POLARIS

Royal Astronomical Society of Canada
London Centre Newsletter
April 2017

The Beauty of Star Clusters

Compiled By Norman McCall

Every astronomer whether armature or professional has one or more favorite objects; targets they keep coming back to year after year. With each viewing, there is a greater appreciation of the beauty of the night sky and the mystery of this universe we all live in.

I believe one favorite on not enough. It is better to have one in every category: a planet, a star, a double star, a star cluster, a nebula, a Galaxy, or other deep-sky object. ...the list just keeps going. Let us take a moment to consider some of the better-known star clusters.

What is in a Star Cluster?

Star clusters are groups of stars which are gravitationally bound. Two distinct types of **star cluster** can be distinguished: **globular clusters** are tight groups of hundreds of thousands of very old stars, while **open clusters** generally contain less than a few hundred members, and are often very young. There are an estimated 1,100 open clusters and approximately 150 global clusters in the Milky Way.

An **open cluster** is a group of up to a few thousand stars that were formed from the same giant molecular cloud and have roughly the same age. They are loosely bound by mutual gravitational attraction and become disrupted by close encounters with other clusters and clouds of gas as they orbit the galactic center. This can result in a migration to the main body of the galaxy and a loss of cluster members through internal close encounters.

Open clusters generally survive for a few hundred million years, with the most massive ones surviving for a few billion years. In contrast, the more massive globular clusters of stars exert a stronger gravitational attraction on their members, and can survive for longer. Open clusters are typically found only in spiral and irregular galaxies, in which active star formation is occurring.

A **globular cluster** is a spherical collection of stars that orbits a galactic core as a satellite. Globular clusters are very tightly bound by gravity, which gives them their spherical shapes and relatively high stellar densities toward their centers. The name of this category of star cluster is derived from the Latin *globulus*—a small sphere. A globular cluster is sometimes known more simply as a *globular*.

Famous Open Clusters

The Double Cluster

One of the brightest and best know deep-sky objects is the **Double Cluster** in Persus and close in proximity to Cassiopeia. Classed as open clusters and lying at a distance of 7500 light years, they are a goods binocular target and can even be seen with the naked eye in a dark sky site. While they were first cataloged as a patch of light in Persus in 130 B.C, William Herschel was the first to recognize the object as two separate clusters. Today they are catalogued as NGC869 and NGC884 and logged as number 14 in the Caldwell catalog.

M44, Beehive Cluster

M44, commonly known as the **Beehive Cluster** with a visual brightness of magnitude 3.7 is another open cluster and favorite target of astronomers. Its brightest stars are blue-white and of magnitude 6 to 6.5. Located in Cancer it is best seen in February or March when it is high in the sky.

(Continued on page 2)

M11, Wild Duck Cluster

M11, the **Wild Duck Cluster** (also know as NGC 6705) being one of the richest and most compact of the know open clusters is high on my list of favorite targets. Containing about 2900 stars with an apparent magnitude 6.3 it is viewable in binoculars. Discovered by Gottfried Kirch in 1681, Charles Messier included it in his catalogue in 1764. If you are looking for something on the wild side, this might be worth another look.

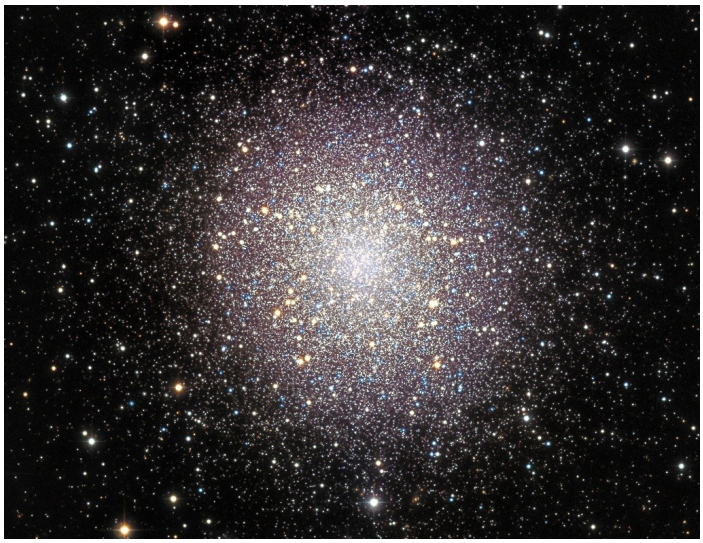
Famous Globular Clusters

Messier 4, NGC 6121

M4 is conspicuous in even the smallest of telescopes a fuzzy ball of light. It appears about the same size as the Moon in the sky. It is one of the easiest globular clusters to find, being located only 1.3 degrees west of the bright star Antares, with both objects being visible in a wide-field telescope. Modestly sized telescopes will begin to resolve individual stars, of which the brightest in M4 are of apparent magnitude of 10.4.

Messier 13

M3, is a stunning globular cluster of about 300,000 stars and sometimes referred to as the Great Globular Cluster in Hercules. It was discovered by Edmond Halley in 1714, and catalogued by Charles Messier on June 1, 1764. With an apparent magnitude of 5.8, it is barely visible with the naked eye on a very clear night. In small telescopes, it is readily viewable.



