POLARIS

Royal Astronomical Society of Canada
London Centre Newsletter
July 2017

What to Know About Lead Acid Batteries Before Putting Out

By: Gaetan Godin

Well, the car battery my neighbour provided for my telescope setup finally died. One cell is gone, the most I can get after a charge is about 10 volts. So now I need to replace it, but with what?

Of course it needs 12 volts (which is actually 12.6 volts) apparently each cell provides 2.1 volts and there are 6 of them in a battery.

Did I say the cells are lead plates immersed in acid? They are connected in series internally and that provides the 12 (12.6) volts.

Lead acid batteries power our cars (whoops, power our starting motor, the alternator actually provides power to the car and recharges the battery when you are motoring).

So a car battery needs a lot of power for a short amount of time, they call that cold cranking amperage or CCA and is usually indicated on the battery. Usual values for car batteries are over 600 and can go up to over 1000. That is the number of amps available at cranking time.

So car batteries are designed like that... lots of power for short amounts of time, they spend most of their lives all charged up and ready to put out fast for a short amount of time (familiar?)

These batteries suffer terribly if they are allowed to discharge too much (to less than 10V) as they become sulphated. The lead plates become covered and there really is no practical way to unsulphate them. Eventually the battery refuses to "put out" and you have to "put-out" to get a new one.

...But — that is not the kind of battery I want. I want a battery that continues to put out and service my equipment right through the night. Luckily there is a battery for that and it is called a deep cycle battery. Looks the same but is built so that it can discharge almost completely before dying. A deep cycle battery has interesting properties.

1) It is rated in amp-hours (Ah), typically 65 Ah and up, depending on how much you want to spend.
2) It has a reserve capacity rating in minutes, typically about 120 minutes.
3) It does not like to be discharged quickly, if you discharge it quickly it has less Ah available.

I went to Walmart and looked at their batteries. One of these deep cycle marine batteries had the following properties:

- 675 Marine cranking amps
- 550 Cold cranking amps
- 65 amp hours (@20 hour)
- 120 reserve minutes

The cranking amps don't concern me (unless my car dies when I am at Fingal!) ...but the other figures do. The 65 amp hours is the number of amps this battery puts out for 20 hours before reaching 0 volts. The 20 hours is critical because these batteries put out less if they are discharged faster and more if they are discharged slower. So, the standard discharge time is 20 hours. For this battery, it must have put out about 65 / 20 = 3.25 amps per hour.

I doubt my equipment needs 3.25 amps per hour so all is good. ...but wait, I don't want to buy a new battery every year. It is recommended not to discharge these batteries past 50% in order to prolong their life. Ok, so now I can power my equipment for 10 hours at 3.25 amps per hour (or 5 hours at 6.50 amps per hour – I plan on connecting my laptop). That's pretty good, especially in the summer when the nights are shorter.

The reserve minutes are an indication of how tough this battery is. It is an indication of how long it takes to discharge this battery while putting 25 amps through it. Since this is a fast discharge rate the battery discharges faster (65 / 25 = 2.6 hrs or 156 minutes) hence its rating of 120 minutes.

Battery Types

There are different kinds of these batteries depending on their electrolyte. Some have acid (flooded) others (gel cell) have a gelling agent added to the electrolyte to reduce movement inside the battery case. Many gel batteries also use one-way valves in place of open vents, which help the normal internal gasses to recombine back into water in the battery, reducing gassing. Absorbent glass mat (AGM) batteries, as their name suggests use a glass mat to absorb the electrolyte. Apparently, AGM is taking over from gel.

An important thing to note about AGM: just because a battery is AGM does NOT make it a deep cycle battery. While some companies, have adopted AGM for starting batteries and other non-deep cycle applications. Those still have the advantages of AGM, but are not deep cycle. It is primarily plate thickness that makes a battery deep cycle, not whether it is flooded, gelled, or AGM.

The amount of maintenance required by lead acid batteries depend on the electrolyte and their construction. Traditional lead-acid batteries have caps over their cells so you can monitor the fluid level and touch it up with distilled water if it becomes low. Some batteries are almost completely sealed but have a small vent hole. They may need to be touched up sometimes too. Others are completely sealed and require no internal maintenance.

