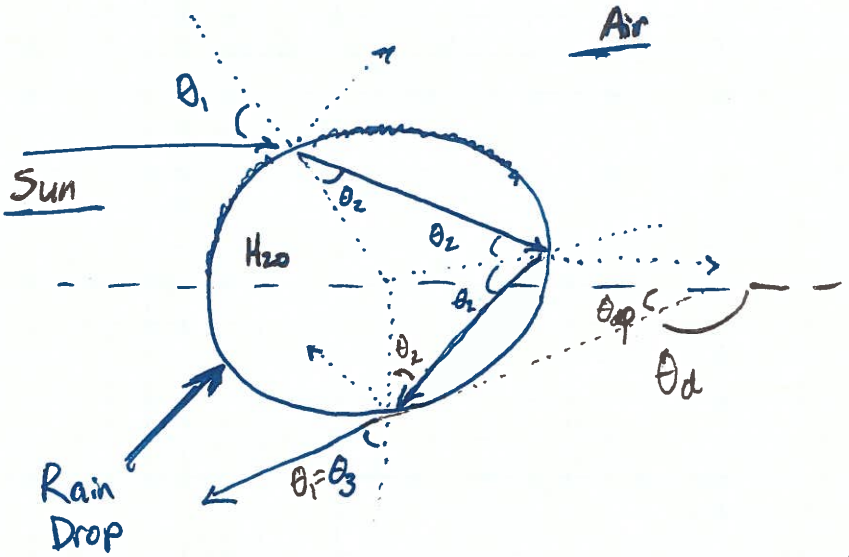
Lecture 31

$n_{air} = 1$, $n_{H_2O} = 1.33$, $n = c/v_p$



$\theta_d = 180° + 2\theta_1 - 4\theta_2$

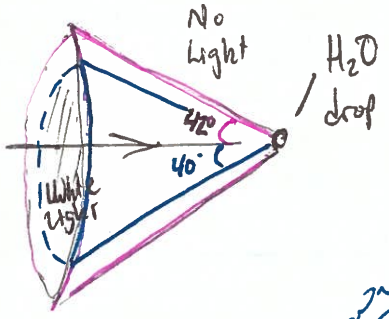
$\theta_2 = \sin^{-1}\left(\frac{n_1}{n_2}\sin\theta_1\right)$

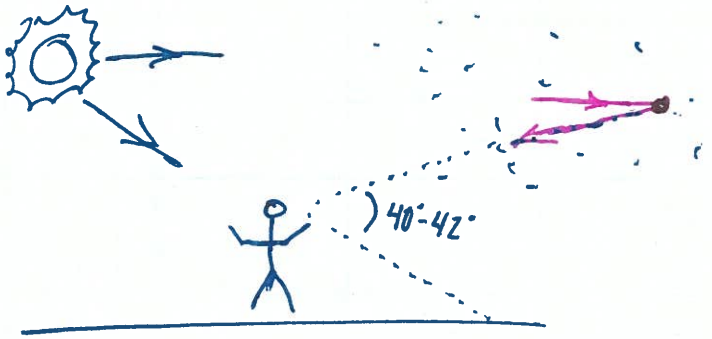
$1 < n(\lambda_{red}) < n(\lambda_{blue})$

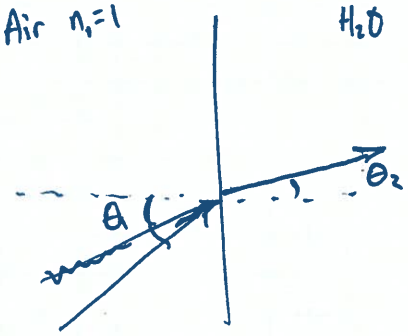
at red θ_d is smallest and θ_φ is largest

($n_{red,H_2O} = 1.331$, $n_{blue,H_2O} = 1.343$)

$\varphi_{max} = 42.4°$ RED, $\varphi_{max} = 40.7°$ BLUE







$n_1 \sin\theta = n_2 \sin\theta_2$

$\theta_2 = \sin^{-1}\left(\frac{n_1}{n_2}\sin\theta_1\right)$

Note, $\theta_2 < \theta_1$ because $n_1 < n_2$

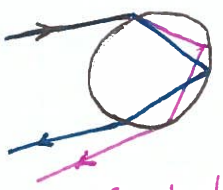
$v_p = \omega/k$

$k = \frac{2\pi}{\lambda}$

$\omega = 2\pi f$

$v_p = \frac{2\pi f}{2\pi/\lambda} = f\lambda$

$v = \frac{c}{\sqrt{\varepsilon\mu}}$



So why do we see red on top?