

PREFACE

In view of the rapid growth in both experimental and theoretical studies of multi-photon processes and multi-photon spectroscopy of atoms, ions, and molecules in chemistry, physics, biology, material science, etc., it is desirable to publish an advanced series that contains review papers readable not only by active researchers in these areas, but also by those who are non-experts but wish to enter the field. The present volume attempts to serve this purpose. Each chapter is written in a self-contained manner by the experts in their own area of expertise so that general readers can grasp the knowledge in that area without too much preparation.

This volume covers five main topics: the first one involves experimental studies on “Dynamics of the vibrationally excited molecules and clusters studied by IR-UV and UV-IR double resonance spectroscopy”, and on “Dynamics of liquid droplet excited by IR multi-photon spectroscopy”. The second topic involves electron and/or nuclear dynamics of atoms and molecules in intense laser fields: “Electron spectroscopy of molecules in intense laser fields” and “Selective bond breaking in dissociative ionization of ethanol induced by tailored intense laser fields”. The third topic is associated with material science: “Evolution of transient structures in solids and liquids by means of time resolved X-ray diffraction and X-ray absorption fine structure”, while the fourth topic is about “Photonic crystal” and its applications. The fifth topic is related to information science: “Quantum computing and entanglement generation by using intramolecular degrees of freedom”.

The editors wish to thank the authors for their important contributions. It is hoped that the collection of topics in this volume will be useful not only to active researchers but also to other scientists in biology, chemistry, physics, material science, and information science.

S. H. Lin,
A. A. Villaeys,
Y. Fujimura