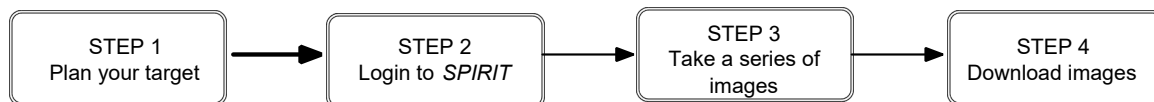


SPIRIT telescopes use monochrome (black and white) cameras for increased sensitivity. In order to create a colour image, images are acquired through red, green and blue filters, then combined using software such as Photoshop.

The same rules apply when taking filtered images as for basic imaging. Bright objects, such as star clusters, can be imaged in short exposures of 20 seconds or less. Faint objects, such as galaxies and nebulae, require longer exposures of 60 seconds or more.

These are the steps to take a colour series with *SPIRIT*:



STEP 1: Plan your target

Use a planetarium program, such as Stellarium, to find out what’s in the sky at the time you intend to image with *SPIRIT*. The best targets for colour astrophotography are bright nebulae.

STEP 2: Login to *SPIRIT*

The *SPIRIT* telescopes may be accessed from <http://spirit.icrar.org/telescope-access/>

Enter your user name and password, **it may ask you to login twice.**

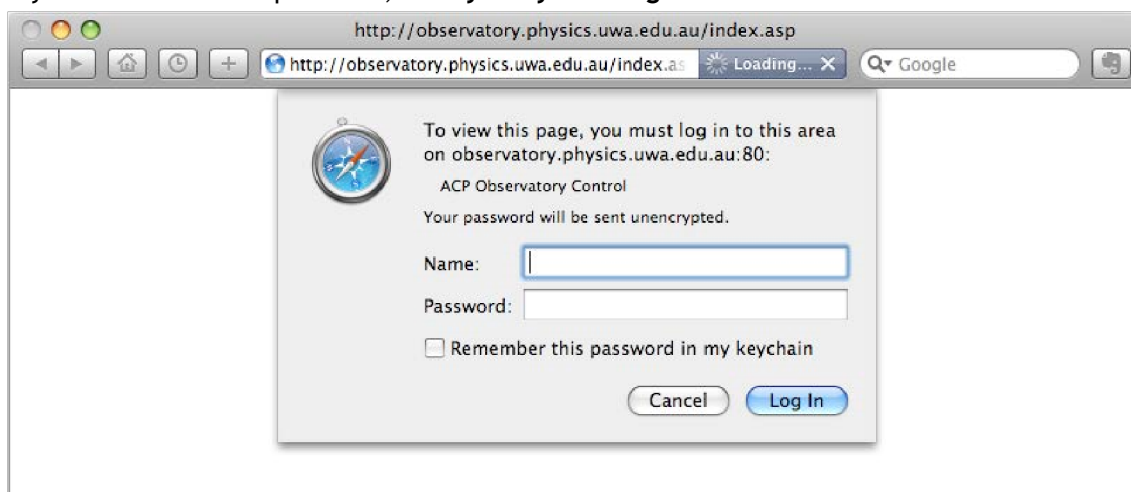


figure 1: Enter your user name and password.

