

Using Stellarium

By Dustin Angell

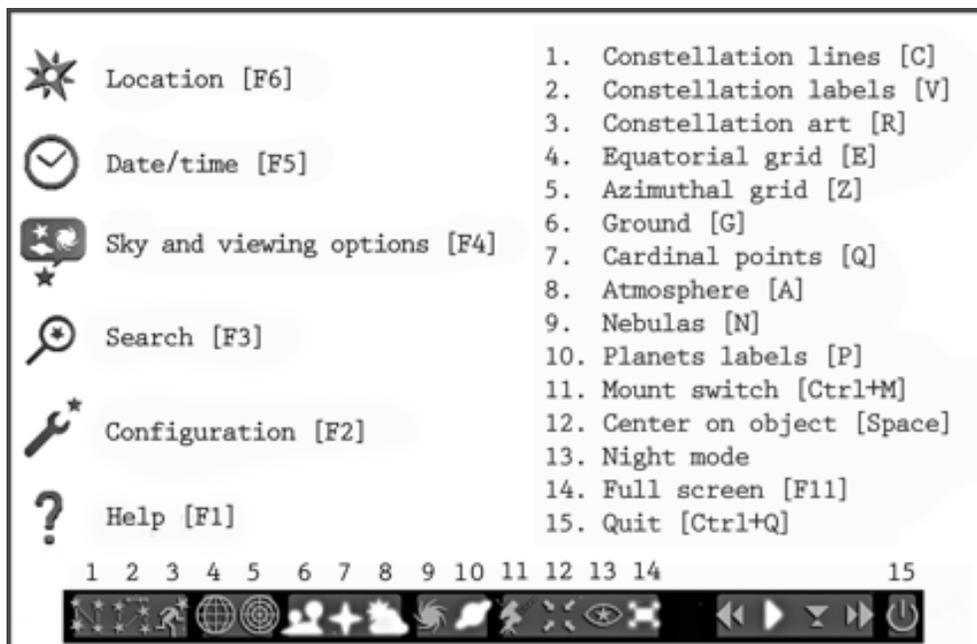
Stellarium

Stellarium is a computer program that can help make astronomy and stargazing fun and accessible. It is free and available for download at www.stellarium.org and can be used by all ages. Some of its many features include showing the real-time positions of the sun and Moon, planets, stars, and constellations. Users can also choose to view the sky from anywhere on Earth and can even look into the future or back into the night skies of the past.



Icon Key

When the program is running there are two rows of icons which appear when the mouse rolls over them. These are located on the left side of the screen and the bottom of the screen. This icon key shows all of these icons and labels their functions.



Help: Before we get started, look for the help icon. When you bring your mouse all the way to the left side of the screen an icon bar will appear. The help icon looks like a question mark, and is located at the bottom of the icon bar. The help section can assist you in understanding Stellarium's many features.

Location: Now lets begin using Stellarium by walking through the icons on the left icon bar, starting with the top icon, "Location." Choose this icon and then set your location on Earth to a place near your home city. Select the box on the bottom left of your window to make this city your default location. On a separate sheet of paper, write down the name of your city, and also record the latitude and longitude.

MOST*

Inside This Packet

Stellarium	1
New York State Standards	1
Icon Key	1
Moving Around	2
Constellations	2
More with "Sky & Viewing"	3
More Features of the Bottom Icon Bar	4
Navigating Time	4

New York State Standards

Middle School Science

Standard 1:

Mathematical: Key Idea 1: M1.1, M1.1c
Scientific Inquiry: Key Idea 1: S1.2, S1.2c

Standard 2:

Key Idea 1: 1.3, 1.4; Key 3: 3.2

Standard 4:

Physical Setting: Key Idea 1: all

Standard 6:

Key Idea 2:2.1; Key Idea 5

Standard 7:

Key Idea 2: gathering and processing information, realizing ideas, common themes

General Skills

Recognize and analyze patterns and trends, identify cause and effect, use indicators and interpret results

Date/Time: Go to the “date/time” icon below “location” and set the time for 22:00. This is military time for 10:00 PM, a great time to look at the stars.

Sky and Viewing Options: Go to the “Sky and viewing options” icon. Choose the “Sky” page at the top left and you can change things like the hourly rate of shooting stars. Now, switch from the “Sky” to the “Markings” page and select Meridian and Azimuthal. Azimuth is the angle measurement from due North around the horizon in a clockwise direction to the point of reference. As you select these, they will appear in the sky behind your “sky and viewing options” window. You’re finished with this for now, so close this window.

Search: Go to the “search” icon under “Sky and viewing” and search for our current North Star, Polaris, by typing in the name. Use the horizontal curved lines to help you find the latitude of Polaris. Measuring the angle between yourself and Polaris will reveal the latitude of your location on Earth. At the North Pole, your latitude would be 90 degrees, meaning the North Star would be right over your head. The further south one travels toward the equator, the more the angle decreases and the North Star drops toward the horizon. Try to figure out the Azimuth too, and record your info on the sheet you’ve just started.

Polaris: Az: _____ Lat: _____

After figuring this out, check the information written in the top left of the screen. Look at the part that says Az/Lat. You can also try this with other objects. When your done, go back to the “Sky and viewing” section and turn off the Meridian and Azimuth.

