



# NOVA

NEWSLETTER OF THE VANCOUVER CENTRE RASC

VOLUME 2004 ISSUE 3

MAY/JUNE 2004

Mirror Grinding, Part 2	1
The Discovery of Space...	2
President's Message	3
Observing Sites	4
Upcoming Events	6
Comet NEAT Chart	10
Members' Gallery	11

## 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.

**May 11:** Evgenya Shkolnik of UBC's Astronomy Dept.: "Planet Creates a Stellar Storm."

**June 8:** Eric Dunn presents his GA 2003 talk, "Up Kitt Peak Without a Paddle: Confessions of a Rain-Soaked Astronomer."

**July 13:** Anna Sajina of UBC's Astronomy Dept.: "Infrared Astronomy and the New Spitzer Space Telescope."

## Next Issue Deadline

Material for the July Nova should be submitted by Monday, July 5, 2004. Please send submissions to:

Gordon Farrell  
(gfarrell@shaw.ca)

## Mirror Grinding, Part 2

by Doug Montgomery

I have not had a lot of time to work on my mirror these days; I have been busy with other projects. I did make a

the time to do the things you want to do (observing and working on the mirror).

But I did promise some



platform to mount the tool and start the rough grinding process.

Astronomy Day and junk week here in Surrey have occupied my time lately. It sometimes is difficult to find

math and so it shall be. My mirror has a diameter ( $d$ ) of 10" and I want it to have a focal ratio ( $f$ ) of  $f/5$ . To find how far down to grind the mirror, you first need to find the focal length,  $F$ . You get this by

continued on page 8

## The Discovery of Space and Navigation

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by Marc Verschueren

It was hard to understand, for anybody thinking about those matters two thousand years ago, that bodies such as the Sun and the Moon could stay up in the heavens. In the philosophy of the day, they were kept there because they were embedded in transparent spheres, otherwise they would just fall down attracted to the lowest point like Aristotle proclaimed. Copernicus already realized that the stars had to be at a much greater distance than the planets for the correct reason that planets move with respect to the field of stars. But this did not create the concept of space in astronomical thinking. Space was still very full of matter, air here below, then ether and the crystal spheres holding the heavenly bodies. When Galileo turned his primitive telescope

towards the sky and saw a lot of detail in the moon, Kepler was one of the first to realize that this meant that space was actually largely empty. His argument was clever. If you looked through a telescope like Galileo's to an object on earth, you noticed a slight deterioration of the image because of the lens. If you now turned the telescope to the moon, one did not see any worse deterioration in the image of the moon. So whatever was between the moon and us had to be more transparent than the little bit of glass of the lens. Space was largely empty. This was the space in which the planets described their elliptical orbits and the moon was a body similar to the earth. This was one of the great revolutions in astronomical thinking.

This empty space in which

the planets moved was available to comets. Halley, of comet fame, was the first to subject the comets to the laws of Newton. To him, this empty space, with objects in it strictly obeying Newton's mechanics, was very real. It is not surprising that Halley was the first to suggest that you could use the transits of Venus to determine distances in this empty space with a greater accuracy than had been done by Cassini and Richer with a triangulation of Mars at its closest approach in 1672. We are lucky that we will be able to see a transit of Venus again next month, rare as it is. It does not have the same scientific interest any more since there are now much more direct and much more accurate methods to determine that distance. But us, astronomers, like the special

continued on page 6



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## President's Message

This spring, the weather has been more cooperative than usual with many clear nights. Of course we did pay our dues when the March Messier Marathon attempt was mainly clouded out. However, in April, up to twenty Messier objects were logged by the ten or so people who viewed from Boundary Bay until the clouds took over. I noticed that some of our members had red eyes during April, which is a great sight for an amateur astronomer because it usually means late nights and clear skies. Of course, I couldn't avoid a small grin because, being retired, I got to sleep in on the mornings after my late night sessions.

**Planet Fest** on March 27, which was held in cooperation with the Space Centre, was very successful. We had half a dozen RASC telescopes out and David Dodge had the GMSO scope in operation. Between 400 and 500 visitors turned up between 7:00 PM and midnight. It was a partly cloudy night with an easily-spotted Mercury, a very bright half-Venus, a rather dull Mars, and the three WOW objects for the evening; the Moon near First Quarter, Saturn and Jupiter. We

continued on page 7

## 2004 Vancouver Centre Officers

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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.

