C. Observing Emission Spectra from hot gas

There are seven gas discharge tubes in the lab. Visit them as they become available. **Use the diffraction grating glasses** provided to visually inspect the gas tubes, and then the iPads to measure their spectra. The goal is to identify which chemical element is in each tube by comparing their spectra with the spectral catalog provided by the TA.

MEASURING SPECTRA:

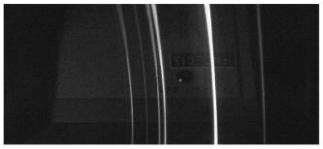
1. Get an iPad from your TA, equipped with a diffraction grating (spectroscope) over the camera. **You are responsible for the safe return of this iPad at the end of the lab**

2. While in Landscape Mode with the iPad, launch the AstroSpec app on the iPad.

3. Erase images by pressing ***'Clear all'*** in the ***'Images'*** tab. You must then ***'Confirm.'***

4. Go to one of the gas discharge lamps and turn it on. On the ***'Dashboard'*** tab within the AstroSpec app on the iPad, press the ***'File...'*** button, and select '***Take Photo'***.

5. Hold camera 4"- 8" away from lamp and slowly rotate the lens/grating on back until the lines in the spectrum are vertical, as shown below. These lines will appear on both sides of the lamp, however **you should take a picture of the lines to the right** of the lamp. Use black material provided as background. Take a picture using the white shutter button on the right.



6. If the lines look bright and clear, press **'*Use Photo'***; otherwise press '***Retake'.***

7. Create the graphical representation of the spectrum by cropping image to include only the spectrum. On the photo, draw with your finger a box about 1cm tall across the spectral lines. **Avoid including the lamp itself or other contaminating light elements.** Following is what you should see on the iPad screen. Once you draw the box around the spectral lines, it should look like this:

Note: If you cannot make the selection above, try the following:

- Exit and re-enter the app, or
- Close the app and re-opening, or
- Shut down the iPad and restarting, or if none of those solve the problem,
- Take the picture outside app and proceed from *4.* using **Choose Existing**

8. Once you're satisfied with the selection, click ***'Crop'*** to crop the image.

9. Click ***'Spectrum'*** to make the graph. (Choose ***'Restore'*** to start over if needed.)

10. Select the lamp number (written on the side of each lamp) from the drop-down box.

11. Show first spectrum to your TA.

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12. Press ***'Save.'*** If this lamp number has already been recorded, you will be prompted to ***'Overwrite'*** the current saved image. The spectra will be saved to the ***'Images'*** tab.

13. Turn off the gas discharge lamp.

14. Repeat this process, starting each new iteration at *4.* until spectra for all lamps have been obtained and saved.

EXAMINING THE SPECTRA and CLASSIFYING:

15. From ***'Images'*** tab, press any saved image to launch gallery. Swipe left and right to view spectra you made for each lamp. Press the ***'x'*** in the top right to close the gallery.

Compare your graphs to those on the Gas Emission Spectrum sheet provided by the TA to fill out the following chart.