

Basic Transitions for Hydrogen in the Bohr Model, Astro 107

This is a study sheet for all the Bohr model electron transitions you need to learn. See Fig 2-12. For an atom which absorbs a photon, the arrow goes AWAY from the nucleus, because the electron is going *up* in energy level, and up in energy means farther from the nucleus. (It's an oversimplification, but it explains well what we see.) Conversely, for emission, the arrow goes TOWARD the nucleus because lower energy levels are closer to the nucleus. If the lower level of the transition is $n = 1$, it's a Lyman (Ly) transition; if it's $n = 2$, it's a Balmer (or "H") transition. If the level change is 1, it's an α , 2 is β , and 3 is γ . Note that for clarity, the levels are presented equally spaced. In reality, the energy differences get smaller the farther the electron is from the ground state ($n = 1$).

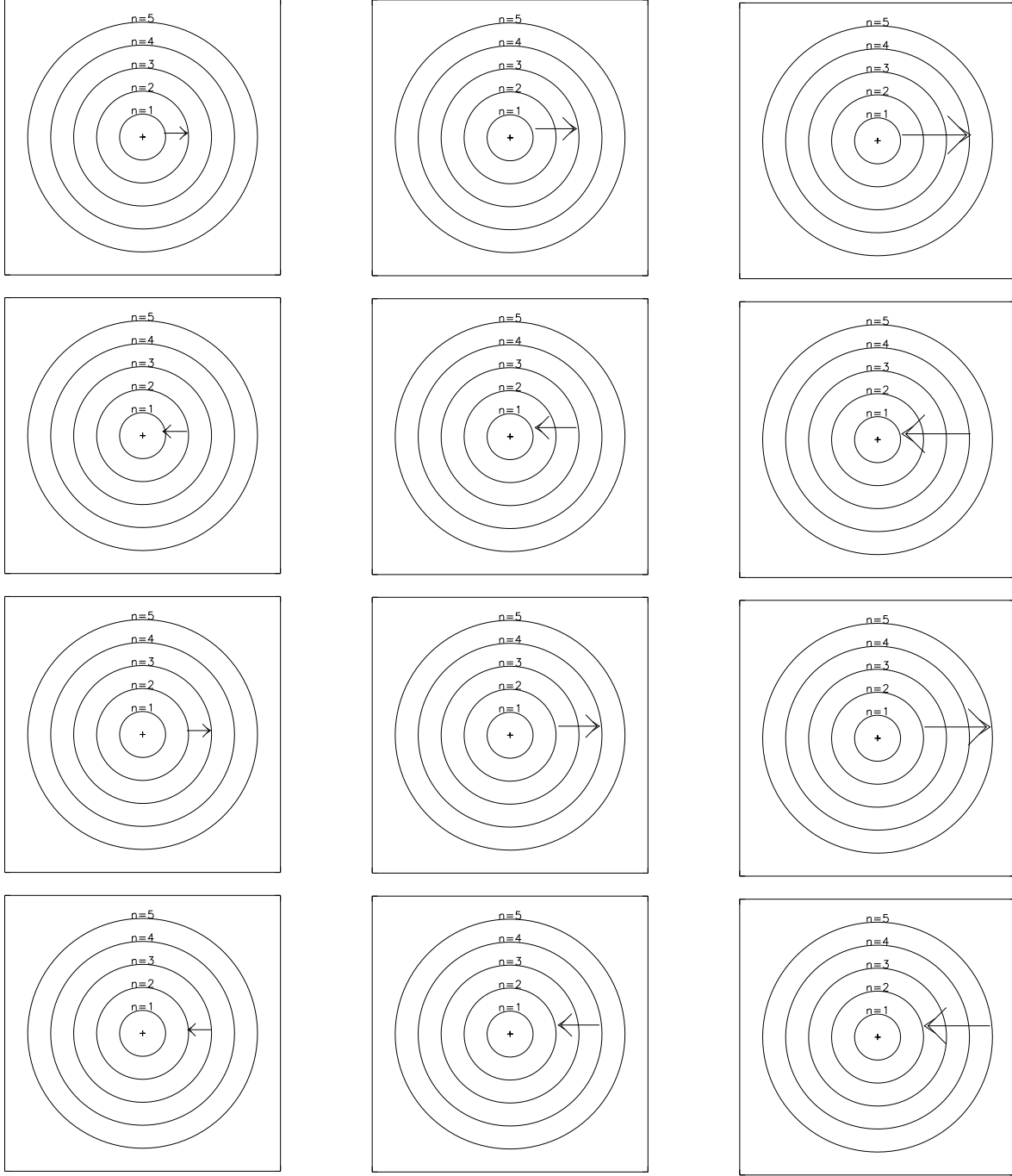


Figure 1: *Top row, left to right: $\text{Ly}\alpha$, $\text{Ly}\beta$, $\text{Ly}\gamma$ absorption. Second row, left to right: $\text{Ly}\alpha$, $\text{Ly}\beta$, $\text{Ly}\gamma$ emission. Third row, left to right: $\text{H}\alpha$, $\text{H}\beta$, $\text{H}\gamma$ absorption. Fourth row, left to right: $\text{H}\alpha$, $\text{H}\beta$, $\text{H}\gamma$ emission.*