

# POLARIS



## Royal Astronomical Society of Canada London Centre Newsletter March 2018

### Upgrading to a Larger Aperture Scope for Visual Observing

*Written By: Norman McCall*

My interest in astronomy began in January 2012 when I joined RASC and started attending the London Centre monthly meetings. Shortly thereafter, I began my adventure by borrowing a Tasco 80mm 900 focal length classic refractor telescope from a friend.

It was a good place to start. Pleiades was my favorite target being it was bright and easy to find. This was the scope I first took to Starfest at Mt. Forrest in the summer of 2013.

#### Selecting My First Scope

In 2014 while attending London Centre monthly meetings, a member who had just recently purchased a Celestron 9.25" wedge-mounted SCT encouraged me to also purchase myself a scope.

I took his advice and began my research. Eventually I selected the David H. Levy Explore Scientific 152mm f/4.8 Maksutov-Newtonian since it offered a high performance flat view across the entire field of view over a wide range of magnifications. It came with a beautiful Explore Scientific 2" 30mm 82° eyepiece which provides a 3.4° true field of view at magnification of 24x. In a dark-sky the views are so immersive they almost pop out of the scope. Simply delightful!

To increase my viewing time, in the summer of 2017 I build my personal backyard observatory named it SkyThrall. The setup consists of my Mak-Newt on a pier mounted iOptron EQ45 PRO GoTo Mount. Like every telescope, the Comet Hunter has its pros and cons. For me it is the 152mm size of aperture which (especially within the city of London) significantly limits views of deep-sky objects. Given that my primary goal is for visual observing, I am now looking at an upgrade path to capture more light.

#### Scope Considerations

There is a wide range of things to consider when selecting a scope. These include: weight, aperture and type (R-C, Newt, SCT, etc) and brand. Since aperture is of particular importance to me each scope was benchmarked by considering the improvement in the light gathering capability relative to my 152mm Mak-Newt. Therefore, using a spreadsheet, for each scope I calculated the effective light gathering area after correcting for the central obstruction.

Other factors included weight of the optical tube assembly (OTA), FOV and resolving power (arc-sec) and the physical size. To minimize the capital outlay, the plan is to

look on-line for a pre-owned scope with the goal of saving 50% off the dealer price.

#### Potential Upgrade Solutions

My investigation has led me to consider a variety of potential upgrade solutions:

- 1) Orion 190mm f/5.3 Mak-Newt Astrograph,
- 2) Vixen VC200L 8" f/9.0 Modified Cassegrain,
- 3) Sky Watcher 250mm (10") f/4.8 Astro-Newt,
- 4) Orion 250mm (10") f/8 Ritchey-Chretien
- 5) Meade 10" LX200-AFC f/10 OTA, and
- 6) Celestron 9.25" or 11" EdgeHD f/10 Schmidt-Cassegrain

#### Orion 190mm f/5.3 Mak-Newt Astrograph

The 190mm f/5.3 Mak-Newtonian is a great cross-over telescope! It's high quality Maksutov-Newtonian design, with fast f/5.3 optics offers flat distortion-free wide-field views.



The optics are highly rated for both visual observers and wide-field astro-photographers.

This OTA comes in at 27.5 lbs and given the length of scope requires a solid mount to maintain stability. The scope has the advantage

that my existing eyepieces will be a good fit and eliminate the need for any upgrades. One significant disadvantage is that given the dimensions of the optical path: 199mm primary and 64mm secondary, it only provides a 52% improvement in light gathering capability from my current 152mm scope. (In a dark sky environment it would be a great scope.)

#### Vixen VC200L 8" f/9.0 Modified Cassegrain



The Vixen VC200L 8" (203mm) f/9.0 is described as a catadioptric Vixen Sixth-Order Aspheric Cassegrain optical system and one of the most sophisticated optical de-

*(Continued on page 2)*

signs available on the market today: free of coma, curvature of field, spherical and chromatic aberration. Especially noteworthy in the Vixen VC200L is its sharpness and flatness at the edge, which far exceeds that of Schmidt-Cassegrain systems of the same aperture. It provides pinpoint star images to less than 15 microns, even at the edge of its 42 mm image circle. If you are looking for a photographic catadioptric, the Vixen VC200L is an excellent choice.

While this is a beautiful (and light-weight) scope, the design has large diffraction spikes and due to a large (40%) secondary obstruction, the low contrast will significantly impact visual observing.

