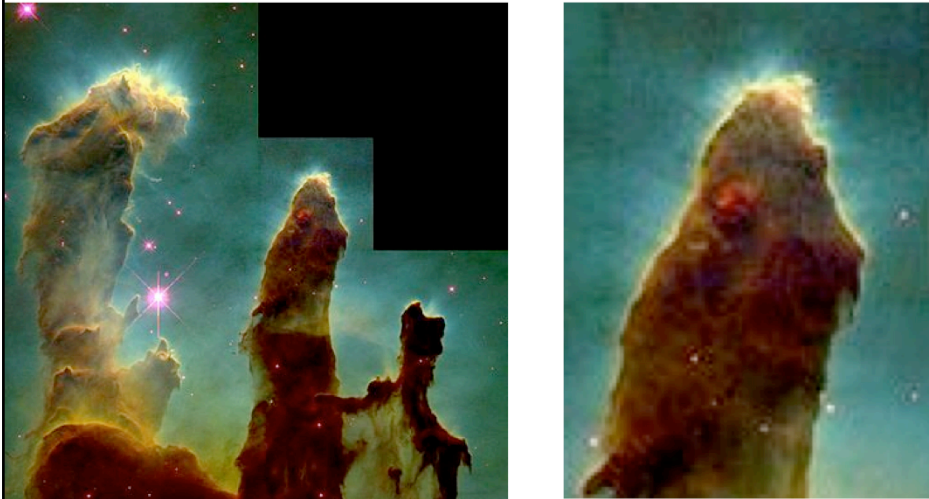


Strömgren length



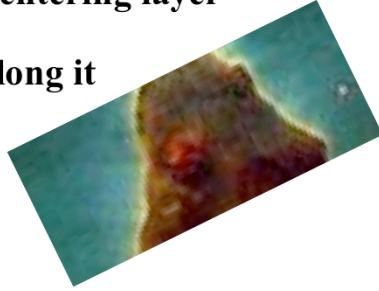
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Strömgren length

- ◆ Number of ionizing photons entering layer is balance by number of recombinations along it

$$\varphi(H) = n_e n_p \alpha L$$

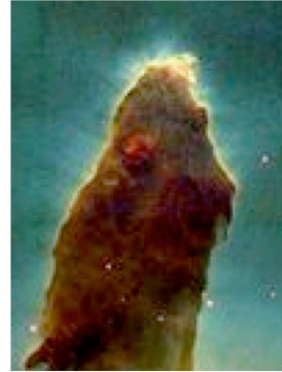
$$L \propto \frac{\varphi(H)}{n_e n_p \alpha}$$



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Beyond the H⁺ layer

- ◆ Little H⁺ ionizing radiation gets past the H⁺ layer
- ◆ Deeper regions are atomic or molecular
- ◆ Also cold and produce little visible light
- ◆ Large extinction due to dust



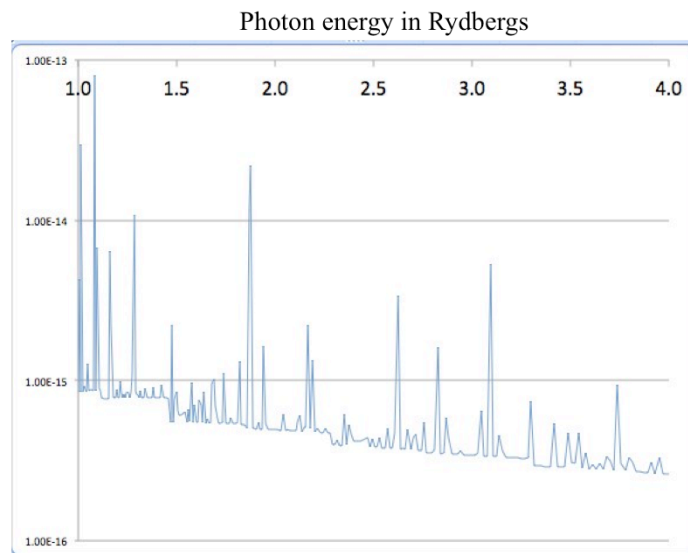
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Helium AGN3 sec 2.3 & 2.4

