

# POLARIS



Royal Astronomical Society of Canada  
London Centre Newsletter  
October 2015

## Fixing Binoculars

By Patrick Whelan

I friend of mine called me about a pair of 25x100 binoculars he bought off the internet. (eBay?) When they arrived they were horribly out of collimation and he had to send them back. Sure he got his money back, but he was out \$100 for shipping!

Then he bought another pair and guess what? Yup. They were way out of collimation too! That is when he called me lamenting about his purchases. So I told him we could probably fix them.

They were 'no name' binoculars. I couldn't find a manufacturing name on them anywhere. It did have BAK4 prisms printed on them. So we put them on a sturdy tripod outside and looked through them. The right eye image was way above the left one.

Collimating binoculars is not as easy as collimating a reflector telescope. Perhaps even the word 'collimating' is wrong. What I am really doing is aligning one barrel of the binoculars with the other. There are some inherent problems in aligning binoculars. Let's say the left barrel of the binoculars is okay and the right barrel is pointing up. I could align them by making the left barrel point up as well. Now they are both 'wrong' but they are aligned and would seem acceptable looking through them. But we wouldn't be getting all the light through them. By standing back from the binoculars a meter or so and looking through the binoculars backwards, you can see the small hole of the eyepieces. As you move your head around you can make the hole seem football shaped or make it round. When you can make it round the image of the circle should also be in the middle of the front lens. With his binoculars, when we were looking (backward) through the right barrel, the hole of the eyepiece was round when it was near the top of the front lens. Hmmm.

There are two screws to adjust each barrel's prisms. There is an outside screw near the eyepiece that adjusts the view

left and right. There is another screw between the barrels and further from the eyepiece that adjusts the view up and down. By adjusting the screw that moves the image up and down we were able to align the binoculars. Looking backward through the binoculars we could see the images of the eyepieces were acceptably in the middle and round so we were done.

There are lots of caveats (warnings) when attempting this. From what I have read, true collimating/aligning should be started by manipulating the front lenses. In most binoculars I have looked at, the front lenses are pretty much glued in. And if not there are no collimating screws like a refractor objective or any other apparent mechanism to adjust them. And there is also the possibility of aligning the barrels but having both barrels improperly collimated. (as I stated above) I guess one way to really check this would be to have a laser pointer (collimator) that could be put on the eyepiece and then shone through the binoculars and you could see if the laser beam exits the middle of the front objective. The optics will probably make the beam diverge but I will give it a try later when I get home. Yup I was right, the beam came out as a large circle when it hit the front objective.



Whether we achieved 'actual' 'perfect' 'true' alignment and/or collimation is hard to say. But my friend now has a pair of working binoculars instead of broken binoculars and he is very happy. And it won't cost him another \$100 to send them back.

Disclaimer: I know you have the binoculars, you have the set of jeweler's screwdrivers and you have a pair of eyes to check them out... but your actual results may vary! Please be careful! And don't run with screwdrivers in your hands, you might put someone's eye out!

I now absolve myself of responsibility for anyone practicing what I have written here. Let the fixer beware!

## Moon Phases



October 20 2015



October 27 2015



November 3 2015



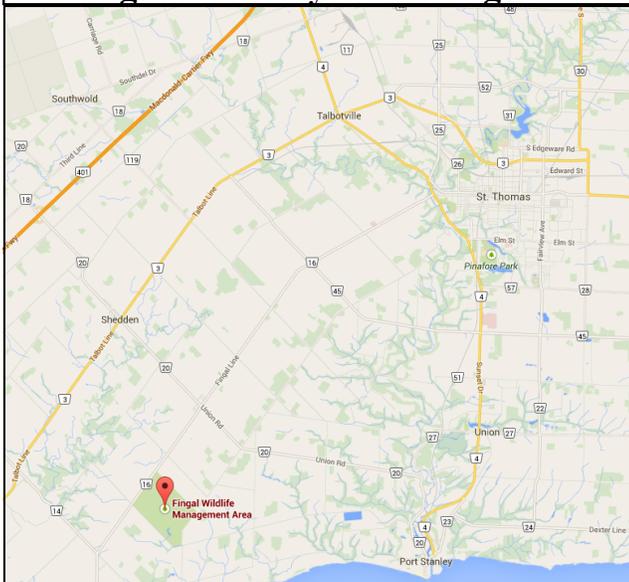
November 11 2015

## October

Our guest speaker will be  
Stan Metchev.

