

RASC Toronto Centre – www.rascto.ca

The Sky This Month – August 6, 2014 to Sept 10, 2014

by Chris Vaughan

NEWS

Space Exploration – Public and Private

Ref. <http://www.spaceflightnow.com/tracking/index.html>

Launches

August TBD - GSLV Mk.3 rocket from Satish Dhawan Space Center, Sriharikota, India, payload Atmospheric Test Flight

Aug 13 pm - Atlas 5 rocket from Vandenberg Air Force Base, California, payload WorldView 3 Earth observation satellite for DigitalGlobe

Aug 13 pm – Long March 4B rocket from Taiyuan, China, payload Gaofen2 remote sensing sat

Aug 21 am - Soyuz rocket from ELS, Sinnamary, French Guiana, payload Galileo full operational capability satellites for Europe's Galileo navigation constellation

Aug 25 TBD - Falcon 9 rocket from Cape Canaveral Air Force Station, Florida, payload AsiaSat 6 comsat

September TBD - H-2A rocket from Tanegashima Space Center, Japan, payload Himawari 8 weather satellite

Sept 11 TBD - Ariane 5 rocket from Kourou, French Guiana, payload Measat 3b & Optus 10 comsats

Sept 12 TBD - Falcon 9 rocket from Cape Canaveral Air Force Station, Florida, payload SpaceX sixth Dragon spacecraft on the fourth operational cargo delivery mission to the ISS

Sept 25 pm - Soyuz rocket from Baikonur Cosmodrome, Kazakhstan, payload next Expedition crew to the ISS

Rosetta Update

Orbiter will map the comet's surface, measure gravity, mass, shape, and analyze the coma and plasma. The 100 kg Philae Lander will make contact on Nov 11, 2014 and use ice-screws to drill/sample comet and harpoons to latch on. The mission will ride the comet to perihelion and beyond!

Aug 6 orbital insertion burns.

Video at <http://blogs.esa.int/rosetta/2014/08/04/whats-happening-in-rosetta-mission-control-today/>

This Month in History (a sampling)

Ref. <http://astroplanet.org/next.php>, <http://www2.jpl.nasa.gov/calendar/>,

<http://space.about.com/library/weekly/bldatechoice.htm>, <http://www.planetary.org/multimedia/space-images/charts/whats-up-in-the-solar-system-frohn.html>

Astro-Birthdays

August 8, 1931 – Sir Roger Penrose, mathematical physicist and cosmologist is born

August 29, 1959 – Canadian Astronaut, singer, social media icon Chris Hadfield, is born

September 7, 1914 – James van Allen – American physicist and magnetospheric researcher is born

Astronomy and Space Exploration

August 6, 2011 – Launch of JUNO mission to Jupiter, scheduled to arrive July 4, 2016, and enter polar orbit

August 11, 3114 BCE – The Beginning of Creation, according to the Maya civilization

August 11 & 17, 1877 – Asaph Hall discovers Phobos and Deimos (aka Gods of Fear and Dread respectively)

August 13, 1642 – Christiaan Huygens discovers the Martian south polar cap

August 15, 1977 – WOW! signal is detected by the SETI program using The Big Ear radio telescope. The 72 sec. signal originating near Chi Sagittarii is never duplicated

August 23, 1966 – Earth is photographed for the first time from lunar orbit by Lunar Orbiter 1

August 24, 2006 – International Astronomical Union (IAU) demotes the planet Pluto to a dwarf planet or "trans-Neptunian object".

August 28, 1789 – William Herschel discovers Enceladus with a 1.26m telescope, the world's largest

August 29, 1541 – Nicolaus Copernicus' book "De Revolutionibus Orbium Coelestium" ("On the Revolutions of the Celestial Spheres") goes to the printer

September 1, 1804 - German astronomer Karl Ludwig Harding discovers the asteroid, Juno

September 4, 1682 - English astronomer Edmund Halley observes "his" comet

September 6, 1997 - Gladman, Nicholson, Burns, and Kavelaars using the 200-inch Hale telescope discover Caliban and Sycorax, moons of Uranus

September 9, 1892 - Edward Barnard of the Lick Observatory discovers Jupiter's innermost satellite, Amalthea. The first since Galileo's four Galilean moons

Star Parties, etc.

