

Contents

LIST OF CONTRIBUTORS

vii

CONTENTS OF PREVIOUS VOLUMES

ix

Interstellar Molecules: Their Formation and Destruction

D. McNally

I. The Interstellar Medium	2
II. The New Interstellar Molecular Species	12
III. Associative Mechanisms for Molecule Formation	17
IV. Dissociative Mechanisms for Molecule Formation	23
V. The Equilibrium of Interstellar Molecules	26
VI. Molecules and Star Formation	31
VII. Conclusion	33
Note Added in Proof	35
References	35

Monte Carlo Trajectory Calculations of Atomic and Molecular Excitation in Thermal Systems

James C. Keck

I. Introduction	39
II. Master Equation	41
III. Transition Kernel	45
IV. Molecular Excitation and Dissociation	52
V. Atomic Excitation and Ionization	64
References	69

Nonrelativistic Off-Shell Two-Body Coulomb Amplitudes

Joseph C. Y. Chen and Augustine C. Chen

I. Introduction	72
II. Two-Body Coulomb Interaction	74
III. Off-Shell Two-Body Coulomb Amplitude	87
IV. Analyticity of the Coulomb Amplitude	99
V. Screening in the Coulomb Interaction	110
VI. Concluding Remarks	118
Appendix A. Fourier Transformation of the Continuum Coulomb Wave-function	118
Appendix B. Equivalence of the Okubo-Feldman and Schwinger Expressions	121

Appendix C. Demonstration that $\tau_a - \tau_{a\dagger} = 0$	122
Appendix D. Evaluation of the Integrals on the RHS of the Unitarity Relation	122
Appendix E. Reduction of Feynman-Type Integrals	126
References	127

Photoionization with Molecular Beams

R. B. Cairns, Halstead Harrison, and R. I. Schoen

I. Introduction	131
II. Apparatus and Techniques	134
III. A Survey of Experiments	139
IV. Photoionization Theory	158
V. Summary	160
References	161

The Auger Effect

E. H. S. Burhop and W. N. Asaad

I. Introduction	164
II. Theory of the Auger Effect	166
III. The Fluorescence Yield	186
IV. The Auger Spectrum	208
V. Miscellaneous Topics	263
Appendix: Tables of Fluorescence Yields and Energies and Intensities of Auger Lines	268
References	278

AUTHOR INDEX	285
--------------	-----

SUBJECT INDEX	294
---------------	-----