THUIIId • Poster III d - Physics

Poster Area
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THUIIId • Poster III d - Physics

THUIIId.1 • 16:15
On the Absence of Carrier Multiplication in InAs Core/Shell/Shell Nanocrystals, •*Meirav Ben-Lulu, David Mocatta, Uri Banin*, and *Sanford Ruhman*; *Department of Physical Chemistry and the Farkas Center for Light Induced Processes, The Hebrew University, Jerusalem 91904, Israel.*.
An ultrafast pump-probe methodology for detecting spontaneous carrier multiplication is applied to InAs/CdSe/ZnSe Core/Shell1/Shell2. Contrary to previous reports no carrier multiplication following above-band gap photoexcitation is observed, questioning the ubiquity of this phenomenon.

THUIIId.2 • 16:15
Ultrafast Laser-Induced Electron Emission from Field Emission Tips and First Applications, •*Catherine Kealhofer*[1], *Peter Hommelhoff*[2], *Seth Foreman*[1], and *Mark Kasevich*[1]; [1]*Physics Department, Stanford University, Stanford, California, 94305,* [2]*Max Planck Institute of Quantum Optics, Garching, Germany*.
We describe a laser-triggered electron source based on a field emission tip. Numerical results indicate that the electron emission times can be sub-femtosecond. We are exploring applications of this source to ultrafast SEM.

THUIIId.3 • 16:15
Three-Dimensional Electronic Spectroscopy of Excitons in GaAs Quantum Wells, •*Daniel Turner, Katherine Stone, Kenan Gundogdu*, and *Keith Nelson*; *Massachusetts Institute of Technology, Cambridge Massachusetts 02139, USA.*
Three-dimensional electronic four wave-mixing spectroscopy of GaAs quantum wells is demonstrated. A previously inaccessible two-dimensional projection correlating events between the first two time periods is used to more accurately measure the biexciton binding energy.

THUIIId.4 • 16:15
Temporal Splitting of Ultrashort Laser Pulses Undergoing Self-Focusing in the Anomalous Dispersion Regime, •*Samuel E Schrauth, Bonggu Shim, Aaron D Slepkov, Luat T Vuong*, and *Alexander L Gaeta*; *Applied and Engineering Physics, Cornell University, Ithaca, New York 14853 USA.*
We show that the dynamics of ultrashort pulses undergoing self-focusing can be greatly altered via temporal pulse shaping. Specifically, we observe that super-Gaussian pulses undergo pulse-splitting, whereas Gaussian pulses undergo spatio-temporal collapse.

THUIIId.5 • 16:15
Nonlinear Optical Response of Metal Nanoantennas, •*Barbara Wild, Jörg Merlein, Tobias Hanke, Alfred Leitenstorfer*, and *Rudolf Bratschitsch*; *Department of Physics and Center for Applied Photonics, University of Konstanz, D-78464 Konstanz, Germany*.
We have excited bowtie-shaped metal nanoantennas fabricated via colloidal lithography with ultrashort light pulses. The spectrum emitted by the nanoantennas consists of a broadband continuum overlapped with a narrowband second harmonic signal.

THUIIId.6 • 16:15
Ultrafast spin dynamics in wide bandgap semiconductors and semiconductor nanostructures, •*Nils Janßen*[1], *Tobias Hanke*[1], *Florian Sotier*[1], *Markus Beyer*[1], *Tobias Graf*[2], *Mario Gjukic*[2], *Martin Brandt*[2], *Kelly Whitaker*[3], *Daniel Gamelin*[3], *Clemens Simbrunner*[4], *Andrea Navarro-Quezada*[4], *Alberta Bonanni*[4], and *Rudolf Bratschitsch*[1]; [1]*Departement of Physics and Center for Applied Photonics, University of Konstanz, D-78457 Konstanz, Germany,* [2]*Walter Schottky Institut, Technical University of Munich, D-85748 Garching, Germany,* [3]*Departement of Chemistry, University of Washington, Seattle, WA 98195, USA,* [4]*Institute of Semiconductor and Solid State Physics, Johannes Kepler University, A-4040 Linz, Austria*.
Time-resolved Faraday rotation measurements on doped GaN layers reveal exchange coupling of itinerant carriers to dopants in different oxidation states. In colloidal ZnO quantum dots competing recombination processes result in a biexponentially decaying spin coherence.

