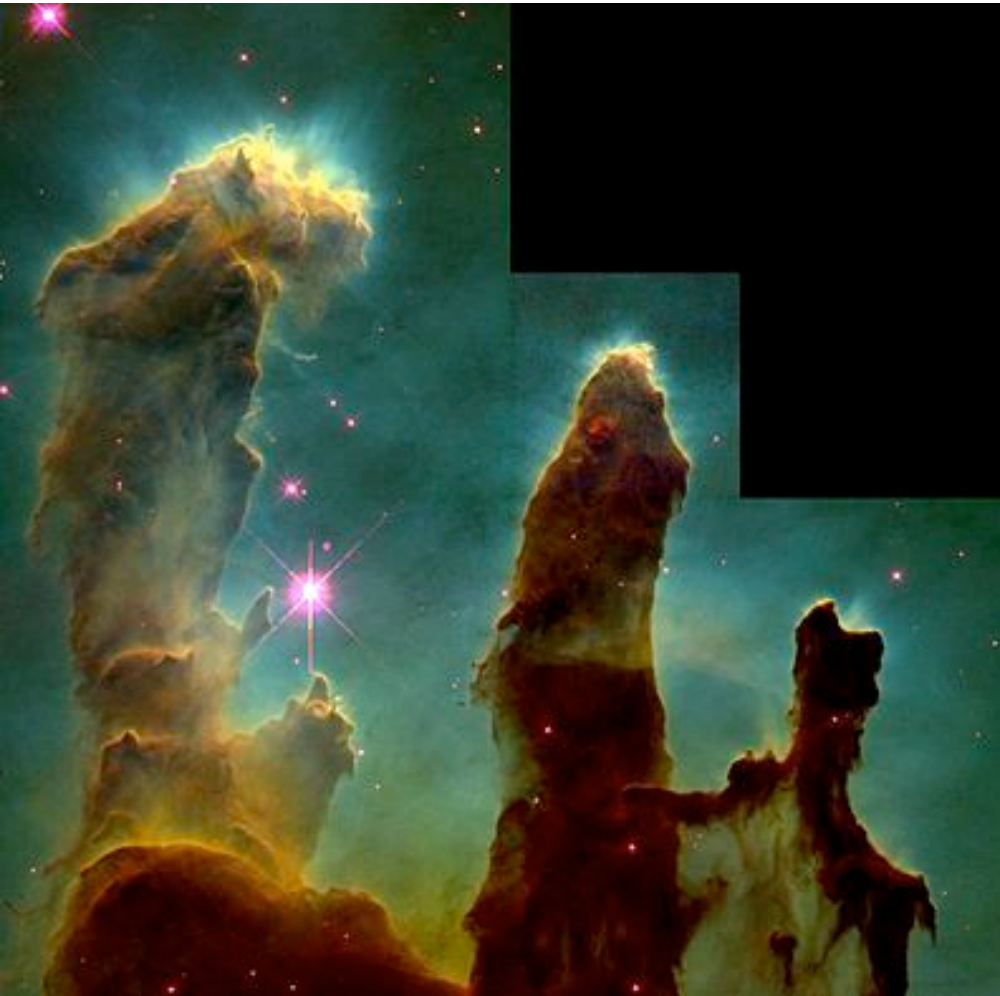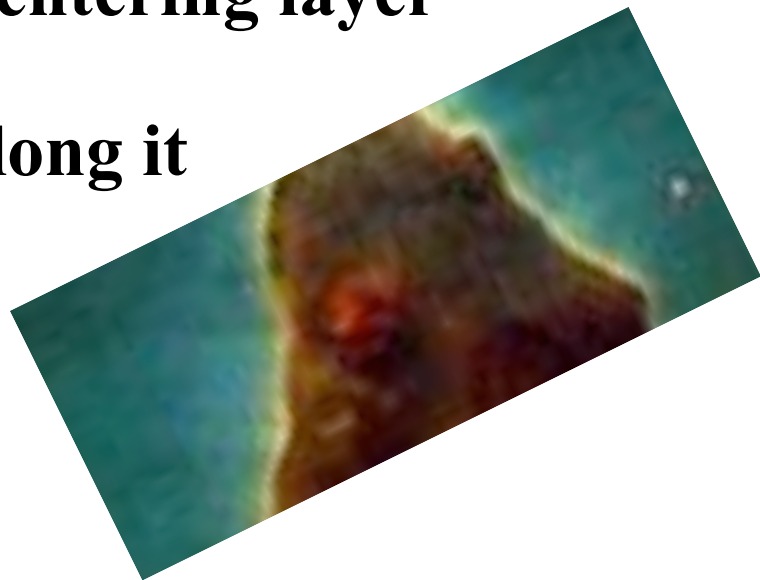# Strömgren length

