HOW TO USE CHIRON

1. **VNC:** From ctimac1, VNC into ctioe1 using Chicken of the VNC.
2. **START CHIRON:** If the CHIRON GUI is not already operating, click the “start_CHIRON” icon on the desktop (shown in Figure 1) to start up CHIRON, and wait for the GUI to fully start up. Figure 2 shows a close up of the CHIRON GUI. Once it is fully loaded, click the “Display...” button located towards the bottom of the GUI.
3. **NAME:** Enter your name in the “Observer” field in the CHIRON GUI.
4. **CHIRON IOS:**

   **IOS Setup**

   **The webpage:** The next step is to startup the CHIRON Interactive Observing Script (IOS). To do so, open Safari on ctimac2. Then, in the browser’s address bar, type ctimac2.ctio.noao.edu. Enter your login information and you’ll be brought to a page similar to what is shown in Figure 3. The IOS is designed to load the current night’s observing script at startup. If you would like to see the observing script for a different night, click the “NOS for yyyy-mm-dd” button to see a pull down menu of the 7 most recent nightly observing scripts. Choose the date for the script you want to see, and then click the “Update Date” button located to the right of the date selection pull down menu. Alternatively, you can change the date in the address bar.

   **The log poller:** Next, click the “CHIRON” log located in the Mac OS X dock on ctimac2 (shown at the top of Figure 4) to see the status of every object. This makes a window pop up showing how far along CHIRON is in initializing for the next observation. Clicking on the log icon starts the script “poll_ios_log_dir” in a new terminal window, which is shown in the middle of Figure 4. When a new object is clicked in the interactive observing script, a blue X11 window (bottom of Figure 4) will pop up showing the status of initializing CHIRON for the next observation (e.g. changing the observation title, the preset mode, the exposure time, exposure meter information, object coordinates to the TCS, etc.). The object coordinates are the first item of the script processed and sent to the TCS. Once the coordinates change on the TCS computer (a message also appears in the blue log window informing the observer that the coordinates have been sent), the observer can safely start slewing to the target while the rest of the script continues. When the script has finished updating CHIRON for the next observation, the log will briefly display a message similar to

```plaintext
=====================================  
FINISHED WRITING LOG FOR: 130325074355  
=====================================  
Mon Mar 25 07:44:36 CLT 2013  
CHIRON UPDATE COMPLETE!  
You may now start exposing!  
Mon Mar 25 07:44:36 CLT 2013  
```

and then disappear. The observer can then safely click the red “Start” button in the CHIRON GUI to start the exposure.
Observing Procedure

Once the CHIRON GUI is running, the IOS for the night is loaded in Safari, and the log poller is running, observing can commence. The observer should proceed through the numbered items of the script, starting with item 1, which should have the object name “BON Setup”. This information is passed to CHIRON by clicking the yellowish-green “Send” button located in the second column of the script and shown in Figure 3. Once the BON Setup has finished, item 2, “Calib1”, should be clicked. This line takes the beginning of night calibrations. These 2 lines should never be skipped and should always be run in this order and before dinner. Among other operations, the BON Setup script takes a ThAr exposure. Once the exposure is complete it should automatically open in ds9 on ctioe1. If you do not see ThAr lines, contact a summit support person to check to make sure the lamps and FEM are functioning properly before proceeding to click Calib1.

At 15-20 minutes before 12º (nautical) twilight the next line of the script, Qtz_i2_Narrow, should be clicked. This takes a few quick calibration exposures. At 12 minutes before 12º twilight the first exposure of the night should start. The “Send” button can be clicked before 12 minutes before 12º twilight, and the observer can slew to the target and prepare for observing, but please do not click the “Start” button in the CHIRON GUI before that time. To determine when twilight occurs, one can use tables calculated by the US Naval Observatory located at the URL:

http://aa.usno.navy.mil/data/docs/RS_OneYear.php

On this site, scroll down to “Form B - Locations Worldwide”. Change the “Type of table” drop down menu to “nautical twilight”, and enter the coordinates for the 1.5 m. The most accurate coordinates to date can be found in the recent report by Mamajek 2012:

http://arxiv.org/abs/1210.1616

These coordinates are:

longitude: W 70 degrees 48.407 minutes
latitude: S 30 degrees 0.145 minutes

At 12 minutes before 12º twilight observing can commence. To start the first exposure click the tia maria (reddish-brown) colored “Start” button. Once the exposure, or series of exposures, has finished, click the “Send” button in the observing script for the next item down on the list. If any object is not observable, click the “Skip” button located to the right of the “Send” button in the observing script.

