

Plenary Talk

PV VI Tue 9:45 e415

Stimulated Raman Adiabatic Passage (STIRAP): a concept conquering new territory. — ●KLAAS BERGMANN — Fachbereich Physik and OPTIMAS research center, Technische Universität Kaiserslautern, Germany

The essential elements (theory and experiments) of the STIRAP concept for lossless transfer of population between quantum states were presented some 25 years ago. STIRAP was initially designed for use in AMO physics and praised for its robustness, i.e. for the insensitivity of the transfer efficiency to small variations of most experimental parameters. That concept has more recently enjoyed very wide spread

application in many fields of physics, chemistry and e.g. optical technology that reach far beyond the initial expectations. After briefly presenting the essential ingredients of the physics that are the basis for the success of STIRAP some highlights from recent applications of STIRAP will be discussed. These include recent progress in the formation of ultra-cold ensembles of molecules, the control of excitation in superconducting circuits, and even the option for transfer of vibrational energy between mechanical oscillators, to name just a few. Furthermore, STIRAP-inspired work, such as the coherent coupling and robust transfer of light between waveguides or to a set of waveguides and even new concepts for wireless energy transfer will be mentioned.