



GUIDE TO USING THE CARDIFF ASTRONOMICAL SOCIETY'S OBSERVATORY AT DYFFRYN GARDENS

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Introduction

1. Use of the Observatory is restricted to paid-up members of the Cardiff Astronomical Society (CAS). The Observatory is situated in the grounds of the National Trust's Dyffryn Gardens (St Nicholas, Vale of Glamorgan. CF5 6SU).
2. Smoking (including vaping) in or close to the Observatory is forbidden as is the consumption of alcohol. Any serious misconduct could lead to the termination of membership of the Society in accordance with the CAS Constitution.

Access to Dyffryn Gardens and the Observatory

3. Any CAS members wishing to use the CAS Observatory must, at least 24 hours in advance of the intended use, notify:
 - Dyffryn Gardens by telephone on 029 2059 3328, and
 - the **CAS Observatory Manager** or the **Assistant Observatory Manager** by telephone on 07745 925170 or 07752 306944 respectively or by email at: Observatory.Manager@cardiff-astronomical-society.co.uk or Assistant.Observatory.Manager@cardiff-astronomical-society.co.uk
4. The Observatory is generally available for use on a 24/7 basis. However, the access arrangements depend upon the time of use. **If any member cancels their plans to use the Observatory both Dyffryn Gardens and the CAS**

Observatory Manager or the Assistant Observatory Manager (see previous paragraph) should be advised without undue delay.

5. Members arriving at Dyffryn Gardens between 09.00 and 18.00 should inform Dyffryn Gardens staff promptly upon their arrival (on 029 2059 3328) and before accessing the Observatory as set out below.
6. If arrival at Dyffryn Gardens is intended to take place after 18.00, Dyffryn Gardens staff should be telephoned (029 2059 3328) before 15.00 on that day in order to confirm that the planned visit is to go ahead. The Dyffryn Gardens staff will then inform the out-of-hours security staff who will arrange for the outer entrance gate to Dyffryn Gardens to be left open for access and egress. Upon arrival at Dyffryn Gardens after 18.00 the out-of-hours security staff should be telephoned on 0750 501 1354 to confirm arrival on site. Alternatively, members can go to the security office (situated in St Michaels cottage opposite the Cory Education Centre) in order to advise the security guard directly.
7. All cars must be parked in the designated places in the car park and NOT adjacent to the Observatory. Parking on the grass is strictly forbidden. All visitors to Dyffryn Gardens should behave in an appropriate manner with due respect and attention paid to other visitors to Dyffryn Gardens.
8. Access to the Observatory site is through a gate controlled by an access security code (which is changed on a regular basis). Any member who is not sure that they have the current security code should ensure that they obtain this in advance from the Observatory Manager (see paragraph 3 above).
9. The keys to the Observatory entrance door are located in the storage facility. Immediately upon entry into the Observatory, the logbook should be signed, and the condition of the Observatory noted in the book.
10. In the event of an emergency, please phone 999 to contact the emergency services (police, fire or ambulance) and note that the Dyffryn Gardens security staff should also be contacted to ensure that the entrance gates are open to enable access by the emergency services. For non-emergencies, the local (Wenvoe) police station can be contacted by dialling 101.
11. It is important that care is taken of the Observatory and the equipment it contains at all times. In wet weather the roof of the Observatory must be closed. Any damage to the Observatory or other defects should be reported promptly to the Observatory Manager (see paragraph 3 above). No items should be taken from the Observatory without the prior permission of the Observatory Manager. The Society's binoculars should not be removed from Dyffryn Gardens. No repair or maintenance of telescopes (including the eyepieces) should be undertaken without the authority of the Observatory Manager. Any approved repairs or maintenance that is carried out must be recorded in the Observatory's Maintenance Log.

Keys to the Observatory

12. Keys to the Observatory are held by several key-holders whose identities are known to the Observatory Manager (see paragraph 3 above).

13. Any member who wishes to visit the Observatory will need to borrow a set of keys from the Observatory Manager (who holds two sets of keys) and can be contacted as shown in paragraph 3 above. **Borrowed keys must be returned without undue delay.** The copying of borrowed keys is strictly forbidden. Any loss of keys should be reported immediately to the Observatory Manager.

