Sky and telescope

Summary

Short Description: This document explains how to utilize Sky and Telescope Astronomical tools.

Language: English

Suitable for age: 10-18 years

Key words: Simulations, Visualization, Predictions

Format: .doc

Link: https: https://skyandtelescope.org/observing/interactive-sky-watching-tools/

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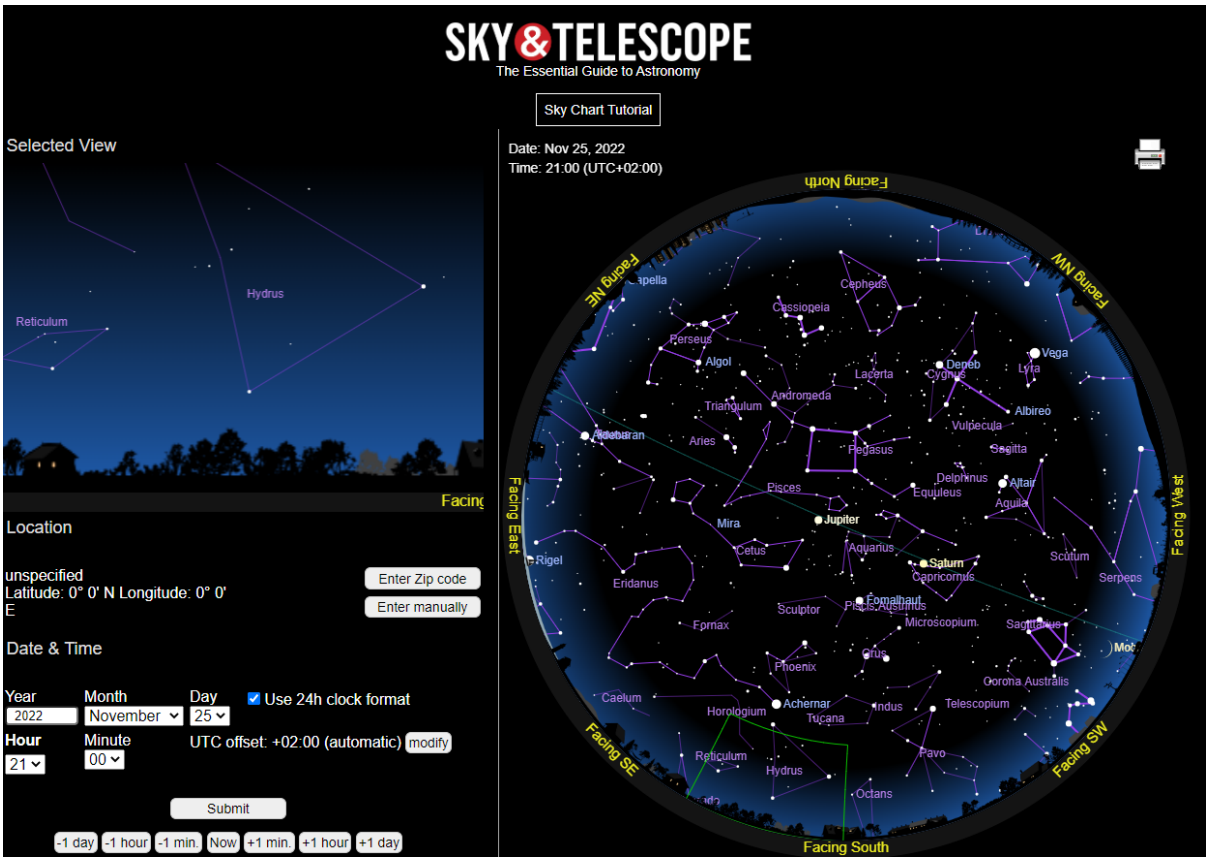
1. Sky and Telescope astronomical tools provide a wide range of interactive simulations that can be used to study phenomena and to predict the position of objects in order to plan your observations.
https://skyandtelescope.org/observing/interactive-sky-watching-tools/

2. These simulations are listed here:

- Interactive Sky Chart

Powered by Heavens Above, the interactive sky chart shows the night sky as seen by eye. The map includes the Moon, stars brighter than magnitude 5, the five bright planets (Mercury, Venus, Mars, Jupiter, and Saturn), and deep-sky objects that can be seen without the use of optical aid. Enter the tool directly from here.