THUIIId.7 • 16:15
Phonon Softening in Bi and Sb Single Crystal: Toward a Simple Cubic Phase?, •*Daniele Fausti*[1], *Oleg Mishoco*[2], and *Paul van Loosdrecht*[1]; [1]*Rug, Groningen, The Netherlands,* [2]*Institute of Solid State Physics, Moscow, Russia*.
We use time-resolved Raman spectroscopy to reveal ultrafast thermodynamical and structural information simultaneously. The ultafast phonon softening in Bismuth and Antimony is interpreted as a precursor of a non-thermodynamical cubic phase.

THUIIId.8 • 16:15
Filament-induced ultrafast AND-gate in rare gas, •*Pierre Béjot, Yannick Petit, Luigi Bonacina, Jérome Kasparian, Michel Moret*, and *Jean-Pierre Wolf*; *GAP-Biophotonics Université de Genève, Genève, Switzerland*.
We demonstrate that strong birefringence can be induced in Argon by ultrashort laser filamentation. This process is used to build an ultrafast optical AND gate between the driving pulse and a probe beam.

THUIIId.9 • 16:15
Observing Signatures of Molecular Structure by High-order Harmonic Generation, •*Ricardo Torres*[1], *Nathaniel Kajumba*[1], *Thomas Siegel*[1], *Immacolata Procino*[2], *Jonathan Underwood*[2], *Joseph Robinson*[1], *Sarah Baker*[1], *John Tisch*[1], *Rebeca de Nalda*[3], *Will Bryan*[4], *Raffaele Velotta*[5], *Carlo Altucci*[5], *Edmond Turcu*[4], and *Jon Marangos*[1]; [1]*The Blackett Laboratory, Imperial College London, London SW7 2BW, UK,* [2]*Department of Physics and Astronomy, University College London, London WC1E 6BT, UK,* [3]*Instituto de Quimica Fisica Rocasolano, CSIC, 28006 Madrid, Spain,* [4]*Central Laser Facility, CCLRC Rutherford Appleton Laboratory, Chilton, Didcot, Oxon OX11 0QX, UK,* [5]*CNSIM and Dipartimento di Scienze Fisiche, Universita di Napoli Federico II, Naples, Italy*.
We demonstrate experimentally how high harmonic generation can show signatures of the orbital structure of polyatomic molecules. Calculations in the strong field approximation are shown in good agreement with the results, and new experimental approaches are discussed.

THUIIId.10 • 16:15

VUV Thomson Scattering in Warm Dense Matter at FLASH, •*R.R. Fäustlin[7], S. Toleikis[7], Th. Bornath[1], L. Cao[2], T. Döpner[1], S. Düsterer[7], E. Förster[2], C. Fortmann[1], S.H. Glenzer[3], S. Göde[1], G. Gregori[4], A. Höll[1], R. Irsig[1], T. Laarmann[5], H.J. Lee[6], K.-H. Meiwes-Broer[1], A. Przystawik[1], P. Radcliffe[7], R. Redmer[1], H. Reinholz[1], G. Röpke[1], R. Thiele[1], J. Tiggesbäumker[1], N.X. Truong[1], Th. Tschentscher[7], I. Uschmann[2]*, and *U. Zastrau[2]*; *[1]Universität Rostock, Universitätsplatz 3, 18051 Rostock, Germany, [2]Friedrich-Schiller-Universität Jena, Max-Wien-Platz 1, 07743 Jena, Germany, [3]LLNL, 7000 East Av., Livermore, CA 94550, USA, [4]University of Oxford, Parks Road, Oxford OX1 3PU, United Kingdom, [5]MBI, Max-Born-Str. 2A, 12489 Berlin, Germany, [6]University of California, Berkley, CA 94720, USA, [7]DESY, Notkestr. 85, 22607 Hamburg, Germany*.
We present the first attempt to diagnose electron temperature and density of a plasma via Thomson Scattering in the Warm Dense Matter Regime using Vacuum Ultraviolet Free Electron Laser radiation.