His talk will be "From exoplanets to comets:  
a (random) walk through  
planetary astronomy".

## Fingal Dark Sky Observing Site



## London Centre Executive

### President

Rick Saunders  
email: ozzy (at) bell.net

### Vice-President and Newsletter Editor

Patrick Whelan  
email: ratman (at) rocketmail.com

### Treasurer

Bill Gardner  
email: gardner.w (at) rogers.com

### Secretary

Everett Clark  
email: Secretary (at) rasclondon.ca

### National Representative

Peter Jedicke  
email: PJedicke (at) fanshawec.ca

### Observer's Chair

Dale Armstrong  
email: observing (at) rasclondon.ca

### Honorary President and once National President

Peter Jedicke  
email: PJedicke (at) fanshawec.ca

### Past President

Public Outreach Coordinator  
Dave McCarter  
email: dmccarter (at) sympatico.ca

### Higher Education Liaison and Librarian

Robert Duff  
email: rduff (at) sympatico.ca

### ATM Chair

Mike Hanes  
email: subareau (at) gmail.com

### Observatory Committee Chair

Pete Raine  
observatory@rasclondon.ca

### Councilor at Large

John Rousom  
councilor2@rasclondon.ca

### System Administrator

Jeff Harrison  
admin@rasclondon.ca

London RASC Website: <http://www.rasclondon.ca/>

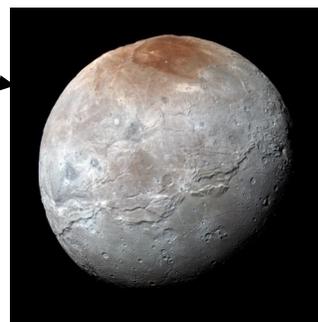
London RASC Forums: <http://forums.rasclondon.ca/>

The ESA sent tardigrades into space in a mission they called Tardigrades in Space. For 12 days in September 2007, some 3000 water bears hitched a ride into space on ESA's orbital Foton-M3 mission. They shortened the mission name to **TARDIS!** Any Dr. Who fans present?

## Sky Events for Late October and November

Oct 16 Mercury greatest elongation West  
 Oct 17 Mars 0.4° N of Jupiter  
 Oct 18 Double shadow transit  
 Oct 25 Double shadow transit  
 Oct 26 Venus greatest elongation West  
 Oct 26 Venus 1.1° S of Jupiter  
 Oct 26 Uranus 0.9° N of Moon  
 Oct 26 Large tides  
 Oct 29 Aldebaran 0.6° S of Moon  
 Nov 1 Daylight saving time ENDS  
 Nov 1 Double shadow transit  
 Nov 3 Venus 0.7° S of Mars  
 Nov 6 Jupiter 2.0° N of Moon  
 Nov 7 Mars 1.8° N of Moon  
 Nov 7 Venus 1.2° N of Moon

Charon!



Mercury well placed in the morning sky  
 Venus shining brightly in the dawn sky  
 Mars low in Eastern dawn in Leo  
 Jupiter low in the morning sky in Leo  
 Saturn low in the sW evening twilight sky  
 Uranus at opposition in Pisces  
 Neptune visible most of the night in Aquarius

Also Charon



### R.A.S.C. London Centre Library Books of the Month October 2015 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 October 2015 are as follows:

Foundations of Astronomy, by Michael A. Seeds. – 7th Edition, c2003.

365 Starry Nights: an Introduction to Astronomy for Every Night of the Year, text and illustrations by Chet Raymo. c1982.

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

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

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

#### **Cronyn Observatory Public Nights, September 19th— 26th / 27th, 2015**

**By Robert Duff**

#### **International Observe the Moon Night @Cronyn Observa- tory, Saturday, September 19th, 2015**

Cloudy, later clearing skies and a north wind greeted nearly 200 visitors to the Cronyn Observatory for the 6th annual International Observe the Moon Night (InOMN), Saturday, September 19th, 2015, 5:00—10:00 p.m. This worldwide celebration

of the Moon was hosted locally by Western University’s Physics and Astronomy Department Exploring the Stars program, CPSX (Centre for Planetary Science and Exploration), CLRN (Canadian Lunar Research Network) and the London Centre of the Royal Astronomical Society of Canada (RASC London Centre).

