GECKO + CAFE — Semester _____
PI: _____
RunID: _____
Wavelengths: _____

- **Gecko session**
  computer: neptune, maka
  login: gecko
  password: _____
  detector: MIT2

  Observer's account
  computer: mahina, makani... NOT neptune
  login: "runID" eg: *03bf11*
  password: _____
  email: "runID" eg: *03bf11@cfht.hawaii.edu*

  NOTE: this information is also written on the board in the control room.

- **Support Astronomer:** Nadine Manset
  Office: 885-3169 or 885-7944
  Astro cell phone: 936-0885 (try that one first)
  Cell phone: 756-3654
  email: manset@cfht.hawaii.edu

- **Other phone numbers:** CFHT offices, Hale Pohaku: 935-9001
  Summit: 961-2630 or 961-2639
  CFHT office, Waimea: 885-7944

- **IMPORTANT NOTE:** Please do not forget to complete the **Run Completion Form** at the end of your run:

  `http://www.cfht.hawaii.edu/ObsInfo/Forms/obsrpt_e.php`

  I would also appreciate getting **photocopies of your log sheets**. Give them to the Observing Assistant.

  If you have any other comment (positive or negative) about the instrument, your observing run, etc., please send me an email!

STARTUP

1. Login onto *neptune* or *maka* using the session login for your Gecko session. There can only be one session running at a time! If there is a session running at the summit, you cannot start a session at Hale Pohaku.

2. Before starting any exposure, open the following windows:

   - Configuration (option in the Gecko Controls window) – used to see the status of Gecko and sometimes change the configuration
   - DetCom Expose (option in the Gecko Controls window) – to take different types of exposure
   - Image and Grapher (top menu bar)
   - an Xterminal window in the right screen – used to run the script that changes the wavelength

3. Open the TCS information windows. The most useful windows are:

   - Dome display (which is red when not ready, blue when ready)
   - Guider Strip (with ± 1 arcsec display)
   - TCS info display

4. Check if the runID and PI name are correct **in the DetCom Exposure window** and change it there if needed. The runID and PI name shown at the bottom of the top menu bar on the center screen might not be correct and should be ignored.

5. On the terminal left of neptune, login in your observer account, start Netscape, and check the SkyProbe plots: `http://www.cfht.hawaii.edu/Instruments/Skyprobe/`

GECKO FOR DUMMIES

Preparation for the night

Before starting the observations, make sure everything is working properly; if you discover a problem early in the evening, the staff will be grateful you did not call them at 2am, and you might avoid loosing time on the sky.

At the beginning of every night, around sunset:

- **Take one bias**; make sure you get a bias exposure with about 3950 ADUs, check that there are no structures in the bias (stripes, patterns, gradients...)
- **Take one 30 sec dark**; make sure you get a dark exposure, and check that there are no light leaks, odd patterns
- **Take one 30 sec Th/Ar exposure** (wavelength not important); check that you see a line spectrum, and that the lines look OK (nothing in the wings, no extra little ripple, no double lines...)
- **Take one 30 sec Flat exposure** (wavelength not important); check that you get a flat exposure
- The **RASTER** size is 200 pixels wide in X and 4096 pixels long in Y, centered on (X,Y) = (500, 2048). To reset this raster, if needed, type in the Director window: `raster 500 2048 200 4096`

GECKO FOR DUMMIES

Observations

(Detailed instructions follow on the next pages)

- Setup your wavelength, using the **gs** script
- Check the focus of the spectrograph: check that the Exposure Meter shutter is closed, turn the Th/Ar lamp ON, and use the Focus/Align Tool; reach for a difference of centroids smaller than 0.1 px
- When the spectrograph is focussed, put the Th/Ar lamp in AUTO mode
- If needed, take Flat Field exposures (make sure the E.M. shutter is closed)
- If needed, take Th/Ar exposures (make sure the E.M. shutter is closed)
- Give the coordinates of your object to the OA
- Click on the Move to Sky button to enable the CAFE TV camera
- Ask the OA to start the guiding
- Open the Exposure Meter Shutter
- Check the telescope focus, by maximizing the counts on the Exposure Meter
- Enter Object, Comments, integration time, number of exposures... and GO
- After the exposure, the Exposure Meter Shutter closes automatically; if it doesn't close it manually
- If needed, take Flat Field exposures and/or Th/Ar exposures; warn the OA that s/he will loose the guiding
- Repeat steps as needed

QUICK REFERENCE

- To **change the wavelength of observation**, use the **gs** scripts in a terminal window, using the following syntax: gs r=XXXX (eg, `gs r=4845`). Use `ls gs*` to see what wavelengths have been setup; for some wavelengths, you have a choice between a filter or a grism; in that case, use for example `gs r=4845f` or `gs r=4845g`.

