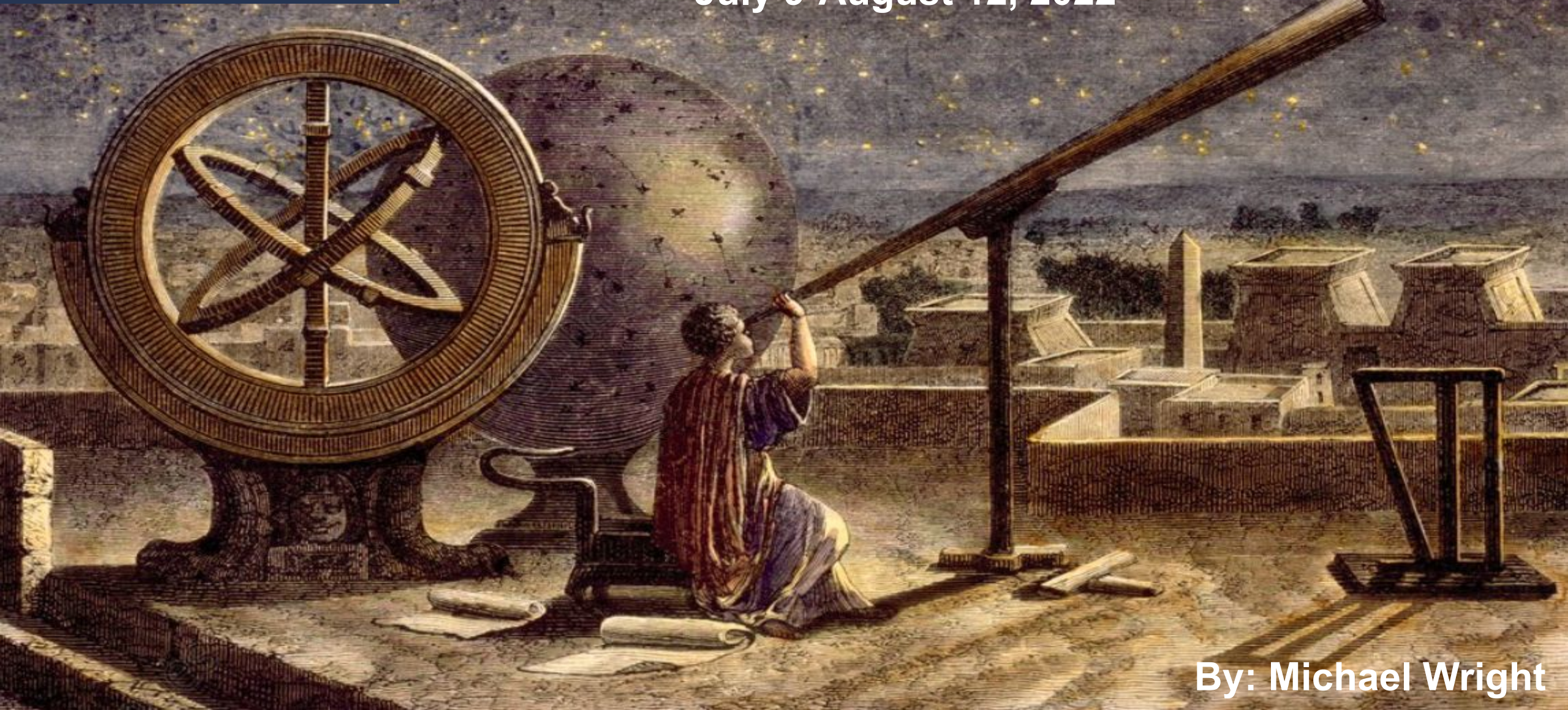


# What's Up?

July 9-August 12, 2022



By: Michael Wright



# What's Up – Solar System

DATE	SOLAR SYSTEM SKY EVENTS
Jul. 13	Full Moon in eastern Sagittarius - Moon at Perigee - Large Tides! - Buck Moon
Jul. 16	Saturn and Moon within 5° in Capricornus between 12am and 3am
Jul. 18	Jupiter 2°N of Moon at 10pm, but does not rise until later (nice view in E at 1:30am!)
Jul. 20	Pluto at Opposition at 2am (mag 14.31, need large scope and GO-TO or good star charts)
Jul. 20	Moon at Last Quarter in Pisces
Jul. 21	Moon near Mars (nice binocular view in morning sky!)
Jul. 22	Moon near Uranus (nice telescopic field view at 2am, binocular target in morning sky!)
Jul. 28	New Moon in Gemini
Jul. 29	Southern Delta-Aquarid meteors peak
Aug.01	Mars within 2°S of Uranus in early morning hours (nice telescopic sight!)
Aug.05	First Quarter Moon in Libra
Aug.12	Full Moon in Capricorn - Sturgeon Moon
Aug.12	Perseid Meteor Shower Peaks Overnight

