

Computer Laboratory: Stellarium

Introduction

There are a number of planetarium applications for computers and smartphones. Stellarium is a free, open source planetarium software that is available for multiple operating systems including Linux, macOS and Windows. Stellarium also offers a web version; however, while the web version can be useful, it isn't nearly as robust as the desktop version.

This laboratory focuses on the basic installation and operation of Stellarium, but you should be aware that there other planetarium applications of the same caliber or better depending on your needs. Some are free while others must be purchased. Of the applications for purchase, TheSkyX (Software Bisque) and Maxim DL (Diffraction Limited) are highly regarded and offer full observatory control.

Another popular, free and multi-platform planetarium application is [KStars](#), which is part of the KDE Education Project. If you purchase a GoTo telescope and want free computer control software, KStars may be right for you.

Installation Procedures

Visit the Stellarium web site (<https://stellarium.org>). At the top of the page, you'll find a list of operating systems. For Linux, choose the "AppImage" download. Also download the "User Guide" linked at the far right of the OS list. The user guide should be your primary source of information.

- For Linux users, the AppImage is all you'll need to run Stellarium. If you are not familiar with how to run an AppImage, visit the [AppImage Quickstart Support](#) page.
- For macOS users, download and unarchive the zip file to expose the Stellarium application bundle. Move the application to your Applications folder to have access via Launchpad.
- Windows users will download either a 32 or 64 bit executable (exe) file. If you're unsure which you should download, choose the 32 bit version. Run the executable to start the installation wizard.

For more information on installing Stellarium to your computer, refer to the user guide section "Installation".

Changing and Saving Settings

Now that you've installed Stellarium, start the application. Stellarium starts in full screen mode by default. At the bottom left of the application window, you'll notice a transparent bar that notes the observer location; field of view (FOV); frames per second (FPS); and current date, time and UTC offset. Hovering the mouse pointer over this bar reveals the main tool bar.



Main Tool Bar

The main tool bar is used to control some of Stellarium's visual effects, such as constellation lines and labels, coordinate grids, atmospheric effects, date & time functions, and more. Refer to the user guide "The Main Tool Bar" for more information.

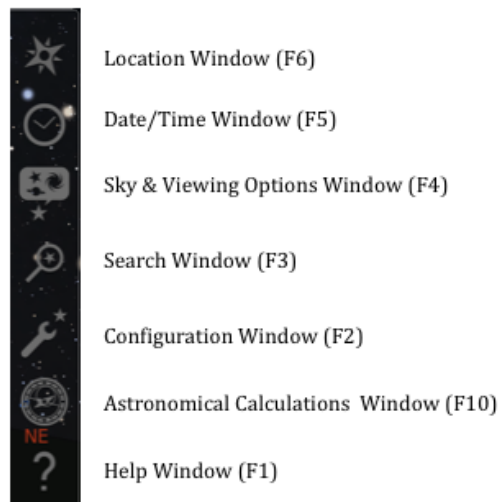
NOTE: Sometimes the tool bar does not respond to the mouse hovering. If this is happens, left-click on the bottom left corner of the application window or move the focus away from the application and back.

From the Main Tool Bar:

- Select to show constellation lines. This can also be done by pressing (C) on the keyboard.
- Select to show constellation labels. This can also be done by pressing (V) on the keyboard.
- Select to turn off atmosphere. This can also be done by pressing 'A' on the keyboard. This will reveal the stars on a black background if it's currently daylight at your location.

Moving the mouse to the left side of the application window near the bottom will reveal the side tool bar. This tool bar controls dialogs for configuring Stellarium and performing object searches. As with the main tool bar, the side tool bar displays informative text when the mouse hovers over a tool bar option.

Side Tool Bar



NOTE: Stellarium does not automatically save configuration settings as you select them! If you make changes that you want to keep, do not close the application until you have saved the settings. You will be instructed on how to save the settings after you've made a few more changes.

