

RASC Toronto Centre

The Sky This Month – January 22, 2014 to February 19, 2014

by Chris Vaughan

NEWS

Space Exploration – Public and Private

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

Jan 23 pm – Launch of Atlas 5 rocket from Cape Canaveral Air Force Station, Florida, payload Tracking & Data Relay comsat in support of ISS and other sats

Jan TBD – Launch of Long March 4B rocket from Taiyuan, China, payload Gaofen 2 high-resolution remote sensing satellite

Feb 5 am – Launch of Soyuz rocket from Baikonur Cosmodrome, Kazakhstan, payload Progress 54P cargo delivery to ISS

Feb 6 pm – Launch of Ariane 5 rocket from Kourou, French Guiana, payload ABS 2 and Athena-Fidus comsats

Feb 14 TBD – Launch of ILS Proton rocket from Baikonur Cosmodrome, Kazakhstan, payload Turksat 4A comsat

Feb 20 TBD – Launch of Delta 4 rocket from Cape Canaveral Air Force Station, Florida, payload USAF GPS sat

Feb 22 TBD – Launch of SpaceX Falcon 9 rocket from Cape Canaveral Air Force Station, Florida, payload 5th Dragon spacecraft for unmanned ISS re-supply

ESA Rosetta Mission

It successfully awoke from dormancy this week and is en route to rendezvous with Comet 67P/Churyumov-Gerasimenko in August, 2014. The 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 and harpoons to latch on. The mission will ride the comet to perihelion and beyond!

China's Chang'e 3 Lander and Yutu Rover on the Moon

Lander instruments

- Three color "topography cameras" for terrain imaging (instrument may have failed)
- Descent camera (1280x1024 pixels)
- Near-ultraviolet telescope (wavelength range 245 to 340 nanometers) for stellar observations down to 13th magnitude
- Extreme ultraviolet camera for observing Earth's plasmasphere

Yutu Rover instruments

- Two color panoramic cameras for stereo imaging
- Two mast-mounted navcams and two forward-facing hazcams
- Ground-penetrating radar (to depths of 30-100 meters)
- Alpha particle X-ray spectrometer
- Visible / near-infrared imaging spectrometer

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

Jan 16, 1944 - Jill Tarter, SETI pioneer

Feb 4, 1906 – Clyde Tombaugh, discoverer of Pluto in 1930

Feb 7, 1824 – Sir William Huggins, pioneer of stellar and nebula spectroscopy

Feb 15, 1564 – Birth of Galileo Galilei, renaissance man, astronomer

Feb 19, 1473 – Nicholas Copernicus, revolutionary author of “On the Revolution of the Heavenly Spheres”

Feb 28, 1749 – Pierre Laplace, mathematician, astronomer, and inventor of metric system

Astronomy and Space Exploration

Jan 15, 2014 – passing of John Dobson, aged 98, pioneer of astronomy outreach and developer of Dobsonian, born Sep 14, 1915 in Beijing

Jan 19, 2006 - New Horizons Mission launch for 9 year trip to Pluto (flyby in July, 2015) and Kuiper Belt

Jan 25, 2004 – Opportunity Rover landing on Mars

Jan 27, 1967 – Apollo 1 crew, Grissom, Chaffee, and White perished in a capsule fire during training

Jan 28, 1986 – Shuttle Challenger explodes shortly after liftoff

Jan 31, 1862 – Alvin Clark discovers Sirius B (the Flea)

Feb 1, 1949 - First Light for the 200" (5.08-m) Hale telescope

Feb 1, 2003 - Space Shuttle Columbia breaks up on re-entry over Texas. All seven lives are lost.

