

## C O N T E N T S

### I N V I T E D      L E C T U R E S

<b><u>Part I: Collisions in Laser Fields</u></b>	1
M. Gavrila:	
Electron-Atom Interactions in Intense, High Frequency Laser Fields	3
F.H.M. Faisal:	
Strong-Coupling Theory of Electron Scattering from Atoms in a Radiation Field	16
C.J. Joachain:	
Electron-Atom Collisions in a Strong Laser Field	37
R. Daniele, G. Ferrante, F. Morales and F. Trombettta:	
Electron Scattering in Stochastic Radiation Fields	51
F. Roussel:	
Laser Assisted Atom-Atom Collisions	71
N. Andersen:	
Laser Spectroscopy of Collision Complexes: A Case Study	84
G. Alber:	
Two-Photon Collisional Redistribution of Radiation	92
 <b><u>Part II: Multiphoton Ionization</u></b>	 109
C.K. Rhodes:	
Studies of Multiquantum Processes in Atoms	111
L.A. Lompré and G. Mainfray:	
Interaction of an Intense Laser Pulse with a Many-Electron Atom: Fundamental Processes	125
M. Crance:	
Multiphoton Ionization of Complex Atoms	136
H. Klar:	
Correlation in Single- and Multiphoton Processes	149

<b><u>Part III: Laser Spectroscopy</u></b>	<b>161</b>
G. Rempe and H. Walther:	
Radiation Interaction of Rydberg Atoms and the One-Atom Maser	163
W.E. Cooke, L.A. Bloomfield, R.R. Freeman and J. Bokor:	
Planetary Atoms	187
H. Rottke, A. Holle and K.H. Welge:	
Laser Spectroscopy of Highly Excited Hydrogen Atoms in Electric and Magnetic Fields	199
H. Helm:	
Dynamic Processes in Molecular Rydberg States	208
C.R. Vidal:	
Four Wave Frequency Mixing in Gases	221
<b><u>Part IV: Laser Cooling and Trapping</u></b>	<b>229</b>
Th. Sauter, W. Neuhauser, and P.E. Toschek:	
Coherence of States in Trapped Ions	231
J. Javanainen:	
Light Pressure Cooling of a Trapped Three-Level Ion	249
V.G. Minogin:	
Nonlinear and Coherent Properties of Laser Radiation Pressure on Atoms	259
<b>C O N T R I B U T E D            P A P E R S</b>	
(ABSTRACTS)	
<b><u>Part I: Collisions in Laser Fields</u></b>	<b>273</b>
A. Maquet and V. Vénier:	
Multiphoton Transitions in the Coulomb Continuous Spectrum	275
M. Zarcone, G. Ferrante, C. Leone and M. Zukowski:	
Gauge Problems in Laser Fields	277
J. Bergou and S. Varró:	
Electron States in a Constant Magnetic Field and the Zero Field Limit in Potential Scattering	279
P. Pradel, P. Monchicourt, D. Dubreuil, J. Heuze, J.J. Laucagne and G. Spiess:	
Laser-Assisted Ionization on $\text{He}(2^1, 2^3\text{S}) + \text{He}(1^1\text{S})$ Collision System	282

<u>Part II: Multiphoton Ionization</u>	285
Z. Deng and J.H. Eberly:	
Variation of k Index in ATI Processes	287
M. Crance and J. Sincelle:	
Multiphoton Ionization of Atoms in a Strong Field	
A Non-Perturbative Method	290
A.F. Starace and P. Zoller:	
Transition Matrix Method for Multiphoton Ionization	
Processes	292
M.G.J. Fink and P. Zoller:	
One- and Two-Photon Detachment of Negative Hydrogen	
Ions: A Hyperspherical Approach	294
<u>Part III: Laser Spectroscopy</u>	297
A. Lami and N.K. Rahman:	
New Aspects of the Radiation Coupling of Two Bound	
States with a Predissociating (Autoionizing) Resonance	299
D. Feldmann, G. Otto, D. Petring, and K.H. Welge:	
Laser Induced Resonances in the MPI-Spectrum of	
Sodium Atoms	301
J. Sasaki, S. Yoshida, Y. Arai, K. Tateishi,	
M.P. Lei and T. Uchiyama:	
Effective Gas Ionization with Simultaneous	
Irradiation of Pulsed CO <sub>2</sub> and Excimer Lasers	304
<u>Part IV: Laser Cooling and Trapping</u>	307
W. Ertmer, R. Blatt, J. L. Hall and M. Zhu:	
Laser Manipulation of Atomic Beam Velocities:	
Demonstration of Stopped Atoms and Velocity Reversal	309
M. Lindberg:	
Dynamics of the Laser-Cooling of a Trapped Ion	311
<u>List of Participants</u>	313