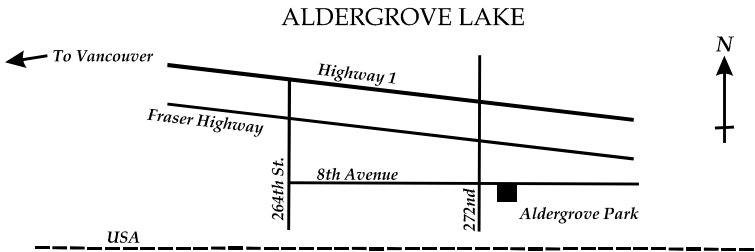
## Advertising

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

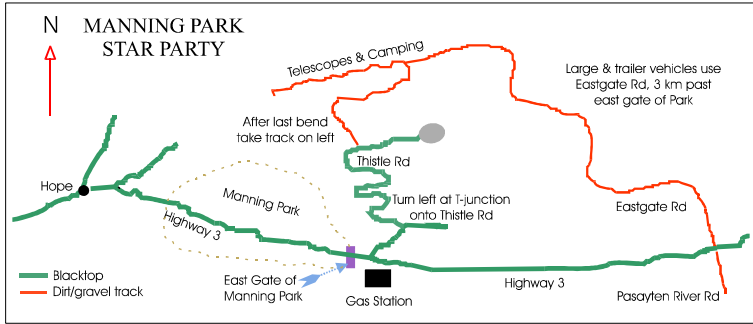
1/2 Page: \$25.00 per issue  
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# Observing Sites

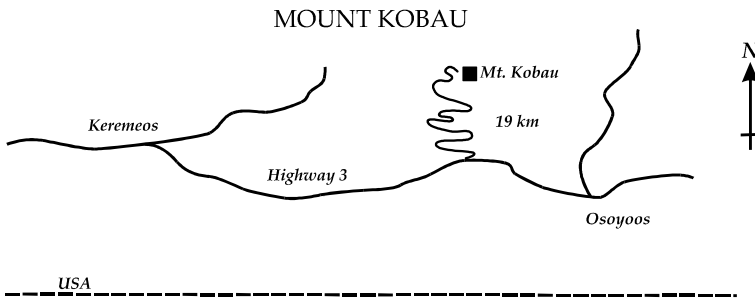


Dale McNabb Observatory in Aldergrove Lake Park (RASC Vancouver Centre's regular viewing site)

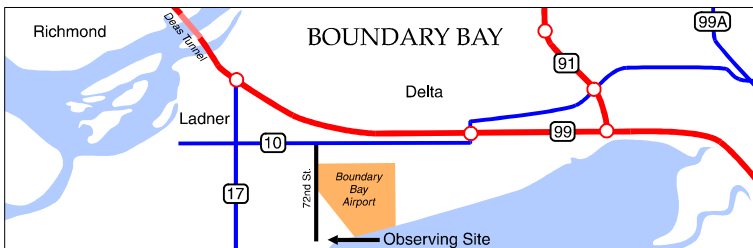
Contact Mike Penndelton (604-888-1505) or Howard Morgan (604-856-9186)



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.

## **LOST & FOUND**

**FOUND:** Telescope tube cap. Looks like it would fit a 5" instrument. Found on Astronomy Day on a table near the GSO. It can be claimed at the GSO after the meeting, or contact a council member for more information.

## **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 8 telescopes available for loan free of charge! We have telescopes ranging from 60mm to 10" diameter. For more information see Phil Morris, Director of Telescopes in the lobby of the GSO *after* the members meeting. All telescopes are to be picked up and returned at the GSO. The loaner period is for one month, to be returned after the next meeting. Telescopes are not allowed to circulate outside of these meetings. You can now reserve 2 different telescopes per year and use what is left at the end of the meeting anytime. Phil can be reached at 604-734-8708.

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 Pennelton at 604-888-1505 or Howard Morgan at 604-856-9186.

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

## Upcoming Events

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### May

21 – Comet NEAT C/2001 Q4  
21-24 – Spring Merritt Star Quest.