Graduate students Parshati Patel (CPSX) and Bhairavi Shankar (CPSX and CLRN) were the event organizers and were joined by other graduate students including Dilini Subasinghe and Shannon Hicks, who operated the big 25.4cm refractor in the dome.

October 2015

Graduate student Laura Lenkic greeted visitors at the swag table (welcome table) along with Jake Hansen from the Planetary Society, London Chapter, who provided a lot of “swag” for the event.

RASC London Centre was represented Dale Armstrong, Peter Jedicke, Bob Duff, Paul Kerans, Charlene Kerans, Tricia Colvin, Mark Tovey, Dave McCarter, Mike Roffey and Ron Sawyer. London Centre member Richard Gibbens was also there and listened to the presentations. Physics and Astronomy Department computer resources person and RASC member Henry Leparskas was also there.

Children and adults were invited to examine a display of meteorites and Earth impact rocks on the in the slide lecture room and enter the astronomical art contest with paper and crayons. Kayle Hansen of the Planetary Society, London Chapter, and Patrick Hill were at the Meteorite Table. Downstairs in the basement CPSX graduate student Christy Caudill invited visitors to test their knowledge of Space Trivia, identifying pictures of craters in the solar system, and graduate student Tony Martinez supervised as young and old dropped objects into a pan of flour and cocoa in the Cratering Experiment.

Professor Jan Cami introduced Patrick Hill who made the first slide presentation, “The Moon and Its Origin” beginning 6:40 p.m. Zach Morse gave the next slide talk, describing his research on the giant impact crater Mare Orientale. Finally, RASC London Centre’s Peter Jedicke made his slide presentation on the forthcoming Total Lunar Eclipse, Sunday, September, 27th, 2015—for which there would be a Public Night at the Cronyn Observatory.

Skies cleared as Parshati Patel announced the art prizes and Jan Cami conducted the raffle draw, which included an Apollo Lunar Module, a Galileoscope and a book by Apollo 17 astronaut Harrison Schmitt, “Return to the Moon” (c2006).

Dilini and Shannon operated the 25.4cm refractor in the dome, showing visitors Saturn and the 2-day-prior-to-first quarter Moon (18mm Radian eyepiece, 244X) and the Moon also with the 32mm Erfle eyepiece (137X). On the roof patio outside the dome Tricia and Mark showed visitors the Moon in the London Centre’s 25.4cm Dobsonian (17mm Nagler eyepiece, 66X). Dale operated the Cronyn Observatory’s 8-inch (20.3cm) Meade 2080/LX3 Schmidt-Cassegrain showing people the Moon (26mm Plossl eyepiece, 77X), Albireo, the Wild Duck Cluster and M15. Dale also helped visitors take pictures of the Moon through the telescope eyepiece with their smartphones. Paul Kerans set up his Celestron 9.25-inch (235mm) Schmidt-Cassegrain on a Sky-Watcher EQ6 Equatorial mount and showed people the Moon (Tele Vue 21mm Ethos eyepiece, 112X) and M31 and M110 (31mm Ethos eyepiece, 76X).

Parshati counted 60 visitors around 6:00 p.m. and with more arrivals and departures Bob estimated some 160 people by mid-evening. There were perhaps close to 200 people by the time the Cronyn began closing down around 10:00 p.m.

### **Homecoming Weekend @Cronyn Observatory, Saturday, September 26th, 2015**

Partly cloudy hazy skies greeted visitors to the Cronyn Observatory for solar observing in the afternoon and evening stargazing, Saturday, September 26th, 2015, 3:00—11:00 p.m. This was in celebrations of Western University’s Homecoming weekend, September 25th—27th, 2015.

Solar observing began around 3:00 p.m., in Western University’s Alumni/Thompson Parking Lot, on the wide brick-paved sidewalk on the south side of the Cronyn Observatory. RASC London Centre members with telescopes included Dale Armstrong, with his 80mm Vernonscope refractor and glass solar filter; Mike Costa, with his iOptron Solar 60 refractor; Harold Tutt, with his 80mm Stellarvue Nighthawk refractor and Baader film solar filter; and Bob Duff, with his 203mm Dobsonian and Kendrick Astro Baader film solar filter. Peter Jedicke set up the Sunspotter (provided by Fanshawe College) on a table and members gave out flyers explaining the upcoming lunar eclipse, Sunday, June 27th. Physics and Astronomy Department staff and RASC member Henry Leparskas was there taking pictures with his camera.

