# 4. Naloga: Spektroskopija

1. Obdelaj vse spektre, kalibriraj fluks in premakni spektre v heliocentrični hitrostni sistem.

2. Identificiraj nekaj najmočnejših spektralnih črt različnih elementov, tudi takšnih, ki niso narisani na spodnji sliki. V pomoč ti je lahko `https://physics.nist.gov/PhysRefData/ASD/lines_form.html`.

3. Oceni spektralno ločljivost spektrov.

4. Iz spektrov oceni spektralni tip zvezd, vključno s klasifikacijo pritlikavk in orjakinj. Za začetek ti je lahko v pomoč spodnja slika. Za bolj natančno analizo pa primerjaj svoje spektre s tistimi v zbirki `http://miles.iac.es//pages/stellar-libraries/the-catalogue.php`. Komentiraj razlike med spektri različnih temperatur in ugotovi, kako ločiš med orjakinjami in pritlikavkami.
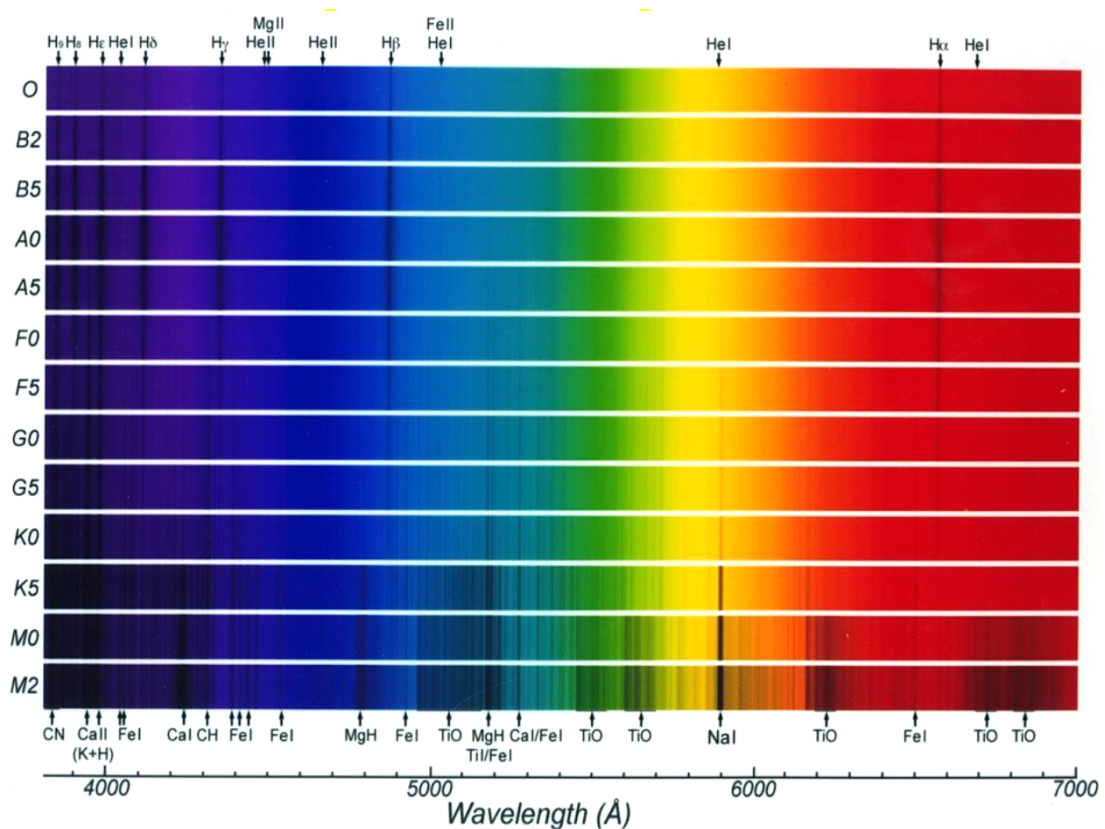
5. Izmeri efektivno temperaturo zvezd tako, da na spekter fitaš Planckov zakon. Primerjaj tako dobljene temperature s tistimi, ki so tipične za spektralne tipe zvezd iz prejšnje točke. Preveri veljavnost Wienovega zakona, ki pravi, da je produkt temperature in valovne dolžine pri maksimumu fluksa konstanta. Zakaj Wienov zakon ne drži?