Opening the Observatory roof

14. **It is essential that the procedures set out here are followed as a failure to do so may impact on the Society's insurance policies.**
15. After opening the Observatory door (a torch fitted with a red light will facilitate this when it is dark) the internal lights should be switched on.
16. New visitors should familiarise themselves with the interior of the Observatory before accessing the main telescope.
17. The dust cover to the telescope can then be removed and from the scope and check the position of the scope. On the side of the telescope's fork arm there are two rectangular marks which should be lined up and will indicate that the telescope is in the correct position for the roof not to be damaged when it is opened.
18. The protective lagging on the motor track can now be removed and attention paid to the electrical junction box which contains several dedicated miniature circuit breakers (MCBs).
19. To turn on the electrical power in the Observatory switch on (i.e. push up) the three unmarked MCBs and then switch on the 13-amp power socket next to the roof. **Note that the three MCBs marked with an "X" must never be turned off (i.e. pushed down).**
20. The red emergency stop should now be released by turning it clockwise and a check made that there are no items that will affect the opening of the roof. Any other visitors present in the Observatory should now be advised that the roof is about to be opened.
21. The roof is opened using the control buttons which are marked as follows: O (bottom button) = Open; S (centre button) = Stop; C (top button) = Close. Thus, pressing the Open button will open the roof **N.B. The roof motor can be stopped immediately by pressing the red Emergency Stop button.**
22. When the roof is completely open the 13-amp power socket should be switched off and the previously removed protective lagging should be used - together with the retaining clips - to cover the roof runner in the ceiling above the outside decking.
23. When the Observatory is being used at night the power pack (located on a shelf behind the Observatory door) for a set of external LED lights should be plugged into the main socket on the outside wall to the right of the main Observatory door and then connected to the plug in the ceiling. The controller for these lights is situated on the right of the Observatory desk.

Closing the Observatory roof

24. Before closing the roof, the retaining clips and protective lagging should be removed and, if being used, the LED lights should be unplugged (and the LED power pack returned to the shelf behind the door).
25. The red emergency stop should then be released by turning it clockwise and the 13-amp socket should be switched on.
26. Other people present in the Observatory should now be advised that the roof is about to be closed but no attempt should be made to close the roof unless a check has been made to ensure there are no obstructions e.g. the telescope!
27. Next, ensure that:
 - the emergency stop button is pushed in
 - the roof socket is switched off
 - the outside roof flap opposite to the door has been closed, and
 - the three MCBs in the junction box have been switched off (i.e. turned down) - **as stressed above, the three switches marked with an "X" must never be switched off.**
28. The protective lagging should now be put in place over the roof runner in the ceiling using the retaining clips.

Leaving the Observatory

29. Prior to leaving the Observatory the names of those members who have been in attendance should be entered in the Observatory attendance book and the entry should be signed.
30. The Observatory should be left in a tidy and orderly state and the internal lights must be switched off.
31. The door to the Observatory should be closed and locked top and bottom. The coded lock should be replaced, and the keys returned to the storage facility.
32. All visitors should leave Dyffryn Gardens quietly and, if departing at night, the security staff should be notified (tel: 0750 501 1354).

Alignment of the Telrad finderscope

33. In order for the Telescope to point accurately to objects in the sky it must first be aligned to known positions (stars) in the sky. The alignment procedure to be followed to achieve this is set out below (see paragraphs 34-40). However, that procedure can be started the Telrad (red dot) finderscope must first be aligned with the Telescope (initially in daylight hours and later in the dark) as follows:

(1) Daytime finderscope alignment process

- connect the Telrad finderscope to the Telescope
- point the Telescope at a distant land object (if possible, more than 50 yards away) and centre the object in the Telescope's eyepiece

- using the directional arrow keys on the hand controller move the Telescope up/down and to the left/right to ensure that the Telrad finderscope is centred on the same object i.e. the object is in the centre of the red ring

(2) Night-time finderscope alignment process

- switch on the power supply to the Telescope and turn on the Telescope
- use the hand controller to centre a bright star in the Telrad's red centre rings
- check whether the star is centred in the eyepiece of the Telescope
- if yes, move on to paragraph 35 below; if not, proceed as follows
- use the hand controller to position the bright star in the centre of the Telescope eyepiece
- screw the red dot mechanism into the Telrad finderscope and, using the adjustment screws on the finderscope, place the target star in the centre of the cross hairs
- switch on the Telrad finderscope and check whether the target star is in the centre of the red ring.
- if it is, move on to paragraph 35 below; if it isn't, use the adjustment screws on the finderscope to ensure that this is the case and then move on to paragraph 35 below as the Telrad finderscope should now be successfully aligned with the Telescope.

