

# AstroNotes

Newsletter of the Ottawa Centre,  
Royal Astronomical Society of Canada

## **Light Pollution**

**Local Politics and Local Decisions**

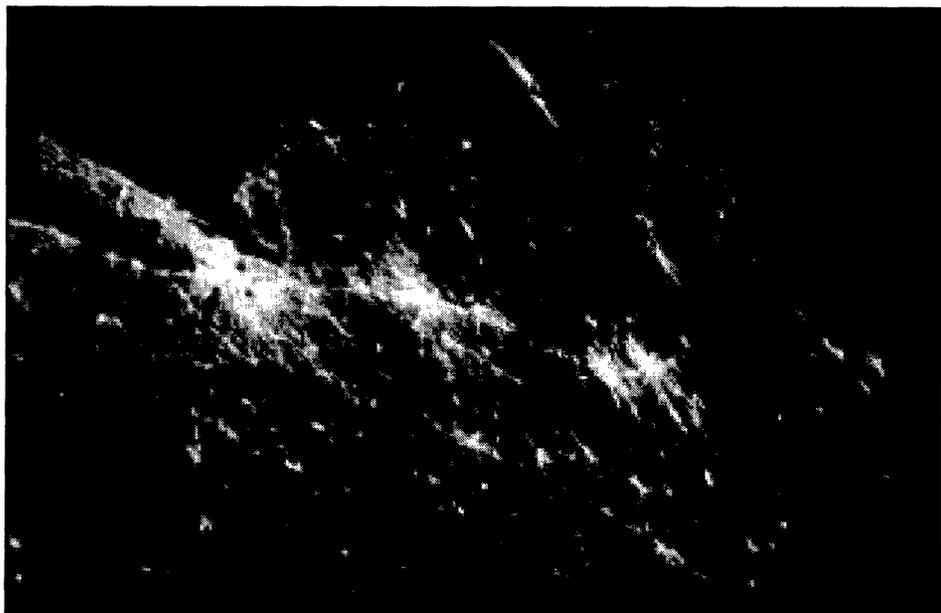


Photo Courtesy NASA

May 2004

Submissions: E-mail to: [astronotes@ottawa.rasc.ca](mailto:astronotes@ottawa.rasc.ca)  
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### Editorial and Production Positions

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### Ottawa Centre, Royal Astronomical Society of Canada



The Ottawa Centre is one of 27 centres of the Royal Astronomical Society of Canada—an organization dedicated to the advancement of astronomy and allied sciences. The Ottawa Centre, formed in 1906, has approximately 500 members. Centre facilities include the *Fred P. Lossing Observatory* near Almonte, which houses several instruments including an excellent 16-inch reflector. The Centre also operates an astronomical book library and a telescope loan library.



Membership in the Ottawa Centre is \$44 per year for regular members (outside Canada, US\$44) and \$27.55 for junior members. Members receive the annual *Observer's Handbook*, the bimonthly *RASC Journal*, the Canadian bi-monthly magazine *SkyNews* and 10 issues of the Ottawa Centre's newsletter, *AstroNotes*.

The Centre can be contacted at P.O. Box 33012, 1363 Woodroffe Ave, Ottawa ON K2C 3Y9; at (613) 830-3381; or via Internet at [ottawa.rasc.ca](http://ottawa.rasc.ca).

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Instrumentation .....	Pat Browne	Variable Stars .....	John Thompson

# Managing Light Pollution

by Tim Cole, Editor

Collectively, the Ottawa Centre did some good work in April. Telus Mobility had applied to put up a cellular phone tower adjacent to Pinhey's Point — hardly good news for our summer star party planning. Cutting to the end of the story, it looks as if that tower will be moved down the road where it will be less of a blight to the residents and visitors at Pinhey's Point.

Ricardo Borba helped start the campaign to get that tower relocated, and quite a few Ottawa Centre members responded. I believe e-mail messages and letters to City Councillor Peggy Feltmate had a lot to do with the city's decision.

One thing that struck me was the conciliatory tone of the messages. Many anti-pollution campaigns get bogged down in ugly rhetoric. In this case, I noticed only one message that seemed snarky, and its writer quickly apologized.

Trying to make people feel guilty about their actions is rarely a good idea, as numerous public interest groups should have realized by now. Solid opposition to development is even more counterproductive. It's not just the cynical idea that money talks. In this case, *people* want to talk — on their cell phones.