From the Side Tool Bar:

- Set the geographic observing location. Stellarium will try to determine your geographic location based on the system time zone or via the internet. If it is correct, no changes need be made. If you want to make changes to the geographic observing location, display the Location Window (F6). In the Location Window, enter the city i.e.(College Station) in the search field and select it in the results field above the search field. You can also manually enter the location and add it to the database.

- Once you set your observing location, close the Location Window and open the Sky & Viewing Options Window. You will now make a few changes to learn your way around. Set the following options:

Sky:

- Under the "Stars" label, set the "Absolute Scale" to 3.50 and the "Relative Scale" to 1.5.

Markings:

- Next to the "Equator (J2000)" label, check the left-most checkbox.
- Next to the "Meridian" label, check the left-most checkbox.
- Use the slider next to "Labels and Markers" to change the number of labels present on the sky display.

Landscape:

- Choose a landscape that you like or choose "Zero Horizon" to display a simple horizon guide. If you don't want a landscape of any kind, uncheck the "Show Ground" checkbox.

Starlore:

- Western constellation lore and line drawings are dominate throughout the world. However, different cultures have their own constellation lore. Leaving this set to "Western" will match more closely with the line drawings used by atlas charts as well as the SFA Star Charts.
- Close the sky and viewing options window.

Before you save the settings you have altered, choose the direction and field-of-view that you want visible the next time you start Stellarium. Use the arrow keys on the keyboard to navigate left, right, up or down. It does not matter which direction you choose. To change how much of the sky you see in the display (field-of-view), zoom in or out using the scroll feature of your mouse or trackpad. You can also use the (Ctrl + Up Arrow) or (Ctrl + Down Arrow) keyboard combination to zoom. On a Mac, use the Command key instead of the Ctrl key.

After you have established the field-of-view and direction of your sky, it's time to make a few more changes and save the settings. From the side tool bar:

- Open the Configuration Window (F2).
- Under the "Information" tab, check/uncheck the boxes next to the information items you want to appear when you click on an object. Display these items: name, catalog numbers, right ascension and declination (J2000), right ascension and declination (of date), hour angle, azimuth and altitude, visual magnitude, type, size, distance and rises, transits and sets. Include any other options of interest.
- To save the configuration settings you have applied, select the 'Main' tab. Click the button labeled "Save View" and then the button labeled "Save Settings".
- Close the configuration window. From now on, return to the configuration window and save any changes you want to keep the next time you start Stellarium.

Name: _____

Date: _____

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In this part of the laboratory assignment, you'll search for a series of objects and note some basic information. You first need to be certain that Stellarium is set to use the normal time rate and the current system clock. If the clock at the bottom of the application window is not running, use the main tool bar and set the normal time rate (K). Ensure the time is current by setting the current clock (8). **Important:** *The date you entered at the top of this page must be the same date used for your answers below.*

Reveal the search window (F3) from the side tool bar. Under the "Object" tab, enter "NGC 6888" in the search field and click on the search button.

- If the object is found, it will be centered in the sky display and information about the object will appear in the upper left corner of the application window.
- If the object is below the horizon, reveal it by disabling the ground from the main tool bar or by pressing (G) on the keyboard.

> Answer the following questions about NGC 6888:

1. What is a name assigned to it (choose one)? _____
2. What are some of the other catalog identifiers? _____

> Search for Pluto and answer the following questions:

3. What is its current (on date) right ascension and declination?

RA _____ DEC _____

4. What is the current magnitude of Pluto? _____
5. What time will Pluto transit next? _____

> Search for the minor planet (asteroid) Vesta and answer the following questions. Hint, in the search window, select the "Lists" tab. Select "Asteroids" from the drop-down list and then select, (4) Vesta. The number '4' is the minor planet designation. Vesta was the 4th asteroid to be discovered.

6. What is the current magnitude of Vesta? _____
7. What time will Vesta rise above the horizon? _____
8. How far away is Vesta from Earth? _____ AU
9. What is its diameter? _____ km