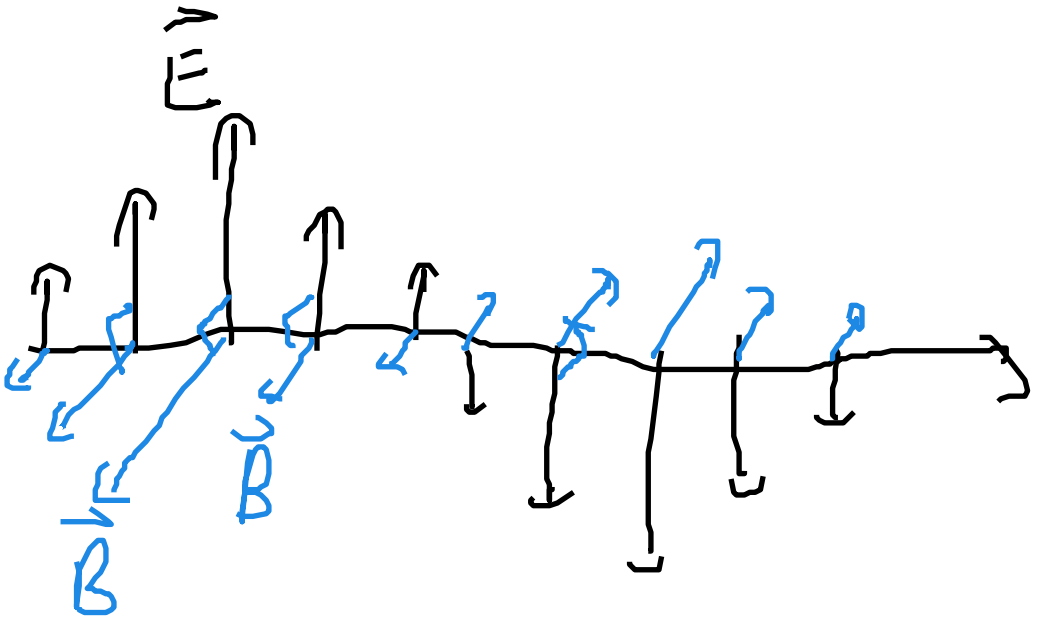
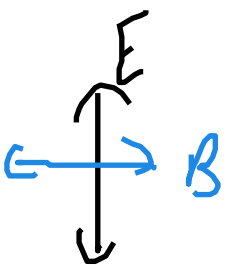
Light is a transverse electromagnetic wave

