ASTR 792
T/R 9:30 - 10:45 AM
Due November 28

Week #15

Draine 14.2a

The Einstein A coefficients for all of the allowed transitions of hydrogen from levels $n \leq 3$ are given in the table below:

u	l	A_{ul} (s^{-1})	λ_{ul} (Å)
$3d$	$2p$	6.465×10^{7}	Hα
$3p$	$2s$	2.245×10^{7}	Hα
$3s$	$2p$	6.313×10^{6}	Hα
$3p$	$1s$	1.672×10^{8}	Ly α
$2p$	$1s$	6.265×10^{8}	Ly β

(a) Consider a hydrogen atom in the $3p$ state as the result of radiative recombination: $p + e \longrightarrow \mathrm{H}(3p)$. What is the probability p_β that this atom will emit a Lyman β photon?