

## Fall Term 2002

### Introduction to Plasma Physics

#### A. Course Organization

##### Lectures:

Monday; 1:30 – 4:20; Room 604

##### Lecturer:

WANG/Chi

Center for Space Science and Applied Research

Chinese Academy of Sciences

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##### Website:

<http://www.spaceweather.ac.cn/plasma.htm>

##### Grading:

Homework (40%), Final Exam (60%)

##### Notes:

To be distributed with each topic, which, to a large extent, based on the lectures in MIT.

##### Recommended books:

- a) 杜世刚编, 等离子体物理, 原子能出版社, 1998
- b) F. F. Chen, Introduction to Plasma Physics and Controlled Fusion, Vol 1: Plasma Physics, Second Edition, Plenum Press, 1984

## **B. Outline of Lectures and Exams**

Sept. 9 (1 lct)

Basic Concepts

Sept. 16 – Sep. 30 (4 lcts)

Charged particle motion in EM fields.

Coulomb collisions: cross-sections, relaxation

Oct. 7 – Nov. 4 (4 lcts)

Transport processes: fluid description

MHD equilibrium

MHD dynamics

Dynamics in two-fluid plasmas

Nov. 11 – Dec. 9 (5 lcts)

Waves in Uniform Plasma (Linear Theory)

Dec. 16 – Jan. 13 (5 lcts)

Microscopic to fluid plasma descriptions

Vlasov-Maxwell kinetic theory.

Linear Landau damping and growth

Kinetic description of waves and instabilities

Jan. 20

Final Exam (3 hours)