Feb 4-9, 1971 – Apollo 14 mission

Feb 18, 1930 – Clyde Tombaugh discovers Pluto

Feb 20, 1994 - 20th Anniversary of Clementine Moon Orbit Insertion

Feb 24, 1968 – Jocelyn Bell at Cambridge announces the first pulsar PSR1919+21 near Sagitta

Star Parties

Ref: <http://ontariostargazing.ca/astronomy-star-parties-events-ontario/>

“RASC City Skies Observing”, Bayview Village Park, Toronto – window opens February 3rd

“RASC Dark Skies Observing”, Long Sault, ON – window opens January 27th

“RASC Dark Skies Observing”, Long Sault, ON – window opens February 24th

Southern Cross Astronomical Society Winter Star Party, Scout Key, Florida - February 23 to March 2, 2014

<http://www.scas.org/winterstarparty.htm>

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/>

Sunrise/Sunset

January 1st sunrise at 7:58 am, sunset at 4:46 pm

February 1st sunrise at 7:40 am, sunset at 5:24 pm

March 1st sunrise at 7:00 am, sunset at 6:02 pm

Moon - Phases

January 1st at 6:14 am – New Moon

January 7th at 10:39 pm – First Quarter Moon (sets around midnight)

January 15th at 11:52 pm – “Full Wolf Moon” (occurs near Apogee, “Wimpy” Moon, smallest of 2014)

January 24th at 12:19 am – Last Quarter Moon (rises around midnight)

January 30th at 4:38 pm – New Moon

February 6th at 2:22 pm – First Quarter Moon (sets around midnight)

February 14th at 6:53 pm – “Full Snow Moon” (occurs near Apogee, “Wimpy” Moon)

February 22nd at 12:15 pm – Last Quarter Moon (rises around midnight)

Moon - Conjunctions

Visible after 1 am on January 23, the Waning Gibbous Moon will be sit only 4 degrees south of (below) Mars, and by 5 am the Moon will move to within about 45 arcminutes of Spica, in the southeastern sky.

On the pre-dawn sky of January 25, the “Last Quarter” Moon sits less than 2 degrees southwest (to the lower right) of Saturn, low in the southeastern sky. Great photo op!

On the evening of February 10, the Waxing Gibbous Moon will be situated only 5.5 degrees southwest (to the lower right) of Jupiter, high in the eastern sky.

In the early hours of February 19, the Waxing Gibbous Moon is about 8 degrees west (to the right) of Mars. At dawn, the Waning Gibbous Moon sits only 2 degrees southwest (to the right) of Spica, low in the western sky.

At 1 am on February 21, the Waning Gibbous Moon sits only 40 arcminutes north (to the upper left) of Zubenelgenubi, low in the southeastern sky.

On the early morning of February 26, the Old Crescent Moon sits less than 4 degrees east (to the lower left) of Venus, low in the southeastern sky. Great photo op!

Moon - Orbit

Apogee on January 15th at 9 pm

Perigee on January 30th at 5 am

Apogee on February 11/12th at 12 am

Perigee on February 27th at 3 pm

Planets and Dwarf Planets

Mercury, reaches greatest eastern elongation on January 31st, when it sets at 7 pm. This is the most favorable apparition for 2014. Look for the New Moon nearby on Jan31/Feb 1. It will become very difficult to observe after the first week of February. It reaches inferior conjunction on February 15.

Venus, in Sagittarius, is a morning object, climbing higher during January and February, and reaching maximum brightness on February 15. It rises at 6:15 am on January 22 week (only 5% illum) and 4:53 am on February 14 (25% illum).

Mars, near Spica in Virgo all month, is visible in late evenings – rising at 11:52 pm on January 22 and 10:49 am on February 15. It's steadily brightening and enlarging as it heads towards opposition in April, the best since 2007.

Jupiter, after recently reaching opposition, can be viewed all night long in Gemini. It rises at 3:36 pm on January 22nd and at 1:55 pm on February 14th. A nice lunar conjunction occurs on February 10th.

Saturn, in Libra all month, is a predawn object, but is climbing away from the Sun. It rises at 2:37 am on January 22nd and at 1:12 am on February 14th. It has a close conjunction with the Moon on January 25.

Uranus, in Pisces, is only observable in early evenings until about the end of February. It sets around 11 pm on January 22nd and at 9 pm on February 14th.

Neptune, in Aquarius, is too low for viewing, setting around 7:30 pm. It reaches conjunction on February 23rd.

Pluto, northeast of Sagittarius' teapot, near Venus, is not yet visible.