Messier 92

M92 (also known as NGC 6341) is a globular cluster of stars in the northern constellation of Hercules. First discovered by Johann Elert Bode in 1777, then published in the Jahrbuch during 1779, the cluster was independently rediscovered by Charles Messier in 1781 and added as the 92nd entry in his catalogue. M92 is at a distance of about 26,700 light-years away from Earth. M92 is one of the brighter globular clusters in the northern hemisphere, but it is often overlooked by amateur astronomers because of its proximity to the even more spectacular Messier 13. It is visible to the naked eye under very good conditions.

Messier 5

Even with the best of viewing conditions, the globular star cluster **M5** is barely detectable to the unaided eye as a faint star. In binoculars, it appears as a faint, fuzzy star. But in even a small telescope, some amateur observers swear that M5 is the finest globular cluster north of the celestial equator for small telescopes – even better than the celebrated M13, the Great Hercules cluster.

Conclusion

As a member of London Centre, take some time to share on the RASC Forum site an image of one of your favorite star clusters to inspire other members in their adventure of astronomy.

London Centre Executive

President
Rick Saunders
prez@rasclondon.ca

Vice-President and Newsletter Editor
Norman McCall
vp@rasclondon.ca

Treasurer
Bill Gardner
treasurer@rasclondon.ca

Secretary
Everett Clark
secretary@rasclondon.ca

National Representative
Mike Hanes
nat_rep@rasclondon.ca

Observer's Chair
Dale Armstrong
observing@rasclondon.ca

Honorary President and once National President
Peter Jedicke
pastpresident@rasclondon.ca

Past President

Public Outreach Coordinator
Dave McCarter
outreach@rasclondon.ca

Higher Education Liaison and Librarian
Robert Duff
uni_liaison@rasclondon.ca

ATM Chair
Mike Hanes
atm@rasclondon.ca

Observatory Committee Chair
Pete Raine
observatory@rasclondon.ca

Youth Programs/Women's Programs
Heather MacIsaac
youth@rasclondon.ca
programs@rasclondon.ca

Councilor at Large
John Rousom
councilor2@rasclondon.ca

System Administrator
Jeff Harrison
admin@rasclondon.ca

Moon Phases

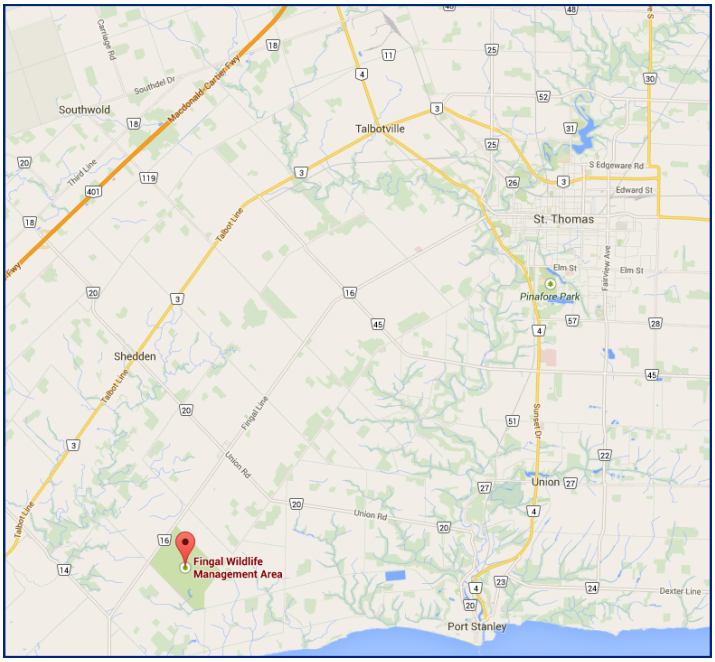

New Moon: April 26, 2017


First Quarter: May 3, 2017


Full Moon: May 10, 2016


Last Quarter: May 25, 2017

Fingal Dark Sky Observing Site



Sky Events for Late April and May

Sunday, April 22 – Neptune 0.5° N of Moon & Venus 5° N of Moon
Sunday, April 30 – Venus greatest illuminated extent
Sunday, May 7 – Jupiter 2° S of Moon Mercury 2° S of Uranus
Friday, May 12 – Double shadow transit on Jupiter
Monday, May 15 – Double shadow transit on Jupiter
Wednesday, May 17 – Mercury greatest elongation

Mercury: Well placed in the morning sky all month.
Venus: Prominent in the dawn sky throughout the month.
Mars: Spends the entire month in Taurus.
Jupiter: Well placed for observation throughout the evening hours on central Virgo.
Saturn: Continues its retrograde motion in the morning sky.