#### Sky-Watcher 250mm f/4.8 Astro-Newt

The Sky-Watcher 250mm f/4.8 Astro Newtonian is a mid-range scope offering decent optics in a cost-effective design. To obtain a good visual experience a quality coma-corrector and field flattener are required.

Of significant concern to me is the weight profile of 32lbs and the field curvature. Given with the secondary obstruction of 32% of the primary diameter, it provides decent 167% increase in light gathering capability.



#### Orion 250mm (10") f/8 Ritchey-Chretien Astrograph

The Orion 10" is a fast f/8 is a highly regarded Ritchey-Chretien optical design with excellent light gathering capability, of durable construction, and virtually coma-free optics. While it is a big 10" R-C (and weighing all of 35 lbs requires a high-end mount) it is ideal for imaging rather than visual observing, my primary objective and therefore, not a suitable upgrade solution.



#### Meade 10" f/10 LX200 AFC OTA

The Meade 10" f/10 LX200-AFC Advanced Coma-Free (ACF) optical system brings high quality optical performance within the reach of most amateur astronomers. The Meade exclusive ACF optics design achieves aplanatic performance — with a flatter field,



reduced astigmatism and eliminated diffractions spikes — equal to Ritchey-Chretien systems, at a fraction of the price.

With a secondary obstruction at 43% by diameter (18.8% by area) and weighing in at 26lbs it offers only a 150% increase in light gathering capability. While an excellent scope it does not seem like the ideal OTA for my visual requirements.

#### Celestron 9.25" or 11" EdgeHD f/10 Schmidt-Cassegrain

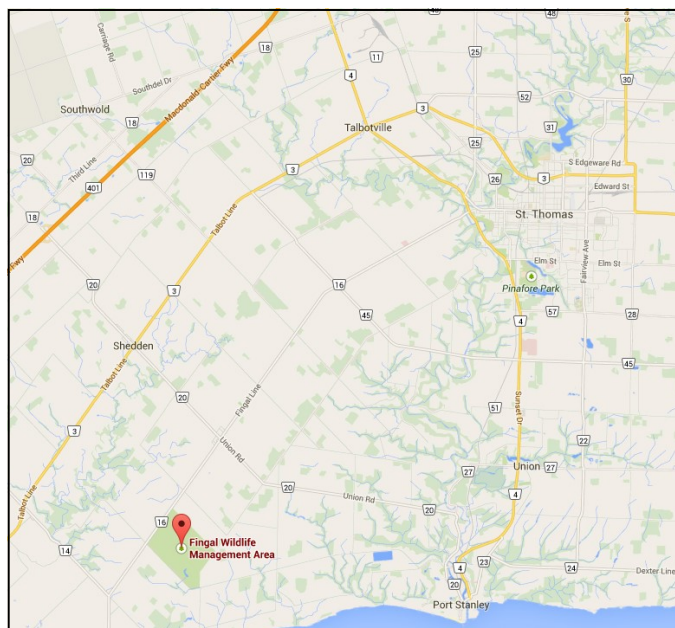
The Celestron 9.25" and 11" EdgeHD f/10 Schmidt-Cassegrain are Celestron's series of premier optical performance scopes with an aplanatic, flat field Schmidt-Cassegrain optical path producing pinpoint stars all the way to the edge of the largest CCD imaging sensors and widest eyepieces. With Celestron's StarBright XLT optical coatings the EdgeHD optics gives maximum light throughput across the widest visual and photographic spectrum.



For the 9.25" and 11" OTA's the secondary mirror obstruction is 36% and 34% by diameter or 13% and 12% by area. Therefore the 9.25" and 11" respectively offer a 130% and a awesome 230% increase in light gathering capability over my existing scope! For me, the C11 looks like the most attractive upgrade solu-

tion for my requirements. Humm, I think it is time to post a "Scope Wanted Ad".