On the roof patio of the Cronyn Observatory event coordinator Professor Jan Cami supervised the set up of the Observatory’s Meade 8-inch (203mm) Model 2080/LX3 Schmidt-Cassegrain, with a Kendrick Astro Baader film solar filter; and the 90mm Coronado H-Alpha Solar Telescope on its Sky-Watcher EQ5 mount. RASC London Centre members Tricia Colvin and Mark Tovey assisted and showed visitors the Sun through these telescopes. They were joined by Paul Kerans who set up his 80mm refractor and glass solar filter on his EQ6 mount.

Homecoming visitors were shown the Sotellunium, a mechanical eclipse demonstration model, set up on a table in the Cronyn Observatory’s slide lecture room and demonstrated by undergraduate student William Hyland. Some 50 people viewed the Sun through solar filtered telescopes on the sidewalk and another 50 on the Cronyn Observatory’s dome roof patio, for an estimated total of 100 visitors. Sunspots were visible in the white light / broadband filters as well as solar prominences in the 90mm Coronado H-Alpha Solar Telescope, despite the hazy clouds.

Evening observing began after 7:00 p.m. with a slide lecture by graduate student Shannon Hicks, “The Mystery of Eclipses,” before some 9 visitors. This was in anticipation of the total lunar eclipse occurring Sunday, September 27th, 2015. Upstairs in the dome, graduate students Tony Martinez, Dilini Subasinghe and Shannon took turns operating the 25.4cm refractor (52mm Erfle eyepiece, 84X) and showing people the one-day-prior-to-full gibbous Moon, as it rose above hazy clouds in the east.

There were 3 telescopes set up on the roof patio outside the dome, including London Centre member Patrick Whelan’s 10-inch (254mm) Meade LXD75 Schmidt-Newtonian on his home-built Dobsonian mount; and Paul Kerans’ 9.25-inch (235mm) Celestron Schmidt-Cassegrain on his EQ6 mount; as well as the Obser-

October 2015

vatory's Meade 8-inch (203mm) Schmidt-Cassegrain. Tricia Colvin, Mark Tovey, Peter Jedicke, Mike Costa, Steve Gauthier, Harold Tutt and Bob Duff assisted and Tricia worked with Jan to set up the Observatory's Celestron NexImage 5 Solar System Imager, installed on the Meade 8-inch (203mm) Schmidt-Cassegrain and connected to a laptop computer and large computer screen down in the lecture room to display the view through the telescope. They did eventually succeed in displaying a live image of the Moon on the laptop and large computer screen, in anticipation of the forthcoming lunar eclipse, Sunday, September 27th.

Paul showed visitors Saturn, M31 and M110, the Owl Cluster (NGC457), Albireo and M13 through his 9.25-inch (235mm) Celestron Schmidt-Cassegrain (21mm Ethos eyepiece, 112X). Patrick Whelan showed visitors the Moon, Saturn and the Double Cluster (NGC869 and NGC884) in Perseus through his 10-inch (254mm) Meade LX75 Schmidt-Newtonian. The Observatory closed down around 10:30 p.m. with some 47 visitors for the evening.

There were some 100 people who viewed the Sun through solar filtered telescopes from 3:00—6:00 p.m., including 50 on the sidewalk and 50 on the Cronyn Observatory's roof patio outside the dome. There were some 47 visitors for evening observing 7:00—10:30 p.m. bringing the total to 147 visitors for September 26th, 2015, 3:00—10:30 p.m.

### **Total Lunar Eclipse @Cronyn Observatory, Sunday, September 27th, 2015**

Partly cloudy skies greeted visitors to Western University's Cronyn Observatory for the Total Lunar Eclipse, coincident with the Supermoon, Sunday, September 27th, 2015. This was also Western University's Homecoming weekend, September 25th—27th, 2015.

There was solar observing from around 3:00 p.m. in Western University's Alumni/ Thompson Parking Lot, on the wide brick-paved sidewalk on the south side of the Cronyn Observatory. Among RASC London Centre members present were Dale Armstrong, with his 80mm Vernonscope refractor and glass solar filter; Mike Costa, with his iOptron Solar 60 refractor; and Peter Jedicke, who set up the Sunspotter (provided by Fanshawe College). Steve Gauthier was also there and Peter estimated that there were some 75 people for solar observing in the afternoon.