THUIIId.11 • 16:15
Time Resolved Photoluminescence (PL) Studies of $In_{0.2}Ga_{0.8}As/GaAs$ Quantum Wells in Ultrahigh Magnetic Fields, •*Jinho Lee[1], Xiaoming Wang[1], David Reitze[1], Stephen McGill[2], Young-Dahl Jho[3], Junichiro Kono[4], Alexey Belyanin[5]*, and *Glenn Solomon[6]*; *[1]Department of Physics, University of Florida, Gainesville, Florida 32611, [2]National High Magnetic Field Laboratory, Tallahassee, Florida, 32310, [3]Department of Information and Comunications, GIST, Oryong-dong, Buk-gu, Gwangju, 500-712, Republic of Korea, [4]Department of Electrical and Computer Engineering, Rice University, Houston, Texas 77005, [5]Department of Physics, Texas A&M University, College Station,Texas 77843, [6]Solid Quantum Processes and Metrology Division, NIST, Gaithersburg, Maryland 20899-8423*.
The dynamics of dense magneto-plasmas excited by intense femtosecond laser pulses in $In_{0.2}Ga_{0.8}As/GaAs$ multiple quantum wells were studied by time-resolved methods under ultrahigh magnetic fields.

THUIIId.12 • 16:15
Ultrashort soft x-ray pulses from a femtosecond slicing source for time-resolved laser pump- x-ray probe experiments, •*Niko Pontius[1], Christian Stamm[1], Torsten Kachel[1], Rolf Mitzner[2], Torsten Quast[1], Karsten Holldack[1], Shaukat Khan[1,3], Hermann A. Dürr[1]*, and *Wolfgang Eberhardt[1]*; *[1]BESSY GmbH, 12489 Berlin, Germany, [2]Physikalisches Institut der Universität Münster, 48149 Münster, Germany, [3]Institut für Experimentalphysik, Universität Hamburg, 22761 Hamburg, Germany*.
The new femtosecond-slicing source generates energy-tuneable femtosecond x-ray pulses which are used for time-resolved soft x-ray spectroscopy. We report on the experimental setup and show first results using the laser pump and x-ray probe technique.

THUIIId.13 • 16:15
Non-equilibrium spin-dynamics of Gd(0001) studied by time-resolved second harmonic generation and magnetic linear dichroism in 4f core-level photoemission, •*Alexey Melnikov[1], Helena Prima-Garcia[2], Martin Lisowski[1], Tanja Gießel[2], Ramona Weber[2], Roland Schmidt[2], Cornelius Gahl[2], Nadezhda Bulgakova[3], Uwe Bovensiepen[1]*, and *Martin Weinelt[1,2]*; *[1]Freie Universität Berlin, Fachbereich Physik, Arnimallee 14, 14195 Berlin, Germany, [2]Max-Born-Institut, Max-Born-Straße 2 A, 12489 Berlin, Germany, [3]Institute of Thermophysics SB RAS, 1 Lavrentyev Ave., 630090 Novosibirsk, Russia*.
Spin-dynamics in Heisenberg ferromagnets was studied at Gd(0001). Dynamics of valence spins fundamentally differs from that in itinerant ferromagnets. The 4f spin-lattice interaction time is estimated to about 100ps by laser pump-, synchrotron probe experiments.

THUIIId.14 • 16:15
Fast Longitudinal and Transverse Structural Relaxation Dynamics in Liquid Glycerol, •*Christoph Klieber[1], Thomas Pezeril[1], Stephane Andrieu[2]*, and *Keith Nelson[1]*; *[1]Department of Chemistry, Massachusetts Institute of Technology, Cambridge, MA 02139, USA, [2]Laboratoire de Physique des Materiaux UMR7556, Universite H. Poincare, 54506 Vandoeuvre, France*.
Novel picosecond ultrasonic techniques for longitudinal and transverse acoustic pulse generation have been employed to probe structural relaxation dynamics in liquid glycerol at gigahertz frequencies over a wide temperature range.

