

# **XVIIIth International Conference on Ultrafast Phenomena 2012**

**EPJ Web of Conferences Volume 41 (2013)**

**Lausanne, Switzerland  
8 - 13 July 2012**

**ISBN: 978-1-63266-187-6**

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

This work is licensed under a Creative Commons Attribution license:  
<http://creativecommons.org/licenses/by/2.0/>

**You are free to:**

**Share** – copy and redistribute the material in any medium or format.

**Adapt** – remix, transform, and build upon the material for any purpose, even commercial.

The licensor cannot revoke these freedoms as long as you follow the license terms.

**Under the following terms:**

You must give appropriate credit, provide a link to the license, and indicate if changes were made.

You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use. The copyright is retained by the corresponding authors.

Printed by Curran Associates, Inc. (2014)

For additional information, please contact EDP Sciences – Web of Conferences  
at the address below.

EDP Sciences – Web of Conferences  
17, Avenue du Hoggar  
Parc d'Activité de Courtabœuf  
BP 112  
F-91944 Les Ulis Cedex A  
France

Phone: +33 (0) 1 69 18 75 75

Fax: +33 (0) 1 69 28 84 91

[contact@webofconferences.org](mailto:contact@webofconferences.org)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2634  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# TABLE OF CONTENTS

<b>Optimal Control of High-Harmonic Generation</b> .....	1
<i>A. Pou, C. Serrat</i>	
<b>Tunable High Harmonic Generation driven by a Visible Optical Parametric Amplifier</b> .....	4
<i>G. Cirmi, C. Lai, S. Huang, E. Granados, A. Sell, J. Moses, K. Hong, P. Keathley, F. Kartner</i>	
<b>Control of High Harmonic Generation using an off-axis Beam</b> .....	7
<i>K. Dinh, P. Hannaford, L. Dao</i>	
<b>Pulse Compression of Phase-matched High Harmonic Pulses from a Time-Delay Compensated Monochromator</b> .....	10
<i>H. Igarashi, A. Makida, M. Ito, T. Sekikawa</i>	
<b>Attosecond Physics at a Nanoscale Metal Tip</b> .....	13
<i>M. Kruger, M. Schenk, M. Forster, S. Thomas, G. Wachter, C. Lemell, J. Burgdorfer, P. Hommelhoff</i>	
<b>Harmonic Generation with Single-Cycle Light Pulses</b> .....	16
<i>A. Drozdov, S. Kozlov, A. Sukhorukov, Y. Kivshar</i>	
<b>Fractional high-harmonic Combs by Attosecond-precision Split-spectrum Pulse Control</b> .....	19
<i>P. Raith, C. Ott, C. Anderson, A. Kaldun, K. Meyer, M. Laux, Y. Zhang, T. Pfeifer</i>	
<b>Polarization-controlled Quasi-phase-matching of High Harmonic Generation</b> .....	22
<i>L. Liu, K. O’Keeffe, S. Hooker</i>	
<b>Attosecond X-ray Free Electron Laser</b> .....	25
<i>S. Kumar, H. Kang, D. Kim</i>	
<b>The Simplest Method for Generation of an Attosecond Pulse Train</b> .....	28
<i>K. Yoshii, J. Anthony, M. Katsuragawa</i>	
<b>Broadband Multilayer Mirror and Diffractive Optics for Attosecond Pulse Shaping in the 280-500 eV Photon Energy Range</b> .....	31
<i>A. Guggenmos, M. Hofstetter, R. Rauhut, C. Spath, S. Hertrich, B. Nickel, S. Yang, E. Gullikson, J. Schmidt, M. Seibald, W. Schnick, F. Krausz, U. Kleineberg</i>	
<b>Spectral Caustics in Attosecond Science</b> .....	34
<i>O. Raz, O. Pedatzur, B. Bruner, N. Dudovich</i>	
<b>Quasi-phase-matching of High Harmonic Generation using Counter-propagating Pulses</b> .....	37
<i>K. O’Keeffe, S. Hooker</i>	
<b>Plasmonic Enhancement of High Harmonic Generation Revisited: Predominance of Atomic Line Emission</b> .....	40
<i>M. Sivilis, M. Duwe, B. Abel, C. Ropers</i>	
<b>Optimized XUV Source at 100 kHz Repetition Rate</b> .....	43
<i>A. Cabasse, G. Machinet, C. Hazera, S. Petit, E. Cormier, E. Constant</i>	
<b>High Order Harmonic Generation in Three Pulse Scattering Geometry</b> .....	46
<i>C. Vozzi, M. Negro, L. Poletto, S. Silvestri, S. Stagira</i>	
<b>Toward a “Perfect-Wave” HHG Driving With a Multicolor OPA</b> .....	49
<i>T. Balciunas, S. Haessler, G. Fan, G. Andriukaitis, A. Pugzlys, A. Baltuska, A. Zair, R. Squibb, L. Chipperfield, L. Frasiniski, J. Tisch, J. Marangos</i>	
<b>Synchronization of FEL and High-order Harmonics of Ultrashort-pulsed Laser for Generating Intense Full-coherent EUV Light Pulses</b> .....	52
<i>A. Iwasaki, T. Sato, S. Owada, T. Togashi, E. Takahashi, K. Midorikawa, M. Aoyama, K. Yamakawa, S. Matsubara, Y. Okayasu, H. Tomizawa, T. Watanabe, M. Nagasono, M. Yabashi, T. Ishikawa, K. Yamanouchi</i>	
<b>Oscillator-based High-order Harmonic Generation at 4MHz for Applications in Time-of-Flight Photoemission Spectroscopy</b> .....	55
<i>C. Chiang, A. Blattermann, M. Huth, J. Kirschner, W. Widdra</i>	