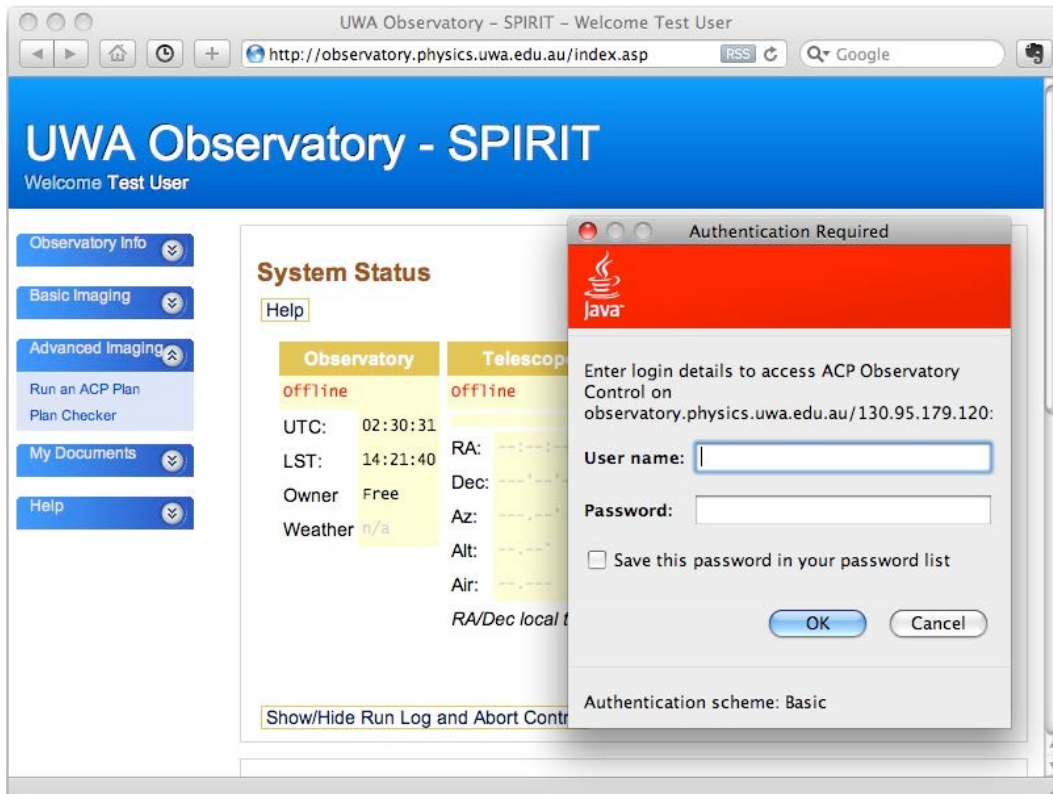


figure 2: Enter your user name and password again, after the first web page has loaded it may ask you to login again.

The *SPIRIT* home page ('Observatory Info') displays three panes: **System Status**, **Weather** and **Welcome**. Use the left hand menu to display other pages, such as 'Take a series of images'.

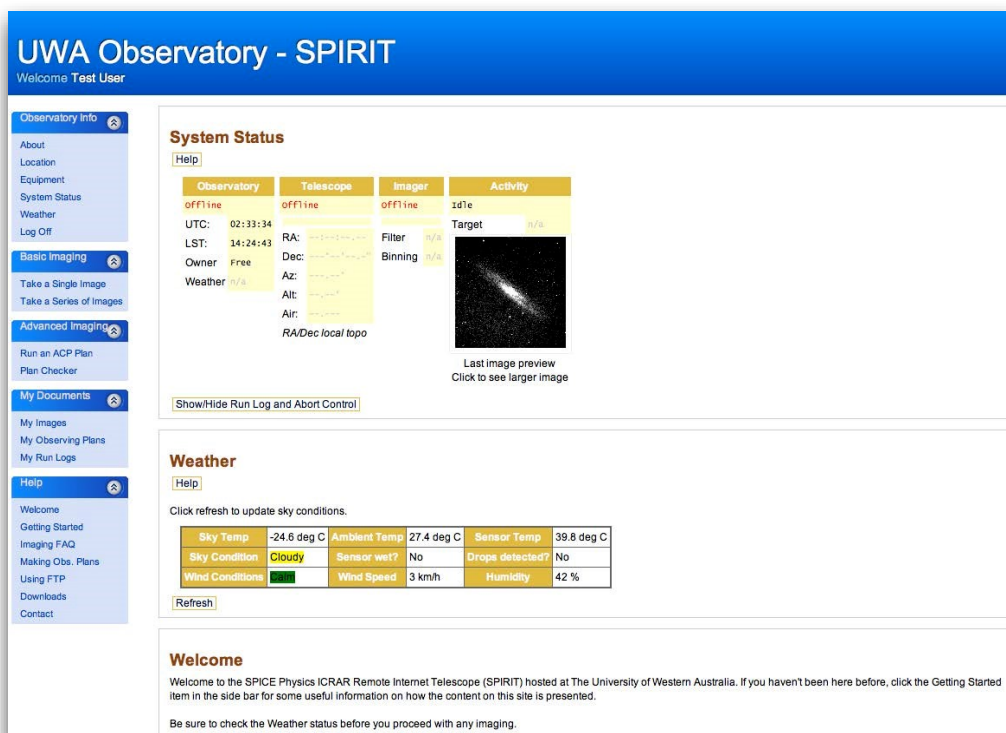


figure 3: *SPIRIT* home page

STEP 3: Take a series of images

Select **Take a series of images** from the left hand menu.

