

Astronomy 200 Lab Exercise

Using Stellarium



Purpose:

- To learn how to use the main features of the planetarium program Stellarium
- To use Stellarium to learn about motion in Stellarium and some basic ideas in astronomy

(Note: There are many features in Stellarium that we will not use in today's exercise. Hopefully this will, however, give you enough familiarity with the program to begin to explore other features on your own. You will need to use this program for future assignments. If you do not have a copy please go to Stellarium.org and download it FOR FREE!!)

Estimated Completion Time: 1 hour

Resources needed:

- Access to a computer equipped with Stellarium
- Text book and on-line lecture notes would be an asset

Questions (2 marks each)

1. We are in the "dog days of summer" - so named because the bright star Sirius in Canis Majoris is rising in the morning. Use the FIND feature (ctrl-F) to find Sirius and tell me:
 - What time Sirius rose this morning as seen from Edmonton and when it will set
 - What the magnitude of Sirius is and how far away it is.

*Sirius rose around 4:05 am, it will set around 12:50
Sirius is $m = -1.45$ and it is 8.60 light years away.*

2. What is the time of local noon on September 9, 2013 at Baker Lake, Nunavut ($64^{\circ}19'N$, $96^{\circ}2'W$) and what is the altitude of the Sun above the southern horizon at this time?

*Local noon at 12:21:20 (sun centred on South meridian)
at an altitude of $30^{\circ}43'$*

3. Cambridge Bay is located at $69^{\circ}07'N$ and $105^{\circ}03'W$. How many days of each year will Cambridge bay experience 24 hour sun?

*24-hour sun begins on May 25 and ends July 23
So, you get about $6 + 31 + 23 \approx \underline{\underline{60}}$ days*

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4. What do the terms altitude and azimuth mean?

Altitude is the angle above your horizon
Azimuth is the angle along the horizon measured from due North and rotating clockwise.

5. What is the location of the moon tonight at 9:00 MDT? Express this in altitude and azimuth units. Approximately how far and in what direction in Stellarium does the moon appear to move each hour with respect to the background stars?

The moon has set! It is at an azimuth ~~342~~³⁰⁴° and altitude -16° - It is in the constellation Gemini.
The moon drifts about $1/2^\circ$ eastward each hour.

6. Find the time of local noon in Edmonton on November 14, 2013 and January 28, 2014. Why does local NOT occur at the same time each day?

Local noon is approx. 12:19 on Nov 14 and at 12:47 on Jan 28. The discrepancy is due to Earth's motion around the sun!

7. At what time next month will the moon be new? Determine what constellation the sun and moon are in and whether or not a total solar eclipse is possible.

Moon is new on Oct 20 at about ~~8:59~~ midnight and is about 3° above the sun in the sky - so no eclipse possible

Moon + sun are in Virgo