1. GRACE KIM RYDBERG CONSTANT LAB

Wavelength (nm)	Wavenumber (m^-1)	Frequency (Hz)	Photon Energy (J)	n (Balmer series)	1/n^2	RH calc	% error
653.9	1.529E+06	4.588E+14	3.040E-19	3	0.11111	1.101E+07	0.372451
487.7	2.050E+06	6.151E+14	4.076E-19	4	0.06250	1.094E+07	0.312812
439.0	2.278E+06	6.834E+14	4.528E-19	5	0.04000	1.085E+07	1.11975
420.5	2.378E+06	7.134E+14	4.727E-19	6	0.02778	1.070E+07	2.447167
						1.087E+07	0.876819

2. AVERAGE OF DATA CALCULATION: The average value for the Rydberg constant from the data is 1.087 x 10^7 m^2kg/s (0.88% error).

3. SLOPE/ GRAPHICAL DETERMINATION: The negative of the slope is the 1.000 x 10^7 m^2kg/s (8.84% error).
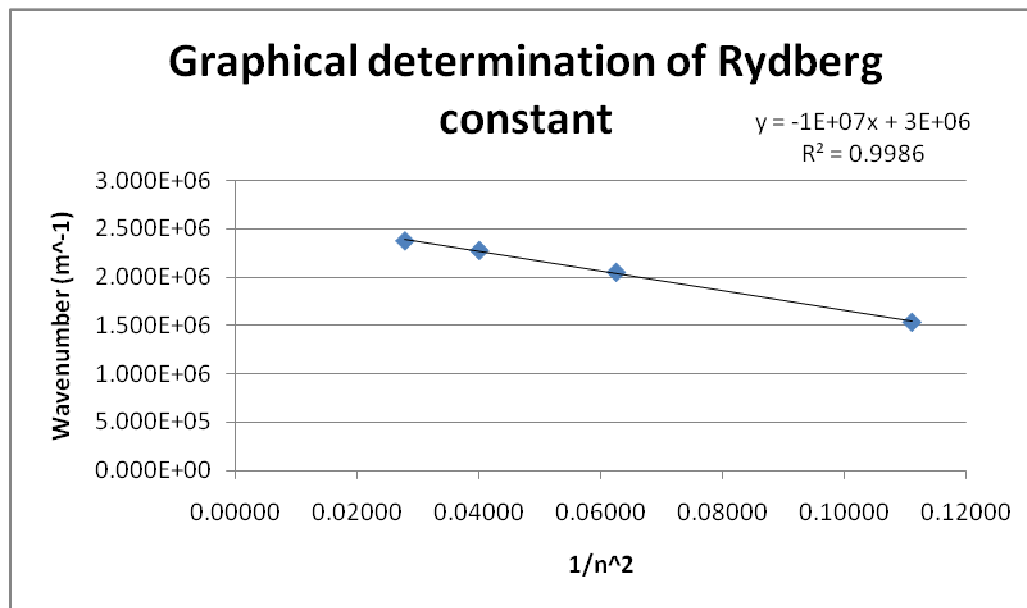

