Editorial

Femtosecond dynamics and coherent control in atoms, molecules and clusters: Theory and experiments

The understanding and control of the dynamics in atoms, molecules and clusters has been a tremendously growing field in the past decade. This has been acknowledged with the 1999 Nobel prize in chemistry awarded to Ahmed Zewail.

The present issue collects some of the newest theoretical and experimental results in the field of ultrafast dynamics and coherent control in the gas phase. The papers are grouped into three categories.

The first section contains work on the "Coherent Control with Femtosecond Laser Pulses". Topics like the general theory of quantum control, the control of electron transfer processes, transformation of chiral molecules and coherent population transfer are treated here.

The "Femtosecond Dynamics" taking place in molecules and clusters is the topic of the second section. New insight into the nature of atomic motion within molecules and relaxation processes is provided.

The last section collects most recent work on the interaction of ultrashort laser pulses with matter. In particular, high harmonic generation, multi-photon ionization and interference effects, as well as the possible orientation of molecules in external fields are discussed.

We think that the present compilation demonstrates that the field of ultrashort pulse spectroscopy is of still growing importance and exciting new phenomena have been revealed in the past and will be discovered in the future.

V. Engel and B. Girard
Guest Editors