

Under certain circumstances it is possible to image the Moon, using the *SPIRIT II* telescope.

Moon phase

Because the Moon steadily brightens over the course of a month, it is best imaged with *SPIRIT II* before it reaches first quarter. It will be too bright to image as it approaches full. The Moon can be imaged after third quarter, although opportunities for imaging during later phases generally occur after midnight.



first quarter

full Moon

third quarter

figure 1: phases of the Moon

Targeting the moon

The *SPIRIT* interface 'Get Coordinates' command can't be used to target the Moon. Instead, specify coordinates (right ascension and declination) of the Moon, for the time you wish to image it. Stellarium or other planetarium software can be used to find coordinates. Select the Moon, enter the date and time you wish to image it, and record values for RA and Dec. These need to be entered into the *SPIRIT* interface at the time of imaging.

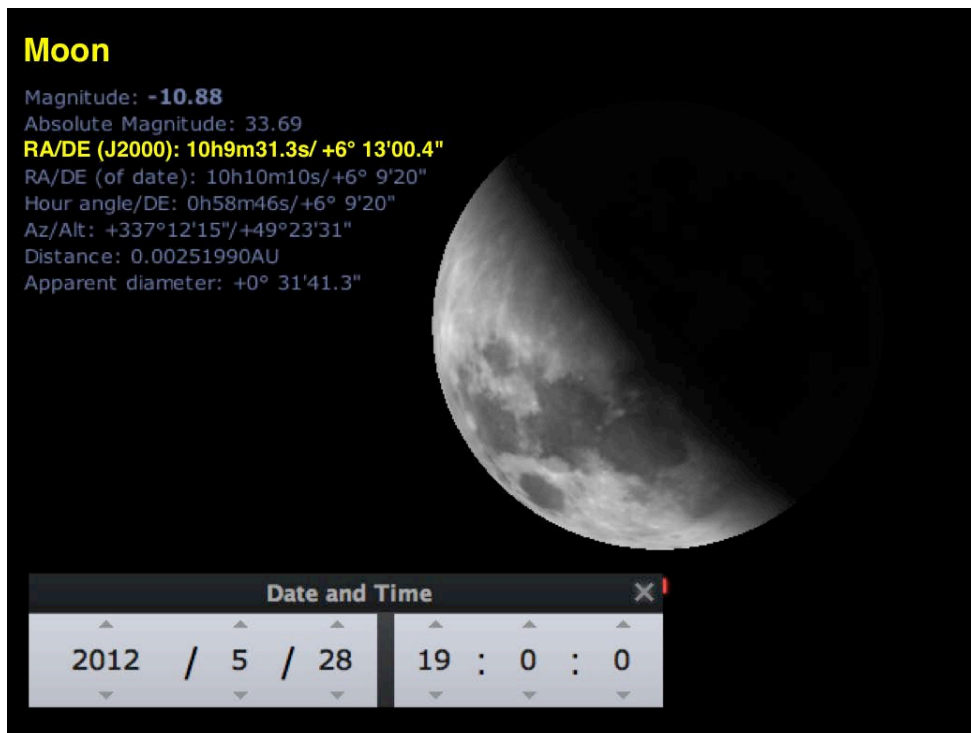


figure 2: Use Stellarium to find coordinates of the Moon for a given date and time.

Imaging requirements

Certain conditions must be met to image the Moon successfully with SPIRIT II.

1. Binning

Sensitivity of the *SPIRIT II* CCD camera needs to be reduced to prevent over-exposure when imaging bright objects, such as the Moon. To do this, set binning mode to 1. Using the camera's native resolution reduces image scale to just 0.63 arcseconds per pixel. Normally this would lead to an oversampled image, in which individual areas of brightness in a target are recorded by more pixels than necessary. In the case of the Moon this is exactly what we want as oversampling effectively reduces camera sensitivity.

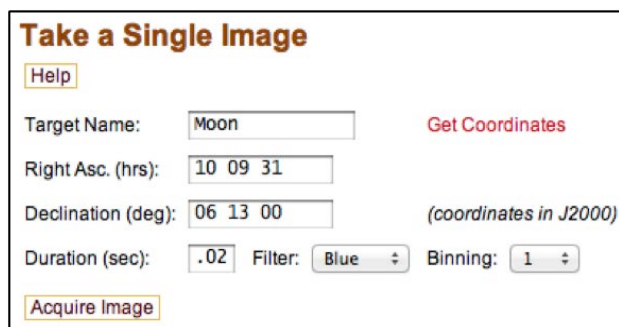
Using binning mode 1 creates large image files of around 36 MB! This is a good reason for ensuring exposure is set correctly.

2. Filters

Sensitivity can be further reduced by imaging through a filter. The best filters for imaging the first quarter Moon are Blue and B filters. These cut out more light than Red or Green filters, and increase flexibility when choosing an exposure. For a very thin crescent moon, try the Red filter.

3. Exposure

Exposures for capturing the Moon need to be very short: approaching the camera's limit of 0.02 s. For the first quarter Moon, use a blue filter and exposure of 0.02 s to avoid over-exposing bright areas.



Take a Single Image

[Help](#)

Target Name: [Get Coordinates](#)

Right Asc. (hrs):

Declination (deg): (coordinates in J2000)

Duration (sec): Filter: Binning:

[Acquire Image](#)

figure 3: *SPIRIT* image dialog with coordinates and exposure details set for imaging the Moon

Image processing

As a general rule, little image processing is required for a correctly exposed image of the Moon. Most images of the Moon benefit however from application of a small amount of sharpening. Photoshop's 'unsharp mask' feature works well.

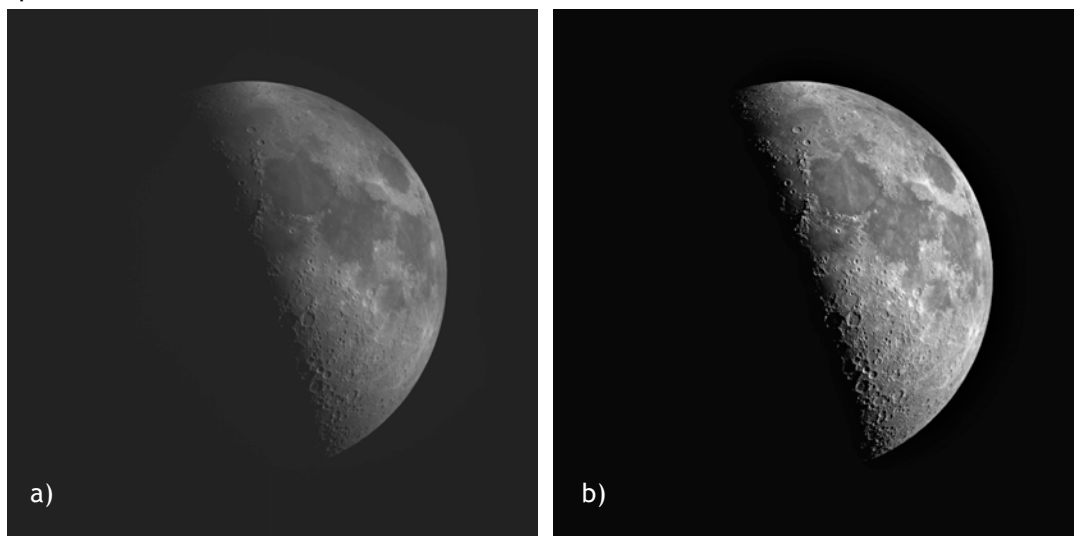


figure 4: the Moon, a) before and b) after image processing