Ref: <http://ontariostargazing.ca/astronomy-star-party-and-astronomy-events-listing-for-canada/>,
<http://www.amsky.com/calendar/events/#may>

"RASC Solar Observing", Ontario Science Centre Teluscape – August 9 and September 6

"RASC City Skies Observing", Bayview Village Park, Toronto – windows open August 5 and September 2

"RASC Dark Skies Observing", Long Sault Conservation Area, ON – window opens August 25

"Thursday Night Astronomy Nights", Gordon's Park Dark Sky Preserve, Manitoulin Island – July/Aug
www.gordonspark.com

"Perseid Meteor Shower Party", Gordon's Park Dark Sky Preserve, Manitoulin Island – August 8-12
www.gordonspark.com

"The Manitoulin Star Party", Gordon's Park Dark Sky Preserve, Manitoulin Island – Aug 29 – Sept 1
www.gordonspark.com

"Starfest", Mt Forest, ON – August 21-24 (<http://www.nyaa.ca/index.php?page=/sf14/sf.home14>)

"Saskatchewan Summer Star Party, SSSP", Cyprus Hills, Sask – August 21-24
<http://www.usask.ca/rasc/starparty.html>)

OBSERVING

Globe at Night 2014

A citizen science program to map light pollution around the world. During the observing window, you are encouraged to make a visual measurement to determine the limiting magnitude of stars you can observe at your location. The website provides charts for assisting observations, instructions for submitting results, and an interactive map showing current and historical results. Details are at <http://www.globeatnight.org/>
 The August campaign focus is on **Hercules**.

Sunrise/Sunset

August 1, sunrise at 6:09 am, sunset at 8:40 pm (14:31 of daylight)

September 1, sunrise at 6:43 am, sunset at 7:52 pm (13:09 of daylight)

Moon - Orbit

Apogee - July 27 at 11 pm

Perigee – August 10 at 2 pm (near Full Moon, large tides)

Apogee – August 24 at 2 am

Perigee – Sept 7/8 at midnight (near Full Moon, large tides)

Moon - Phases

August 3 at 8:50 pm – First Quarter Moon (sets around midnight)

August 10 at 2:09 pm – Full “Sturgeon/Green Corn/Grain” Moon (largest “Supermoon” for 2014)

August 17 at 8:26 am – Last Quarter Moon (rises around midnight)

August 25 at 10:13 am – New Moon

September 2 at 7:11 am – First Quarter Moon (sets around midnight)

Moon - Conjunctions

Visible from late evening onward on August 11, the Full Moon (97% illum.) sits approx. 4° to the north (upper left) of Neptune (mag. 7.6). A month later, on September 7, the pair meet again (~6° sep.).

Visible in pre-dawn of August 18, the Last Quarter Moon (41% illum.) begins to traverse The Hyades and sits about 4° to the west (upper right) of Aldebaran in the southeastern sky. Photo op!

Visible from approx. 4:45 am to dawn on August 23 in the southeastern sky, a triple conjunction of the Old Crescent Moon (4% illum.) sits about 6° to the southwest (right) of Jupiter (mag -1.4) and 8° to the southwest (upper right) of Venus (mag. -3.3). Photo op!

Visible with difficulty just after sunset on August 27, the New Crescent Moon (5% illum.) sits about 10° to the southeast (left) of Mercury, low in the western sky.

Visible in early evening on August 29 in the western sky, the Waxing Crescent Moon (17% illum.) sits about 2° to the east (upper left) of Spica.

In the southwestern sky in early evening on August 31, look for a triple conjunction of the Waxing Crescent Moon (35% illum.) roughly between Mars (mag. +0.8) and Saturn (mag. +0.8). Photo op!