## ATOMIC, MOLECULAR AND OPTICAL SCIENCE – GAS PHASE

<b>Enhancing Temporal Resolution in Pump-probe Experiments with Noisy Pulses</b> .....	58
<i>K. Meyer, C. Ott, P. Raith, A. Kaldun, Y. Jiang, A. Senfleben, M. Kurka, R. Moshhammer, J. Ullrich, T. Pfeifer</i>	
<b>Quantum Resonance, Anderson Localisation and Selective Rotational Excitation in Periodically Kicked Molecules</b> .....	61
<i>J. Flob, I. Averbukh</i>	
<b>Attosecond Streaking of Shake-up and Auger Electrons in Xenon</b> .....	64
<i>A. Verhoeft, A. Mitrofanov, M. Krikunova, N. Kabachnik, M. Drescher, A. Baltuska</i>	

<b>Ultrafast Relaxation Dynamics of Highly-excited States in N<sub>2</sub> Molecules Excited by Femtosecond XUV Pulses</b> .....	67
<i>M. Lucchini, K. Kim, F. Calegari, F. Kelkensberg, W. Siu, G. Sansone, M. Vrakking, M. Hochlaf, M. Nisoli</i>	
<b>Highly Efficient Molecular Ionization Probed by Few-cycle Laser Pulses</b> .....	70
<i>S. Roither, X. Xie, M. Schoffler, D. Kartashov, L. Zhang, A. Iwasaki, H. Xu, S. Bubin, M. Atkinson, K. Varga, K. Yamanouchi, A. Baltuska, M. Kitzler</i>	
<b>Chirped Auger Electron Emission Due to Field-assisted Post-collision Interaction</b> .....	73
<i>B. Schutte, S. Bauch, U. Fruhling, M. Wieland, M. Gensch, E. Plonjes, T. Gaumnitz, A. Azima, M. Bonitz, M. Drescher</i>	
<b>Electron Acceleration in Vacuum by Ultrashort and Tightly Focused Radially Polarized Laser Pulses</b> .....	76
<i>V. Marceau, A. April, M. Piche</i>	
<b>Attosecond Intramolecular Electron Dynamics</b> .....	79
<i>A. Becker, N. Takemoto, A. Picon, A. Jaron-Becker</i>	
<b>Ultrafast Nonlinear Double Excitations of He in Intense EUV FEL Fields</b> .....	82
<i>M. Fushitani, Y. Hikosaka, A. Matsuda, C. Liu, T. Morishita, E. Shigemasa, A. Hishikawa</i>	
<b>Optical Multidimensional Spectroscopy of Atomic Vapor</b> .....	85
<i>H. Li, G. Moody, A. Bristow, M. Siemens, S. Cundiff</i>	
<b>Carrier Envelope Phase Effects in Strong Field Ionization of Xenon with Few-cycle 1.8 <math>\mu</math>m Laser Pulses</b> .....	88
<i>B. Schmidt, M. Moller, A. Saylor, A. Shiner, G. Vampa, F. Legare, D. Villeneuve, G. Paulus, P. Corkum</i>	
<b>Controlling Ionisation and Fragmentation Processes in CO<sub>2</sub> via Inelastic Electron Recollisions</b> .....	91
<i>M. Oppermann, S. Weber, L. Frasiniski, J. Marangos</i>	
<b>Time-resolved Four-body Coulomb Explosion Imaging of Correlated Dynamics of Hydrogen Atoms in Acetylene Dication</b> .....	94
<i>A. Matsuda, M. Fushitani, E. Takahashi, A. Hishikawa</i>	
<b>Strong-field-induced Attosecond Dynamics in SiO<sub>2</sub></b> .....	97
<i>M. Schultze, E. Bothschafter, A. Sommer, S. Holzner, M. Fiess, M. Hofstetter, R. Kienberger, V. Apalkov, V. Yakovlev, M. Stockman, F. Krausz</i>	
<b>Visible and Ultraviolet Photoelectron Spectroscopy of Fullerenes using Femtosecond Laser Pulses</b> .....	100