### Fingal Dark Sky Observing Site





## Sky Events for Late March and Early April

Mar. 19 Venus 4° N of Moon  
 Mar. 22 Aldebaran 0.9° S of Moon, occultation  
 Mar. 24 First quarter & double shadow transit on Jupiter  
 Mar. 29 Venus 0.07° S of Uranus  
 Mar. 31 Full Moon  
 Apr. 2 Mars 1.3° S of Saturn  
 Apr. 7 Saturn 1.9° S of Moon  
 Apr. 16 New Moon



### Planets

Mercury: Reaches maximum elongation on April 29th

Venus: Becomes more prominent in evening twilight

Mars: Begins April close to Saturn achieving conjunction on April 2nd

Jupiter: In retrograde through central Libra throughout the month

Saturn: Remains in Sagittarius where it will achieve conjunction with Mars on April 2nd

Uranus: Too close to the Sun to be seen

Neptune: Gradually emerging in the morning twilight for telescopic observers

## R.A.S.C. London Centre Library — Books of the Month, March 2018

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 February 2018 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*)
- *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

### Cronyn Observatory Public Nights, Exploring the Stars & Special Events, February 12th — March 7th, 2018

By Robert Duff

#### Cronyn Observatory Public Night, Monday, February 12<sup>th</sup>, 2018

A clear sky with some hazy clouds greeted some 50—60 visitors to Western University's Cronyn Observatory Week-day Public Night, Monday, February 12<sup>th</sup>, 2018, 7:00 p.m. Graduate student Viraja Khatu and Professor Jan Cami were there early to greet a video team from Rogers TV, who arrived around 6:30 p.m. RASC London Centre members Everett Clark, Henry Leparskas and Mark Tovey were also there around 6:00 p.m., joined shortly thereafter by Bob Duff, and later in the evening, Edith Tovey. Since there was no slide presentation, visitors simply went upstairs into the dome and downstairs for demonstrations in the “Black Room” and tours of the “Period Rooms.” Viraja was interviewed by the Rogers TV team (cameraman and lady interviewer) in the lecture room and Bob was later interviewed by 2 journalism students.

Viraja, Everett, Henry and Jan made ready the big 25.4cm refractor in the dome and set up the London Centre's home-built 30.5 Dobsonian on the observation deck. They used the hour angle and declination setting circles on the 25.4cm refractor with celestial coordinates provided by the *Starry Night Pro* software on the computer to locate Uranus, which appeared as a blurry blue-green disk in the 17mm Nagler eyepiece (258X). They also showed visitors the Double Cluster (NGC869 884) through the 25.4cm refractor, using

the 52mm Erfle eyepiece (84X), and the double star Gamma Andromedae (Almach), using the 17mm Nagler (258X) and Meade 28mm Super Wide Angle (157X) eyepieces. Outside on the observation deck Bob showed visitors the Orion Nebula (M42) and Henry showed them the Pleiades (M45) star cluster through the 30.5 Dobsonian (Meade 28mm SWA eyepiece, 54X).

Downstairs in the “Black Room” Professor Jan Cami gave 3 demonstrations of the “Transit Demo” model—demonstrating the transit detection method for finding extra-solar planets. Jan also gave 3 demonstrations of the “Spectroscopy Demo,” with the visitors putting on the *diffraction grating* glasses to view the spectra of 4 gas discharge lamps set out on the table, including: hydrogen, helium, neon and mercury. Mark Tovey gave tours of the historic “1940s Period Room,” a recreation 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 the “1967 Period Room,” recreating the early control room of the Elginfield Observatory to celebrate the 150<sup>th</sup> anniversary of Confederation—Canada 150. Edith Tovey assisted with the “Period Rooms” tours. Both “Period Rooms” were designed by Mark Tovey.

There was an ISS pass observed at 6:45—6:52 p.m. (18:45:58—18:52:13), travelling west northwest—south south-east, reaching a maximum altitude of 43 degrees above the southwest horizon at 6:49 p.m. (18:49:06). There was also an

Iridium flare (magnitude 7.9) at altitude 43 degrees above the south southeast horizon at 7:10 p.m. (19:10:11)\*

Everett gave out 2 “*Star Finder*” planispheres and one “*Moon Gazers’ Guide*” cards to interested visitors. The visitors were gone by around 9:00 p.m., after an enjoyable evening learning about astronomy and observing through telescopes.