Planets and Dwarf Planets

Mercury reaches superior conjunction on August 8. This low Ecliptic apparition can be observed with difficulty after sunset starting in the second week of August and reaching greatest eastern elongation on September 22. On August 27, the New Crescent Moon (5% illum.) sits about 10° to the southeast (left) of Mercury, very low in the western sky. On September 10th it will be setting at 8:22 pm (mag +0.15) and be 73% illuminated.

Venus, a bright morning object low in the eastern sky, is dropping towards the Sun and moves from Gemini through Cancer and into Leo over the next month. It rises at 4:24 am on August 6th (mag -3.3 and 93% illum) and 5:32 am on September 10th (mag -3.4 and 98% illum). In the morning twilight of August 18, Venus will be positioned approximately 15 arc-minutes from Jupiter, on the southwestern edge of Praesepe/The Beehive (M44), a telescopic treat! On August 23, from approximately 4:45 am to dawn in the southeastern sky, a three object grouping occurs - the Old Crescent Moon (4% illum.) sits about 6° to the southwest (right) of Jupiter (mag -1.4) and 8° to the southwest (upper right) of Venus (mag. -3.3). Photo op!

Mars is an orange-red object low in the southwestern sky after dusk. Over the next month, it rapidly shifts eastward from Virgo into Libra and remains small, but observable in early evening. It sets at 11:36 pm on August 6th (mag +0.6) and at 10:17 pm on September 10th (mag +0.9). For about a week starting August 19th, look for Mars to pass Zubenelgenubi and Saturn – with the best binocular/photo ops on August 24-26! Then, in early evening on August 31, the nearly First Quarter Moon will be situated above and between Mars and Saturn. Binocular/Photo op! Bonus early heads up – on September 27, Mars will pass within 3° of its visual twin, Antares (latin for “not Mars”).

Jupiter, in Cancer all month, recently passed conjunction. By mid-August it will have climbed out of the dawn glow and become available for morning viewing. It rises at 5:24 am on August 6th (mag -1.3) and at 3:45 am on September 10th (mag -1.4). On the morning twilight of August 18, Jupiter will be positioned approximately 15 arc-minutes from Venus, with the southwestern edge of Praesepe/The Beehive (M44) off to the left (east) - a telescopic treat! On August 23, from approximately 4:45 am to dawn in the southeastern sky, the Old Crescent Moon (4% illum.) sits about 6° to the southwest (right) of Jupiter (mag -1.4) and 8° to the southwest (upper right) of Venus (mag. -3.3). Photo op!

Saturn is an early evening object in the southwestern sky moving prograde (east) in Libra all month. It sets at 12:21 am on August 6th (mag +0.75) and at 10:08 pm on September 10th (mag +0.8). For about a week starting August 19th, look for Mars to pass Zubenelgenubi and Saturn – with the best photo ops on August 24-26! Then, in early evening on August 31, the nearly First Quarter Moon will be situated above and between Mars and Saturn. Binocular/Photo op! From approximately 1:30 to 2 pm on August 31, Saturn (mag. 0.0) will be briefly occulted by the waxing crescent Moon – visible in the GTA, low in the southeastern sky.

Uranus, moving retrograde (west) in Pisces all month, becomes an evening observing target over the next weeks. In early August, it is observable in the southeastern late-night sky, rising at 10:52 pm (mag 6.1) on August 6th. By early September, it becomes an all evening target, rising at 8:33 pm on September 10th (mag 6.5). On September 10, Uranus will rise just as it emerges from behind the one day past Full Moon.

Neptune (mag 7.6) in Aquarius, is in the southeastern evening sky, and reaches opposition on August 29, making it an all-night target this month. It rises at 9:26 pm on August 6th and at 7:06 pm on September 10th. The Full Moon sits 3° north of Neptune on August 11.

Pluto, north of Sagittarius' teapot, a faint mag 14.1 object, sets at 3:44 am on August 6 and at 1:24 am on September 10.

Vesta (mag 7.5) and **Ceres** (mag 8.8) are in the same area, about 8° northeast of Mars in Virgo and are travelling east towards Libra on Sept 10. They are available for early evening viewing.