## Morning Sky

Mars – AQR    Vesta – AQR  
 Venus - GEM    Juno - PSC  
 Jupiter – PSC    Pallas - ERI  
 Neptune - AQR

## Most of the Night

Saturn - CAP  
 Pluto - SGR

## Evening Sky

Mercury - GEM/CNC  
 Ceres - GEM/CNC

# What's Up – Lunar Librations



Northern Libration - July 16



Northern Libration - August 12

# (134340) Pluto

Type: dwarf planet  
 Magnitude: 14.31 (reduced to 14.63 by 2.49 Airmasses)  
 Absolute Magnitude: -1.00  
 Mean Opposition Magnitude: 15.12  
 RA/Dec (J2000.0): 19h58m08.49s/-22°50'28.0"  
 RA/Dec (on date): 19h59m28.07s/-22°46'51.5"  
 HA/Dec: 23h58m08.98s/-22°44'35.9" (apparent)  
 Az./Alt.: +179°32'03.0"/+23°39'58.2" (apparent)  
 Gal. long./lat.: +18°38'26.5"/-24°21'12.4"  
 Supergal. long./lat.: +228°39'45.8"/+48°28'16.8"  
 Ecl. long./lat. (J2000.0): +297°02'25.6"/-2°07'54.3"  
 Ecl. long./lat. (on date): +297°21'08.0"/-2°08'03.3"  
 Ecliptic obliquity (on date): +23°26'16.7"  
 Mean Sidereal Time: 19h57m37.7s  
 Apparent Sidereal Time: 19h57m37.0s  
 Rise: 21h03m  
 Transit: 1h32m  
 Set: 6h01m  
 Parallax angle: -0°21'57.0"  
 IAU Constellation: Sgr  
 Hourly motion: +0°00'04" towards 256.2°  
 Hourly motion:  $da = -0°00'04"$   $d\delta = -0°00'01"$   
 Elongation: +177°51'25.1"  
 Elong. in Ecl.Long.: +179°50'32.4"  
 Phase angle: +0°03'46.7"  
 Distance from Sun: 34.567 AU (5171.163 M km)  
 Distance: 33.552 AU (5019.242 M km)  
 Light time: 4h39m02.4s  
 Sidereal period: 90797.00 days (248.589 a)  
 Apparent diameter: +0°00'00.10"  
 Diameter: 2376.6 km  
 Sidereal day: 153h17m36.1s  
 Mean solar day: 153h16m57.2s  
 Equatorial rotation velocity: 13.529 m/s  
 Position Angle of axis: +25°53'57"  
 Center point:  $L_s = +324°18'06"$   $\phi_s = +58°08'46"$   
 Subsolar point:  $L_s = +324°14'13"$   $\phi_s = +58°11'56"$   
 Albedo: 0.55  
 Solar Az./Alt.: +359°49'03"/-25°45'18"  
 Lunar Az./Alt.: +89°52'12"/+9°02'03"

# Finding Pluto at Opposition



Terebellum

Nunki

Constellation labels [v]