We dodged a bullet this time, but there will be many more bullets. In the long run, the best way to manage our precious sky resources is to resist the urge to become strident. Surely you don't like activists berating you to do something or other. Nobody else does either. Let's stay polite, respectful and *successful*.

New lighting regulations for Mississippi Mills, the relocation of a cell phone tower — let's congratulate all our Centre's light pollution "wardens."

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## Cover Photo: Northeastern Seaboard Lights

Photo Courtesy NASA — STS098-382-0014 (7-20 February 2001)

City Lights of the Northeastern Seaboard of the U.S. were captured with a 35mm camera by an STS-98 astronaut aboard the Space Shuttle *Atlantis*. The nighttime scene shows the bright lights from both very large urban areas as well as smaller towns and cities. The largest cluster of brightness emanates from the greater New York metropolitan area (left center) and a series of bright spots progress southwesterly to include Philadelphia (PA), Baltimore (MD), Washington (D.C.), Richmond (VA), ending with the Newport News/ Norfolk (VA) lights (top center). Many major ground transportation arteries appear as linear features radiating from the central business districts of cities. Even the lights of smaller cities such as Allentown, Reading, Lancaster, York, and Harrisburg (PA) are visible (bottom center).

## Wanted: Lunar Observations!

Your friendly Ottawa Centre Lunar Co-ordinators would like to know what you have been observing on the Moon. The idea is that by sharing your findings we can all learn more about specific details of the lunar surface. Results of members' Moon observations (reports, images, sketches) may be presented at Centre meetings during the semi-regular *The Ten-Minute Moon* segment.

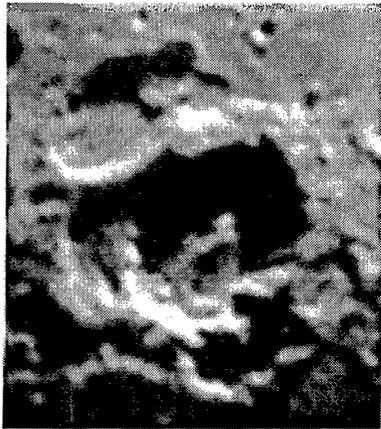
We encourage everyone to take a close look at some part of the Moon over the next few months and to forward details of your observations to:

*brian.brightstar@sympatico.ca* or by mail to:

Brian McCullough,  
324-300 Earl Grey Drive, Kanata, ON K2T 1C1.

Clear skies,

Brian McCullough and Lee Macdonald,  
Ottawa Centre Lunar Co-ordinators



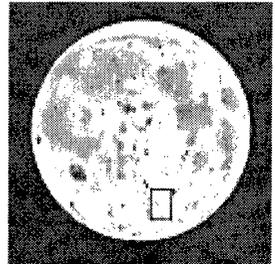
Sketch by Brian McCullough / Digital Image by Lee Macdonald

Crater Maurolycus

### Maurolycus' Atlas Entry

Maurolycus: 41.8° S, 14.0° E, Rühl Section 66  
114 km diameter, 4730 m deep

Walled plain with central peaks in the Moon's  
southeast region





# **The Venus Transit of 2004**

by Michael A. Earl, Ottawa Centre Meeting Chair

The planet Venus is well known by many astronomers and non-astronomers as the third brightest object in the sky, topped only by the Sun and the Moon. Astronomers since Galileo have known that Venus exhibits phases when it is observed through a small telescope, much like our own Moon does.

Venus has an additional property that was very useful for measuring the distance scale of our solar system. Venus can get as close as 41 million kilometres to us when it lies directly between the Earth and the Sun.

Astronomers in the 17<sup>th</sup>, 18<sup>th</sup>, and 19<sup>th</sup> centuries carefully measured the time Venus took to transit the Sun's disk to establish an accurate value of the Astronomical Unit (AU), which is defined as the average distance from the Earth to the Sun.

You might have noticed that the 20<sup>th</sup> century was not mentioned. This is because there was no Venus transit (seen from Earth anyway) during that entire century! The last time Venus was seen to transit the Sun was December 6, 1882. In order to fully appreciate the amount of time that has passed between then and the next Venus transit this June 8<sup>th</sup>, all you have to do is think that Canada was only an infant (15 years old) and Sir John A. MacDonald was our Prime Minister during the last Venus transit. (In an eerie coincidence, Sir John A. was also getting over a recent scandal at the time.)

