

South African Astronomical Observatory

INTRODUCTION TO STELLARIUM

www.stellarium.org



Stellarium is an interactive planetarium programme that allows you to explore the night sky from any location on earth, at any time of the year. It is free open source software which shows a realistic sky in 3D - just like what would be seen with the naked eye, binoculars or a telescope.

OBJECTIVES

- ❖ Become familiar with the Stellarium programme and its user interface
- ❖ Acquire basic astronomy skills
- ❖ Learn some constellations

❖ USING THE STELLARIUM PROGRAMME

1. Set your location: Click on the Location Window icon (vertical toolbar, top icon). Specify where you are by typing "Cape Town" in the search box.
2. Set your time: in the Date/Time Window icon (vertical toolbar, second icon). It should initially display the current and correct date and time. Let's go ahead and see the sky earlier this morning. Change the time to 6:00AM, and notice how dramatically your view changes. Close the date/time window.
3. Activate the horizontal toolbar placing the mouse over it. The icons on the right end of the toolbar control the passage of time.
4. Explore your landscape. You can navigate using the mouse or the arrow keys. Spin around, look up, and look down.
5. Now try to find some objects from your current location.

- What planets are out in the sky tonight at about 8pm?
- What planets are near the Sun in the sky right now?

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❖ SOME BASIC ASTRONOMY SKILLS

Every star has an "address" in space - astronomical coordinate systems. There are several systems that can be used to locate objects in the sky. We will distinguish between two coordinate systems (same as x and y axes on a paper): **azimuth/altitude (Az/Alt)** and **right ascension/declination (RA/Dec)**. They can tell you where to look in the sky to find an object, but not how far away those objects are from the Earth.

A. AZIMUTH/ALTITUDE (AZ/ALT)

1. Turn and face north. *Toggle on the Azimuthal grid* and examine the coordinate system. **AZIMUTH** is the angle measured in a horizontal circle, around your horizon. **ALTITUDE** is the angle measured from the horizon (0°) to the zenith (90° , or directly overhead). Thus, any point in the sky that you can see can be specified by telling you which direction to face (azimuth), and how high up to look (altitude).
2. Set your time for today, at 10:00AM. Locate the star Sirius, and record its Az /Alt coordinates (clicks on the star, and information appears in the top left of your screen).

Sirius: Az _____ / Alt _____

B. RIGHT ASCENSION/DECLINATION

1. Toggle between equatorial and azimuthal mount. The equatorial mount makes no sense if you imagine you are outside looking at the sky with your naked eye, but makes sense if you imagine that you are looking through the eyepiece of a telescope. Many telescopes are mounted parallel to the celestial equator, which makes adjusting to find objects easy using RA/Dec coordinates.

Geography	Astronomy
Equator	Celestial Equator
Latitude	Declination
Longitude	Right Ascension

2. Toggle "off" the Az/Alt coordinates and to "on" the equatorial grid. You are now looking at the right ascension/declination coordinate system. Locate the star Canopus. Record its RA and Dec (RA coordinates are not given in degrees).

Canopus: RA _____ / Dec _____



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❖ CONSTELLATIONS

A constellation is an internationally defined area of the celestial sphere. These areas are grouped around asterisms (which themselves are generally referred to in non-technical language as "constellations"), which are patterns formed by prominent stars within apparent proximity to one another on Earth's night sky.

Identify the constellations below:

- a) _____ b) _____
c) _____ d) _____
e) _____ f) _____
g) _____ h) _____

Cancer - The Crab

Canis Major - Big Dog

Gemini - The Twins

Leo - The Lion

Orion - The Great Hunter

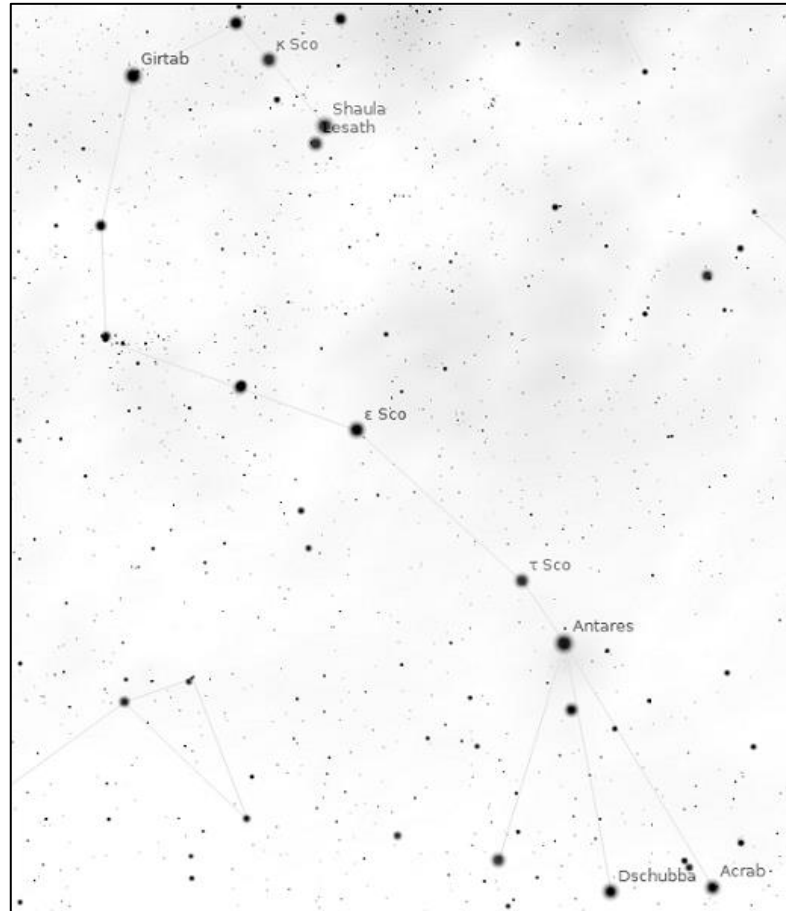
Scorpius - The Scorpion

Taurus - The Bull

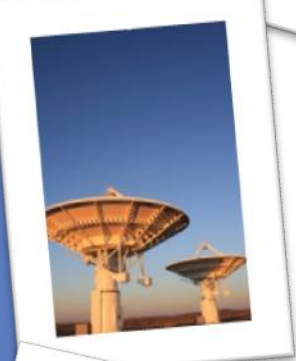
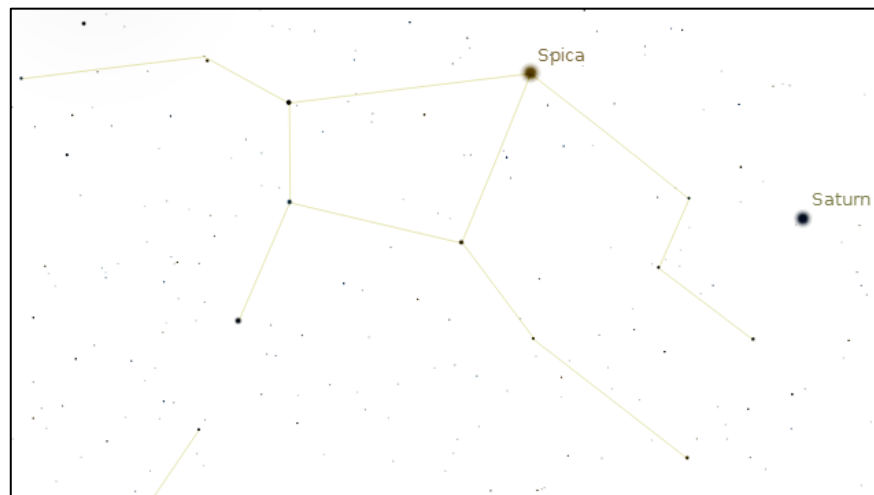
Virgo - The Virgin

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a)

