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Scientific Evening Talk

Tuesday, 19 January 2016, 6:30 p.m.
Magnus-Haus Berlin, Am Kupfergraben 7, 10117 Berlin

Prof. Andrea Cavalleri

Max Planck Institute for the Structure and Dynamics of Matter, Hamburg, Germany
Department of Physics, University of Oxford, UK
Department of Physics, University of Hamburg, Germany

Controlling Solid Phases with Light

The discussion will be chaired by
Prof. Dr. Wolfgang Eberhardt
Scientific Director of the Magnus-Haus Berlin

'Nachsitzung' with food and drinks in the 'Remise' sponsored by Wilhelm und Else Heraeus-Foundation.

To attend the Scientific Evening Talk please register:
http://www.dpg-physik.de/dpg/magnus/formulare/formular_2016-01-19/anmeldung-2016-01-19.html

Andrea Cavalleri
was trained in Electrical Engineering and in Laser Physics at the Universities of Pavia (Italy) and Essen (Germany). He received a Laurea Degree (Pavia) and his PhD (Pavia) in 1994 and 1998, respectively. Between 1998 and 2001 he was a Postdoc at UC San Diego, working with the late K.R. Wilson. Between 2001 and 2005, he was at the Lawrence Berkeley National Laboratory. In 2004, Cavalleri received the European Young Investigator Award and joined the faculty of the University of Oxford. He was promoted to Professor of Physics in 2006. In 2008 Andrea Cavalleri was appointed Professor at the University of Hamburg and first director of the Max Planck Research Department for Structural Dynamics, a pilot project that in 2013 lead to the foundation of the Max Planck Institute for the Structure and Dynamics of Matter, of which he is currently the managing director.
Amongst recent distinctions, Cavalleri was named a fellow of the American Physical Society in 2011, was the 2012 Angstroem Lecturer at Uppsala University, received a 2013 ERC Synergy grant and was awarded the 2015 Max Born Medal and Prize by the UK Institute of Physics and the German Physical Society.

Abstract
Phase transitions, commonly understood in terms of changes in microscopic symmetries of solids, have to date been understood in terms of static models and conventional statistical mechanics. However, impulsive perturbations can be used to drive collective changes rapidly, for example melting solids, switching magnetic properties or turning a transparent insulator into an opaque metal within times that are similar to individual atomic motions. This is the realm of femtosecond science, in which short bursts of light only few 10-15 sec long (few millionths of a billionth) are used to drive and observe rearrangements of matter. In this talk I will discuss experiments aimed at driving phase transitions with light. I will give special attention to the light induced superconducting transition, a mysterious phenomenon in which electrons are synchronize their wave functions into a rigid liquid that transports currents without resistance.