ETH
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Observational Techniques in Astrophysics
Exercise 1
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If you are taking Adam's class…

* Do NOT set ur_setup as default

```
ur_setup(){
    eval'path-to-home-directory/.ureka/ur_setup -sh $*' &> /dev/null
}
ur_forget(){
    eval'path-to-home-directory/.ureka/ur_forget -sh $*' &> /dev/null
}
ur_setup &> /dev/null
```

* Install python from MacPorts following Adam's notes

Problem 1 : Conversion Vega - AB magnitude

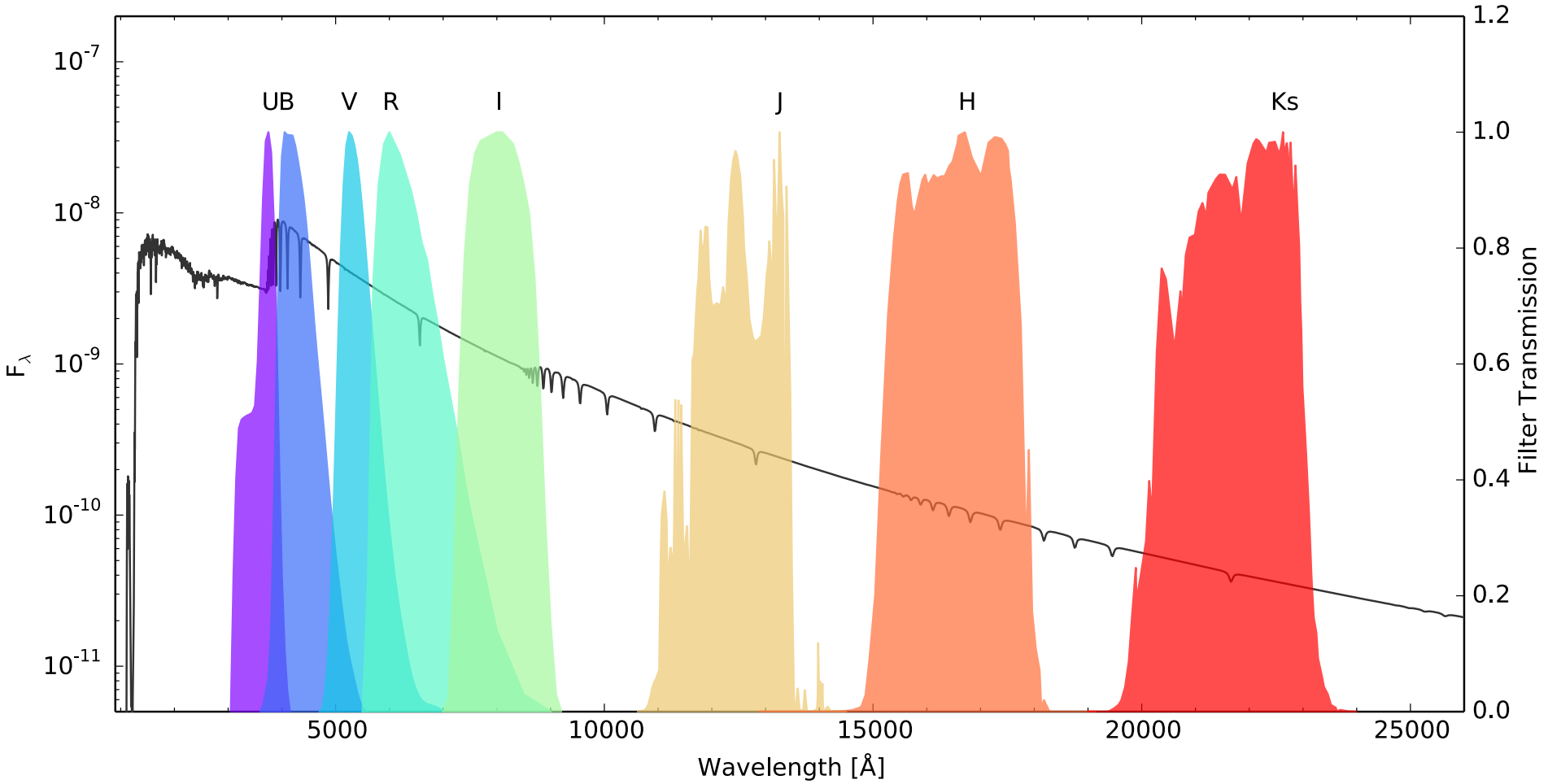
$$m_{\rm Vega} = -2.5 \log \frac{\int d\nu \, f_\nu R_\nu/\nu}{\int d\nu \, f_\nu^{\rm Vega} R_\nu/\nu}$$

$$m_{\rm AB} = -2.5 \log \frac{\int d\nu \, f_\nu R_\nu/\nu}{\int d\nu \, R_\nu/\nu} - 48.6$$

* Zeropoint AB magnitude: $f_\nu = 3.63 \times 10^{-20}$ erg s^{-1} cm^{-2} Hz^{-1}

* AB magnitude of Vega in V-band = 0

Problem 1 : Conversion Vega - AB magnitude



Problem 2 : Stellar mass function

$$\Phi(M)\,dM = e^{-M/M^*}\left[\phi_1^*\left(\frac{M}{M^*}\right)^{\alpha_1} + \phi_2^*\left(\frac{M}{M^*}\right)^{\alpha_2}\right]\frac{dM}{M^*}$$

* Local stellar mass function from Baldry et al. (2012)
* data are binned in log scale → dM = log(10) * M
* `from scipy.optimize import curve_fit`