



# NOVA

NEWSLETTER OF THE VANCOUVER CENTRE RASC

VOLUME 2002 ISSUE 2

MARCH/APRIL 2002

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## Looking Ahead

Remember, you are always welcome to attend meetings of Council, held on the first Tuesday of every month at 7:30pm in the G.S.O.

**March 12:** Rajiv Gupta on Astrophotography, including a demonstration based on his article in *Sky and Telescope*.

**April 9:** Dr. Mark Halpren of UBC on NASA's Microwave Anisotropy Probe [MAP], a follow up to the COBE mission of the early 1990's.

**May 14:** Andrew Chakin, author of *A Man on the Moon* talks about "The Apollo Experience."

## Next Issue Deadline

Material for the May Nova should be submitted by Monday, May 6, 2002. Please send submissions to:

Gordon Farrell  
(gfarrell@shaw.ca)

## Artificial Star Party

by Seamus Dunne

**When:** 3:00 PM, Sunday 24 March 2002 (light rain or shine).

**Where:** Hillcrest Park on Clancy Loranger Road.

The star party is intended to help members get the best performance from their equipment, regardless of its optical design. What is an artificial star? My wife wondered that too. Why do you guys have to make a star when there are already zillions in the sky? Are you that desperate? An artificial star is used for testing the optical performance of an optical system—for example, a primary mirror, a secondary mirror and an eyepiece as an aligned system. Why not use a real star? There are several important advantages to using an artificial star for these tests: it's steady, bright, and motionless. The word motionless bears repeating. Further, no motor

drive or polar alignment is required. Certainly the star Polaris could be used, eliminating the need for motor-driven optics, but if you've ever tried this sort of test on any star, you will know that sufficiently steady atmospheric condition required for this testing occurs very rarely, perhaps only hours per year.

A star test, whether the star is artificial or real, is intended to reveal defects in your telescope's optical system, defects perhaps you didn't know were there. In many cases these defects simply require a minor adjustment to remedy, in other cases there is no simple remedy. An example of the former is a collimation error; an example of the latter is an imperfectly figured lens or mirror. Nevertheless, even a small adjustment in your telescope's collimation can bring about a remarkable

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## The Easter Moon

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by Marc Verschueren

Astronomy normally does not play an important role in the daily lives of most people. There are very few practical applications in our technological society that depend on astronomy. That is one of the problems in defending requests for funds from the authorities. Of course we can always refer to such endeavours as space exploration, but that by itself is considered a debatable area of research by many people. This does have an advantage; it helps to keep astronomy pure. There is very little direct pressure of commercialism or politics.

But there are some very practical applications in our daily lives that depend on astronomy, and in the course of history astronomy has played, from time to time, an important and sometimes controversial role. The calendar by which we count days and months and years is a creation of astronomy. The calendar, as it is in use today in most places on earth, has a very old and colourful history. When I write this it is still rather cold and snowy, but Easter is coming—the yearly festival of Spring. Today in our secular society,

Easter is not so important any more. It is just another holiday in the year inherited from the Christian element in our history. Easter is a movable feast; it has no fixed date in the calendar. Its date is determined by astronomical events, and this has been so for thousands of years, from before the Christian era. The determination of the date of Easter is related to the date of the Jewish Passover, and its current determination finds its roots in that tradition.

The basic principle of the date of Easter is simple enough. Easter is supposed to fall on the first Sunday after the first full Moon after the Spring equinox. If you check your astronomical calendar you will easily find that this is indeed true this year, on March 31, 2002, three days after the full Moon. In the days of the very small Christian communities in the Middle East it was not too difficult for the religious authorities to predict a few months ahead of time when this was going to happen and let all the members know. But once Christianity spread over the whole Roman Empire this became a problem since these astronomical events do not happen necessarily at the same date everywhere, and the

church authorities preferred that the feast would be celebrated at the same time in the whole community. Easter should be defined at a particular place in the Christian world and that date could then be accepted by everybody. But that means that one has to establish a calendar of the Easter dates ahead of time and preferably for many years. In the Christian Church this was considered very important.