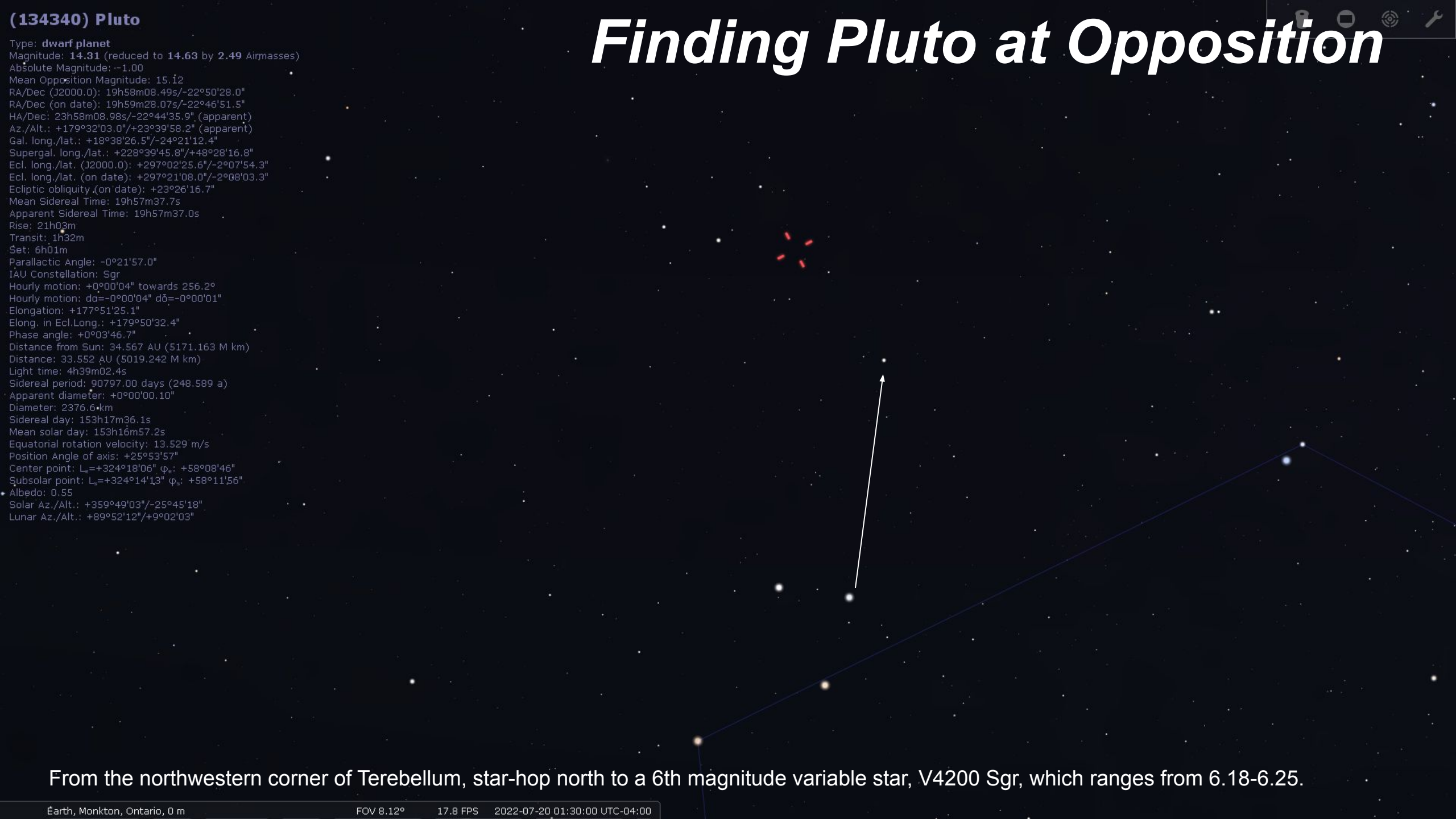
Earth, Monkon, Ontario, 0 m

FOV 22.1°

17.9 FPS

2022-07-20 01:30:00 UTC-04:00





# Finding Pluto at Opposition

## (134340) Pluto

Type: dwarf planet  
 Magnitude: 14.31 (reduced to 14.63 by 2.49 Airmasses)  
 Absolute Magnitude: -1.00  
 Mean Opposition Magnitude: 15.12  
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 RA/Dec (on date): 19h59m28.07s/-22°46'51.5"  
 HA/Dec: 23h58m08.98s/-22°44'35.9" (apparent)  
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 Rise: 21h03m  
 Transit: 1h32m  
 Set: 6h01m  
 Parallax angle: -0°21'57.0"  
 IAU Constellation: Sgr  
 Hourly motion: +0°00'04" towards 256.2°  
 Hourly motion:  $da = -0°00'04"$   $d\delta = -0°00'01"$   
 Elongation: +177°51'25.1"  
 Elong. in Ecl.Long.: +179°50'32.4"  
 Phase angle: +0°03'46.7"  
 Distance from Sun: 34.567 AU (5171.163 M km)  
 Distance: 33.552 AU (5019.242 M km)  
 Light time: 4h39m02.4s  
 Sidereal period: 90797.00 days (248.589 a)  
 Apparent diameter: +0°00'00.10"  
 Diameter: 2376.6 km  
 Sidereal day: 153h17m36.1s  
 Mean solar day: 153h16m57.2s  
 Equatorial rotation velocity: 13.529 m/s  
 Position Angle of axis: +25°53'57"  
 Center point:  $L_s = +324°18'06"$   $\phi_s = +58°08'46"$   
 Subsolar point:  $L_s = +324°14'13"$   $\phi_s = +58°11'56"$   
 Albedo: 0.55  
 Solar Az./Alt.: +359°49'03"/-25°45'18"  
