

CONTENTS

Preface	vii
---------------	-----

MEMORIAL

In Memory of Clarence F. Barnett "Barney" October 7, 1923–June 11, 1989	ix
---	----

ATOMIC PROCESSES

Electron-Impact Ionization and Recombination in Positive Ions	3
<i>D. C. Griffin and M. S. Pindzola</i>	
Relativistic and Quantum Electrodynamical Effects in Highly-Charged Ions	19
<i>Yong-Ki Kim</i>	
State Selective Charge Transfer Relevant for Plasma Physics	40
<i>R. Hoekstra, F. J. de Heer, and R. Morgenstern</i>	
Effects of Electric Fields on Autoionization and Implications for Dielectronic Recombination	48
<i>R. R. Jones and T. F. Gallagher</i>	

DATABASES

The ALADDIN Atomic Physics Database System	63
<i>Russell A. Hulse</i>	
The Opacity Project: Progress and Methods	73
<i>Yan Yu</i>	
Update on the OPAL Opacity Code	82
<i>F. J. Rogers, C. A. Iglesias, and B. G. Wilson</i>	

LOW-DENSITY PLASMAS

A Discussion of Some Less Well Accounted for Atomic Processes Responsible for XUV Emission from Magnetically Confined Fusion Plasmas	95
<i>Michael Finkenthal</i>	
Laser Optogalvanic and Fluorescence Spectroscopy in Glow Discharge Plasmas	107
<i>J. E. Lawler and E. A. Den Hartog</i>	
A Plasma Spectroscopic Study of Molecular Hydrogen and Hydrocarbons in a Tokamak: Techniques and Problems	116
<i>Takashi Fujimoto and WT-III Group</i>	
Atomic Processes and Spectroscopic Techniques Applied to Fusion Plasma Diagnostics	122
<i>R. J. Fonck</i>	

Modeling of Impurity Emissions from Tokamak Plasmas.....	135
<i>B. C. Stratton</i>	
Liquid and Solid Atomic Ion Plasmas	152
<i>J. J. Bollinger, S. L. Gilbert, D. J. Heinzen, W. M. Itano,</i>	
<i>and D. J. Wineland</i>	
Critical Quantities for Solar System Science in Atomic and Molecular	
Reactions.....	163
<i>D. E. Shemansky</i>	

DENSE PLASMAS

Problems in Line Broadening and Ionization Lowering.....	177
<i>J. Davis and M. Blaha</i>	
Large Scale Calculations of the Structure and Dynamics of	
Dense Matter	193
<i>Stephen M. Younger</i>	
Spectroscopic Analysis of Hot Dense Laser Produced Plasmas.....	204
<i>C. F. Hooper, Jr., R. C. Mancini, D. P. Kilcrease,</i>	
<i>and L. A. Woltz</i>	
Atomic Processes in Plasmas under Ultra-Intense Laser Irradiation	217
<i>G. T. Schappert, D. E. Casperson, J. A. Cobble,</i>	
<i>J. C. Comly, L. A. Jones, G. A. Kyrala, K. J. LaGattuta,</i>	
<i>P. H. Y. Lee, G. L. Olson, and A. J. Taylor</i>	
Spectroscopy of Dynamic, Nonequilibrium and Turbulent Plasmas in	
Pulsed-Power Systems.....	232
<i>Y. Maron</i>	

XUV LASERS

A Quest for More Efficient X-Ray Lasers: Atomic Parameters Involved	
and Recent Experiments	257
<i>R. C. Elton, E. A. McLean, J. A. Stamper, C. K. Manka,</i>	
<i>and B. H. Ripin</i>	
Improved Performance of Recombination Balmer-α Laser by Short	
Pulse Irradiation.....	267
<i>Y. Kato, H. Azuma, K. Yamakawa, M. Nishio, T. Tachi, H. Shiraga,</i>	
<i>E. Miura, H. Takabe, K. Nishihara, S. Nakai, S. A. Ramsden,</i>	
<i>G. J. Pert, M. H. Key, S. J. Rose, and C. P. J. Barty</i>	
Harmonic Generation in Rare Gases: Single Atom Response and	
Propagation Effects	277
<i>L.-A. Lompré, A. L'Huillier, M. Ferray, and G. Mainfray</i>	
Author Index.....	289

Note: The author who delivered the talk is designated by italics.