

Lab 1: The Moon

Goals of Lab

This week we will be focusing on observing the moon.

Resources

East Valley Astronomy Club: [Lunar Program](#)

Terms

Some key [terms](#) and concepts that are important to know for this lab are:

- **Apogee** – The point of the moon's orbit furthest from Earth.
- **Basin** – A large impact crater with a diameter in excess of 100km.
- **Craters** – Indentations that are bowl or saucer shaped in configuration. Formed by impact or geologic activity
- **Escarpment** – A steep slope or long cliff that forms as a result of faulting or erosion and separates two relatively level areas having different elevations.
- **Highlands** – Densely cratered and higher elevated areas of the lunar surface.
- **Lacus** – Small plain.
- **Mare** – Latin for seas. Large dark basaltic planes on the moon formed by ancient asteroid impacts on the far side of the Moon that triggered volcanic activity on the near side.
- **Mon** - Mountain
- **Montes** – Mountains
- **Palus** – A small plain.
- **Perigee** – Point of lunar orbit closest to Earth.
- **Rill** – Any of several long, narrow meandering valleys or trenches on the moon's surface.
- **Rima** - One of 18 different categories of lunar features recognized in the current system of IAU nomenclature. The IAU defines a rima as a "fissure". The term is used as prefix to the feature name.
- **Rupes** – (aka Scarp), a one-sided feature with the terrain on one side being at a substantially different elevation from that on the other.
- **Terminator** – The line on the Moon or a planet that divides the bright, sunlit part from the part in shadow. It's usually the most exciting and detailed region of the Moon to view through a telescope.
- **Terra** – Latin for land. The higher elevations of the moon.
- **Vallis** – Valley

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Exercise: The Moon

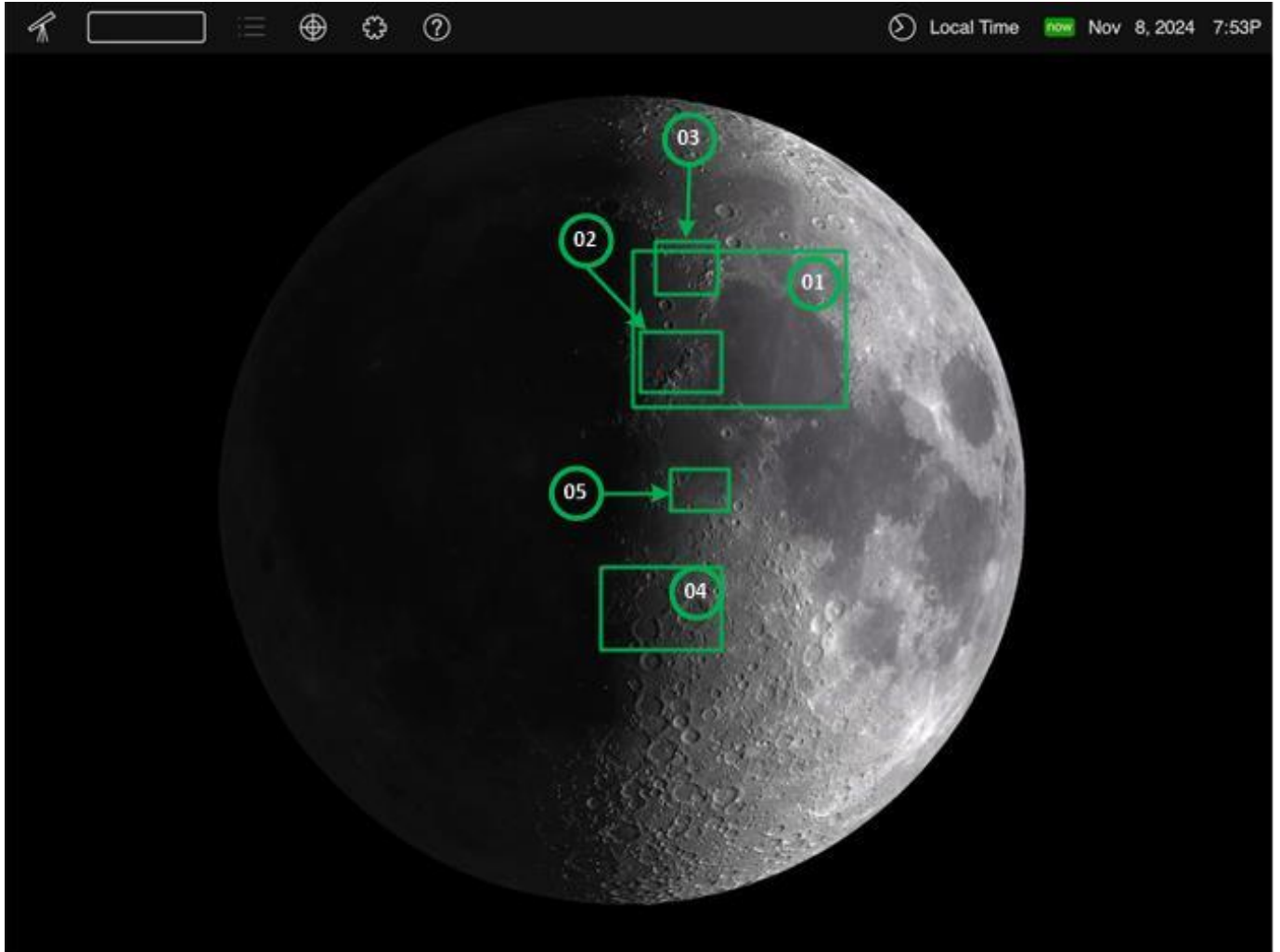
What objects of interest to view on the moon is highly dependent on the phase of the moon when you observe it. This is because features close to the terminator since shadows are more pronounced and highlights features better.

