

# ZERNIKE INSTITUTE COLLOQUIUM

Thursday, November 6<sup>th</sup>, 2008

16:00h, Lecture Hall: 5111.0080

Coffee and cakes from 15:30h

## Ultrafast Control of Complex Phases of Solids

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The overarching goal of our work is to use coherent light fields to control the complex electronic, magnetic and structural phase of solids.

Is it possible to switch the magnetic state of a macroscopic solid at THz rates?  
Can one control orbital excitations on the ultrafast timescale and their interactions with other degrees of freedom of the system?  
Can we photo-induce superconductivity?

This field of research is nowadays enormously energized by the new developments in light source technology. Using a combination of tabletop lasers and accelerator-based sources, the femtosecond pulses are accessible from THz wavelengths to the hard x-rays, spanning a photon energy range of 7 orders of magnitude. This allows new forms of control and observation on the elementary timescale of atomic, electronic and spin rearrangements.

In this talk I will discuss the current state of our work, which includes new ways to photo-stimulate and observe insulator-metal transitions in a number of transition metal oxide materials and of strongly correlated organics.