 Lunar Az./Alt.: +89°52'12"/+9°02'03"

From the northwestern corner of Terebellum, star-hop north to a 6th magnitude variable star, V4200 Sgr, which ranges from 6.18-6.25.

# Finding Pluto at Opposition

Type: **star**  
Magnitude: **7.55** (reduced to **7.87** by **2.51** Airmasses)  
Absolute Magnitude: 1.39  
Color Index (B-V): **0.32**  
RA/Dec (J2000.0): 19h56m41.54s/-23°03'55.3"  
RA/Dec (on date): 19h58m01.29s/-23°00'21.3"  
HA/Dec: 23h59m35.71s/-22°58'04.2" (apparent)  
Az./Alt.: +179°53'54.3"/+23°26'34.5" (apparent)  
Gal. long./lat.: +18°16'53.8"/-24°07'13.1"  
Supergal. long./lat.: +228°04'04.6"/+48°23'42.1"  
Ecl. long./lat. (J2000.0): +296°40'09.3"/-2°17'11.7"  
Ecl. long./lat. (on date): +296°58'51.6"/-2°17'20.7"  
Ecliptic obliquity (on date): +23°26'16.7"  
Mean Sidereal Time: 19h57m37.7s  
Apparent Sidereal Time: 19h57m37.0s  
Rise: 21h03m  
Transit: 1h30m  
Set: 5h58m  
IAU Constellation: Sgr  
Distance: 556.58±3.98 ly  
Proper motion: 43.37 mas/yr towards 172.2°  
Proper motions by axes: 5.85 -42.97 (mas/yr)  
Parallax: 5.860±0.042 mas  
Spectral Type: A3mA3/5-F2  
Solar Az./Alt.: +359°49'03"/-25°45'18"  
Lunar Az./Alt.: +89°52'12"/+9°02'03"

(134340) Pluto



From V4200 Sgr, navigate northeast to mag 7.5 HIP 98135, also known as SAO188737. You can find it as the brightest and second north-most in a small arc of fainter stars.