- Astronomical Almanac

The Astronomical Almanac presents basic astronomical data customized for your location for any date from AD 1600 to 2400. The interactive tool displays sunrise and sunset times, morning and evening twilight times, moonrise and moonset times, the Moon's phase, a list of naked-eye planets visible in the evening and morning skies, rise and set times for each of these planets, and more. Enter directly the tool from here.

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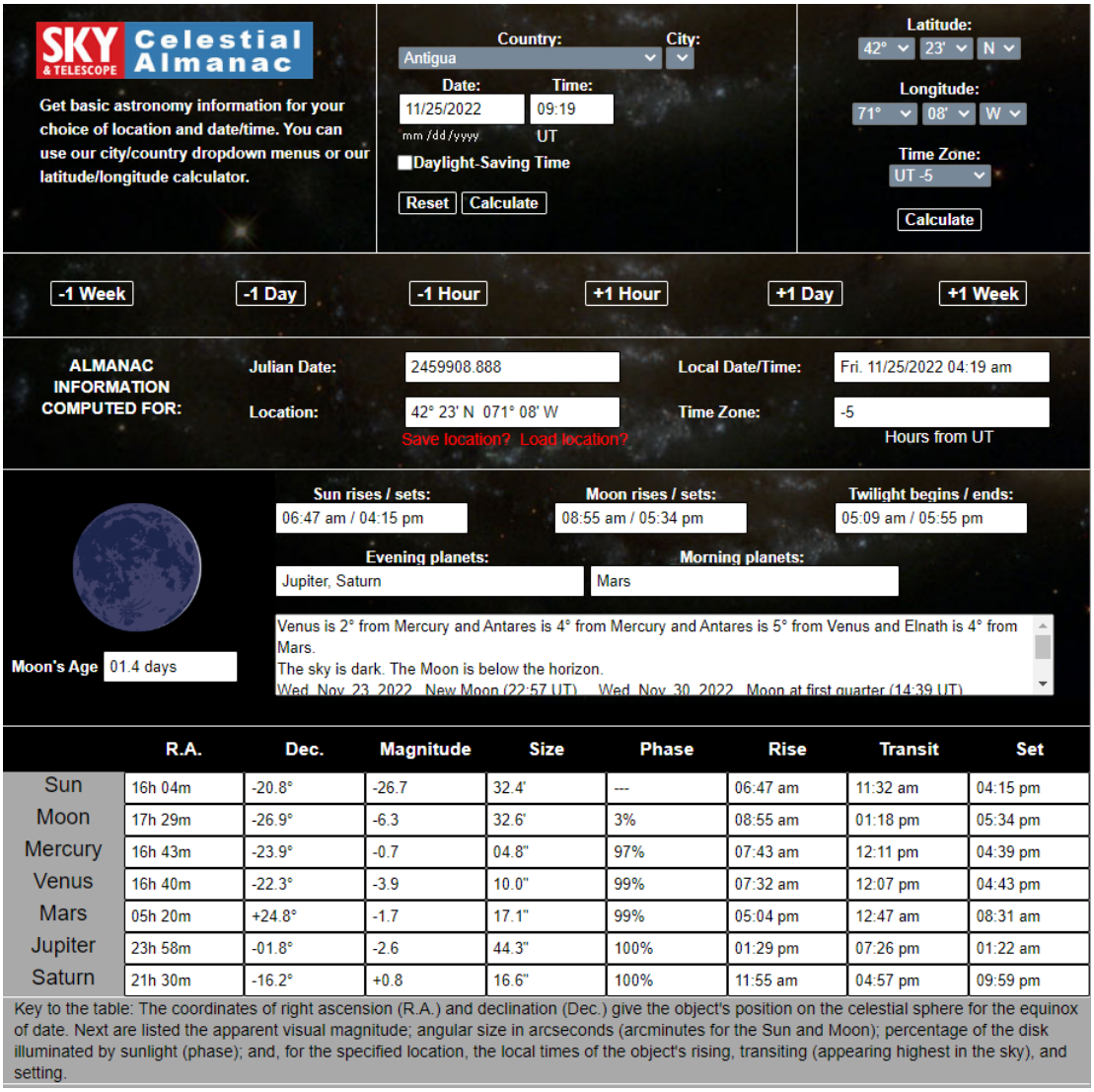
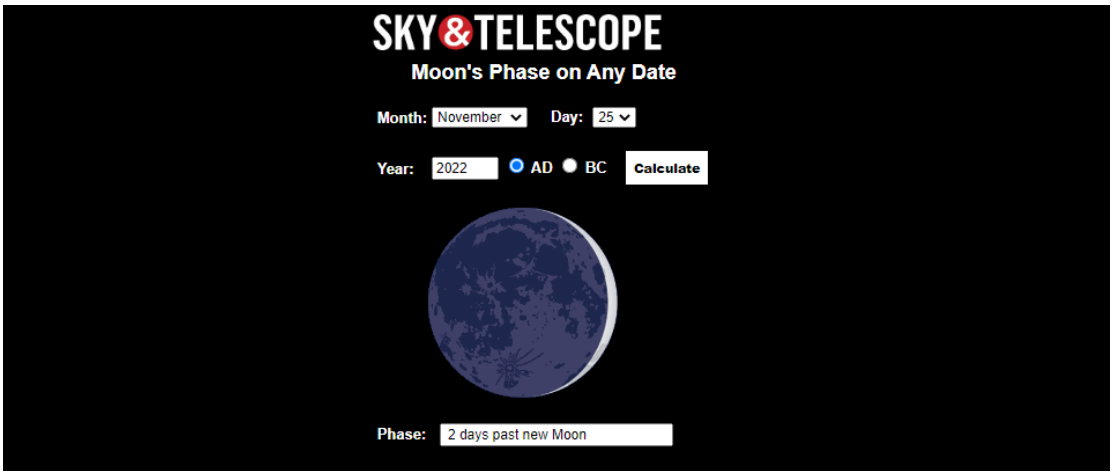


