

Group Members:

Introduction To Starry Night Pro

The purpose of this activity is to introduce you to the *Starry Night* astronomy software package. You will learn how to start it, select controls and panels from the menus, use many of *Starry Night's* different buttons, and find your way around the night sky.

1) Getting Started

To run *Starry Night Pro* on the laptops in lab double-click on the *Starry Night Pro* icon on the desktop. If there is no *Starry Night Pro* icon go to the **Start** button, select **All Programs** then *Starry Night Pro* and, finally, *Starry Night Pro*. The program may ask if you wish to update the Asteroid, comet and satellite data. Since this requires access to the computers hard drive (which you do not have), click **Cancel**.

You now see the main *Starry Night* window with a view to the south at the time set on your computers' clock. Check to see that you are viewing the sky from the correct location. Under **Viewing Location** at the top you should see *Clarksville, USA*. If you don't see Clarksville USA click on the down arrow to the right and see if Clarksville USA is listed there. If it isn't listed, ask your instructor for help in setting the home location.

2) Controlling *Starry Night*

Starry Night Pro is operated using a combination of menus and top and side toolbars. The menus are at the very top of the window, the top toolbar is visible just below the menus and the side toolbar is located on the left side.

Menus

- **File**...standard file menu (Open, Save, Save As, Print, etc.) with a few extra things specific to *Starry Night*. One of those extra things is **Set Home Location**. If you messed up your home location when you first started the program you can go here and fix it.
- **Edit**...standard edit menu (Undo, Redo, Cut, Paste, Copy, etc.)
- **View**...changes the appearance of the *Starry Night* window. You can hide the toolbars, show scroll bars, change the tools shown in the toolbars, etc.
- **Options**...allows you to change viewing location, take trips to faraway places flip the screen upside down and several other neat things.
- **Labels**...allows you to label objects and constellations
- **LiveSky**...connects you to the internet where you can get current astronomy news and events, even live telescope images (they aren't free!).

- **Favorites**...This is where you find the stuff about space missions (see what their path was and where they are now), views from other planets, stars, galaxies and other places in the universe.
- **Window**...standard window menu. If you have more than one location open you can switch back and forth between them here.
- **Help**...the help menu is somewhat better than help in some programs but it is easy to get lost in all the sub-categories. The Companion Book and User's Guide are particularly useful if you are trying to set-up the program on your own computer.

Top Toolbar

- **Hand**...controls what the cursor is. The small arrow to the right of the hand shows the different options available. Leave it in the adaptive mode.
- **Time and Date**...shows the date and time (default is the date and time in your computer). You can change a date or time by just left mouse clicking on the number and entering whatever you want it to be. To change the month, enter the number of the month (i.e. January = 1, February = 2, etc.). Below the Date/Time indicator are three buttons: **Now**, **Sunrise** and **Sunset**. The Sunrise and Sunset buttons change the time to sunrise or sunset for today and Now returns you to the current time.
- **Time Flow Rate**...changes the speed of time the program runs at. Click on the down arrow to see the different options. You can also manually enter a number by left-clicking on the number in the box and entering whatever you want it to be. Underneath the Time Flow Rate are the play buttons. These work just like a CD/VCR/DVD player (stop, play forward, play reverse, fast forward, fast reverse).
- **Viewing Location**...at this point it should show Clarksville USA unless you took a trip somewhere. The down arrow to the right shows the different viewing locations available. Underneath the Viewing Location are several buttons: **down arrow** (moves you down in altitude), **up arrow** (moves you up in altitude), **Home** (returns you to your home location) and **Spaceship** (puts you on a spaceship ready for an interplanetary or interstellar trip).
- **Gaze**...gives the direction you are looking in altitude and azimuth. Underneath it are the cardinal direction buttons: **N**, **S**, **E**, **W** and **Z** (zenith) which change your viewing direction.
- **Zoom**...changes your field of view left-click on the down arrow beside it to see the preset options or use the + or – buttons underneath it to change it in steps.

Side Toolbar

The choices are **Find**, **Options**, **Favorites**, **Status**, **Info**, **Sky Guides**, **Sky Calendar**, **Planner**, **Live Sky**, **FOV** and **Telescope**. Left click on one of the tabs to bring out its choices.

- **Find**...there are several celestial objects you can find (sun, moon, planets, comets, asteroids, satellites) or you can enter the name of an object in the “Q”

box. Not everything in the sky is available in the database the programs searches and if you misspell it the program won't find it.

