Computing the total scattering probability

The total scattering cross section is given in (Ω,E_f) space, but *S* is given in (q,ω)
A variable change must be done for the integration (Jacobian).

We like to play games in (q,ω) space

$$\frac{d\Omega}{d\theta} = -2\pi sin\theta$$

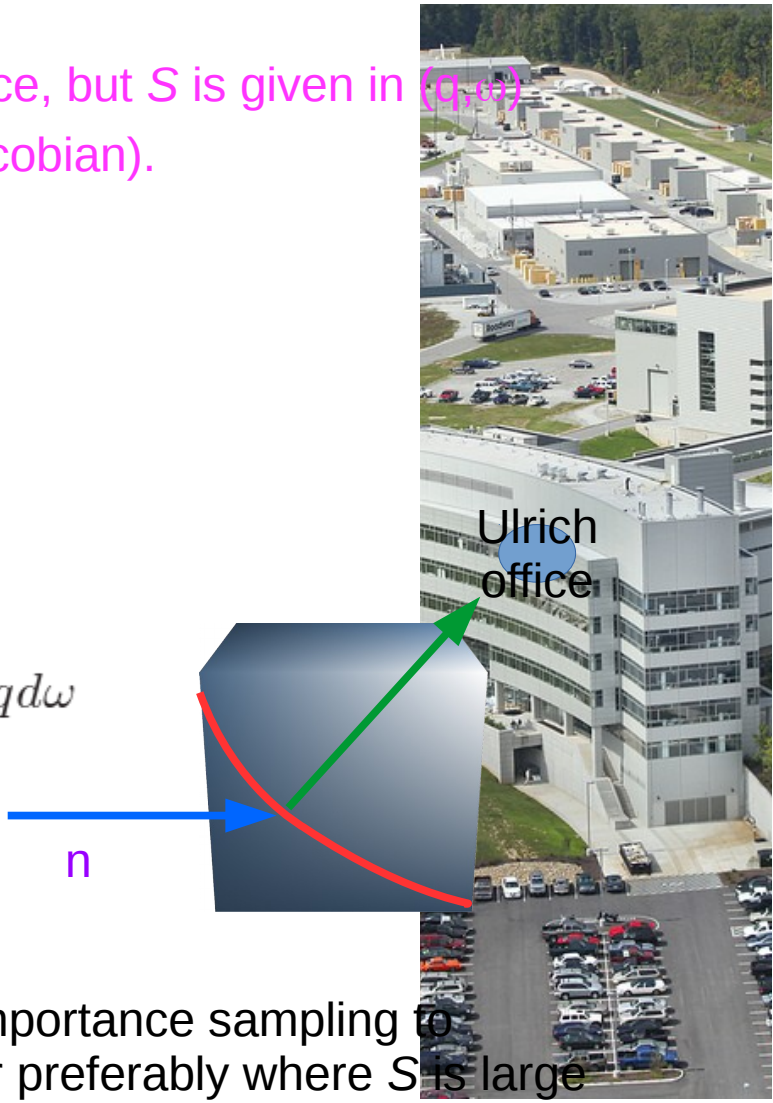
$$\frac{dq}{d\theta} = -\frac{k_i k_f sin\theta}{q}$$

Effective cross section in (q,ω) space

$$\hat{\sigma} = \sigma \iint \frac{S(q,\omega)q}{2k_i^2} dq d\omega$$

Probability to transmit

$$p = e^{-\rho \hat{\sigma} x}$$



Scattering distribution

S(q,ω)

with importance sampling to scatter preferably where *S* is large