

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	Homework	40%	
	(2) Midterms	20% each	(February 27) (April 10)
	Final	20%	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)