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

The Backyard Astronomer's Guide, by Terence Dickinson & Alan Dyer. Revised Edition. 2002.
Cataclysmic Cosmic Events and How to Observe Them, by Martin Mobberley. c2009. (Astronomers' Observing Guides)
The Science of Shakespeare: A New Look at the Playwright's Universe, by Dan Falk. c2014

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://www.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

Exploring the Stars Events & Cronyn Observatory Public Nights, March—April 2017

By Robert Duff

Exploring the Stars, 110th Byron Sparks, March 20th, 2017

Written by Robert Duff, as Reported by Paul Kerans

Cloudy skies greeted 25 visitors (14 children and 11 adults / leaders) from the 110th Byron Sparks for Exploring the Stars at Western University's Cronyn Observatory, Monday, March 20th, 2017, 6:30 p.m. Graduate student Viraja Khatu presented the digital slide presentation *"Constellations"* and fielded questions. Viraja followed this with the activity *"Make Your Own Constellation / Constellation Detective"* showing a slide displaying 4 different patterns of dots connected with lines and having the children correctly match them with those on 4 laminated sheets—having images of 4 different constellations—distributed to them.

RASC London Centre was represented by Everett Clark and Paul Kerans. Everett set up the observatory's Orion 6-inch (15cm) Newtonian reflector (26mm Plossl eyepiece, 29X) on the Sky-Watcher EQ5 mount inside the dome so as to view the Western Sports & Recreation Center through the door to the roof patio. When everybody arrived upstairs in the dome, Paul gave a brief talk on the history of the Cronyn Observatory and some of the technical aspects of the big 25.4cm refractor. Paul explained the difference between a refractor and reflector telescope. The children viewed the air conditioner on the roof of the Western Sports & Recreation Center through the Orion 6-inch (15cm) Newtonian reflector (26mm Plossl eyepiece, 29X).

Paul showed the visitors his chondrite (stony) and iron meteorites as well as his Moon and Mars meteorite samples in small plastic display cases. Paul had placed his lunar meteorite sample display case in a wooden block with a transparent *Lexan* polycarbonate sheet cover and the children were invited to *"walk on the Moon."* Paul gave out one *"Star Finder"* planispheres. The visitors were gone by around 7:30 p.m. after an enjoyable evening learning about astronomy and telescopes.

Exploring the Stars, Private Group, March 22nd, 2017

Clear skies greeted 11 visitors (7 adults and 4 children) of a private family group for Exploring the Stars at Western University's Cronyn Observatory, Wednesday, March 22nd, 2017, 7:00 p.m. Graduate student Robin Arnason presented the digital slide presentation *"Our Solar System"* and fielded questions. Robin followed this with the *"Constellations"* activity, distributing 9 *"Star Finder"* planispheres. He was assisted by RASC London Centre member Bob Duff in helping the visitors assemble the planispheres with adhesive tape. Robin showed the slide *"Reading a Star Finder"* followed by 2 slides of constellations for them to practice using the planispheres.

RASC London Centre was represented by Everett Clark and Bob Duff. When everybody arrived upstairs in the dome, Bob gave a brief talk on the history of the Cronyn Observatory and some of the technical aspects of the big 25.4cm refractor. Everett showed the visitors Sirius, the Orion Nebula (M42) and Betelgeuse through the 25.4cm refractor, using the 28mm Meade Super Wide Angle eyepiece (157X). Everett, Bob and Robin talked with the visitors and answered many interesting questions. Bob gave a brief tour of the stars and constellations visible from the roof patio outside the dome.

Everett later set up the London Centre's home-built 30.5cm Dobsonian (17mm Nagler eyepiece, 88X) on the roof patio for the visitors to view Sirius and the Orion Nebula (M42). The visitors were gone by around 9:30 p.m. after a very enjoyable evening of astronomy under clear skies.

Exploring the Stars, London District Catholic School Board Grade 7 Enrichment Class, Thursday, March 23rd, 2017

Written by Robert Duff, as Reported by Paul Kerans

Cloudy skies greeted 41 visitors (20 children and 21 adults) from the London District Catholic School Board Grade 7 Enrichment Class for Exploring the Stars at Western University's Cronyn Observatory, Thursday, March 23rd, 2017, 6:30 p.m. Graduate student Kendra Kellogg presented the digital slide presentation *"The Life and Times of Stars"* and fielded questions. The visitors were then divided into 2 groups with the children going downstairs with Kendra into the *"Black Room"* for the *"Transit Demonstration"* activity and the adults upstairs for a tour of the big 25.4cm refractor in the dome. The 2 groups then traded places, with Kendra showing each group the *"Transit Demo"* model—demonstrating the transit detection method for finding extra-solar planets.

RASC London Centre was represented by Everett Clark and Paul Kerans. When the adults arrived upstairs in the dome, Paul gave a talk on the history of the Cronyn Observatory and technical aspects of the big 25.4cm refractor. He gave the same talk to the children when the the adults went downstairs for the *"Transit Demo"* demonstration. Paul also showed his meteorites to both groups, including the chondrite (stony) and iron meteorites as well as the Moon and Mars meteorite samples in small plastic display cases. This included the *"walk on the Moon"* with visitors invited to step on his lunar meteorite sample display case placed in a wooden block with a transparent *Lexan* polycarbonate sheet cover.