### June

6 – Fraser River Festival.

### July

1-4 – GA 2004  
17 – Manning Outreach.  
17-18 – Manning Park Star Party.  
24-31 – SOAR.

### August

12/13 – Perseid Meteor Shower at Aldergrove Lake.  
14-21 – Mt. Kobau Star Party.

### September

10-12 – Fall Merritt Star Quest.  
25/26 – Sidewalk Astronomy.

### October

9/10 – Sidewalk Astronomy (alternate date).

### December

14 – AGM

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continued from page 2

positions of the objects in our sky. Even seeing Jupiter or Venus close to the moon is a thrill. The astronomical literature has told us many stories of the epic voyages by adventurous astronomers to observe the transit. This year we will be able to see it, live, on TV and the Internet, I presume. The British organized an expedition in 1769 with Captain Cook. The cost of the trip was justified by the phoney argument that the distance of the Earth from the Sun was important for astronomy, and astronomy was very important for navigation. Navigation was a critical tool for the merchant marines and the Royal Navy. This statement is true, but the distance between us and the sun is irrelevant for celestial navigation. It is only the angles and the time that count. Not too surprisingly, Capt. Cook had a

more or less secret mission of looking for the Southern Continent. The funds supporting the scientific research were mixed up in less scientific endeavours, as is very often the case—somewhat like the military in the US or the former Soviet Union always keeping an eye on the space research funded for scientific purposes.

But navigation by the stars was immensely important. I have always thought that the discovery of a reliable method to navigate at sea using the stars was one of the greatest achievements of the early scientific world. It allowed us to travel the world. It was a great cultural achievement. But as always, the ease to travel the world had the inevitable political, military and economic consequences—which it would not be very wise to consider in this article for

this magazine. Preparing for the trip to Tahiti, the astronomer accompanying Capt. Cook, Mr. Green, discovered that Capt. Cook did not know how to navigate using the lunar distance method, notwithstanding that the Board of Longitude had published fairly accurate tables of lunar positions. The lunar distance method uses the motion of the moon as a time keeper, visible everywhere on earth. The lunar method is appealing to the astronomer because it uses only astronomical objects and no mechanical contraptions like chronometers, even if they are a lot easier to use and more accurate. It was strongly defended by people such as Newton.

But these courageous navigators really started from scratch. When Cook arrived in Tahiti, the first thing to do was

continued on page 10

continued from page 3

were hoping for a real treat from Jupiter which was going to have a double moon, triple shadow transit that night. We observed Callisto's shadow and then Ganymede joined it in transit. It was really getting exciting, but just as Io was about to transit, the clouds occulted Jupiter! We never got to see Callisto's shadow joined by the shadows of Io and Ganymede for the very rare triple-shadow transit.

Through much of that event, clouds covered about half of the sky with a few sucker holes here and there so we got lots of practice switching back and forth between them. I got lots of work hand-tracking my C8 because of a loose battery-wire; something I made sure was fixed the next day, so that I wouldn't have to do that again on Astronomy Day. The planets tended to move along the edge of the clouds or appeared here and there through sucker holes so that we kept getting such questions as, "there goes Saturn, can we switch to Jupiter?" Transits are so much fun that I have decided to go off and try to time the Transit of Venus... maybe from a nice quiet beach in Cyprus?

It was notable that the cloud-cover, transparency, and

seeing were all very well predicted by Attila Danko's **Clear Sky Clock**. If you haven't used it, the predictions for Vancouver are available on our website opening page. In addition, under the "Observing:" link, you can click on the table-image and it will take you to the interactive page for Vancouver. There is a check-box to the left of the table which, when clicked, gives a details-window for any one-hour box as the mouse is passed over it. A few months ago, Attila's site went down and there was a great deal of moaning and groaning on our RASCALS mailing list, from observers who depend on its predictions from one or more of the approximately 1800 sites. The data used originates free from Environment Canada, but the calculations and costs of internet access, web hosting, computers, software development and lots of caffeine are carried by Attila. There was considerable discussion on RASCALS about how to improve the undependable server that Attila was using and a suggestion was made that RASC members should become sponsors and at least cover the cost of their Centre's site. Ottawa Centre became a sponsor and at our last Council

meeting, Vancouver Centre voted to make a \$100 contribution for this year. To offset the cost to the club, we will have the donation box out at the next meeting if anyone wants to make a contribution.