The main problem is the movement of the Moon. The Moon has a very complex motion and a very accurate almanac of the lunar motion did not exist until the middle of the 18th century. At that time, the astronomer Tobias Mayer, with the help of the mathematician Leonhard Euler, produced a set of lunar tables of reasonable accuracy. The purpose of it at that time was one of the major practical applications of astronomy: the determination of longitude at sea. But that was way in the future for the ecclesiastical fathers of the 5th century AD. The astronomers and calendar makers of the day came up with a very ingenious and simple solution. They re-created the Moon. Since the motion of the Moon was

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## President's Message

Hi all.

It is hard to believe, but a quarter of the year will have passed at the end of the month. Time sure seems to fly when you are busy. We have a number of events for this month, so please check out the individual articles or speak to one of the executive if you have questions.

The Messier Marathon will be held at our Boundary Bay site Mar. 15/17<sup>th</sup>. We will go out on Friday night provided the skies are clear and use Saturday as the rain date. We will have lists with the order of appearance and as the horizons are quite good we should be able to get quite a few Messiers if the weather will co-operate. Bob and Eric are going to do the run at CARO again this year so we need to try and beat their number. I know that I hope to complete my list this year and there are a couple of other members who should be able to as well. Come on out, scope or not, and have a great night.

On March 24<sup>th</sup> we will hold the Artificial Star Party. Bob will have an article elsewhere in NOVA so give him a shout if you have further questions. This is a great time for those

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## About RASC

The Vancouver Centre, RASC meets at 7:30 PM in the auditorium of the H.R. MacMillan Space Centre at 1100 Chestnut St., Vancouver, on the second Tuesday of every month. Guests are always welcome. In addition, the Centre has an observing site where star parties are regularly scheduled.

Membership is currently \$51.00 per year (\$26.00 for persons under 21 years of age) and can be obtained by writing to the Treasurer at the address below. Annual membership includes the invaluable Observer's Handbook, six issues of the RASC Journal, and, of course, access to all of the club events and projects.

For more information regarding the Centre and its activities, please contact our P.R. Director.

NOVA, the newsletter of the Vancouver Centre, RASC, is published on odd numbered months. Opinions expressed herein are not necessarily those of the Vancouver Centre.

Material on any aspect of astronomy should be e-mailed to the editor, mailed to the address on page 5, or uploaded to SpaceBase™ at 604-473-9358, 59.

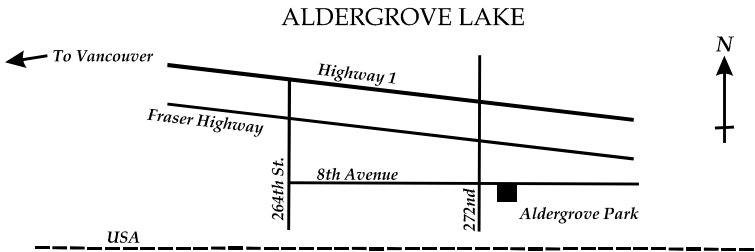
## Advertising

Nova encourages free use of its classified ads for members with items for sale or swap. Notify the editor if you wish your ad to run in more than one issue.

## Commerical Rates

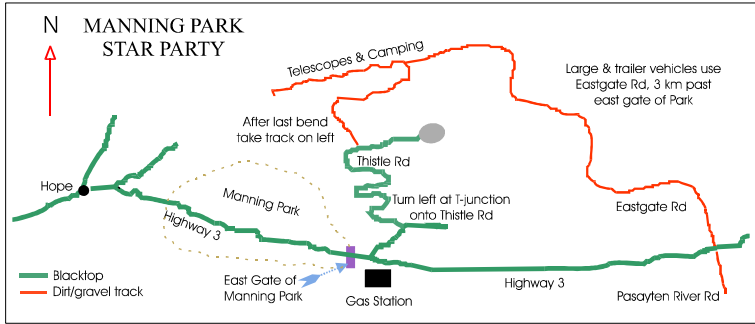
1/2 Page: \$25.00 per issue  
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Rates are for camera-ready, or electronic files. Payment, by cheque, must accompany ad material. Make cheque payable to: RASC Vancouver Centre.

