## exp_hubble_linearNote guide for Expanding Space

**Olber’s Paradox**

Were the universe infinite in age and size…

**Red Shift of the “spiral nebulae” -**

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| Approximate Redshift Δλ = Amount the wavelength shifts (longer)λ = Original wavelengthv = Recession velocityc = 3.00x108 m/s(The real formula – not in data packet)λ’ = Red shifted wavelengthλ = Original wavelength | **Example:** What is the change in wavelength of the 656 nm line of a galaxy receding at 20,000 km/s? What is the new wavelength?  |
| Hubble’s law H = Hubble’s constant (71 ± 2 km/s/Mpc)d = Distance to object in Mega parsecs.v = Recession velocityCalculates the rate an object recedes from us due to the expansion of the Universe based on its distance from us | **Example:** What is the distance to a galaxy that has a 480 nm line that comes in at 497 nm?  |
| **Example:** Estimate the age of the universe from the a Hubble constant of 71 km/s/MPc (1 ly = 9.46x1012 km, 1 parsec = 3.26 ly, 1 yr = 3.15x107 s) |