**Astronomy Day** this year was also a cooperative event with the Space Centre, thanks to the new Executive Director, Donna Livingstone, and her staff. It was very successful with an estimated 2000 visitors. There were displays by Harrison Scientific, Vancouver Telescope and Celestron in front of the GMSO, and by Jim Bernath and Ted Stroman up in the Space Centre lobby. Talks were given by Phil Morris, Dan Collier, Michael Jensen, Ed Hanlon and Bill Burnyeat. The weather really came through for us, so I guess that no club member has recently bought a new, fancy telescope. Viewing was excellent all day and throughout the evening. Thanks go to David Dodge and Norman Song for going on the air to advertise the event and to Todd Jones for his press releases. Kudos also go to Ron Jerome and Chris Dolman for their fine poster displays and to Doug Montgomery and Sally Baker for manning the club's tables all day. The Kids theme was a success and particular

continued on page 10

continued from page 1

multiplying the focal ratio by the diameter:

$$F = f \times d$$

or  $5 \times 10$ , to get 50". Then you multiply the focal length by 2 to get the radius of curvature:

$$R = F \times 2$$

so  $50 \times 2 = 100$ ". The next

of the mirror:

$$g = r^2 / (2 \times R)$$

so that's  $5^2/200$ . That totals  $1/8$  of an inch, so I need to grind the mirror out  $1/8$ " in the middle. In Jean Texereau's book he uses a drill bit under a steel ruler to test for the correct depth. Victor Pollok of FVAS uses a set of Vernier Callipers to measure the depth.

they can be loosened, as you must turn both tool and blank during the grinding process. This way you grind evenly over the surface of both tool and blank.

I am hoping to get more work done on this project this summer. With warmer temperatures, I can spend more time in the shop. I cleaned out a large area to give me the room I will need to finish this scope

for the fall Star Quest, hopefully.

In the picture, you can see how the tool is mounted on the work surface. I painted the work surface so it is smooth so it can be cleaned between grits, you don't want any coarse grit around when you are using fine grit. \*



The grinding tool

equation tells us how deep we have to grind the mirror (g), and for this we need the radius (r)

To mount the tool on a flat surface, you need three wedges evenly spaced and also made so



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continued from page 6

to determine the exact longitude of the island. They did this with the occultations of the moons of Jupiter. I tried to do this in my back yard a few

days ago. It is easy to reach an accuracy of a few arc minutes in position without too much effort. Of course I used my dependable, accurate Timex to determine the local time. But

it is not going to be too difficult to calibrate local time using a sundial. It is very valuable to keep in touch with history, and to understand how we got where we are. ★

continued from page 7

thanks must go to our junior club members Tara Weinmar, Gwen Rickerby and Wyldie Maxwell and to the Space Centre youth volunteers for providing children's activities. All club volunteers, who gave your time, brought out

telescopes and solar filters, talked to the public and just generally pitched in, give yourselves a big pat on the back. Finally, special thanks to Pomponia Martinez for great planning and providing delicious sandwiches and chilli and to Harrison Scientific,

Vancouver Telescope and Celestron for their displays and the donations of the door prizes. It was a long day but a lot of fun and I am already looking forward to next year.