Three-Star Alignment of the Celestron 11" HD Edge Telescope

34. This Three-Star Alignment procedure is used to ensure that the Telescope will accurately point to objects in the sky. It is started by switching on the Telescope and picking up the hand controller whose screen should display scrolling set-up instructions to be followed. The alignment procedure is started by pressing the ENTER key.
35. Using the No. 9 key on the controller scroll down to "Three-Star Alignment" and press ENTER. Now select three stars in different areas of the sky (i.e. as far apart as possible) and insert a 25 mm eyepiece into the star diagonal of the Telescope.
36. Using the hand controller, centre the first alignment star in the Telrad rings. Then look through the finderscope and, using the directional arrow keys on the hand controller, place the target star in the centre of the cross hairs. When this has been achieved, press ENTER.
37. If the Telrad finderscope has been properly aligned the star should now also be visible in the field of view of the Telescope's eyepiece. Again using the hand controller, centre the star in the field of view and press ALIGN on the hand controller.
38. Now turn to the second chosen alignment star and repeat the process described in paragraphs 39-40 and finish by pressing ALIGN.
39. Repeat this process again for the third alignment star. After pressing ALIGN on the hand controller the wait for the screen on the hand controller to show "Alignment Successful".
40. It is then possible to use the hand controller to select specific celestial objects to observe through the Telescope for which there are various eyepieces.

Solar Alignment of the Celestron 11" HD Edge Telescope

N.B. NEVER LOOK DIRECTLY AT THE SUN WITHOUT USING SUITABLE EYE PROTECTION - PERMANENT AND IRREVERSIBLE EYE DAMAGE MAY RESULT. Also, the Sun should never be observed with any optical apparatus that has not been fitted with a proper solar filter.

41. This procedure is used to ensure that the Telescope will track the Sun for effective solar viewing. Start by removing the front cover from the Telescope and checking that the solar filter has not been damaged in any way. the solar filter can now be installed but it is essential to check that it has been properly installed.
42. The power supply to the Telescope should be turned on. The screen on the hand controller should show scrolling set-up instructions that are to be followed. Start by pressing the ENTER to start the alignment procedure
43. Using the No. 9 key on the controller scroll down to "Solar System Align" and press ENTER. The controller screen will display pre-determined GPS settings and will then switch automatically to allow various celestial objects to be selected.
44. Again using the No. 9 key on the hand controller, scroll down to the Sun (or to any planet you would like to follow) and press ENTER.
45. Using the hand controller, the Sun should now be centred in the solar finderscope and then in the eyepiece of the Telescope and press ALIGN on the hand controller whose screen should now display "Align Successful" which means that the Telescope will track the movement of the Sun.

How to hibernate the Celestron 11" HD Edge Telescope

46. Hibernating the Telescope enables it to be completely powered down, but it will retain its star alignment when it is switched back on. The process saves a lot of time and effort.
47. To put the Telescope in Hibernation mode:
 - in the Utilities menu on the hand controller scroll down to "Hibernate"
 - using the directional arrow keys on the hand controller, slew the Telescope to a position where it will not obstruct the closing of the Observatory roof and press ENTER
 - turn the Telescope off but note that **the Telescope must not be moved when it is in Hibernate as this will lose the saved star alignment. Similarly, any use of the directional arrow buttons keys on the hand controller while the Telescope is in Hibernate mode will cancel the stored star alignment.**

How to bring the Telescope out of hibernation

48. To bring the Telescope out of hibernation:
 - Switch on the Telescope and the screen on the hand controller will display "Wake Up".
 - Press ENTER

- Scroll through the displayed time and site information to check on the current setting and then press ENTER to wake up the Telescope.

[This document was last edited by Peter Crabb on behalf of the Cardiff Astronomical Society on 3rd December 2018]