POLARIS

Royal Astronomical Society of Canada
London Centre Newsletter
January 2017

Exploring Sundials

By Patrick Whelan

Winters in South Western Ontario can certainly be devoid of clear night skies. However, one night last week it was actually clear so I put my 12" SkyWatcher Collapsible Dobsonian outside to cool down. One and a half hours later I went out and braved the elements.

The Orion Nebula, M42 was due south so I pointed at it. Not a bad viewing target for in the city. Using an Orion SkyGlow Ultrablock Narrowband filter, the nebula popped out beautifully. I then tried an 0xygen-III filter to boost the contrast. I think it was better at showing the nebula.

The moon was coming up so I pointed the scope at it for a while. As it was low and the seeing wasn't very good, I packed it in for the night. By this time the outside of the scope was already coated in a thin sheet of ice. Cold! I used to be able brave the cold to observe. However, not so much anymore. Maybe it's a sign of aging.

So, what to do with my astronomy hobby in the Great White North? One idea is to rediscover sundials by reading about them and making them.

There is a wealth of information on the internet about making sundials. You should use a Google search to see some of the sundials people have made! There are plans for building sundials and even software for creating sundials. Or, if you prefer, you can go 'old school' and use books.

Several years ago, I found some freeware software on the internet called **Shadows**; a package for understanding and creating sundials. It is still available and is very current. There are now 3 versions of it: Freeware, Expert and Pro.

The Freeware program is great! It allows you to create customized sundials for your exact longitude and latitude. You can create horizontal, vertical, polar and equatorial sundials. You can print out the sundial itself as well as the gnomon (the arm that casts the shadow on the dial) and the equation of the time scale as well. If you want to spend some money, the other versions of the software will allow you to create many more types of sundials. Sundials like: reclining, Shepherd sundial and armillary ring. I bought an armillary ring sundial from Lee Valley years ago. They still carry sundials but not that type.

Here is a description of some common types of sundials.

Horizontal Dial

This is the type found commonly on pedestals in gardens. The dial plate is horizontal. The gnomon (which

Horizontal sundial made using Shadows program

casts the shadow) makes an angle equal to the latitude of the location for which it was designed.

Vertical Dial

This is the type found on the walls of churches and other buildings. Vertical sundials may be direct south

Vertical Sundial

dials if they face due south (in which case the gnomon will be at an angle equal to the co-latitude of the place,

and the hour lines, if delineated for local time at the place, will be symmetrical about the vertical noon line).

If they do not face directly south, they are described as declining dials, and in this case the gnomon will be at a lesser angle than the co- latitude, and the hour lines will generally be grouped more tightly in the morning hours, for south-east decliners and, conversely, grouped in the afternoon hours for south-west decliners

Though much less common, there are dials with dial plates which are neither vertical nor horizontal. These are called reclining dials

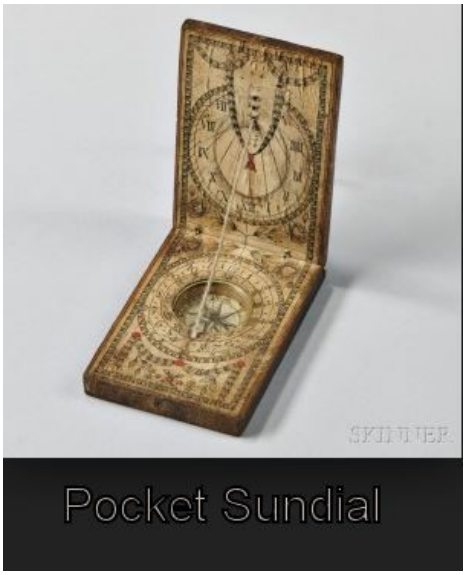
Equatorial Dial

This type of sundial has its main surface parallel to the Earth's equator and the gnomon is perpendicular to it. The gnomon points to the Celestial north pole. Both sides of the dial must be marked since the shadow will be on one side in the summer

and the other side in the winter.

Pocket Dial

This is a folding sundial with a string for the gnomon. It usually has a small compass inlaid into it so you can point it North.



Spherical or Armillary Ring

This dial has a gnomon which is parallel to the polar axis (it points to the Celestial north pole) and the shadow is cast on a bar which has been bent into a semi-circular shape.

Internet Resources

It is fun to print and create a sundial out of paper with a child. It helps them understand how the Earth rotates and moves in its orbit around the Sun. Look at the weblinks below for other sundials you can customize to your location and then download and print. Or, download **Shadows Freeware** and print sundials to your hearts content!