2014 Cloudy workshop

Strömgren length

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

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

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

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**

2014 Cloudy workshop
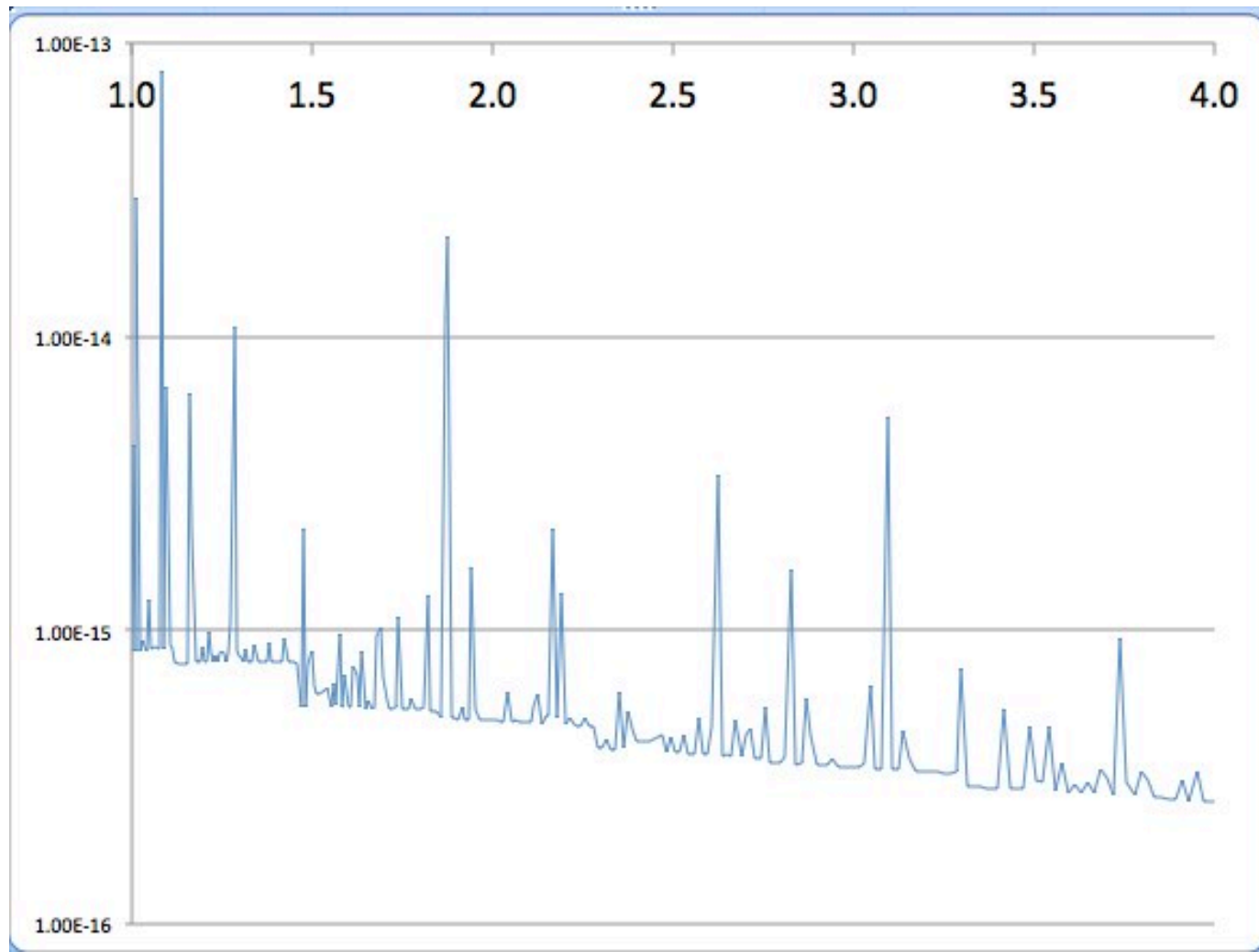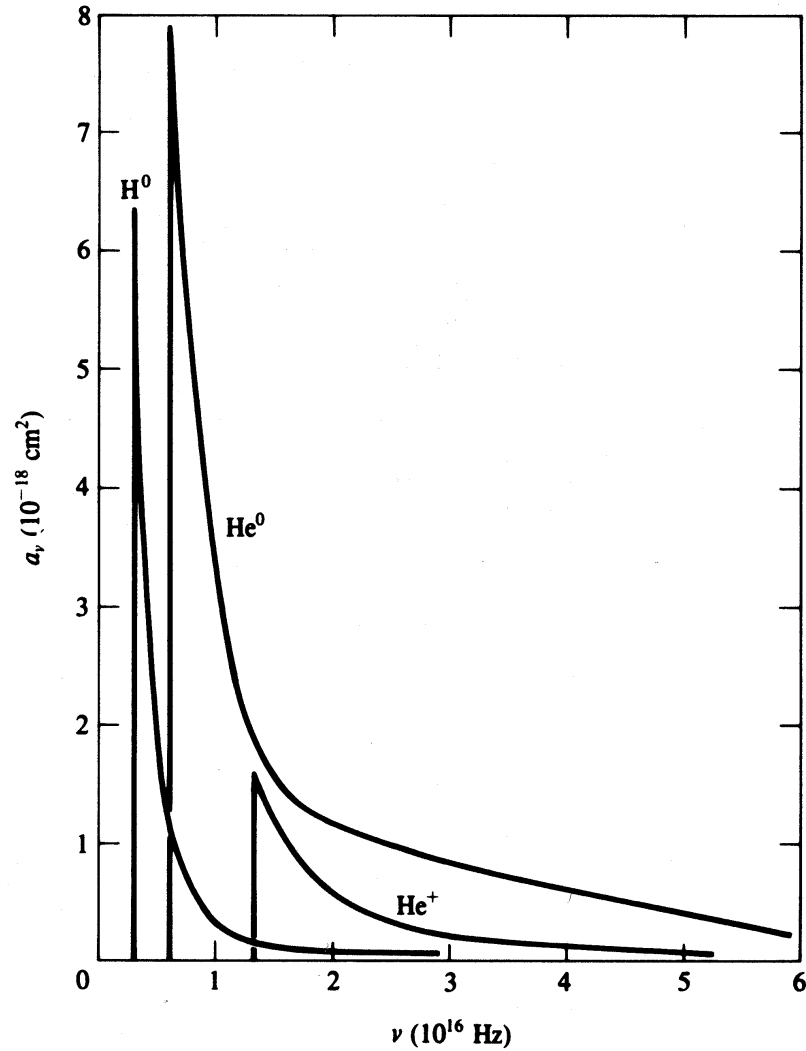
Helium AGN3 sec 2.3 & 2.4