<i>J. Johansson, G. Henderson, E. Campbell</i>	
<b>Low-Energy Peak Structure in Strong-Field Ionization by Mid-Infrared Laser Pulses</b> .....	103
<i>C. Lemell, K. Dimitriou, D. Arbo, X. Tong, D. Kartashov, J. Burgdorfer, S. Grafe</i>	
<b>Probing the Longitudinal Momentum Spread of the Electron Wave Packet at the Tunnel Exit</b> .....	106
<i>C. Cirelli, A. Pfeiffer, A. Landsman, M. Smolarski, D. Dimitrovski, L. Madsen, U. Keller</i>	
<b>Dependence of Rydberg Yield on Ellipticity in Strong Field Ionization</b> .....	109
<i>A. Landsman, A. Pfeiffer, M. Smolarski, C. Cirelli, U. Keller</i>	
<b>When Does an Electron Exit a Tunneling Barrier?</b> .....	112
<i>D. Shafir, H. Soifer, B. Bruner, M. Dagan, Y. Mairesse, S. Patchkovskii, M. Ivanov, O. Smirnova, N. Dudovich</i>	
<b>Unidirectional Rotation of Molecules Measured by the Rotational Doppler Effect</b> .....	115
<i>O. Korech, U. Steinitz, R. Gordon, I. Averbukh, Y. Prior</i>	
<b>Fragmentation Control of a Polyatomic Molecule by Fully Determined Laser-Fields</b> .....	118
<i>X. Xie, S. Roither, M. Schoffler, D. Kartashov, H. Xu, L. Zhang, T. Rathje, G. Paulus, K. Doblhoff-Dier, S. Grafe, S. Bubin, M. Atkinson, K. Varga, K. Yamanouchi, A. Baltuska, M. Kitzler</i>	
<b>Ponderomotive Dressing of Doubly-excited States with Intensity-controlled Laser Light</b> .....	121
<i>C. Ott, A. Kaldun, P. Raith, K. Meyer, M. Laux, Y. Zhang, S. Hagstotz, T. Ding, R. Heck, T. Pfeifer</i>	
<b>Time-resolved Spectroscopy of Doubly-excited States in Helium</b> .....	124
<i>C. Ott, A. Kaldun, P. Raith, K. Meyer, M. Laux, Y. Zhang, S. Hagstotz, T. Ding, R. Heck, T. Pfeifer</i>	
<b>Temporal and Spectral Evolution of an Interrupted Virtual Single-photon Transition: Creation of Optical Gain and Loss</b> .....	127
<i>J. Herrmann, M. Weger, R. Locher, M. Sabbar, P. Riviere, U. Saalman, J. Rost, L. Gallmann, U. Keller</i>	
<b>Monitoring Molecular Chirality Exchange by Photon Echoes</b> .....	130
<i>F. Sanda, S. Mukamel</i>	
<b>Efficient Attosecond Control of Electron Dynamics in Molecules</b> .....	133
<i>H. Braun, P. Hoff, T. Bayer, R. Siemering, R. Vivie-Riedle, M. Wollenhaupt, T. Baumert</i>	
<b>Coherent Wave Packet Dynamics in Photo-excited NaI</b> .....	136
<i>T. Leitner, F. Buchner, A. Luebcke, A. Rouzee, L. Rading, P. Johnsson, M. Odelius, H. Karlsson, M. Vrakking, P. Wernet</i>	
<b>Femtosecond Pump-probe Spectroscopy for Single Trapped Molecular Ions</b> .....	139
<i>M. Kowalewski, S. Kahra, G. Leschhorn, T. Schatz, R. Vivie-Riedle</i>	
<b>Probing Chirality with a Femtosecond Reaction Microscope</b> .....	142
<i>N. Ram, C. Lehmann, M. Janssen</i>	
<b>Intra-cluster Dynamics Induced in Molecular Clusters by Femtosecond UV Radiation</b> .....	145
<i>S. Chekalin, V. Kompanets, V. Apatin, D. Ogurok, V. Likhman, D. Poydashev, E. Ryabov</i>	

