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Ultraprecise Optical Spectroscopy – Are the Fundamental Constants Constant?

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For more than three decades, precise optical spectroscopy of the simple hydrogen atom has motivated many advances in laser spectroscopy and optical frequency metrology. Such experiments provide accurate values of fundamental constants and they permit stringent tests of basic physics laws. Recently, femtosecond laser optical frequency comb synthesizers have arrived as revolutionary tools for ultraprecise spectroscopy. Measurements of the frequency of the ultraviolet 1S-2S two-photon transition set new limits for possible slow variations of fundamental constants.

Personal information:
Theodor W. Hänsch is Director of the Max-Planck-Institut für Quantenoptik in Garching and Professor of Physics at the Ludwig-Maximilians-Universität München. His focus of research is in *Ultraprecise Laser Spectroscopy* including atomic hydrogen, antihydrogen, test of fundamental constants, and in *Quantum Physics of Ultracold Atoms* including laser cooling, Bose-Enstein condensate, microtraps, optical lattices, interferometry, and atom lasers. He is author of about 400 publications and 10 Patents, and the recipient of numerous important distinctions.

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