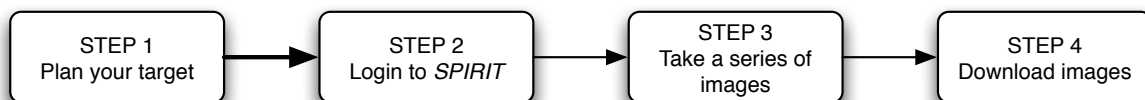


SPIRIT telescopes use monochrome (black and white) cameras for increased sensitivity. In order to create a colour image, images are acquired through red, green and blue filters, then combined using software such as Photoshop.

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://spice.wa.edu.au/spirit/spirit-telescope-access>

Enter your user name and password, twice.

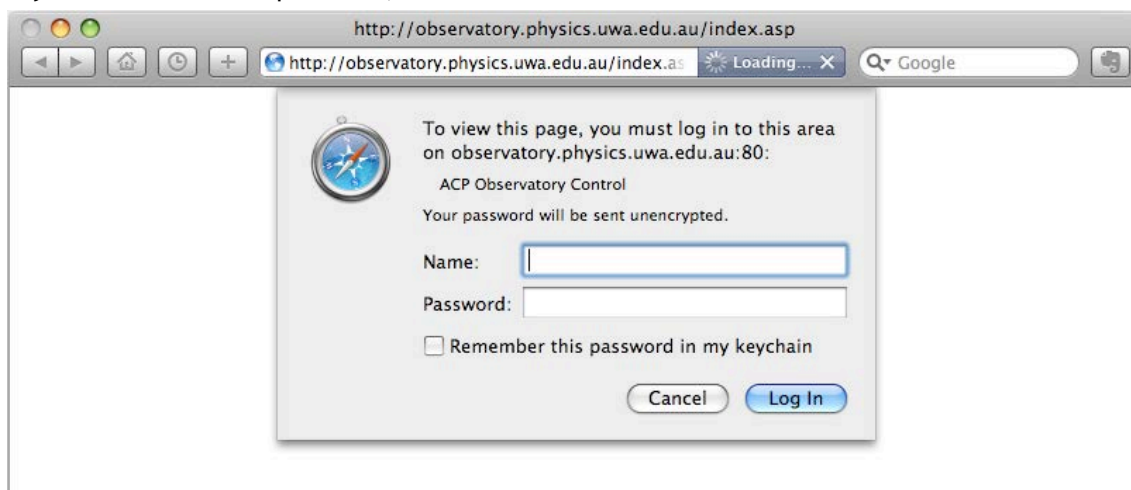


figure 1: Enter your user name and password.

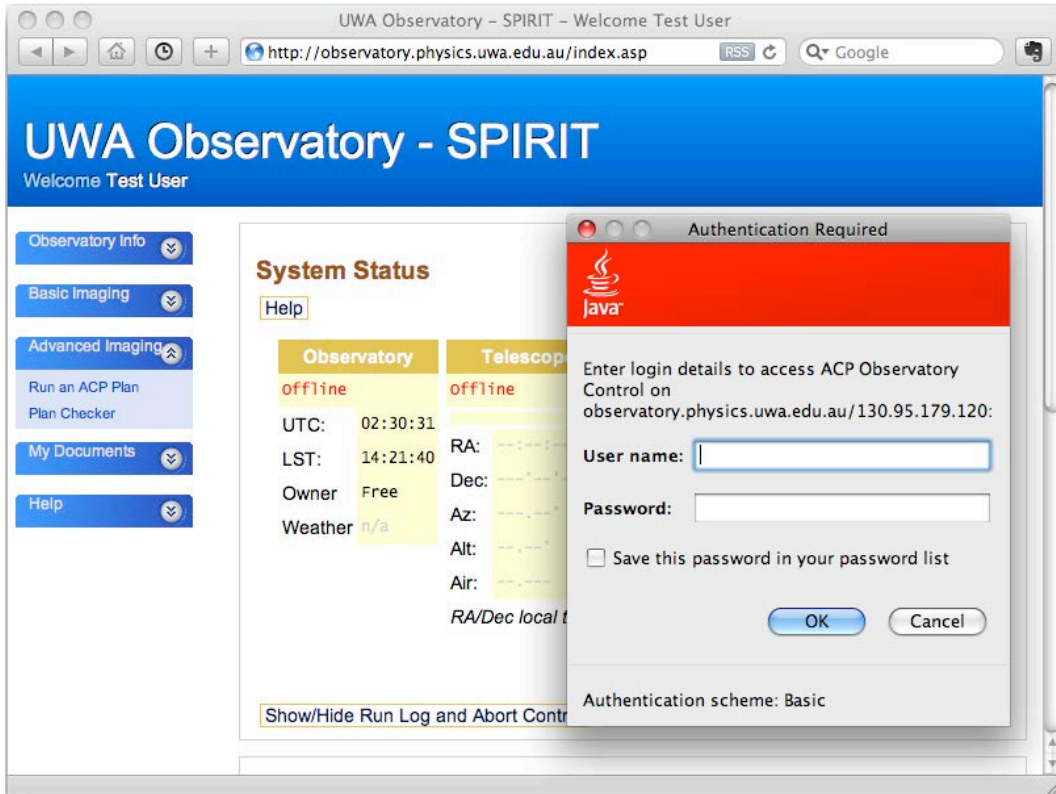


figure 2: Enter your user name and password again, after the first web page has loaded.