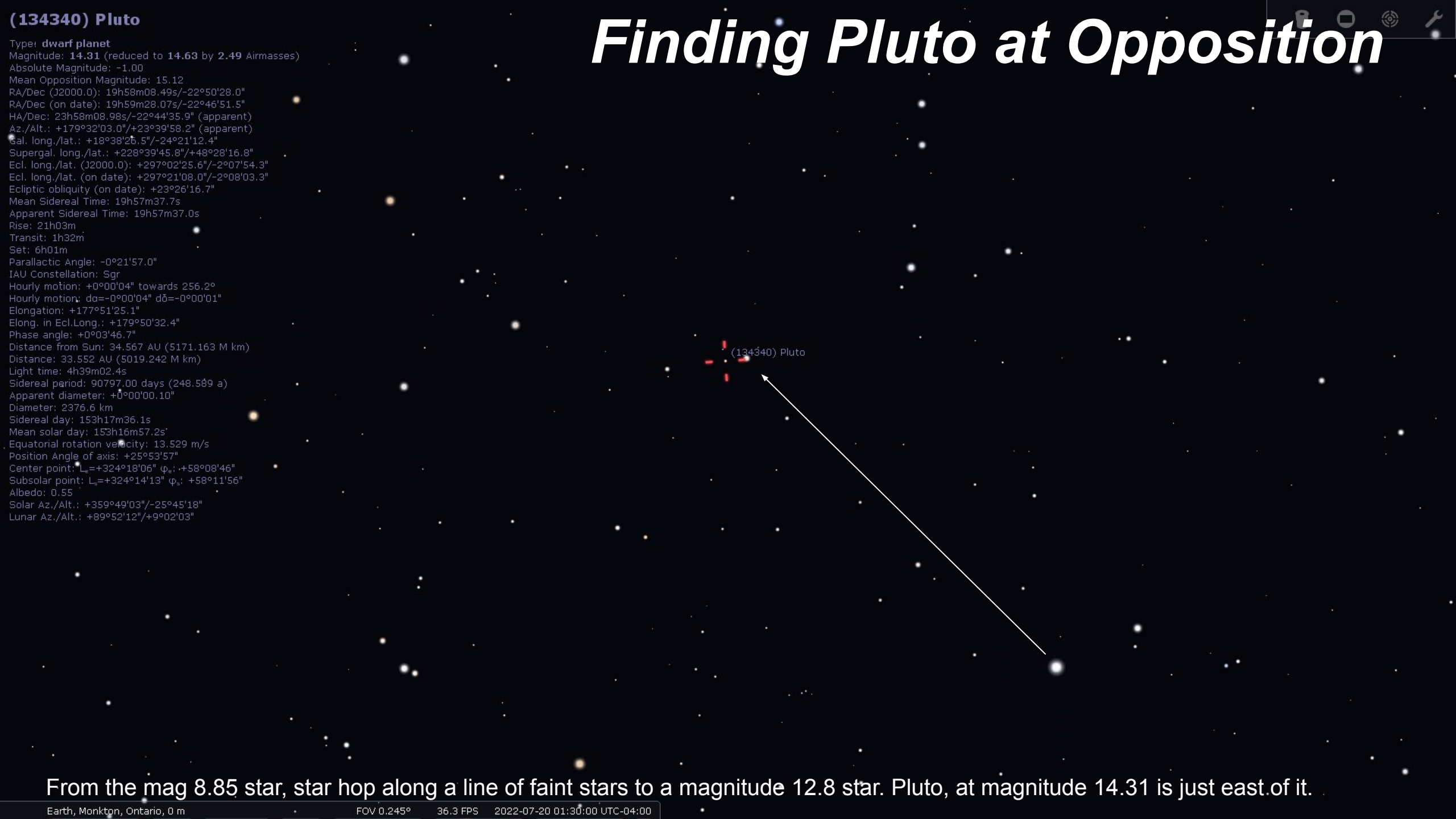
# Finding Pluto at Opposition

Type: **star**  
 Magnitude: **8.85** (reduced to **9.17** by **2.50** Airmasses)  
 Color Index (B-V): **0.41**  
 RA/Dec (J2000.0): 19h57m42.77s/-22°56'00.0"  
 RA/Dec (on date): 19h59m02.41s/-22°52'24.3"  
 HA/Dec: 23h58m34.62s/-22°50'08.0" (apparent)  
 Az./Alt.: +179°38'32.2"/+23°34'28.1" (apparent)  
 Gal. long./lat.: +18°30'28.1"/-24°17'36.8"  
 Supergal. long./lat.: +228°28'16.2"/+48°25'31.4"  
 Ecl. long./lat. (J2000.0): +296°55'31.7"/-2°12'10.2"  
 Ecl. long./lat. (on date): +297°14'14.1"/-2°12'19.2"  
 Ecliptic obliquity (on date): +23°26'16.7"  
 Mean Sidereal Time: 19h57m37.7s  
 Apparent Sidereal Time: 19h57m37.0s  
 Rise: 21h03m  
 Transit: 1h31m  
 Set: 6h00m  
 IAU Constellation: Sgr  
 Solar Az./Alt.: +359°49'03"/-25°45'18"  
 Lunar Az./Alt.: +89°52'12"/+9°02'03"

(134340) Pluto



From HIP 98135, star hop east-northeast to a magnitude 8.85 star.



