Prof. Stephen Sekula  
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Supplementary Material for  
PHY 3305 (Modern Physics)  
Harris Ch. 2.6-2.7
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Review

- We got our hands dirty with relativity
  - life of the muon
  - “twins paradox”
- Started discussing motion
  - the Doppler Shift
Binomial Expansion

\[(a + x)^n = a^n + na^{n-1}x + \frac{n(n-1)}{2!}a^{n-2}x^2 + \frac{n(n-1)(n-2)}{3!}a^{n-3}x^3 + ...\]

(\text{where } x^2 < a^2)

If \(a=1\) and \(x<<1\), just study the first 2-3 terms:

\[(1 + x)^n = 1 + nx + \frac{n(n-1)}{2!}x^2 + ...\]
LEGENDARY EQUATION

\[ E = mc^2 \]
LIGHTBULB WEIGHT LOSS

75W
\[ E = MC^2 \]
$E=mc^2$

PET Scanner
WAVE PROPERTIES

/home/sekula/Documents/Notebooks/ModernPhysics/wave-interference_en.jar

http://phet.colorado.edu/simulations/sims.php?sim=Wave_Interference
LIGHT AS A WAVE

Light Diffraction by a Razor Blade

Interference by two laser beams

Figure 2
NEXT TIME

- What is light . . . really?
- Particle properties of radiation
- So which is it - waves or particles?