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'.

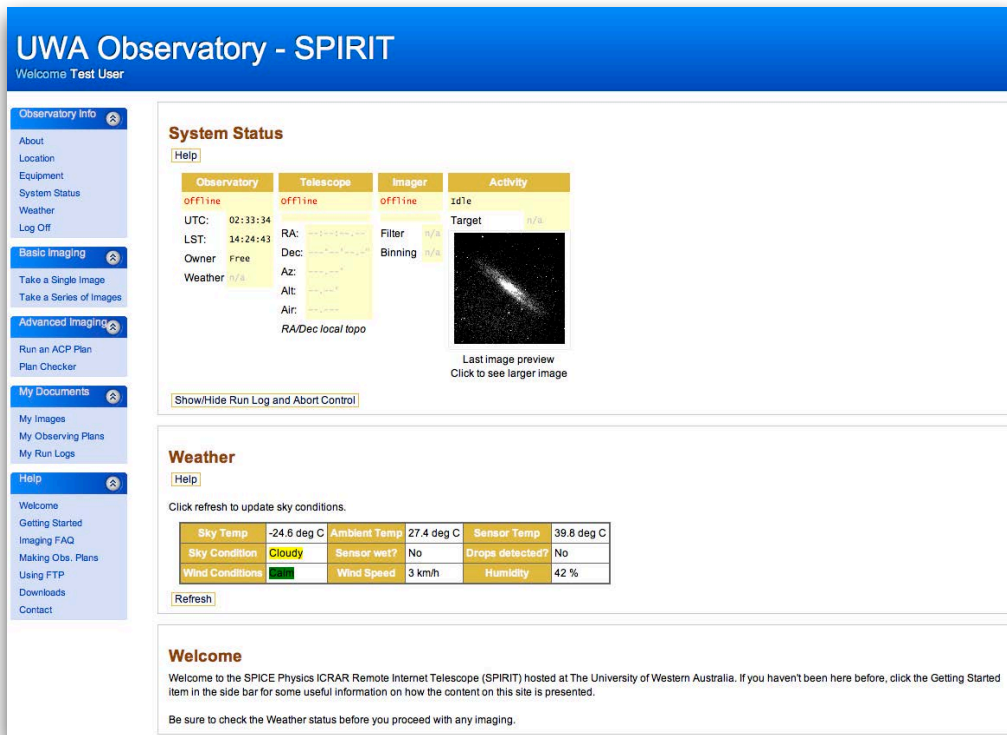


figure 3: *SPIRIT* home page

STEP 3: Take a series of images

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

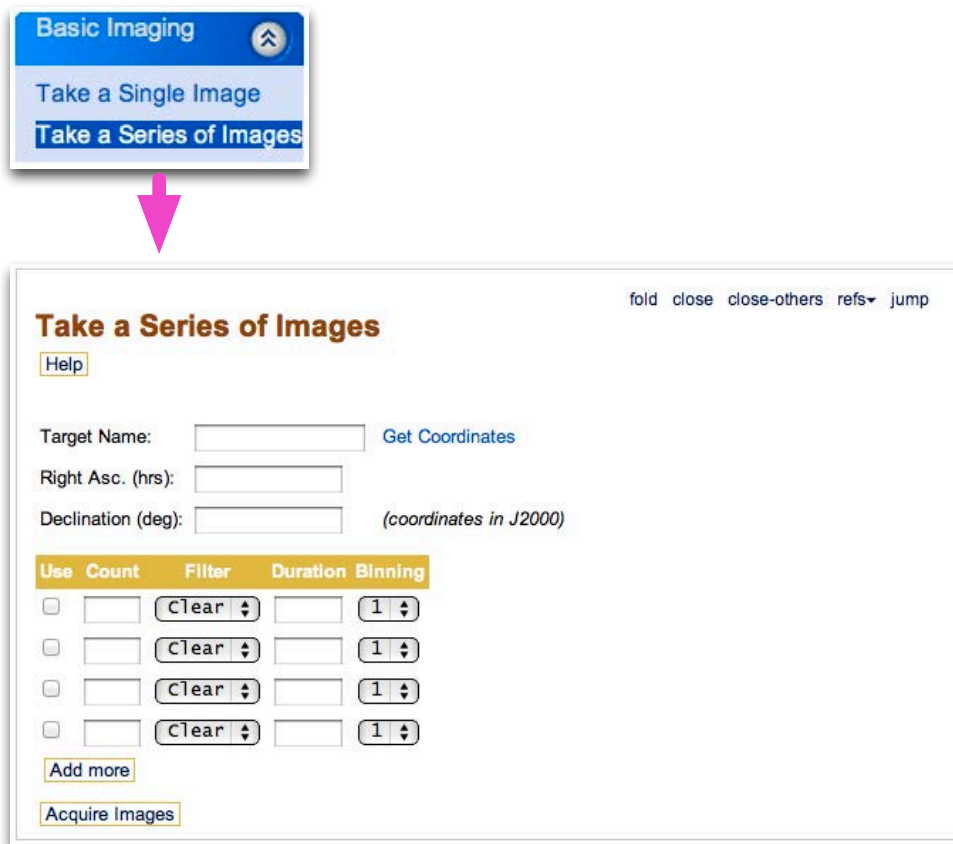


figure 4: Select 'Take a Series of Images' from the left hand menu.

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

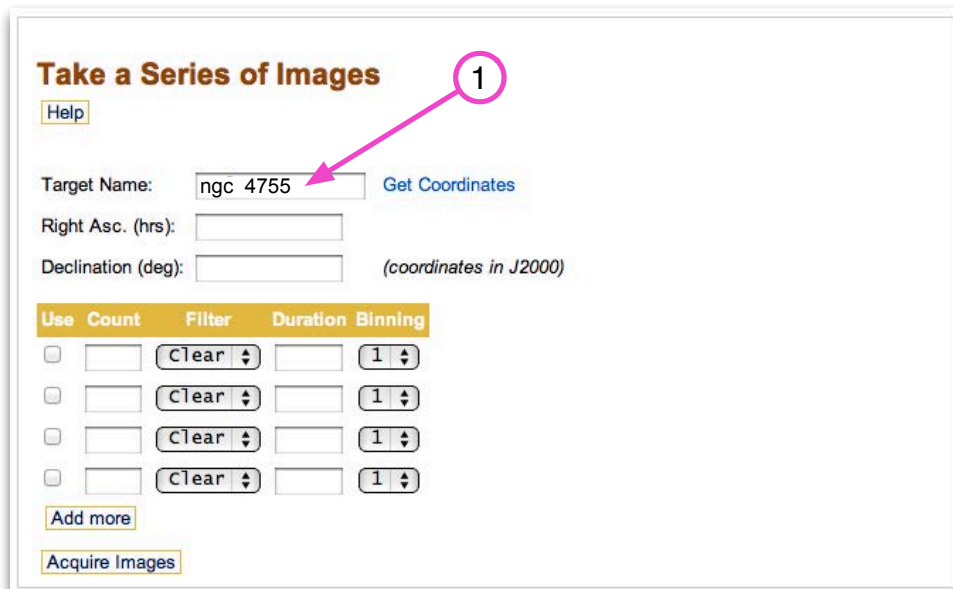


figure 5: Enter your target name.

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

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="text" value="Clear"/>	<input type="text"/>	<input type="text" value="1"/>
<input type="checkbox"/>	<input type="text"/>	<input type="text" value="Clear"/>	<input type="text"/>	<input type="text" value="1"/>
<input type="checkbox"/>	<input type="text"/>	<input type="text" value="Clear"/>	<input type="text"/>	<input type="text" value="1"/>
<input type="checkbox"/>	<input type="text"/>	<input type="text" 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*).

Take a Series of Images fold close close-others refs▼ jump

[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="text" value="Red"/>	<input type="text" value="10"/>	<input type="text" value="1"/>
<input checked="" type="checkbox"/>	<input type="text" value="3"/>	<input type="text" value="Clear"/>	<input type="text" value="10"/>	<input type="text" value="1"/>
<input type="checkbox"/>	<input type="text"/>	<input checked="" type="text" value="Green"/>	<input type="text"/>	<input type="text" value="1"/>
<input type="checkbox"/>	<input type="text"/>	<input type="text" value="Blue"/>	<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.

- 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"/>

[Add more](#) 4

[Acquire Images](#)

figure 8: Add as many rows as required.

- 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		

[Show/Hide Run Log and Abort Control](#)

[Stop Run](#)

```

;-----
; 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)

```

Last image preview
Click to see larger image

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.