	R.A.	Dec.	Magnitude	Size	Phase	Rise	Transit	Set
Sun	16h 04m	-20.8°	-26.7	32.4'	---	06:47 am	11:32 am	04:15 pm
Moon	17h 29m	-26.9°	-6.3	32.6'	3%	08:55 am	01:18 pm	05:34 pm
Mercury	16h 43m	-23.9°	-0.7	04.8"	97%	07:43 am	12:11 pm	04:39 pm
Venus	16h 40m	-22.3°	-3.9	10.0"	99%	07:32 am	12:07 pm	04:43 pm
Mars	05h 20m	+24.8°	-1.7	17.1"	99%	05:04 pm	12:47 am	08:31 am
Jupiter	23h 58m	-01.8°	-2.6	44.3"	100%	01:29 pm	07:26 pm	01:22 am
Saturn	21h 30m	-16.2°	+0.8	16.6"	100%	11:55 am	04:57 pm	09:59 pm

Key to the table: The coordinates of right ascension (R.A.) and declination (Dec.) give the object's position on the celestial sphere for the equinox of date. Next are listed the apparent visual magnitude; angular size in arcseconds (arcminutes for the Sun and Moon); percentage of the disk illuminated by sunlight (phase); and, for the specified location, the local times of the object's rising, transiting (appearing highest in the sky), and setting.

- Find the Phase of the Moon

The tool shows the phase of the Moon for a chosen date. It will open with the current phase of the Moon, including a text description at the bottom. To obtain the Moon's phase on any other date, select the month and day from the dropdown menus and type the year. Select AD or BC, then click Calculate. Enter directly the tool from here.