\*Information concerning “*ISS – Visible Passes*” and “*Iridium Flares*” was found using the coordinates for London, Ontario, on the “*Heavens Above*” Web site: <http://www.heavens-above.com/>

### Exploring the Stars, London District Catholic School Board Enrichment Opportunities Program, Grade 7, February 21<sup>st</sup>, 2018

Cloudy skies and rainy weather greeted 22 visitors (20 students and 2 teachers) from the London District Catholic School Board Enrichment Opportunities Program, Grade 7, for Exploring the Stars at Western University’s Cronyn Observatory, Wednesday, February 21<sup>st</sup>, 2018, 12:30—2:30 p.m. PhD graduate and Centre for Planetary Science and Exploration (CPSX) Outreach Program Coordinator Parshati Patel, brought them over around noon to have lunch after a morning of activities with CPSX. They were greeted by graduate students Jeff Vankerkhove and Viraja Khatu. Jeff presented the digital slide presentation “*Our Star – The Sun*” and fielded questions. Jeff and Viraja then introduced the activity “*Telescope Kits*,” with the students assembling and testing the telescopes from small reusable kits. This was followed by the students dividing into 2 groups, who alternated between tours of the upstairs dome and the downstairs “*Black Room*.”

RASC London Centre was represented by Heather MacIsaac, Henry Leparskas and Bob Duff. Since cloudy wet weather at first ruled out opening the dome, the Cronyn Observatory’s 90mm Coronado H-Alpha Solar Telescope was set up inside the dome along with the London Centre’s 25.4cm Dobsonian. Heather MacIsaac, also set up her Celestron NexStar 90SLT 90mm Maksutov-Cassegrain with a Kendrick (Baader film) Solar filter inside the dome. When the first group of students arrived upstairs in the dome, Bob gave a brief talk on some of the history and technical aspects of the big 25.4cm refractor, using the 52mm Erfle eyepiece (84X) for demonstration. Jeff followed this with a further description of the big telescope and, since it was no longer raining, he opened the dome and directed the big 25.4cm refractor towards the communications tower in south London. Jeff swapped in the Meade 28mm Super Wide Angle eyepiece (157X), in place the 52mm Erfle eyepiece, and invited the visitors to climb the observing ladder and view the tower through the 25.4cm refractor.

The 25.4cm Dobsonian and Heather’s Celestron NexStar 90SLT 90mm Maksutov-Cassegrain were both moved outside onto the observation deck. The Sun was visible through hazy clouds but could not be seen through the Kendrick (Baader film) Solar filter on Heather’s 90mm Maksutov. Heather removed the solar filter and showed the students the communications tower through her 90mm Maksutov-Cassegrain (32mm Plossl eyepiece (39X). Bob showed them the wind turbine on the Engineering building through the 25.4cm Dobsonian (17mm Nagler eyepiece, 66X).

Downstairs in the “*Black Room*” Viraja presented the “*Transit Demonstration*” activity, giving 2 demonstrations of the “*Transit Demo*” model—showing how the transit detection method worked for finding extra-solar planets, as well as 2 demonstrations of 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.

Both groups of students alternated between the “*Transit Demo*” and “*Spectroscopy Demo*” demonstrations in the “*Black Room*” and tours of the dome, with viewing through telescopes. The visitors were gone by around 2:30 p.m. after a very interesting morning and afternoon learning about astronomy at CPSX and the Cronyn Observatory.

### Exploring the Stars, Talbot Street Church GEMS, February 22<sup>nd</sup>, 2018

A partly cloudy sky greeted 31 visitors (25 children and 6 adults) from the Talbot Street Church GEMS for Exploring the Stars at Western University’s Cronyn Observatory, Thursday, February 22<sup>nd</sup>, 2018, 7:10—8:45 p.m. Graduate student Jeff Vankerkhove presented the digital slide presentation “*The Scout / Guide Astronomy Badge*” and fielded questions. Jeff followed this with the activity “*Telescope Kits*,” showing several slides about telescopes and having the children assemble and test simple telescopes from small reusable kits.

RASC London Centre was represented by Everett Clark, Heather MacIsaac, Henry Leparskas and Bob Duff. Henry made ready the big 25.4cm refractor (Meade 28mm Super Wide Angle eyepiece, 157X) and Jeff supervised as the visitors viewed the one-day-prior-to-first quarter Moon—visible through thin, hazy, moving clouds. On the observation deck outside the dome, Bob showed them the Moon through the London Centre’s home-built 30.5cm Dobsonian (17mm Nagler eyepiece, 88X) and Heather showed them the Moon through her Celestron NexStar 90SLT 90mm Maksutov-Cassegrain (32mm Plossl eyepiece, 39X).