Since it was cloudy, the visitors were invited to view the communications tower in south London through the big 25.4cm refractor (28mm Meade Super Wide Angle eyepiece, 157X) in the dome. Everett set up the London Centre's home-built 30.5cm Dobsonian (17mm Nagler eyepiece, 88X) on the roof patio for the visitors to view the wind turbine on the Engineering building. The visitors were very interested and were gone by around 8:15 p.m. after an enjoyable evening learning about the stars, the transit method for detecting extra-solar planets, meteorites and viewing through telescopes despite the cloudy sky.

Cronyn Observatory Public Night, Saturday, March 25th, 2017

Cloudy skies with occasional rain showers greeted 18 visitors (12 adults and 6 children) to Western University's Cronyn Observatory Public Night, Saturday, March 25th, 2017, 8:00 p.m. Graduate student Robin Arnason presented his digital slide presentation *"How I Helped Discover a Black Hole (and Lived to Tell the Tale!)"* before an audience of 16 visitors and fielded questions. Two more people arrived later in the dome to bring the total to 18 visitors for the evening.

RASC London Centre was represented by Everett Clark, Paul Kerans and Bob Duff. Rain ruled out opening the dome. Everett set up the observatory's 8-inch (20.3cm) Meade Schmidt-Cassegrain (26mm Plossl eyepiece, 77X) inside the dome so as to view the TV screen in the Western Sports & Recreation Center through the roof patio door. He set up the other observatory 8-inch (20.3cm) Meade Schmidt-Cassegrain (20mm Plossl eyepiece, 100X) without its tripod on the table facing out the open window so as to view the red light above the north campus buildings.

When the visitors arrived upstairs in the dome, Bob gave a talk on the the history of the Cronyn Observatory and some of the technical aspects of the big 25.4cm refractor. Bob also explained the Cassegrain Reflector telescope and Schmidt Camera piggy-backed on the 25.4cm refractor as well as the Schmidt-Cassegrain telescopes set up inside the dome. Everett and Bob talked with the visitors and showed them the London Centre's 30.5cm and 25.4cm Dobsonian telescopes in the storeroom, explaining how a reflector telescope worked.

Following Robin's slide presentation Paul spoke with some of the visitors in the lecture room and showed them his meteorites, including the chondrite (stony) and iron meteorites as well as the Moon and Mars meteorite samples in small plastic display cases. Paul invited visitors to *"walk on the Moon"* by stepping on his lunar meteorite sample display case placed in a wooden block with a transparent *Lexan* polycarbonate sheet cover. The observatory was closed down around 10:00 p.m. after the last visitors left.

Exploring the Stars, Woodstock Girl Guides, March 27th, 2017

Written by Robert Duff, as Reported by Paul Kerans

Cloudy skies and rain greeted 26 visitors (14 children and 12 adults / leaders) from the Woodstock Girl Guides for Exploring the Stars at Western University's Cronyn Observatory, Monday, March 27th, 2017, 6:30 p.m. Graduate student Viraja Khatu presented the digital slide presentation *"The Scout / Guide Astronomy Badge"* with the title slide *"The Basics"* and fielded questions. Viraja followed this with the activity *"Kitchen Comet,"* making a comet from dry ice and other materials.

RASC London Centre was represented by Everett Clark and Paul Kerans. Light rain ruled out opening the dome. Everett set up the observatory's 8-inch (20.3cm) Meade Schmidt-Cassegrain (26mm Plossl eyepiece, 77X) inside the dome so as to view the lights on the communications tower in south London through the door to the roof patio. When the adults arrived upstairs in the dome, Paul gave a talk on the history of the Cronyn Observatory and technical aspects of the big 25.4cm refractor and the Schmidt-Cassegrain telescopes.

Paul also showed the Guides his meteorites, including the chondrite (stony) and iron meteorites as well as the Moon and Mars meteorite samples in small plastic display cases. Paul invited them to *"walk on the Moon"* by stepping on his lunar meteorite sample display case placed in a wooden block with a transparent *Lexan* polycarbonate sheet cover. The visitors were gone by around 8:00 p.m. after an enjoyable evening learning about astronomy, comets, meteorites and telescopes.

Exploring the Stars, 88th London Sparks Unit, March 29th, 2017

Written by Robert Duff, as Reported by Everett Clark

Cloudy skies greeted 26 visitors (14 children and 12 adults / leaders) from the 88th London Sparks Unit for Exploring the Stars at Western University's Cronyn Observatory, Wednesday, March 29th, 2017, 6:00 p.m. Graduate student Jeff Vankerkhove presented the digital slide presentation *"The Scout / Guide Astronomy Badge"* with the title slide *"The Basics"* and fielded questions. Jeff followed this with the activity *"Kitchen Comet,"* making a comet from dry ice and other materials.

