ZAH - Astronomisches Rechen-Institut
Galactic and Extragalactic Astronomy (MVAstro3) - Winter semester 2021
Hitesh Lala `Hitesh.Lala@uni-heidelberg.de`

Exercise Sheet #11

Submit by Wednesday 31-03-2021

Exercise 1. - Active galaxies

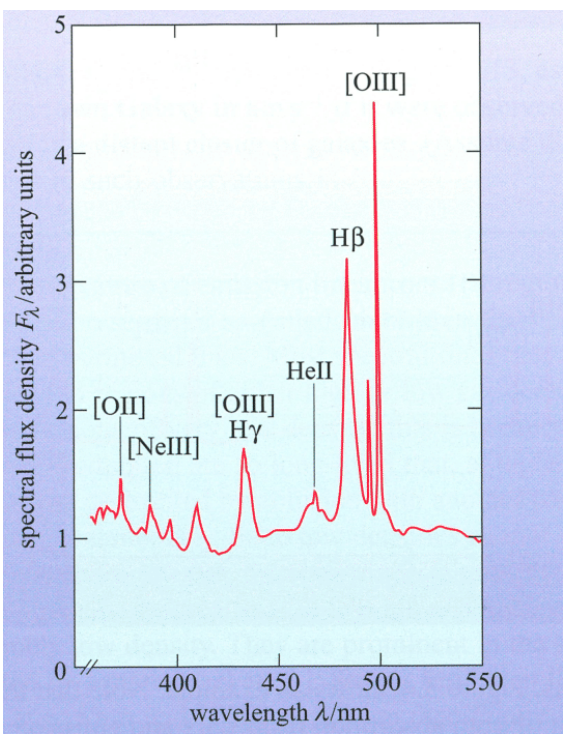

Figure 1: Schematic spectrum of an active galaxy. From Jones & Lambourne (2004)

(a) From what you have learned in the lecture, what can be the nature of the strong and broad emission lines that you can see in Fig. 1? (10 points)

(b) Make an estimate of the wavelength and the width of the Hβ line (at half the height of the peak above the background) and calculate the velocity dispersion of the gas from which it was emitted. (10 points)

(c) Estimate the temperature of the gas assuming that the broadening is given only by thermal Doppler broadening. Is your result realistic? (15 points)

Exercise 2. - Seyfert galaxies

(a) As which Seyfert types would you classify the spectra shown in Fig. 2 Why? (10 points)

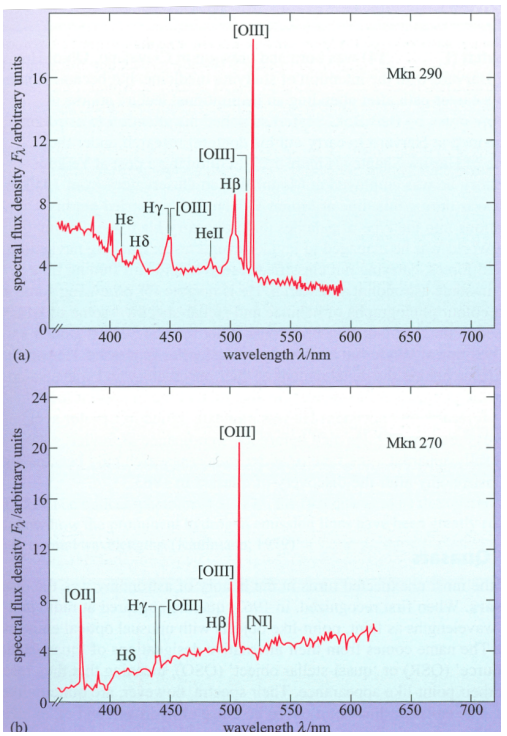

Figure 2: Spectra of two Seyfert galaxies. From Jones & Lambourne (2004)