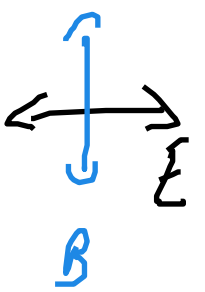


Direction of $\vec{E}$ defines the polarization of the light

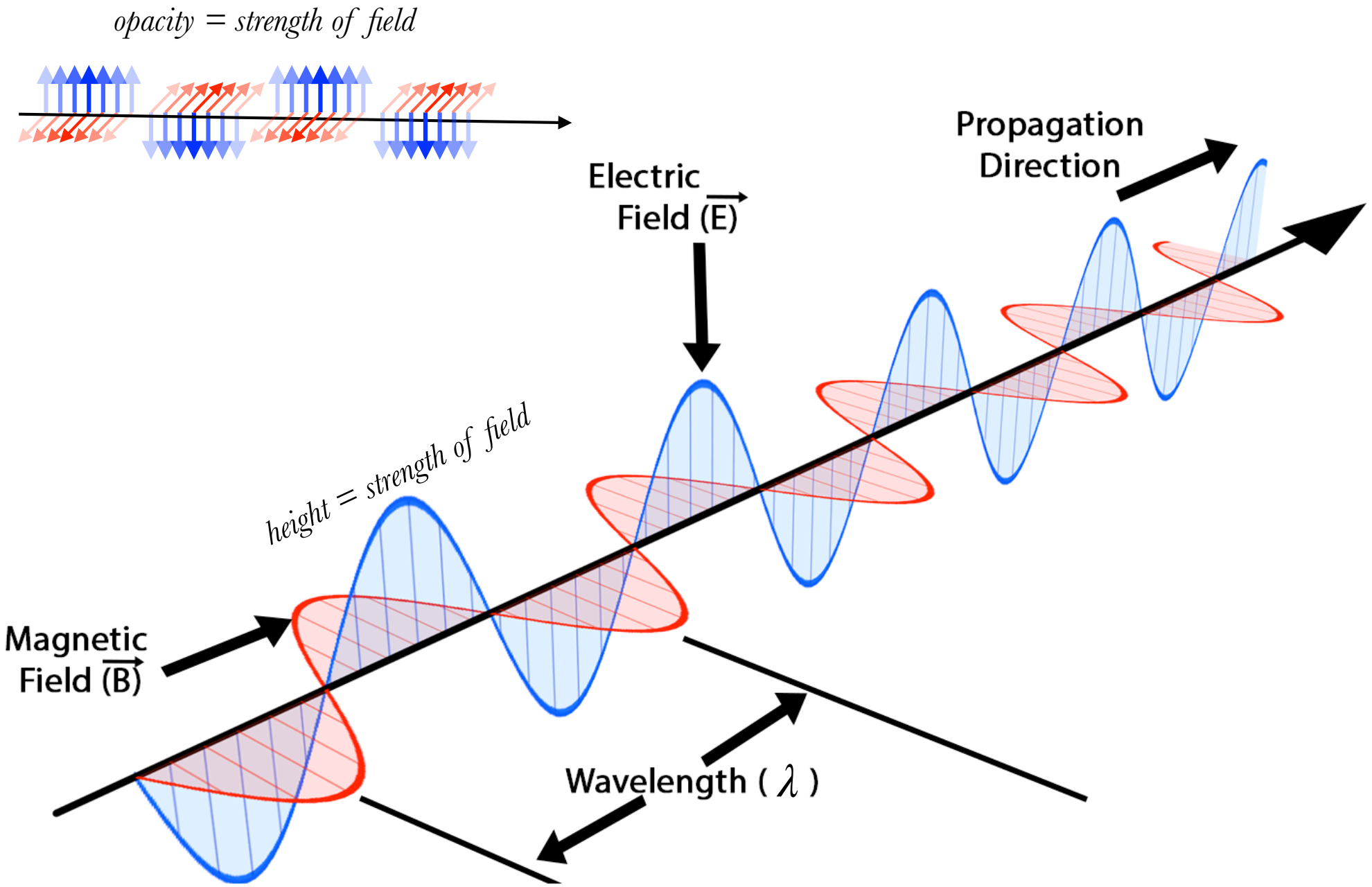
Vertically polarized



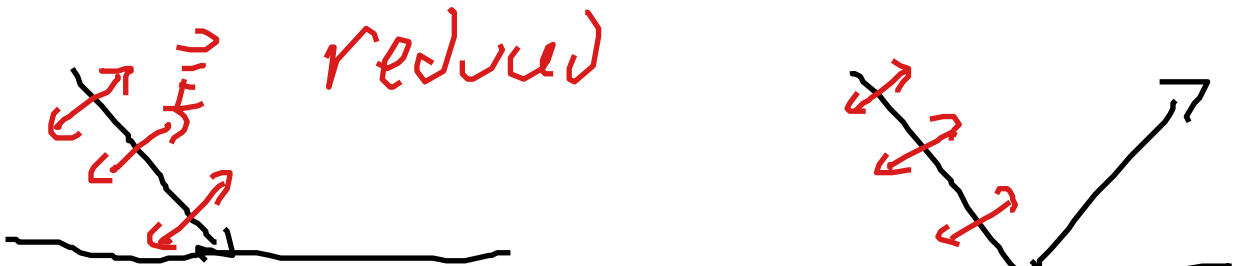
horizontally polarized



Electromagnetic Wave

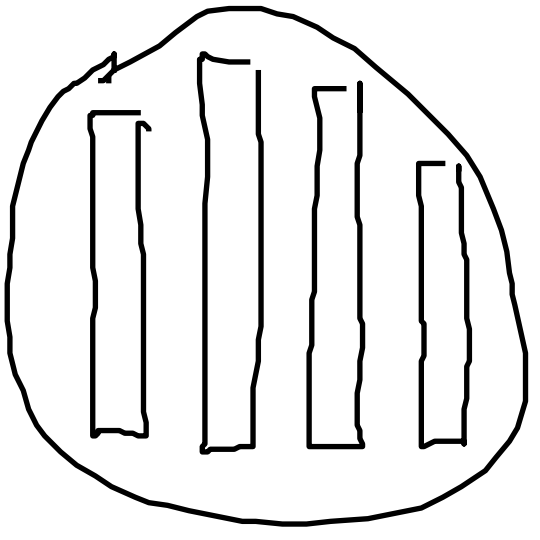


Reflected light is partially polarized