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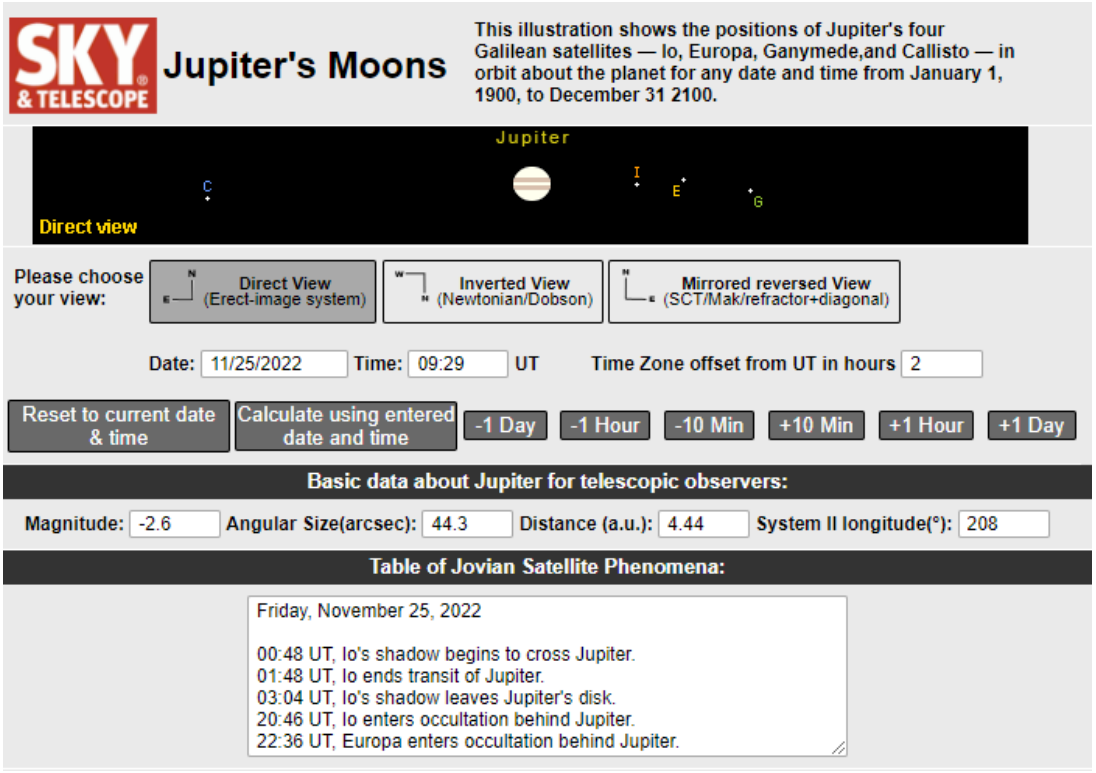
- [Find Jupiter's Moons]

If you turn a telescope to Jupiter you'll easily pick out its "stars", the dots of light from the four big Galilean moons that orbit the planet. Which one is which? This interactive tool shows the positions of Io, Europa, Ganymede, and Callisto for any date and time between January 1900 and December 2100. The tool is also customizable, so that you can change the view according to the type of telescope you're using. You'll also find extra information on whether and when a moon might hide behind Jupiter or cast its shadow on the planet's cloudtops. Enter the tool directly from here.