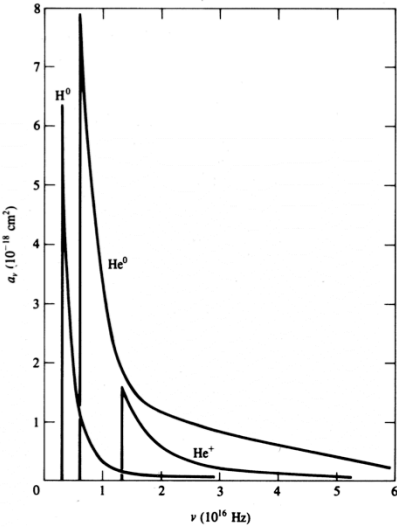
- ◆ **Second most abundant element**
 - Important but not as dominant as H
- ◆ **Three stages may be present, He^0 , He^+ , He^{++}**
- ◆ **He II recombination lines can photoionize H^0 and He^0**
- ◆ **He I recombination lines can photoionize H**

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He emission lines



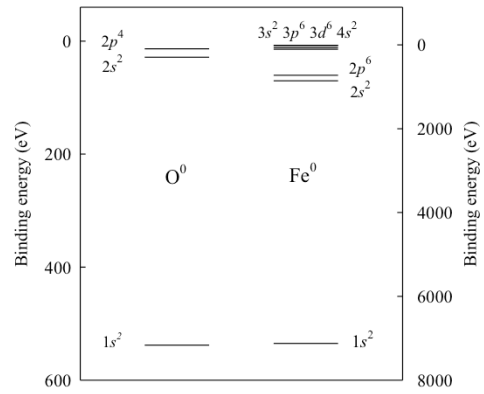
Photoionization cross sections



AGN3 Fig 2.2

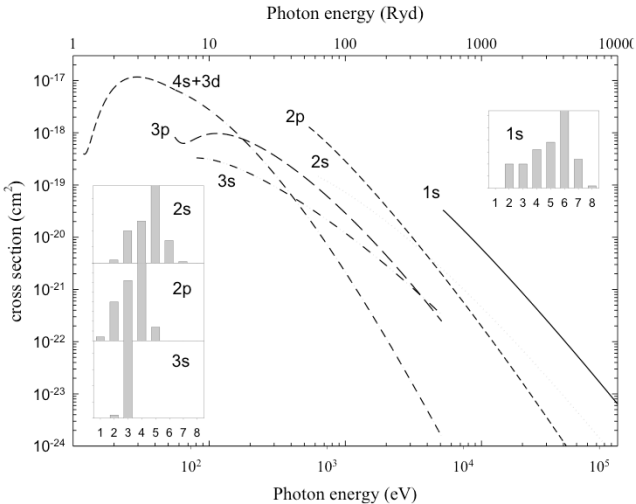
Heavy elements

- ◆ Inner shell processes & Auger effect
- ◆ AGN3 Sec 11.2, Appendix



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Cross sections & Auger yield



AGN3 Fig 11.2

Results ..

◆ AGN3 Fig 2.3

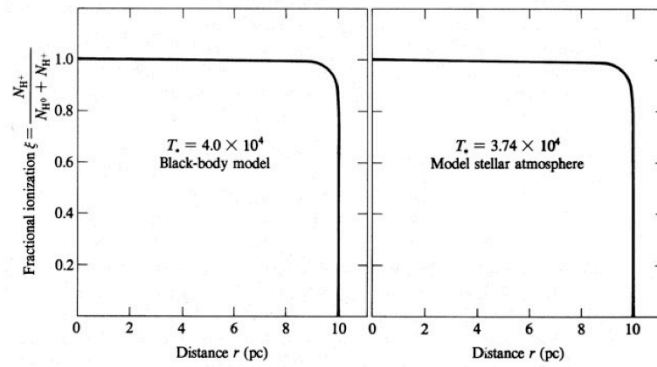


FIGURE 2.3 Ionization structure of two homogeneous pure-H model H II regions.

Results ..

◆ AGN3 Fig 2.3

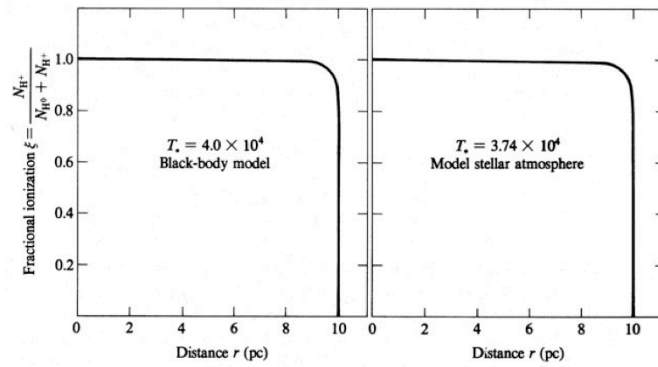


FIGURE 2.3 Ionization structure of two homogeneous pure-H model H II regions.

Effects of stellar temperature

AGN3 Fig 2.4