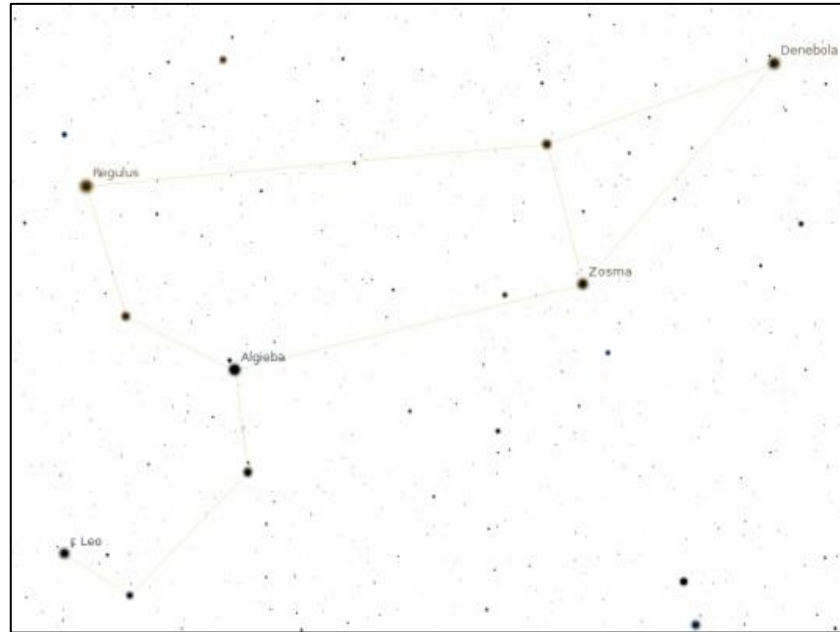


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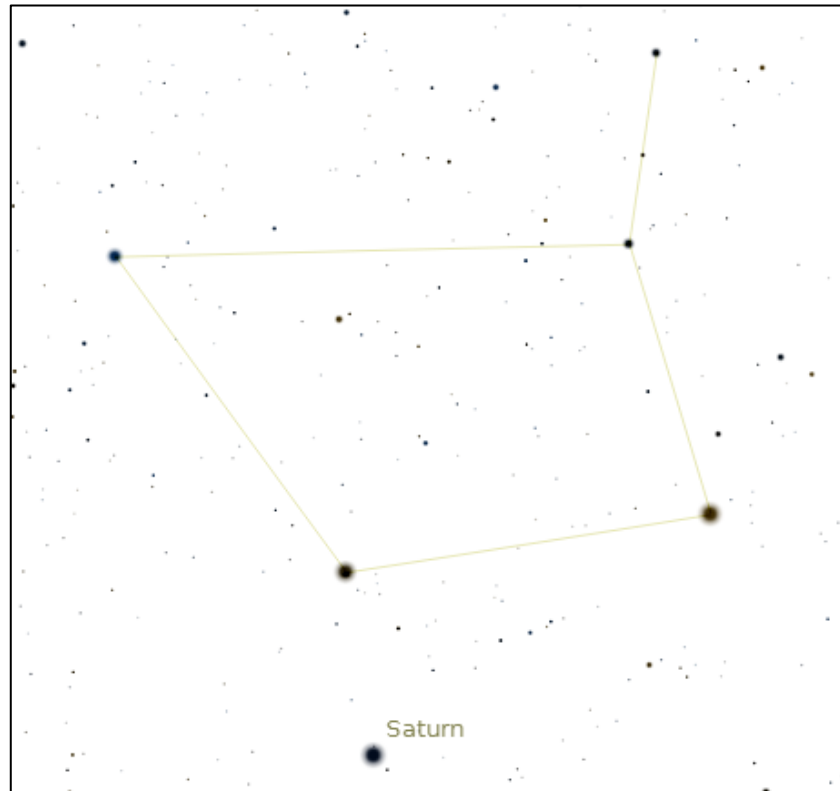


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c)