<b>Initial Processes of Proton Transfer in Salicylideneaniline Studied by Time-Resolved Photoelectron Spectroscopy</b> .....	148
<i>T. Sekikawa, O. Schalk, G. Wu, A. Boguslavskiy, A. Stolow</i>	
<b>Sigma*-mediated Electronic Relaxation in 200nm Photoexcited Ammonia and Heteroaromatics</b> .....	151
<i>S. Ulrich, H. Yu, N. Evans</i>	
<b>Quantum-dynamical Modeling of the Rydberg to Valence Excited-State Internal Conversion in Cyclobutanone and Cyclopentanone</b> .....	154
<i>T. Kuhlman, S. Sauer, T. Solling, K. Moller</i>	
<b>Hydrogen Scrambling in H<sub>3</sub><sup>+</sup> Generation from Ethane Induced by Ultrashort Intense Laser Fields</b> .....	157
<i>R. Kanya, T. Kudou, N. Schirmel, S. Miura, K. Weitzel, K. Hoshina, K. Yamanouchi</i>	
<b>Dynamic Stark Shift of the <sup>3</sup>R<sub>1</sub> Rydberg State of CH<sub>3</sub>I</b> .....	160
<i>G. Balerdi, M. Corrales, G. Gitzinger, J. Gonzalez-Vazquez, I. Sola, V. Lorient, R. Nalda, L. Banares</i>	
<b>Time-Resolved Photoelectron Spectroscopy of Coupled Nuclear-Electronic Dynamics</b> .....	163
<i>M. Falge, V. Engel, S. Grafe</i>	
<b>The Dynamophore – Localization of Excited State Dynamics Studied by Time-Resolved Photoelectron Spectroscopy</b> .....	166
<i>O. Schalk, A. Boguslavskiy, M. Schuurman, A. Stolow</i>	
<b>Investigations of Ultrafast Dynamics in Electronically Excited Alkylbenzenes</b> .....	169
<i>Y. Liu, T. Gerber, P. Radi, Y. Sych, P. Maksyutenko, G. Knopp</i>	

## **CORRELATED ELECTRON SYSTEMS, MAGNETIZATION, AND SPIN DYNAMICS**

<b>The Earliest Stage of Photoinduced Phase Transition in a Strongly Correlated Organic System Using a 10-fs Pulse</b> .....	172
<i>K. Onda, Y. Matsubara, T. Ishikawa, Y. Okimoto, S. Koshihara, T. Hiramatsu, G. Saito, Y. Nakano, H. Yamochi</i>	
<b>Optical and X-ray Time Resolved Study of the Structural Transition in Mixed Valence Manganites</b> .....	175
<i>A. Caviezel, U. Staub, S. Johnson, S. Mariager, G. Ingold, E. Mohr-Vorobeva, M. Garganourakis, S. Huang, C. Milne, Q. Jia, S. Cheong, P. Beaud</i>	
<b>Measuring 3D Magnetic Correlations During the Photo-induced Melting of Electronic Order in La<sub>0.5</sub>Sr<sub>1.5</sub>MnO<sub>4</sub></b> .....	178
<i>R. Tobey, S. Wall, M. Forst, H. Bromberger, V. Khanna, J. Turner, W. Schlotter, M. Trigo, O. Krupin, W. Lee, Y. Chuang, R. Moore, A. Cavalleri, S. Wilkins, H. Zeng, J. Mitchell, S. Dhesi, A. Cavalleri, J. Hill</i>	
<b>Photoinduced Femtosecond Formation of Ferromagnetism in a Strongly Correlated Antiferromagnetic Manganite</b> .....	181
<i>T. Li, A. Patz, J. Yan, T. Lograsso, I. Perakis, J. Wang</i>	
<b>Ultrafast Hot Electron Induced Phase Transitions in Vanadium Dioxide</b> .....	184
<i>M. Hada, Y. Hontani, R. Marvel, R. Haglund, J. Matsuo</i>	
<b>Ultrafast Dynamics of the VO<sub>2</sub> Insulator-to-Metal Transition Observed by Nondegenerate Pump-Probe Spectroscopy</b> .....	187
<i>N. Brady, K. Appavoo, M. Seo, J. Nag, R. Prasankumar, R. Haglund, D. Hilton</i>	
<b>Ultrafast Optical Manipulation of Atomic Motion in Multilayer Ge-Sb-Te Phase Change Materials</b> .....	190
<i>K. Makino, J. Tominaga, A. Kolobov, P. Fons, M. Hase</i>	
<b>Dynamics of Optical Phonons in Bi<sub>2</sub>Se<sub>3</sub> Crystal Studied using Femtosecond Time-resolved Reflection Measurement</b> .....	193
<i>K. Norimatsu, J. Hu, A. Goto, K. Igarashi, T. Sasagawa, K. Nakamura</i>	
<b>Ultrafast Quasiparticle Dynamics of FeTe<sub>0.75</sub>Se<sub>0.25</sub> Superconductor</b> .....	196
<i>Y. Kabasawa, T. Eda, J. Hu, I. Katayama, J. Takeda, M. Kitajima, T. Katagiri, T. Sasagawa, K. Nakamura</i>	
<b>Nonlinear Ultrafast Dynamics of High Temperature YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-δ</sub> Superconductors Probed with THz Pump / THz Probe Spectroscopy</b> .....	199
<i>B. Perkins, H. Hwang, N. Grady, L. Yan, D. Trugman, Q. Jia, H. Chen, A. Taylor, K. Nelson</i>	
<b>Photoinduced Femtosecond Relaxation of Antiferromagnetic Orders in the Iron Pnictides Revealed by Ultrafast Laser Ellipsometry</b> .....	202
<i>A. Patz, T. Li, S. Ran, S. Bud'ko, P. Canfield, J. Wang</i>	
<b>Transient Spin Density Wave Order Induced in the Normal State of BaFe<sub>2</sub>As<sub>2</sub> by Coherent Lattice Oscillations</b> .....	205
<i>K. Kim, A. Pashkin, H. Schafer, M. Beyer, M. Porer, T. Wolf, C. Bernhard, J. Demsar, R. Huber, A. Leitenstorfer</i>	
<b>Photoinduced Coherent Spin Fluctuation in Primary Dynamics of Insulator to Metal Transition in Perovskite Cobalt Oxide</b> .....	208
<i>T. Ishikawa, K. Yamada, H. Itoh, S. Iwai, T. Arima, S. Yamada, T. Sasaki</i>	
<b>Time and Momentum Resolved Resonant Magnetic X-ray Diffraction on EuTe</b> .....	211
<i>C. Trabant, N. Pontius, E. Schierle, E. Weschke, T. Kachel, G. Springholz, K. Holldack, A. Fohlisch, C. Schubler-Langeheine</i>	

