



FWF SFB NEXT GENERATION LIGHT SYNTHESIS AND INTERACTION

## NEXT-LITE SEMINAR

### **Time-dependent density functional theory for electron dynamics under strong electromagnetic fields**

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**Date and Time:** Friday, March 15, 2013, 11:00 c.t.

**Location:** TU Wien, SEM 138A, 7th floor (yellow section), 1040 Wien,  
Wiedner Hauptstraße 8-10

We have been developing a first-principles computational approach to describe electron dynamics in crystalline solids based on the time-dependent density functional theory. In my talk, first I explain theoretical and computational aspects of our method. I then show several applications on electron dynamics in dielectrics induced by intense and ultrashort laser pulses. They include high density electron-hole pair generation [1], ultrafast changes of dielectric properties of solid surface, coherent phonon generation [2], and reflection and transmission of intense laser pulses [3].

[1] T. Otobe, M. Yamagiwa, J.-I. Iwata, K. Yabana, T. Nakatsukasa, G.F. Bertsch, Phys. Rev. B 77, 165104 (2008).

[2] Y. Shinohara, K. Yabana, Y. Kawashita, J.-I. Iwata, T. Otobe, and G.F. Bertsch, Phys. Rev. B 82, 155110 (2010) [3] K. Yabana, T. Sugiyama, Y. Shinohara, T. Otobe, and G.F. Bertsch, Phys. Rev. B 85, 045134 (2012).

Host: J. Burgdörfer

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Der Wissenschaftsfonds.