

POLARIS



Royal Astronomical Society of Canada London Centre Newsletter February 2011

NASA's Great Observatories Patrick Whelan

We love observing the cosmos from our back yards or our favourite dark sky site. But there is a location that is ideal to observe from that most of us will never visit. Of course I am talking about being in outer space! Without weather to interfere. Without any atmosphere at all to interfere with observing, it is the ideal location for telescopes.

NASA has four observatories that make up their Great Observatories program. The 'vision' of each observatory is quite different from each other. The spectrum they observe goes from infrared to visible to x-rays and gamma rays. An important aspect of having these observatories was to have them operational in the same time frame. That way an object could be observed by all four observatories at approximately the same time.

Hubble Telescope

The first observatory, and probably the best known, is the Hubble telescope. It is a Cassegrain reflector and it is 12.2 meters long and weighs 11,110 kilograms! It orbits at 569 kilometers above the Earth's surface and completes an orbit in 97 minutes. It was launched in 1990 by the space shuttle but its optics were less than perfect. In 1993 another shuttle mission serviced the Hubble and fixed its optics. The Hubble telescope can observe the universe at ultraviolet, visual and near-infrared wavelengths.

The Wide Field Camera 3 (WFC3) sees three different kinds of light: near-ultraviolet, visible and near-infrared.

The Cosmic Origins Spectrograph (COS), Hubble's other new instrument, is a spectrograph that sees exclusively in ultraviolet light

The Advanced Camera for Surveys (ACS) sees visible light. The Space Telescope Imaging Spectrograph (STIS) is a spectrograph that sees ultraviolet, visible and near-infrared light, and is known for its ability to hunt black holes.

The Near Infrared Camera and Multi-Object Spectrometer (NICMOS) is Hubble's heat sensor. It is sensitive to infrared light.

Compton Gamma Ray Observatory

This was the second of NASA's Great Observatories. It weighs 15,876 kilograms and in 1991 was the most massive

instrument ever launched by a NASA Space Shuttle.

Compton had four instruments that covered an unprecedented six decades of the electromagnetic spectrum, from 30 keV to 30 GeV. In order of increasing spectral energy coverage, these instruments were the Burst And Transient Source Experiment (BATSE), the Oriented Scintillation Spectrometer Experiment (OSSE), the Imaging Compton Telescope (COMPTEL), and the Energetic Gamma Ray Experiment Telescope (EGRET).

Due to failing gyroscopes it was safely deorbited and entered Earth's atmosphere on June 4, 2000.

Chandra X-ray Observatory

This is the third of NASA's Great Observatories. It was deployed by the space shuttle in 1999. Chandra detects and images X-ray sources that are billions of light years away. The mirrors on Chandra are the largest, most precisely shaped and aligned, and smoothest mirrors ever constructed. Chandra abilities lets it investigate black holes, supernovas and dark matter. It is the heaviest payload the shuttle has ever launched. It weighs 4790 kilograms and measures 13.7 meters long. It orbits at an altitude that varies from 133,000 to 16,000 kilometers.

Spitzer Space Telescope

Spitzer is the fourth and final of NASA's great observatories. It is a Ritchey-Chretien telescope. It was launched into space by a Delta rocket on August 25, 2003. It weighs 950 kilograms. It makes observations in the infrared between wavelengths of 3 and 180 microns. Most infrared radiation is blocked by the Earth's atmosphere so outer space is the only good place for an infrared telescope! It is the largest infrared telescope ever launched into outer space. The Cryogenic Telescope Assembly contains the a 85 centimeter telescope and Spitzer's three scientific instruments: the Infrared Array Camera, the Infrared Spectrograph, and the Multiband Imaging Photometer. The telescope must be kept a few degrees above absolute zero or -273 degrees Celsius to function properly.

Create your own Great Observatories out of paper at:
<http://science.nasa.gov/kids/the-universe/universe-spacecraft-paper-models/>

Moon Phases



February 11 2011



February 18 2011



February 24 2011



March 4 2011

Canis Major

The great Overdog,
That heavenly beast
With a star in one eye,
Gives a leap in the east.