First, we need to determine the phase of the moon for our observation session. A great online resource for this is the NASA website [NASA Dial-A-Moon](#). You can also purchase moon atlases or download an application for exploring the moon. The [Moon Globe HD](#) (iOS, \$1.00) is a great application for this. A [PDF map of the moon](#) showing many features can be downloaded from the USGS website.

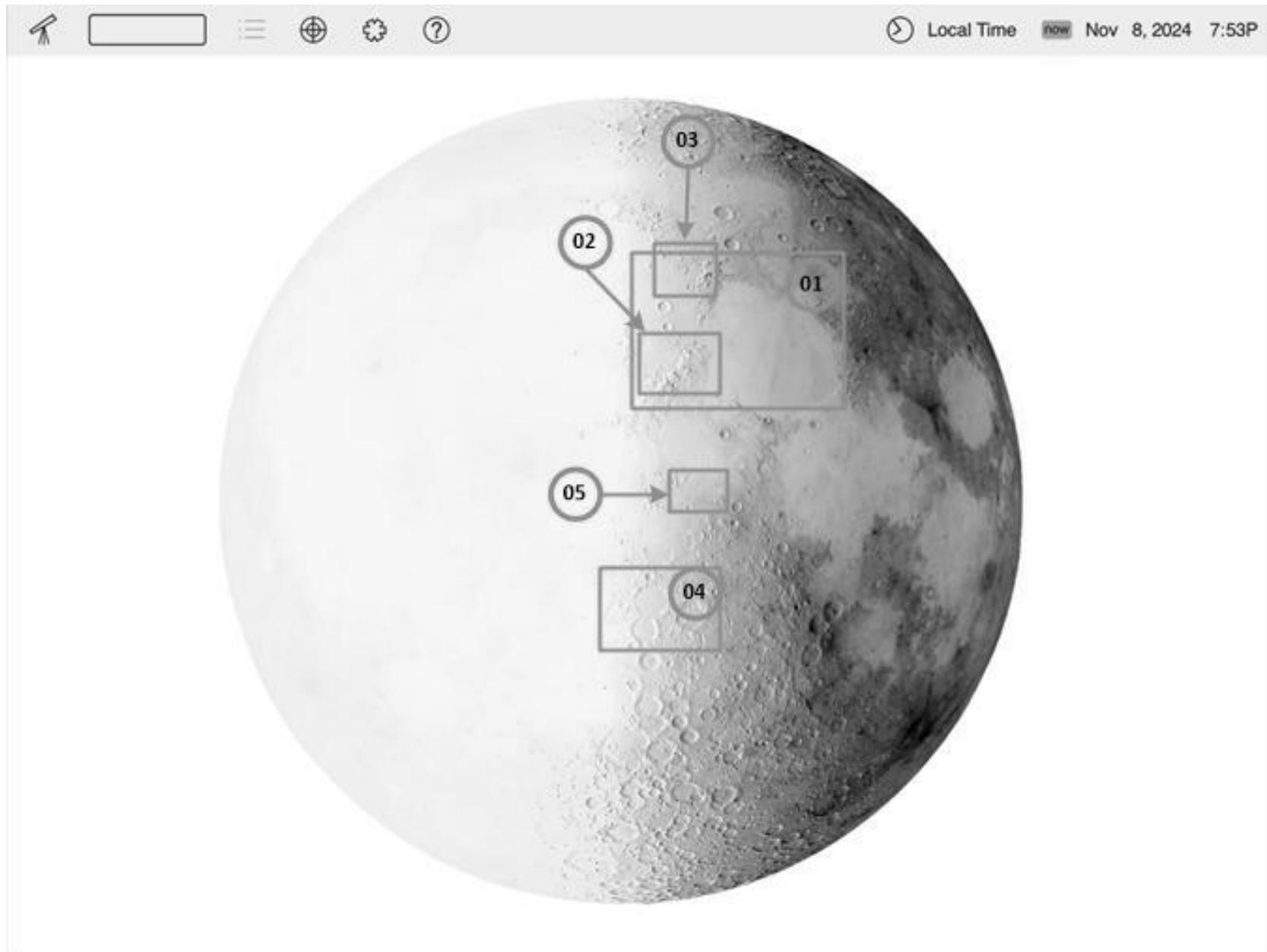
Using your references and knowledge of where the terminator will be for the lab, locate a few objects you would like to observed along the terminator line area. Make note of where the targeted item is in reference to one of the easily identified landmarks on the moon.

Reference	Targets	
Area 1 – Mare Serenitatis	A – Aristillus Crater	Diameter = 34 miles. In the middle three clustered peaks rise to a height of about ½ mile.
	B – Mountain Range	See what details you can identify on this rang that divides the Mare Imbrium from the Mare Serenitatis
Area 2 – Rimae Fresnel	A – Apollo 15	Apollo 15 landing site
	B - Fissure	Expected to be caused by tectonic stress
Area 3 - Cassini	A - Crater	Note the various other craters within this crater
Area 4 - Ptolemaeus	A – Line of Craters	Note the line of craters. Was this caused by a series of meteors impact or from cavern cave-ins?
	B – Albatengnius Crater	Examine the crater and center mountain
Area 5 - Hyginus	A - Fissure	Note the craters along the fissure expected to be cave-ins