4. Homework: Spectroscopy

1. Reduce all spectra, calibrate their flux and correct the velocity scale for the heliocentric velocity.

2. Identify some strong spectral lines of different elements, including some not marked in the image below. You can utilize the list at `https://physics.nist.gov/PhysRefData/ASD/lines_form.html`.

3. Estimate the spectral resolution of your spectra.

4. From the obtained spectra determine the spectral types of the stars, including the dwarf/giant category. In the beginning you can compare them with the image below. For a more accurate analisis, compare your spectra with those collected here: `http://miles.iac.es//pages/stellar-libraries/the-catalogue.php`. Discuss the differences between spectra of different temperatures and figure out how to tell giants from the dwarfs.
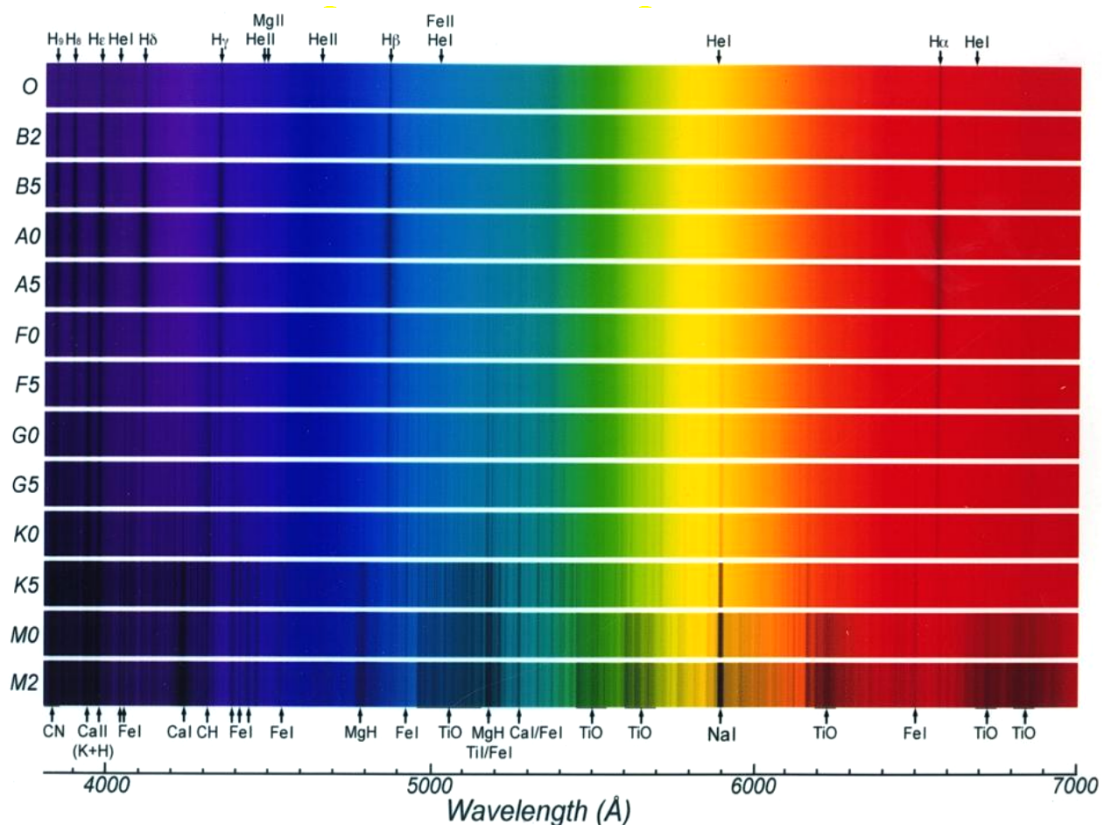
5. Measure the effective temperature of the stars by fitting a Planck function to your spectra. Compare the temperature with the one typical for it's spectral class. Check whether the Wien law holds. Wien law says that the product of effective temperature and the wavelength of the maximum flux is a constant. Why does it not hold?