Sky is partially polarized

Polarizers



plastic/glass with parallel grooves etched into it

allows vertical light

partially blocks horizontal light

Crossed polarizers may block some or all light.

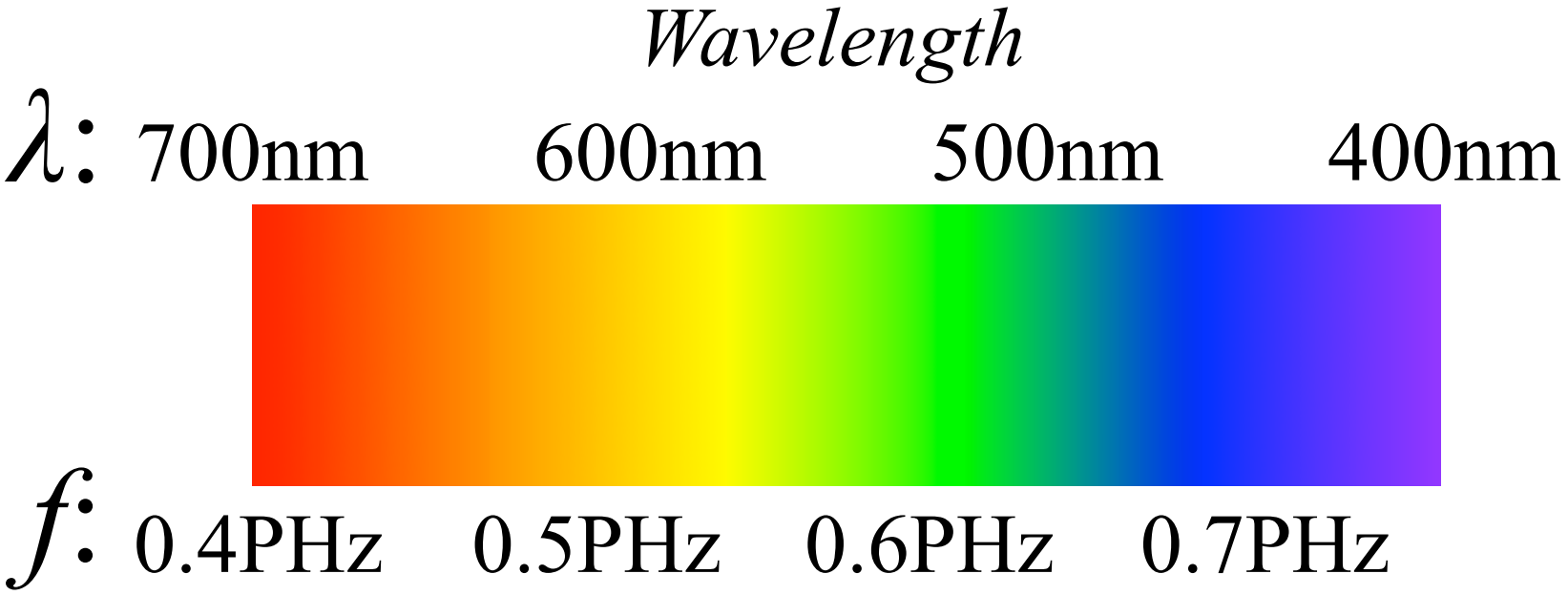
Not all "light" is visible

- wavelength sets the scale of interaction
- frequency generally measures "color" of light