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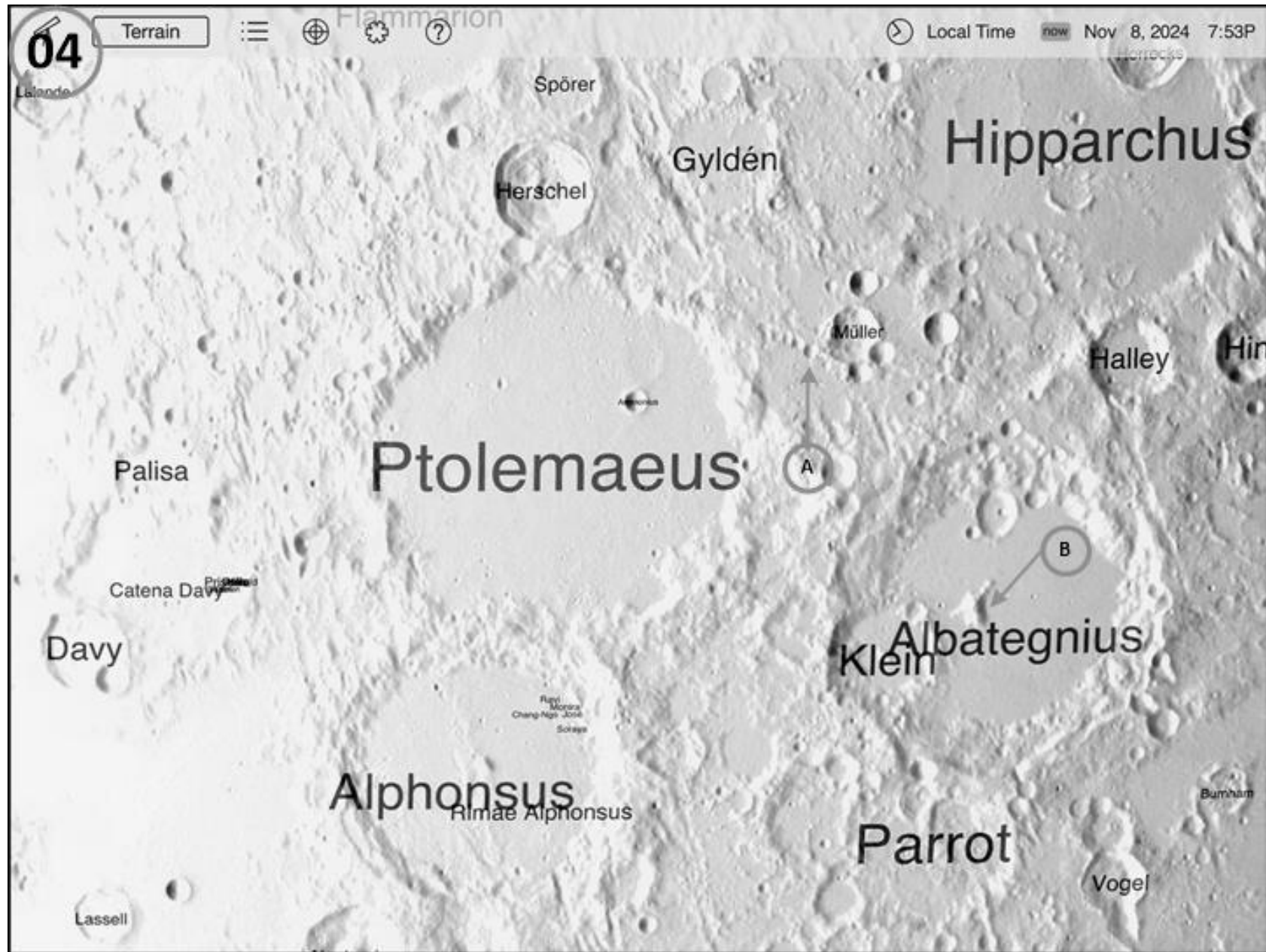
