cloudy nights, she still checks out the astronomical sites – on the



**Sandy and the 10" Dob. She calls it her "scope for dummies", but we'd say it was a pretty smart move.**

Internet. And when the sun comes up, she's busy in her garden, tilling the soil of planet Earth.

It's refreshing to chat with a contemporary who is just getting started in amateur astronomy. Talking with them reconnects one to that magical sense of wonder and enthusiasm that launched us all into this hobby. So next star party or PAA meeting, make it a point to introduce yourself to Sandy Johnston. She'll probably ask you a thousand questions, but hey, isn't that what an astronomy club is all about?

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## Space Memorabilia of the Swift-kind

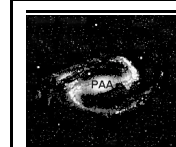
How many of you remember seeing this item back in 1958? I don't, as I was only 2 years old at the time. Recently I ran across this Swift's (Premium Meats) Space Travel Guide. I would venture to say that Swift was ahead of their time with this one. The space race was in its infancy in 1958. This "wheeled chart" is well designed

to educate on the workings of the solar system. The attached pictures show the front and back of the guide with Mars dialed up on the wheel. The wheel options include all nine planets and the earth's moon.

When a planet is dialed up on the front top window, you also get the "Astronomical Sign", "Maximum Surface Temperature (°F)", "Dist. From Earth at Closest Approach (millions of miles)", "Period of Revolution Around Sun (years)". The data that is shown is fairly accurate, given the information is from a knowledge base that is 45 years



**The front of the Swift Space Travel Guide**



**Peterborough  
Astronomical  
Association**

*The Reflector* is a publication of the Peterborough Astronomical Association (PAA). Founded in 1970, the PAA is your local group for astronomy in Peterborough and the Kawarthas.

### Website

[www.geocities.com/paa\\_ca](http://www.geocities.com/paa_ca)

### Email

[paa\\_ca@yahoo.com](mailto:paa_ca@yahoo.com)

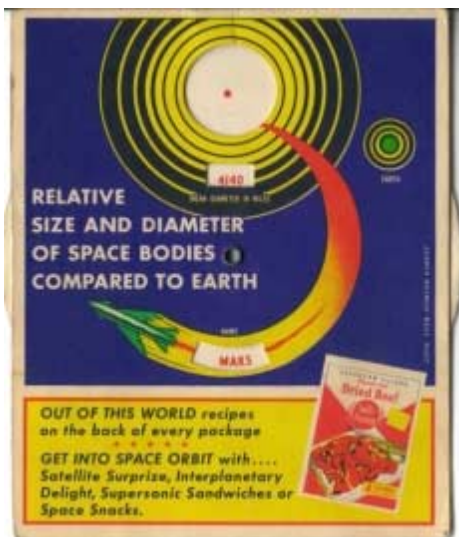
### Club Mailing Address

c/o Dave Duffus  
7 Riverview Hts.  
Peterborough, ON, Canada K9J1A9

old.

Across the bottom at the front a bit of solar information is added stating:

*“The Sun has a diameter of 864,000 miles. The average distance from earth is about 93,000,000 miles. The average surface temperature has been computed to be about 10,000 Fahrenheit. The light from the Sun reaches the Earth in 498.6 seconds or slightly more than eight minutes.”*



### The back of the Swift Space Travel Guide

On the back is a schematic that illustrates the “Relative Size and Diameter of Space Bodies Compared to Earth”. A window states the “Mean Diameter in miles” and the dot in the concentric circles shows relative size of the planet that is dialed up.

Across the bottom reads:

*“OUT OF THIS WORLD recipes on the back of every package.*

*GET INTO SPACE ORBIT with .... Satellite Surprise, Interplanetary Delight, Supersonic Sandwiches or Space Snacks.”*

Now this is my kind of play on words. Why does no one do this sort of advertising any more? Is space passé? I hope not.

Just thought I would share this bit of space memorabilia with you all. If any one else has this sort of thing, it would be nice to share it in a future newsletter.

Have a nice summer,

Rick Stankiewicz  
PAA member  
(Collector of space junk)

## Some Visual Double Stars To Test Your Eyesight

It is estimated that about 1/3 of all stars in the sky are binary double stars. This means that two stars orbit each other because of gravitational

forces between them. Optical double stars also appear very close to each other but they do not orbit each other. They are close only along our line of sight and do not attract each other. From another star they would not appear close at all. We have tried to find a list of double stars that are sufficiently bright and separated to be seen and resolved with the naked eye. We have used Struve’s recently revised list as well as a variety of star atlases. In the table are double stars whose minimum separation is 3 minutes of arc and whose faintest component, Mag B, is magnitude 6 or brighter. With these constraints there are not very many such examples. The separations are listed for the year 2000 but the values should not change much for several years at least. The least separation of double stars that is resolvable by the human eye is said to be about 2 minutes of arc. A lot will depend on the age and experience of the observer as well as whether vision is imperfect. Binoculars should be used to

RA	Dec	Mag A	Mag B	Separation (min of arc)	Name
4h 29m	+15d 52m	4.7	5	5.6	$\theta^2$ -Tau
4h 25m	+22d 17m	5	6	5.7	$\kappa$ -Tau
4h 39m	+15d 55m	5.2	5.7	7.3	$\sigma^2$ - Tau
5h 6m	+58d 58m	5	6	3.0	11-Cam
10h 16m	+23d 25m	3.8	6	5.5	35-Leo
13h 10m	+38d 30m	5.5	5.9	4.6	17-CVn
13h 24m	+54d 56m	2.3	3.9	11.8	$\zeta$ -UMa
14h 51m	-16d 2m	2.8	5.2	3.9	$\alpha$ -Lib
16h 22m	+33d 48m	4.8	5.1	6.0	$\nu$ -CrB
18h 44m	+39d 40m	4.6	4.7	3.5	$\epsilon$ -Lyr
19h 29m	+24d 40m	4.4	5.7	7.0	$\alpha$ -Vul
20h 14m	+46d 44m	3.8	5.0	5.6	31-Cyg
20h 21m	-14d 47m	2.5	6	3.4	$\beta$ -Cap
20h 18m	-12d 33m	3.2	4.2	6.4	$\alpha$ -Cap
21h 10m	+10d 8m	4.2	5.2	5.7	$\gamma$ -Equ

confirm the observation.

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## The Sky This Summer

### MERCURY:

Mercury reaches it's greatest elongation on June 3rd and August 14, but it is not easily visible at these times.

### VENUS:

Venus will be low in the morning sky throughout the summer and is not in a favorable position for observation. Venus reaches superior conjunction on August 18th.

### MARS:

Mars will become visible this month in the evening hours over the summer. It will brighten significantly this month as it is getting closer to us. It will be at it's closest (and brightest) on August 27th.

### JUPITER:

Jupiter will be in Cancer and appears as the brightest object visible in the evening sky. It will disappear into the Sun's glare in late June.

### SATURN:

Saturn is not visible this month.