– Bill Ronald ★

## Comet NEAT (C2001 Q4) at 10:00 PST from Vancouver

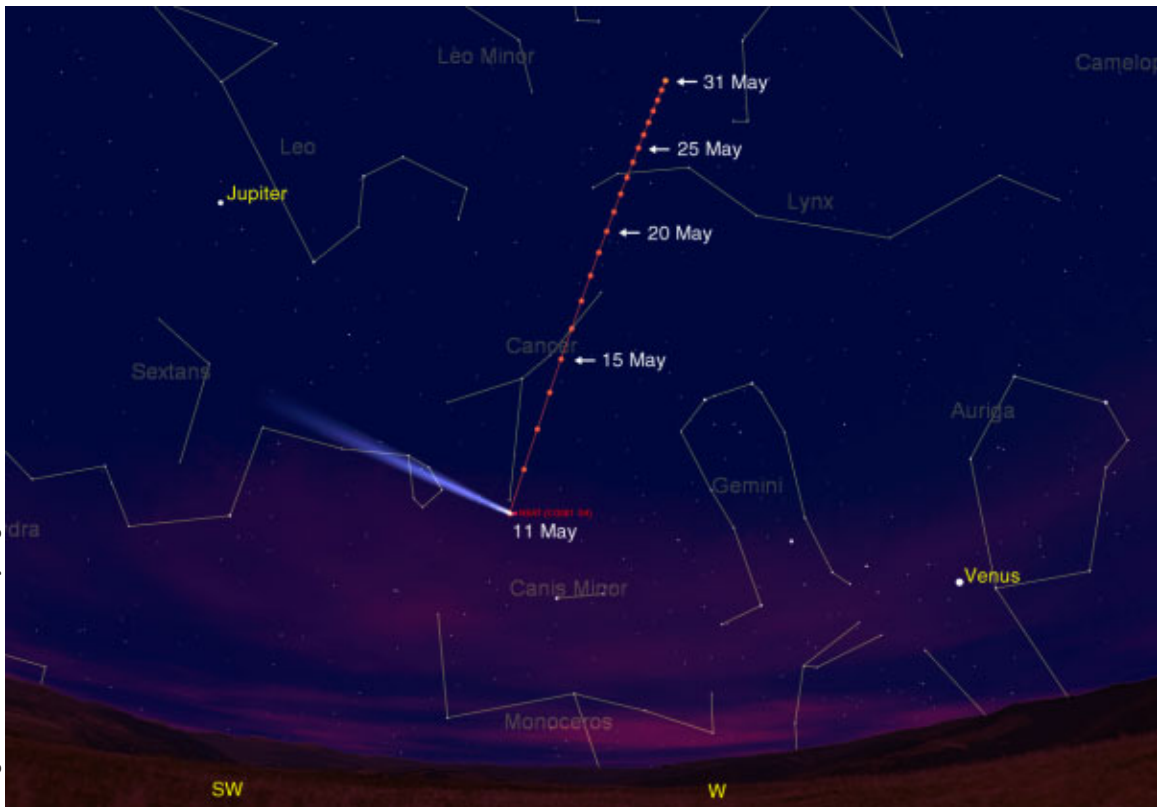
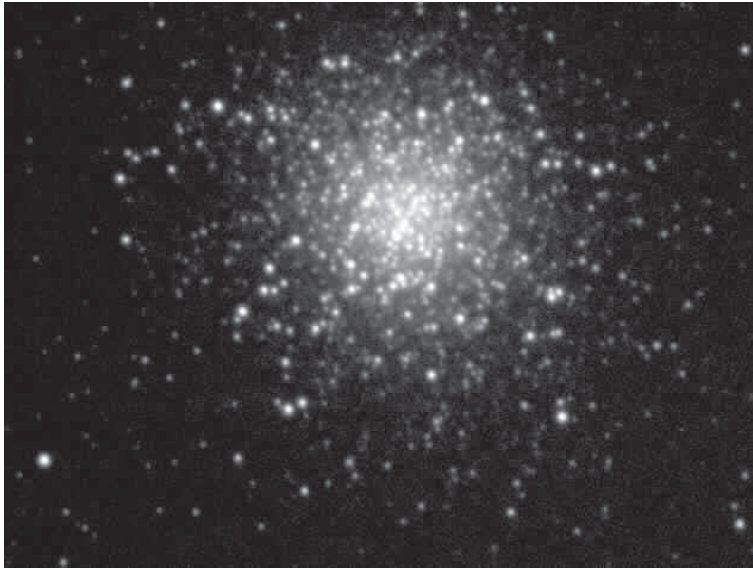


Image created with Starry Night Pro 4.5

## Members' Gallery

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**M13**  
Jason Rickerby

SBIG ST-237  
Celeston 8"  
July 9, 2001  
Delta, BC

**Aurora & Highway**  
Jason Rickerby

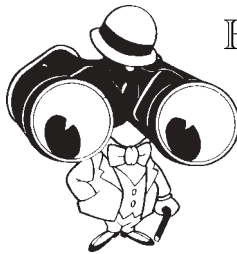
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