<b>Ultrafast Electron Spin Dynamics in ZnO and Zn<sub>1-x</sub>Co<sub>x</sub>O Sol-gel Thin Films</b> .....	214
<i>M. Raskin, K. Whitaker, G. Kiliani, K. Beha, S. Ochesenbein, N. Janben, T. Stiehm, M. Fonin, U. Rudiger, A. Leitenstorfer, D. Gamelin, R. Bratschitsch</i>	
<b>Ultrafast Mid-infrared Spectroscopy of the Charge- and Spin-Ordered Nickelate La<sub>1.75</sub>Sr<sub>0.25</sub>NiO<sub>4</sub></b> .....	217
<i>G. Coslovich, B. Huber, W. Lee, Y. Chuang, Y. Zhu, T. Sasagawa, Z. Hussain, H. Bechtel, M. Martin, R. Schoenlein, Z. Shen, R. Kaindl</i>	
<b>Doppler Velocimetry of Spin and Charge Currents in the 2D Fermi Gas</b> .....	220
<i>J. Koralek, L. Yang, D. Tibbetts, J. Reno, M. Lilly, J. Orenstein</i>	
<b>Ultrafast Carrier Dynamics and Radiative Recombination in Multiferroic BiFeO<sub>3</sub> Single Crystals and Thin Films</b> .....	222
<i>Y. Sheu, S. Trugman, J. Xiong, Y. Park, S. Lee, H. Yi, S. Cheong, Q. Jia, A. Taylor, R. Prasankumar</i>	
<b>Coherent Electron Dynamics in 10 fs Time Scale in Organic Charge Ordered and Dimer-Mott Insulators</b> .....	225
<i>S. Iwai, Y. Kawakami, T. Ishikawa, Y. Sakurai, H. Itoh, K. Yamamoto, T. Sasaki</i>	
<b>Photoinduced Growth of Ferroelectric Charge Order in Organic Dimer-Mott Insulator</b> .....	228
<i>K. Itoh, H. Itoh, S. Iwai, M. Naka, S. Ishihara, S. Saito, N. Yoneyama, T. Sasaki</i>	
<b>Ultrafast Charge Relocation in an Ionic Crystal Probed by Femtosecond X-ray Powder Diffraction</b> .....	231
<i>M. Woerner, F. Zamponi, P. Rothhardt, J. Stingl, T. Elsaesser</i>	
<b>Time-domain Evidence for an Excitonic Insulator</b> .....	234
<i>S. Hellmann, T. Rohwer, M. Kallane, K. Hanff, A. Carr, M. Murnane, H. Kapteyn, L. Kipp, M. Bauer, K. Rossnagel</i>	
<b>Charge Density Wave Dynamics from Ultrafast XUV ARPES</b> .....	237
<i>J. Petersen, S. Kaiser, N. Dean, A. Simoncig, H. Liu, A. Cavaliere, C. Cacho, I. Turcu, E. Springate, F. Frassetto, L. Poletto, S. Dhesi, H. Berger, A. Cavalleri</i>	
<b>Photoinduced Dynamics in the Charge Density Wave Compound 4H<sub>B</sub>-TaSe<sub>2</sub></b> .....	240
<i>N. Erasmus, M. Eichberger, K. Haupt, I. Boshoff, G. Kassier, R. Bimurske, H. Berger, J. Demsar, H. Schwoerer</i>	
<b>Time-resolved Fermi Surface Mapping of the Charge Density Wave Material DyTe<sub>3</sub></b> .....	243
<i>L. Rettig, R. Cortes, J. Chu, I. Fisher, F. Schmitt, P. Kirchmann, R. Moore, Z. Shen, M. Wolf, U. Bovensiepen</i>	
<b>Ultrafast Phase Transition in Vanadium Dioxide Driven by Hot-Electron Injection</b> .....	246
<i>K. Appavoo, N. Brady, M. Seo, J. Nag, R. Prasankumar, D. Hilton, R. Haglund</i>	