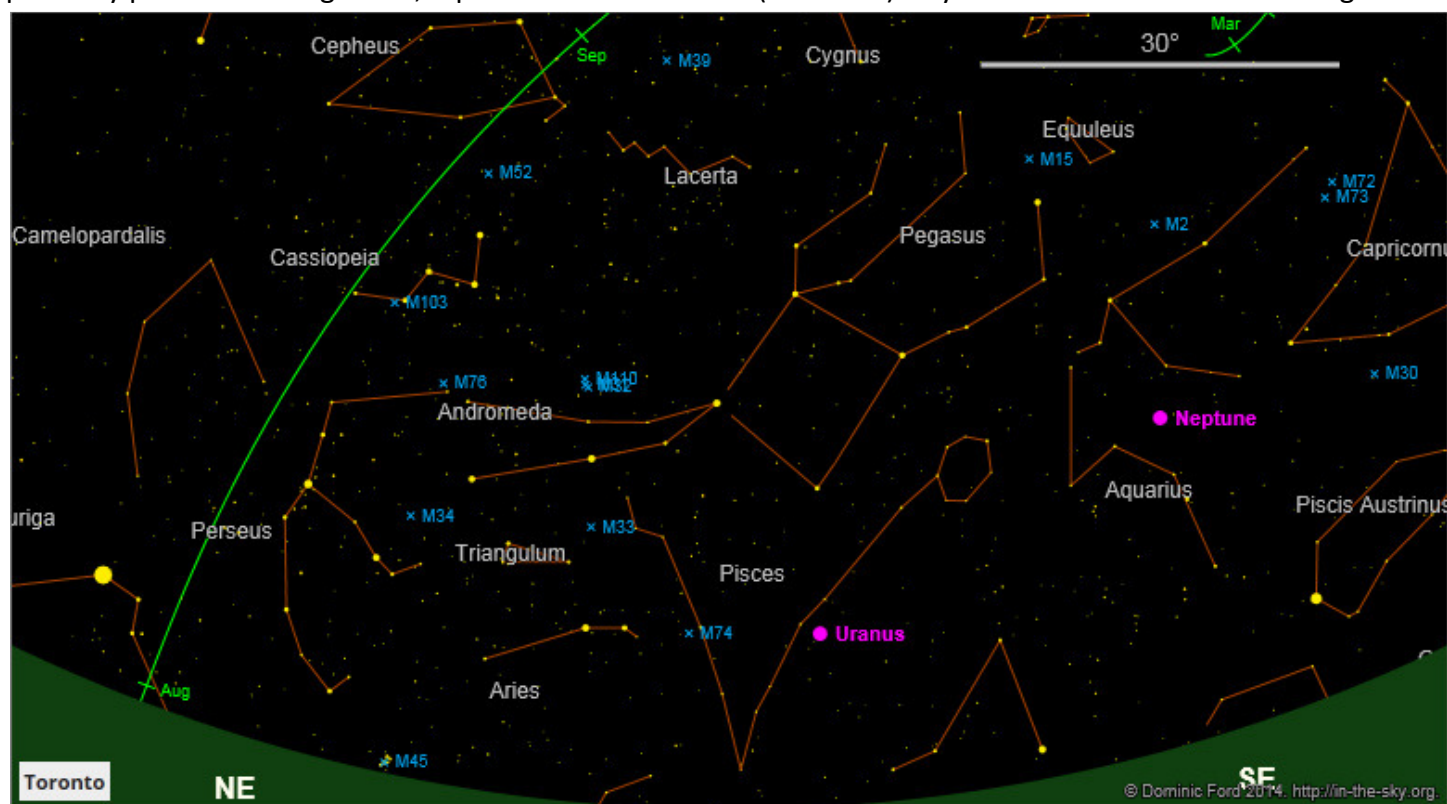
Comets

Ref <http://www.aerith.net/comet/weekly/current.html>, <http://cometchasing.skyhound.com/>, <http://in-the-sky.org/comets.php>

Comet C/2014 E2 (Jacques)

On August 6, C/2014 E2 (Jacques) is observable in the NE sky after midnight. On August 8 it becomes circumpolar and moves northwest from Auriga, then east, through the Heart & Soul nebulae on August 20. Travelling eastward past Cassiopeia and through Cepheus, it passes within 20 arc-minutes of Herschel's Garnet

Star at 9 pm on August 30, and into Cygnus by Sept 10. In early August its brightness is at ~6.9 and has probably peaked. On August 29, it passes closest to Earth (0.564 AU). Sky shown below at 12:30 am Aug 6.



