

CONTENTS

CHAPTER I. CLASSICAL STRONG COUPLING

Thermodynamic Functions, Transport Coefficients and Dynamic Correlations in Dense Plasmas.....	3
<i>S. Ichimaru, H. Iyetomi and S. Tanaka</i>	
Static and Dynamic Properties of Strongly-Coupled Classical One-Component Plasmas: Numerical Experiments on Supercooled Liquid State and Simulation of Ion Plasma in the Penning Trap.....	19
<i>H. Totsuji</i>	
Extraction of the One-Component Plasma Bridge Function from Computer Simulation Data.....	35
<i>P. D. Poll and N. W. Ashcroft</i>	
Some Properties of a Polarized OCP.....	41
<i>H. L. Helfer and R. L. McCrory</i>	
Perturbation Theory of the Miscibility Gap in Metal Salt Solutions.....	45
<i>G. Chabrier</i>	

CHAPTER II. PLASMA EXPERIMENTS

A High- Γ , Strongly-Coupled, Non-Neutral Ion Plasma.....	53
<i>R. Brewer, J. D. Prestage, J. J. Bollinger and D. J. Wineland</i>	
Laser Scattering Measurements of Thermal Entropy and Non-Acoustic Fluctuations in Collision-Dominated Plasmas.....	65
<i>A. N. Mostovych, Y. Q. Zhang and A. W. DeSilva</i>	
Production and Diagnosis of Dense Cool Alkali Plasmas.....	77
<i>O. L. Landen and R. J. Winfield</i>	

Shock Waves and Thermodynamics of Strongly Compressed Plasmas.....	87
<i>V. E. Fortov and V. K. Gryaznov</i>	

Strongly-Coupled Plasma Diagnostics and Experimental Determination of DC Electrical Conductivity.....	99
<i>M. M. Popovic' and S. S. Popovic'</i>	

CHAPTER III. MOLECULAR DYNAMICS AND KINETIC THEORY

Two Component Plasmas in Two and Three Dimensions.....	111
<i>J.-P. Hansen</i>	

Kinetic Theory of the Interdiffusion Coefficient In Dense Plasmas.....	123
<i>D. B. Boercker</i>	

Transport Properties of a Fully Ionized Plasma: Semi-Classical or Quantum Mechanical Approach.....	133
<i>J. Wallenborn, B. Bernu and V. Zehnle'</i>	

CHAPTER IV. ASTROPHYSICS

Dense Matter in Astrophysics: Selected Topics.....	139
<i>E. Schatzman</i>	

Transport Processes and Neutrino Emission Processes in Dense Astrophysical Plasmas.....	151
<i>N. Itoh</i>	

White Dwarf Stars: Laboratories for Strongly Coupled Plasma Physics.....	161
<i>G. Fontaine</i>	

Toward an Improved Pure Hydrogen EOS for Astrophysical Applications.....	173
<i>D. Saumon and H. M. Van Horn</i>	

Solar Oscillations and the Equation of State.....	179
<i>W. Däppen</i>	

CHAPTER V. QUANTUM PLASMAS

Thermodynamic Properties and Phase Transitions in Hydrogen and Rare Gas Plasmas.....	185
<i>H. Hess and W. Ebeling</i>	

Nonideal Plasmas and Bound States.....	199
<i>W. D. Kraeft and D. Kremp</i>	
High-Order Levinson Theorems and the Plank- Larkin Partition Function for Reacting Plasmas.....	215
<i>D. Bollé</i>	
Metallic Lithium by Quantum Monte Carlo.....	229
<i>G. Sugiyama, G. Zerah and B. J. Alder</i>	
Thomas-Fermi Theory and its Generalizations, Applied to Strongly Coupled Plasmas.....	239
<i>G. Senatore and N. H. March</i>	
The Thomas-Fermi and Related Models.....	253
<i>S. Eliezer</i>	
Occupation Numbers in Partially Ionized Plasmas.....	261
<i>F. J. Rogers</i>	
Thomas Fermi Calculation of the Degree of Ionization in a Dense Plasma.....	267
<i>R. Ying and G. Kalman</i>	