Event coordinator Professor Jan Cami and Dale Armstrong worked to install the Observatory's Celestron NexImage 5 Solar System Imager on Dale's 80mm Vernonscope refractor to display a live image of the Sun on a laptop computer. Graduate students Dilini Subasinghe and Parshati Patel were there, as was Physics and Astronomy Department staff and RASC member Henry Leparskas, taking pictures with his camera.

On the roof patio of the Cronyn Observatory Tricia Colvin showed visitors sunspots on the Sun through the Observatory's Meade 8-inch (203mm) Schmidt-Cassegrain (26mm Plossl eyepiece, 77X) and Kendrick Astro Baader film solar filter. Mark Tovey showed people solar prominences on the Sun through the

Observatory's 90mm Coronado H-Alpha Solar Telescope (18mm Plossl eyepiece and 2X Barlow lens, 98X). Visitors were also shown the Sotellunium, a mechanical eclipse demonstration model, set up on a table in the Cronyn Observatory's slide lecture room and demonstrated by undergraduate student William Hyland.

Towards evening a huge lineup of people formed at the entrance of the Cronyn and curved all the way around to the south side of the Observatory where more RASC London members set up their telescopes. Faculty members present included Professors Els Peeters, Sarah Gallagher and Peter Brown. Post-doctoral fellow Bhairavi Shankar, assisted by RASC London member Bob Duff, retrieved "Getting Started in Astronomy" (RASC, SkyNews [2015]) pamphlets from the basement for distribution with other promotional materials from Western, CPSX and CLRN on a table at the Cronyn entrance.

The Cronyn slide lecture room was packed as Professor Jan Cami's made the first 2 presentations—including demonstrations of the Sotellunium—of the slide lecture "Total Lunar Eclipse, 2015-09-27," composed by Peter Jedicke, who soon arrived to make 7 more presentations to an estimated total of some 600 visitors. Jan made 2 more slide presentations for the huge crowd of people outside, with a large computer screen set up in the open back of a hatch-back vehicle. In all there were estimated to be between 800—1,000 visitors for the lunar eclipse event.

Graduate student Tony Martinez was at the big 25.4cm refractor in the dome as fellow graduate student and RASC London Centre member Emily McCullough gave a talk to the visitors. The sky became cloudy and obscured the Moon's first contact with the Earth's umbral shadow at 9:07 p.m. EDT. A brief clearing in the clouds revealed a half-eclipsed Moon. However, the sky did not clear out until total eclipse began at 10:11 p.m., lasting 72 minutes until 11:23 p.m. when the Moon began to emerge from the Earth's shadow. The Moon had a deep red colour and people took pictures with telescopes and cameras.