# Finding Pluto at Opposition

(134340) Pluto

Type: dwarf planet  
 Magnitude: 14.31 (reduced to 14.63 by 2.49 Airmasses)  
 Absolute Magnitude: -1.00  
 Mean Opposition Magnitude: 15.12  
 RA/Dec (J2000.0): 19h58m08.49s/-22°50'28.0"  
 RA/Dec (on date): 19h59m28.07s/-22°46'51.5"  
 HA/Dec: 23h58m08.98s/-22°44'35.9" (apparent)  
 Az./Alt.: +179°32'03.0"/+23°39'58.2" (apparent)  
 Gal. long./lat.: +18°38'26.5"/-24°21'12.4"  
 Supergal. long./lat.: +228°39'45.8"/+48°28'16.8"  
 Ecl. long./lat. (J2000.0): +297°02'25.6"/-2°07'54.3"  
 Ecl. long./lat. (on date): +297°21'08.0"/-2°08'03.3"  
 Ecliptic obliquity (on date): +23°26'16.7"  
 Mean Sidereal Time: 19h57m37.7s  
 Apparent Sidereal Time: 19h57m37.0s  
 Rise: 21h03m  
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 IAU Constellation: Sgr  
 Hourly motion: +0°00'04" towards 256.2°  
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 Albedo: 0.55  
 Solar Az./Alt.: +359°49'03"/-25°45'18"  
 Lunar Az./Alt.: +89°52'12"/+9°02'03"

(134340) Pluto

From the mag 8.85 star, star hop along a line of faint stars to a magnitude 12.8 star. Pluto, at magnitude 14.31 is just east of it.