4. The % error is given in parenthesis after the value for #2 and #2.

5. Since the error for the slope from the graph is so high, I used the average from my data.

1/λ= 1.087 x 10^7 (1/(2^2) - 1/(7^2)) = 2295918.367 m^{-1}, so λ=400.6 nm.
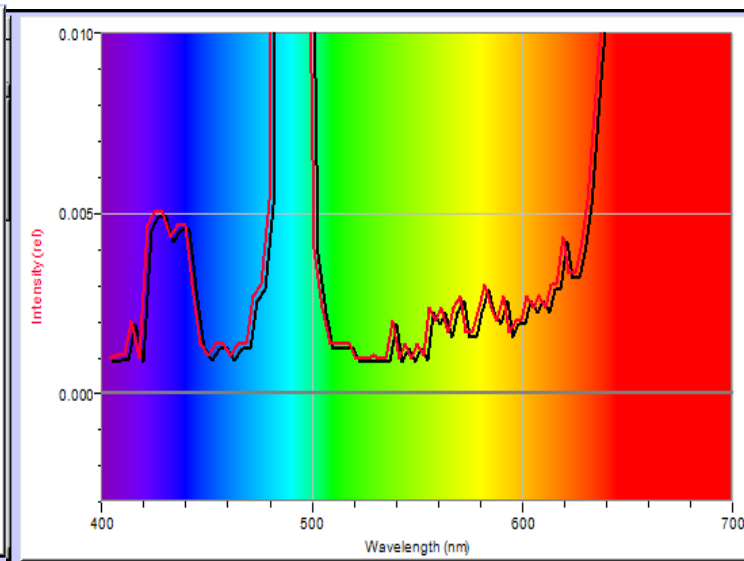
There was a lot of noise in our spectrum (see below) and the calculated wavelength is on the edge of the detection range, so I do not think the fifth Balmer line appears in the graph.
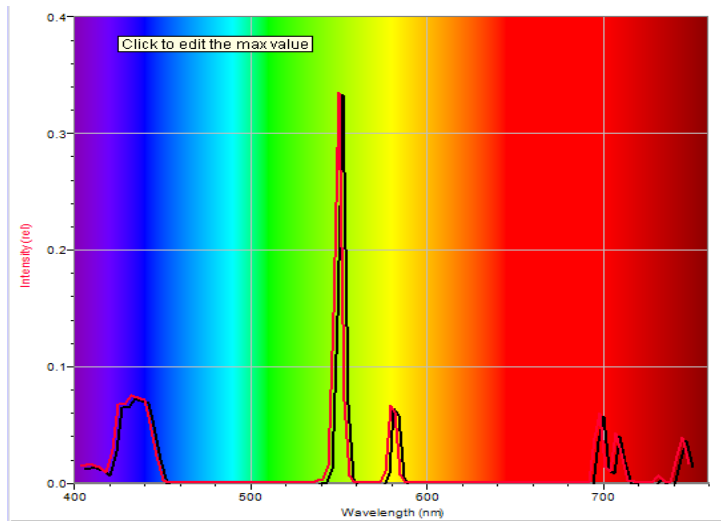
Hydrogen-alpha
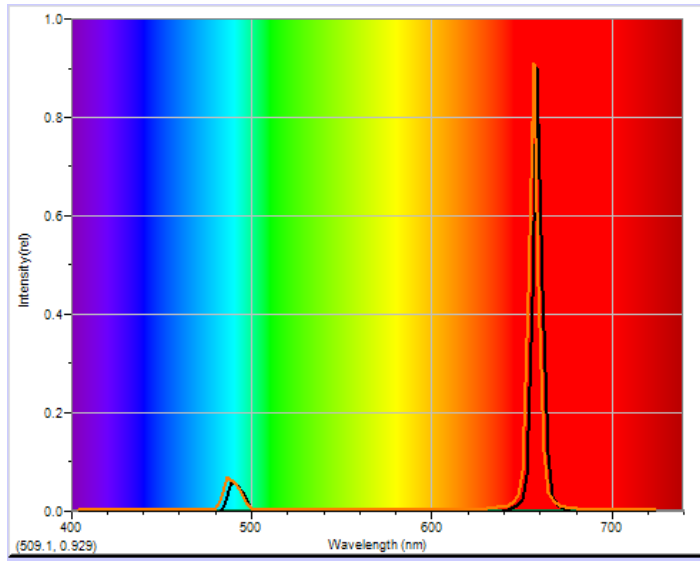
653.9 nm, 487.7 nm

Hydrogen-lower intensity

439.0 nm, 420.5 nm (estimates based on other lab groups—a lot of noise)
(435.03 nm) (417.48 nm) ← other groups numbers

Mercury calibration

549.6nm, 579.1 nm

Fluorescent light