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## Chapter 6: The Bohr Atom

### Overview

We will be using a grating spectrometer to study the emission spectrum of Hydrogen and compare it to that predicted by the Bohr model.

### Suggested Reading Assignment

The section on the Bohr model of the hydrogen atom in your modern physics text.

E.g., Section 4-3 of Tipler and Llewellyn, 4<sup>th</sup> edition.

### Pre-lab Questions

1. What is the formula for the energy levels of the Hydrogen atom as proposed by Bohr? What is the origin of the quantum number  $n$  in the equation for the energy?
2. Explain the process of absorption and emission of radiation. What is the relationship between the wavelength, the initial quantum number, and the final quantum number of the electron? Look up the value of the Rydberg constant.
3. All of the possible electron transitions that end at the same quantum number are called a “series”. What are their names of the first four series for hydrogen, and their corresponding quantum numbers? Also look up in which part of the electromagnetic spectrum these lie (i.e., infrared, visible, etc.)
4. What do  $H_\alpha$ ,  $H_\beta$ ,  $H_\gamma$ , and  $H_\delta$  refer to? Compute the wavelength for each, using the “accepted value” of the Rydberg constant.