

THEODORE MAIMAN SEMINARS on physics 2019

IMPRS **APS**



Laser Spectroscopy with extreme Resolution

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(Abbe Center of Photonics, Jena)

7th of March 2019

11:30 h, Lecture Hall of Max Planck Institute of Quantum Optics

<https://www.attoworld.de/>

<http://www2.mpg.mpg.de/APS/>

<https://www.en.physik.uni-muenchen.de/>

This talk is devoted to modern methods of laser spectroscopy, with the special focus on applications that require extreme ultraviolet (XUV) radiation and extreme resolution.

Ultra-high spectral resolution can be essential for resolving densely-packed resonances like the Rydberg series that converge against the first ionization energy, located in the XUV for most elements. Dual comb spectroscopy, an innovative form of traditional Fourier transform spectroscopy (FTS), combines short measurement times with simultaneously unprecedented spectral resolution. Due to the versatility of the method, a variety of dual comb spectrometers have been realized recently in the THz, visible and infrared spectral region but not yet in the (extreme) ultraviolet. Our recent efforts towards this development are discussed in the talk.

XUV radiation accesses also ultrafast electron dynamics that can be resolved in real time by attosecond pump-probe spectroscopy. Recent results will be presented showing the unprecedented combination of transient absorption and time-resolved ion spectroscopy providing a detailed picture of ionization dynamics in highly excited atoms.