# Observing Sites

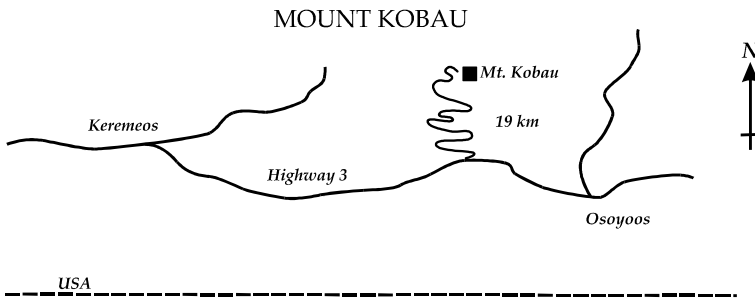


Dale McNabb Observatory in Aldergrove Lake Park (RASC Vancouver Centre's regular viewing site)

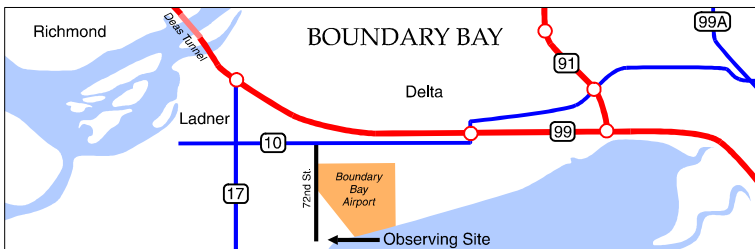
Contact Mike Penndelton (604-888-1505) or Howard Morgan (604-856-9186)



Site of the annual star party organized by the RASC Vancouver Centre



Site of the annual Mt. Kobau Star Party organized by the Mount Kobau Astronomical Society



Site of the regular Thursday night star party. On the dike at the foot of 72nd St.

## **ASTROCOMPUTING**

**SpaceBase™** (604-473-9358,59). Affiliated since 1992 with RASC Vancouver, our link to RASC Net, RASC Members only chat area. Future data distribution hub for CARO Project. Features include latest HST images, current world space news and astronomy programs. Provides a file uploading facility for submitting articles and imagery to Nova.

## **LIBRARY**

The centre has a large library of books, magazines and old Nova's for your enjoyment at the GSO. Please take advantage of this club service and visit often to check out the new purchases. Suggestions for future library acquisitions are appreciated.

### **RASCVC on the Internet**

<http://members.shaw.ca/rascvan/>  
or <http://www.rasc.ca/vancouver>

## **H.R. MACMILLAN SPACE CENTRE**

The Pacific Space Centre Society is a non-profit organization which operates the H.R. MacMillan Space Centre and Gordon M. Southam Observatory. Annual Membership (\$30 Individual, \$65 Family) includes a newsletter, Discounts on Space Camps, special programs and lectures, Vancouver Museum Discounts, and free admission to the Space Centre. Admission to the Space Centre includes: Astronomy shows, Motion Simulator rides, multimedia shows in GroundStation Canada, and access to the Cosmic Courtyard Exhibit Gallery. For Membership information, call Mahi Jordao at 604-738-7827, local 237 for information. You can also reach them on the Internet at <http://www.hrmacmillanspacecentre.com/>

## **MEMBERSHIP HAS ITS PRIVILEGES!**

New members, did you know? The Vancouver Centre has 6 telescopes available for loan free of charge! We have telescopes ranging from 3" to 10" diameter. For more information call Phil Morris, Director of Telescopes at 604-734-8708, or see him in the lobby of the GSO after the members meeting. The loaner period is for one month only. All telescopes are to be picked up and returned after the members meeting. No telescope will be allowed to circulate outside of these meetings!