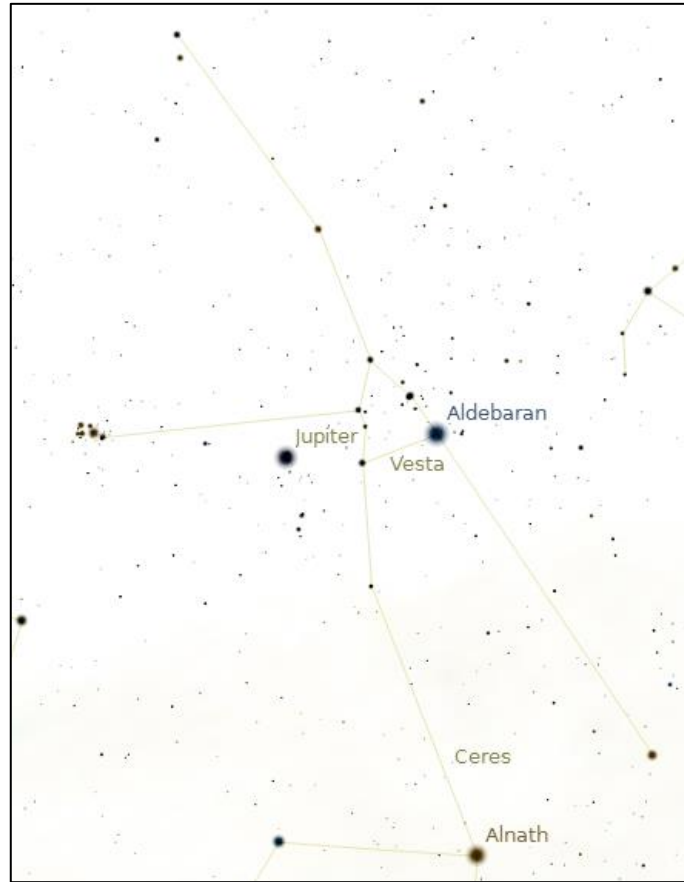


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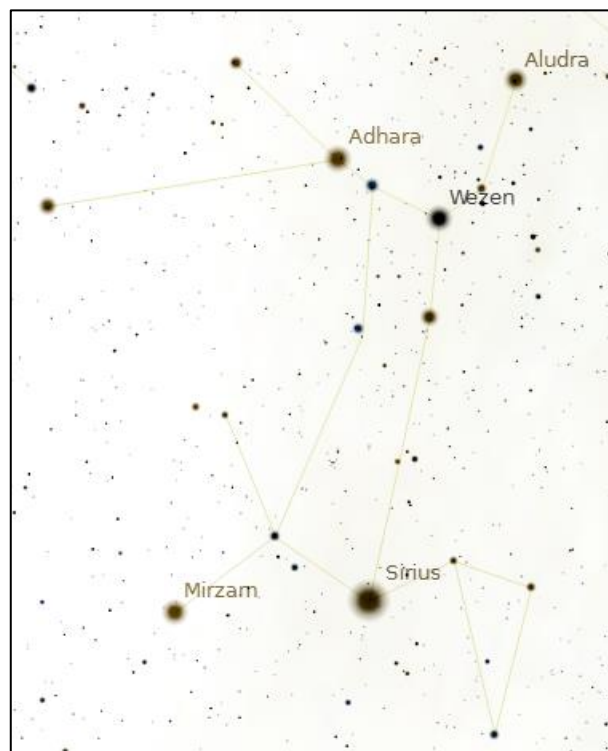


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e)

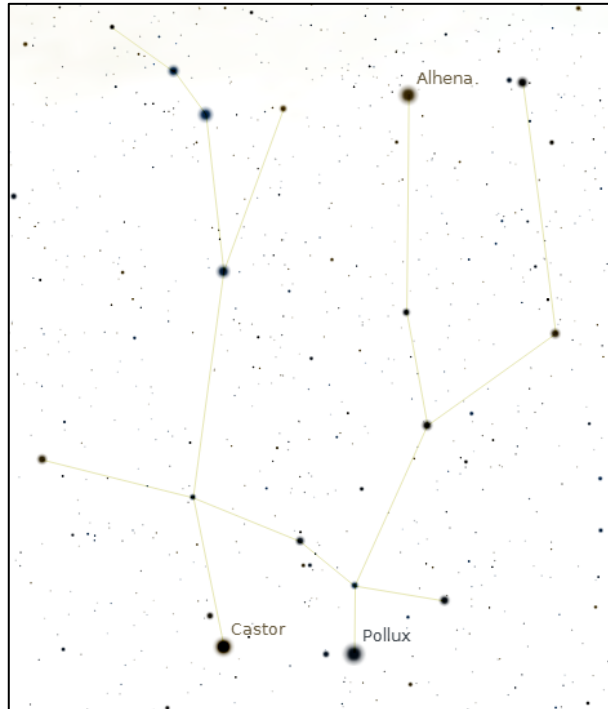


f)



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g)



h)