$$c = \lambda f$$

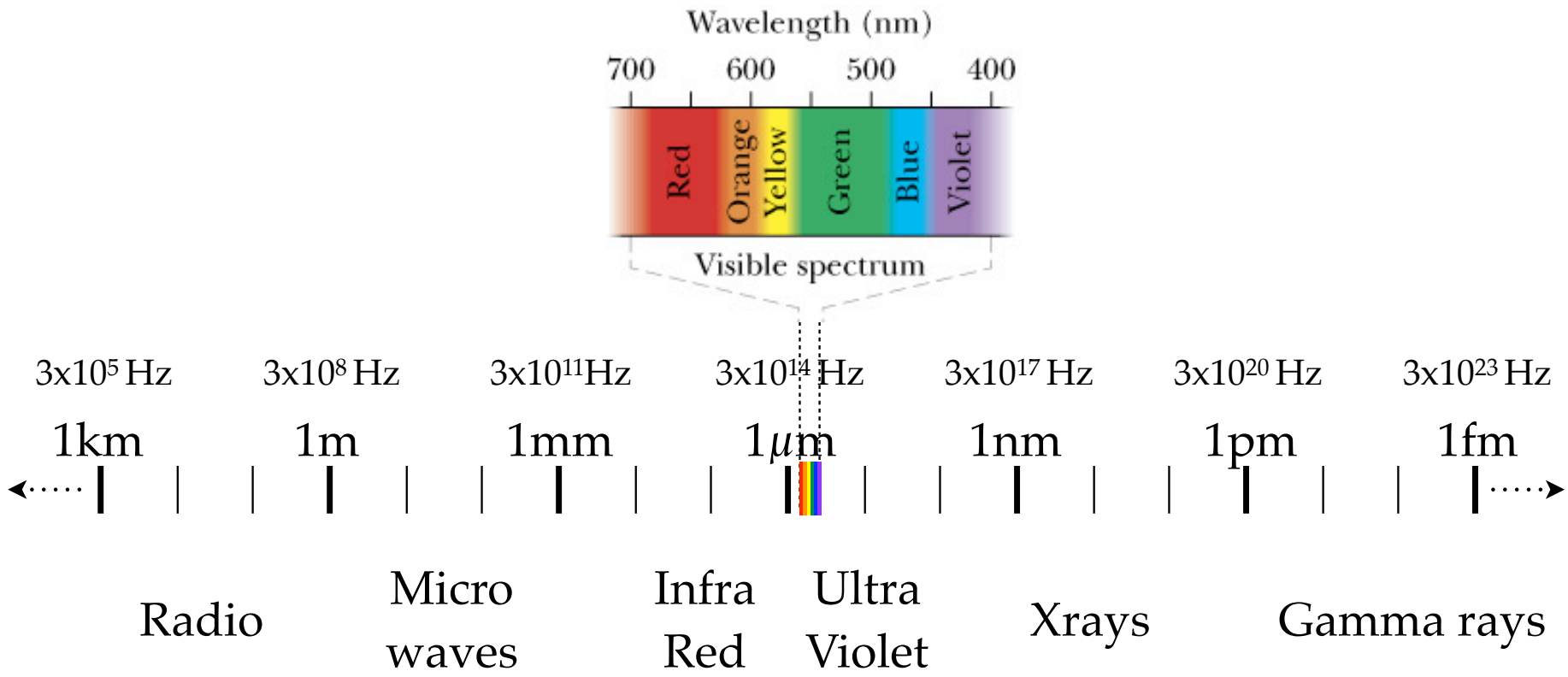
3×10^8 m/s

speed of light


Wavelength
λ: 700nm 600nm 500nm 400nm
f: 0.4PHz 0.5PHz 0.6PHz 0.7PHz

1 PHz=10^{15} Hz

The Electromagnetic Spectrum

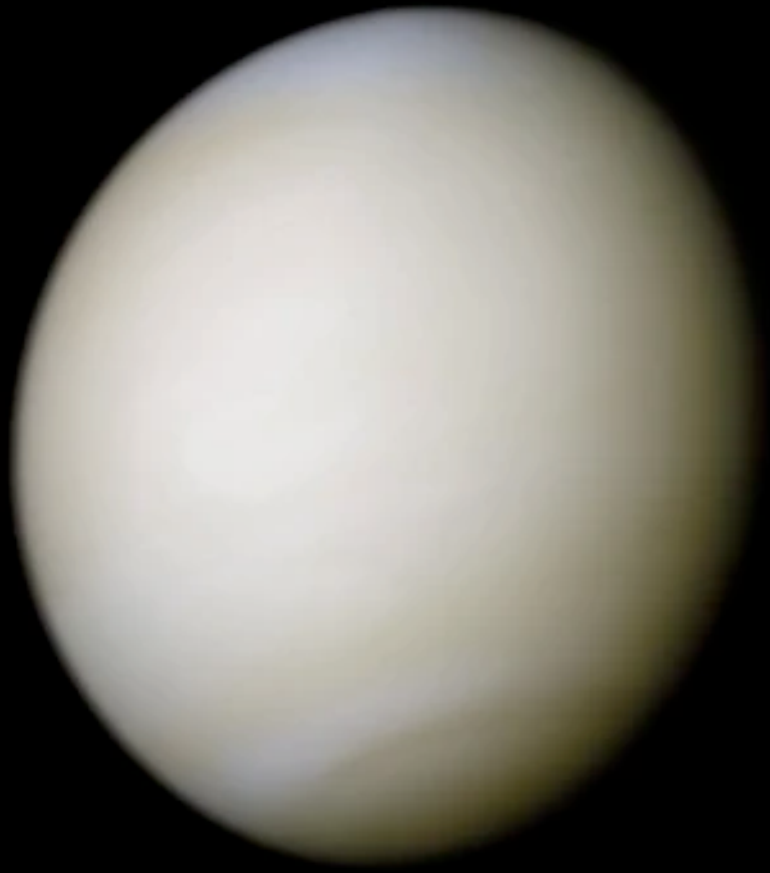