RASC London Centre was represented by Everett Clark and Norm McCall. When everybody arrived upstairs in the dome, Jeff gave a brief talk about the big 25.4cm refractor. Everett had set up the London Centre's home-built 30.5cm Dobsonian

(17mm Nagler eyepiece, 88X) on the roof patio outside the dome and Everett and Norm showed the Sparks a red light on the construction crane and later the wind turbine on the Engineering building. The visitors were gone by around 7:30 p.m. after an enjoyable evening learning about astronomy, comets and telescopes.

Exploring the Stars, 80th Westmount Cubs, April 4th, 2017

Written by Robert Duff, as Reported by Paul Kerans

Cloudy rainy skies greeted 14 visitors (10 children and 4 adults / leaders) from the 80th Westmount Cubs for Exploring the Stars at Western University's Cronyn Observatory, Tuesday, April 4th, 2017, 6:30 p.m. Graduate student Kendra Kellogg presented the digital slide presentation *"Our Solar System"* and fielded questions. Kendra followed this with the activity *"Telescope Kits"* with the Cubs assembling and testing simple telescopes from small reusable kits.

RASC London Centre was represented by Everett Clark and Paul Kerans. Rainy weather ruled out opening the dome. When everybody arrived upstairs in the dome, Kendra gave a talk explaining some of the technical aspects of the big 25.4cm refractor, as well as the observatory's 8-inch (20.3cm) Meade Schmidt-Cassegrain (20mm Plossl eyepiece, 100X), which Everett had set up inside the dome so that the Cubs could view the TV screen in the Western Sports & Recreation Center through the roof patio door.

Paul showed the Cubs his meteorites, including the chondrite (stony) and iron meteorites as well as the Moon and Mars meteorite samples in small plastic display cases. Paul invited them to *"walk on the Moon"* by stepping on his lunar meteorite sample display case placed in a wooden block with a transparent *Lexan* polycarbonate sheet cover. The visitors were gone by around 8:15 p.m. after an enjoyable evening learning about astronomy, telescopes and meteorites.

Exploring the Stars, 4th London Cubs, April 5th, 2017

Cloudy skies with some light rain greeted 18 visitors (12 children and 6 adults / leaders) from the 4th London Cubs for Exploring the Stars at Western University's Cronyn Observatory, Wednesday, April 5th, 2017, 7:00 p.m. Graduate student Jeff Vankerkhove presented the digital slide presentation *"The Scout / Guide Astronomy Badge"* with the title slide *"The Basics"* and fielded questions. Jeff followed this with the activity *"Kitchen Comet,"* making a comet from dry ice and other materials.

RASC London Centre was represented by Everett Clark and Bob Duff. Rainy weather ruled out opening the dome. Everett set up the observatory's 8-inch (20.3cm) Meade Schmidt-Cassegrain (20mm Plossl eyepiece, 100X) inside the dome so as to view the lights on the communications tower in south London through the door to the roof patio.

When the visitors arrived upstairs in the dome, Bob gave a talk on the history of the Cronyn Observatory and some of the technical aspects of the big 25.4cm refractor. Bob also explained the Cassegrain Reflector telescope and Schmidt Camera piggy-backed on the 25.4cm refractor as well as the 8-inch (20.3cm) Schmidt-Cassegrain telescope set up inside the dome. He also explained the 2 clocks on the east wall of the observatory and the difference between Standard and Sidereal Time.

The Cubs viewed through 8-inch (20.3cm) Schmidt-Cassegrain, which was directed towards the communications, and later redirected by Everett towards the TV screen in the Western Sports & Recreation Center. The visitors were gone by around 8:30 p.m. after an enjoyable evening learning about astronomy, comets and telescopes.

Exploring the Stars, St. Thomas Aquinas Catholic Secondary School, April 6th, 2017

Cloudy skies with rain, later changing to wet snow, greeted 11 visitors (including 9 students, one teacher and one parent) from St. Thomas Aquinas Catholic Secondary School Grade-10 Science class, for Exploring the Stars at Western University's Cronyn Observatory, Thursday, April 6th, 2017, 7:00 p.m. Graduate student Jeff Vankerkhove presented 2 digital slide presentations, including *"Black Holes"* followed by *"Telescopes"* and fielded questions. Jeff followed this with the activity *"Telescope Kits"* showing the slide *"Telescope Activity"* and distributing simple telescopes, already assembled from the small reusable kits, for the students examine and answer question.

RASC London Centre was represented by Everett Clark and Bob Duff. Rainy weather ruled out opening the dome. Everett set up the observatory's 8-inch (20.3cm) Meade Schmidt-Cassegrain (20mm Plossl eyepiece, 100X) inside the dome so as to view the TV screen in the Western Sports & Recreation Center through the door to the roof patio. When the visitors arrived upstairs in the dome, Bob gave a talk on the history of the Cronyn Observatory and some of the technical aspects of the big 25.4cm refractor. Bob also explained the Cassegrain Reflector telescope and Schmidt Camera piggy-backed on the 25.4cm refractor as well as the 8-inch (20.3cm) Schmidt-Cassegrain telescope set up inside the dome. He also explained the 2 clocks on the east wall of the observatory and the difference between Standard and Sidereal Time.