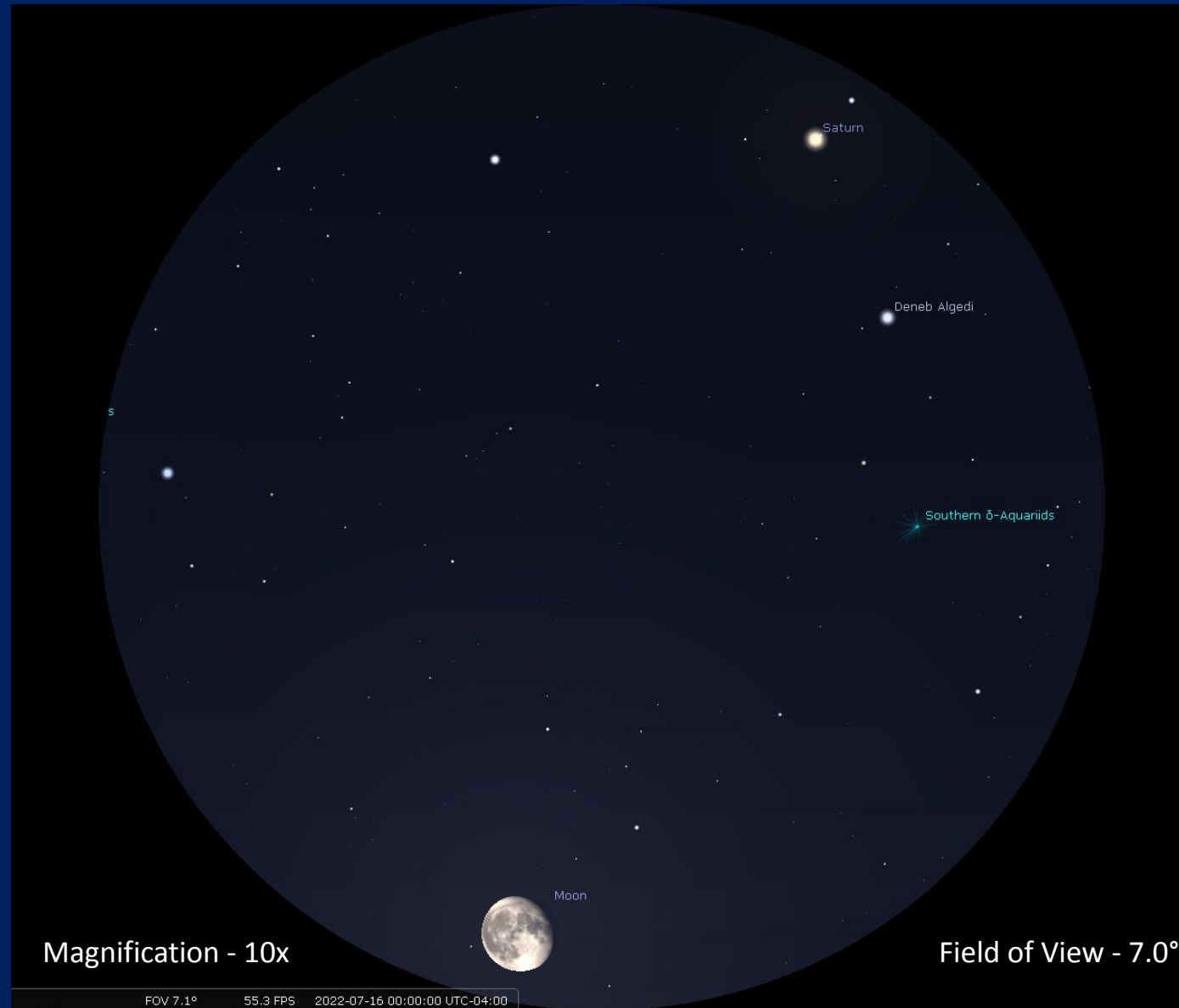
## Nice Sight No. 1

# Saturn & Moon In Binoculars

July 16-17

12:00-3:00 AM

View to SE



*Graphic created with Stellarium*

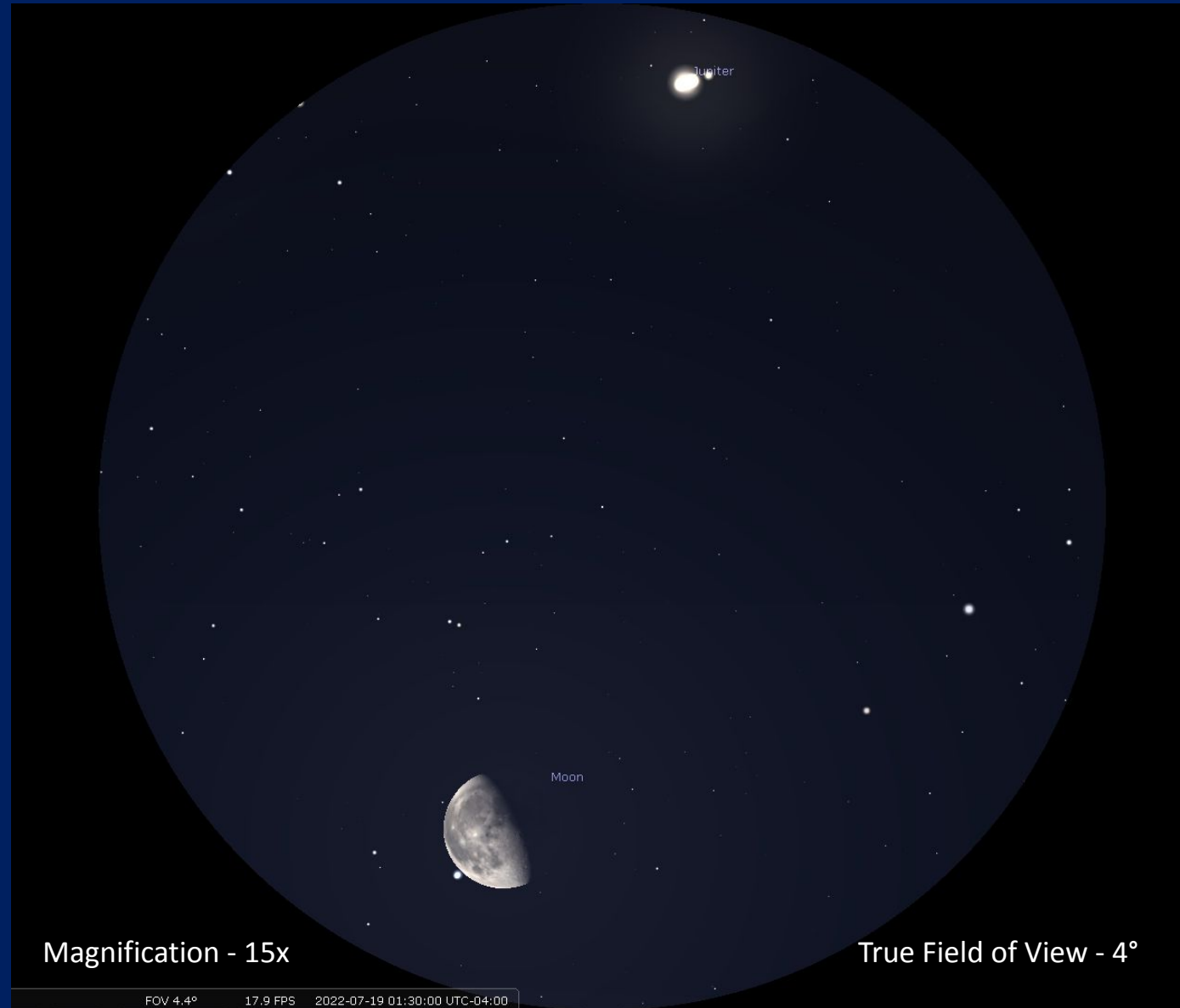
## Nice Sight No. 2

# Moon & Jupiter In Binoculars

Mon. July 18

1:30 AM

View to SE



*Graphic created with Stellarium*

## Nice Sight No. 3

### Moon & Mars In Binoculars

Thurs. July 21

5:30 AM

View to SE

Sunrise: 5:58 AM



*Graphic created with Stellarium*

## Nice Sight No. 4

# Moon & Uranus In Telescope

Fri. July 22

2:00 AM

View to E

Sunrise: 5:58 AM

Newtonian Telescope - Image Vertically Flipped



Magnification - 37.5x

True Field of View - 1.8°

FOV 2.67° 35.6 FPS 2022-07-22 02:00:08 UTC-04:00

*Graphic created with Stellarium*

## Nice Sight No. 5

### Mars & Uranus In Telescope

Thurs. August 1

5:00 AM

View to SE

Sunrise: 6:08 AM

Newtonian Telescope - Image Vertically Flipped



Magnification - 37.5x

True Field of View - 1.8°

FOV 2.67° 17.9 FPS 2022-08-01 05:00:08 UTC-04:00

*Graphic created with Stellarium*

# Evening Sky Highlights



SE

SW

S

10:30pm EDT July 20 2022

Facing South

# July Deep Sky Highlights

## Open & Globular Clusters!

\* = RASC Finest NGC

Catalogue #	Type	Cons	Details	Difficulty
M4	gcl	Sco	Cat's Eye Globular - Large, round, bisected by a bright lane	easy
M80	gcl	Sco	Small, round, yellowish silver glow with fractured core at high power	moderate
C69/NGC6302	pn	Sco	Bug Nebula - bipolar planetary with knots and brightenings	moderate
