



Time 15th January 09:15 – 12:00 + 13:15 – 14:00
16th January 09:15 – 12:00 + 13:15 – 15:00

Location ETH Zurich, Hönggerberg Campus, HCI J4

Speaker **Robin Santra**, ETH-Fast Fellow
Center for Free-Electron Laser Science, DESY + Department of Physics, University of Hamburg

Title **Theory of interacting electrons in electromagnetic fields**

Papers http://desy.cfel.de/cfel_theory_division/publications/2012/

Abstract The theory of the interacting electron and electromagnetic fields will be developed within the Coulomb gauge. It will be shown that in the electric-dipole approximation, the minimal-coupling and multipolar formalisms lead, respectively, to the so-called velocity and length forms of the Hamiltonian. A focus of the course will be an introduction to electronic-structure theory based on the second quantization of the electron field. This includes a discussion of the concept of configuration interaction and of the Condon rules. The Hartree-Fock mean-field and its implications will be analyzed. A number of illustrative examples of electron correlation effects in photoabsorption will be presented.

The course will conclude with a discussion of atomic strong-field physics from first principles.

Host **Ursula Keller**, [Ultrafast Laser Physics](#), D-PHYS, Direction Committee of ETH-FAST

More www.opteth.ethz.ch/news/laser_seminar

Info www.nccr-must.ch/fast_centers/eth-fast/eth-fast_fellows.html

Handouts and certificate will be available for the registered participants.
Please use www.nccr-must.ch to register ([direct link](#) in the right banner)

Contact Dr. Rainer Sigg, Coordinator
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