### URANUS & NEPTUNE:

Uranus and Neptune are visible over the summer months, being in Capricorn. Neptune is at opposition on August 4, and Uranus is at opposition on August 24. Finder charts are available in *Sky & Telescope* or the *RASC Observer's Handbook*.

### PLUTO:

Pluto will be visible throughout the summer. It is located in Ophiuchus and is

best seen in the summer months. It is at opposition in June 9th. You will need to a finder chart like those published in *Sky & Telescope* or the *RASC Observer's Handbook* to find Pluto.

### METEOR SHOWERS:

There are a number of major shower this summer:

<u>June Lyrids:</u>	Jun. 10-21
<u>Southern <math>\delta</math>-Aquarids:</u>	Jul 14-Aug 18
<u>Perseids:</u>	Jul 23-Aug 22

There are also several minor meteor showers this month. For details on these see <http://comets.amsmeteors.org/meteors/calendar.html>.

## Off the Beaten Path

Finally summer has arrived, which means some of the best objects in the night sky can be seen over the next few months. The glorious Milky Way, visible in the summer sky, contains objects for everyone's pallet. Cruising from Cygnus to Sagittarius there are many binocular objects. These range from open clusters to spectacular gas clouds.

One of the most interesting objects is an open cluster. This is Cr399 otherwise known as the "Coat Hanger", which truly looks like its name. The Coat Hanger is located in Vulpecula just north of Sagitta. This is one of those objects that stands out in binoculars even when you are not looking for it.



Cr399—The Coat Hanger



NGC7000—The North American Nebula, photo courtesy of John Crossen

Cygnus, to the north, contains many beautiful nebulae. Two of the most famous, the Veil and the North American nebulae, are often overlooked by most amateurs because they are believed too faint and difficult. In fact since it is so large, the North American nebula is best seen in binoculars on a very dark night. It is located just east of Deneb and is believed to be powered by Deneb itself. The Veil, otherwise known as the Cirrus Nebula because of its resemblance to that type of cloud, is a bit more difficult, but with an OIII filter at low power it will pop into view, even in suburban skies. It is also possible to see the brightest parts of the Veil in binoculars in very dark skies. Back in May 1994, from a dark site near Perth, I was able to make out the Veil as a ghostly circular object in 11x80 binoculars. In an 8" scope some of the filamentary nature of the Veil can easily be seen. The Veil is easily located because it passes through the field of 52-Cygni.

Ophiuchus contains some of the finest star clouds in the Milky Way. These star clouds are mottled and streaked by an intricately shaped dark winding lanes of so called "dark nebulae". Dark nebulae are like ordinary nebulae except there is no nearby stars around to illuminate it. Some dark nebulae contain dust particles in addition to the usual hydrogen gas which obscures things behind it. To see dark nebulae requires a very dark sky and a good pair of binoculars. Most dark nebulae are designated with B numbers after E. Barnard of "Barnard's Star" fame. B78 is the largest dark nebulae in

the region (next to the great rift itself). It is part of the Pipe Nebula which stretches eastward in the southern part of Ophiuchus. It looks like a pipe that your grandfather might have smoked. A small extremity of the Pipe nebula, B72, is known as the Snake or S-Nebula. It is located 1.5 degrees north of  $\theta$ -Oph. .



**B78—The Pipe Nebula**

Even if it not dark enough to see the dark nebulae running through the Milky Way, scanning our galaxy with binoculars can still yield some spectacular views of open clusters, emission nebulae like the Lagoon, Swan and Trifid and lots of globular clusters hanging around the "bulge" of the Milky Way. So on the next clear night, be adventuresome and go off the beaten path. Enjoy the some of the new scenery.

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## HFO's Thomas Kovacs Addresses PAA Members at Recent Meeting.

Highlight of the May 3<sup>rd</sup> PAA meeting was an informal talk given by Haliburton Forest Observatory's resident astronomer, Thomas Kovacs. Mr. Kovacs set the tone by describing the dark skies and fabulous observatory facilities available to the public. Located on a 59,000-acre tract of land north of Haliburton, the original purpose of the



**Tom Kovacs of the Haliburton Forest Observatory**

site was to conduct research into ecologically responsible forestry.

It seems, however, that things have grown since then. Today it's called the Haliburton Forest & Wildlife Reserve and it offers a number of attractions. Most famous is the Wolf Centre, which receives visitors from across North America and around the world. But there's more. Like hiking, fishing, camping, outdoor education courses, biking and...well, what couldn't you do on 59,000 acres!

Most unique is the elevated catwalk that gives adventurers the rare opportunity to tour the forest canopy. But most interesting to PAA members was the reserve's roll-off-roof observatory and the three Meade LX200 computerized scopes that live within it.

Thomas had us drooling as he described the pitch-black skies that extend  $2\pi$  steradians from horizon to horizon. And he enticed us further as he detailed the amazing all-sky star chart that was designed by local artist Andy Hillo that occupies the grounds in front of the observatory.

Imagine an 8'x10' backlit star chart that not only outlines the constellations, but provides background data on the moon and planets, too. And it changes with the seasons. It's a one-of-a-kind attraction that's worth seeing in the daytime just to appreciate the detail and craftsmanship that has gone into it.

At the conclusion of his talk, Mr. Kovacs presented the PAA club library with a copy of the AAVSO Atlas and data for plotting the positions Mars' moons Phobos and Deimos during the planets history-making closest approach in August (see article in this issue).

Our thanks to Thomas for his thoughtful gifts and his enlightening presentation. We'll be up sometime soon.

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## Astronomy in Philately

This issue will highlight a great moment in space exploration. On June 16<sup>th</sup> will be the 40<sup>th</sup> anniversary of the first women in space. No, it is not Ralph Cramdon's wife Alice. Although he offered to send her "to the moon" many times, the distinction of the first women in space goes to Russian, Valentina Vladimirovna Tereshkova (1937-). She actually piloted Vostok 6.

The two stamps depicted here are from Russia on the 20<sup>th</sup> anniversary of her flight and from Korea on the 25<sup>th</sup> anniversary. Both stamps show the helmeted smiling Tereshkova, which is her signature pose. Also depicted in the background is the rocket on the launch pad, the Vostok 6 spacecraft and planet Earth.



**A Soviet Stamp from 1983 commemorating the 20th anniversary of Tereshkova's first flight into space.**

In the three days that Tereshkova was in space, she orbited the Earth 48 times. Another feat was coming to within 3 miles (5 km) of Vostok 5, which was



**A North Korean Stamp depicting  
Valentina Tereshkova**

launched two days prior to Vostok 6 and stayed up a day longer to set a space endurance record at the time. Rumors have it that Tereshkova stepped in at the last minute to pilot the mission only because the scheduled cosmonaut failed her physical examination. These Russians sure were ahead of the game at this point. All this and women's lib too! How many years was it before the U.S. allowed a woman to pilot a space mission?

Tereshkova after receiving her hero's welcome and being touted as the symbol of feminism and expanding opportunities for women everywhere, she went on to marry a fellow cosmonaut. She married Andrian Nikolayev, who had piloted Vostok 3. I could be wrong, but I am sure this was another first. The Russian's were impressed enough that at the government-sponsored ceremony, the then Soviet leader Nikita Khrushchev gave away the bride. Then Mrs. Nikolayev had a baby (another first) and you can imagine the carefully examining the child would have endured to see if there was any medical consequences of being the offspring of parents how had been in space.