THUIIId.15 • 16:15
Nonlinear optical effects in germanium in the THz range, •*János Hebling[1,2], Matthias C Hoffmann[1], Harold Y Hwang[1], Ka-Lo Yeh[1]*, and *Keith A Nelson[1]*; *[1]Massachusetts Institute of Technology, 77 Massachusetts Ave., Cambridge, MA, 02139, [2]Department of Experimental Physics, University of Pécs, 7624 Hungary*.
Absorption saturation and self-phase-modulation of ultrashort THz pulses was observed in germanium at THz intensities of 100 MW/cm2. These effects, observed both in temporal and frequency domain are likely caused by free carriers.

THUIIId.16 • 16:15
Two-dimensional Fourier transform electronic spectroscopy with a pulse-shaper, *Jeffrey A. Myers, Kristin L. M. Lewis, Patrick F. Tekavec*, and •*Jennifer P. Ogilvie*; *Department of Physics and Biophysics, University of Michigan, Ann Arbor, MI, 48109, USA*.
We report 2D electronic spectra obtained using a pulse-shaper in a pump-probe geometry. We demonstrate the method at visible wavelengths on a dye system and discuss the benefits of this approach compared to other implementations.

THUIIId.17 • 16:15
Relativistic Attosecond Electron Pulses from Cascaded Acceleration using Ultra-intense Radially Polarized Laser Beams, *Charles Varin[1], Pierre-Louis Fortin[2]*, and •*Michel Piché[2]*; *[1]University of Ottawa, Ottawa, Ontario K1N 6N5, Canada, [2]Centre d'optique, photonique et laser, Université Laval, Québec, Qc G1V 0A6 , Canada*.
Attosecond electron pulses with peak energy above 200 MeV could be produced with ultrafast 100-TW radially polarized laser beams in a two-stage configuration. Such electron beams would be collimated and quasi-monoenergetic.

THUIIId.18 • 16:15
Ultrafast dynamics of coherent optical phonons in α-quartz, *Konrad von Volkmann, Tobias Kampfrath, Marcel Krenz, Martin Wolf*, and •*Christian Frischkorn*; *Freie Universität Berlin, Fachbereich Physik, Arnimallee 14, 14195 Berlin, Germany*.

Femtosecond laser excitation of α-quartz causes oscillations in the transmission of probe light due to coherent phonons modulating the refractive index of the sample. Polarization, temperature and fluence dependent data will be presented.

THUIIId.19 • 16:15
Frequency dependence of the molecular reorientation of liquid water, •*Huib Bakker*; *AMOLF, Kruislaan 407, 1098 SJ Amsterdam, The Netherlands*.
Using multi-color femtosecond mid-infrared spectroscopy we find that the reorientation of liquid water involves large frequency jumps. In contrast to recent theoretical predictions, we find that the jumping probability is strongly frequency dependent

THUIIId.20 • 16:15
Structural Dynamics in Organic Semiconductors, *Henrik T. Lemke[1], Tine Ejdrup[1], Dag W. Breiby[2], Peter Hammershøj[1]*, and •*Martin M. Nielsen[1]*; *[1]Centre for Molecular Movies, Niels Bohr Institute, University of Copenhagen, Universitetsparken 5, 2100 Copenhagen, Denmark., [2]Department of Physics, Norwegian University of Science and Technology, Høgskoleringen 5, N-7491 Trondheim, Norway.*.
The first time resolved X-ray structural investigation of electron-phonon coupling in thin films of organic semiconductors. Standing acoustic waves were found, arising from the mechanical coupling at the interface between the film and substrate material.

THUIIId.21 • 16:15
Photoexcitation Decay in DNA-Wrapped Carbon Nanotubes: Exciton Transport and Annihilation, •*Richard Sutton[1], Konstantin Litvinenko[1], Konstantinos Bourdakos[1], Quan-Hong Yang[2], Tom Brown[3]*, and *Jeremy Allam[1]*; *[1]Advanced Technology Institute, University of Surrey, Guildford, UK, [2]Optoelectronics Research Centre, University of Southampton, Southampton, UK, [3]School of Chemistry, University of Southampton, Southampton, UK*.
Intensity-dependent degenerate and non-degenerate pump-probe measurements on DNA-wrapped carbon nanotubes show that the photoexcitation decay is determined by the dimensionality and the enhanced electron-electron interactions in the nanotube.