The students viewed the TV screen in the Western Sports & Recreation Center through 8-inch (20.3cm) Schmidt-Cassegrain. The visitors left the dome around 8:30 p.m. and were gone from the observatory by 9:00 p.m. after a very interesting evening learning about black holes and telescopes, despite the rain and wet snow.

Exploring the Stars, 81st London Venturing Crew, April 11th, 2017

Written by Robert Duff, as Reported by Paul Kerans

Cloudy skies greeted 6 students (16—18 years of age) from the 81st London Venturing Crew for Exploring the Stars at Western University's Cronyn Observatory, Tuesday, April 11th, 2017, 7:00 p.m. Graduate student Kendra Kellogg presented the digital slide presentation *"The Life and Times of Stars"* and fielded questions. Kendra followed this with the activity *"Kitchen Comet,"* making a comet from dry ice and other materials.

RASC London Centre was represented by Everett Clark and Paul Kerans. Cloudy skies ruled out opening the dome. Everett set up the observatory's 8-inch (20.3cm) Meade Schmidt-Cassegrain (20mm Plossl eyepiece, 100X) inside the dome so as to view the TV screen in the Western Sports & Recreation Center through the door to the roof patio. When everybody arrived upstairs in the dome, Kendra gave a talk on the history and technical aspects of the big 25.4cm refractor. She explained the difference between the 25.4cm refractor and the 8-inch (20.3cm) Meade Schmidt-Cassegrain reflector telescope.

Paul gave a talk about his meteorites, including the chondrite (stony) and iron meteorites as well as the Moon and Mars meteorite samples in small plastic display cases. Some of the students accepted Paul's invitation to *"walk on the Moon"* by stepping on his lunar meteorite sample display case placed in a wooden block with a transparent *Lexan* polycarbonate sheet cover.

Kendra took the students downstairs into the *"Black Room"* around 8:20 p.m. for the rest of the evening, where she did the *"Transit Demonstration"* activity, showing them the *"Transit Demo"* model—demonstrating the transit detection method for finding extra-solar planets.

The students had a great time throughout the evening and asked a lot of good questions. The visitors were gone by around 9:00 p.m. after an enjoyable and very interesting evening learning about stars, comets, telescopes, meteorites and the transit method for detecting extra-solar planets, despite the cloudy skies.

Exploring the Stars, 77th London Cubs, March 30th, 2017

Written by Robert Duff, as Reported by Paul Kerans

Cloudy skies and rain greeted 23 visitors (11 children and 12 adults / leaders) from the 77th London Cubs for Exploring the Stars at Western University's Cronyn Observatory, Thursday, March 30th, 2017, 7:00 p.m. Graduate student Jeff Vankerkhove presented the digital slide presentation *"The Scout / Guide Astronomy Badge"* with the title slide *"The Basics"* and fielded questions. Jeff followed this with the activity *"Telescope Kits"* with the Cubs assembling and testing simple telescopes from small reusable kits.

Rain ruled out opening the dome. RASC London Centre member Paul Kerans set up the observatory's Orion 6-inch (15cm) Newtonian reflector on the Sky-Watcher EQ5 mount inside the dome for demonstration since wind and rain prevented opening the door to the roof patio. When everybody arrived upstairs in the dome, Paul gave a brief talk on the history of the Cronyn Observatory and some of the technical aspects of the big 25.4cm refractor. Paul explained the difference between a refractor and reflector telescope.

Paul talked about the size of the solar system, including the Kuiper belt and the Oort cloud, and answered many questions. Paul also showed the Cubs his meteorites, including the chondrite (stony) and iron meteorites as well as the Moon and Mars meteorite samples in small plastic display cases. Paul invited them to *"walk on the Moon"* by stepping on his lunar meteorite sample display case placed in a wooden block with a transparent *Lexan* polycarbonate sheet cover. He handed out one *"Star Finder"* planisphere. The visitors were gone by around 8:45 p.m. after an enjoyable evening learning about astronomy, telescopes and meteorites.

Exploring the Stars, 80th Westmount Cubs, April 4th, 2017

Written by Robert Duff, as Reported by Paul Kerans

Cloudy rainy skies greeted 14 visitors (10 children and 4 adults / leaders) from the 80th Westmount Cubs for Exploring the Stars at Western University's Cronyn Observatory, Tuesday, April 4th, 2017, 6:30 p.m. Graduate student Kendra Kellogg presented the digital slide presentation *"Our Solar System"* and fielded questions. Kendra followed this with the activity *"Telescope Kits"* with the Cubs assembling and testing simple telescopes from small reusable kits.

RASC London Centre was represented by Everett Clark and Paul Kerans. Rainy weather ruled out opening the dome. When everybody arrived upstairs in the dome, Kendra gave a talk explaining some of the technical aspects of the big 25.4cm refractor, as well as the observatory's 8-inch (20.3cm) Meade Schmidt-Cassegrain (20mm Plossl eyepiece, 100X), which Everett had set up inside the dome so that the Cubs could view the TV screen in the Western Sports & Recreation Center through the roof patio door.