Tereshkova went on to an illustrious career both academically and socially.

After achieving the rank of colonel in the air force she obtained a technical sciences degree. She advanced through the government ranks. In 1974 she became a member of the Supreme Soviet Presidium and in 1989 was elected as a People's Deputy. Even since the breakup of the Soviet Union, she has chaired the Russian Association of International Cooperation. There you have the "First Lady of Space".

Your Astronomical Philatelist  
Rick Stankiewicz  
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*Knock, Knock...*

*Who's there?*

*Astronaut.*

*Astronaut who?*

*Astronaut what your country can  
do for you, but what you can do  
for your country.*

## The PAA Library Grows Again

Most of us in the Peterborough Astronomical Association never knew Mr. Sid Barry. But thanks to his interest in astronomy and the generosity of his wife Eileen, we are all heirs to his wealth of knowledge, and in some individual instances – his equipment.

The club's library recently grew substantially last week, thanks to the donation of some of Mr. Barry's books. Checking through the titles and publishing dates, it becomes obvious that his interest in astronomy went back many years. One of the books was dated September 4<sup>th</sup>, 1945. By coincidence, I was celebrating my first birthday on that date.

Running down the list of titles profiles the classic amateur astronomer of the 40's and 50's. In those days you didn't pop down to the astronomy store and put a computerized SCT on your Visa card. Nope, you got your hands dirty (and most of the house, too) because you had to build it yourself. Hence, there are lots of books on how to grind your own lenses, mirrors and the different telescope designs of the day.

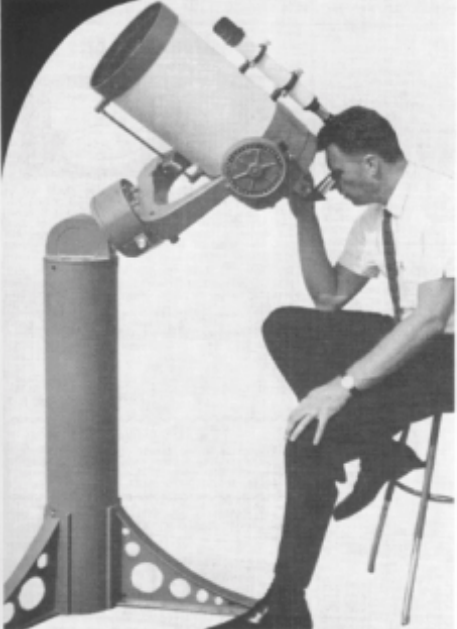
But not all of Mr. Barry's books are from the "growing years" of amateur astronomy. One of the more recent books features photographs by Canada's well-known astrophotographer, Jack Newton. And there are seven volumes of The Webb Society Deep-Sky Observer's Handbook, which judging from their pristine condition, he never had the opportunity to use.

The PAA library isn't the only benefactor of Sid's astronomical interests. Any of you who have looked through Rene Bowe's scope have made eye contact of a sort with Sid Barry. After all, Rene's scope is built around one of Sid's mirrors. And Charles Baetsen can thank Mr. Barry for the revolving roof over his head because at one time that nifty little observatory was in Sid's backyard.



**Sid Barry and his "Hexadome"  
observatory circa 1987. It now has a  
brand new dome and lives in Charles  
Baetsen's back yard.**

In the next issue of the Reflector we'll profile one of Mr. Barry's telescopes –




**The Celestron 10**  
*Schmidt-Cassegrain Telescope*

There are few possessions that the individual can aspire to which will match the pride of ownership, the lasting utility, and freedom from obsolescence of the Celestron 10. The proud owner of this fine instrument will find it to be the center of attraction at star parties attended by amateurs and professionals alike. Think of the enjoyment you will realize when showing your friends, neighbors and youngsters their first truly impressive views of the moon, planets, or remote nebulas.

**Features:**  
 Clear Aperture ..... 10"  
 Tube Length ..... 32"  
 Cassegrain e.f.l. .... 350"  
 Weight (less pier) ..... 65#  
 Substantially flat Cassegrain field.  
 Crank drive with 65° worm gear.  
 Manual slow-motion controls.  
 Large Setting Circles.  
 Portable pier with adjustable wedge.

*The Celestron 10 is truly a giant in performance, in spite of its compact design, maintenance is where it belongs. The inherent stability of short-tube construction and lock mount give the Celestron 10 performance usually found only in massive observatory instruments. Professional observatory standards were the guide in the design of the Celestron 10; not if it within the budget of the serious amateur.*

Complete as shown ..... \$1870.00



**Celestron Pacific**  
 13214 Crenshaw Boulevard, Gardena, California,  
 Telephone (213) DA 3-6160

The C10 f/15 SCT as depicted in the promotional literature of the day. Even amateur astronomers wore a white shirt and tie back in '65.

the 10-inch Celestron f/15 Schmidt Cassegrain. This scope was built in 1965. That ranks it as one of the first commercially-built SCT's. Looking through the literature that accompanied it, takes one back nearly 40 years. In those days Russia's Sputnik satellite had just spawned the term "beatnik." John Glen and the astronauts were every kids' heroes. And we could only visit the Moon via our telescopes. That "giant step for mankind" was still 4 years into the future.

As mentioned, the PAA library received a wonderful boost with the addition of Mr. Barry's books. We'll publish an updated list of titles soon. In the mean time, we tip our toques to Eileen Barry for her generous donation, and thank our lucky stars for Mr. Barry's interest in our favourite hobby.

John Crossen  
 JohnCstargazer@aol.com

## "Hexadome" Gets a New Dome

In 1999, I had the opportunity to get an observatory for free, so obviously I took advantage of this. I picked up this semi-portable observatory from Mr. Sid Barry and transported it to my observing site.

At first, I had no idea what whether or not it was a homebrew project or some kind of kit. Later, I found out that the observatory was Hexadome kit from



The Refurbished "Hexadome" as seen in Spring 2000

Kinard Manufacturing in Texas. Mr. Barry had purchased and assembled it in 1987 (see photo in previous article). In the intervening 12 years until I picked it up, the base had stood up well but the canvas dome was rotten in many places. In order to use it I rebuilt the dome using blue tarp material (see Feb 2002 issue). The new tarp material didn't last as long as the original "Herculon 20" canvas that came with the observatory did. This past winter, it finally succumbed to the UV radiation and many windstorms. I knew this would happen eventually, so last year I started drafting up plans for a brand new wooden dome.



Three years of UV radiation and wind storms takes its toll on the tarp dome.

On June 7, 2003, my dream of a truly domed observatory finally came to fruition. The new dome even got its "leak test" that night (with a massive downpour) and seems to be fulfilling its main design criteria – to keep my scope and equipment dry!