Your greatest opportunity as a member of the R.A.S.C. is to take advantage of the company of other enthusiasts to increase your knowledge, enjoyment and skill in astronomy.

The best thing you can do to gain the most from your membership is to get active! Take in the club meetings; engage other members with questions; come out to observing sessions (also known as "star parties"), and, by all means, volunteer to take part in our many public events.

Observing takes place at the Dale McNabb Observatory in the Aldergrove Lake Park, located in Langley, on 8th Avenue, just east of 272nd Street. We are there most clear nights. Contact Mike Pennedlton at 604-888-1505 or Howard Morgan at 604-856-9186.

**RASC  
1100 Chestnut Street  
Vancouver, B.C.  
V6J 3J9  
604-738-2855**

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who are new to the hobby or unsure of how to collimate your scope to learn how this is done. The event will be held near the Nat Bailey Stadium and run by Seamus Dunne and Bob Parry.

Astronomy Day is fast approaching, and there is a great opportunity for members to get out and meet the public and fellow stargazers. Call Bob or Pomponia to find out what you can do to help. This is one of our main outreach projects and is a good time to promote the club. This year we will be having an astronomy book sale during the day. Contact William Fearon if you have astronomy related books you wish to donate to the sale. Magazines are always welcome, so bring out your *Sky and Tel*, *Astronomy* or *Sky News*.

We will be mailing our Membership list out to all members at the end of March. There was some discussion as to whether we should send it electronically but decided it is so useful beside the phone for doodling that you should all receive a paper copy. We usually send this out with this copy of *Nova* but will do a separate mailing this year.

As I announced at the last meeting, Norman Song has

agreed to take up the duties as Public Relations Director for the Centre. Norman has already brought a number of new ideas to us for consideration and Council feels we are in good hands with his skills. Welcome aboard in an official capacity, Norman.

There have been several requests from membership with respect to purchasing, in bulk, the latest version of *Earth Centered Universe*. I have contacted David Lane and am pleased to announce he will furnish us with upgrades for \$25.00 each. If you wish to participate in this upgrade, I will need your name, address and the serial number from your old version in order to get this special rate. I already have my copy and there have been several changes made to the program that have improved it a lot. For the first time buyers, let me know as I have sent a request off to David for a group price for that as well. David usually charges \$59.95 US for this program.

The "Explore The Universe Certificate" program has been started by several members. This is something I would encourage all members to get out and do. Most of us will be able to do it quite easily and I am doing it in conjunction

with my two sons (10 and 12 years old) and my wife. We are meeting every clear Thursday night at the Boundary Bay site to work on it so come on out if you want some company or help. I have given a copy of the program to the science teachers at Renfrew Elementary and will be working with them to get it into the schools. I think this is a great way to introduce children to our hobby and watching them learn the night sky can provide many rewards.

In closing, keep looking up, and share your scope with someone tonight! ★

## Upcoming Events

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### March

15-17 – Messier Marathon at Boundary Bay  
16-22 – Enviro-Fair 2002 at the H.R. MacMillan Space Centre  
24 – Artificial Star Party. Starts between noon and 1pm at Nat Bailey Stadium  
TBD – Public opening of GSO’s new telescope

### April

20 – Astronomy Day  
15-20 – Moon passes by all 5 visible planets

### May

3 – Space Day  
17-19 – 2002 GA in Montreal

### June

2 – Fraser River Festival  
7 – Sidewalk Astronomy #1 (rain day: June 8)  
10 – Annular Solar Eclipse (45% in Vancouver)

### July

5-7 – Manning Park Star Party #1  
TBD – Manning Outreach

### August

3-11 – Mt. Kobau Star Party

12 – Perseid meteor shower peaks; observation at Aldergrove Park

### September

6-7 – Manning Park Star Party #2

### October

4 – Sidewalk Astronomy #2 (rain day: Oct. 5)

### November

18 – Leonid meteor shower peaks

### December

10 – Annual General Meeting

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## Why? To Long for a Child’s Knowledge of Infinity

by Dan Collier

(third in a series)

Children like to think about infinity. In school, the formal introduction to the concept is something rather dull called the number line. But science can do much better to excite the child’s imagination. I was lucky to receive a number of engaging ideas about the things that just go on forever.