...and then, for completeness, there are hybrid batteries. They have good cranking ratings so they can be used in cars and are also built to withstand repeated discharging like deep cycle batteries. They are less expensive than deep cycle batteries but have compromises both as car batteries and as deep cycle batteries.

The battery I used as an example here, from Walmart, EverStart Marine Deep Cycle battery (part no. 24DC-700N), lists at $115.00. Canadian Tire has the equivalent (010-2499 – Dual purpose starting & deep cycle – flooded) and it lists at $124.00. Canadian Tire also has one (010-2498 – Ultra - AGM) that lists at $199.00, 79 Ah and 145 minutes.

Warranties also enter into this. Depending on how long you have had the battery they may also pro-rate the credit you get on a new battery. I am heading out to Walmart for the 24DC-700N ($115.00) battery.

Now what to do about a good quality battery charger? Not sure if I will need to put out to buy a new one. However, that is a topic for another article.

OBS 2 News

As folks may know, last fall the Celestron C-14 in OBS2 developed a haze on the onside of the corrector plate. Dale has taken the lead to photograph the problem and report it top Celestron. Since the scope is out of the warranty, it was possible that we could be responsible for an expensive repair.

Fortunately, Dale has found threads on Cloudy Nights regarding an out-gassing issue within the tube, which Celestron has apparently addressed in the past. This being the case, this information was brought to the attention of Celestron's Technical Support staff. Fortunately, Celestron has offered to repair the unit without charge. (Provided we cover shipping costs.)

The C-14 has now been removed OBS2 so the site will be out of commission for 3-4 weeks.

Thanks to Dale Armstrong, Pete Raine and Mike Hanes (and any others involved) for working on this issue.

Moon Phases

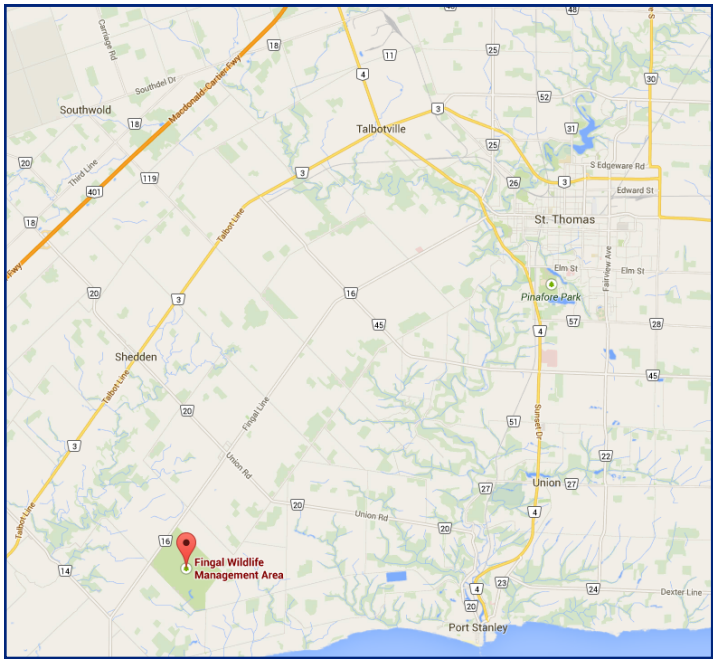
New Moon: July 23, 2017

First Quarter: July 30, 2017

Full Moon: Aug. 7, 2017

Last Quarter: Aug. 15, 2017

Fingal Dark Sky Observing Site



Sky Events for Late June and early July

July 23 New Moon
July 25 Mercury 0.9° & Regulus 0.07° S of Moon
July 26 Mercury 1.1° S of Regulus
July 30 Moon — First Quarter
Aug. 3 Saturn 3° S of Moon
Aug. 7 Full Moon
Aug. 12 Perseid meteors peak
Aug. 15 Moon — Last Quarter
Aug. 21 New Moon — Total Solar Eclipse
Aug. 29 Moon — First Quarter
Aug. 30 Saturn 4.0° S of Moon

Planets
Mercury: Well placed in the evening sky in first half of the month
Venus: Receding from Earth bur remains prominent in the dawn sky
Mars: Too close to the Sun to be seen.
Jupiter: Low in the evening sky throughout the month.
Saturn: Moderately well placed in the late evening hours.
Uranus: Rises in the late evening sky in Pisces
Neptune: Rises in the mid evening.

