Laser Physics (Physics 4513)  Spring 2019         Dr. Story  Room 108  Physics

Text Book:  Laser Physics, J.G. Story

Office Hours  4:00-5:00 Monday, 10:00-12:00 Tuesday

Grading  
<table>
<thead>
<tr>
<th>Homework</th>
<th>40%</th>
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<tbody>
<tr>
<td>(2) Midterms</td>
<td>20% each</td>
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<tr>
<td>Final</td>
<td>20%</td>
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(February 27) (April 10)  
Tuesday, May 14, 3:00 pm

I.  Electro-Magnetic Fields
   a.  Resonance
   b.  Wave Equation
   c.  Uncertainty Relation
   d.  Fourier Transforms
   e.  Frequency Detection

II. Resonant Cavities
    a.  Fabri-Perots
    b.  Photon Lifetime
    c.  Driven Cavities

III. Atomic Physics
     a.  Black Body Radiation
     b.  Stimulated Emission
     c.  Amplification
     d.  Line Broadening

IV. Laser Operation
    a.  Gain
    b.  Threshold
    c.  Saturation
    d.  Numeric Modeling

V. Laser Systems
   a.  Continuous Wave Lasers
   b.  Pulsed Lasers
   c.  Inversion Production
   d.  Q-Switching
   e.  Mode Locking
   f.  Semiconductor Lasers

VI. Laser Applications
    a.  Spectroscopy
    b.  High Intensity Effects
    c.  Laser Cooling of Atoms

VII. Quantized Fields (Photons)