

**TUE1 • High Harmonics as Structural Probes**

Auditorium

8:30–10:15

**TUE1 • High Harmonics as Structural Probes**

Chair: Stephen Leone, University of California and Lawrence Berkeley National Laboratory, USA

**TUE1.1 • 8:30****•Invited•**

**Ultrafast Molecular and Materials Dynamics probed by Coherent X-Rays**, •Margaret Murnane and Henry Kapteyn; JILA, University of Colorado, Boulder, CO, USA.

Ultrafast short-wavelength light is ideal as a probe of complex, highly-excited, systems. We observe for the first time the decay of core-excited atoms adsorbed onto a surface, and core-excited molecular dissociation.

**TUE1.2 • 9:00**

**Large Amplitude Modulation of High-Order Harmonic Generation from Vibrationally Excited Molecules**, •Wen Li<sup>1</sup>, Xibin Zhou<sup>1</sup>, Robynne Lock<sup>1</sup>, Henry Kapteyn<sup>1</sup>, Margaret Murnane<sup>1</sup>, Serguei Patchkovskii<sup>2</sup>, and Albert Stolow<sup>2</sup>; <sup>1</sup>JILA and Department of Physics, University of Colorado, Boulder, CO, 80309, <sup>2</sup>Stecie Institute of Molecular Sciences, National Research Council of Canada, Ottawa, ON Canada.

We observe large vibrationally-induced modulations in high harmonic conversion in N<sub>2</sub>O<sub>4</sub>. We explain this result as due to different electronic states of cations, leading to preferential emission at the outer turning point of the vibration.

**TUE1.3 • 9:15**

**HOMO-1 Contribution in High Harmonic Generation**, •Markus Guehr, Brian K. McFarland, Joseph P. Farrell, and Philip H. Bucksbaum; Stanford PULSE Center, Physics Department, Stanford University CA 94305 and SLAC CA 94025, USA.

We observe the contribution of the HOMO-1 orbital in high harmonic generation on N<sub>2</sub> and discuss the harmonic modulation in the rotational revivals.

**TUE1.4 • 9:30**

**Ultrafast Multiphoton Crystallography**, •Marina Gertsvolf<sup>1,2</sup>, Hubert Jean-Ruel<sup>1</sup>, Pattathil P. Rajeev<sup>1</sup>, David M. Rayner<sup>1</sup>, and Paul B. Corkum<sup>1</sup>; <sup>1</sup>National Research Council of Canada, Ottawa, Ontario K1A 0R6, Canada, <sup>2</sup>University of Ottawa, Ottawa, Ontario K1N 6N5, Canada.

We show that non-resonant multiphoton ionization of dielectric crystals depends on the alignment of the laser field to the crystal lattice. Through absorption measurements we probe the local symmetry non-invasively, anywhere inside the sample.

**TUE1.5 • 9:45**

**High-order harmonic generation in high intensity laser-solid interactions**, •Cedric Thaury<sup>1</sup>, Fabien Quere<sup>1</sup>, Herve George<sup>1</sup>, Jean-Paul Geindre<sup>2</sup>, Pascal Monot<sup>1</sup>, and Philippe Martin<sup>1</sup>; <sup>1</sup>Service des Photons, Atomes et Molécules, Commissariat à l'Energie Atomique, DSM/DRECAM, CEN Saclay, 91191 Gif-sur-Yvette, France, <sup>2</sup>Laboratoire pour l'Utilisation des Lasers Intenses, CNRS, Ecole Polytechnique, 91128 Palaiseau, France.

We will discuss the two mechanisms involved in high-order harmonic generation from plasma mirrors, and show that they can be clearly identified experimentally. The phase and coherence properties of these harmonics will be analyzed.

**TUE1.6 • 10:00**

**Feasibility of probing coherent optical phonons by Extreme Ultraviolet radiation based on high-order harmonic generation**, •Evangelos Papalazarou<sup>1</sup>, Davide Boschetto<sup>1</sup>, Julien Gautier<sup>1</sup>, Constance Valentin<sup>1</sup>, Marino Marsi<sup>2</sup>, Philippe Zeitoun<sup>1</sup>, and Philippe Balcou<sup>3</sup>; <sup>1</sup>Laboratoire d'Optique Appliquée, Chemin de la Hunière, F-91761 Palaiseau, France, <sup>2</sup>Laboratoire de Physique des Solides, Bât 510, Université Paris-Sud, 91405 Orsay, France, <sup>3</sup>Centre Lasers Intenses et Applications, Université Bordeaux I, CNRS, CEA, Domaine du Haut Carré, 351 Cours de la Libération, 33405 Talence, France.

We report a new experimental approach used to time-resolve coherent high-amplitude optical phonons within the Brillouin zone of a Bismuth (111) crystal by extreme ultraviolet (XUV) femtosecond pulses based on high-order harmonic generation in rare gases.