R.A.S.C. London Centre Library — Books of the Month, July 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 July 2017 are as follows:

The Backyard Astronomer's Guide, by Terence Dickinson & Alan Dyer. Revised Edition. 2002.

NightWatch: a Practical Guide to Viewing the Universe, by Terence Dickinson. 3rd Edition, Revised and Expanded for Use Through 2010. 1998 (2003 printing).

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

For a complete listing of our RASC London Centre Library collection please click on the Library menu at the top of the RASC London Centre main Web page: http://rasclondon.ca/
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**

Exploring the Stars Events & Cronyn Observatory Public Nights & Special Events, June 10th —July 12th 2017

By Robert Duff

Cronyn Observatory Public Night, Saturday, June 10th, 2017

Written by Robert Duff, as Reported by Everett Clark, Heather MacIsaac, Steve Imrie and Henry Leparskas

Partly cloudy skies greeted some 100 visitors to Western University's Cronyn Observatory Summer Public Night, Saturday, June 10th, 2017, 8:30 p.m. Professor Martin Houde made 3 presentations of his digital slide presentation *"Submillimetre Astronomy"* and fielded questions. Undergraduate student Angus Keith was "crowd manager." There were 48 visitors at the first slide presentation, 28 at the second and 15 at the third for a total attendance of 91 visitors. There were a few people who went directly upstairs into the dome, bringing the estimated total to 100 visitors.

RASC London Centre was represented by Everett Clark, Heather MacIsaac, Steve Imrie and Henry Leparskas. Henry welcomed and directed visitors during the first slide presentation. Undergraduate student Sean Huggins was "telescope operator" for the big 25.4cm refractor in the dome and Henry helped him learn how to use the hour angle and declination setting circles using celestial coordinates provided by the *Starry Night Pro* software on the computer. Sean successfully found Jupiter in the bright twilight sky. Visitors enjoyed a good views of Jupiter and Saturn through the 25.4cm refractor, using the 28mm Meade Super Wide Angle eyepiece (157X).

On the roof patio outside the dome, Everett Clark and Heather MacIsaac supervised as visitors

viewed Jupiter through the observatory's 20.3cm Meade Schmidt-Cassegrain (20mm Plossl eyepiece, 100X). Steve Imrie showed visitors Jupiter and Saturn through the London Centre's home-built 30.5cm Dobsonian (17mm Nagler eyepiece, 88X) as well as the one-day-past-full waning gibbous Moon, rising low in the eastern sky and partly obscure by tree branches. Heather MacIsaac showed visitors Jupiter and Saturn through her Celestron Go-To 90mm Maksutov (17mm Plossl eyepiece, 73.5X).

Henry Leparskas spent the evening downstairs in the *"Black Room"* giving demonstrations the *"Transit Demo"* model—showing how the transit detection method worked for finding extra-solar planets. Henry also gave visitors tours of the downstairs *"1940s Period Room,"* an historic recreation (designed by RASC London member Mark Tovey) of Dr. H. R. Kingston's 1940 office with his brass refractor and the *Sotellunium*—a mechanical eclipse demonstration model built by W. G. Colgrove—on display. He did not open the *"1967 Period Room"* on which work was still being done.

Henry closed down *"Black Room"* and *"1940s Period Room"* at 10:30 p.m. and went upstairs to take over the observatory's 20.3cm Meade Schmidt-Cassegrain, showing visitors Saturn and Jupiter (20mm Plossl eyepiece, 100X) and the "Double-Double" star system Epsilon Lyrae (12.5mm Ortho eyepiece, 160X). The observatory was closed down around 11:00 p.m. after an excellent evening or astronomy.

Cronyn Observatory Public Night
Saturday, June 17th, 2017

Mostly cloudy, later partly clearing skies greeted 26 visitors to Western University's Cronyn Observatory Summer Public Night, Saturday, June 17th, 2017, 8:30 p.m. Undergraduate student Meet Panchal made his digital slide presentation on *"Charles Messier's Catalog of the Heavens"* and fielded questions. Due to technical difficulties, the laptop computer from the *"Transit Demo"* in the *"Black Room"* was used for the slide presentation.

