THU.4: Postdeadline Paper Session

Chair: Giulio Cerullo, Politecnico di Milano, Milan, Italy

Time: Thursday, 17:15–19:00 Location: Festsaal

Oral THU.4.1 17:15

Interferometric attosecond lock-in measurement of extreme ultraviolet circular dichroism — •Doron Azoury[1], Omer Kneller[1], Michael Krüger[1], Barry Bruner[1], Oren Cohen[2], Yann Mairesse[3], and Nirit Dudovich[1] — [1]Department of Physics of Complex Systems, Weizmann Institute of Science, Rehovot 76100, Israel — [2]Solid State Institute and Physics department, Technion, Haifa 32000, Israel — [3]Université de Bordeaux - CNRS - CEA, CELIA, UMR5107, F-33405 Talence, France

We establish an extreme ultraviolet lock-in detection scheme, allowing the isolation and amplification of weak chiral signals, by achieving a direct time-domain polarization control. We demonstrate it by a phase-resolved measurement of magnetic circular dichroism.

Oral THU.4.2 17:30

Attosecond angular streaking and tunnelling time in atomic hydrogen — Undurti Satya Sainadh[1], Han Xu[1], Xiao-Shan Wang[2], Atia Atia-tul-Noor[1], William Wallace[1], Nicolas Douguet[3], Alexander Bray[4], Igor Ivanov[5], •Anatoli Kheifets[4], Robert Sang[1], and Igor Litvinyuk[1] — [1]Centre for Quantum Dynamics, Griffith University, Brisbane, Australia — [2]School of Nuclear Science and Technology, Lanzhou University, China — [3]Department of Physics, University of Central Florida, Orlando, USA — [4]Research School of Physics and Engineering, Australian National University, Canberra, Australia — [5]Centre for Relativistic Laser Science, Institute for Basic Science, Gwangju, Korea

By performing the first attoclock experiment on atomic hydrogen and comparing with accurate 3D-TDSE simulations we conclude that the offset angles originate entirely from the long-range Coulomb potential with no contribution from tunnelling time delay

Oral THU.4.3 17:45

Orientation-dependent stereo Wigner time delay and electron localization in a small molecule — •Jannie Vos[1], Laura Cattaneo[1], Sergei Patchkovskii[2], Tomas Zimmermann[3], Claudio Cirelli[1,4], Matteo Lucchini[1], Anatoli Kheifets[5], Alexandra S. Landsman[3], and Ursula Keller[1] — [1]Physics Department, ETH Zurich, 8093 Zurich, Switzerland — [2]Max Born Institute, 12489 Berlin, Germany — [3]Max Planck Institute for the Physics of Complex Systems, D-01187 Dresden, Germany — [4]Empa – Swiss Federal Laboratories for Materials Science & Technology, 8600 Dübendorf, Switzerland — [5]Research School of Physics and Engineering, The Australian National University, Canberra ACT 0200, Australia

We present orientation-dependent stereo Wigner time delays of CO molecules, which reveal the electron localization at the ionization moment. Together with theoretical calculations this constitutes a spatially- and temporally-resolved reconstruction of the molecular photoelectric effect.

Oral THU.4.4 18:00

Lightwave-driven Dirac currents in a subcycle band structure movie — •J. Reimann[1], S. Schlauderer[2], C.P. Schmid[2], F. Langer[2], S. Baierl[2], K.A. Kokh[3], O.E. Tereshchenko[4], A. Kimura[5], C. Lange[2], J. Güdde[1], R. Huber[2], and U. Höfer[1] — [1]Fachbereich Physik, Philipps-Universität, 35032 Marburg, Germany — [2]Department of Physics, University of Regensburg, 93040 Regensburg, Germany — [3]V.S. Sobolev Institute of Geology and Mineralogy SB RAS, 636090, Novosibirsk, Russian Federation — [4] A.V. Rzhanov Institute of Semiconductor Physics SB RAS, 636090, Novosibirsk, Russian Federation — [5]Graduate School of Science, Hiroshima University, 739-8526 Hiroshima, Japan

In the first subcycle angle-resolved photoemission study, we observe how an intense terahertz field drives topologically protected Dirac currents on the surface of Bi2Te3. Spin-momentum locking enables fully ballistic lightwave currents over several 100 nm.

Oral THU.4.5 18:15

New Long-lived Metastable State in 1T-TaSe2 launched via Ultrafast Charge Smearing and Mode-Selective Electron-Phonon Coupling — Xun Shi[1], Wenjing You[1], Yingchao Zhang[1], Zhensheng Tao[1], Peter M. Oppeneer[2], Xianxin Wu[3], Ronny Thomale[3], Kai Rossnagel[4,5,6], Michael Bauer[4], •Henry Kapteyn[1], and Margaret Murnane[1] — [1]Department of Physics and JILA, University of Colorado and NIST, Boulder, Colorado 80309, USA — [2]Department of Physics and Astronomy, Uppsala University, Box 516, 75120 Uppsala, Sweden — [3]Institut fur Theoretische Physik und Astrophysik, Julius-Maximilians-Universitat Wurzburg, 97074 Wurzburg, Germany — [4]Institute of Experimental and Applied Physics, Kiel University, D-24098 Kiel, Germany — [5]Deutsches Elektronen-Synchrotron DESY, D-22607 Hamburg, Germany — [6]Ruprecht Haensel Laboratory, Kiel University and DESY, D-24098 Kiel and D-22607 Hamburg, Germany

We observe a long-lived metastable state in 1T-TaSe2 using time- and angle-resolved photoemission spectroscopy. This new state is distinct from the equilibrium phases and must be induced by ultrafast charge smearing and mode-selective electron-phonon coupling.

Oral THU.4.6 18:30

High-order harmonic generation traces ultrafast coherent phonon dynamics in ZnO — •Richard Hollinger[1,2], Valentina Shumakova[3], Audrius Pugžlys[3], Andrius Baltuška[3], Sherzod Khujanov[1], Christian Spielmann[1,2], and Daniil Kartashov[1] — [1]Institute of Optics and Quantum Electronics, Abbe Center of Photonics, Friedrich-Schiller-University Jena, Jena, Germany — [2]Helmholtz-Institut Jena, Helmholtzweg 4, 07743 Jena, Germany — [3]Photonics Institute, TU Wien, Gußhausstrasse. 25-29, 1040 Vienna, Austria

Ultrafast coherent phonon dynamics in ZnO is studied via high-order harmonic generation by intense mid-IR laser pulses. We show, the phonon dynamic is very different after excitation in the tunnel and multiphoton regime.

Oral THU.4.7 18:45

Dual-Comb, Few-Cycle Electric Field Sampling for Broadband Infrared Spectroscopy — •Henry Timmers[1], Abijith Kowligy[1], Alex Lind[1], Ugaitz Elu[2], Flavio Cruz[1], Peter Schunemann[3], Trina Mouchahoir[4], John Schiel[4], Jens Biegert[2], and Scott Diddams[1] — [1]Time and Frequency Division, NIST, Boulder, CO — [2]ICFO, Barcelona, Spain — [3]BAE Systems, Nashua, NH — [4]Biomolecular Measurements Division, NIST, Gaithersburg, MD

We present the direct electro-optical sampling of few-cycle infrared pulses spanning over two-octaves (3-25 um) using a dual frequency comb configuration. The technique enables fast-acquisition, high-resolution spectroscopy of both atmospheric compounds and protein antibodies.