Configuration: A beginning viewer may not have much use for these options, but the scripts displayed are enjoyable to watch, and more can be downloaded at www.stellarium.org.

Moving Around

Right click your mouse to deselect Polaris. Practice moving the screen around to look in different directions. You can do this by holding down the mouse’s left click button while moving the mouse in the desired direction. If you see anything interesting, like a planet, try zooming out and in with the scroller on your mouse or by using keyboard commands “\” and “/”.

Constellations: The First Section of the Bottom Icon Bar

Now we are going to look for constellations. A constellation is an area in the sky typically represented by connecting imaginary lines from star to star to form a picture. Stellarium can show students the constellation boundaries as well as the pictures. There are 88 official constellations agreed upon by the International Astronomical Union, but most of them come to us from ancient Rome. Stellarium refers to them as the “Western” constellations.

If your location is set for Central New York, you can see the Big Dipper all year round. Turn your sky to face north and try to find it. The Big Dipper has three stars that look like a long curved handle and another four that look like a rectangular bowl.

Note: If you’re from someplace where the Big Dipper isn’t visible, look for another constellation you know.

Constellation lines/labels/art: Now take your cursor to the bottom of the screen and click on the icon farthest to the left, labeled “Constellation Lines.” When the lines appear showing the constellations, check to see if the stars you were viewing connected to make the Big Dipper. You will notice that other stars are also connected to the Big Dipper. This is because the Big Dipper is technically not a true constellation, but an asterism within the constellation of Ursa Major. Bring your cursor to the next icon to select “Constellation Labels” and the name will appear. Click the next icon in the row, labeled “Constellation art,” and drawings of the constellations should appear.

Note: All constellation drawings are an interpretation of the artist. You are free to imagine these any way you want. Turn the drawings off before going to the next section.

Using Stellarium

More with “Sky and Viewing Options”

Boundaries: Open up your “Sky and viewing options window” again. Under the “Markings” section you have an option to show the constellation boundaries. Check the box and these appear. You also have the ability to change the brightness of the lines. Drag the “Markings” window to the side so you can look at your sky. Now you can see the boundaries that make up the constellations. Once you’ve finished, turn the boundaries off.

Starlore: Go from the “Markings” page to the “Starlore” page. In Stellarium, students can see other constellations recognized by a variety of cultures. Work through this list and watch familiar constellations change. What becomes of Ursa Minor (The Little Bear) when you switch to the Chinese constellations? Or the Lakota?

Landscapes: Now go to the “Landscapes” menu. Select the different options and watch the landscape change. This is the generic list that is bundled with the program, but if you go to the Stellarium website you can download more landscapes that other users have uploaded. In fact, you can even make your own landscapes. The directions are found in the website. This is not a simple or short task, but it is rewarding to turn Stellarium on and see the view from your own school, backyard, or favorite vacation spot.

More Features of the Bottom Icon Bar

Equatorial & Azimuthal Grids: The next two icons on the bottom icon bar after the constellation trio will bring up the Equatorial and Azimuthal grids. Both are also options in the “Sky and viewing window” we looked at earlier.

Ground, Cardinal Points, & Atmosphere: When searching for celestial objects, you may find yourself looking at the ground because the object you’re interested in is being blocked by Earth. The “Ground” icon allows you to correct this problem by making Earth disappear. Play around with this and notice how Stellarium still shows the horizon line, which helps you to keep your bearings. The “Cardinal Points,” are automatically turned on when you start the program. Once you’ve become more comfortable with the program and the constellations, we recommend turning the cardinal points off occasionally to test yourself. Try to disorient yourself with these turned off, and then find your way using only the stars. Try it with the constellation lines showing and also without them. The next icon controls the atmosphere; the “Atmosphere” icon is helpful when viewing the daytime sky. It is also interesting to use Stellarium’s atmosphere to look at the effects of light pollution on our view of the nighttime stars. In “Sky and viewing options” you can adjust the light pollution levels and observe the dramatic changes.

Nebulas and Planets: When selected, the next two icons label the locations of planets and nebulae. Turn these on and look for both a nebula and a planet. Zoom in and out on both. *Note: The plural of “nebula” is “nebulae.”*

Mount Switch: Switch between equatorial and azimuth mount. The function of these icons is to simulate different types of telescope mounts.

Center on Object: When zooming in on an object you want to keep it in the center of the screen. If you do not, then as you zoom the object will move out of your screen. Once you have an object selected, use this icon or the space bar to center it.

Night Mode: Night mode is designed to be used in the dark, so as to not interfere with your night vision.

Full-Screen Mode: When using Stellarium, you will notice that it takes up the full screen. After choosing this icon, Stellarium becomes a floating window you can drag around. You must use this if you want to minimize the program. *Note: Using the windows button on the bottom of your keyboard will allow you to switch between open folders and programs.*

Quit: The red “X” quits the program.

Navigating Time

The last section of your bottom tool bar allows you to navigate through time. You can reverse time, fast forward time, or return to the actual time. You can see the date and time (in military form) written to the left of these controls.