- [Transit times of Jupiter's Great Red Spot]

This tool is a calculator that you can use to predict the local and Universal Times and dates that the center of the Great Red Spot should cross Jupiter's central meridian, the imaginary line down the center of the planet's disk from pole to pole. Click "Initialize to today" to view the dates and times of the next three transits of the GRS. Or you can enter any date this year to find other transit times. The listed times should be accurate to within a few minutes.

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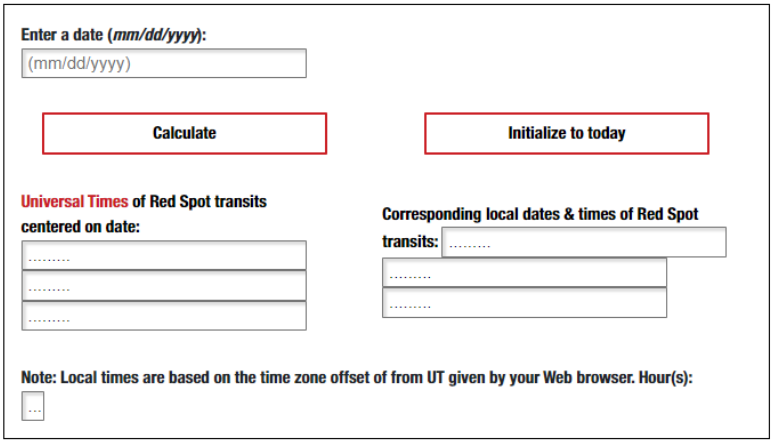
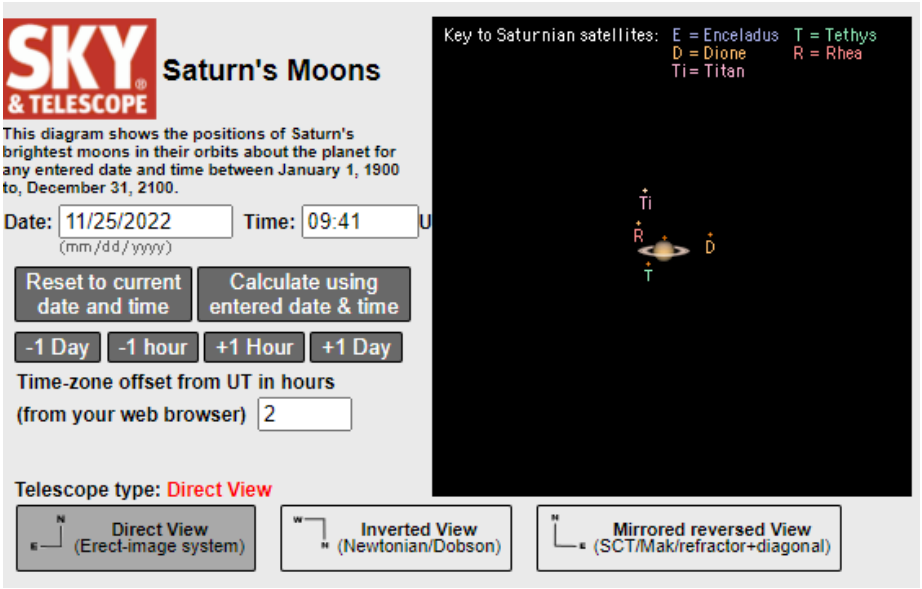