- **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**

He emission lines
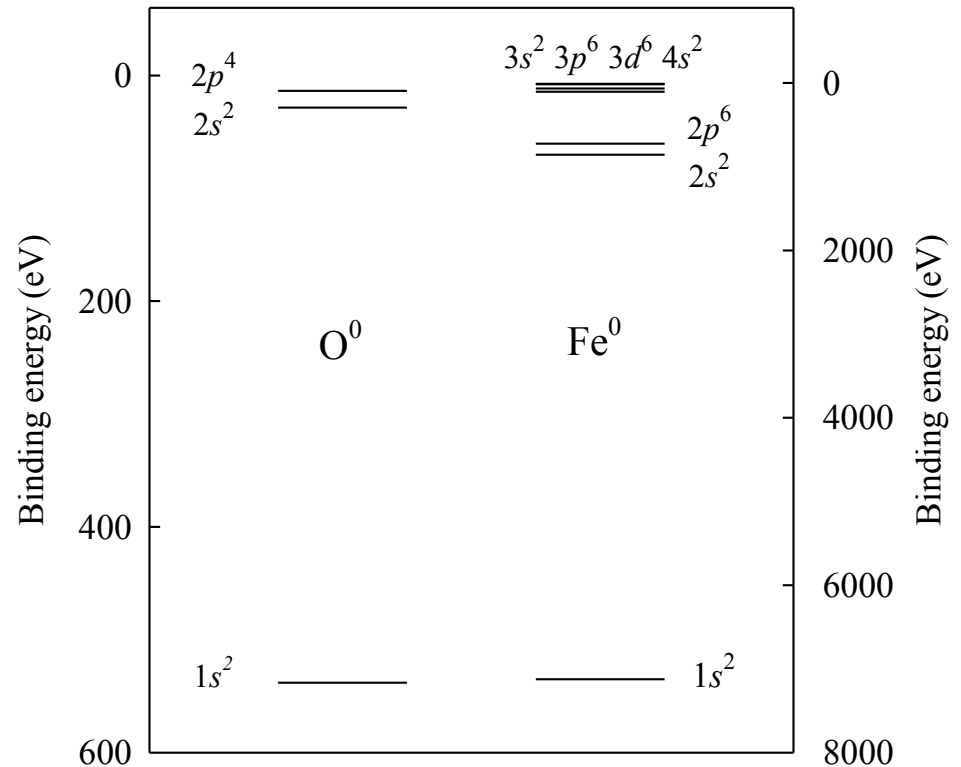
Photon energy in Rydbergs
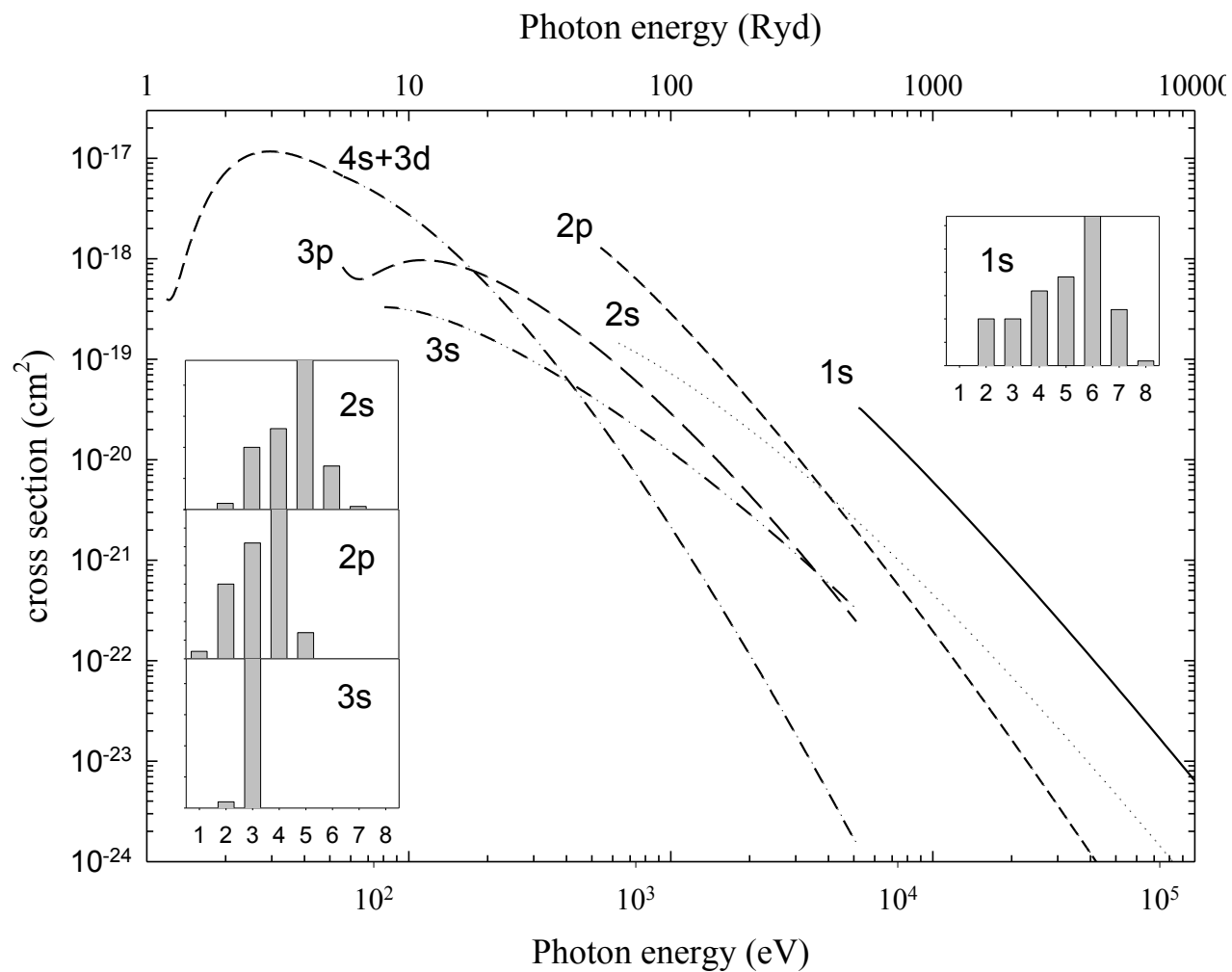
Photoionization cross sections

