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Nano-Femto Group Seminar

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Non-adiabatic multi-electron dynamics in moderately intense laser fields ($<10^{14}$ W/cm²) - C₆₀ a model case for large, finite systems?

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With present day ultrashort pulse laser systems it is possible to create electric fields which are comparable to typical intramolecular fields. Interaction of such fields with isolated molecules and clusters leads to a variety of new phenomena which may be summarized as non-adiabatic multi electron dynamics (NMED). After discussing some general implications of molecular and chemical physics in strong laser fields we concentrate on the photo dynamics induced in C₆₀. With its well defined, highly symmetric structure and its 60 essentially equivalent, delocalized π electrons it may be seen as a prototype of a large finite molecular system – and at the same time as a mini surface with typical solid state properties such as a band structure. Our recent experimental studies of Rydberg excitation, ionization and non-statistical fragmentation involve laser intensities from 10^{10} to 10^{14} W/cm². Most recent results demonstrate the use of optimal control schemes in such strong fields for selective bond breaking in C₆₀ and model peptide systems.

If you would like to meet the speaker please contact Tobias Hertel (phone 322-2864, e-mail: tobias.hertel@vanderbilt.edu or via <http://people.vanderbilt.edu/~tobias.hertel>)