Preface
Sponsors
Committees

Concluding Remarks from a Theoretician  p. 3
Concluding Remarks from an Experimentalist  p. 5
Resonance Ionization Spectroscopy  p. 9
Analysis of Ultra Low Activities to Detect Solar Neutrinos with the Radiochemical GALLEX Detector  p. 15
Atom Counting with Accelerator Mass Spectrometry  p. 22
Manipulating Quantum Fields with a Single Atom in a Cavity  p. 30
Femtosecond-Multiphoton-Ionization of Molecules: Absorption and Fragmentation Processes  p. 39
Photoionization and Molecular Fragmentation Using Nanosecond and Femtosecond Lasers  p. 43
Field Ionization of Alkali-Metal Rydberg States Formed by Resonance Absorption of Sunlight: Application as an Ultraviolet Radiation Detector  p. 47
Matrix-Assisted Laser Desorption Ionization and Why a Second Laser for Gas Phase Excitation May Be a Useful Addition  p. 53
Fast DNA Analysis by Laser Mass Spectrometry for Human Genome Analysis  p. 59
Investigations of Desorbed Species from Matrix Materials Used in MALDI  p. 64
Laser Desorption/Resonance Post-Ionization of Large PAH's: Ionization and Surface Specific Fragmentation of Decacylene  p. 68
Theoretical Models of Laser-Induced Processes  p. 75
Supersonic Jet/Multiphoton Ionization Spectrometry of Chemical Species Resulting from Thermal Decomposition and Laser Ablation of Polymers  p. 81
Characterization of Semiconductor Thin Films and Interfaces by Resonance Ionization Mass Spectrometry  p. 87
The Electronic Excitation of Atoms in Atomization Processes Studied by Resonance Ionization Mass Spectrometry  p. 91
Ionization and Heating Processes During Laser Ablation and Vaporization of Solid Targets  p. 97
State-Resolved Study of keV Sputtered Neutral Atoms by Resonance Ionization Spectroscopy  p. 101
Laser Microprobe Sampling and Laser-Enhanced Ionization Spectrometry in Flames for Surface Analysis  p. 105
Application of Diode Lasers to the Isotopically Selective Determination of Uranium in Oxides by Optogalvanic Spectroscopy  p. 111
Two-Dimensional Ion-Imaging of the Angular Distribution of Fragments Produced by Photolysis of State-Selected and Oriented Molecules  p. 117
Efficient Coherent Population Transfer in NO-Molecules Using Pulsed Lasers  p. 122
Rydberg States of Molecules  p. 126
RIS Beyond the First Ionization Limit: Multiphoton Studies of Planetary States  p. 133
RIS Probed Dynamical Effects in Two-Electron Barium Atom  p. 139
Adiabatic Theory of the Planetary Atom States  p. 143
Absolute Cross Sections for Photoionization of Excited Rare Gas Atoms Near Threshold: $\text{Ar}^* (4p^{3}D^{3})$, $\text{Kr}^* (5p^{3}D^{3})$, and $\text{Xe}^* (6s^{3}P^{0})$ p. 146

Population and Spectroscopy of Highly-Charged Ions by Laser-Induced Recombination in the ESR p. 150

New Field Ionizer for Fast Rydberg Atoms p. 157

Multiphoton Potential Scattering of Rydberg Atoms by the Microwave Field p. 161

Experimental Studies of Laser-Induced Continuum Structure in the Atomic Ionization Continuum p. 165

Modification of Continua and Quasi-Bound States Through Coherent Interactions p. 171

Laser Ionization of Molecular Clusters p. 179

Formation of Biomolecular Clusters in a Supersonic Jet: An Example of Molecular Recognition? p. 183

Photofragmentation of Stored Cluster Ions p. 187

Phase Control on an Atomic System p. 193

Measurement of the Muonium 1S-2S Transition Frequency p. 197

Element Selective Laser Ion Source for On-Line Mass Separator p. 203

Isotope Shift Measurements at the $^{242}_{\text{Am}}$ Fission Isomer p. 207

Detection of Daughter Nuclei, $^{136}_{\text{Ba}}$ from Double Beta Decay of $^{136}_{\text{Xe}}$ p. 211

Laser Resonant Ionization of Thermal Hydrogen-like Atoms Produced by Nuclear Reactions p. 215

Investigation of Radioactive Nuclei by Resonance Ionization Spectroscopy p. 221

RIMS Efforts in China p. 227

Continuous Wave Laser Probe I-Xe Analysis Using the RELAX Mass Spectrometer p. 233

Laser-Enrichment of the Odd Isotopes of Gadolinium for Use as Burnable Poison in Nuclear Reactors p. 237

Ultratrace Analysis of Long-Lived Radioisotopes in the Environment p. 243

Trace Determination of $^{90}_{\text{Sr}}$ and $^{89}_{\text{Sr}}$ in Environmental Samples by Collinear Resonance Ionization Spectroscopy p. 251

Resonance Ionization and Time-of-Flight Mass Spectrometry for the Analysis of Trace Substances in Complex Gas Mixtures p. 255

The Detection of Energetic Materials with a Laser Ionization Ion Mobility Spectrometer p. 259

Resonance Ionization Spectroscopy in Atmospheric Plasmas with Mass Spectrometric Detection for Trace Analysis p. 265

Three-Step Laser Induced Ionization of Ir and Hg Atoms in an Air-Acetylene Flame and a Gas Cell p. 269

Monitoring of Atomic Metastable State Lifetimes by the Laser-Enhanced Ionization Technique - A New Method for Probing Local Stoichiometric Combustive Conditions p. 273

Plasma Wave Detection in Laser Spectroscopy and Gas Chromatography p. 277

Resonant Ionization Spectroscopy in the XUV Spectral Region p. 283

Photoassociative Ionization Spectroscopy in Ultracold Sodium p. 289