Spectroscopy Lesson

Part 1. Examine Figure 1. This is a spectrum of the emission nebula NGC7009, The Saturn Nebula. It is the outer layers of a dying star ejected back into space and glowing due to the excitation of the hot core remaining behind.

A. Calibrate the graph using the known lines of Hβ and Hα. Measure the distance between these 2 lines in mm using your ruler, and knowing their wavelength of emission (shown in the figure), determine the scale of the graph in **Angstroms/mm.**

a. Scale _____

B. Using your ruler now measure various other emission lines in the spectrum and assign the elements/ions in the table to a particular line. Show this on the graph.

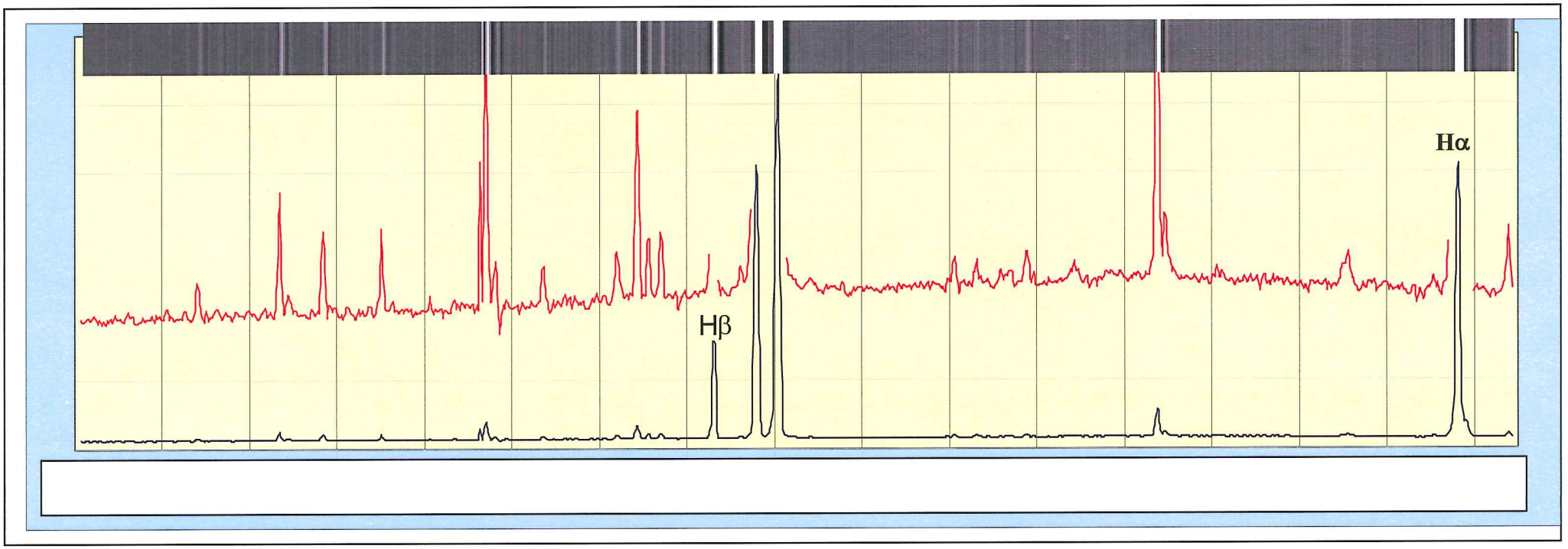
Part 2. Now examine Figure 2, this is the absorption spectrum of the star 13-theta Cygnus and it show many absorption lines due to various elements in the outer layers of the star, including the strong lines due to Hγ and Hδ, labeled in the figure.

A. As in Part 2 above, make measurement of the distance between these 2 lines and their known wavelengths shown in the figure to determine the scale in **Angstroms/mm**.

a. Scale _____

B. Using your ruler now measure various other absorption lines in the spectrum and assign the elements in the table to a particular line. Show this on the graph.

Figure 1 Spectrum of Planetary Nebula



6562	H-alpha
5876	He
5007	O +2
4959	O +2
4861	H-beta
4739	Ar +3
4711	Ar +3
4685	He +1
4640	N +2
4472	He
4340	H-gamma
4326	O +1
3866	Ne +2

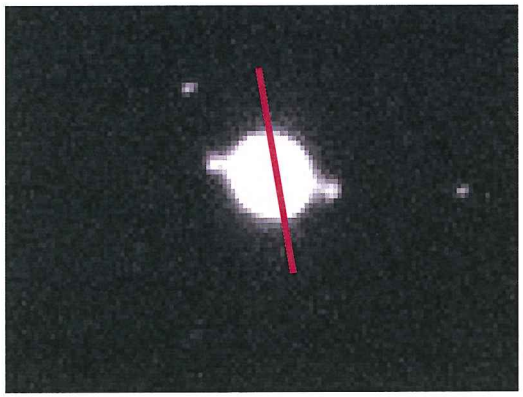
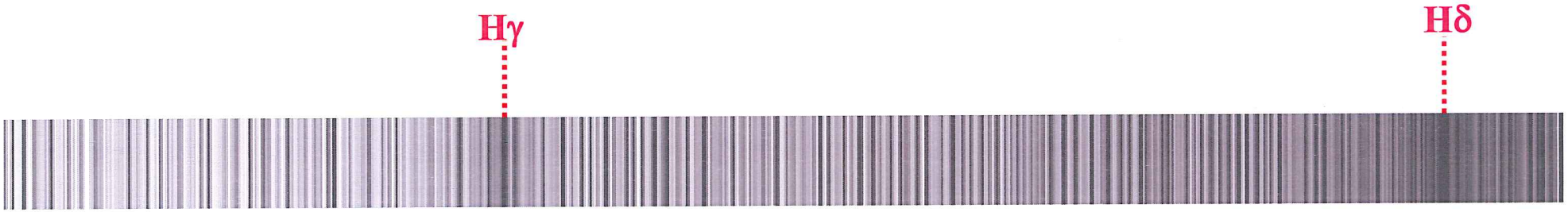


Figure 2 Spectrum of 13-theta Cygnus



4380.1	V
4340.5	**Hγ**
4331	Ni
4289.9	Cr
4274.6	Cr
4271.6	Fe
4259.6	Fe
4255.9	Cr
4250.5	Fe
4226.9	Ca
4198.6	Fe
4168	Mg
4101.8	**Hδ**