Weblinks

http://www.mysundial.ca/
http://sundials.org/ (North American Sundial Society)
www.shadowspro.com (great software called Shadows)

Moon Phases

Last Quarter: January 19, 2017

New Moon: January 28, 2017

First Quarter: February 4, 2017

Full Moon: February 11, 2016

Sky Events for Late January and February

Tuesday, January 24 – Saturn 4° S of Moon
Thursday, January 26 – Mercury 4^0 S of the Moon
Monday, January 30 – Neptune 0.2^0 S o Moon occultation
Tuesday, January 31 – Venus 0.02° N of Moon
Friday, January 3 – Ceres 1.0^0 S o Moon, Occultation
Saturday, February 11 – Regulus 0.8^0 N of Moon
Friday, February 17 – Venus greatest illuminated extent

The Moon occults both Aldebaran and Regulus somewhere in the world each lunar month.
On Tuesday January 31st Mars, Venus and the waxing crescent Moon will fit in a 6^0 circle in the evening sky.
In January, Mercury and Saturn emerge in the morning sky.
Venus is prominent in the evening sky and Uranus sets in late evening
In February, Uranus low in the western evening sky.
Neptune vanishes into the evening twilight early in the month.

R.A.S.C. London Centre Library
Books of the Month, January 2017
By Robert Duff

As always, these "Books of the Month" are available for loan to members, to be returned at the following monthly meeting. The books for January 2017 are as follows:

Cataclysmic Cosmic Events and How to Observe Them, by Martin Mobberley. c2009. (Astronomers' Observing Guides)

Universe on a T-shirt: the Quest for the Theory of Everything, by Dan Falk. c2002

Sky & Telescope [compact disc]: January—December, 2015 (1 DVD-ROM disc) – c2016.

For a complete listing of our library collection please go to the *Main Menu* on the left side of the *RASC London Centre* Web site main page and click on *Club Library*: **http://www.rasclondon.ca/library-and-rentals**

If there is a particular book or video you wish to borrow, please feel free to contact me by telephone at (519) 439-7504 or by e-mail at **rduff@sympatico.ca**

Cronyn Observatory Public Night & Exploring the Stars Event, January 9th & 12th 2017
By Robert Duff

Cronyn Observatory Public Night Monday, Jan. 9th, 2017

Hazy cloudy skies greeted 19 visitors to Western University's Cronyn Observatory Public Night, Monday, January 9th, 2017, 7:00 p.m. Since there was no slide presentation, visitors simply went upstairs into the dome where they were greeted by graduate student Robin Arnason and RASC London Centre members Everett Clark and Bob Duff.

Robin showed visitors the 4-day-past 1st quarter gibbous Moon through the big 25.4cm refractor in the dome, using the 28mm Meade Super Wide Angle eyepiece (157X). There were craters visible on the edge of the Moon despite the view through the thin hazy clouds. Everett set up the observatory's 8-inch (20.3cm) Meade Schmidt-Cassegrain, with the 12.5mm Ortho eyepiece (160X), inside the dome so as to view out the door to the roof patio for visitors to view the TV screen, visible through the windows of the Western Sports & Recreation Center. Bob later swapped in the 20mm Plossl eyepiece (100X) for a better view though the Schmidt-Cassegrain.

Everett distributed 4 *"Star Finder"* planispheres to interested visitors. The visitors were gone by around 8:45 p.m. and the observatory was closed down after an interesting evening viewing through the telescopes and learning about astronomy, despite the clouds.

Exploring the Stars, Private Group, Jan. 12th, 2017

Mostly cloudy skies greeted a private group of 24 visitors (18 children and 6 adults) for Exploring the Stars at Western University's Cronyn Observatory, on Thursday, January 12th, 2017, 7:00 p.m. They were welcomed by graduate students Kendra Kellogg and Viraja Khatu. Kendra presented the slide presentation *"The Earth Moon System"* and fielded questions. Kendra and Viraja followed this with the *"Star Finder"* planispheres activity, distributing 16 *"Star Finder"* planispheres and showing the children how to assemble and use them. (There were only 16 planispheres distributed by

Kendra since a lady visitor brought 2 additional planispheres from a previous event.)

RASC London Centre was represented by Everett Clark and Bob Duff. When everybody arrived upstairs in the dome, Bob gave a brief talk about the Cronyn Observatory and some of the technical aspects of the big 25.4cm refractor. Bob also explained the 2 clocks on the east wall of the dome and the difference between Standard and Sidereal Time. Everett set up the observatory's 8-inch (20.3cm) Meade Schmidt-Cassegrain (26mm Plossl eyepiece, 77X) inside the dome so as to view out the door to the roof patio and Bob supervised as the children viewed the TV screen through the windows of the Western Sports & Recreation Center. Everett also showed the visitors the full Moon, through the big 25.4cm refractor (32mm Erfle eyepiece, 137X), as it appeared between the clouds.

Towards the end of the evening Kendra and Viraja introduced the *"Crater Experiment"* activity, which involved dropping various size balls into a pan of flour topped with chocolate powder, which was placed on the floor of the lecture room. Everybody was gone by around 9:00 p.m. after expressing their appreciation for a very enjoyable evening of astronomy.