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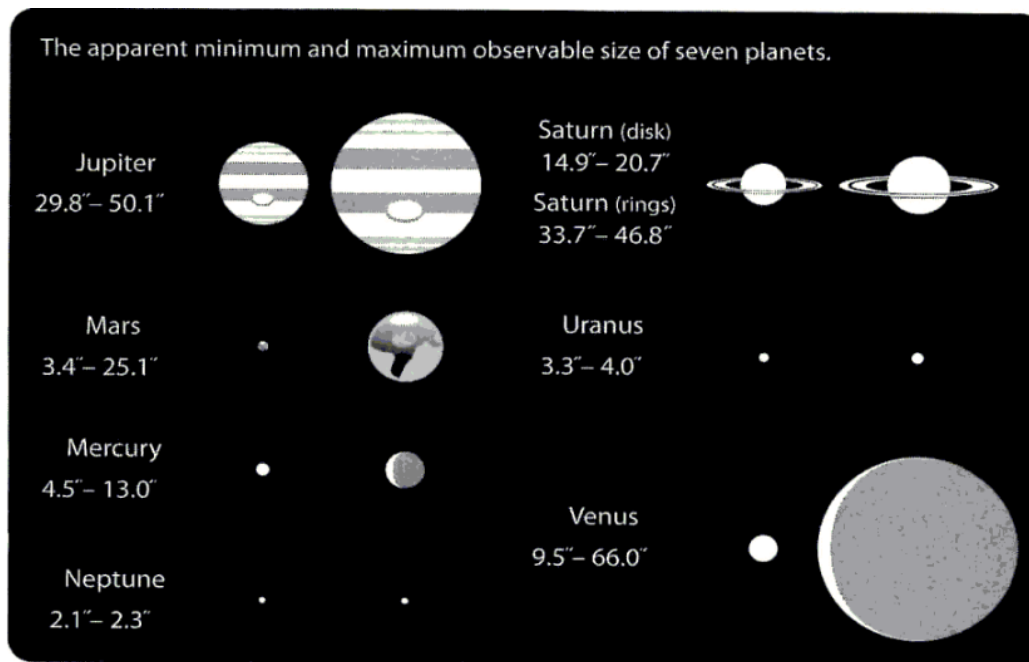