He dances upright
All the way to the west
And never once drops
On his forefeet to rest.

I'm a poor underdog,
But tonight I will bark
With the great Overdog
That romps through the dark.

-Robert Frost (1874-1963)

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LONDON RASC MONTHLY MEETINGS

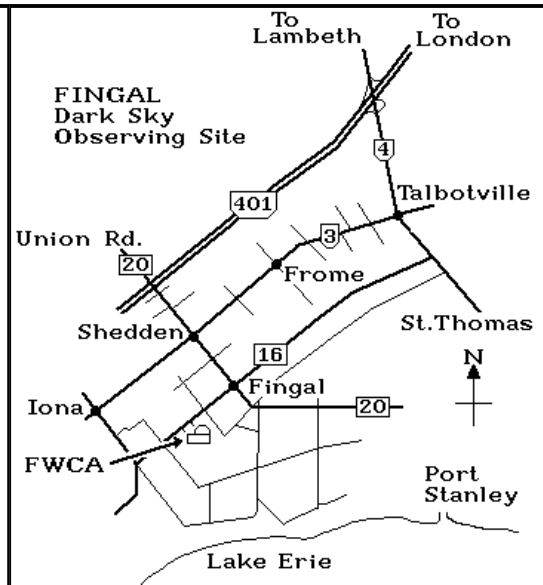
The London RASC group meets at Fanshawe College in London Ontario, September through July on the third Friday of the month at 19:00. We meet in room B1073.

Everyone interested in astronomy is invited to attend and enjoy our guest speaker, member activity and observing reports, announcements of new discoveries and upcoming events, telescopes and telescope accessories show and tell, and other fun activities. Have a look at our future and past activities on our website to see what we are doing.

Parking is free on Friday evenings, and there is plenty of room in the east parking lot off Oxford St. and parking spaces on the south side of B building. Enter the college by B building doors near Oxford Street, just west of the bus stop. College signs at key hallway locations will help you find us.

The London RASC webpage can be found at: www.rasc.ca/London

Our dark sky observing site is at the **Fingal Wildlife Management Area**.



Sky Events for late February and early March 2011

February 20 Zodiacal light visible in the west after twilight for two weeks
 February 28 Vesta 0.9 N of Moon
 March 1 Venus 1.6 S of Moon
 March 11 Moon 1.7 S of Pleiades (M45)
 March 12 Juno at opposition
 March 13 Daylight saving time begins
 March 13 Moon 1.2 S of M35
 March 16 Mercury 2.0 N of Jupiter

Mercury vanishes into the dawn twilight
Venus is brilliant in the eastern morning sky
Mars is not visible
Jupiter in the early evening sky
Saturn in the morning sky retrograding in Virgo
Uranus vanishes into the evening twilight
Neptune not visible



R.A.S.C. London Centre Library Books of the Month February 2011 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 2011 are as follows:

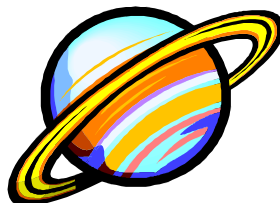
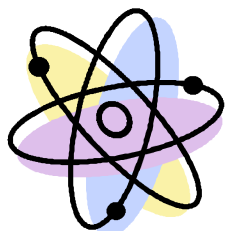
NightWatch: a Practical Guide to Viewing the Universe, by Terence Dickinson. 3rd Edition, Revised and Expanded for Use Through 2010. 1998 (2003 printing).

Pale Blue Dot: a Vision of the Human Future in Space, by Carl Sagan. c1994.

