

PHYSICS 230: GENERAL PHYSICS II
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Topics on Review #3

- **Multiple slit interference**
- **Thin film interference**
- **Diffraction**
- **Optical resolution**
- **Polarization**
- **Frames of reference**
- **Einstein's postulates of special relativity**
- **Simultaneity and measurements of length**
- **Quantitative time dilation / length contraction**
- **Relativistic momentum and energy**
- **Blackbody radiation, the photoelectric effect, and photons**
- **the deBroglie wavelength and wave/particle duality**
- **quantum mechanical (QM) objects and uncertainty**
- **wavefunctions, probabilities, and the Schrodinger equation**
- **QM objects in boxes**
- **Atomic spectra, the Bohr atom, and the QM atom**

Equations that will be provided on Review #3

$d \sin \theta = m\lambda$	$\Delta\varphi_{tot} = \Delta\varphi_{b,refl} + 2Ln/\lambda_{vac} - \Delta\varphi_{a,refl}$	$\sin \theta = \lambda/D$
$I_t = I_0 \cos^2 \theta$	$c = 3 \times 10^8 \text{ m/s}$	$L = L_0 \sqrt{1 - v^2/c^2}$
$\Delta t = \frac{\Delta t_0}{\sqrt{1 - v^2/c^2}}$	$p = \frac{mu}{\sqrt{1 - u^2/c^2}}$	$E = \frac{mc^2}{\sqrt{1 - u^2/c^2}}$
$E^2 = p^2 c^2 + m^2 c^4$	$E = hf$	$h = 2\pi\hbar = 6.6 \times 10^{-34} \text{ J} \cdot \text{s}$
$KE_{max} = hf - \phi$	$\lambda = h/(mv)$	$\Delta x \Delta p \geq \frac{1}{2} \hbar$
$\int_{-\infty}^{\infty} P(x) dx = 1$	$\frac{-\hbar^2}{2m} \frac{d^2\psi}{dx^2} + U(x)\psi(x) = E\psi(x)$	$E_n = \frac{h^2 n^2}{8mL^2}$
$P(x) dx = \psi(x) ^2 dx$	$mvr_n = n\hbar$	$r_n = n^2 r_1$
$E_n = E_1/n^2$	$r_1 = 0.5 \times 10^{-10} \text{ m}$	$E_1 = -13.6 \text{ eV}$
$e = -1.6 \times 10^{-19} \text{ C}$	$hc/\lambda = E_u - E_l$	$m_e = 9.1 \times 10^{-31} \text{ kg}$