RASC London member Bob Duff counted visitors. There were 16 people in the lecture room at the beginning of the slide presentation. More people arrived, including some who joined the slide presentation and 4 who went directly upstairs into the dome and one who arrived later after the lecture. Graduate student Pranav Manangath was "crowd manager" and confirmed some 26 visitors at the end of the evening.

Graduate student Viraja Khatu was telescope operator for the big 25.4cm refractor in the dome. RASC London Centre was represented by Everett Clark, Heather MacIsaac, Henry Leparskas, Bob Duff, Peter Jedicke and Mark Tovey. Everett, Henry and Heather used celestial coordinates provided by the *Starry Night Pro* software on the computer to locate Jupiter, although it was obscured by clouds. Everett set up the observatory's 20.3cm Meade Schmidt-Cassegrain (20mm Plossl eyepiece, 100X) inside the dome so as to view the communications tower in south London, through the door to the observation deck (roof patio). Heather also set up her Celestron Go-To 90mm Maksutov (17mm Plossl eyepiece, 73.5X) inside the dome near the door so as to view the communications tower. When everybody arrived upstairs after the slide presentation, Peter gave a talk about the history and technical aspects of the Cronyn Observatory and the 25.4cm refractor. He then invited the visitors to view through the 20.3cm Schmidt-Cassegrain and 90mm Maksutov telescopes supervised by Bob and Heather, respectively.

The skies partly cleared around 9:50 p.m. and Jupiter was glimpsed from the observation deck. Jupiter and later Saturn were observed through the 25.4cm refractor (32mm Erfle eyepiece, 137X). Everett later swapped in the 28mm Meade Super Wide Angle eyepiece (157X) for a better view of Jupiter. Visitors tried taking pictures though the eyepiece with their smartphones and one man took a picture showing Jupiter with 3 of the Galilean moons near the planet. Henry Leparskas later swapped in the 17mm Nagler eyepiece (258X) for an even more impressive view of Jupiter through the 25.4cm refractor.

Henry Leparskas gave visitors tours of the downstairs *"1940s Period Room,"* an historic recreation (designed by RASC London member Mark Tovey) of Dr. H. R. Kingston's 1940 office with his brass refractor and the *Sotellunium*—a mechanical eclipse demonstration model built by W. G. Colgrove—on display. Henry also showed them the work being done by Mark on the *"1967 Period Room,"* recreating the early control room of the Elginfield Observatory to celebrate the 150th anniversary of Confederation—Canada 150. When the laptop computer became available after the slide lecture, Henry also gave demonstrations of the *"Transit Demo"* model—showing how the transit detection method worked for finding extra-solar planets—in the *"Black Room."* Henry was later joined by Mark Tovey who did some work in the *"1967 Period Room."*

Observing continued until the 11:10 p.m. when the dome was closed down and the RASC London members congregated in the *"1940s Period Room"* before closing down the observatory and leaving around 11:30 p.m. It was an enjoyable evening of astronomy despite the uncertain weather and partly cloudy sky.

Cronyn Observatory Public Night
Saturday, June 24th, 2017

Partly cloudy skies greeted 47 visitors to Western University's Cronyn Observatory Summer Public Night, Saturday, June 24th, 2017, 8:30 p.m. Postdoctoral fellow Dr. Andrew Pon made 2 presentations of his digital slide presentation *"The Most Spectacular Images from Astronomy, and the Science behind Them"* and fielded questions. Undergraduate student Roy Zang was "crowd manager" and counted 19 visitors (including 7 children) for the first slide presentation. Dr. Andrew Pon counted about 20 visitors for each of his 2 slide presentations. Several people arrived after the slide lectures or went directly upstairs into the dome. Roy counted a total of 47 visitors for the evening.