Following the observing session, Henry did a demonstration in the lecture room of the *Sotellunium*—a mechanical eclipse demonstration model built by W. G. Colgrove—which he brought upstairs from the “*1940s Period Room*,” where it was on display. The visitors were gone by around 8:45 p.m. after a very enjoyable evening learning about astronomy and looking through telescopes.

### Cronyn Observatory Public Night, Saturday, February 24<sup>th</sup>, 2018

An overcast sky with thin hazy clouds greeted some 63 visitors to the Western University’s Cronyn Observatory Public Night, Saturday, February 24<sup>th</sup>, 2018, 7:00 p.m. Graduate student Viraja Khatu made 2 presentations of the digital slide presentation “*Galaxies*.” There were 50 visitors in the lecture room for Viraja’s first slide presentation, as counted by RASC London Centre member Bob Duff at 7:22 p.m. There were just 13 people for Viraja’s second presentation. In all, there were some 63 visitors for the evening.

RASC London Centre was represented by Everett Clark, Heather MacIsaac, Henry Leparskas, Bob Duff, Mark Tovey, Edith Tovey and Dale Armstrong. Henry made ready the big 25.4cm refractor (17mm Nagler eyepiece, 258X) in the dome and Everett supervised as visitors viewed the one-day-past-first quarter Moon—visible through thin, hazy, moving clouds. On the observation deck outside the dome, Bob showed them the Moon through the London Centre’s home-built 30.5cm Dobsonian (Meade 28mm Super Wide Angle eyepiece, 54X) and Heather showed them the Moon through her Celestron NexStar 90SLT 90mm Maksutov-Cassegrain (32mm Plossl eyepiece, 39X).

Downstairs in the “*Black Room*” graduate student Jeff Vankerkhove gave demonstrations of the “*Transit Demo*” model—showing how the transit detection method worked for finding

extra-solar planets, as well as demonstrations of 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. Mark Tovey gave tours of the historic “1940s Period Room,” a recreation 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 the “1967 Period Room,” recreating the early control room of the Elginfield Observatory to celebrate the 150<sup>th</sup> anniversary of Confederation—Canada 150. Edith Tovey assisted with the “Period Rooms” tours. Both “Period Rooms” were designed by Mark Tovey.

The visitors were gone by around 9:00 p.m., after an enjoyable evening learning about astronomy and observing the Moon through telescopes, despite the thin, hazy clouds.

#### **Exploring the Stars, 10th London Sparks and Brownies, February 26<sup>th</sup>, 2018**

A clear sky greeted 27 visitors (14 children and 13 adults) from the 10<sup>th</sup> London Sparks and Brownies, for Exploring the Stars at Western University’s Cronyn Observatory, Monday, February 26<sup>th</sup>, 2018, 6:00 p.m. Graduate student Amanda DeSouza presented the digital slide presentation “Our Solar System” and fielded questions. Amanda 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. Everett made ready the big 25.4cm refractor in the dome, at first installing the 17mm Nagler eyepiece (258X). Everett also set up the London Centre’s home-built 30.5cm Dobsonian (Meade 28mm Super Wide Angle eyepiece, 54X) on the observation deck. Bob gave a brief telescope talk when everybody arrived upstairs in the dome and then invited the visitors to divide into 2 groups and alternate between viewing the 3-day-past-first quarter Moon through the big 25.4cm refractor in the dome and the 30.5cm Dobsonian on the observation deck.

Everett supervised observing through the 25.4cm refractor and began by swapping in the 32mm Erfle eyepiece (137X) for a better view the Moon, and later showed them Alnilam (Epsilon Orionis), which is the middle star in Orion’s Belt, and then the double star Castor. Bob showed them the Moon and the Orion Nebula (M42) through the 30.5cm Dobsonian (Meade 28mm SWA eyepiece, 54X). The visitors were gone by around 8:00 p.m. after a very enjoyable evening of astronomy under a clear sky.

#### **Exploring the Stars, Space Society of London, February 27<sup>th</sup>, 2018**

A clear, later increasing hazy, sky greeted 7 visitors from the Space Society of London for Exploring the Stars at Western University’s Cronyn Observatory, Tuesday, February 27<sup>th</sup>, 2018, 6:00 p.m. Graduate student Dan Hatfield presented the digital slide presentation “Extra Solar Planets” and fielded questions. There were 5 visitors early in the slide lecture with 2 later arrivals for a total of 7 visitors.

