



## Sapan Ranjita

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### High-resolution spectroscopy in atoms using coherent control

Einstein's notions of reciprocity between absorption and stimulated emission and their relationship to spontaneous emission are backbone to the quantum theory of light-matter interactions. I will discuss the study of the fundamental phenomena of coherent interaction of light with matter (atoms) to improve the precision measurements and techniques. Special attention is given to get the narrow resonances of subnatural electromagnetically induced transparency (EIT), electromagnetically induced absorption (EIA) and nonlinear magneto-optic rotation (NMOR) observed in the different types of alkali atoms vapor cell. The theoretical treatment allows to associate each of the features of the spectra with quantum phenomena related to interferences, coherences, optical pumping etc. I will also discuss laser cooling and trapping of rubidium atoms in the magneto-optic trap using Zeeman slowed atoms.

10. März 2014, 11:00 Uhr

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