  Select the **Exposure Meter filter** suitable for your wavelength of observation; the **gs** script does not change the filter for you.

- **Focus:** First **turn the Th/Ar lamp ON (not in AUTO mode)**, because it does not go on automatically when the focus tool is started. Open the "Focus/Align Tool" by clicking on the button in the Gecko Controls window. Enter an exposure time of about 30sec (the exact value depends on the wavelength), and a cut value around 100 (the exact value depends where the order is centered on the chip), and press "Expose and Graph". Wait until the 2 exposures are taken and Director says "Sending images to grapher". On the graph that appears, you will see 2 spectra (one in red, one in yellow). Select one **bright** line close to the **center** of the chip, **zoom in** until you see only that one line, click on both sides to get just a little bit of the continuum (not too much), and do an "Area stats".

  A good focus sequence (with 1+3 open, then 2+4 open) shows a difference of centroids smaller than 0.1 px, and a FWHM of about 3.0 px at the center of the detector (**NOTES:** lines are thinner at the blue end of the spectrum, and fatter at the red end - the chip is not perfectly flat, and can show focus differences in different areas).

$\Delta_{centroids} \leq 0.1$ px	$FWHM \approx 3.0$ px

  If $\Delta_{centroids} \geq 0.1$ px, cut and paste the 2 "Centroid" values given into the boxes for Step 2a, click on "Calc and Move", and re-do Step 1.

  Focus should be checked every night; filling the dewar slightly moves the detector environment, and can then affect slightly the focus. Error messages about det_y, det_x, det_z, or det_rot values that have changed will appear in red in the DetCom window, and are due to dewar filling; just refocus, and everything will be back to normal.

- **Grapher Window:**
  - Use Left-Click on the mouse to set 2 positions on each side of the line.
  - Use Right-Click on the mouse to do (1) zoom area, (2) area stat (which gives centroid and FWHM) and (3) zoom1 (whole image).

  If the **printing** option does not work, click on the desktop's background to get a menu, select the print summit option, and then click on the window you wish to print.

  To graph more than one file, do not use the option "Configure plot"; instead, click on the "Graph" button (Top Menu bar) and configure your plot from there.

- **Notes about the Flat field Lamp:** The intensity of the flat field lamp decreases quickly after it has been turned ON; the intensity starts very hight and then decreases significantly after about 10 seconds. Keep that in mind when you want to compare the flux from a very short exposure (5 sec) to a longer one (over 60 sec): you will get less flux than what you would have expected from the short exposure.

  The Flat field lamp has 7 intensities, from 1 (low) to 7 (high). Here is the approximate relation between the flux at intensity=1 and the fluxes at other intensities:

  Intensity 2 has 2.5 more flux than intensity 1
  Intensity 3 has 4.4 more flux than intensity 1
  Intensity 4 has 6.4 more flux than intensity 1
  Intensity 5 has 8.9 more flux than intensity 1
  Intensity 6 has 11.4 more flux than intensity 1
  Intensity 7 has 14.8 more flux than intensity 1

- **Shutter ballistics:** Remember that it takes 0.1 sec for the shutter to be totally closed or opened. Integrations that are too short will have more flux in the center than on the edges.

- **Printers:** The summit printer is called "sps"; the printer at Hale Pohaku is called "hpps".

- **Log Sheets:** PostScript files for the log sheets are available on Gecko's Web page, under Observer's Corner. Print with the command `lpr -Psps`.

- If you need to go in the **Coudé Room**, please use booties to cover your shoes. If you have to use a light, please **turn off the gain of the Exposure Meter**.