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The Planets



Planetary viewing is particularly dependent upon the seeing conditions. These are fairly bright objects, so higher magnifications will bring some benefit but again, will be limited by how good the seeing is for the night. It usually is best to observe the planet for at a couple of minutes, since you will notice that there will be moments when the view gets particularly good for a split second before the atmosphere muddies the image. It is at these moments when you may catch a glimpse of some of the more subtle features of the planet.


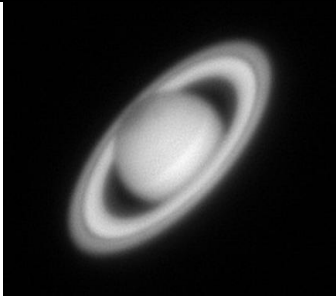

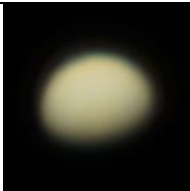
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2025-04-24

Venus | Set = 09:12pm

Jupiter | Transit=05:34pm | Set = 12:d43am

Uranus | Set = 09:04pm

Image	Description
	<p>Jupiter Usually, the two main bands are visible, and sometimes the great red spot is visible. The four major moons of Jupiter: Io, Europa, Ganymede and Callisto appear as for bright stars in the same orbital plane circling the planet. Occasionally one of the moons transits the planet and if the seeing is particularly good you can see the moon shadow make its way across the surface of the planet (Cool!).</p> <p>Inspect the image here and you can see the two main bands, upper and lower bands, the great red spot and even the shadow of a moon near the pole of the planet.</p>
	<p>Saturn Rings of Saturn should be visible. When seeing is particularly good you may be able to spot the Cassini Division in the rings. A number of the moons of Saturn are typically visible, but unlike Jupiter the main moons of Saturn are not in the same orbital plane, so they are harder to distinguish from the background stars.</p> <p><i>The Cassini Division will not be visible for us since the rings are almost edge-on.</i></p> <p>The Cassini Division is clearly visible in this image.</p>
	<p>Mars Generally, not much in features can be seen except some lighter and darker regions can be glimpsed. Careful observation may reveal a light region in the top or bottom of the planet. This is a polar cap that grows and shrinks as the Mars Winter progresses.</p> <p>Lighter and darker regions of Mars along with the polar cap is visible in this image.</p>
	<p>Venus No features of Venus will be visible. What is interesting to observe is that since Venus is an inner planet, it displays phases like the moon.</p> <p>No features to see, but a phase is clearly visible here.</p>