The entire project took about 3 weeks to complete and actually was not as much work as I thought it would be. The total material cost is estimated to be about \$500.00. Surprising to me, the wood (mainly sheets of 1/8" masonite and 1/2" plywood) was only about a third of the above cost. Most of the money went into "little things" like paint, trim, caulking and hardware. You can do most of the work by yourself with a few good tools



**The newly installed Wooden Dome on the old “Hexadome” base. This more permanent structure should provide decades of enjoyment.**

(primarily a jigsaw and router), but some aspects will require help from others (i.e., tracing out the gords and lifting the dome in place).

I would highly recommend pursuing such a project. The three weeks of hard work will reward you for decades of use. Details of the dome construction will be published on my web site [www.geocities.com/va3ngc](http://www.geocities.com/va3ngc) in the near future. If you want to know more or would like to have a tour of the new observatory, please e-mail or talk to me at the meetings.

Clear Skies

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## Phobos and Deimos Maximum Elongation Events

**M**ars is back and it will be closer than ever – or at least closer than it has been in thousands of years. While there will be many articles suggesting

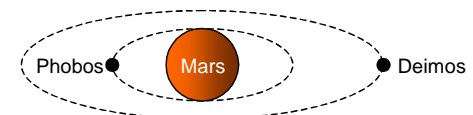
ways to best observe the Red Planet appearing over the next few months, this article is meant to help and encourage you to observe the Martian moons, Phobos and Deimos. They are very tough targets -- relatively few observers have ever seen them. So if you do manage to observe them it will be a weighty addition to your logbook, in addition to the knowledge you have accomplished a very difficult observing task. If you bag these two objects, you will be ready for anything!

There are several things you must do to ensure success. The real problem is not their brightness, for at opposition the inner moon Phobos shines at magnitude 10.4 and Deimos at mag 11.4, so they are actually within reach of binoculars. The trouble is Mars itself! At opposition Mars will shine brilliantly at almost mag -3, and the moons are very close to the planet -- 34" for Phobos and 87" for Deimos. So, if Mars were not in the picture -- or at least not nearly so close, the two moons would be just as easy as, say, several of Saturn's moons, or of individual stars in an average open cluster. But we cannot remove Mars from the sky... but we can remove Mars from the view, and that is one thing that must be

done in order to see the moons. More on that in a minute!

Another very important thing to do is to try to catch a moon when at its greatest elongation from Mars. This is when the moons are at their largest distance possible from the planet. If we were watching a sped up computer simulation, we would see the disk of Mars with a moon moving away from it, hesitate, then begin to move towards the planet. The time best time to see either moon is when it “hesitates”.

The list of dates and times shows all the best opportunities to see either moon. The graphic below shows a typical event with Phobos at its greatest elongation. Note that as the summer progresses, while the size of Mars will increase then decrease after opposition, the relative distances of the moons will not change – Phobos will always appear about one planetary diameter away from Mars, and Deimos about three planetary diameters away. Knowing this will help estimate its position when you begin your search.



**Relative Orbits of Mars's Moons**

Now for removing Mars from the picture. What you must do is make an occulting bar to physically block the contrast-destroying glare of Mars from entering your eye. There are several variations of the occulting bar – and I will strongly recommend one – but they all more or less work the same way. Basically, a thin bar is inserted up into the bottom end of an eyepiece and pushed all the way up the chrome tube until it is very close to the first (bottom-most) lens (usually called the field lens), and that's all there is to it, it is very simple. The occulting bar is now close enough to the field lens that when looking through the eyepiece it will be seen in sharp relief against the planetary system (or star field). The trick is to position the planet (or star, if you are trying to split a tight double like Sirius and the Pup) behind the bar – occulting it – to block its contrast-

robbing light. The fainter companion is then revealed in the darker field of view.

My preferred method of making an occulting bar is different, but it still works the same way and I recommend that you try it. What I do is use semi-transparent blue plastic cut into the shape of a half-moon. I have been using the cover of a duo-tang cover, but you could use almost anything found laying about the house. Using a semi-transparent material like this allows you to see the star or planet, but at a greatly reduced brightness. This will allow you to better judge the position of the fainter object in relation to the bright primary. In my case with the duo-tang cover, I have found it necessary to use two half-circles stacked on top of one another, but you may use a material that will require one layer – or maybe three. You will have to experiment. One more step I took that made a huge difference is at the bottom of the two layers of plastic (on the side facing the incoming starlight), I added a third layer of black felt with a tiny rectangular notch cut out of it with an exacto-knife (see diagram). This allows me to position the brighter object in the “notch”. This way while I know exactly where Mars is, most of its light and almost all its glare is being cut off.

You will have to toy around with sizes of the half-circles – some eyepieces have different internal diameters than others, and the “notch” size will depend on the magnification and telescope. However, it is easy to do and cost almost nothing, so be sure to experiment until you have something you are happy with.

A few other steps deal with the telescope itself. It will probably have to be at least a 10”, although once on a superb night I saw Deimos, and I remember thinking that it should be visible in an 8” scope. I’ve never seen Phobos in any scope, but then, conditions were not ever optimal, so don’t be afraid to try for it in a 10” as well (It is closer to the planet, but it is also a full magnitude brighter). Even a smaller scope may do – why not give it a try? Remember that either moon would be visible in binoculars (on a good dark night); you are more battling the contrast

problem.

Make sure your optics is very clean and have no traces of dew on them. If you are using a SCT, there is another trick I came up with that allowed me to see Deimos. This was by reducing the aperture of the exit hole at the rear of the telescope, but in front of the diagonal. Use a piece of felt-covered cardboard made to fit snugly inside the backplate adapter and begin with a 1” hole cut in its centre – again, experiment with the hole size, but you may even make the hole considerably smaller. We are after a tiny field of view, after all, and SCT’s like to send lots of stray light down the baffle tube. The cardboard stop will block most of it before it ever reaches the diagonal. I’ve never tried this with other scope designs (I really had little reason to) but you may find it beneficial – it won’t hurt to try.

I would try to avoid wide-field eyepieces and go with narrow-field “planetary” eyepieces instead. When it comes to critical observing, the wide-fields, regardless of make or value, just soften the view too much. Even a well made Plossl should do better here than the most expensive Naglers.

I haven’t mentioned yet what seems obvious – you will also need a great night, great skies, great transparency... you get the idea. Viewing these two moons really can be tough. Please write me if you have any questions – plus I’d love to hear of any successes. Happy hunting!