If an object needs to be skipped, clicking the “Skip” button will pop up a new window titled “Skip this object”, and several reasons can be selected and notes can be entered.
The reasons are “Equipment Failure”, “Weather”, “Simon” and “Skipped”. Please choose the appropriate reason for skipping a target and enter any specifics not covered in the end of night report in the “Notes” section of the “Skip this object” window. Regardless if objects have been skipped or not at the end of the night, it is always required to run the “EON Setup” and “Calib2” items located towards the end of the script. If there is time remaining at the end of the night before 12 minutes past 12º twilight is reached, please skip EON Setup and calib2 and select targets that are observable towards the end of the observing script listed after the Calib2 line. Once 12 minutes past 12º twilight is reached, go back and click the “Send” buttons on the “EON Setup” and “Calib2” lines in the script. Just as with the “BON Setup” and “Calib1” lines, these items should always be selected in that order. Once calib2 has been clicked at the end of the night, it is not necessary to stay in the read out room until completion of the script. Look at the CHIRON GUI for a few minutes to make sure the GUI is updating, which indicates that the calibrations are running smoothly. If everything is running smoothly, complete the end of night shutdown procedures for the telescope and get some rest!

If there are any problems observing with CHIRON, look towards the end of this document for troubleshooting tips.
Figure 1. The ctoe1 desktop showing the icon that needs to be clicked to start the CHIRON GUI.

Figure 2. CHIRON GUI showing the various text fields described in this document.
Figure 3. The CHIRON Interactive Observing Script (IOS) web page.
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Figure 4. (Top) Clicking on the log icon with CHIRON written on it starts the script “poll_ios_log_dir” in a new terminal window (middle). When a new object line is clicked in the IOS, a blue X11 window pops up (bottom) showing the log file for each individual observation. When all relevant parameters have been updated (e.g. object name, number of exposures, exposure time, exposure meter information, coordinates to TCS, etc.) the blue window goes away, alerting the observer that they can now safely start the exposure.
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Troubleshooting

If error messages are cropping up, here’s a list of steps to take for troubleshooting. Follow them in this order:

A. IOS Errors

1. Refresh the IOS page. This can be done by either typing command-r, or clicking the circling arrow located at the far right of the URL window.
2. If refreshing the page didn't fix the solution, try restarting the CHIRON GUI. This can be achieved by clicking the red “EXIT” button in the top right corner of the GUI. Once this has been done, look towards the beginning of this document for instructions on how to restart it.
3. If neither 1 nor 2 solved the problem, try restarting ctimac2 and/or ctioe1.
4. If there are still problems, contact Matt Giguere, John Brewer or Marco Bonati.

B. CHIRON GUI Errors

1. Restart the CHIRON GUI This can be achieved by clicking the red “EXIT” button in the top right corner of the GUI. Once this has been done, look towards the beginning of this document for instructions on how to restart it.
2. If 1 didn’t solve the problem, try restarting ctioe1.
3. If neither 1 nor 2 solved the problem, contact Marco Bonati or Matt Giguere.

C. Calibration Errors

1. If the calibrations didn’t work properly, or you would like to stop the calibrations you need to kill the processes. To do so:

   1. On ctimac2 type “ps -ax | grep -i chi_object_core” at the command line. Note the process id for the line item that is not the command you just typed and kill it by typing “kill pid”. For example:

   ```
   [ctimac2:~] observer% ps -ax | grep -i chi_object_core
   66916 ?? 0:00.01 /bin/csh -f /mir7/Scripts/chi_object_core 0 0 Calib1 0 0 0
   7980.00 1 Calib1 33 0 /mir7/logs/ios_temp/130325151756_ios.log
   88188 ttys003 0:00.00 grep -i chi_object_core
   [ctimac2:~] observer% kill 66916
   [ctimac2:~] observer%
   ```

   Then SSH into ctioe1. If it is the beginning of night calibrations, the job you are looking for is calib_beg, if it is the end of night calibrations, the job you are looking for is calib_end. For example:

   ```
   observer@ctioe1 <5:25pm> {201}ps -ax | grep -i calib_beg
   Warning: bad syntax, perhaps a bogus '-'? See /usr/share/doc/procps-3.2.7/FAQ
   ```
Then follow troubleshooting section C above. If the IOS page still isn’t working properly, choose the relevant Calib# item from the “preset mode/scripts” pull down menu in the CHIRON GUI. This runs the same calibration script, but it is not logged properly, so this should only be done if the troubleshooting mentioned above doesn’t fix the problem.