AGN3 Fig 2.2

Heavy elements

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

Cross sections & Auger yield

AGN3 Fig 11.2

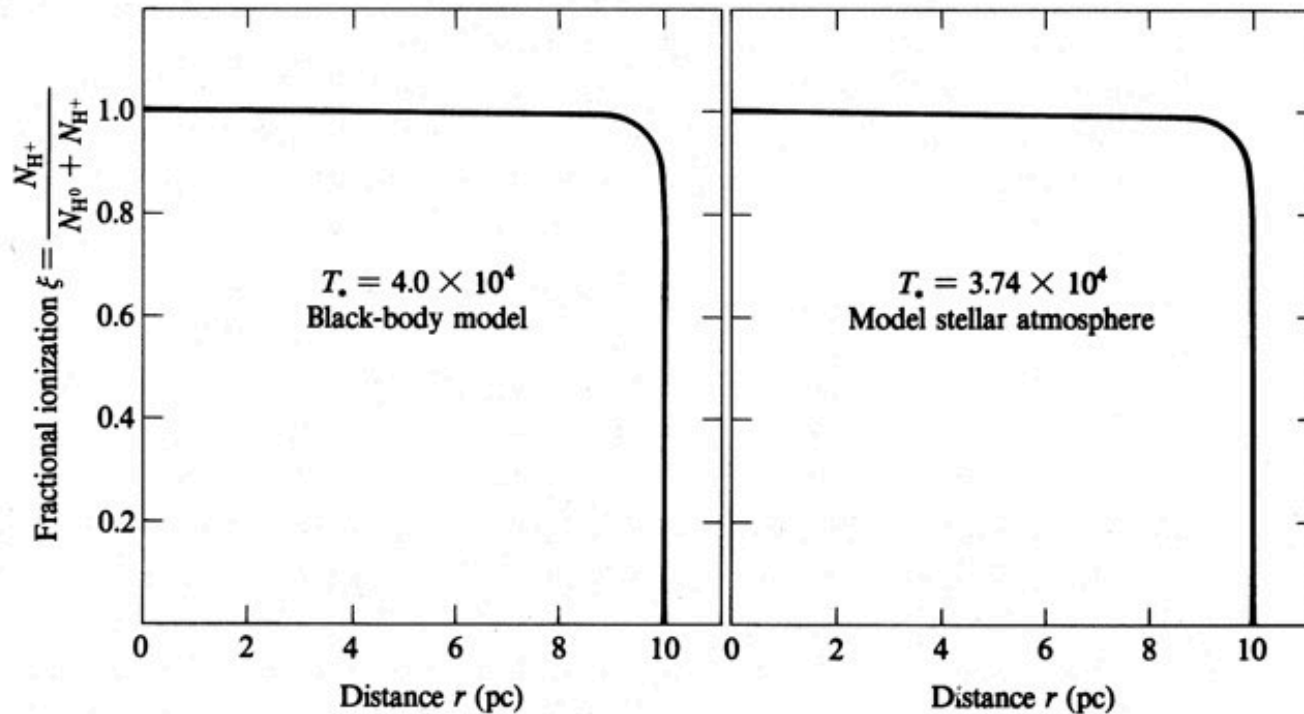# Results ..

