

Rymdfysik/Space Physics, 7.5p - ht 2012

No	Date	Topic	Subtopics
1.	3/9	Introduction	Rockets and satellites.
2.	6/9	Celestial Mechanics	Kepler's laws, Conic sections. Interplanetary missions.
3.	10/9	Motion of charged particles	Gyro-motion, $\mathbf{F} \times \mathbf{B}$ -drift, adiabatic invariants.
4.	13/9	Motion of charged particles	Particles in Earth's magnetic field.
5.	14/9	The Plasma concept	Debye screening, plasma-oscillations. Kinetic theory.
6.	17/9	The Sun and solar wind	Sun's energy production, effects of the solar wind on Earth.
7.	20/9	Rocket launch	10, 9, 8, 7, ... (Outdoors!)
8.	21/9	MHD-theory	Moment equations, frozen-in magnetic fields. MHD-generators.
9.	24/9	Magnetosphere	Bow shock and magnetopause. Magnetic pressure.
10.	27/9	Atmosphere and ionosphere	Layering, ozone, ionization.
11.	28/9	Ground-based measurements	Indices and observatory instruments.
12.	1/10	Waves in plasmas	Radio waves, electrostatic waves.
13.	4/10	Radars, optical instruments	Radar equation, incoherent scatter, data interpretation.
14.	5/10	Exercises	Radar and optical problems on ionospheric phenomena.
15.	8/10	Satellite measurements	Instruments onboard satellites
16.	12/10	Magnetosphere	Magnetotail and current systems.
17.	15/10	Ionosphere/magnetosphere interaction	Ionospheric currents and conductivities. Field aligned currents.
18.	22/10	Waves in plasmas	Wave propagation in iono- and magnetosphere.
19.	25/10	Aurora	Dynamics, substorms, acceleration processes and aurora.
20.	29/10	Problems and exercises.	
21.	1/11	Examination	