RASC London Centre was represented by Heather MacIsaac, Dale Armstrong, Bob Duff, Steve Imrie, Steve Gauthier, Mark Tovey and Peter Jedicke. Dale set up the observatory's 20.3cm Meade Schmidt-Cassegrain on the observation deck and located Jupiter, using the 15mm Sky-Watcher UltraWide eyepiece (133X). He helped undergraduate student Meet Panchal, who was telescope operator, locate Jupiter with the big 25.4cm refractor. Meet showed visitors Jupiter and Saturn through the 25.4cm refractor, using the 18mm Radian eyepiece (244X). Dale later helped Meet direct the 25.4cm refractor (18mm Radian eyepiece, 244X) to show people the "Double-Double" star system Epsilon Lyrae, the yellow and blue double-star Albireo and the Ring Nebula (M57).

Dale showed visitors Jupiter through the 20.3cm Schmidt-Cassegrain (15mm Sky-Watcher UltraWide eyepiece, 133X) but soon doubled the magnification by installing the CEMAX 2X Barlow lens—from the observatory's 90mm Coronado H-Alpha solar telescope—to show Jupiter and Saturn at 266X. Dale later used his Lumicon Oxygen-III (OIII) filter to split the double star Antares in the 20.3cm Schmidt-Cassegrain (266X).

Steve Imrie and Steve Gautier operated the London Centre's home-built 30.5cm Dobsonian to show people Jupiter and Saturn, using the 17mm Nagler eyepiece (88X), and later swapping in the 12.5mm Ortho eyepiece (120X) for a better look at Saturn. Heather MacIsaac showed visitors Jupiter through her Celestron Go-To 90mm Maksutov (17mm Plossl eyepiece, 73.5X).

Mark Tovey gave visitors tours of the downstairs *"1940s Period Room,"* an historic recreation (designed Mark) of Dr. H. R. Kingston's 1940 office with his brass refractor and the *Sotellunium*—a mechanical eclipse demonstration model built by W. G. Colgrove—on display. Mark also showed them his work being done on the *"1967 Period Room,"* recreating the early control room of the Elginfield Observatory to celebrate the 150th anniversary of Confederation—Canada 150.

There was a bright Iridium flare visible towards the west at 11:08 p.m. (as reported on the Heavens *Above Web* site) and viewed by everybody on the observation deck. The observatory was closed down around 11:25 pm., after a very enjoyable evening of astronomy.

Asteroid Day at the Cronyn Observatory
June 30th, 2017

Western University's Centre for Planetary Science and Exploration (CPSX) in collaboration with the Department of Physics and Astronomy and the Department of Earth Sciences hosted a special event at the Hume Cronyn Memorial Observatory on Asteroid Day, Friday, June 30, 2017, 2:00—5:00 p.m. Asteroid Day is held each year on the anniversary of the 1908 Tunguska impact event in Siberia—the largest in recent history—and is a global awareness campaign bringing people around the world together to learn about asteroids and how to protect future generations from cosmic impacts.

The event organizer was recent Western University doctoral graduate in astronomy, Parshati Patel, who is Outreach Program Coordinator for Western's Centre for Planetary Science and Exploration. RASC London Centre was represented by Henry Leparskas, Heather MacIsaac and Bob Duff. There were digital slide presentations by 2 faculty members, including Professors Peter Brown, *"Asteroid Impacts and Hazards"* (2:30 p.m.) and Paul Wiegert *"Search for Asteroids"* (3:30 p.m.).

Downstairs in the *"Black Room"* Professor Audrey Bouvier, Curator of the Western Meteorite Collection, Earth Sciences Department; and Kayle Hansen, Research Assistant at CPSX (and Planetary Society, London Chapter, Outreach Coordinator), fielded questions at the *Meteorites & Impactites Display* table. People were invited to bring rocks they thought might be meteorites for inspection by a Meteorite Expert on site. Dr. Audrey Bouvier was there 2:00—4:30 p.m. Recent doctoral graduate in astronomy Maryam Tabeshian presided over the *Edible Rock Analysis* display table and compared cut-away chocolates and chocolate bars with pictures of meteorite cross-sections to explain different types of meteorites. Parshati later took over the *Edible Rock Analysis* display table. Undergraduate student Dana Beaton operated the *Impact Cratering Demonstration*, using the Short Range Projectile Launcher mounted on a stand to fire a 2cm diameter ball into a transparent Plexiglas box filled with sand at the bottom. A slow motion demonstration of an impact was also shown on a small laptop computer. A CTV London cameraman was there and videoed the impact cratering demonstrations and other activities.