When I was about eight, I read that mathematicians can prove that some kinds of infinity are larger than others. This sounded completely

reasonable to me, as a child. I was not old enough to understand the violent reaction that this idea received when it first came out.

My childhood vision of the boundary of the Universe was an infinite shell of solid rock.

Once, when looking at a deeply-exposed photo of the sky with thousands of pinpoint stars in it, I asked myself a silly question. *Is that it?* Are there no more stars to capture, no matter how long the film is exposed? Or do they just keep showing up forever, fainter and

fainter? The astronomers say no, the stars do tail off eventually. In the Hubble “Deep Field,” the most extreme camera exposure ever attempted, the stars are said to be vastly outnumbered by the galaxies in the background. But I’m not sure I believe them.

My fourth-grade teacher once showed me a diagram of the Galaxy with many, many little stars. She pointed to one and said, “See? That’s our Sun.” I never forgot that. ★



## National Representatives' Report - January 26, 2002

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by Bob Parry &  
Pomponia Martinez

The topic of concern at the latest National Council Meeting held on January 26 was that of De-Coupling. Pomponia and myself have tried to keep the club members informed on this important issue, however at the last members' meeting I did not explain the issues well enough to allow our members to make a decision on this issue. I will try and explain the issue in a more understandable way.

At the core of the issue is the 60/40 split of the fees that a member pays to join the RASC. Sixty percent of the membership fee goes to the National organization to operate the society. The other 40% is sent to the various Centres the members are "attached to" for their operations. Many—but not all—Centres add a surcharge to the basic membership to cover expenses at the local level that cannot be met by the basic 40%. Vancouver Centre adds a surcharge of \$8.00.

Over the years the National organization has taken over tasks that were previously handled at the local level. Of these, the membership function is the biggest role now done by National. Because of this

increase in services as well as increases in publication-related costs, National have had problems balancing their budget over the last several years.

To facilitate budget approvals, National wants to de-couple the costs to operate the National RASC from the local RASC. Each would be responsible for setting the membership costs at their level—National for their costs and the local Centres for their costs. The total of these two would be the cost to join the RASC.

It is our feeling that over time, this may lead to increases at the National level that local centres would not be able to pass on without the risk of losing local members.

One of our primary worries is that de-coupling will lead, over time, to a weakening of the very unique structure of the RASC that has served us well over many years. This is what we want to preserve above all, as does every other member of the National Council. This concern over de-coupling is in no way meant to imply that the national executive of RASC has anything but the best intentions for the further enhancement of our very unique club.

Similar dissociation between membership setting at local and national levels has, in our experience, led to local clubs drifting away from the central organization as the central organization concentrates more on its needs and pays less attention to those of local clubs. This would be a tragedy should this occur. In our view the risks outweigh any benefits that might occur from de-coupling.

The Vancouver Centre has outlined some things that could be done to address these problems at National that do not de-couple the connection between the National RASC and the local centres. These involve changing the 60/40 split to another ratio such as 70/30 or 65/35. This would address the extra costs involved and would not break the link between the two levels. Another issue that comes out of this is that to make these changes will involve expenses to change the computer system and forms and other items required to implement these changes.

In addition Pomponia wants to join the finance committee and help with the budgeting and planning for the RASC.

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Another issue that consumed much discussion on the Rascals mailing list and the council meeting, was the issue of unattached members. This is not an insignificant issue as unattached members are the second largest block of members after Toronto centre. There was discussion on how their membership will be calculated and what services they receive. It is my opinion that there should be no unattached members and that all members should be attached to the nearest centre to their location. The complications of unattached members is not easily resolved. Functionally, unattached members have no

say at the National Council and no representative. This is a problem with no easy solution as unattached members are spread across the country and even around the world.

