PHY 712 Electrodynamics
11-11:50 AM MWF Olin 103

Notes for Lecture 35:

Review

21	Fri: 03/25/2022	Chap. 9	Radiation from localized oscillating sources	[#18](#)	03/30/2022
22	Mon: 03/28/2022	Chap. 9	Radiation from oscillating sources		
23	Wed: 03/30/2022	Chap. 9 & 10	Radiation and scattering	[#19](#)	04/01/2022
24	Fri: 04/01/2022	Chap. 11	Special Theory of Relativity	[#20](#)	04/04/2022
25	Mon: 04/04/2022	Chap. 11	Special Theory of Relativity	[#21](#)	04/06/2022
26	Wed: 04/06/2022	Chap. 11	Special Theory of Relativity		
27	Fri: 04/08/2022	Chap. 14	Radiation from moving charges	[#22](#)	04/11/2022
28	Mon: 04/11/2022	Chap. 14	Radiation from accelerating charged particles	[#23](#)	04/18/2022
29	Wed: 04/13/2022	Chap. 14	Synchrotron radiation		
	Fri: 04/15/2022	No class	*Holiday*		
30	Mon: 04/18/2022	Chap. 14 & 15	Thompson and Compton scattering	[#24](#)	04/20/2022
31	Wed: 04/20/2022	Chap. 15	Radiation from collisions of charged particles		
32	Fri: 04/22/2022	Chap. 13	Cherenkov radiation		
33	Mon: 04/25/2022		Special topic: E & M aspects of superconductivity		
34	Wed: 04/27/2022		Review		
35	Fri: 04/29/2022		Review		

Important dates: Final exams available Apr. 29; due May 9
Outstanding work due May 9

Full electrodynamics with time varying fields and sources
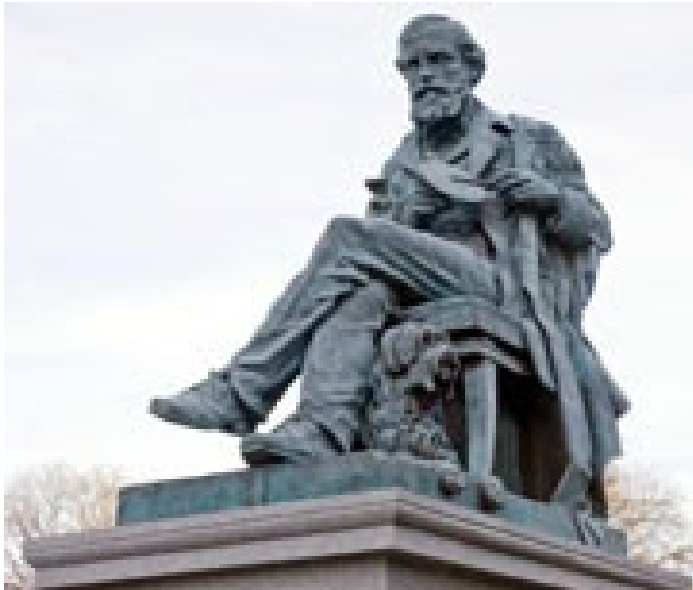
Maxwell's equations

"From a long view of the history of mankind - seen from, say, ten thousand years from now - there can be little doubt that the most significant event of the 19th century will be judged as Maxwell's discovery of the laws of electrodynamics"

Richard P Feynman

Image of statue of James Clerk-Maxwell (1831-1879) in Edinburgh

http://www.clerkmaxwellfoundation.org/

Maxwell's equations

Coulomb's law :
$$\nabla \cdot \mathbf{D} = \rho_{free}$$

Ampere - Maxwell's law :
$$\nabla \times \mathbf{H} - \frac{\partial \mathbf{D}}{\partial t} = \mathbf{J}_{free}$$

Faraday's law :
$$\nabla \times \mathbf{E} + \frac{\partial \mathbf{B}}{\partial t} = 0$$

No magnetic monopoles :
$$\nabla \cdot \mathbf{B} = 0$$

Reminder: Keep track of unit systems.

Formulas in Jackson are in SI units for Chapters 1-10

in cgs Gaussian for Chapters 11++