CHAPTER VI. DENSITY FUNCTIONAL THEORY

Density-Functional Methods in Hot Dense Plasmas.....	275
<i>C. Dharma-wardana</i>	
Description of Atomic Species in Dense Plasmas Using a Density-Functional-Theory Approach.....	293
<i>F. Perrot</i>	
The Freezing of Charged and Uncharged Hard-Sphere Systems.....	305
<i>M. Baus</i>	
Atomic Structure of an Impurity Neon In Liquid Metallic Hydrogen.....	315
<i>J. Chihara</i>	

CHAPTER VII. 2-D PLASMAS

Solvable Models of Coulomb Systems in Two Dimensions.....	331
<i>A. Alastuey</i>	

Charge Correlations and Sum Rules in Coulomb Systems I.....	349
<i>B. Jancovici</i>	
Charge Correlations and Sum Rules in Coulomb Systems II: Dynamics.....	357
<i>P. A. Martin</i>	
Theory of the Strongly Coupled 2-D Plasma with the $1/r$ Potential.....	365
<i>K. I. Golden</i>	

CHAPTER VIII. METALLIC FLUIDS

Metallic Fluids in the Critical Region.....	381
<i>F. Hensel</i>	
Acoustic Velocity Measurements on Fluid Metals From Two-Fold Compressions to Two-Fold Expansions.....	395
<i>J. W. Shaner</i>	
Structure of the Jovian Envelope and the Equation of State of Dense Hydrogen.....	407
<i>W. B. Hubbard and M. S. Marley</i>	

CHAPTER IX. RESPONSE FUNCTIONS AND ION STOPPING POWER

Nonlinear Fluctuation-Dissipation Theorems and Their Applications to Dynamical Problems in Strongly Coupled Plasmas.....	417
<i>G. J. Kalman</i>	
Collective Modes and Mode Coupling for a Dense Plasma in a Magnetic Field.....	431
<i>L. G. Suttorp</i>	
Ion Stopping Power in Dense Partially Degenerate Plasmas.....	441
<i>C. Deutsch</i>	
Exact Asymptotic Expression for the State Dielectric Function of a Uniform Liquid at Large Wave Vectors.....	463
<i>A. Holas</i>	
The Strongly Coupled OCP Plasmon Dispersion for Finite Wavenumbers.....	483
<i>M. Minella and G. Kalman</i>	

CHAPTER X. ELECTRIC MICROFIELD AND OPTICAL PROPERTIES

Electric Microfield Distributions.....	493
<i>J. W. Dufty</i>	
Optical Properties of Non-Ideal Plasmas.....	511
<i>G. A. Kobzev</i>	
Simulation Studies of Ion Dynamic Effects on Dense Plasma Line Shapes.....	527
<i>E. L. Pollock</i>	
Electric Microfield Distribution in Strongly Coupled Plasmas from Integral Equation Solutions.....	539
<i>F. Lado</i>	
Effects of Dielectronic Satellite Broadening on the Emission Spectra from Hot Plasmas.....	545
<i>A. Goldberg and B. F. Rozsnyai</i>	
Influence of Effective Interionic Potentials on the Low Frequency Electric Microfield Distributions in Dense Semi-Classical Hydrogen Plasmas.....	549
<i>R. Mazighi, B. Bernu and J. P. Hansen</i>	
Stark Effect in Dense, Correlated Plasmas.....	559
<i>Y. Vitel and M. Skowronek</i>	
Resonant Absorption in Dense Cesium Plasma.....	565
<i>J. Larour, J. Rous and M. Skowronek</i>	

CHAPTER XI. INTEGRAL EQUATIONS

Onsager-Thomas-Fermi "Atoms" and "Molecules": "Chemistry" of Correlations in Dense Plasmas.....	573
<i>Y. Rosenfeld</i>	
Quantal Hypernetted Chain Equation Applied to Liquid Metallic Hydrogen.....	587
<i>J. Chihara</i>	
Computation of an Improved Integral Equation by Non Linear Resummation of the First Graphs of the Bridge Function.....	597
<i>M. Lavaud and J. M. Victor</i>	
LECTURERS.....	603
INDEX.....	607