These days, the Venus transit is seen as more of a historical event rather than a scientific necessity. This is very ironic, because if the astronomers of 1882 had access to the equipment most amateur astronomers can afford today, they would have been ready to pay a King's ransom for it. Just think: In 1882, the best astrophotography technology available was the bulky box camera armed with dry emulsion photographic plates with speeds so slow that it took a 137-minute exposure to get an image of the Orion Nebula with an 11-inch aperture telescope! Measuring angles from photographic plates was certainly not as convenient, or accurate, as using today's digital cameras, webcams, and CCDs that all come with convenient measuring grids and the software to automatically analyze the images.

Despite these relative shortcomings, images of both the 1874 and 1882 Venus transits were made. Very few of these images have survived to the present day. Of the images taken by U.S. Naval Observatory (USNO) expeditions, only 11 plates survived the ravages of time.

True, the upcoming Venus transit does not rank up there with a total solar eclipse (or even a lunar one), but it is certainly worth getting a safe and reliable solar filter to place over your small telescope aperture to take a peek at it.

Venus's silhouette will appear as a black disk about 1/30 the apparent diameter of the Sun. If you are concerned about large sunspots causing confusion, sunspots generally do not appear perfectly circular, and most have darker centers surrounded by a lighter grey ring. Venus's silhouette will appear to be travelling along the lower southern hemisphere of the Sun, an area where sunspots are rarely seen. The silhouette will also appear to move more quickly across the Sun's disk than any sunspot would.

Venus will begin its transit at about 1:13 a.m. E.D.T., well before sunrise here in Ottawa. We will therefore see Venus' transit in progress when the Sun rises

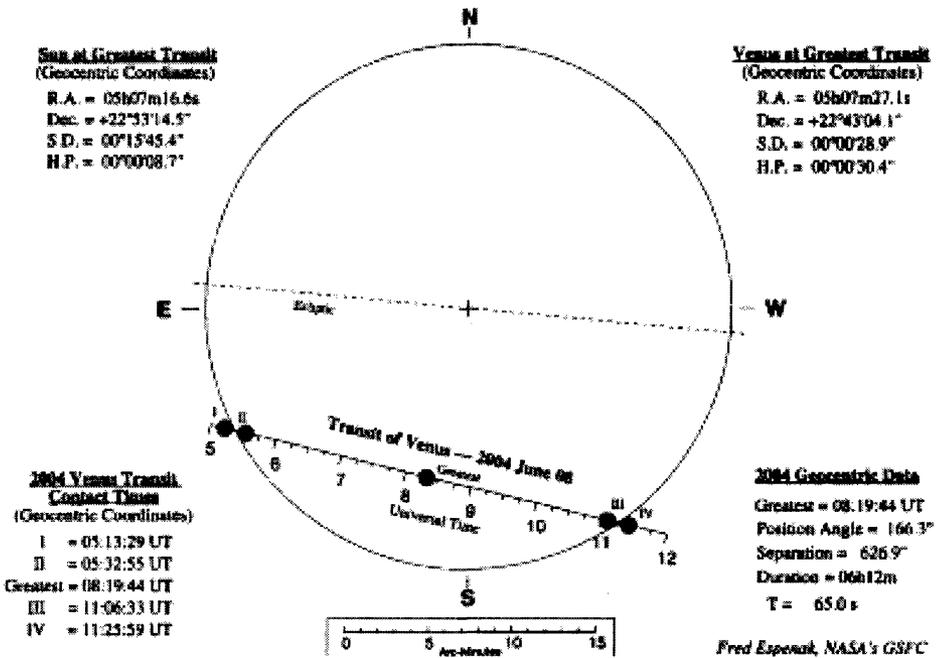


Image courtesy Fred Espenak, NASA GSFC (from the RASC Observer's Handbook 2004)

### Venus Transit 08 June 2004

four hours later at 5:13 a.m. E.D.T. Venus will have completed about 66% of its transit by this time. We will be able to enjoy the last 34% of the transit until last contact occurs at 7:26 a.m. E.D.T. when the Sun will be about 20 degrees above our local eastern horizon. Venus will then stay hidden in the Sun's glare until the second half of June, and then will reappear low in the eastern dawn sky as the "Morning Star" during the rest of the month.

In order to see the entire transit live from beginning to end, you would need to travel north of the Arctic Circle to take advantage of the midnight sun, or to anywhere in Europe.