A Portfolio of Lunar Drawings, by Harold Hill. 1991.
 (Practical Astronomy Handbooks, 1)

For a complete listing of our library collection please see our RASC London Centre Library Web page at: http://www.astro.uwo.ca/~rasc/newrasc_library.html

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



You can find the last four years (or so) of Polaris newsletters online at:
<http://patusratus.ca/Polaris/index.html>

Star Nights & Other Events

By Robert Duff

Slide Presentation, Tecumseh Public School, January 19th, 2011

Dave McCarter made his digital slide presentation “Asteroids!” before 22 grade-6 students and their teacher at Tecumseh Public School on Wednesday, January 19th, beginning 2:20 p.m. Dave showed about 100 slides with the presentation ending around 3:30 p.m. Bob Duff distributed Galileo Moment cards to the class and gave the teacher 25 fully assembled Star Finder planispheres. The children enjoyed the presentation and asked many questions. An evening of Exploring the Stars at the Cronyn Observatory is scheduled for Thursday, February 10th, and Dave and Bob will be returning to the classroom later in February for more astronomy activities!

Exploring the Stars, Cronyn Observatory, January 18th—February 10th, 2011

By Robert Duff

I assisted at these events, bringing the RASC London Centre’s photographic display and setting it up and laying out some brochures.

Exploring the Stars, Thamesford Cubs, January 18th, 2011

Graduate student Alexander DeSouza greeted 5 visitors (4 children and 1 adults) from the Thamesford Cubs, for an evening of Exploring the Stars at the Cronyn Observatory, Tuesday, January 18th, 7:00 p.m. He made the digital slide presentation, “The Cub Astronomy Badge.” Bob Duff set up the RASC London Centre’s photographic display and laid out a couple of brochures on the table in the lecture room.

Since the sky was clouded out Alexander showed them the big 25.4cm refractor but did not open the dome. He gave the Cub leader 5 Star Finder planispheres to take with them and assemble and the group left around 8:05 p.m. after an interesting evening.

Exploring the Stars, Mother Teresa Secondary School, January 19th, 2011

Graduate student Robin Wing made his digital slide presentation, “Our Messy Solar System,” before 7 visitors (5 students and 2 teachers) from the grade-9 class of Mother Teresa Secondary School, Wednesday, January 19th, 6:30 p.m.

RASC London Centre was represented by Paul and Charlene Kerans and by Bob Duff who arrived during the presentation and set up the London Centre’s photographic display, laying out 3 brochures and “Become a Sidewalk Astronomer” booklets on the table in the lecture room.

Robin gave the visitors a tour of the 25.4cm refractor in the dome and Paul and Bob set up and demonstrated the London Centre’s 25.4cm Dobsonian in the dome. It was an interesting evening for the visitors even though clouds and possible snow ruled out observing.

Exploring the Stars, Homeschool, January 25th, 2011

Graduate student Robin Wing made his digital slide presentation, “Telescopes: What We Can See,” before 18 members of a homeschool group, including 12 children (ages 7—10) and 6 adults, at the Cronyn Observatory for Exploring the Stars, Tuesday, January 25th, 6:30 p.m. They then assembled cardboard telescopes and went up on the Observatory’s roof patio to try them out. Since it was cloudy, Robin also gave them a tour of the dome and Bob Duff showed them views of the communications tower in south London through the big 25.4cm refractor. The group was gone by 7:40 p.m.

(Continued on page 5)

February 2011 Pocket Sky Atlas Challenges

Oh it is the riot of stars that draws February’s astronomer away from the warm hearth into bluster and cold nights. Gemini and Orion are full of pleasures and there are dogs and dog stars to look for as well. Some how the clear night don’t seem so cold with these old friends around. Even a quick venture with binoculars can soon turn into a full viewing session with just a little more planning.

I’ve indexed the object to its star chart page.

Naked Eye:

Wasat and Mabsuta, Page 23, Adhara, Page 27.

Small Scopes and binoculars:

M41, Page 27, M44, M67 Page 24

Larger Scopes:

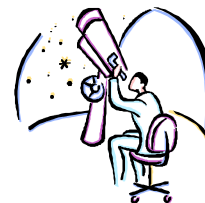
IC 2149 page 23; NGC 2266, Page 23; NGC 2359, Page 27

Bonus objects:

Cr 121, Cr 132 and Cr 140, Page 27 (These are all Collinder objects)

Happy hunting.

