**Quick guide to the new software**

1. Click on the VIREO link
2. File -> Log in -> Enter (you do not need to fill in the form)
3. File -> Run Exercise -> The Hubble Redshift-Distance Relation
4. Telescopes -> Optical -> choose the 4.0 m (bigger is better)
5. Click the switch to open the Dome
6. When the Dome is open, turn the Telescope Control Panel on (it currently says off, just click the button)
7. This will bring up another window. On the left side there is a button called “Tracking”. Click this button so that the telescope field of view does not drift.
8. You are now almost ready to take an observation. You will take observations of four galaxies (See the table in the packet).
9. In the menu at the top click Slew -> Observation hot list. Choose one of the following galaxies: 2, 3, 5 and 7
10. Once the telescope has stopped slewing (moving to) that galaxy, zoom in by clicking the switch to “Telescope” (It is currently on “finder scope”)
11. Make sure the two lines in the middle of the field of view are centered on your galaxy (galaxies are fuzzy). If it is not you can use the **N,S,E,W** buttons to move it a little.
12. Check that your instrument says Spectrometer then click the Access button. This brings up yet another window, which is where you will collect the data.
13. Write down the name of your object, and its Apparent Magnitude.
14. You want to take data so you have *at least* 20 signal to noise. **Pay attention to how long it takes you to get to 20!** You will need to do a comparison between galaxies later. Click “GO” to take the data and “stop” when you think you have a good spectrum.
15. Save the spectrum by going to File -> Data -> Save Spectrum. Close the spectrum window and go back to the Telescope.
16. Repeat steps 9-15 for the other four galaxies in the list.
17. Once you have this data saved, return to the Observatory Main Control Panel (not the telescope one). Go to Tools -> Spectrum Measuring. A new window will pop up (looks a lot like the take a spectrum window but it is different). Load one of your saved spectra by going to File -> Data -> Load Saved Spectrum.
18. You will need to measure the wavelength of the right-most line of the pair of lines. This is the H line of Calcium (see the other packet for more details). Write the measured wavelength in your table.



1. You can now return to step 18 of the original packet. Please note the information immediately above step 18 since you will need it.