- [Find Saturn's Moons]

For any date and time between 1900 and 2100, this tool shows the positions of Titan and four other bright moons: 10th-magnitude Rhea, Tethys, and Dione, and 12th-magnitude Enceladus. Moreover, the tool can match the view through your telescope's optical system whether it shows the sky with north up or south up, and either correct-imaged or mirror-reversed. Enter the tool directly from here.



- [The Elusive Moons of Uranus]

Four of Uranus's 27 known satellites can be seen in moderate to large amateur telescopes. Both Titania and Oberon have been glimpsed with apertures as small as 20 centimeters (8 inches). Umbriel and Ariel, however, because they lie much closer to the planet's glare, are difficult to distinguish with even twice that aperture. For any date and time between 2008 and the current year, this interactive tool shows the positions of Ariel, Umbriel, Titania, Oberon, and — for those seeking a special challenge — Miranda. Moreover, the utility can match the view in your telescope's optical system, whether it shows a correct or mirror-reversed image. Enter the tool directly from here.

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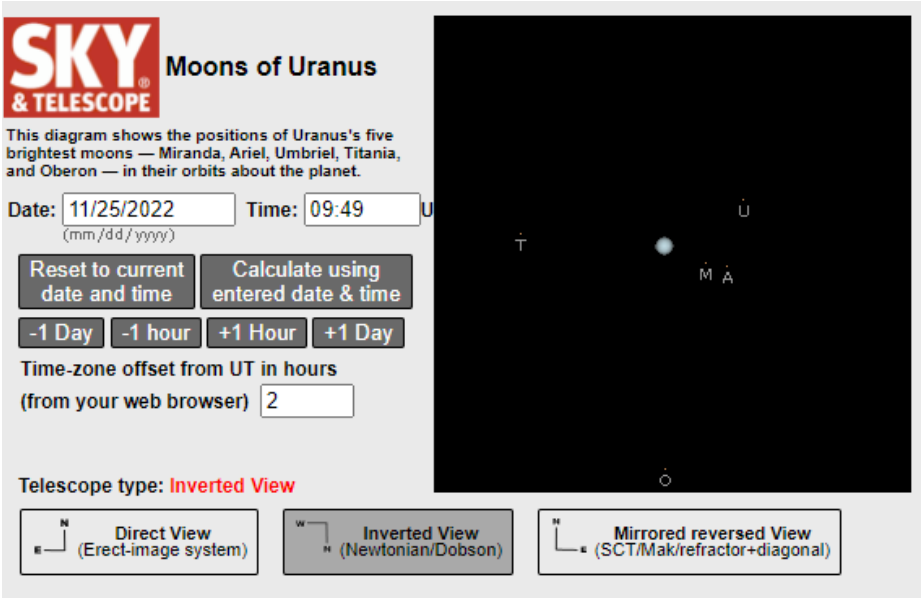
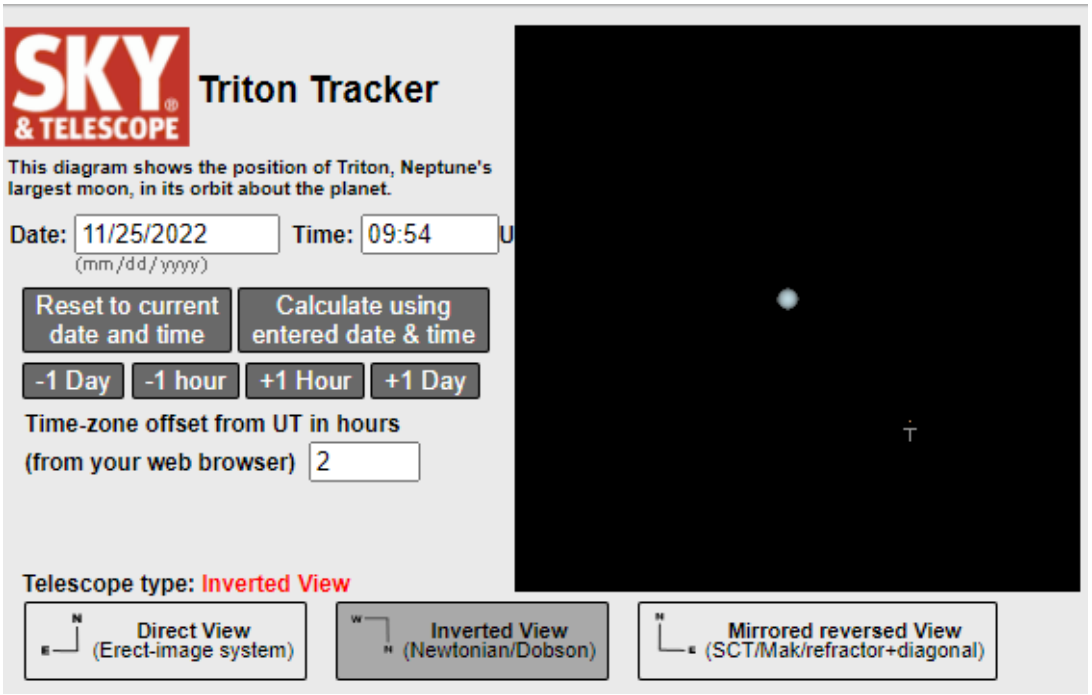


- [Track Triton, Neptune's largest Moon]

Neptune, at magnitude 8, is beyond the reach of the naked eye and even some binoculars. Locating the most distant planet can be a bit daunting on its own. But if you are up for a serious challenge, you can go further and try spotting its largest moon, Triton. Triton is tricky. It shines at only ~13.5 magnitude, nearly as dim as Pluto. With this interactive tool you can try to spot it. Enter the simulation directly from here.



- [Telescope calculator: How does your telescope preform?]

With this tool you can find out how different eyepieces and accessories change your telescope's performance. To use this calculator properly, you'll need to know a few basic details about your telescope and eyepieces. Most of these numbers can be found on your eyepiece barrel, on your telescope's tube or mount, or in the equipment's instruction manual. Failing that, you can always visit the website of your telescope or eyepiece manufacturer.