- **MIT2** CCD:
  - 2048 px × 4096 px
  - Gain = 1.2 e-/ADU
  - Readout noise = 7.5 e-
  - Gecko science raster 200 px × 4096 px, by typing in the director window: `raster 500 2048 200 4096`
  - Binning is available; type for example `raster 500 2048 200 4096 2 2`
  - Readout + writing ≈ 25 sec
  - Saturation ≈ 60 000, not recommended to go over ≈ 40 000 ADUs
- **Script to take darks:** It is possible to write a script that will take series of darks of different integration times. In the example below, the Object and Comment FITS fields are filled, the exposure type is set to Dark, the exposure time is set to 30 sec, and 3 exposures are taken. Then, the exposure time is set to 60 sec, and 3 exposures are taken. Note that each instruction has to be preceded by the command *clicmd:*

```
clicmd fits object Dark
clicmd fits comment Series of Darks
clicmd etype d
clicmd etime 30
clicmd go 3
clicmd etime 60
clicmd go 3
```

  Save in the /h/gecko/ directory. Then **fake TCS** by typing `ln -s bin/fake tcsh` and run the script by typing `source FileName`. After the darks are taken, before starting observations, unfake TCS by typing `rm tcsh`. The script can be started at the end of the night from the summit, or can be started from Hale Pohaku in the morning, after loging out of the summit session. There can only be one session running at a time!

- **How to send coordinates electronically to the OA:**

  You can prepare a list of targets and coordinates, and send it by email to your Observing Assistant; this can speed up the observations. The file should have one line per target, with the following format where fields may be separated by either spaces or tabs:

  n RA Dec Eq "Name" pmRa pmDec

  n is a number to identify the target. Can be anything.

  RA and Dec should have colons, as in 12:34:56.78. If there are negative Dec's, the minus sign must be snug against the numbers. Spaces are bad.

  Eq can be a number for equinox, or "appa" for apparent. The number can be integer if desired.

  name is the name's target. Must be in quotes if there are spaces. It's safer to put it all in quotes.

  pmRa pmDec are optional proper motion values.

- **SkyProbe and attenuation measurements**

  The SkyProbe camera is a small (500 x 700 pixels) SBIG camera with a 50 mm lens, which observes a large field of view (roughly 5 x 7 degrees) to a depth around 12 magnitudes. The camera is roughly co-aligned with the telescope, and takes an image every 60 seconds. It provides a measurement of the atmospheric attenuation at a frequency of roughly one sample per minute. The measurement is valid for the field at which the CFHT 3.6m telescope is currently pointing, and is stable to 0.3%. Note that telescope slews cause artificial jumps in the attenuation plots. Please see the page `http://www.cfht.hawaii.edu/Instruments/Skyprobe/` for more information and real-time plots.

USEFUL RESOURCES

- Gecko Web page: www.cfht.hawaii.edu/Instruments/Spectroscopy/Gecko/
- Gecko Filters: www.cfht.hawaii.edu/Instruments/Filters/cf4.html
- CFHT Coude Comparison Spectral Atlases
  www.cfht.hawaii.edu/Instruments/Spectroscopy/Gecko/CoudeAtlas/
- NOAO Spectral Atlas Central www.noao.edu/kpno/specatlas/
- EEV1 CCD www.cfht.hawaii.edu/Instruments/Detectors/CCDs/EEV1/
- MIT2 CCD www.cfht.hawaii.edu/Instruments/Detectors/CCDs/MIT2/
- Sky Calendars www.cfht.hawaii.edu/Temporal/SkyCalendars/
- Weather www.cfht.hawaii.edu/weather.php
- Summit view of CFHT www.cfht.hawaii.edu/webcam/
- Summit view of Gemini www.cfht.hawaii.edu/misc/summitview.html
- Mauna Kea Web Cameras
  mkwc.ifa.hawaii.edu/current/cams/index.cgi?mode=multi
- Mauna Kea forecast mkwc.ifa.hawaii.edu/forecast/mko/index.cgi
- Other tools and Information for Observerswww.cfht.hawaii.edu/observing.php/

PROBLEMS THAT ARE EASY TO FIX

- **If no light can be seen** on the TV screen, check if: (1) the primary mirror covers are opened, (2) the blue sail is not still deployed over the primary mirror, (3) Cassegrain mirror is not covered and is in position 6 in CAFE mode.
- **If no counts are recorded by the Exposure Meter**, check if: (1) the star is seen on the TV screen, (2) the Slit Shutter is open, (3) the Exposure Meter Shutter is open, (4) the Exposure Meter has been turned ON, and its voltage set to the appropriate value, (5) the star is not too faint (mag 10-12 are too faint for the E.M.)

NM - September 15, 2006