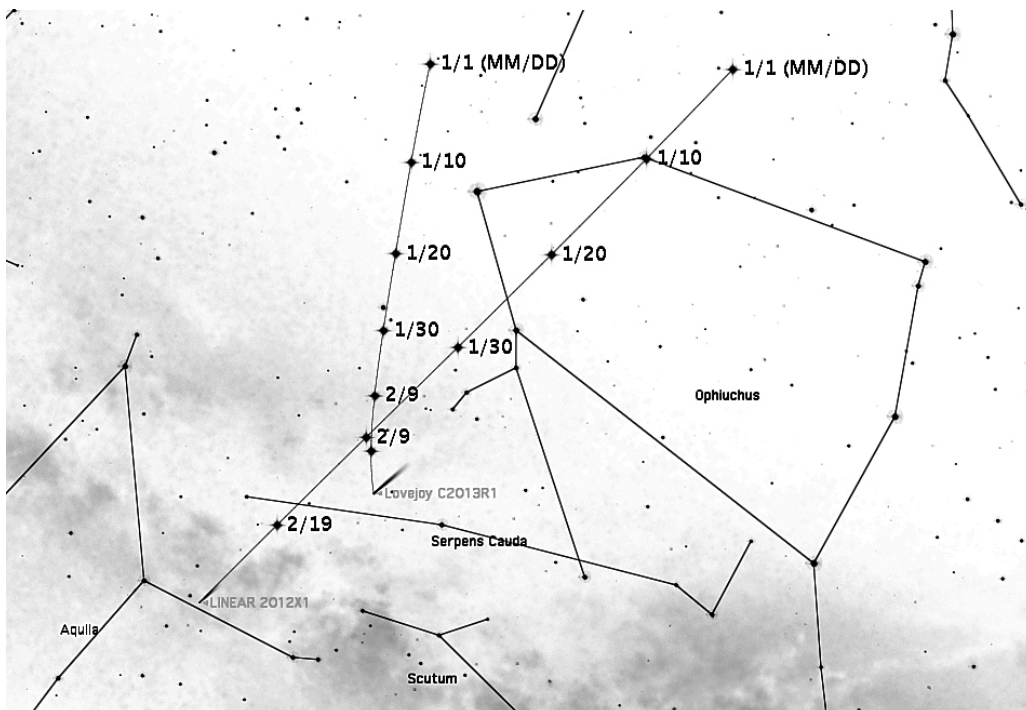
Ceres and **Vesta** are near Mars in Virgo, and are well placed for early morning viewing. Both will reach opposition along with Mars in April.

Comets

Ref. <http://www.aerith.net/comet/catalog/2012S1/2012S1.html>

Comet C/2013 R1 Lovejoy

Lovejoy is in the eastern pre-dawn sky, roughly between Ophiuchus and Altair and moving slowly towards Scutum. It rises at 3:30 am on January 22 (approx 7 degrees below Rasalhague) and at 2:45 am by mid-February. Its mid-January brightness is reported to be magnitude 6 or brighter. It will remain well positioned for months to come, becoming an evening target by summer.



Comet C/2012 X1 Linear

Linear is in the eastern pre-dawn sky, moving out of Ophiuchus and towards Altair. It rises about 3 am for the next month. On January 22nd it sits approx 6 degrees to the lower right of Rasalhague. Its mid-January brightness is reported to be magnitude 9 and may still brighten a little. It will remain well positioned in mornings for months to come. (see the finder chart above)

Note: On February 7 at 8 UT, the two comets will pass within 2 degrees of each other!

Meteor Shower(s)

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

No news

Supernova!

New supernova PSN (Preliminary Supernova) J09554214+6940260 in M82 or Bode's Nebulae "only" 12 million light-years away and may not reach peak brightness for two more weeks. It appears to be a Type Ia supernova (standard candle to measure the expansion of the universe). Closest supernova since the Supernova 1987A and the closest supernova Type Ia since SN 1972E." The discovery was made by students working with astrophysicist Steve Fossey at University College London.

Asteroids

Ref. <http://neo.jpl.nasa.gov/ca/>

2014-Feb-10 asteroid (2006 DP14) will pass 0.016AU or 6.2 lunar distances from Earth. Size is 460 to 1,000m.