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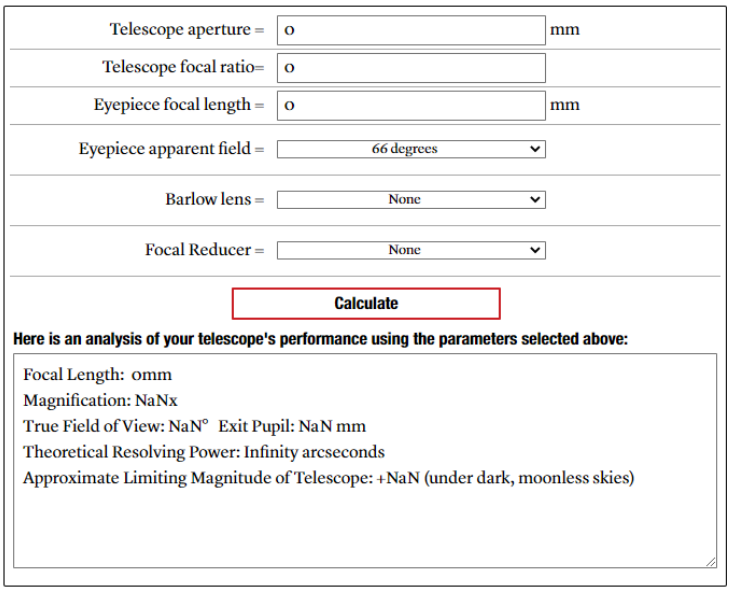
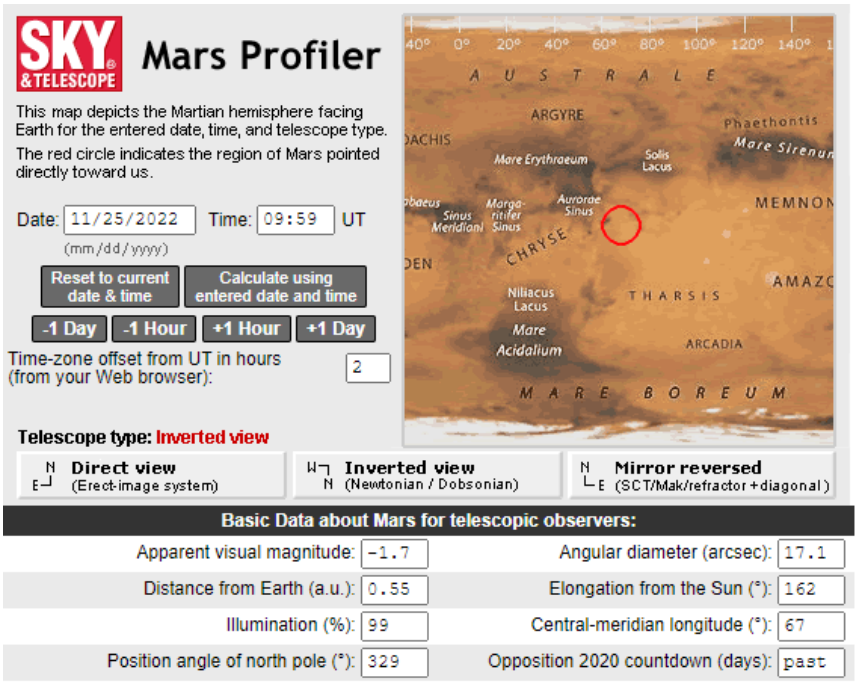


- [Mars profiler: Which side is visible?]

If you want to compare what you see on Mars when you look through a telescope with a map, you need to know which side of the planet you're seeing. This tool can show you that and more for any date and time. Best of all, it shows a map of Mars so that you can identify any bright and dark markings you see. Enter the tool directly from here.



- [Satellite tracking tool: Track the ISS and Hubble]

The brightest (and biggest) artificial satellite in the sky is the International Space Station (ISS). It's brighter than Jupiter and even rivals brilliant Venus as it creeps across the sky after dusk or before dawn. The Hubble Space Telescope, though more difficult to see, has taken some of the most iconic images we have of the cosmos. With this tool you can predict when and where to see the International Space Station and the Hubble Space Telescope. Enter the tool directly from here.