Meteor Shower(s)

Ref. <http://www.amsmeteors.org/meteor-showers/meteor-shower-calendar/>

Perseids - Active period July 13 – Aug 26, peaking before dawn on August 12th. The August 10 Supermoon will spoil the fun. The shower radiant point is between Camelopardalis and Perseus in the NE sky – and nearly overhead by dawn (RA 3h 12m, Dec. +57.6°). Source of material was comet 109P/Swift-Tuttle (130 year period). Usually 60-80 per hour at the peak, many of a fireball nature.

Asteroids

Ref. <http://neo.jpl.nasa.gov/ca/>, <http://www.minorplanetcenter.net/>

According to the Minor Planet Centre...

Near-Earth Objects Discovered This Year:	721 (~100/month)
Minor Planets Discovered This Year:	35,392 (~4915/month)
Comets Discovered This Year:	33 (~5/month)

September 9 - Asteroid 276049 - 2002 CE26 (3.5 km) will pass within 48 Lunar Distances, peak magnitude 16.8

Satellites

Current GTA International Space Station evening pass series runs from August 4th to 25th (Most are visible between 9:30 pm and 12:30 am). Morning passes commence on Sept 10th.

Some higher/brighter ones include*:

Date	Mag.	Time	Direction	Alt.
05-Aug	-3.1	9:12:55 pm to 9:19:24 pm	moving SW to ENE	50°
07-Aug	-2.8	9:11:38 pm to 9:18:16 pm	moving WSW to NE	67°
15-Aug	-2.5	10:44:42 pm to 10:47:29 pm	moving NW to NNW	50°
16-Aug	-2.3	9:55:41 pm to 10:00:06 pm	moving NW to ENE	39°
18-Aug	-3.3	9:54:06 pm to 9:58:16 pm	moving WNW to ESE	82°
19-Aug	-2.8	9:05:02 pm to 9:10:58 pm	moving NW to ESE	52°
20-Aug	-2.4	9:52:40 pm to 9:56:33 pm	moving WNW to S	39°
21-Aug	-3.1	9:03:25 pm to 9:09:21 pm	moving WNW to SE	69°

*far future predicted times may shift slightly

Iridium Flares most frequent evening passes occur between 9 pm and 10 pm. Local occurrences info at www.heavens-above.com and enter your location, from phone/tablet apps, Chris Vaughan's Skylights (subscribe to email or visit www.astrogeoguy.tumblr.com)