A screenshot of the 'Take a Series of Images' form. At the top right are links: 'fold close close-others refs jump'. The form has a 'Help' button. Below are input fields for 'Target Name', 'Right Asc. (hrs)', and 'Declination (deg)'. A 'Get Coordinates' link is next to the Target Name field. Below the input fields is a table with columns: 'Use', 'Count', 'Filter', 'Duration', and 'Binning'. Each row has a checkbox, an empty count field, a 'Clear' button, an empty duration field, and a '1' button. At the bottom are 'Add more' and 'Acquire Images' buttons.

figure 4: Select 'Take a Series of Images' from the left hand menu.

1. Enter your target name. Be sure to leave a space between the catalogue and number (eg 'ngc 4755', not 'ngc4755').

A screenshot of the 'Take a Series of Images' form, identical to the previous one, but with 'ngc 4755' entered in the 'Target Name' field. A pink arrow points from a circled '1' to the 'ngc 4755' text.

figure 5: Enter your target name.

2. Select **Get Coordinates**. This will automatically put values into fields for 'Right Asc.' (RA) and 'Declination' (Dec).

fold close close-others refs▼ jump

Take a Series of Images

[Help](#)

Target Name: [Get Coordinates](#)

Right Asc. (hrs):

Declination (deg): (coordinates in J2000)

| Use | Count | Filter | Duration | Binning |
|--------------------------|----------------------|--------------------------------------|----------------------|--------------------------------|
| <input type="checkbox"/> | <input type="text"/> | <input type="button" value="Clear"/> | <input type="text"/> | <input type="text" value="1"/> |
| <input type="checkbox"/> | <input type="text"/> | <input type="button" value="Clear"/> | <input type="text"/> | <input type="text" value="1"/> |
| <input type="checkbox"/> | <input type="text"/> | <input type="button" value="Clear"/> | <input type="text"/> | <input type="text" value="1"/> |
| <input type="checkbox"/> | <input type="text"/> | <input type="button" value="Clear"/> | <input type="text"/> | <input type="text" value="1"/> |

[Add more](#)

[Acquire Images](#)

figure 6: Get the coordinates of your target.

3. Enter values for Count (the number of images to be taken), Filter and Duration (exposure length). Leave Binning set to its default value ('1' for *SPIRIT I* and '3' for *SPIRIT II*).

fold close close-others refs▼ jump

Take a Series of Images

[Help](#)

Target Name: [Get Coordinates](#)

Right Asc. (hrs):

Declination (deg): (coordinates in J2000)

| Use | Count | Filter | Duration | Binning |
|-------------------------------------|--------------------------------|--|---------------------------------|--------------------------------|
| <input checked="" type="checkbox"/> | <input type="text" value="3"/> | <input type="button" value="Red"/> | <input type="text" value="10"/> | <input type="text" value="1"/> |
| <input checked="" type="checkbox"/> | <input type="text" value="3"/> | <input type="button" value="Clear Red"/> | <input type="text" value="10"/> | <input type="text" value="1"/> |
| <input type="checkbox"/> | <input type="text"/> | <input checked="" type="button" value="Green"/> | <input type="text"/> | <input type="text" value="1"/> |
| <input type="checkbox"/> | <input type="text"/> | <input type="button" value="Blue"/> | <input type="text"/> | <input type="text" value="1"/> |
| <input type="checkbox"/> | <input type="text"/> | <input type="button" value="H-a"/> | <input type="text"/> | <input type="text" value="1"/> |

[Add more](#)

[Acquire Images](#)

figure 7: Select exposure details, such as filter choice, for each image set.

4. Select **Add more** to create additional rows, if required. Figure 8 shows *SPIRIT* programmed to capture three images at 10 and 15 second durations for the red, green and blue filters. This will produce 18 images in total.

Take a Series of Images

[Help](#)

Target Name: [Get Coordinates](#)

Right Asc. (hrs):

Declination (deg): (coordinates in J2000)

| Use | Count | Filter | Duration | Binning |
|-------------------------------------|--------------------------------|--------|---------------------------------|--------------------------------|
| <input checked="" type="checkbox"/> | <input type="text" value="3"/> | Red | <input type="text" value="10"/> | <input type="text" value="1"/> |
| <input checked="" type="checkbox"/> | <input type="text" value="3"/> | Green | <input type="text" value="10"/> | <input type="text" value="1"/> |
| <input checked="" type="checkbox"/> | <input type="text" value="3"/> | Blue | <input type="text" value="10"/> | <input type="text" value="1"/> |
| <input checked="" type="checkbox"/> | <input type="text" value="3"/> | Red | <input type="text" value="15"/> | <input type="text" value="1"/> |
| <input checked="" type="checkbox"/> | <input type="text" value="3"/> | Green | <input type="text" value="15"/> | <input type="text" value="1"/> |
| <input checked="" type="checkbox"/> | <input type="text" value="3"/> | Blue | <input type="text" value="15"/> | <input type="text" value="1"/> |

figure 8: Add as many rows as required.

