

# Eksperimen Penentuan Konstanta Rydberg

# OBJECTIVES

In this experiment, you will:

- Measure and analyze the emission spectrum of a hydrogen gas discharge tube.
- Use the data from the hydrogen emission spectrum to calculate the Rydberg constant

## MATERIALS

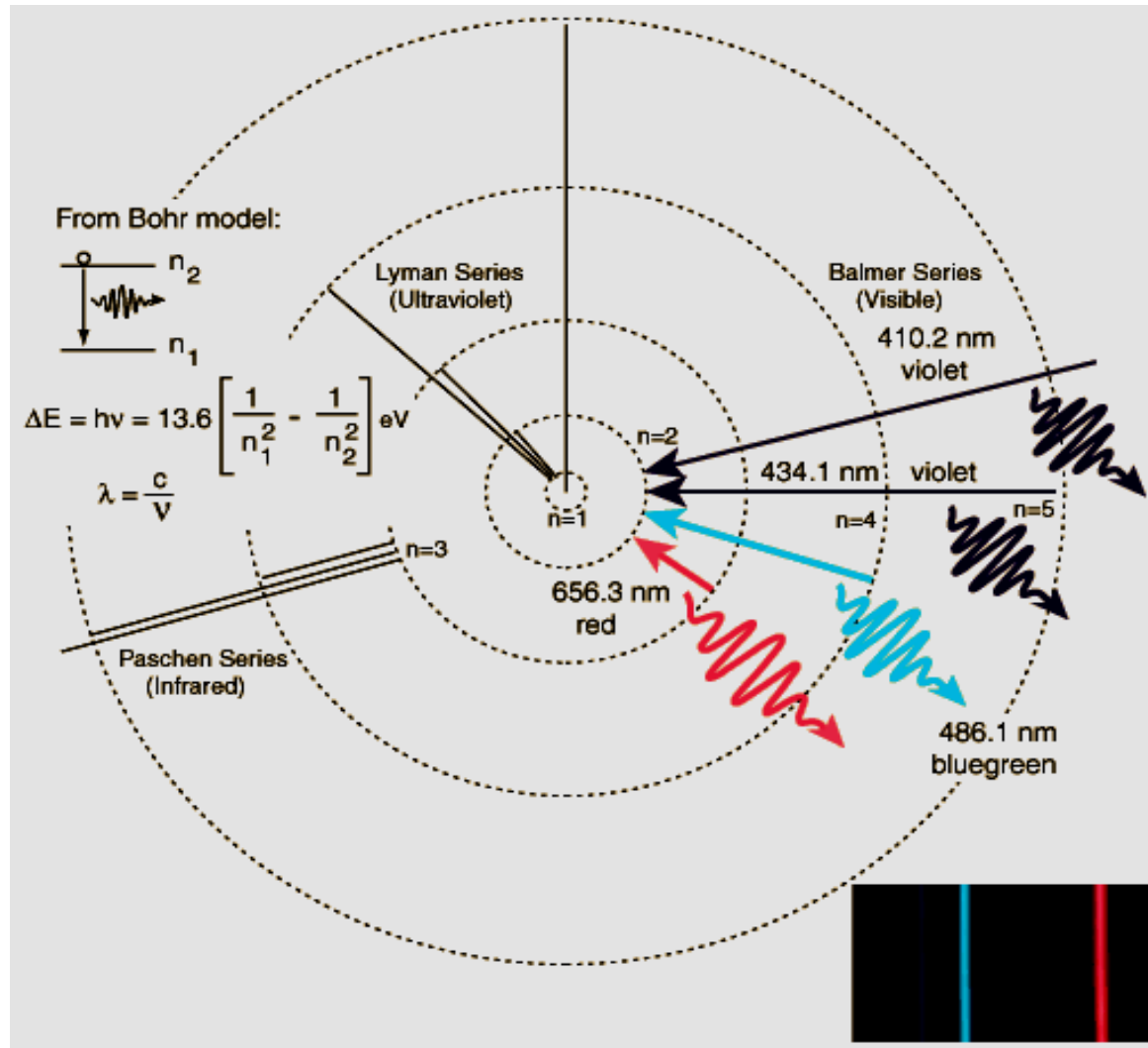
- Ocean Optics Spectrometer
- LabQuest or computer
- LabQuest App or Logger *Pro*
- Optical Fiber accessory
- hydrogen gas discharge tube and power supply

# Theory

Johannes Rydberg was a mathematics teacher like Balmer (he also taught a bit of physics). In 1890, Rydberg's research of spectroscopy (inspired, it is said, by the work of Dmitri Mendeleev) led to his discovery that Balmer's equation was a specific case of a more general principle. Rydberg substituted the wavenumber,  $1/\text{wavelength}$ , for wavelength and by applying appropriate constants he developed a variation of Balmer's equation. The Rydberg equation is shown below.

$$\frac{1}{\lambda} = R_H \left( \frac{1}{n_f^2} - \frac{1}{n_i^2} \right)$$

# Spektrum Atom Hidrogen



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