

TABLE OF CONTENTS

The Interface of Atomic and Nuclear Physics

Inner Shells as a Link Between Atomic and Nuclear Physics Eugen Merzbacher	1
Compound-Nucleus Effects on Inner-Shell Ionization W. E. Meyerhof	13
Determination of the Electron Neutrino Mass from Experiments on Electron-Capture Beta Decay B. Jonson, J. U. Andersen, G. J. Beyer, G. Charpak, A. de Rdjula, B. Elbek, H. A. Gustafsson, P. G. Hansen, P. Knudsen, E. Laegsgaard, J. Pedersen, and H. L. Ravn	27
Relativistic Theory of Shakeoff Accompanying Beta Decay J. Law	47

Inner-Shell Ionization

Alignment in Ionization by Ion, Electron and Photon Impact Werner Mehlhorn	53
Alignment Studies in Inner-Shell Processes W. Jitschin	74
Inner-Shell Ionization by Relativistic Electron Impact Harald Genz	85
Multi-Vacancy Effects in Argon K Spectra R. D. Deslattes, P. L. Cowan, R. E. LaVilla and K. Dyall	100
Atomic Inner-Shell Threshold Excitation with Synchrotron Radiation G. E. Ice, G. S. Brown, G. B. Armen, M. H. Chen, B. Crasemann, J. Levin, and D. Mitchell	105
Evidence for Intensity Shifts of K X Rays G. L. Borchert, T. Rose, and O. W. B. Schult	115

Ion-Atom Collision Processes

Information-Theoretical Description of Heavy-Ion-Atom Collisions T. Åberg and O. Goscinski	121
Impact-Parameter Dependence of L and K-Shell Excitation Mechanisms in Near-Symmetric Heavy-Ion Collisions E. Morenzoni, M. Nessi, P. Burgi, Ch. Stoller, and W. Wolfli	133
Resonant Behavior in the Projectile K X-Ray Yield Associated with Electron Capture in Ion-Atom Collisions J. A. Tanis, E. M. Bernstein, W. G. Graham, M. Clark, S. M. Shafrroth, B. M. Johnson, K. Jones, and M. Meron .	146

Angular Distribution of Electrons and X Rays from High-Energy Ion-Atom Collisions D. Berényi	158
In Search of Spontaneous Positron Creation Jack S. Greenberg	173
Theory of Positron Creation in Heavy-Ion Collisions U. Müller, J. Reinhardt, T. de Reus, P. Schlüter, G. Soff, W. Greiner, and B. Müller	206
<u>Collisionally Excited Few-Electron Systems</u>	
Collisionally Excited Few-Electron Systems: Theoretical Introduction and Survey A. L. Ford, J. F. Reading, and R. L. Becker	229
Production of Collisionally Excited Few-Electron Ions C. L. Cocke	242
X Rays and Auger Electrons from Few-Electron Recoil Ions Heinrich F. Beyer, Rido Mann, and Finn Folkmann	253
High Precision Spectroscopic Studies of Few Electron Ions J. P. Briand	271
Review of Single and Double K Electron Transfer in MeV/u Heavy Ion Atom Collisions A. Chetioui	291
<u>New Devices for Atomic Inner-Shell Experimentation</u>	
Sources of Low-Energy, Very Highly Ionized Atoms - Present Status and Possible Future Developments Vaclav O. Kostroun	303
Wigglers and Undulators as Intense X-Ray Sources G. S. Brown	318
<u>Theoretical Aspects of Inner-Shell Vacancy Production and Decay - Fundamental Concepts and Effects of Relativistic Interactions</u>	
The Theoretical Basis for Calculations of the Production and Decay of Inner-Shell Vacancies Steven T. Manson	321
Relativistic Effects in Atomic Inner-Shell Transitions Mau Hsiung Chen	331
Inner-Shell Relativistic Features in Photoeffect R. H. Pratt	346
<u>Photon Scattering and Bremsstrahlung</u>	
Photon-Atom Elastic Scattering M. Gavrila	357
Electron Bremsstrahlung Experiments Werner Nakel	389