THUIIId.22 • 16:15
Infuence of Lattice Heating Time on Strain Wave Dynamics in InSb, •*Faton Krasniqi*, *Steven Johnson*, *Paul Beaud*, *Maik Kaiser*, *Daniel Grolimund*, and *Gerhard Ingold*; *Swiss Light Source, Paul Scherrer Institute, CH-5232 Villigen PSI, Switzerland*.
Time resolved X-ray diffraction with sub-picosecond time resolution is used to investigate the fluence dependence of the lattice heating time in InSb.

THUIIId.23 • 16:15
Ultrafast carrier dynamics in spherical CdSe core / elongated CdS shell nanocrystals., •*Maria Grazia Lupo[1,2], Margherita Zavelani Rossi[2], Guglielmo Lanzani[2], Luigi Carbone[1], Liberato Manna[1]*, and *Roberto Cingolani[1]*; *[1]ItalyNNL CNR-INFM, Università degli Studi di Lecce, Italy, [2]Dipartimento di Fisica Politecnico di Milano, piazza Leonardo da Vinci 32 Milano Italy*.
We use femtosecond pump probe transient spectroscopy to study ultrafast carrier dynamics CdSe/CdS asymmetric core/shell nanorods and to obtain information about the different mechanisms responsible of radiative and non radiative recombination.

THUIIId.24 • 16:15
Momentum-resolved lifetime study of image potential states using a novel 500 kHz two-color fiber-laser based NOPA system, •*Klaus Duncker*, *Mario Kiel*, and *Wolf Widdra*; *Martin-Luther-Universität Halle-Wittenberg, 06120 Halle, Germany*.
The momentum-dependent lifetimes of image potential states at a Ag(001) surface have been determined by the use of a novel fiber-based laser-amplifier working at 500 kHz that drives two independent NOPAs.

THUIIId.25 • 16:15
Ultrafast Photoinduced Ferromagnetic Order in a Magnetic Semiconductor Heterostructure, •*Ingrid Cotoros[1], Jigang Wang[1], Xinyu Liu[2], Jacek K. Furdyna[2]*, and *Daniel S. Chemla[1]*; *[1]Department of Physics, University of California at Berkeley and Materials Science Division, Lawrence Berkeley National Laboratory, Berkeley CA, USA, [2]Department of Physics, University of Notre Dame, Notre Dame IN, USA*.
We report ultrafast enhancement of ferromagnetism in GaMnAs via photo-excited holes. The ultrafast magnetization increase close to the critical Curie temperature constitutes the first transient evidence of photoinduced phase transition from para- to ferromagnetic state.

THUIIId.26 • 16:15
A Compact Synchrotron Radiation Source Driven by a Laser-Plasma Wakefield Accelerator, •*Richard Shanks[1], Jordan Gallacher[1], Enrico Brunetti[1], Mark Wiggins[1], Hans Peter Schlenvoigt[2], Kerstin Haupt[2], Alexander Debus[2], Fabian Budde[2], Oliver Jackel[2], Sebastian Pfotenhauer[2], Heinrich Schwoerer[2,3], Erich Rohwer[3]*, and *Dino Jaroszynski[1]*; *[1]Department of Physics, Scottish Universities Physics Alliance, University of Strathclyde, Glasgow G4 0NG, UK, [2]Institut für Optik und Quantenelektronik, Friedrich-Schiller-Universität, 07743 Jena, Germany, [3]Laser Research Institute, University of Stellenbosch, 7602 Matieland, South Africa*.
This presentation outlines the first demonstration of a compact synchrotron radiation source driven by a laser-plasma wakefield accelerator. Mono energetic electron bunches were produced and combined with an undulator to produce visible synchrotron radiation.