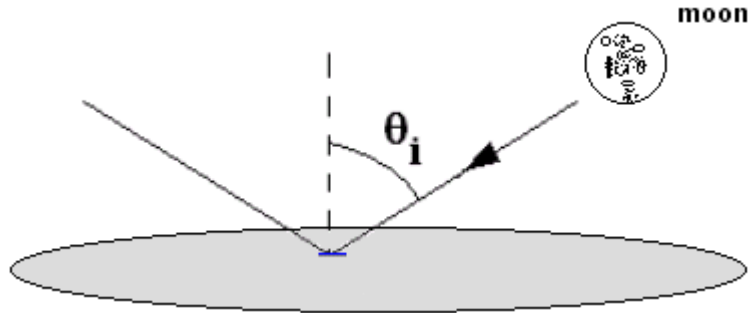


# Optics

## Brewster angle

**Problem 1.-** Calculate the angle of incidence of moonlight on the surface of a waxed surfboard, so the reflected light is totally polarized perpendicular to the plane of incidence.  
[Take the index of refraction of wax = 1.18]



**Solution:** We need to find the Brewster angle, so:

$$\tan \theta_p = 1.18 \rightarrow \theta_p = \tan^{-1}(1.18) = 49.7^\circ$$

**Problem 2.-** Calculate the angle of incidence of unpolarized light on an oily surface, so the reflected light is totally polarized perpendicular to the plane of incidence.  
[Take the index of refraction of oil = 1.43]

**Solution:** If the TM mode is going to be totally transmitted, so the reflected light is totally polarized perpendicular to the plane of incidence, then the ratio of the index of refractions will be equal to the tangent of the incident angle:

$$\tan \theta_i = 1.43 \rightarrow \theta_i = 55^\circ$$