Now on to other National business: the budget. The forecast for the coming year is for a balanced bottom line; that means no deficit but also no surplus. This may be somewhat misleading as there are several large charges to the operating budget that really should be accounted differently. These involve the \$6,000 to the Calgary Centre. There were other controversial charges such as \$500/month for computer maintenance. This service is not likely to be used

every month but has been budgeted that way. This was done because the volunteer people that service National's computers have real jobs and have been unable to provide needed service on short notice. Last year a deficit of \$5,600 was predicted, however because of additional revenue we ended up with a surplus. This could happen again this year as the estimates are always quite conservative.

The remaining business was rather routine with the exception of the new observers' certificate programme that has just gotten underway. Please see Craig's report on this for more detailed information. ★

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elusive they invented an artificial moon. The phases of this Moon would be under full control of the designer. The calendar was based on the Metonic cycle of 19 years. This allowed them to keep their artificial Moon not too far from the real one. The dates of the new and full moons were set at particular points in time, not too far from the real date but with no further relation to the motion of the real moon. Once you have such a calendar, one can, of course, construct an

almanac for the dates of Easter. This was first done around 500 AD.

This was not the end of the problem. This almanac depended on the Julian calendar. For centuries it was known that the Julian year was too long. Easter began to fall earlier and earlier in the tropical year, a problem of great concern for the clerics of that time. This was eventually fixed by the introduction of the Gregorian calendar in the 16th century, which is still in use today. But at that time the

determination of the date of Easter had to be revised as well. And that revision is still in use today. Most often the date of Easter corresponds to the general rule based on the real Moon, but not always. Sometime in the 19th century there was a full Moon on Easter Sunday.

Easter is coming at the end of the month, and that is so because astronomers decided that a long time ago. But they used an artificial Moon to do it. The Easter Moon does not really exist. ★

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improvement in performance and greatly increase your enjoyment of it. Having made this sort of test a few times I can recommend its value. Tiny misalignments in the optical elements show up as a distorted star. After adjusting my primary mirror by what seemed to be a negligible amount, the star's distorted image became perfect. I later discovered a huge improvement when I was next observing. Saturn, for example, really did have multiple rings!

The artificial star (which I have made from an old projector) has a 50-watt quartz-halogen lamp at its heart. Light from this source is reflected by a condenser mirror through a small aperture stop, then through a microscope objective. The result is a dazzling point of light approximately one tenth of a millimetre in diameter, with a very high colour temperature. This is placed at a distance of 50 to 100 metres from the scope and aimed at it (misleading results are obtained if the scope is not a considerable distance from the star). For the test, you must very critically observe the appearance of the star using high magnification while moving the eyepiece just inside

and outside of focus.

We intend to do the testing during the day, simply because it's easier to see and tweak those usually tiny adjustment screws, although contrast and apparent brightness of the star suffer as a trade-off for having the convenience of daylight. Doing a star test after dark obviously improves the visibility of an artificial star. The only disadvantage is one we're familiar with: stumbling around in the dark.

In my (limited) experience, I've found that a cool, overcast day is best, for two reasons: First, contrast is improved. Secondly, there is much less heating of the ground due to the sun, which destroys the 'seeing.' In my experience, the seeing always limits the usefulness of the test. The star's image, which should be steady, squirms and wavers in the eyepiece. Put another way, it's a very rare evening when atmospheric conditions are sufficiently steady to equal the steadiness of an artificial star. When it's good, the artificial star's diffraction circles and Airy disk appearance is as steady as those you may have seen in textbooks. However, if the sun is shining, we'll try to take advantage of the situation; we'll use the sunlight reflected

from a Christmas tree ornament as another artificial star. You then compare what you are seeing to star images in a textbook and decide upon the remedy to be taken, if any.