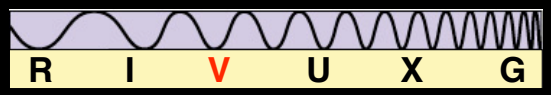
lower f
large λ

higher f
small λ

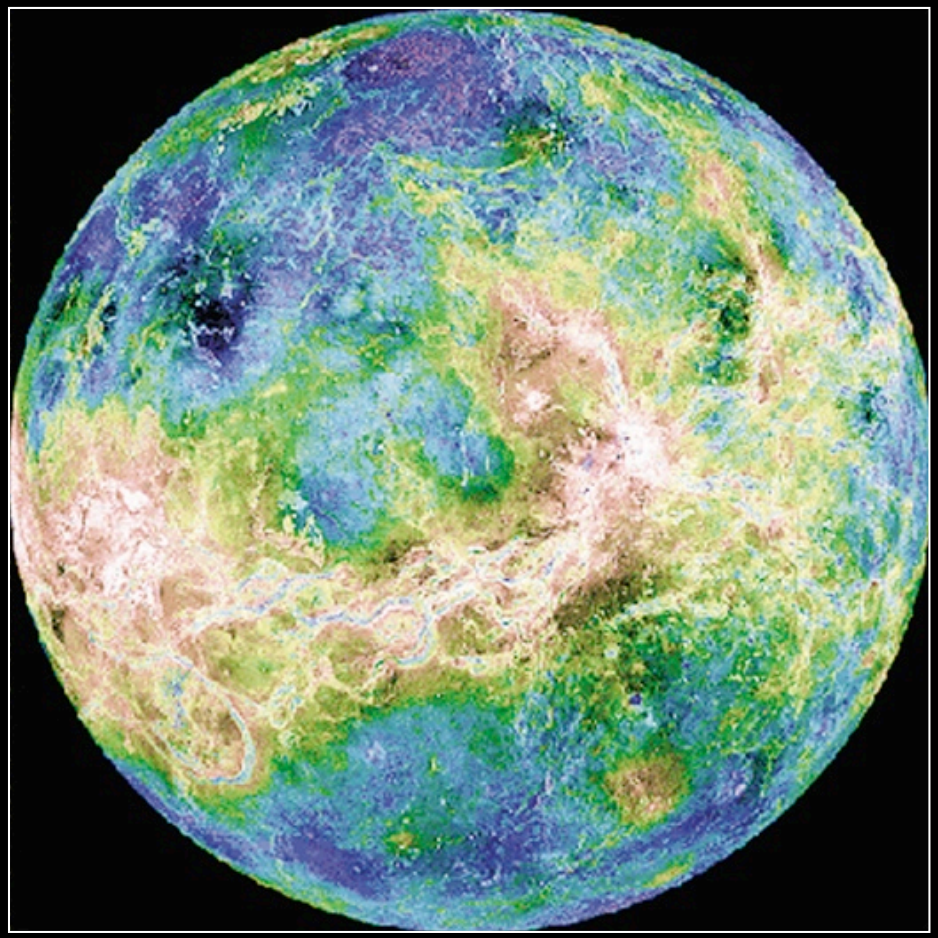
Venus

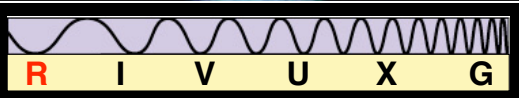
seen in visible light





