29 Advanced Lighting

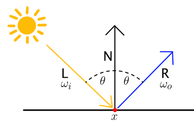
A real-life example of global illumination and caustics

The Rendering Equation

$$L_o(\mathbf{x}, \omega_o, \lambda, t) = L_e(\mathbf{x}, \omega_o, \lambda, t) + \int_\Omega f_r(\mathbf{x}, \omega_i, \omega_o, \lambda, t)\, L_i(\mathbf{x}, \omega_i, \lambda, t)\, (\omega_i \cdot \mathbf{n})\, d\omega_i$$

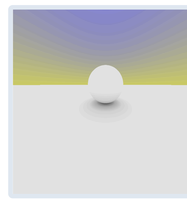
The rendering equation

Reflection



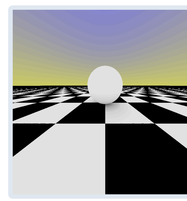
Reflection

Getting Started

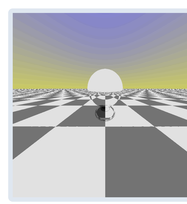


The starter app

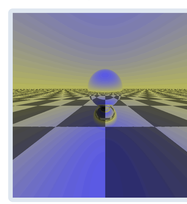
Drawing a Checkerboard Pattern



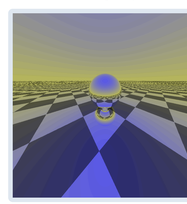
The checkerboard pattern



Reflecting the checkerboard

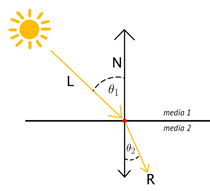


Reflecting the sky



Animated reflections

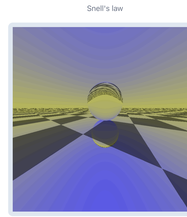
Refraction



Refraction

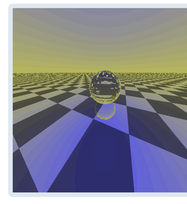
$$\frac{\sin\theta_2}{\sin\theta_1} = \frac{IOR\ of\ media\ 1}{IOR\ of\ media\ 2}$$

Snell's law



Refraction

Raytraced Water



A water ball