We will also need volunteers who are experienced in star testing of telescope systems. Although some defects (pinched optics) can be easily detected, other defects (such as turned-edge) take a trained eye to recognise. So we are asking for those with some expertise to assist us. If you do wish to attend keep these things in mind:

- this is a free service to RASC members.
- you should plan to have your equipment set up and cooling off about one hour before we start; tube currents inside a scope make this evaluation very difficult.
- there is no need for any clock drive or electricity in your equipment.
- however, you may wish to bring a laptop computer and CCD imaging equipment and capture pictures of the star. You must supply your own power.
- you must bring the eyepieces and Barlow lenses which give you maximum magnification, typically 200x

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- or more. Insufficient magnification makes this test inconclusive.
- be prepared to do any optical testing by observing ‘straight through’ your scope, that is, **without a star diagonal in place**. You will get more useful results. Later, you should do the same testing with your usual set-up (for example, if astigmatism—a serious flaw—is present while using a star diagonal, then it may be the cause. Only by eliminating the star diagonal can you be certain).
  - bring any special tools you need to access & adjust your optics: small screwdrivers, pliers, wrenches, tweezers, hex wrenches, masking tape, notepad, sledge hammer, etc. We simply supply assistance and advice; we cannot supply tools.
  - bring a lunch. This sort of thing is not accomplished in 15 minutes.
  - bring rain gear. It has been known to rain on Sundays in Vancouver.
  - **Dobsonian owners:** For your comfort bring a *\*stable\** platform or table about 30 inches high on which you can set up your scope since you will be looking at the artificial star which is on the

horizon. Otherwise you must crouch very low for a long period in order to look through your eyepiece (if it were me, having to crouch like this would make this test impossible). A folding chair would be useful too.

**Where:** Hillcrest Park on Clancy Loranger Road (north side of Nat Bailey Baseball Stadium at Ontario St. and 33<sup>rd</sup> Ave, Vancouver). You can park and unload on Clancy Loranger Road. You’ll find a soccer/baseball field to the north; this is Hillcrest Park. The road is only 100 metres long; it’s a dead-end. There’s free parking for lots of cars and a public washroom right there. There also exists a very large, very stable power-utility box about 4 feet high upon which a Dobsonian scope can be set-up, but there’s only room for one scope at one time.

**When:** Sunday 24 March, 3pm until 7pm.

**Weather:** Ideally the day will be cool and overcast. Colder is better, so dress for a cold day. What if it’s sunny? The sun, if it’s visible, causes poor seeing due to ground heating. This is a problem but we’ll try it anyway. We decided that we would cancel the date in the event of anything more

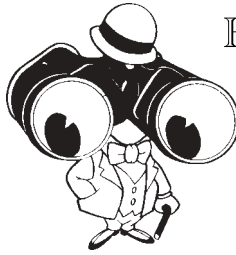
than very light rain (scope owners likely will not want to allow more than a few drops on their equipment). If we should cancel during the event, I suggest we then retire to Solly’s Bagels for coffee at 28<sup>th</sup> and Main.

Questions? Seamus Dunne ( 3 2 7 - 7 2 6 2 )  
dogstar@interchange.ubc.ca or  
Bob Parry (215-8844)  
robpar@telus.net. ★

## RASC MERCHANDISE

Available for purchase after meetings:

Calendars	\$12.00
Beginners' Guides	\$15.00
Observers' Guides	\$20.00
Star Charts	\$10.00
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Assorted eyepieces, barlows,  
star diagonals 0.96" - 2"

New and second hand

Visit our Web site at

[www.vancouvertelescope.com](http://www.vancouvertelescope.com)

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### Second Hand

Omcon 813SV 5"	\$ 399.00
Omcon 119DRG. 93mm/E/M M/drive	\$ 500.00
Pentax 65ED. E/M, accessories	\$ 900.00
Celestron G-N8 E/M, accessories	\$ 1500.00
JMI NGC Micro-max (C8/GP mount)	\$ 300.00
Meade 4" Ring Tube C/Weight	\$ 45.00
Meade APO Universal Thread Adaptor	\$ 39.00
Meade 2080 8"SC + many accessories	\$ 2500.00
Sky Instruments E/mount, M/drive, tripod	\$ 99.00
Ortho 1 1/4" 4/7/12.5mm	each \$ 39.95
1 1/4" colour filters	each \$ 13.00