Satellites

Current GTA International Space Station morning pass series continues until January 30 (between 4:45 am and 7 am). Evening passes from February 5 to 27 (Most are visible between 6 pm and 8 pm)

Some higher/brighter ones include*:

Date	Mag.	Time	Direction	Alt.
24 Jan	-3.2	from 7:05:09 am to 7:11:47 am	moving WNW to SE	68°
25 Jan	-3.2	from 6:18:41 am to 6:23:33 am	moving NW to ESE	75°
9 Feb	-3.3	from 6:57:04 pm to 7:01:53 pm	moving WSW to NE	80°
10 Feb	-3.1	from 6:08:33 pm to 6:15:09 pm	moving SW to ENE	62°

*far future predicted times may shift slightly

Iridium Flares most frequent evening passes occur between 5:45 and 8 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/Eclipses

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

Rank 98 - 10 Feb 2014 at 06:16 UT Asteroid 98 (345) Tercidina (mag 11.9) occults star 2UCAC 33556309 (mag 13.2) - visible from Thunder Bay to Washington DC, drops 0.3mags for 14.8secs, alt 38°

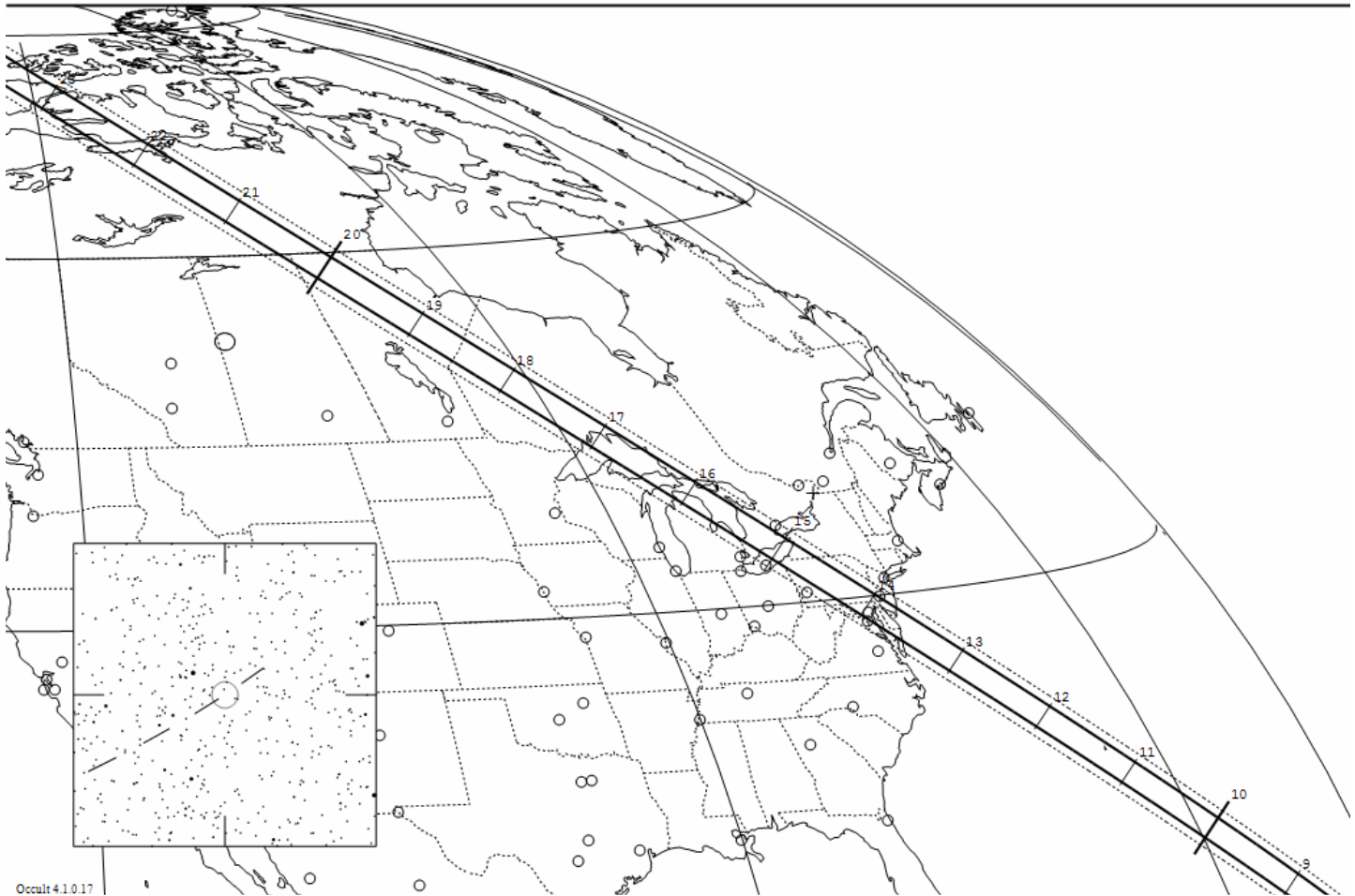
http://www.asteroidoccultation.com/2014_02/0210_345_34182.htm