C75/NGC6124	ocl	Sco	Large and bright but challenging close to the horizon	difficult
C76/NGC6231	ocl	Sco	False Comet Cluster - Very bright but challenging due to horizon	difficult
M6	ocl	Sco	Butterfly Cluster - Icy hued stars surrounded by dark nebulosity	easy
M7	ocl	Sco	Ptolemy's Cluster - golden, gem-studded flower shape	easy
NGC6441	gcl	Sco	Silver Nugget Globular - tight, bright cometary glow	moderate
M62	gcl	Oph	Flickering Globular - asymmetrical, core appears to flicker in colour	easy
M19	gcl	Oph	Oblate, challenging to resolve due to faint (mag<14) constituent stars	easy
NGC6369*	pn	Oph	Little Ghost Nebula - Against blackness of B77, annular shape	moderate
M9	gcl	Oph	Small, compressed, moderate aperture required to resolve stars	moderate
M10	gcl	Oph	Outer halo bluish, pale salmon interior, pyramids of 12 mag stars	easy
M12	gcl	Oph	Gumball Globular - loosely packed nucleus, dark V-shaped lane	easy
M14	gcl	Oph	Pale straw colour, small but surprisingly detailed	moderate
IC4665	ocl	Oph	Summer Beehive Cluster - Best in binocs or rich-field telescopes	easy
NGC6572*	pn	Oph	Emerald Eye Nebula - brighter than M57 but 5x smaller! Use high mag!	difficult
NGC6633*	ocl	Oph	Tweedledum & Tweedledee - cluster paired with IC4756 in Serpens	easy



# What's Up? Resources

**RASC Observer's Handbook - The Sky By Month**

**NASA SVS Moon Viewer: <https://svs.gsfc.nasa.gov/4955>**

**Stellarium: <https://www.stellarium.org>**

**The Sky Live: <https://theskylive.com/>**

**Time and Date: <https://www.timeanddate.com/>**

*Thank you!*