Mark Tovey gave visitors tours of the downstairs *"1940s Period Room,"* an historic recreation (designed by Mark) of Dr. H. R. Kingston's 1940 office with his brass refractor and the *Sotellunium*—a mechanical eclipse demonstration model built by W. G. Colgrove—on display. Mark also showed them his work being done on the *"1967 Period Room,"* recreating the early control room of the Elinfield Observatory to celebrate the 150th anniversary of Confederation—Canada 150.

There was solar observing upstairs on the observation deck outside the dome under partly cloudy skies with the bright Sun occasionally obscured by clouds. Henry Leparskas, later assisted by Bob Duff, showed visitors prominences and filament on the Sun through the observatory's 90mm Coronado H-Alpha Solar Telescope (CEMAX 18mm eyepiece and 2X Barlow lens, 88X) on the Sky-Watcher EQ5 mount. Heather MacIsaac showed people a tiny sunspot on the Sun through her Celestron Go-To 90mm Maksutov (32mm Plossl eyepiece, 39X) with a Kendrick Astro Baader film solar filter. Heather gave 2 visitors a tour of the big 25.4cm refractor in the dome and explained the Standard and Sidereal Time clocks on the east wall. Henry gave one lady 2 *"Star Finder"* planispheres.

Bob counted 38 visitors in Peter Brown's slide presentation at 3:10 p.m. and 33 visitors in Paul Wiegert's slide presentation at 3:38 p.m. There was a steady stream of visitors in the *"Black Room"* and *"Period Rooms"* as well as on the observing deck upstairs. Parshati estimated

that there were 70—75 visitors in all for the afternoon. Solar observing continued until around 5:10 p.m. and the observatory was shut down around 5:50 p.m. after the last visitors left.

Cronyn Observatory Public Night
Saturday, July 1st, 2017

Mostly clear skies greeted some 32 visitors to Western University's Cronyn Observatory Summer Public Night, Saturday, July 1st, 2017, 8:30 p.m. Undergraduate student Meet Panchal made 3 presentations of his digital slide presentation on *"Gravitational Waves"* and fielded questions. Graduate student Richard Bloch was "crowd manager" for the evening and counted a total of 32 visitors. Since it was the Canada Day 150 anniversary there were fewer visitors than usual, although fireworks in Harris Park were visible from the observation deck at 10:00 p.m.

Professor Jan Cami was there early in the evening and helped the telescope operator, undergraduate student Roy Zang, direct the big 25.4cm refractor in the dome towards Jupiter, using hour angle and declination coordinates from the *Starry Night Pro* software on the computer. Roy showed visitors excellent views of Jupiter and Saturn through the 25.4cm refractor, with the 28mm Meade Super Wide Angle eyepiece (157X), throughout the evening.

RASC London Centre was represented by Henry Leparskas, Steve Imrie, Heather MacIsaac, Paul Kerans, Dan Tremblay, Bob Duff, Dale Armstrong, Steve Gauthier, Mark Tovey and Edith Tovey. On the roof patio outside the dome Paul Kerans set up his Celestron 9.25-inch (23.5cm) Schmidt-Cassegrain on a Vixen equatorial mount and showed visitors the one-day-past-first quarter Moon (28mm eyepiece, 84X) and then Jupiter, the globular cluster M13, and the galaxies M81 and M82, using his Sky-Watcher LE 15mm eyepiece (157X). Heather showed visitors good views of Jupiter and Saturn through her Celestron Go-To 90mm Maksutov using a 17mm Plossl eyepiece (73.5X), and then Saturn again, using a 13mm Plossl eyepiece (96X).

Steve Imrie directed the London Centre's home-built 30.5cm Dobsonian (17mm Nagler eyepiece, 88X) towards the one-day-past-first quarter Moon. He was joined by Steve Gauthier, who used his laser collimator to improve the secondary mirror collimation in the 30.5cm Dobsonian, and realigned the finderscope. They showed visitors the Moon and Jupiter (88X) and then swapped in the 12.5mm Ortho eyepiece (120X) to show them Jupiter again. They then borrowed Paul's 2-inch 2X Barlow lens and combined it with the 17mm Nagler eyepiece to view Jupiter at 176X in the 30.5cm Dobsonian.