If you miss the transit, do not despair! You can download images taken by the SOHO spacecraft as it regularly gets images of the Sun in different wavelengths, including visual. There is also another Venus transit predicted to occur on 06 June 2012. You would have to travel to the eastern half of the world to be able to see that one though, or at least rely on SOHO's successor. After that, the next transit is on 11 December 2117. Be sure to eat right, take your vitamins, and exercise regularly to see that one!

For more information about the Venus transit, consult your *2004 Observer's Handbook*, pages 188 to 199. For those who do not have an *Observer's Handbook*, the very same article is on the web at <http://sunearth.gsfc.nasa.gov/eclipse/OH/transit04.html>. The web also has many sites devoted to public awareness and special events for measuring the total transit time and parallax effects on the Earth, as well as just plain having fun viewing it with others!

Hopefully, both June's and July's meeting will be full of Venus transit images taken by Ottawa RASC Members. You are encouraged to make observations, sketches, and images of this rare event to mark your place in history as one of the lucky generations to see a Venus transit.



## **Voyage to a Double Planet**

by Patrick L. Barry and Dr. Tony Phillips, NASA/JPL

Download a “nine planets” screensaver for your computer with spectacular photos of our solar system, and you’ll notice that one planet is conspicuously missing: Pluto. Icy and mysterious, Pluto is the only planet never visited and photographed by NASA space probes.

In fact, the clearest image we have of Pluto is a tiny, pixelated blob of light and dark patches taken by the Hubble Space Telescope in 1994. It’s tantalizing — but not much more. Earth-based telescopes have succeeded, however, in discovering one amazing fact: Pluto is not a lone world, but a double-planet system. Its companion, measuring about half the size of Pluto itself, is named Charon.

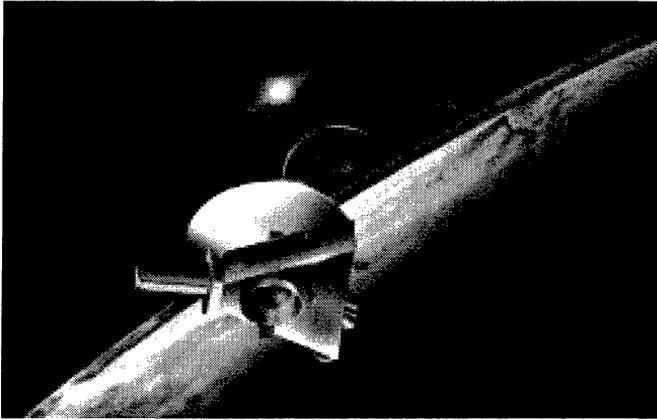


Illustration courtesy Dan Durda and NASA/JPL

Artist's conception of the New Horizons spacecraft at Pluto and Charon.

Work is underway to launch a robotic probe to visit and photograph Pluto and Charon. The project, called New Horizons, will map both worlds. Sensors will chart surface minerals and ices, and catalog the gases that make up Pluto's wispy atmosphere. "It's the second epoch in the exploration of the

planets," says Alan Stern, the principal investigator for New Horizons at the Southwest Research Institute in Colorado. "We're going to the very edge of the solar system."

The probe is scheduled to launch in January 2006. Its journey will be a long one. Pluto is more than 30 times further away from the Sun than Earth is! Even with a speed boost from a flyby of Jupiter, the probe won't arrive at Pluto until July 2015. Afterward, the probe will venture on to explore the Kuiper Belt, a distant "halo" of small, frozen objects surrounding the solar system, from which comets originate.

Aside from sheer curiosity about these distant worlds, scientists are motivated by questions about the formation of the solar system. Orbiting in the deep freeze far from the sun, Pluto and Charon have undergone less change than the inner planets during the solar system's 4.5 billion year history. These two worlds will provide a glimpse into the past.

Pluto could also shed light on the origin of our own Moon. Earth, with its single, large moon, is unusual. The Pluto-Charon system is the only other pair like it in the solar system. In fact, some astronomers consider Earth and the Moon to be a double planet, too. So knowing more about Pluto and Charon could give clues about how the Earth-Moon system formed.

And, of course, the spectacular, up-close photos of Pluto and Charon are going to look great as a screensaver!