Paul showed the Cubs his meteorites, including the chondrite (stony) and iron meteorites as well as the Moon and Mars meteorite samples in small plastic display cases. Paul invited them to *"walk on the Moon"* by stepping on his lunar meteorite sample display case placed in a wooden block with a transparent *Lexan* polycarbonate sheet cover. The visitors were gone by around 8:15 p.m. after an enjoyable evening learning about astronomy, telescopes and meteorites.

Exploring the Stars, 4th London Cubs, April 5th, 2017

Cloudy skies with some light rain greeted 18 visitors (12 children and 6 adults / leaders) from the 4th London Cubs for Exploring the Stars at Western University's Cronyn Observatory, Wednesday, April 5th, 2017, 7:00 p.m. Graduate student Jeff Vankerkhove presented the digital slide presentation *"The Scout / Guide Astronomy Badge"* with the title slide *"The Basics"* and fielded questions. Jeff followed this with the activity *"Kitchen Comet,"* making a comet from dry ice and other materials.

RASC London Centre was represented by Everett Clark and Bob Duff. Rainy weather ruled out opening the dome. Everett set up the observatory's 8-inch (20.3cm) Meade Schmidt-Cassegrain (20mm Plossl eyepiece, 100X) inside the dome so as to view the lights on the communications tower in south London through the door to the roof patio.

When the visitors arrived upstairs in the dome, Bob gave a talk on the history of the Cronyn Observatory and some of the technical aspects of the big 25.4cm refractor. Bob also explained the Cassegrain Reflector telescope and Schmidt Camera piggy-backed on the 25.4cm refractor as well as the 8-inch (20.3cm) Schmidt-Cassegrain telescope set up inside the dome. He also explained the 2 clocks on the east wall of the observatory and the difference between Standard and Sidereal Time.

The Cubs viewed through 8-inch (20.3cm) Schmidt-Cassegrain, which was directed towards the communications, and later redirected by Everett towards the TV screen in the Western Sports & Recreation Center. The visitors were gone by around 8:30 p.m. after an enjoyable evening learning about astronomy, comets and telescopes.

Exploring the Stars, St. Thomas Aquinas Catholic Secondary School, April 6th, 2017

Cloudy skies with rain, later changing to wet snow, greeted 11 visitors (including 9 students, one teacher and one parent) from St. Thomas Aquinas Catholic Secondary School Grade-10 Science class, for Exploring the Stars at Western University's Cronyn Observatory, Thursday, April 6th, 2017, 7:00 p.m. Graduate student Jeff Vankerkhove presented 2 digital slide presentations, including *"Black Holes"* followed by *"Telescopes"* and fielded questions. Jeff followed this with the activity *"Telescope Kits"* showing the slide *"Telescope Activity"* and distributing simple telescopes, already assembled from the small reusable kits, for the students examine and answer question.

RASC London Centre was represented by Everett Clark and Bob Duff. Rainy weather ruled out opening the dome. Everett set up the observatory's 8-inch (20.3cm) Meade Schmidt-Cassegrain (20mm Plossl eyepiece, 100X) inside the dome so as to view the TV screen in the Western Sports & Recreation Center through the door to the roof patio. When the visitors arrived upstairs in the dome, Bob gave a talk on the history of the Cronyn Observatory and some of the technical aspects of the big 25.4cm refractor. Bob also explained the Cassegrain Reflector telescope and Schmidt Camera piggy-backed on the 25.4cm refractor as well as the 8-inch (20.3cm) Schmidt-Cassegrain telescope set up inside the dome. He also explained the 2 clocks on the east wall

of the observatory and the difference between Standard and Sidereal Time.

The students viewed the TV screen in the Western Sports & Recreation Center through 8-inch (20.3cm) Schmidt-Cassegrain. The visitors left the dome around 8:30 p.m. and were gone from the observatory by 9:00 p.m. after a very interesting evening learning about black holes and telescopes, despite the rain and wet snow.

Cronyn Observatory Weekday Public Night, Monday, April 10th, 2017

Cloudy skies with rain and lightning, followed by hazy clouds, greeted 40 visitors to Western University's Cronyn Observatory Weekday Public Night, Monday, April 10th, 2017, 8:00 p.m. Since there was no slide presentation, graduate student Viraja Khatu greeted visitors and directed them upstairs into the dome. Viraja and RASC London member Bob Duff (who was upstairs in the dome) counted visitors. Viraja later joined everybody in the dome with a count of 40 visitors by the end of the evening.

RASC London Centre was represented by Everett Clark, Paul Kerans and Bob Duff. Rainy weather ruled out opening the dome. Everett set up the observatory's 8-inch (20.3cm) Meade Schmidt-Cassegrain (20mm Plossl eyepiece, 100X) inside the dome so as to view the TV screen in the Western Sports & Recreation Center through the door to the roof patio. Everett, Paul and Bob talked with visitors as they arrived throughout the evening. Everett invited them to view through the 8-inch (20.3cm) Schmidt -Cassegrain and hauled out the London Centre's home-built 30.5cm Dobsonian for display in the dome. Bob talked to visitors about the big 25.4cm refractor in the dome, using the 52mm Erfle eyepiece (84X) for demonstration, and explained the Schmidt Camera and Cassegrain Reflector telescope piggy-backed on the main telescope. He also explained the 8-inch (20.3cm) Schmidt-Cassegrain and 30.5cm Dobsonian set up inside the dome, the 2 clocks on the observatory's east wall and the difference between Standard and Sidereal Time.