345 Tercidina occults 2UCAC 33556309 on 2014 Feb 10 from 6h 7m to 6h 25m UT

Star:
Mv = 13.2
RA = 7 29 42.9929 (J2000)
Dec = 5 6 31.300
[of Date: 7 30 30, 5 4 29]
Prediction of 2014 Jan 19.0

Max Duration = 14.8 secs
Mag Drop = 0.29
Sun : Dist = 148 deg
Moon: Dist = 26 deg
illum = 81 %
E 0.044"x 0.038" in PA 93

Asteroid:
Mag = 11.9
Dia = 108km, 0.113"
Parallax = 6.677"
Hourly dRA = -1.534s
dDec = 15.03"



Occult 4.1.0.17

Rank 79 - 01 Feb 2014 at 04:59 UT Asteroid 79 (234) Barbara (mag 13.0) occults star TYC 0803-00667-1 (mag 10.4) - visible from Thunder Bay to NYC, drops 2.7mags for 3.1secs, alt 62° http://www.asteroidoccultation.com/2014_02/0201_234_33553.htm

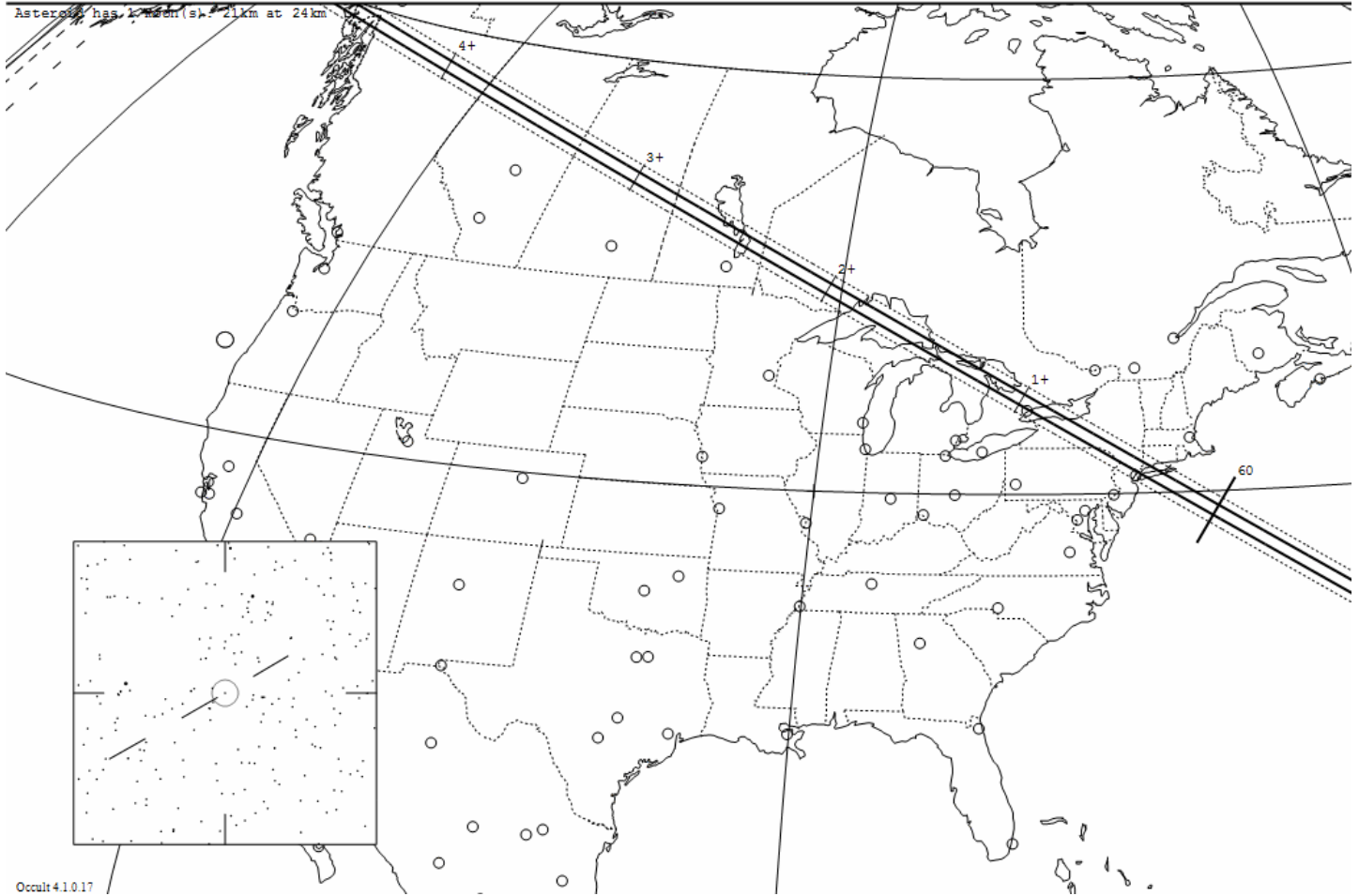
234 Barbara occults TYC 0803-00667-1 on 2014 Feb 1 from 4h 53m to 5h 5m UT