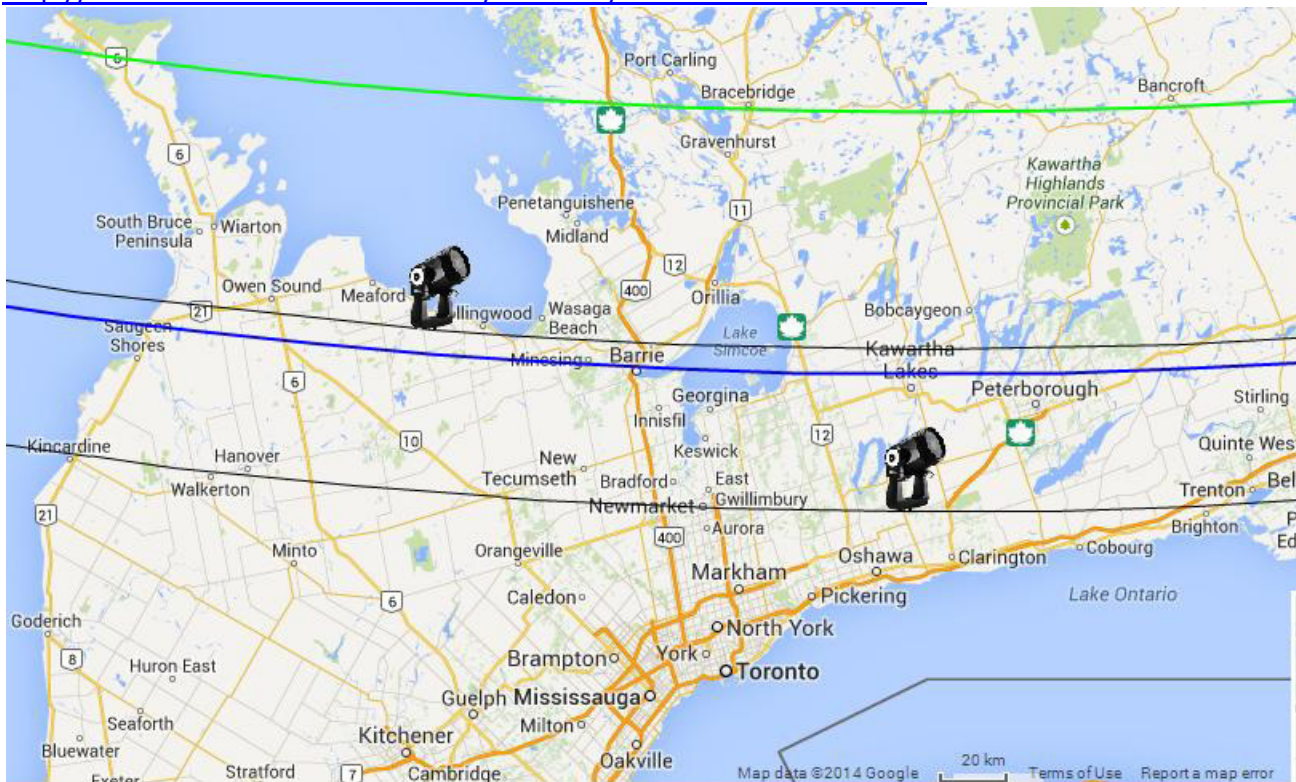
Occultations

Ref: <http://www.asteroidoccultation.com/> (additional links on the following URLs open track maps)

Thanks to Guy Nason for local track maps! (RASC TC observing sites are under the telescopes' bases.)

Rank 27 - 12 Aug , 04:46 UT Asteroid (1343) Nicole (mag 14.2) occults star TYC 7427-01105-1 (mag 10.4), visible over SE Canada, drops 3.8 mags for 5.8 seconds, alt. 10°

http://www.asteroidoccultation.com/2014_08/0812_1343_33645.htm



Rank 46 – 16 Aug 2014 , 07:19 UT Asteroid (289) Nenetta (mag 12.9) occults star 2UCAC 28110627 (mag 12.5) in Capricornus – visible over Lake Erie and Lake Ontario corridor, drops 1.0 mags for 3.4 seconds, alt. 65°