Paul showed visitors his meteorites, including the chondrite (stony) and iron meteorites as well as the Moon and Mars meteorite samples in small plastic display cases. Paul invited them to *"walk on the Moon"* by stepping on his lunar meteorite sample display case placed in a wooden block with a transparent *Lexan* polycarbonate sheet cover.

The sky seemed to partially clear later in the evening and Everett moved the 30.5cm Dobsonian on to the roof patio where visitors viewed the nearly full Moon through hazy clouds in the east and later a red light on the construction crane behind the Engineering building. The visitors were gone by around 10:00 p.m. after an interesting and informative evening at the Cronyn Observatory despite the unfavorable weather.

Exploring the Stars, 81st London Venturing Crew, April 11th, 2017

Written by Robert Duff, as Reported by Paul Kerans

Cloudy skies greeted 6 students (16—18 years of age) from the 81st London Venturing Crew for Exploring the Stars at Western University's Cronyn Observatory, Tuesday, April 11th, 2017, 7:00 p.m. Graduate student Kendra Kellogg presented the digital slide presentation *"The Life and Times of Stars"* and fielded questions. Kendra followed this with the activity *"Kitchen Comet,"* making a comet from dry ice and other materials.

RASC London Centre was represented by Everett Clark and Paul Kerans. Cloudy skies ruled out opening the dome. Everett set up the observatory's 8-inch (20.3cm) Meade Schmidt-Cassegrain (20mm Plossl eyepiece, 100X) inside the dome so as to view the TV screen in the Western Sports & Recreation Center through the door to the roof patio. When everybody arrived upstairs in the dome, Kendra gave a talk on the history and technical aspects of the big 25.4cm refractor. She explained the difference between the 25.4cm refractor and the 8-inch (20.3cm) Meade Schmidt-Cassegrain reflector telescope.

Paul gave a talk about his meteorites, including the chondrite (stony) and iron meteorites as well as the Moon and Mars meteorite samples in small plastic display cases. Some of the students accepted Paul's invitation to *"walk on the Moon"* by stepping on his lunar meteorite sample display case placed in a wooden block with a transparent *Lexan* polycarbonate sheet cover.

Kendra took the students downstairs into the *"Black Room"* around 8:20 p.m. for the rest of the evening, where she did the *"Transit Demonstration"* activity, showing them the *"Transit Demo"* model—demonstrating the transit detection method for finding extra-solar planets.

The students had a great time throughout the evening and asked a lot of good questions. The visitors were gone by around 9:00 p.m. after an enjoyable and very interesting evening learning about stars, comets, telescopes, meteorites and the transit method for detecting extra-solar planets, despite the cloudy skies.

Exploring the Stars, Chris' Discipleship Group, April 12th, 2017

Clear, slightly hazy skies greeted 9 visitors from Chris' Discipleship Group for Exploring the Stars at Western University's Cronyn Observatory, Wednesday, April 12th, 2017, 8:00 p.m. Graduate student Jeff Vankerkhove presented the digital slide presentation *"The Life and Times of Stars"* and invited questions. Jeff then took the group downstairs into the *"Black Room"* where he did the *"Transit Demonstration"* activity, showing them the *"Transit Demo"* model—demonstrating the transit detection method for finding extra-solar planets.

RASC London Centre was represented by Everett Clark and Bob Duff. Everett made ready the big 25.4cm refractor in the dome, installing the 28mm Meade Super Wide Angle eyepiece (157X). When everybody arrived upstairs in the dome, Bob gave a talk on the history of the Cronyn Observatory and technical aspects of the 25.4cm refractor, and explaining the Schmidt Camera and Cassegrain Reflector telescope piggy-backed on the main telescope. Bob also explained the 2 clocks on the observatory's east wall and the difference between Standard and Sidereal Time. Everett called everybody's attention to a bright ISS pass travelling west-northwest to east-northeast, 8:58 p.m.—9:03 p.m., reaching a maximum altitude of 88 degrees, 9:01 p.m. (20:58:06—21:03:42; maximum altitude 88 degrees @21:01:22 [Source: *Heavens Above, ISS – Visible Passes* Web site]). The visitors were thrilled to see the ISS pass overhead from the roof patio outside the dome.

Everett operated the 25.4cm refractor (28mm Meade SWA eyepiece, 157X) for the evening, showing the visitors Jupiter, Sirius and Betelgeuse. The one-day-past-full Moon rose above the eastern horizon late in the evening but was too low in the sky to be viewed by anything other than the big refractor's finderscope.

The visitors were gone by around 10:00 p.m. after thanking everybody for a very enjoyable evening learning about stars, the transit method for detecting extra-solar planets and viewing Jupiter and the stars through the big telescope.