Mark Tovey gave visitors tours of the downstairs *"1940s Period Room,"* an historic recreation (designed by Mark) of Dr. H. R. Kingston's 1940 office with his brass refractor and the *Sotellunium*—a mechanical eclipse demonstration model built by W. G. Colgrove—on display. Mark also showed them his work being done on the *"1967 Period Room,"* recreating the early control room of the Elginfield Observatory to celebrate the 150th anniversary of Confederation—Canada 150. Henry Leparskas gave demonstrations of the *"Transit Demo"* model—showing how the transit detection method worked for finding extra-solar planets—in the *"Black Room"* for the first half of the evening.

Mark later closed down the *"Period Rooms"* and joined the observers upstairs on the observation deck. Dale Armstrong took pictures with his camera and tripod in the dome and on the observation deck throughout the evening. Observing continued until 11:10 p.m., with the dome being closed down around 11:25 p.m., after a very enjoyable evening of astronomy.

Cronyn Observatory Public Night
Saturday, July 8th, 2017

Clear skies greeted some 111 visitors to Western University's Cronyn Observatory Summer Public Night, Saturday, July 8th, 2017, 8:30 p.m. Professor Margaret Campbell-Brown made 2 presentations of her digital slide presentation *"Meteor Showers"* and fielded questions. Undergraduate student Josh Folkerson was "crowd manager" for the evening and counted a total of 111 visitors.

Professor Peter Brown was telescope operator, and directed the big 25.4cm refractor in the dome towards Jupiter, using hour angle and declination coordinates from the *Starry Night Pro* software on the computer. Visitors enjoyed excellent views of Jupiter through the 25.4cm refractor, using the 28mm Meade Super Wide Angle eyepiece (157X) and 18mm Radian eyepiece (244X). Saturn was observed after 11:00 p.m. through the 25.4cm refractor, using the 28mm Meade SWA eyepiece (157X) and 17mm Nagler eyepiece (258X).

RASC London Centre was represented by Dale Armstrong, Heather MacIsaac, Steve Imrie, Henry Leparskas, Bob Duff, Mark Tovey, Steve Gauthier and Peter Jedicke. There were 3 amateur telescopes set up on the observation deck outside the dome. Dale showed visitors Jupiter and Saturn through the observatory's 20.3cm Schmidt-Cassegrain (15mm Sky-Watcher UltraWide eyepiece, 133X). He later doubled the magnification by installing the CEMAX 2X Barlow lens—from the observatory's 90mm Coronado H-Alpha solar telescope—and used his Lumicon Oxygen-III (OIII) filter to try and split the double star Antares in the 20.3cm Schmidt-Cassegrain (266X). The OIII filter revealed what appeared to be a bright emerald companion to the fainter red Antares. However, a similar double image was revealed when viewing Arcturus, indicating that an internal reflection in the OIII filter was producing the double image. Dale later showed visitors the "Double-Double" star system Epsilon Lyrae, through the 20.3cm Schmidt-Cassegrain (12.5mm Ortho eyepiece, 160X), the Ring Nebula (M57) and globular cluster M13.

Steve Imrie operated the London Centre's home-built 30.5cm Dobsonian to show people Jupiter, using the 17mm Nagler eyepiece (88X). Steve Gauthier arrived and used his laser collimator to adjust the 30.5cm Dobsonian's secondary mirror. They then showed visitors good views of Jupiter and Saturn using Steve Gauthier's 9mm Nagler eye-

piece (166X), and Saturn again with his 7mm Nagler (214X). Bob Duff brought out the Zhumell 2-inch Variable Polarizing Filter, donated to the London Centre by Norm McCall for use at the Cronyn Observatory, and Steve Gauthier installed it in the 17mm Nagler eyepiece (88X) to show visitors a comfortable view of the full Moon through the 30.5cm Dobsonian.