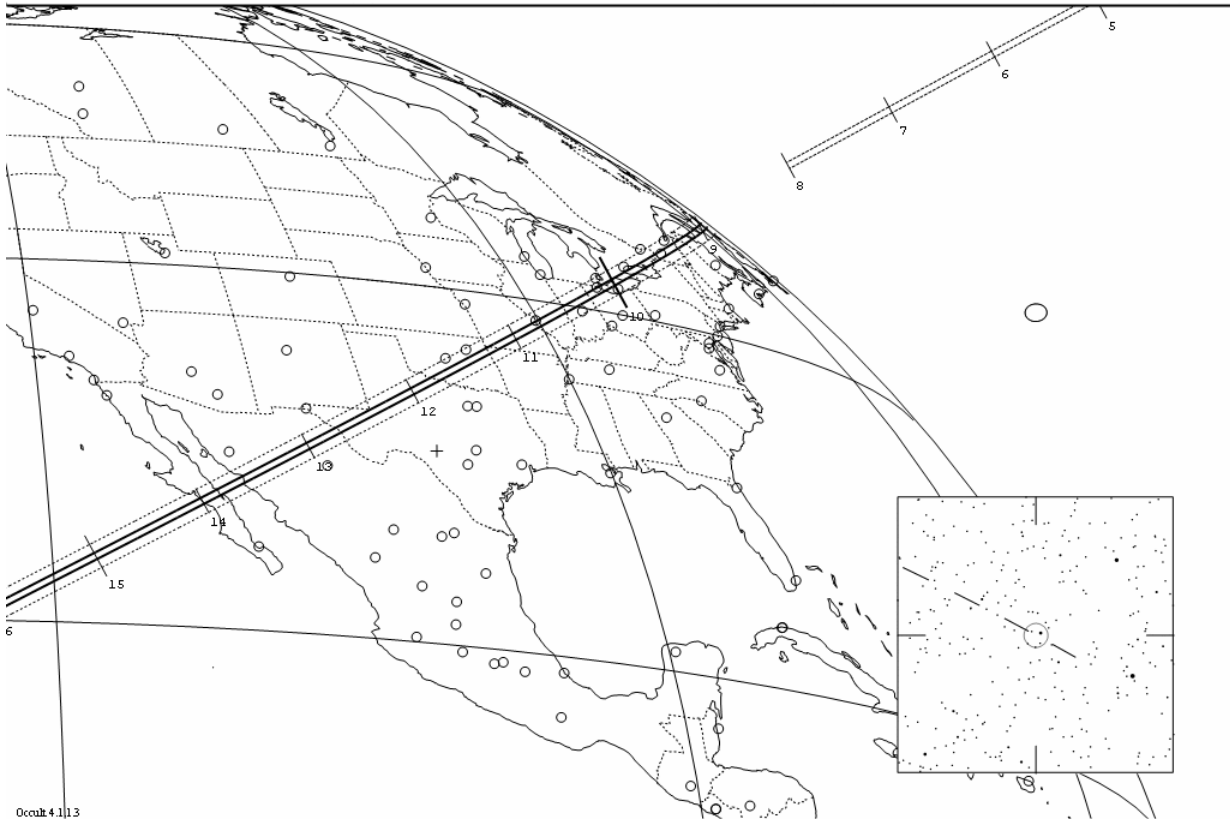
http://www.asteroidoccultation.com/2014_08/0816_289_32870.htm

289 Nenetta occults 2UCAC 28110627 on 2014 Aug 16 from 7h 9m to 7h 30m UT

Star:
Mv = 12.5
RA = 20 23 51.9552 (J2000)
Dec = -10 41 21.517
[of Date: 20 24 42, -10 38 15]
Prediction of 2014 Aug 3.0