John Kulczykcki



and Robin and Bob Duff disassembled the cardboard telescopes.

Exploring the Stars, Dorchester Beavers, January 26th, 2011

Graduate student Alexander DeSouza made the digital slide presentation, "The Cub Astronomy Badge," before a group of 21 visitors (10 children and 11 adults) from the Dorchester Beavers, at the Cronyn Observatory for Exploring the Stars, Wednesday, January 26th, 6:30 p.m. RASC London Centre member Richard Gibbens was there with one other man interested in seeing the slide presentation. Bob Duff arrived around 6:50 p.m. and set up the London Centre's photographic display and laid out 3 brochures on the table in the lecture room. In all, there were 2 London Centre members and 22 visitors.

Since the sky was cloudy Alexander showed them the big 25.4cm refractor and opened the dome briefly. I talked with one of the leaders and she took a London Centre brochure. The group left around 7:50 p.m. after an interesting evening.

Exploring the Stars, 49th London Brownies / Sparks, January 27th, 2011

Cloudy skies ruled out stargazing for the 49th London Brownies and Sparks who arrived at the Cronyn Observatory for Exploring the Stars, Thursday, January 27th, 6:30 p.m. Graduate student Emily McCullough made the digital slide presentation, "Our Messy Solar System." She followed this with a drawing activity, rolling out approximately 4½ metres of ½ metre-wide paper on the floor, and having the children draw the planets in order from the Sun, using colour pencil crayons.

Emily took the group upstairs for a tour of the 25.4cm refractor in the dome, which remained closed due to the snowy weather. Bob Duff brought out the 25.4cm Dobsonian for demonstration inside the dome. Emily gave one family with a small telescope at home a Star Finder planisphere and Bob gave them a copy of "Become a Sidewalk Astronomer" and a London Centre brochure. The group left around 8:30 p.m. after a full evening of activity. There were in all 15 visitors (9 children and 6 adults), including one lady and child who arrived late, after everybody had gone upstairs into the dome.

Exploring the Stars, Princess Anne French Immersion School, February 3rd, 2011

Clear skies and cold temperatures greeted 20 visitors (11 children and 9 adults) from Princess Anne French Im-

mersion School (Grade-6), at the Cronyn Observatory for Exploring the Stars, Thursday, February 3, 6:30 p.m. Graduate student Emily McCullough made the presentation, "The Big Bang." RASC London Centre member Greg Andres and his son Abram set up their 20.3cm Sky-Watcher Dobsonian on the Observatory's roof patio after shovelling away some snow. Bob Duff set up the London Centre's 25.4cm Dobsonian and also made ready the 25.4cm refractor in the dome.

Emily showed visitors Jupiter and a star through the 25.4cm dome refractor (32mm Erfle eyepiece, 137X). Bob showed them the Orion Nebula (M42) through the 25.4cm Dobsonian (17mm Nagler eyepiece, 67X). They viewed the Pleiades and Andromeda Galaxy (M31) through Greg and Abram's 20.3cm Dobsonian. Children and adults were excited and happy to see all these objects, despite the cold. Bob talked to one man who apparently had an old 11.4cm Tasco reflector about nova and supernova and gave him a "Become a Sidewalk Astronomer" pamphlet and RASC and London Centre brochures. Everybody was gone by 8:30 p.m.

Exploring the Stars, Notre Dame School, February 7th, 2011

Cloudy skies greeted some 54 visitors (49 children and 5 adults) from Notre Dame School (Grades 4—6) for Exploring the Stars at the Cronyn Observatory, Monday, February 7th, 1:00 p.m. Graduate student Alexander DeSouza made his digital slide presentation, "Our Sun," and this was followed by a tour of the 25.4cm refractor in the dome. Also there were graduate student Robbie Halonen and faculty member Dr. Carol Jones.