#### **Event Listing**

\*Best is highest altitude and greatest darkness

2003 Jun 26 03:18a Phobos Western  
Elongation, Sep=+00°00'22", Alt=25°,  
91% Dark

2003 Jun 30 02:59a Phobos Eastern  
Elongation, Sep=+00°00'23", Alt=24°,  
100% Dark

2003 Jul 3 03:44a Phobos Western

Elongation, Sep=+00°00'24", Alt=29°,  
88% Dark

2003 Jul 4 02:42a Phobos Western  
Elongation, Sep=+00°00'24", Alt=24°,  
100% Dark

2003 Jul 6 03:42a Deimos Eastern  
Elongation, Sep=+00°01'01", Alt=30°,  
90% Dark

2003 Jul 7 03:24a Phobos Eastern  
Elongation, Sep=+00°00'25", Alt=29°,  
96% Dark

2003 Jul 8 02:22a Phobos Eastern  
Elongation, Sep=+00°00'25", Alt=23°,  
100% Dark

2003 Jul 23 02:09a Phobos Eastern  
Elongation, Sep=+00°00'29", Alt=27°,  
88% Dark

2003 Jul 25 02:28a Deimos Eastern  
Elongation, Sep=+00°01'13", Alt=29°,  
95% Dark

2003 Jul 25 03:56a Phobos Western  
Elongation, Sep=+00°00'29", Alt=32°,  
90% Dark

2003 Jul 26 02:54a Phobos Western  
Elongation, Sep=+00°00'29", Alt=31°,  
98% Dark

2003 Jul 27 01:51a Phobos Western  
Elongation, Sep=+00°00'30", Alt=26°,  
100% Dark

2003 Jul 29 03:35a Phobos Eastern  
Elongation, Sep=+00°00'30", Alt=32°,  
100% Dark

2003 Jul 30 02:32a Phobos Eastern  
Elongation, Sep=+00°00'30", Alt=30°,  
100% Dark

2003 Jul 30 03:40a Deimos Eastern  
Elongation, Sep=+00°01'16", Alt=32°,  
100% Dark

2003 Jul 31 01:30a Phobos Eastern  
Elongation, Sep=+00°00'31", Alt=25°,  
100% Dark

2003 Aug 1 01:07a Deimos Western  
Elongation, Sep=+00°01'17", Alt=23°,

100% Dark		2003 Aug 30 00:52a Phobos Eastern Elongation, Sep=+00°00'35", Alt=29°, 100% Dark
2003 Aug 1 04:19a Phobos Western Elongation, Sep=+00°00'31", Alt=31°, 91% Dark	2003 Aug 23 00:29a Phobos Eastern Elongation, Sep=+00°00'35", Alt=27°, 100% Dark	2003 Aug 30 01:29a Deimos Western Elongation, Sep=+00°01'27", Alt=29°, 100% Dark
2003 Aug 2 03:17a Phobos Western Elongation, Sep=+00°00'31", Alt=32°, 100% Dark	2003 Aug 23 03:00a Deimos Eastern Elongation, Sep=+00°01'27", Alt=28°, 93% Dark	2003 Aug 30 11:50p Phobos Eastern Elongation, Sep=+00°00'35", Alt=27°, 100% Dark
2003 Aug 3 02:14a Phobos Western Elongation, Sep=+00°00'31", Alt=30°, 100% Dark	2003 Aug 23 04:21a Phobos Western Elongation, Sep=+00°00'35", Alt=21°, 93% Dark	2003 Aug 31 03:39a Phobos Western Elongation, Sep=+00°00'35", Alt=21°, 100% Dark
2003 Aug 4 01:12a Phobos Western Elongation, Sep=+00°00'32", Alt=25°, 100% Dark	2003 Aug 23 11:26p Phobos Eastern Elongation, Sep=+00°00'35", Alt=22°, 100% Dark	2003 Aug 31 10:47p Phobos Eastern Elongation, Sep=+00°00'35", Alt=21°, 100% Dark
2003 Aug 5 03:57a Phobos Eastern Elongation, Sep=+00°00'32", Alt=31°, 100% Dark	2003 Aug 24 03:19a Phobos Western Elongation, Sep=+00°00'35", Alt=26°, 96% Dark	2003 Aug 31 10:55p Deimos Western Elongation, Sep=+00°01'26", Alt=24°, 100% Dark
2003 Aug 6 02:17a Deimos Western Elongation, Sep=+00°01'20", Alt=30°, 100% Dark	2003 Aug 25 00:25a Deimos Western Elongation, Sep=+00°01'27", Alt=27°, 100% Dark	2003 Sep 1 02:37a Phobos Western Elongation, Sep=+00°00'35", Alt=26°, 100% Dark
2003 Aug 6 02:55a Phobos Eastern Elongation, Sep=+00°00'32", Alt=32°, 100% Dark	2003 Aug 25 02:16a Phobos Western Elongation, Sep=+00°00'35", Alt=29°, 100% Dark	2003 Sep 2 01:35a Phobos Western Elongation, Sep=+00°00'34", Alt=29°, 100% Dark
2003 Aug 7 01:52a Phobos Eastern Elongation, Sep=+00°00'32", Alt=29°, 100% Dark	2003 Aug 26 01:14a Phobos Western Elongation, Sep=+00°00'35", Alt=30°, 100% Dark	2003 Sep 3 00:32a Phobos Western Elongation, Sep=+00°00'34", Alt=29°, 100% Dark
2003 Aug 8 00:50a Phobos Eastern Elongation, Sep=+00°00'33", Alt=24°, 70% Dark	2003 Aug 27 00:11a Phobos Western Elongation, Sep=+00°00'35", Alt=27°, 100% Dark	2003 Sep 4 02:40a Deimos Western Elongation, Sep=+00°01'26", Alt=24°, 100% Dark
2003 Aug 8 04:41a Phobos Western Elongation, Sep=+00°00'33", Alt=27°, 87% Dark	2003 Aug 27 03:59a Phobos Eastern Elongation, Sep=+00°00'35", Alt=21°, 100% Dark	2003 Sep 4 03:20a Phobos Eastern Elongation, Sep=+00°00'34", Alt=21°, 100% Dark
2003 Aug 9 03:39a Phobos Western Elongation, Sep=+00°00'33", Alt=31°, 100% Dark	2003 Aug 27 11:08p Phobos Western Elongation, Sep=+00°00'35", Alt=22°, 100% Dark	2003 Sep 5 02:17a Phobos Eastern Elongation, Sep=+00°00'34", Alt=26°, 100% Dark
2003 Aug 19 11:50p Phobos Western Elongation, Sep=+00°00'34", Alt=23°, 83% Dark	2003 Aug 28 02:56a Phobos Eastern Elongation, Sep=+00°00'35", Alt=26°, 100% Dark	2003 Sep 16 09:29p Phobos Eastern Elongation, Sep=+00°00'32", Alt=21°, 100% Dark
2003 Aug 21 02:34a Phobos Eastern Elongation, Sep=+00°00'34", Alt=30°, 85% Dark	2003 Aug 28 04:05a Deimos Eastern Elongation, Sep=+00°01'27", Alt=20°, 100% Dark	2003 Sep 18 11:14p Phobos Western Elongation, Sep=+00°00'32", Alt=29°, 93% Dark
2003 Aug 22 01:32a Phobos Eastern Elongation, Sep=+00°00'35", Alt=30°, 90% Dark	2003 Aug 29 01:54a Phobos Eastern Elongation, Sep=+00°00'35", Alt=29°, 100% Dark	2003 Sep 19 09:24p Deimos Eastern