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This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

## Ottawa Centre Bulletin Board

### For Sale: Binoculars

Universe 7x35 Extra Wide Angle binoculars (\$40) offer an amazingly bright view across 11 degrees of sky... perfect for general stargazing and easy starhopping to fields of interest.

Also, Bushnell Ensign 10x50 binoculars (\$50)... just right for that extra bit of oomph when zeroing in on a target before going after it in the telescope. These two binoculars make a very useful combination.

Contact [brian.brightstar@sympatico.ca](mailto:brian.brightstar@sympatico.ca) or at 831-4932

### For Sale: Astronomy Kit-bag Cleanup

- Pentax ME-F 35mm SLR body — manual shutter operation \$100
- Olympus OM-1 astrophotography kit — the gold standard for film-based astrophotography!
  - Olympus OM-1 35mm SLR camera (with Zuiko 50mm f/1.8 lens) All manual, mirror lockup to cut vibration, interchangeable focus screen \$350
  - Beattie Intenscreen focus screen for OM-1 (#4, plain) for brighter images and easier focussing \$40
  - Olympus OM T-mount adapter \$10
  - Stellar Technologies Stiletto IV Ronchi focus with OM-1 adapter and 15mm Plossl eyepiece. Focus your telescope precisely by nulling the line patterns of a Ronchi grating. \$130
- Package: OM-1, Intenscreen, T-mount adapter, Stiletto IV: \$490 (\$40 off, no haggling!)
- Celestron radial guider \$60
- Scopetronix universal camera/camcorder mounting bracket \$25
- Kendrick Model 2064 SCT laser collimator, with adapters \$150
- JMI NGC-MAX digital setting circles computer unit (without encoders. You can add an encoder kit from JMI, or use standard US-Digital model S-2 optical encoders.) \$200

All prices negotiable. Contact Tim Cole at [TimCole@rogers.com](mailto:TimCole@rogers.com)

**For Sale: SkyWatcher 130mm f/7 Newtonian Telescope**

Assembled but *never* used. Purchased for \$350. Can now be purchased new for \$300. Asking \$225 or best offer.

This telescope has retractable **wooden** legs (tripod) rather than aluminum. For detailed specifications visit: <http://www.skywatchertelescope.net/1309EQ2.html>

For inquiries — please call at 726-7317. You can ask for Cheryl or Margaret.

**Meteorites and Tektites for sale.**

Stones and nickel-iron meteorites are available. I am thinning out my collection again, so hurry while supplies last. This is your opportunity to acquire genuine rocks from space.

Also available: impact specimens from Sudbury, shattercones, breccia etc.

Contact Ron at 842-9125 evenings after 6:30 PM or e-mail anytime at [spacerocks@rogers.com](mailto:spacerocks@rogers.com).

**Starlight Theatre**

Need containers for a precious eyepiece? Bring it in and pick a *Skypiece* container that fits.

If you are learning your way around the sky, you will find our *Celestial Sphere* videotape or star maps very useful. They are great for beginners or as presents for beginners. We also have teaching materials for educators. A description of these and other items is on our web site ([www.starlight-theatre.ca](http://www.starlight-theatre.ca)). Buy at the RASC meetings for discounts and save on shipping and handling charges.

We set up after every meeting beside the coffee table. We accept cash and checks made out to Starlight Theatre.

Contact Robert Dick at [slt@starlight-theatre.ca](mailto:slt@starlight-theatre.ca)

**Atlas of Finest NGC Objects and Messier Atlas**

*Atlas of Finest NGC Objects* covers 110 FNGC objects and over 130 other NGC objects on 107 charts. Charts are 3 x 4 degrees with limiting magnitude of 12.4. Info on objects is summarized at the bottom of each page. Includes 26-page, mag. 7.3 Star Atlas. 145 pages. *Messier Atlas* covers all Messier objects; same format as *FNGC Atlas*. 140 pages. Both atlases available in "Correct Image" and "Mirror E/W" formats. Prices are \$20.00 each atlas or both for \$35.00. For more information, call Harry Adams at (613) 584-4804 or e-mail [far.star@sympatico.ca](mailto:far.star@sympatico.ca)

## Next RASC Ottawa Centre Meeting

**Canada Science and Technology Museum  
Special Date!  
8:00 PM Friday 11 June 2004**

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The Ottawa Centre warmly thanks the Chapters Bookstores of the Ottawa area for their generous donations of astronomy-related books for our meeting door prizes.

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*Clear skies!*

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