Star:
Mv = 10.4 Mp = 10.7 Mr = 10.2
RA = 8 22 14.7208 (J2000)
Dec = 12 10 26.458
[of Date: 8 23 3, 12 7 28]
Prediction of 2014 Jan 19.0

Max Duration = 3.1 secs
Mag Drop = 2.7 (2.4x)
Sun : Dist = 170 deg
Moon: Dist = 154 deg
illum = 3 %
E 0.026"x 0.024" in PA 90

Asteroid:
Mag = 13.0
Dia = 48km, 0.035"
Parallax = 4.700"
Hourly dRA = -2.411"
dDec = 20.53"

Asteroid has L₁ node(s) at 24km



Rank 89 - 27 Jan 2014 at 06:45 UT Asteroid 89 (780) Armenia (mag 14.9) occults star HIP 64795 (mag 9.1) - visible E Canada, E USA, Mexico, drops 5.8mags for 9.7secs, alt 32°

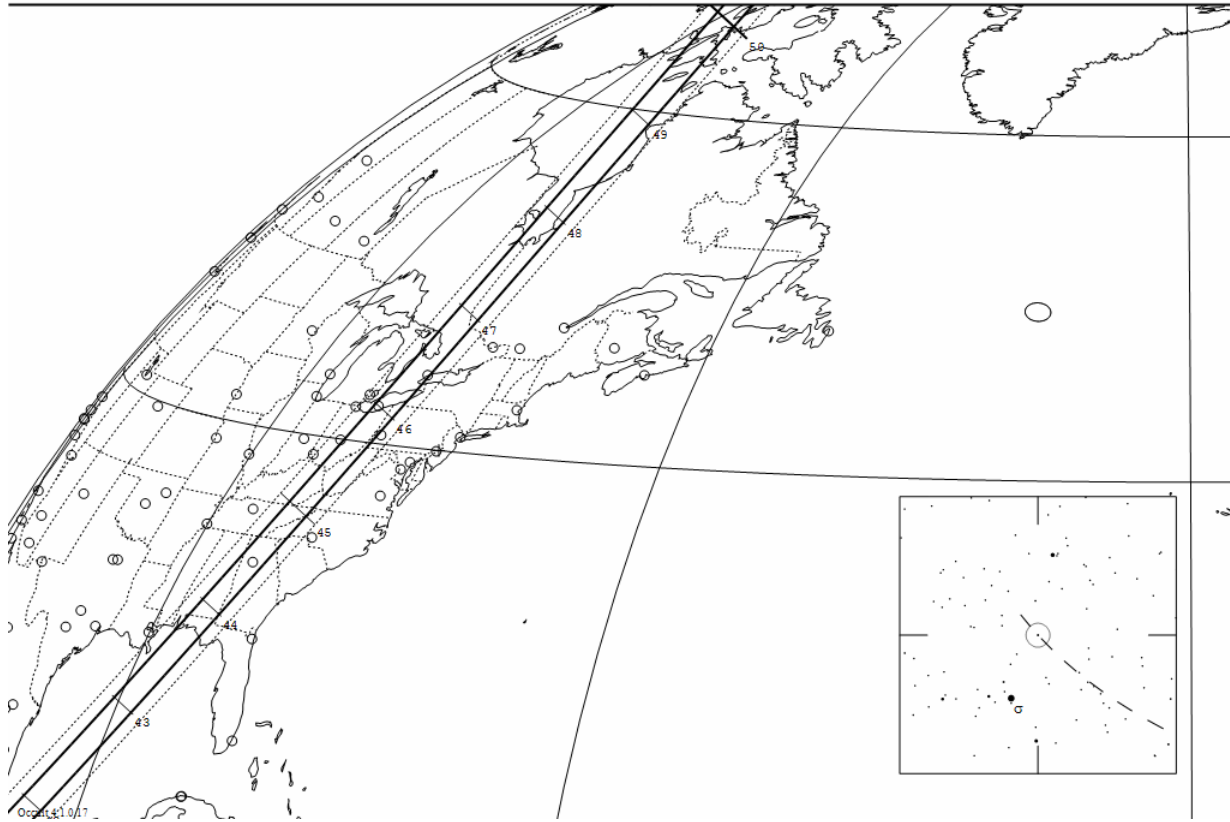
http://www.asteroidoccultation.com/2014_01/0127_780_32133.htm

780 Armenia occults HIP 64795 on 2014 Jan 27 from 6h 40m to 6h 51m UT

Star:
Mv = 9.1 Mp = 9.5 Mr = 8.9
RA = 13 16 49.5944 (J2000)
Dec = S 55 31.728
[of Date: 13 17 33, S 50 57]
Prediction of 2014 Jan 19.0

Max Duration = 9.7 secs
Mag Drop = 5.8 (5.6r)
Sun : Dist = 111 deg
Moon: Dist = 61 deg
illum = 19 %
E 0.028"x 0.020" in RA 94

Asteroid:
Mag = 14.9
Dia = 98km, 0.046"
Parallax = 2.998"