Bremsstrahlung Induced by High-Energy, Heavy Charged Particle Impact K. Ishii and S. Morita	405
<u>Soft X-Ray and Electron Energy-Loss Spectroscopy of Atoms and Molecules</u>	
USX Emission Spectroscopy of Atoms and Molecules Carl Nordling	415
Recent Advances in Inner-Shell Excitation of Free Molecules by Electron Energy Loss Spectroscopy C. E. Brion, S. Daviel, R. Sodhi, and A. P. Hitchcock .	429
<u>X Rays from Plasmas</u>	
X Rays from Laboratory and Astrophysical Plasmas U. Feldman	447
X-Ray Diagnostics of Tokamak Plasmas Elisabeth Källne and Jan Källne	463
Measurements and Analyses for Soft X-Ray Gain in Plasmas R. C. Elton, R. H. Dixon, and J. F. Seely	480
Laser Generation of Light in the Extreme Ultraviolet and Soft X-Ray Regime R. R. Freeman, R. M. Jopson, J. Bokor, and P. Bucksbaum	491
<u>Photoionization and Auger Processes: Dynamics and Many-Body Effects, Resonances and Correlations</u>	
Dynamic Effects in Core Spectra G. Wendum	495
One-Step Model of X-Ray Photoemission and Auger Processes O. Gunnarsson and K. Schönhammer	517
Electron Correlation Manifested by Satellites in Atomic Spectra F. P. Larkins	530
Post-Collision Interaction in Inner-Shell Ionization Volker Schmidt	544
Many-Electron Effects in Photoelectron Core Spectra I. Lindau	559
Resonance and Threshold Effects in Photoemission up to 3500 eV D. A. Shirley, P. H. Kobrin, D. W. Lindle, C. M. Truesdale, S. H. Southworth, U. Becker, and H. G. Kerkhoff	569
The 4d Photoabsorption of Ba, Ba ⁺ , and Ba ⁺⁺ : A View of Shell Collapse vs. Contraction T. B. Lucatorto, T. J. McIlrath, W. T. Hill III, and C. W. Clark	584

Partial Photoionization Cross Sections of Rare-Earth Metals in the Region of the 4d Resonance	
F. Gerken, J. Barth, and C. Kunz	602
Photoionization of Atoms in Excited States	
Fran�ois J. Wuilleumier	615
Photoionization of the Inner-Shell Electron under Changing Outer-Shell Electronic Environment in Alkali Atoms	
T. N. Chang and Young Soon Kim	633
Atomic Physics Experiments Combining Synchrotron Radiation and Lasers: Present Capabilities and Future Possibilities	
P. M. Koch	645
<u>Fundamentals of Core Excitation Processes in Solids</u>	
Configuration Interaction and Screening in Core-Level Spectroscopy of Solids	
J. C. Fuggle	661
Dynamical Screening of Core Holes by Conduction Electrons	
C. Noguera	676
X-Ray Edge in Metals	
John W. Wilkins	687
3d-4f Resonant Raman Scattering in Rare-Earth Metal	
Takeshi Watanabe, Akimasa Sakuma, and Hiroshi Miyazaki	707
<u>Electrons and Ions in Solids</u>	
Channeling Radiation: Atomic and Molecular Physics in One and Two Dimensions	
Sheldon Datz	723
Equilibration Lengths for K-Shell Charge-Exchange Processes for Fast Ions Traversing Foils - Evidence from Multiple- Scattering Distributions and Auger-Yield Measurements	
Elliot P. Kanter, Dieter Schneider, and Donald S. Gemmell	735
<u>Spectroscopies of Surfaces and Adsorbates</u>	
Absorption Fine Structure from Surface Excitations	
D. Norman	745
Photoemission Spectroscopy of Surfaces and Adsorbates	
T.-C. Chiang, G. Kaindl, F. J. Himpsel, and D. E. Eastman	759
Electron- and Photon-Stimulated Desorption	
M. L. Knotek	772
List of Participants	787
Author Index	801