RASC London Centre was represented by Everett Clark and Bob Duff. Everett made ready the big 25.4cm refractor (32mm Erfle eyepiece, 137X) in the dome and set up the London Centre’s 25.4cm Dobsonian (17mm Nagler eyepiece 66X) on the observation deck, directing both telescopes towards the 4-day-past-first quarter gibbous Moon. Bob installed the *Zhumell 2-inch Variable Polarizing Filter #3* on the 17mm Nagler eyepiece in the 25.4cm Dobsonian to reduce the Moon’s brightness for a

more comfortable view. (The *Zhumell 2-inch Variable Polarizing Filter #3* was donated to the RASC London Centre for use at the Cronyn Observatory by London Centre member Norman McCall in November 2016.)

Everett showed the visitors the Moon and the double star Castor through the 25.4cm refractor and Bob showed them the Moon and the Orion Nebula (M42), and the stars Betelgeuse, Sirius, Rigel and Aldebaran. The visitors asked many good questions and everybody was gone by around 7:50 p.m., after an enjoyable evening of astronomy.

#### **Exploring the Stars, 1<sup>st</sup> Ilderton Beavers, March 1<sup>st</sup>, 2018**

A cloudy sky with wind and falling snow greeted 20 visitors (10 children and 10 adults) from the 1<sup>st</sup> Ilderton Beavers for Exploring the Stars at Western University’s Cronyn Observatory, Thursday, March 1<sup>st</sup>, 2018, 6:00—7:30 p.m. Graduate student Jeff Vankerkhove presented the digital slide presentation “Constellations” and fielded questions. Jeff followed this with the activity “Make Your Own Constellation / Constellation Detective”—but leaving out the “Constellation Detective”—with the children drawing their own constellations by connecting the dots on a given pattern of stars on white transparency sheets with magic markers, and making up their own constellation stories.

RASC London Centre was represented by Everett Clark and Bob Duff. Since it was snowing, the dome remained closed. Everett set up the London Centre’s 25.4cm Dobsonian (17mm Nagler eyepiece, 66X) inside the door to the observation deck. When everybody arrived upstairs in the dome, Jeff gave a talk on some of the history and technical aspects of the big 25.4cm refractor, using the 32mm Erfle eyepiece (137X) for demonstration. He showed them how the shutter worked on the Schmidt camera, which was piggybacked on the 25.4cm refractor along with the Cassegrain reflector telescope. Jeff rotated, but did not open, the dome to show how it worked. Jeff showed them the 25.4cm Dobsonian and explained how a reflector telescope worked.

Bob supervised as the Beavers lined up to view the wind turbine on the Engineering building through the 25.4cm Dobsonian (17mm Nagler eyepiece, 66X), which was set up just inside the door to the observation deck. The visitors asked good questions and everybody was gone by around 7:30 p.m., after an enjoyable evening learning about the constellations and telescopes, despite the snowy, cloudy weather.

#### **Exploring the Stars, 1<sup>st</sup> Dorchester Sparks and Brownies, March 5<sup>th</sup>, 2018**

A clear sky greeted 40 visitors (21 children and 19 adults) from the 1<sup>st</sup> Dorchester Sparks and Brownies, for Exploring the Stars at Western University’s Cronyn Observatory, Monday, March 5<sup>th</sup>, 2018, 6:30 p.m. Graduate student Viraja Khata presented the digital slide presentation “Constellations” and followed this with the activity “Make Your Own Constellation / Constellation Detective.”

Viraja had made ready the big 25.4cm refractor and opened the dome prior to making her slide presentation. RASC London Centre member Bob Duff installed the 32mm Erfle eyepiece in the big 25.4cm refractor and also set up the London Centre’s 25.4cm Dobsonian (17mm Nagler eyepiece, 66X) on the observation deck. 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 25.4cm refractor. Viraja then directed the big 25.4cm refractor towards the star Sirius and showed the visitors a yellow star, later identified—using the *Stellarium* planetarium software on the laptop computer—as proba-



bly HIP 31827, a K2 spectral class star (magnitude 4.8) in the constellation Canis Major. Bob showed them the Orion Nebula (M42) through the 25.4cm Dobsonian (17mm Nagler eyepiece, 66X) set up on the observation deck.