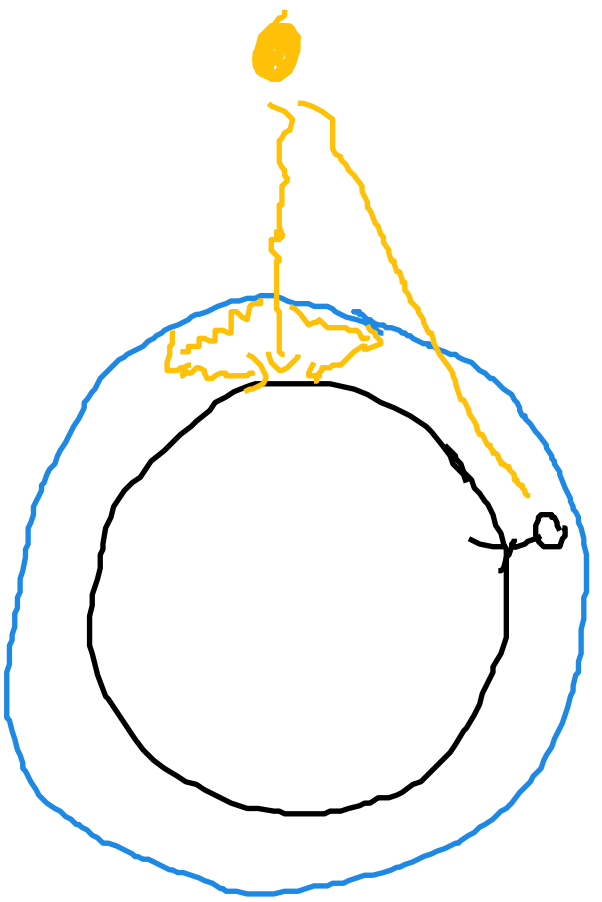
seen in radio frequencies





false color image, of course

Why is the sky blue?



sees sunlight minus blue - looks reddish

Blue light is more likely to be scattered than red light

Rayleigh scattering