Heather showed visitors good views of Jupiter and Saturn through her Celestron Go-To 90mm Maksutov, using a 17mm Plossl eyepiece (73.5X), and later doubled the magnification with a 2X Barlow lens to show Saturn at 147X.

Mark Tovey gave visitors tours of the downstairs *"1940s Period Room,"* an historic recreation (designed by Mark) of Dr. H. R. Kingston's 1940 office with his brass refractor and the *Sotellunium*—a mechanical eclipse demonstration model built by W. G. Colgrove—on display. Mark also showed them his work being done on the *"1967 Period Room,"* recreating the early control room of the Elginfield Observatory to celebrate the 150th anniversary of Confederation—Canada 150. Henry Leparskas gave demonstrations of the *"Transit Demo"* model—showing how the transit detection method worked for finding extra-solar planets—in the *"Black Room"* throughout the evening.

Henry and Bob gave out 7 of the observatory's eclipse glasses folded into RASC London Centre brochures, to a group of visitors who requested them, as well as 7 *"Star Finder"* plansipheres. Observing Saturn through the 25.4cm refractor continued past 12:00 midnight, long after the last visitors had left, with the observatory being closed down by the remaining RASC London members, sometime later after a very enjoyable evening of astronomy.

SHAD: Solar Observing at the Cronyn Observatory
Monday, July 12th, 2017

Cloudy skies with some light rain greeted 79 visitors (including 68 students and 11 adults) from the SHAD program, for solar observing at Western University's Cronyn Observatory, Wednesday, July 12th, 2017, 2:00 p.m. The SHAD program is for highly gifted high school students from across Canada. They were welcomed in the lecture room by Professor Jan Cami who presented a digital slide presentation on *"Astronomy and Space Research at Western."* After the slide presentation the students were then divided into 2 groups of about 30 each, with one group going upstairs into the dome and the other downstairs into the *"Black Room"* and *"1940s Period Room."*

Downstairs in the *"Black Room"* Jan demonstrated the *"Transit Demo"* model—showing how the transit detection method worked for finding extra-solar planets, as well as the *"Spectroscopy Demo"* with the visitors putting on *diffraction grating* glasses to view the spectra of 4 gas discharge lamps set out on the table, including: hydrogen, helium, neon and mercury. Jan also gave tours of the *"1940s Period Room,"* an historic recreation (designed by RASC London member Mark Tovey) of Dr. H. R. Kingston's 1940 office with his brass refractor and the *Sotellunium*—a mechanical eclipse demonstration model built by W. G. Colgrove—on display.

RASC London Centre was represented by Paul Kerans and Heather MacIsaac. Together with graduate student Viraja Khatu, they showed the visitors the different telescope in the dome. Cloudy skies ruled out solar observing. Paul set up the observatory's 90mm Coronado H-Alpha solar telescope (Sky-Watcher EQ5 mount) and the London Centre's home-built 30.5cm Dobsonian on display inside the dome, which remained closed due to weather conditions. Viraja set up the observatory's Orion AstroView 6 (15cm) Newtonian reflector, with the CEMAX 12mm eyepiece (62.5X)—from the observatory's 90mm Coronado H-Alpha solar telescope—installed, and Jan directed it so as to view the communications tower in south London, through the door to the observation deck. Paul also set up the London Centre's 25.4cm Dobsonian (17mm Nagler eyepiece, 66X) inside the door so as to view the wind turbine on the Engineering building. Heather set up her Celestron Go-To 90mm Maksutov (32mm Plossl eyepiece, 39X) inside the door so as to view the communications tower in south London. Viraja, Paul and Heather welcomed each of the 2 groups of students as they circulated between the downstairs *"Black Room"* and *"1940s Period Room"* and the dome.

Paul gave a talk to each group, when they arrived, on the history of the Cronyn Observatory and technical aspects of the big 25.4cm refractor in the dome. He also explained the difference between the Dobsonian reflector telescope and the refractor. Heather explained the 2 clocks on the east wall and the difference between Standard and Sidereal Time. They invited the students to look though the telescopes that had been set up inside the dome. The event was over by around 4:00 p.m. with the students having enjoyed the demonstrations in the *"Black Room"* and tours of the *"1940s Period Room"* and observatory dome.