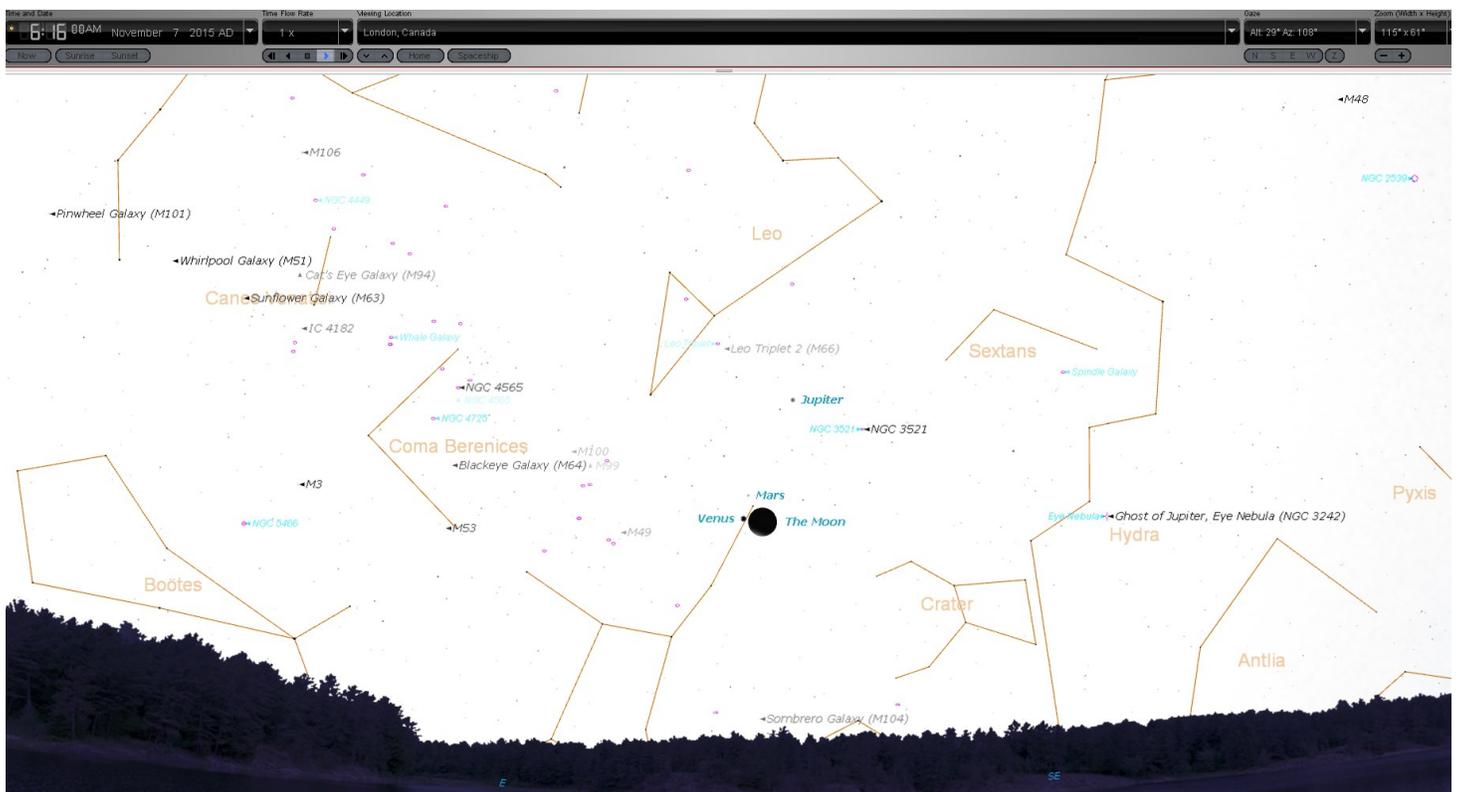
People crowded around the telescopes set up on brick-paved sidewalk on the south side of the Cronyn Observatory. RASC London Centre members with telescopes included Dale Armstrong, with his 254mm Newtonian on its alt-az. mount; Mike Costa, with his iOptron Solar 60 refractor (minus the solar filter); Dave Clark, with his Celestron Super C8 (20.3cm) Schmidt-Cassegrain; Mike Roffey, with his 150mm Celestron NexStar 6SE Schmidt-Cassegrain; Steve Gauthier, with his Ceravolo 145mm HD Maksutov-Newtonian and tripod mounted 10X70mm Fujinon binoculars; Patrick Whelan, with his Meade 254mm LX75 Schmidt-Newtonian on a home-built Dobsonian mount; and Harold Tutt, with his 80mm Stellarvue Nighthawk refractor. Mike Hanes was there and Bob Duff took pictures of the event with his FujiFilm FinePix AV160 digital camera, including pictures of the Moon half-emerged from the eclipse through Steve Gauthier's Ceravolo 145mm HD Maksutov-Newtonian.

On the roof patio of the Cronyn Observatory Tricia Colvin showed visitors the eclipsed Moon in the London Centre's 25.4cm Dobsonian (17mm Nagler eyepiece, 66X) and Mark Tov-

October 2015

ey supervised smartphone photography with the Cronyn Observatory's 8-inch (20.3cm) Meade 2080/LX3 Schmidt-Cassegrain (26mm Plossl eyepiece, 77X). Paul Kerans set up his Celestron 9.25-inch (235mm) Schmidt-Cassegrain (31mm Ethos eyepiece, 76X) on a Sky-Watcher EQ6 mount and Charlene Kerans set up a camera and tripod to take pictures of the eclipse.

In addition to the RASC London members, there was one undergraduate student, Ian Mulholland, who set up his 114mm Newtonian on the south side of the Cronyn. This very successful eclipse evening ended around 11:30 p.m. with clear skies and with many thanks going to everybody who made it a success.



Get up early on November 7 and look east. A crescent Moon so close to Venus and Mars. Might Jupiter lies above.  
Beautiful!  
(I used Starry Night to create the above image)