◆ **AGN3 Fig 2.3**

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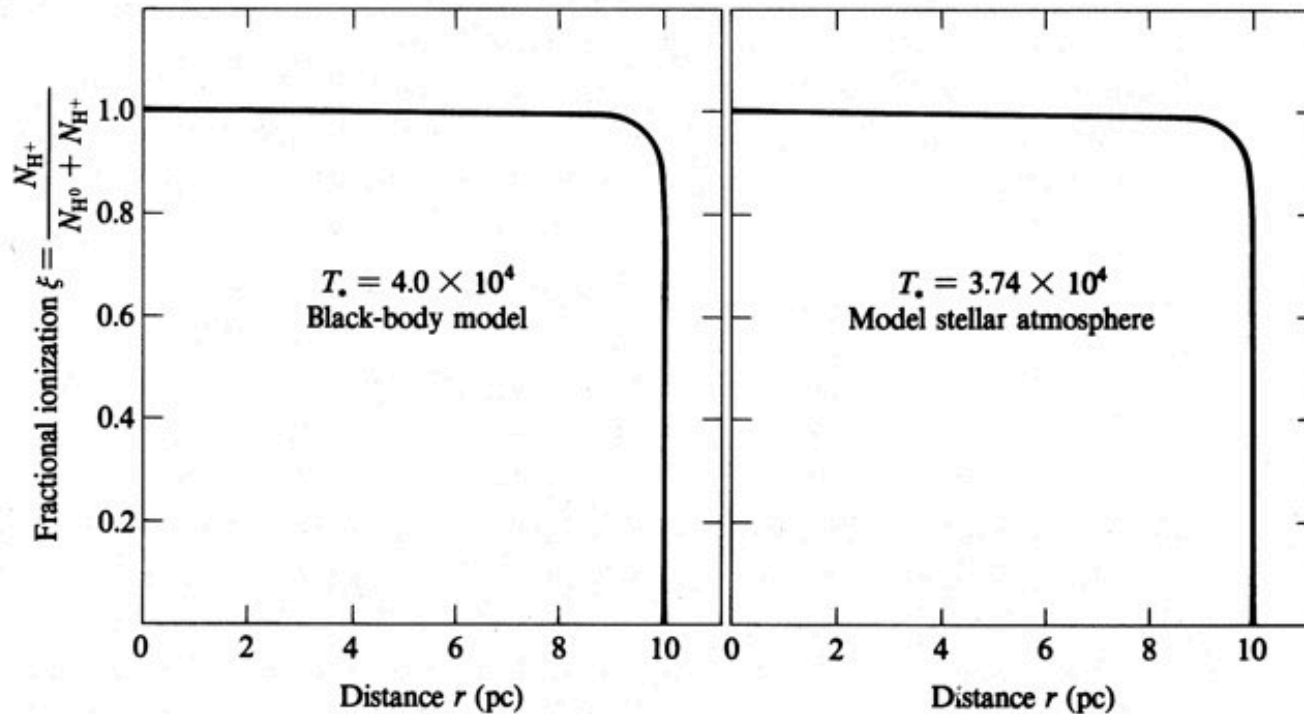
Results ..

◆ **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