The visitors were gone by around 7:45 p.m. after expressing their thanks for a very enjoyable evening learning about stars and constellations and observing through telescopes under a clear sky.

#### **Exploring the Stars, #3 Striker Squadron, Royal Canadian Air Cadets, March 6<sup>th</sup>, 2018**

A clear, later partly cloudy sky, greeted 46 visitors, including 40 Cadets and 4 adults (later joined by 2 more adults) from #3 Striker Squadron of the Royal Canadian Air Cadets, who arrived on a school bus from Strathroy, for Exploring the Stars at Western University's Cronyn Observatory, Tuesday, March 6<sup>th</sup>, 2018, 7:15 p.m. Graduate student Amanda DeSouza presented the digital slide presentation "*The History of Space Exploration*" and then invited RASC London member Bob Duff to the front of the room to help field questions.

Amanda then divided everybody into 2 groups with one group going upstairs into the dome and the other remaining in the lecture room to do the activity "*Telescope Kits*," with the Cadets assembling and testing simple telescopes from small reusable kits. The 2 groups later traded places between the dome and the "*Telescope Kits*" activity in the lecture room.

RASC London Centre member Everett Clark directed the big 25.4cm refractor (17mm Nagler eyepiece, 258X) towards the double star Castor and set up the London Centre's 25.4cm Dobsonian (Meade 28mm Super Wide Angle eyepiece, 40X) on the observation deck. Bob gave 2 telescope talks, one to each group as they arrived in the dome, on some of the history of the observatory and technical aspects of the 25.4cm refractor. Everett showed the Cadets the double star Castor through the 25.4cm refractor. Bob supervised as the Cadets viewed the stars Sirius, Betelgeuse and Aldebaran, and the Pleiades (M45) star cluster through the 25.4cm Dobsonian.

At their request, Amanda took a group picture of the Cadets in the dome from the top of the observing ladder. The Cadets were gone by around 8:40 p.m. after expressing their thanks for very interesting and enjoyable evening learning about space exploration and observing the stars through telescopes.

#### **Exploring the Stars, London Waldorf School (Grades 5-6), March 7<sup>th</sup>, 2018**

Mostly cloudy skies greeted 28 visitors (24 children and 4 adults) from the London Waldorf School, Grades 5-6, for Exploring the Stars at Western University's Cronyn Observatory, Wednesday, March 7<sup>th</sup>, 2018, 10:00 a.m. They were welcomed by graduate students Viraja Khatu and Jeff Vankerkhove. Viraja presented the digital slide presentation "*Our Star: The Sun*" and fielded questions. This was followed by the "*Building Sundial*" activity with Jeff demonstrating how to cut out and assemble a sundial from a pattern on a printed sheets of paper (with the caption "*I Tell Only Sunny Hours*") and Viraja supervising as the children cut out and assembled their own sundials.

When everybody arrived upstairs in the dome, RASC London Centre member Bob Duff gave brief a talk on the history of the observatory and technical aspects of the big 25.4cm refractor, demonstrating with the 32mm Erfle eyepiece (137X) and rotating but not opening the dome. Bob explained how the Schmidt camera and Cassegrain reflector telescope piggy-backed on the 25.4cm refractor worked and the difference between a re-

flector and refractor telescope. Bob also explained the 2 clocks on the east wall and the difference between Standard and Sidereal Time.

Jeff supervised as the visitors lined up to view the Sun through the observatory's 90mm Coronado H-Alpha Solar Telescope (CEMAX 18mm eyepiece, 44X) on the observation deck, while Bob showed them the Sun through the Meade 20.3cm Schmidt-Cassegrain (26mm Plossl, 77X) with the Kendrick (Baader film) Solar filter. Viraja showed them the wind turbine on the Engineering building through the London Centre's 25.4cm Dobsonian (17mm Nagler eyepiece, 66X). Clouds obscured the Sun until it briefly appeared towards the end of the observing session and the visitors enjoyed views through both solar filtered telescopes.

Viraja and Jeff then brought the visitors downstairs into the "*Black Room*" where they presented 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.

After the "*Spectroscopy Demo*" Viraja brought the children back into the lecture room and had them fill out feedback forms. The visitors were gone by 12:00 p.m. noon, after an interesting and enjoyable morning learning about the Sun and spectroscopy and doing some solar observing, despite the mostly cloudy sky.