Harold Tutt, Dave McCarter and Bob Duff represented the RASC London Centre.

Harold and Dave both brought their 80mm Stellarvue refractors with white light solar filters. Cloudy skies ruled out solar viewing and a demonstration of the 90mm Coronado hydrogen-alpha solar telescope newly acquired by the University for Exploring the Stars. However, Dave gave a brief presentation on safe viewing of the Sun through a telescope using a full aperture white-light filter. Harold gave the children a view of an astronomy poster through his telescope set up in the lecture room. Bob Duff and Alexander DeSouza gave the teachers 20 Star Finder planispheres, with Bob giving a brief demonstration to the students and teachers on how to assemble them.

The students boarded school bus for departure just prior to 2:30 p.m. after a day that had also featured a tour of the meteorite lab at the UWO Planetary Exploration and Science Centre.

Exploring the Stars, Nancy Campbell Collegiate Institute, February 9th, 2011

Graduate student Robin Wing made the digital slide presentation, "Our Messy Solar System," before a group of 20 visitors (13 children and 7 adults) from Nancy Campbell Collegiate Institute at the Cronyn Observatory for Exploring the Stars, Wednesday, February 9th, 6:30 p.m.

It was a clear cold night with some sky haze. Robin showed them Jupiter through the big 25.4cm refractor in the dome. Bob Duff set up the RASC London Centre's 25.4cm Dobsonian on the Observatory's roof patio and showed them the Moon. Everybody was gone by 8:30 p.m. after an interesting evening of astronomy.

Exploring the Stars, Tecumseh Public School, February 10th, 2011

Graduates student Alexander DeSouza greeted 34 visitors (22 children and 12 adults) from Tecumseh Public School (Grade-6) for Exploring the Stars at the Cronyn Observatory, Thursday, February 10th, 7:00 p.m. It was a cold clear night and Alexander brought them into the dome immediately where Dave McCarter showed them Jupiter in the big 25.4cm refractor, using the Meade 28mm Ultra-Wide eyepiece (157X).

On the Observatory's roof patio Greg Andres showed them the Moon in his 20.3cm Sky-Watcher Dobsonian and Bob Duff showed them the Orion Nebula (M42) in the London Centre's 25.4cm Dobsonian. Bob used his green laser pointer to identify stars in Orion and other constellations.

Returning to the lecture room everybody had a chance to warm up during Alexander's presentation, "Our Messy Solar System," and ask many questions. Another observing session followed with splendid views of the

Moon in the 25.4cm refractor (157X) and 25.4cm Dobsonian. Greg also showed them the Andromeda Galaxy (M31) in his 20.3cm Dobsonian. The sky was very clear and everybody enjoyed this exceptional evening despite the cold.

Cronyn Observatory Open House, Saturday, January 29th, 2011

Graduates student Emily McCullough distributed several hand-held spectroscopes to visitors to the Cronyn Observatory Open House, Saturday, January 29th, 7:00 p.m. They looked at the ceiling lights and Emily took them outside briefly to view streetlights. She explained how spectroscopy was used to identify the chemical elements in the atmospheres of the Sun and stars. Emily continued with a the digital slide presentation, "Our Messy Solar System." Afterwards she had them assemble Star Finder planispheres. RASC London Centre members Dave McCarter and Bob Duff assisted by helping people assemble their planispheres with Scotch tape. There were 20 visitors for Emily's presentation, later joined by 2 more people for a total of 22 visitors for the evening, including students in campus residence.

Despite the cloudy skies visitors viewed the communications tower in south London through the 25.4cm refractor in the dome. A star appeared briefly between the clouds and then vanished before there was a chance to observe it in the telescope. Bob set up the London Centre's 25.4cm Dobsonian for visitors to view the weather-vane on the roof of the Engineering building. Dave talked to several of the visitors about how to use a planisphere, Polaris and the Earth's precession, the ISS and the Heavens Above Web site and other questions. It was an enjoyable and interesting evening with everybody gone and the Observatory closed by 9:30 p.m.