- **Options**...similar to the Labels menu at the top. Allows you to label objects and constellations, add in grid lines and change the sky (daylight, night, light pollution).
- **Favorites**...same as the Favorites menu at the top.
- **Status**...shows information about when and where you are and lets you make an H-R diagram of stars
- **Info**...gives information on the object in the sky you have selected.
- **Sky Guide**...an interactive interface with information on recent celestial events, things in the news, what's up in the sky and lots of other stuff.
- **Planner**...shows you what's coming up tonight and when. If you want to go out and actually look at the real sky this tool helps you to plan your viewing schedule.
- **Live Sky**...shows a live image of the sun (left-click the **Refresh** button for an updated image). Also has links to live images from a number of locations around the world and in orbit.
- **FOV**...lets you see small circles that are the size of the area you would see through different telescopes or binoculars.
- **Telescope**...lets you set-up and control a telescope

Now that you know where the buttons are, let's start using the program to find some stuff.

3) Observations

In the main toolbar, click on the Home button and then click on the Stop playback button. This will ensure that everyone is looking at the same view. Using the date and time controls on the toolbar, set the date and time to 11 pm on January 20 of this year.

Let's turn on the constellation outlines and labels. In the **Options** side tab open **Constellations** (left-click on the small + to the left of the word Constellations) and left click the **Boundaries** and **Labels** choices. This will give you the astronomical outlines of the constellations. Now left-click on the **Options** tab again to hide it.

A. Constellations

a. Big Dipper

Locate the pattern of the Big Dipper in the constellation of Ursa Major to the north. Such a portion of a constellation is known as an asterism. See if you can figure out how to show the stick figure as an asterism. Choose one of the stars of the Big Dipper and get more information about that star by moving the cursor over it. Write down the following information.

Name _____

Apparent magnitude _____

Distance _____

The Bayer system of star names consists of the name of a stars constellation followed by a Greek letter to indicate its brightness (α is brightest, β is second brightest and so on). What is your star's Bayer designation? Hint: try left-clicking on the star to select it and then open the *Info* tab on the left side.

What does the word **magnitude** in the context of astronomy mean? (Use your textbook or search the web if you don't know.)

b. Northern Sky

Use the zoom tool on the right side of the main toolbar to return to a 100° . Using the *Options* tab, turn off the constellation outlines and labels. Change your viewing angle so that you are looking due north (if you have just been looking at Polaris, you should be facing in the right general direction). Using the main toolbar set the time step to 2 minutes. Click on the Play button and watch the **northern** sky for a couple of hours. What do you observe?

c. What's in the Southern Sky?

Change your viewing angle so that you are looking due south. Change your date and time back to January 20 of the current year at 11 p.m. Scan the sky between the horizon and the zenith. Can you identify any constellations on your own? If so, what?

Turn the labels and outlines back on. Name three constellations that are in the southern sky.

B. Planets

Are there any planets visible in the sky for this date and time? Under the *Options* tab, open the *Solar System* and left-click on the boxes next to *Planets* and *Labels*. This will label any planets that are up in the sky. Now search the sky to find all the planets visible at this time.

Are there any asteroids, comets, satellites or space missions visible at this time?

C. The Moon

Use the *Find* tab to find the Moon. If it is not visible, when does it rise next? If necessary, jump to the time at which it rises to answer the next two questions.

When is the next moonrise? _____

What constellation is it located in? _____

What is its phase? _____

D. Favorites

a. Atlas View

Starry Nigh Pro will show you the paths of the planets and a celestial grid. Under the *Favorites* menu select *Atlas* from *Guides* option. Set the *Time Flow Rate* to 1 sidereal day and press *Play*. Watch the sky for a year or two and describe what you see.

b. Solar System Views

You can also get a view of the solar system from far above the north pole of the sun. Under *Favorites/Solar System* select the *Outer Solar System* option. You can slow things down by changing the *Time Flow Rate*. Describe what you see.

c. Analemma

Select Analemma from the *Favorites/Local View* menu. Press the *Play* button to start the animation. Search on the web to find an explanation of what this animation is showing you. Describe it in your own words here.

d. Join a space mission

Under the *Favorites* menu, select *Space Missions*. Choose one of the several missions listed and take a trip on a rocket ship to another world. Describe where you went and what you saw.

e. Other

Try some of the other choices in the *Favorites* menu. Describe at least two other places you went to.