

## EINLADUNG

zum Vortrag  
von

**Prof. Dr. Ingolf V. Hertel**

Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie, Berlin-Adlershof, und Freie Universität Berlin

über

**Intense, temporally shaped fs laser pulses - an efficient tool to control bond breaking in large molecules and material processing**

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**Dienstag, 3. Juni 2008, um 17.30 Uhr**

Ort: Großer Hörsaal der Experimentalphysik, Universität Wien,  
1090 Wien, Strudlhofgasse 4 / Boltzmannngasse 5, 1. Stock

### Abstract:

The control of photophysical processes with judiciously tailored femtosecond (fs) laser pulses is a cutting edge topic in modern laser science. Temporally shaped intense laser fields are able to modify interatomic and molecular potential surfaces and offer the possibility to control photochemical processes. Several examples will be presented: i) the prototype of a large finite system,  $C_{60}$  can be excited to giant oscillations making use of multi electron dynamics, ii) in model peptides specifically selected bonds can be broken - thus opening a new dimension to selective mass spectroscopy of (potentially) proteins and iii) wave guide writing in transparent materials (such as glass) with femtosecond lasers may be optimized by temporal pulse shaping. The talk will include a brief history of research on the photophysics of  $C_{60}$  in short pulse laser fields and an overview on recent advances.

T. Laarmann, I. Shchatsinin, P. Singh, N. Zhavoronkov, C.P. Schulz, and I.V. Hertel, I. V., Femtosecond pulse shaping as analytic tool in mass spectrometry of complex polyatomic systems, *J. Phys. B: At. Mol. Phys.* **41** (2008) 074005/1-9

T. Laarmann, I. Shchatsinin, A. Stalmashonak, M. Boyle, N. Zhavoronkov, J. Handt, R. Schmidt, C.P. Schulz, I.V. Hertel, *Phys. Rev. Lett.* **98** (2007) 058302.

I. V. Hertel, T. Laarmann, and C. P. Schulz, *Ultrafast excitation, ionization and fragmentation of  $C_{60}$* , in *Adv. At. Mol. Opt. Phys.*, edited by B. Bederson and H. Walther (Elsevier, Amsterdam, 2005), Vol. 50, p. 219.

R. Stoian, A. Mermillod-Blondin, N. M. Bulgakova, A. Rosenfeld, I. V. Hertel, M. Spyridaki, E. Koudoumas, P. Tzanetakis, and C. Fotakis, Optimization of ultrafast laser generated low-energy ion beams from silicon targets, *Appl. Phys. Lett.* **87**, 124105/1 (2005).

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### CHEMISCH-PHYSIKALISCHE GESELLSCHAFT

c/o Universität Wien, Fakultät für Physik, 1090 Wien, Boltzmannngasse 5

Tel.: +43-(0)1-4277/51108 - Fax: ++43-(0)1-4277 9511 - E-Mail: [Christl.Langstadinger@univie.ac.at](mailto:Christl.Langstadinger@univie.ac.at)

<http://www.cpg.univie.ac.at> - Sekretär: Ao.Univ.Prof. Dr. Georg Reischl

Vorsitzender 2007/08: Ao.Univ.Prof. Dr. Ernst Bauer, Institut für Festkörperphysik, Technische Universität Wien