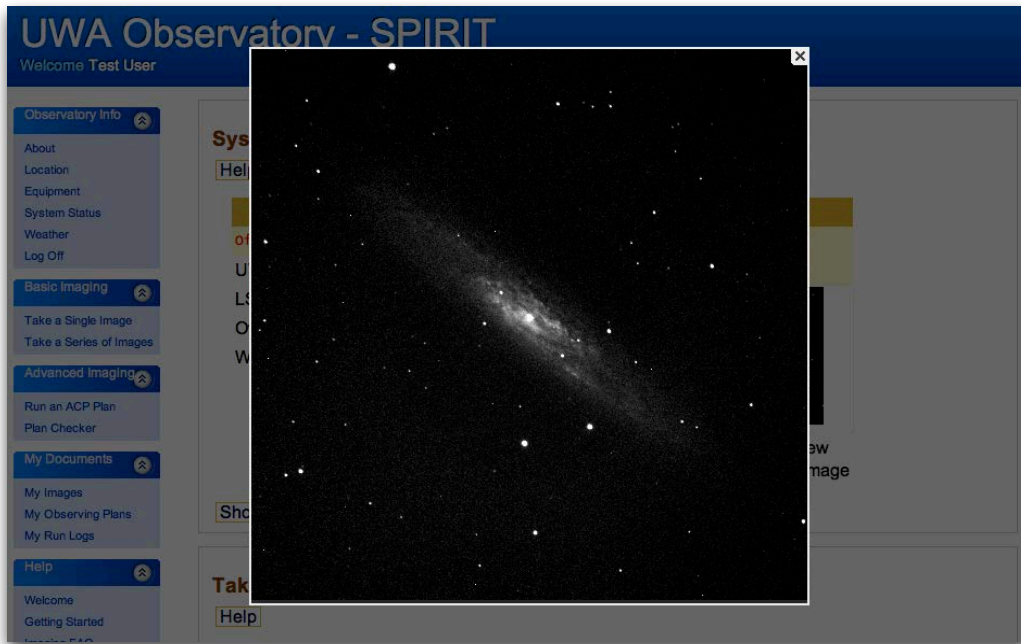


figure 10: Preview your image.

Your images can be viewed and downloaded from **My Images** under 'My Documents'. Images are grouped into folders, by date.

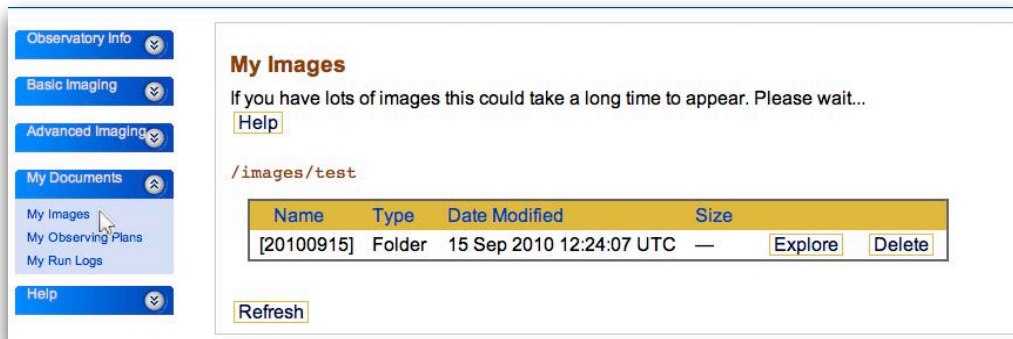


figure 11: Display a list of your images.

Navigate to the folder containing images you wish to download. JPEG versions of images may be downloaded and viewed without special software.

My Images fold close close-others refs+ jump

If you have lots of images this could take a long time to appear. Please wait...
[Help](#)

Parent Folder: [/images/test/20100915](#)

Name	Type	Date Modified	Size	
m 73-S001-R001-C001-Clear.fts.zip	Compressed (zipped) Folder	15 Sep 2010 12:12:12 UTC	3.36Mb	Delete
m 73-S001-R001-C001-Clear.jpg	JPEG image	15 Sep 2010 12:12:12 UTC	699.70Kb	Delete
ngc 253-S001-R001-C001-Clear.fts.zip	Compressed (zipped) Folder	15 Sep 2010 12:24:06 UTC	3.11Mb	Delete
ngc 253-S001-R001-C001-Clear.jpg	JPEG image	15 Sep 2010 12:24:05 UTC	780.54Kb	Delete
RAW-m 73-S001-R001-C001-Clear.fts	MaxIm DL Image	15 Sep 2010 12:12:09 UTC	2.01Mb	Delete
RAW-ngc 253-S001-R001-C001-Clear.fts	MaxIm DL Image	15 Sep 2010 12:23:55 UTC	2.01Mb	Delete

[Refresh](#)

figure 12: JPEG images can be viewed without special software.



figure 13: image taken by SPIRIT