

AST 553. Plasma Waves and Instabilities (2023)

Course Schedule (tentative)

09/06 Wed	Lecture 1	Electromagnetic dispersion
09/11 Mon	Lecture 2	A sneak preview: waves in cold non-magnetized plasma
09/13 Wed	Lecture 3	Quasimonochromatic waves: basic theory
09/18 Mon	Seminar 1	[HW] Basics
09/20 Wed	Lecture 4	Equations of geometrical optics I
09/25 Mon	Lecture 5	Equations of geometrical optics II
09/27 Wed	Lecture 6	Waves in cold magnetized plasma
10/02 Mon	Seminar 2	[HW] Wave propagation in inhomogeneous plasma
10/04 Wed	Lecture 7	Waves in warm plasma: hydrodynamic approach
10/09 Mon	Lecture 8	Introduction to kinetic theory of plasma waves
10/11 Wed	Exam 1	Midterm exam
10/16 Mon	—	Fall recess (Oct 14 - Oct 22)
10/18 Wed	—	Fall recess (Oct 14 - Oct 22)
10/23 Mon	Seminar 3	[HW] Fluid waves in magnetized plasma
10/25 Wed	Lecture 9	Eigenmodes in kinetic theory
10/30 Mon	—	APS (Oct 30 - Nov 3)
11/01 Wed	—	APS (Oct 30 - Nov 3)
11/06 Mon	Lecture 10	Dispersion in nonmagnetized plasma, power dissipation
11/08 Wed	Lecture 11	Electrostatic waves in isotropic Maxwellian plasma
11/13 Mon	Lecture 12	Landau damping. General waves in nonmagnetized plasma
11/15 Wed	Seminar 4	[HW] Kinetic waves I
11/20 Mon	Lecture 13	Dielectric tensor of magnetized plasma: kinetic theory
11/22 Wed	—	Thanksgiving recess (Nov 21 - Nov 26)
11/27 Mon	Lecture 14	Waves in warm magnetized plasma
11/29 Wed	Seminar 5	[HW] Kinetic waves II
12/04 Mon	Lecture 15	Quasilinear theory
12/06 Wed	Lecture 16	Dressed particles and ponderomotive forces
12/11 Mon	Seminar 6	[HW] Kinetic waves III
12/18 Mon	Exam 2	Final exam