## **PHYSICS – CONDENSED PHASE, SURFACES AND LOW DIMENSIONAL SYSTEMS**

<b>Quantum-Optical Spectroscopy of Semiconductors</b> .....	249
<i>S. Cundiff, A. Hunter, R. Smith, M. Mootz, M. Kira, S. Koch</i>	
<b>Transition from Ballistic to Drift Motion in High-field Transport in GaAs</b> .....	252
<i>P. Bownan, W. Kuehn, K. Reimann, M. Woerner, T. Elsaesser, R. Hey, C. Flytzanis</i>	
<b>Observation of Exciton-polariton Ultrafast Dynamic Stark Effect</b> .....	255
<i>C. Lange, A. Hayat, L. Rozema, A. Darabi, H. Driel, A. Steinberg, B. Nelsen, D. Snoke, L. Pfeiffer, K. West</i>	
<b>Non-perturbative Four-wave Mixing in InSb with Intense off-resonant Multi-THz Pulses</b> .....	258
<i>B. Mayer, F. Junginger, C. Schmidt, S. Mahrlein, O. Schubert, A. Pashkin, R. Huber, A. Leitenstorfer</i>	
<b>Competition Between Inverse Piezoelectric Effect and Deformation Potential Mechanism in Undoped GaAs Revealed by Ultrafast Acoustics</b> .....	261
<i>G. Vaudel, P. Ruello, T. Pezeril, V. Gusev</i>	
<b>Ultrafast Electronic Dynamics in Laser-excited Crystalline Bismuth</b> .....	264
<i>A. Melnikov, O. Misochko, S. Chekalin</i>	
<b>Ultrafast Nonlinear Dynamics in thin GaN Films Studied by Femtosecond Digital Holography</b> .....	267
<i>N. Siaulys, A. Urniezius, T. Stanislaukas, T. Malinauskas, V. Kudriasov, A. Melninkaitis</i>	
<b>Polarization-induced Phase Shift of Ultrafast Photocurrents</b> .....	270
<i>S. Priyadarshi, K. Pierz, M. Bieler</i>	
<b>Vibrational and Electronic Ultrafast Relaxation of the Nitrogen-vacancy Centers in Diamond</b> .....	273
<i>V. Huxter, T. Oliver, D. Budker, G. Fleming</i>	
<b>Ultrafast Charge Separation in Low Band-Gap Polymer Blend for Photovoltaics</b> .....	276
<i>M. Maiuri, G. Grancini, D. Fazzi, H. Egelhaaf, D. Brida, G. Cerullo, G. Lanzani</i>	
<b>Photoinduced Charge Transfer Between Indoline D149 and Porous ZnO Detected in Transient Absorption</b> .....	279
<i>E. Rohwer, C. Litwinski, K. Stauch, N. Heming, C. Richter, T. Nyokong, D. Schlettwein, H. Schwoerer</i>	
<b>Exciton and Hole-Transfer Dynamics in Polymer: Fullerene Blends</b> .....	282
<i>A. Serbenta, V. Pavelyev, J. Hummelen, P. Loosdrecht, M. Pshenchnikov</i>	
<b>Ultrafast Laser-induced Melting and Ablation Studied by Time-resolved Diffuse X-ray Scattering</b> .....	285
<i>M. Nicoul, F. Quirin, A. Lindenberg, A. Barty, D. Fritz, D. Zhu, H. Lemke, M. Chollet, D. Reis, J. Chen, S. Ghimire, M. Trigo, M. Fuchs, K. Gaffney, J. Larsson, T. Becker, S. Meyer, T. Payer, F. Heringdorf, M. Hoegen, M. Jerman, K. Sokolowski-Tinten</i>	