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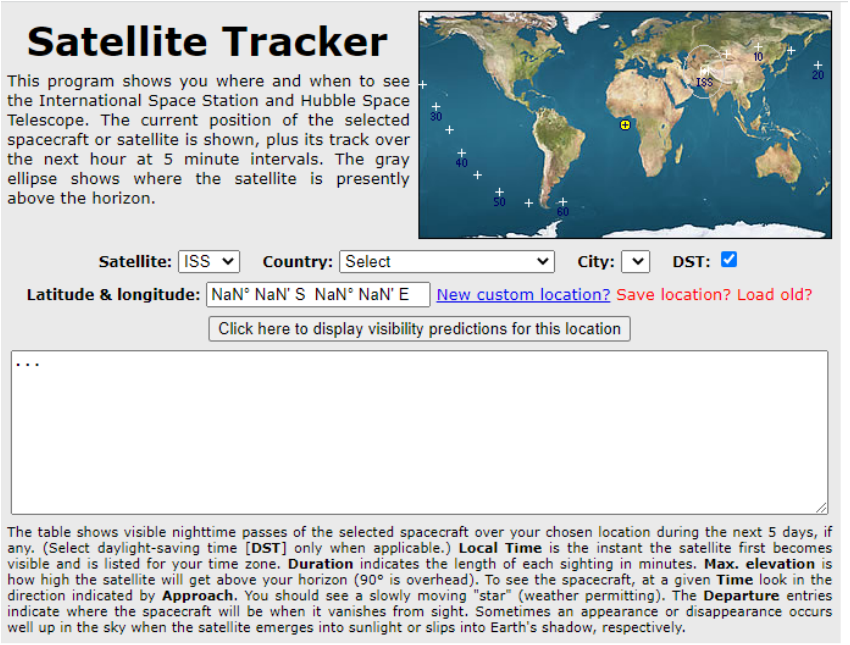
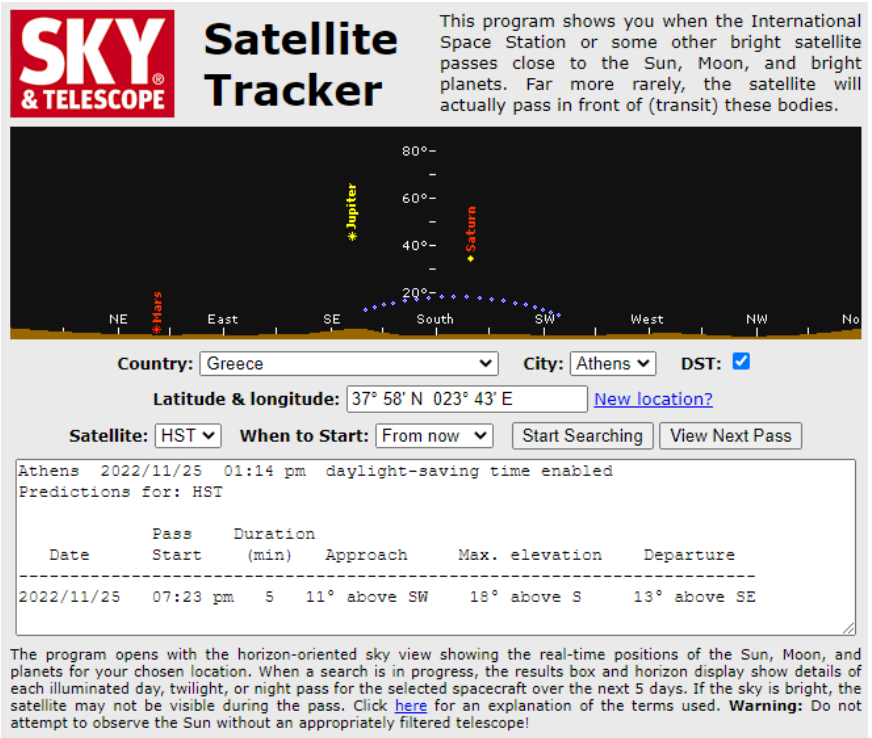


- [Satellite transit tool: Spot ISS transits of the Sun and Moon]

Astronomers and photographers that manage to catch the instant that the International Space Station passes in front of the Sun or the Moon plan their observation very carefully. This tool can help you capture moments like these. You can calculate when the International Space Station or Hubble Space Telescope will be visible from your location, and find out what path the satellite will take across the sky. The tool will alert you if the ISS or Hubble is due to come within 10° of any naked-eye planet, the Moon, or the Sun. Enter the tool directly from here.



- [The Minima of Algol]

The star Algol (Beta Persei) was the first eclipsing variable star ever discovered and it's still one of the most famous. You can check on it whenever you step outdoors on nights when Perseus is

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in view. Algol fades and rebrightens like clockwork every 2.87 days. You can use this tool to predict when Algol will be at mideclipse. Click "Initialize to today" to view the dates and times of Algol's minima for the next three weeks. Or you can enter any current date to see the dates and times of eight consecutive minima. The times given should be accurate to within a few minutes.

Please enter a date:
(*mm/dd/yyyy*)

Calculate	Initialize to today

Computed dates (*mm/dd/yyyy*) and Universal Times of Algol minima:	**Corresponding local dates (*mm/dd/yyyy*) and times of Algol minima:**
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Note: local times are based on a time zone offset of
... hour(s) from UT as given by your Web browser.

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