

Plasma Astrophysics

Chapter 0, Introduction

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Lecture Website

Lecture Website

<http://www.phys.nthu.edu.tw/~mizuno/plastro.html>

- No specific text book for this lecture
- Upload lecture note of each chapter (ppt or pdf) on this website

Couse Contents

- Basic concepts of plasma
- Single particle motion
- Kinetic Theory + Multi-fluid theory
- Magnetohydrodynamics – MHD
- Waves in plasma
- Shocks and discontinuities
- Instabilities in plasma
- Dynamo
- Outflow and accretion
- Magnetic reconnection

Recommended Text

- Introductory plasma physics:
 - F.F. Chen, Introduction to plasma physics and controlled fusion
 - R.J. Goldston & P.H. Rutherford, Introduction to Plasma Physics
 - T.J.M. Boyd and J.J. Sanderson, The Physics of Plasmas
- Magnetohydrodynamics:
 - J.P. Freidberg, Ideal Magnetohydrodynamics
 - J.P. Goedbloed and S. Poedts, Principles of Magnetohydrodynamics
- Plasma Astrophysics:
 - E.R. Priest, Solar Magnetohydrodynamics (1984)
 - A.R. Choudhuri, The Physics of Fluids and Plasmas, intro for Astrophysicists (1998).
 - R.M. Kulsrud, Plasma Physics for Astrophysics (2004).

Notice

- Unit:
 - Mixed SI (MKSA) & cgs
 - Most of equations are written in SI unit
 - In astrophysics, cgs unit is popular
- Derivation of equations:
 - I try to show most of derivation
 - But ...