<b>Slow Propagation of Photon-like Polaritons Generated by Exciton-exciton Scattering in ZnO Thin Films .....</b>	<b>288</b>
<i>H. Ichida, S. Wakaiki, T. Kawase, K. Mizoguchi, D. Kim, M. Nakayama, Y. Kanematsu</i>	
<b>Ultra-fast Polariton Dynamics in an Organic Microcavity .....</b>	<b>291</b>
<i>T. Virgili, D. Coles, A. Adawi, C. Clark, P. Michetti, S. Rajendran, D. Brida, D. Polli, G. Cerullo, D. Lidzey</i>	
<b>Ultrafast Surface-Plasmon Enhancement of Exciton and Defect Luminescence in ZnO Thin Films .....</b>	<b>294</b>
<i>B. Lawrie, R. Mu, R. Haglund</i>	
<b>Surface Carrier Dynamics on Semiconductor Studied with Femtosecond Core-Level Photoelectron Spectroscopy Using Extreme Ultraviolet High-Order Harmonic Source .....</b>	<b>297</b>
<i>K. Oguri, T. Tsunoi, K. Kato, H. Nakano, T. Nishikawa, H. Gotoh, K. Tateno, T. Sogawa</i>	
<b>Depth-dependent Detection Mechanisms of Coherent Phonons in n-type GaAs.....</b>	<b>300</b>
<i>K. Ishioka, A. Basak, H. Petek</i>	
<b>Manipulation of Squeezed Two-Phonon Bound States using Femtosecond Laser Pulses.....</b>	<b>303</b>
<i>J. Hu, O. Misochko, K. Nakamura</i>	
<b>Coherent Phonon Frequency Comb Generated by Few-cycle Femtosecond Pulses in Si.....</b>	<b>306</b>
<i>M. Hase, M. Katsuragawa, A. Constantinescu, H. Petek</i>	
<b>Interband Excitation and Carrier Relaxation as Displacive Driving Force for Coherent Phonons .....</b>	<b>309</b>
<i>E. Bothschafter, A. Paarmann, N. Karpowicz, E. Zijlstra, M. Garcia, F. Krausz, R. Kienberger, R. Ernstorfer</i>	
<b>A Direct View Onto the Carrier Dynamics in Graphite at the H Point .....</b>	<b>312</b>
<i>A. Stange, C. Sohrt, T. Rohwer, S. Hellmann, G. Rohde, L. Kipp, K. Rossnagel, M. Bauer</i>	
<b>Ultrafast Low-energy Dynamics of Graphite Studied by Nonlinear Multi-THz Spectroscopy.....</b>	<b>315</b>
<i>C. Schmidt, B. Mayer, F. Junginger, M. Rebholz, A. Grupp, D. Brida, R. Huber, A. Leitenstorfer, A. Pashkin</i>	
<b>Ultrafast Two-dimensional THz Spectroscopy of Graphene.....</b>	<b>318</b>
<i>P. Bowlan, E. Moreno, K. Reimann, M. Woerner, T. Elsaesser</i>	
<b>Ultrafast Non-Thermal Electron Dynamics in Single Layer Graphene .....</b>	<b>320</b>
<i>D. Brida, C. Manzoni, G. Cerullo, A. Tomadin, M. Polini, R. Nair, A. Geim, K. Novoselov, S. Milana, A. Lombardo, A. Ferrari</i>	
<b>Two-pulse Space-time Photocurrent Correlations at Graphene p-n Junctions Reveal Hot Carrier Cooling Dynamics Near the Fermi level.....</b>	<b>323</b>
<i>M. Graham, S. Shi, D. Ralph, J. Park, P. McEuen</i>	
<b>Probing the Origin of Fluorescence Quenching of a Graphene-porphyrin Hybrid Material.....</b>	<b>326</b>
<i>D. Sharma, X. Zhang, B. Feringa, W. Browne, J. Herek, A. Huijser</i>	
<b>Resonant Enhancement of Coherent Phonons in Carbon Nanotubes Observed with Sub-10fs Time Resolution .....</b>	<b>329</b>
<i>I. Katayama, K. Tahara, J. Takeda, K. Yanagi, J. Tang, M. Kitajima</i>	
<b>Decoherence in a Landau Quantized Two Dimensional Electron Gas .....</b>	<b>332</b>
<i>J. Curtis, T. Tokumoto, J. Cherian, B. Sangala, S. McGill, D. Hilton</i>	
<b>Tracking Ultrafast Carrier Dynamics in Single Semiconductor Nanowire Heterostructures .....</b>	<b>335</b>
<i>M. Seo, J. Yoo, D. Perea, S. Dayeh, S. Picraux, A. Taylor, R. Prasankumar</i>	
<b>Electron Dynamics of Interatomic Coulombic Decay in Quantum Dots: Singlet Initial State.....</b>	<b>338</b>
<i>A. Bande, F. Pont, P. Dolbundalchok, K. Gokhberg, L. Cederbaum</i>	
<b>CdTe Nanowires Studied by Transient Absorption Microscopy .....</b>	<b>341</b>
<i>S. Lo, T. Major, N. Petchsang, L. Huang, M. Kuno, G. Hartland</i>	
<b>Coherent Phonons in CdSe Quantum Dots Triggered by Ultrafast Electron Transfer .....</b>	<b>344</b>
<i>L. Dworak, M. Braun, J. Wachtveitl</i>	
<b>Multixciton Absorption Cross Sections of CdSe Nanocrystals at Band-Edge Energy .....</b>	<b>347</b>
<i>N. Lenngren, T. Garting, K. Zheng, M. Abdellah, N. Lascoux, F. Ma, A. Yartsev, K. Zidek, T. Pullerits</i>	
<b>Absolute Femtosecond Measurements of Auger Recombination Dynamics in Lead Sulfide Quantum Dots .....</b>	<b>350</b>
<i>B. Cho, W. Peters, V. Tiwari, A. Spencer, D. Baranov, R. Hill, D. Jonas</i>	
<b>Dynamic Interactions of CdSe/ZnS Quantum Dots with Cyclic Solvents Probed by Femtosecond Four-Wave Mixing .....</b>	<b>353</b>
<i>Y. Hirose, H. Kouzai, H. Miyagawa, N. Tsurumachi, S. Koshihara, S. Nakanishi, V. Biju, M. Ishikawa</i>	
<b>Hyperspectral Probing of Exciton Dynamics and Multiplication in PbSe Nanocrystals .....</b>	<b>356</b>
<i>I. Gdor, H. Sachs, A. Roitblat, D. Strassfeld, M. Bawendi, S. Ruhman</i>	