5. Select **Acquire Image** when you have finished adding exposure details. The sequence of commands to take the images will now commence. You can monitor progress in the 'System Status' pane. Select **Show/Hide Run Log and Abort Control** to expand the progress window.

System Status

[Help](#)

| Observatory | Telescope | Imager | Activity |
|---------------------|-------------------|-------------------|-------------|
| In use | Stopped | Shutter Closed | Observing |
| UTC: 15:02:32 | RA: 03:04:32.04 | Filter: Clear | Target: M31 |
| LST: 00:18:01 | Dec: -25°13'21.2" | Binning: 1:1 | |
| Owner: Paul Luckas | Az: 090.32° | Cooler: -15°C/49% | |
| Weather: Clear Wind | Alt: 53.06° | | |
| Shutter: Open | Air: 1.251 | | |
| Dome: Slave | RA/Dec local topo | | |

```

-----
; This plan was generated by ACP Planner 4.1.1
; -----
;
; For: Administrator
; Location: Perth, Australia
; Coords: Lat = -31° 56' 00" Lon = -115° 50' 00"
; Targets: 7
; Start Imaging: 23:40:18 (local)
; Total Time: 00:36:33
;
; User Comments:
; Test Plan 14th Oct. 2010
; -----
;
; --- Target M31 ---
;
; (wait until 15:40:18 UTC)
; (turning tracking off)

```

figure 9: Monitor the progress of image acquisition.

STEP 4: Download images

Once imaging is complete, a low quality image thumbnail appears in the 'System Status' pane. Select the image to enlarge the view.

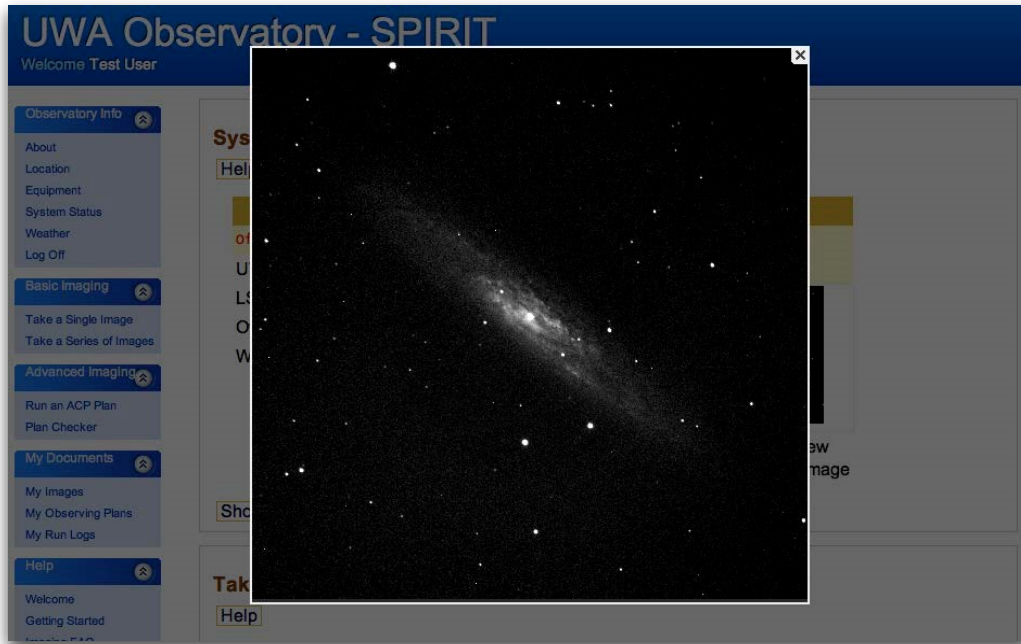


figure 10: Preview your image.

Your images are best accessed by FTP rather than attempting to download the images from the telescope web interface. Please contact us for the FTP server addresses or for help with FTP.