

SPRING 2006

ELECTROMAGNETISM & PLASMA PHYSICS
Physics 213 a.k.a. Astronomy 202

TIME/PLACE: Tue/Thurs 4:00–5:45** 356 Interdisciplinary Sciences Bldg
INSTRUCTOR: George Blumenthal, 359 ISB, x9-2005

BOOKS: J. D. Jackson, *Classical Electrodynamics* **2nd** or 3rd edition
L. Landau & E. Lifschitz, *Classical Theory of Fields*
L. Landau & E. Lifschitz, *Electrodynamics of Continuous Media*

REQUIREMENTS: Midterm Exam, Final Exam, Homework

WEB PAGE : www.ucolick.org/~george/emp/home.html

TOPICS: Introduction & Review
Covariance & Maxwell's Equations
Magnetic Monopoles
Plane Electromagnetic Waves
Multipole Radiation
Radiation by Accelerated Charges
 Synchrotron Radiation
 Compton Scattering
 Radiative Reaction
 Bremsstrahlung & Virtual Quanta
Coulomb Energy Loss Formulas
Coherence
Particle Orbits
Maxwell's Equations in Media
 Dispersion Relations
 Why Sunglasses Do Not Predict the Future
 Cherenkov Radiation & the Razin Effect
Plasma Physics
 Magnetohydrodynamic Waves
 Plasma Oscillations
 Two Stream Instability
 Landau Damping
 Cosmic Ray Interaction with Alfvén Waves

** During a number of weeks a class period will be rescheduled to either Monday 3:30-5:15 or Friday 2:00-3:45 in the same room.