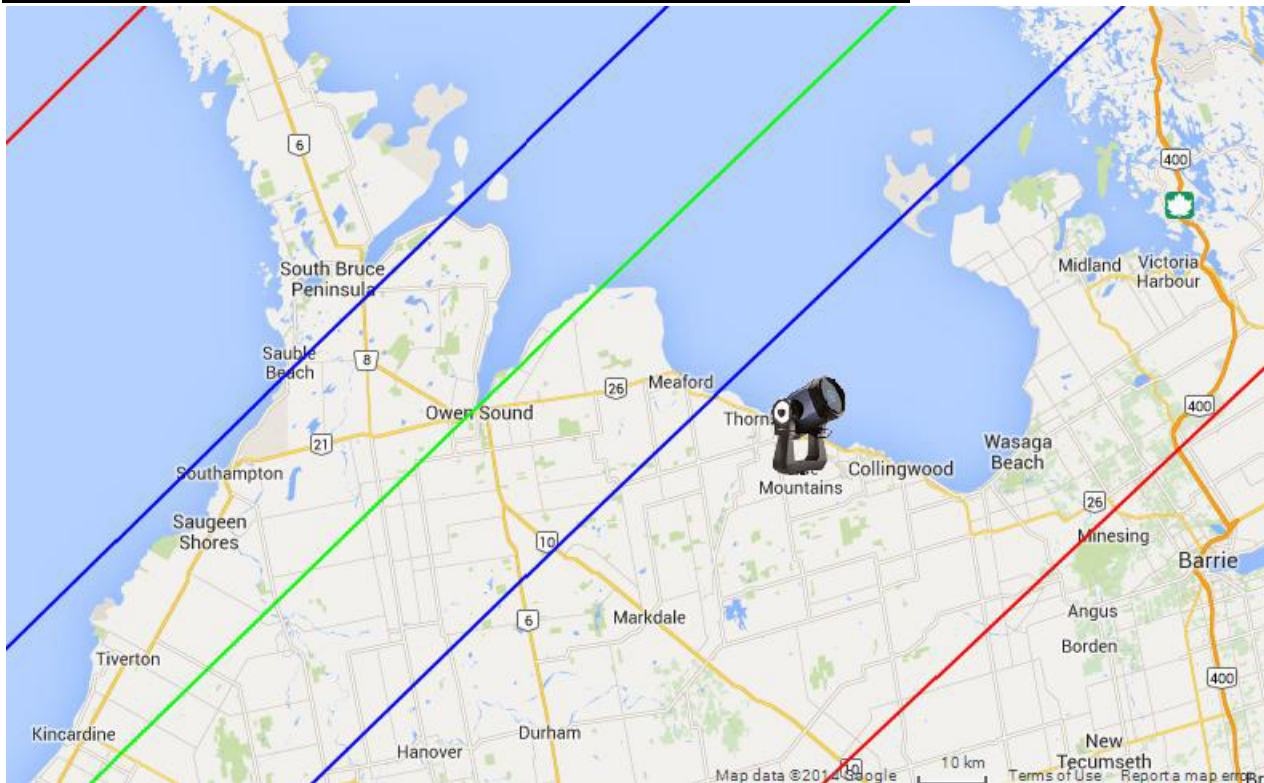
Max Duration = 3.4 secs
Mag Drop = 1.0
Sun : Dist = 160 deg
Moon: Dist = 93 deg
illum = 63 %
E 0.046"x 0.037" in PA 87

Asteroid:
Mag = 12.9
Dia = 31km, 0.028"
Parallax = 5.820"
Hourly dRA = -1.756s
dDec = -14.09"



Rank 55 - 25 Aug 2014 , 06:22 UT Asteroid 794 Irenaea (mag 14.1) occults star 2UCAC 27010127 (mag 12.3) in Capricornus – visible over Lake Huron Georgian Bay corridor, drops 2.0 mags for 6.2 seconds, alt. 65°

http://www.asteroidoccultation.com/2014_08/0825_794_35536.htm



Constellations near the Meridian (Annually in August)

11 pm: Corona Australis, Sagittarius, Scutum, Aquila, Sagitta, Vulpecula, Cygnus, Lyra, and Draco

1 am: Microscopium, Capricornus, Aquarius, Equuleus, Delphinus, Lacerta, Cygnus, and Cepheus

3 am: Sculptor, Piscis Austrinus, Aquarius, Pisces, Pegasus, Andromeda, Lacerta, Cassiopeia, and Cepheus

Summer Star party Skylights (Annually in August)

Summer Triangle, Milky Way, the Coathanger, etc. (eye / binoculars),

Summer Globs – M13, M92 (Her), M5 (Ser), M4 (Sco), etc. (binoculars / telescope)

Summer Blobs – Lagoon, Trifid (Sag), Veil, N American, Crescent (Cyg), etc. (binoculars / telescope),

Summer Knobs – Ring (Lyr), Dumbbell (Vul), Blinking Planetary (Cyg), Cat's Eye (Dra), etc. (binoculars / telescope)

Seeing Double – Izar (Boo), Albireo (Cyg), Eps Lyrae Double-double (Lyr), Marfik (Her/Oph), etc. (binoculars / telescope)

Hit Singles - Antares (Sco), Vega (Lyr), Altair (Aqu), Deneb (Cyg), Arcturus (Boo), Herschel's Garnet Star (Ceph) (eye / binoculars / telescope)

Come out to Long Sault C A, Bayview Village Park, CAO, or DDO!