

AKjDPG 2: Tutorial Modern Spectroscopy

Time: Monday 9:00–10:30

Location: H2

Tutorial AKjDPG 2.1 Mon 9:00 H2
spectroscopy at extreme limits — •HANIEH FATTABI — Max Planck Institute for the Science of Light

This tutorial is devoted to novel methods for laser spectroscopy. I will give an overview of the fundamentals of spectroscopy, and techniques to resolve electron/molecular dynamics. The tutorial is concluded by discussing emerging spectroscopy techniques and their application in hyperspectral imaging.

Tutorial AKjDPG 2.2 Mon 9:45 H2
Cold molecules: the new frontier — •GERHARD REMPE — Max Planck Institute of Quantum Optics, Hans-Kopfermann-Str. 1, 85748 Garching, Germany

Understanding the world around us requires understanding molecules

and their interaction with other molecules at the most fundamental quantum level. Towards this goal, radically new cooling and trapping techniques need to be developed for molecules which cannot straightforwardly be manipulated with lasers. Exploiting the presence of a permanent electric dipole moment especially of polyatomic molecules, the new techniques include electrostatic skimming, guiding and trapping, Stark and centrifuge deceleration, as well as cryogenic buffer-gas and Sisyphus cooling. With suitable techniques combined in one setting, it is now possible to prepare samples of simultaneously cold, dense, and slow molecules for, e.g., high-resolution spectroscopy and dipolar-collision studies, thus opening up new possibilities for fundamental-physics and quantum-information experiments. The talk introduces basic concepts of this promising research and discusses selected achievements.