Elongation, Sep=+00°01'18", Alt=22°,  
100% Dark

2003 Sep 19 10:11p Phobos Western  
Elongation, Sep=+00°00'31", 25°, 100%  
Dark

2003 Sep 20 02:01a Phobos Eastern  
Elongation, Sep=+00°00'31", 21°, 89%  
Dark

2003 Sep 20 09:09p Phobos Western  
Elongation, Sep=+00°00'21", 21°, 100%  
Dark

2003 Sep 21 00:59a Phobos Eastern  
Elongation, Sep=+00°00'31", 26°, 98%  
Dark

2003 Sep 21 11:56p Phobos Eastern  
Elongation, Sep=+00°00'31", 29°, 100%  
Dark

2003 Sep 22 10:54p Phobos Eastern  
Elongation, Sep=+00°00'31", 29°, 100%  
Dark

2003 Sep 23 01:08a Deimos Western  
Elongation, Sep=+00°01'16", 25°, 100%  
Dark

2003 Sep 23 09:52p Phobos Eastern  
Elongation, Sep=+00°00'30", Alt=26°,  
100% Dark

2003 Sep 24 01:41a Phobos Western  
Elongation, Sep=+00°00'30", Alt=21°,  
100% Dark

2003 Sep 24 08:50p Phobos Eastern  
Elongation, Sep=+00°00'30", Alt=21°,  
100% Dark

2003 Sep 24 10:35p Deimos Eastern  
Elongation, Sep=+00°01'15", Alt=29°,  
100% Dark

2003 Sep 25 00:39a Phobos Western  
Elongation, Sep=+00°00'30", Alt=26°,  
100% Dark

2003 Sep 25 11:37p Phobos Western  
Elongation, Sep=+00°00'30", Alt=29°,  
100% Dark

2003 Sep 26 10:35p Phobos Western  
Elongation, Sep=+00°00'30", Alt=29°,

00% Dark

2003 Sep 27 09:32p Phobos Western  
Elongation, Sep=+00°00'29", Alt=26°,  
100% Dark

2003 Sep 28 01:22a Phobos Eastern  
Elongation, Sep=+00°00'29", Alt=22°,  
100% Dark

2003 Sep 28 08:30p Phobos Western  
Elongation, Sep=+00°00'29", Alt=21°,  
93% Dark

2003 Sep 29 00:20a Phobos Eastern  
Elongation, Sep=+00°00'29", Alt=27°,  
100% Dark

2003 Sep 29 11:17p Phobos Eastern  
Elongation, Sep=+00°00'29", Alt=29°,  
100% Dark

2003 Sep 29 11:47p Deimos Eastern  
Elongation, Sep=+00°01'12", Alt=29°,  
100% Dark

2003 Sep 30 10:15p Phobos Eastern  
Elongation, Sep=+00°00'28", Alt=29°,  
100% Dark

2003 Oct 1 09:13p Phobos Eastern  
Elongation, Sep=+00°00'28", Alt=26°,  
84% Dark

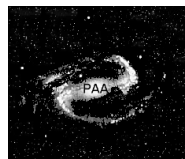
2003 Oct 1 09:14p Deimos Western  
Elongation, Sep=+00°01'11", Alt=26°,  
84% Dark

2003 Oct 2 01:02a Phobos Western  
Elongation, Sep=+00°00'28", Alt=23°,  
100% Dark

2003 Oct 2 00:00a Phobos Western  
Elongation, Sep=+00°00'28", Alt=28°,  
100% Dark

Thomas Kovacs  
hfo@sympatico.ca

## The Annual



**PETERBOROUGH  
ASTRONOMICAL  
ASSOCIATION**

# Star Party

will be held

**August 2 and 3rd**  
(Civic Holiday Weekend)

at the

**Buckhorn Observatory**

for more information contact John Crossen at 705-657-7718 or see  
our web page at [www.geocities.com/paa\\_ca](http://www.geocities.com/paa_ca)

## ARTICLES

**S**ubmissions for *The Reflector* must be received by the date listed below. E-mail or “sneaker-net” (i.e., floppy disk) submissions are preferred (Microsoft Word, ASCII and most graphics formats are acceptable). Typed or hand-written submissions are acceptable provided they are legible (and not too long). Copyrighted materials will not be published without written permission from the copyright holder. Submissions may be edited for grammar, brevity, or clarity. Submissions will be published at the editor’s sole discretion. Depending on the volume of submissions, some articles may be published at a later date. Please submit any articles, thoughts, or ideas to this address:

Charles Baetsen  
4094 Squair Rd  
Orono, ON  
L0B 1M0

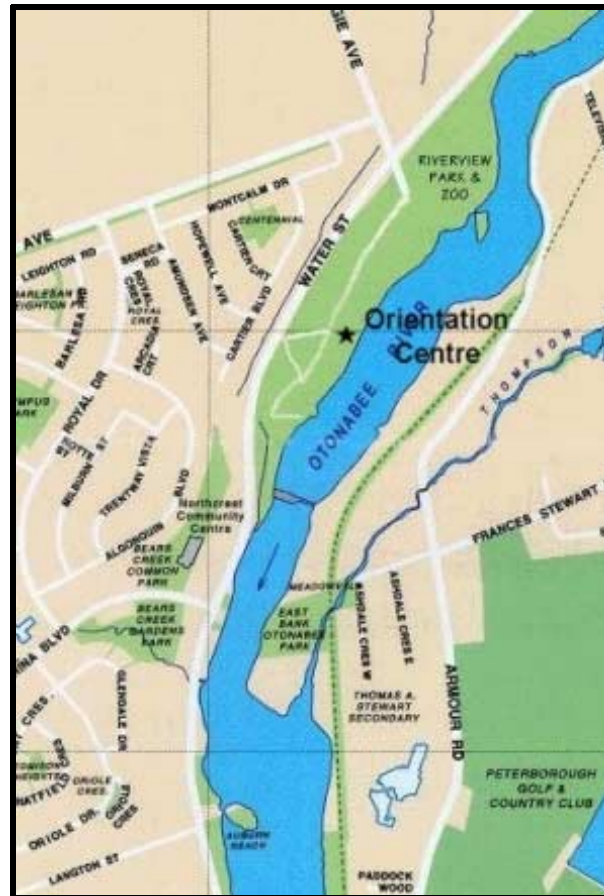
or via e-mail at:  
va3ngc@rac.ca

**NEXT ISSUE'S  
DEADLINE IS  
Sept 1st, 2003**



## MEETINGS

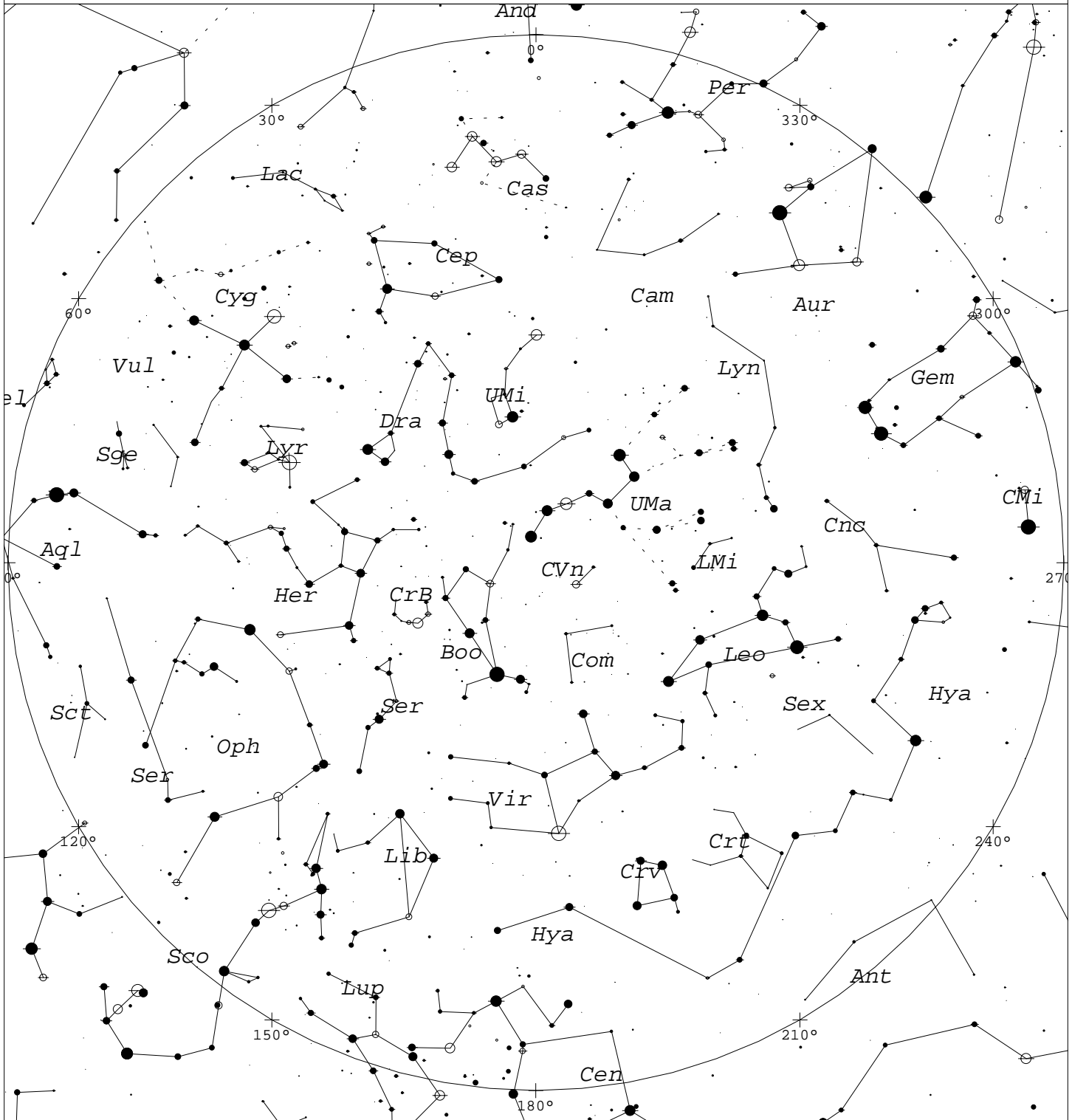
The Peterborough Astronomical Association meets every second Friday at the Peterborough **Zoo Orientation Centre** (Next to the PUC Water Treatment Plant) at **7:30 pm**.



## 1 CALENDAR OF EVENTS 1

June 7, 2003	First Quarter (☽)
June 13, 2003	General Meeting — Topic to be announced
June 14, 2003	Full Moon (☉) First Quarter (☽)
June 21, 2003	Last Quarter (☾)
June 27, 2003	General Meeting — Topic to be announced
June 29, 2003	New Moon (☾)
July 11, 2003	General Meeting — Topic to be announced.
July 25, 2003	General Meeting — Topic to be announced, <b>PAA Star Party</b> —Aug 1-4
August 8, 2003	General Meeting — Topic to be announced
August 22, 2003	General Meeting — Topic to be announced, <b>Starfest Weekend</b> —Aug 21-24
September 6, 2003	General Meeting — Topic to be announced

# June Skies



## STARS

- <1   • 3.5
- 1.5   • 4
- 2   • 4.5
- 2.5   • >5
- 3

## SYMBOLS

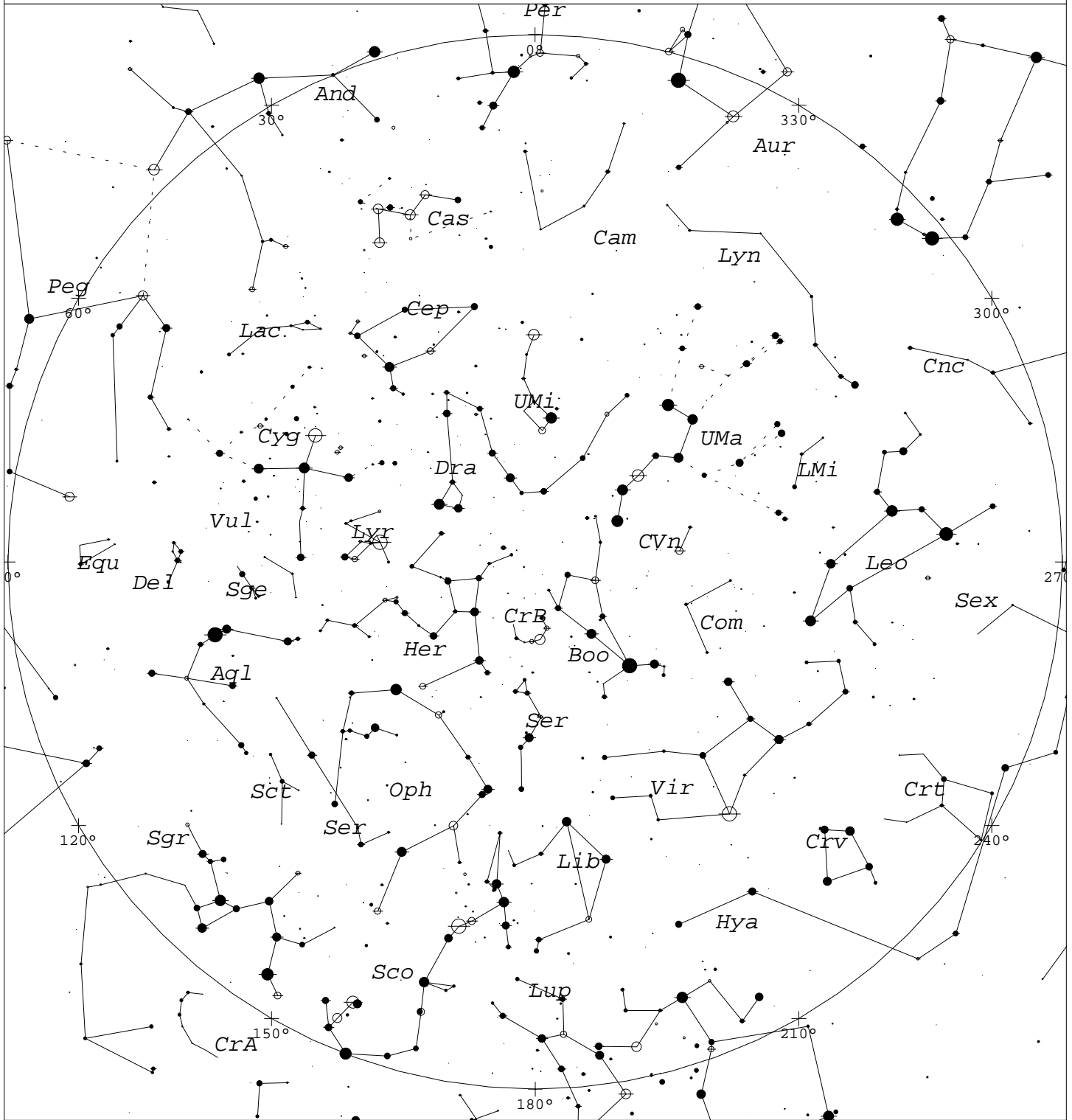
- |                 |                    |                |
|-----------------|--------------------|----------------|
| ● Multiple star | ☐ Dark nebula      | △ Radio source |
| ○ Variable star | ⊕ Globular cluster | × X-ray source |
| ☄ Comet         | ○ Open cluster     | ○ Other object |
| ☉ Galaxy        | ○ Planetary nebula |                |
| ☐ Bright nebula | ⊗ Quasar           |                |

