Topic-Level learning goals for *Emission & Absorption of Light*

UBC PHYS 250, *Introduction to Modern Physics*, Summer 2009

(updated July 30, 2009)

3. Electrons as waves and particles

a. emission and absorption of light by isolated atoms

- Explain how the discrete colors produced by neon signs, mercury and sodium street lights, and other discharge lamps rule out Rutherford's model of the atom as like a miniature solar system with electrons orbiting the nucleus.
- Relate the colors of light produced by a discharge lamp to energy levels of the electron in the atoms in the lamp.
- Be able to explain why such light sources are so much more efficient than incandescent light bulbs.
- List the basic assumptions of the Bohr model of the atom and explain how those assumptions are consistent with the light emitted by a hydrogen discharge lamp.
- Be able to provide a basic design for a gas laser, giving the basic components and qualitative requirements for it to operate.