Hourly dRA = 0.779s
dDec = 12.64"



Constellations on the Meridian (Annually in January/February)

7 pm: Fornax, Eridanus, Cetus, Taurus, Aries, Perseus, and Camelopardalis

9 pm: Columba, Lepus, Orion, and Auriga

11pm: Canis Major, Monoceros, Canis Minor, Gemini, and Lynx

Winter Star party Skylights (Annually in January/February)

Milky Way now seen looking outwards (eye)

Orion and his Belt, the Hyades in Taurus, Auriga, and the Winter Hexagon (eye / binoculars)

Snow Balls – NGC457 Owl/ET (Cas), NGC884/869 Double Cluster (Per), M45 The Pleiades (Tau), M44 The Beehive (Cnc), etc. (binoculars, telescope)

Warm Hearts – M42 Orion Nebula and M78 (Ori), Heart & Soul Nebulae (Cas), etc. (telescope)

Cold Gems – M31 (And), M81,82 Bode's (Uma), Eskimo Nebula (Gem), Blue Snowball (And) (telescope)

Seeing Double – Castor (Gem), Almach (And), Algieba (Leo), etc. (telescope)

Hit Singles – Sirius (CMa), Procyon (CMi), Betelgeuse and Rigel (Ori), Capella (Aur), Aldebaran (Tau) (eye, binoculars, telescope)

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