Local Time: 21:00:00 1-Jun-2002  
 Location: 43° 39' 0" N 75° 0' 0" W

UTC: 02:00:00 2-Jun-2002  
 RA: 13h41m29s Dec: +43° 38' Field: 182.0°

Sidereal Time: 13:41:29  
 Julian Day: 2452427.5833

# July Skies



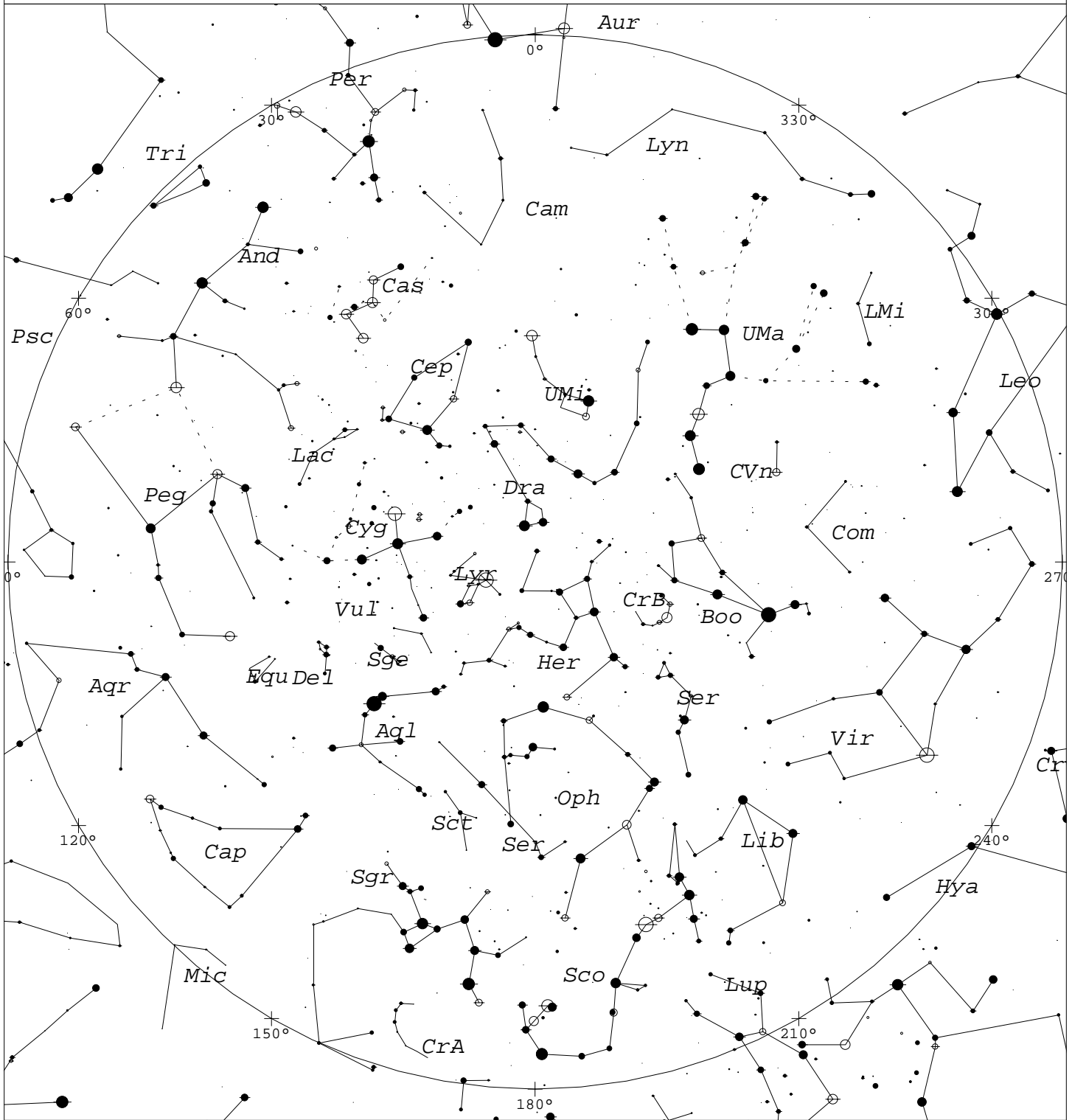
STARS		SYMBOLS		
● <1	• 3.5	● Multiple star	☐ Dark nebula	△ Radio source
● 1.5	• 4	○ Variable star	⊕ Globular cluster	× X-ray source
● 2	• 4.5	☄ Comet	○ Open cluster	○ Other object
● 2.5	• >5	☉ Galaxy	○ Planetary nebula	
• 3		☐ Bright nebula	☉ Quasar	

Local Time: 21:00:00 1-Jul-2002  
 Location: 43° 39' 0" N 75° 0' 0" W

UTC: 02:00:00 2-Jul-2002  
 RA: 15h39m46s Dec: +43° 38' Field: 182.0°

Sidereal Time: 15:39:46  
 Julian Day: 2452457.5833

# August Skies



## STARS

- <1   • 3.5
- 1.5   • 4
- 2   • 4.5
- 2.5   • >5
- 3

## SYMBOLS

- Multiple star
- Variable star
- ☄ Comet
- Galaxy
- Bright nebula
- ◻ Dark nebula
- ⊕ Globular cluster
- Open cluster
- Planetary nebula
- ⊗ Quasar
- △ Radio source
- ⊗ X-ray source
- Other object

Local Time: 21:00:00 1-Aug-2002  
 Location: 43° 39' 0" N 75° 0' 0" W

UTC: 02:00:00 2-Aug-2002  
 RA: 17h41m59s Dec: +43° 38' Field: 182.0°

Sidereal Time: 17:41:59  
 Julian Day: 2452488.5833