## **CHEMISTRY – CONDENSED PHASE**

<b>Exploring Higher-Lying Electronic States of a Molecular Switch by Coherent Triggered-Exchange 2D Electronic Spectroscopy .....</b>	<b>359</b>
<i>S. Ruetzel, M. Kullmann, J. Buback, P. Nuernberger, T. Brixner</i>	

<b>Vibrational Dynamics Resolved with Sub-10-fs deep-ultraviolet Pulses</b> .....	362
<i>T. Kobayashi, Y. Kida</i>	
<b>Exploring the Polarization Degrees of Freedom in Collinear Two-dimensional Infrared Spectroscopy</b> .....	365
<i>J. Rehault, J. Helbing</i>	
<b>Femtosecond Mid-Infrared Study of the Aqueous Solution Photochemistry of a CO-Releasing Molecule (CORM)</b> .....	368
<i>P. Rudolf, F. Kanal, D. Gehrig, J. Niesel, T. Brixner, U. Schatzschneider, P. Nuernberger</i>	
<b>Monitoring of the Ultrafast Vibrational Kinetic During Formation of Photo-induced Linkage Isomers in Na<sub>2</sub>[Fe(CN)<sub>5</sub>NO] 2H<sub>2</sub>O Single Crystal</b> .....	371
<i>G. Galle, M. Nicoul, T. Woike, D. Schaniel, E. Freysz</i>	
<b>Influence of the Chemical Design on the Coherent Photoisomerization of Biomimetic Molecular Switches</b> .....	374
<i>J. Leonard, D. Polli, G. Cerullo, M. Olivucci, S. Haacke</i>	
<b>Ultrafast CARS with Improved Spectral Resolution</b> .....	377
<i>M. Lutgens, S. Chatzipapadopoulos, S. Lochbrunner</i>	
<b>The Interplay of Different Relaxation Channels in the Excited State Dynamics of Photoinitiators</b> .....	380
<i>T. Wolf, J. Fischer, D. Voll, M. Wegener, C. Barner-Kowollik, A. Unterreiner</i>	
<b>Dynamics of a Photochromic Spiropyran Under Aqueous Conditions</b> .....	383
<i>J. Kohl-Landgraf, M. Braun, C. Ozcoban, D. Goncalves, H. Heckel, J. Wachtveitl</i>	
<b>High Spin ↔ Low Spin Ultrafast Excitation and Relaxation of an Isolated Iron(II) Complex</b> .....	386
<i>G. Galle, J. Tribollet, G. Jonusauskas, M. Tondusson, C. Mauriac, J. Letard, E. Freysz</i>	
<b>Effect of Bridge on Energy Transfer and Photoinduced Charge Separation in Perylene-diimide-naphthalene-bisimide-hexathiophene based Donor-bridge-acceptor Triads</b> .....	389
<i>J. Zaks, J. Sun, S. Kirmayer, J. Urban, T. Tilley, R. Segalman, G. Fleming</i>	
<b>Ultrafast One-Photon (232 vs 266 nm) Bond-Selective Photochemistry of Bromiodomethane (CH<sub>2</sub>BrI) in Solution</b> .....	392
<i>E. Butaeva, A. Mereshchenko, M. Panov, A. Tarnovsky</i>	
<b>Ultrafast Measurements of Coherent Vibrations in Benzenethiol Monolayer Film</b> .....	395
<i>K. Shudo, K. Doi, I. Katayama, M. Kitajima, J. Takeda</i>	
<b>Transient Anisotropy in Degenerate Systems: Experimental Observation in a Cd-porphyrin</b> .....	398
<i>Y. Liang, O. Schalk, A. Unterreiner</i>	
<b>New Perspectives on Ultrafast Förster Resonant Energy Transfer</b> .....	401
<i>I. Pugliesi, H. Langhals, H. Kauffmann, E. Riedle</i>	
<b>Ultrafast Ignition of a Uni-directional Molecular Motor</b> .....	404
<i>J. Conyard, K. Addison, I. Heisler, A. Cnossen, W. Browne, B. Feringa, S. Meech</i>	
<b>Electronic Excited State and Vibrational Dynamics of Water Solution of Cytosine Observed by Time-Resolved Transient Absorption Spectroscopy with Sub-10fs Deep Ultraviolet Laser Pules</b> .....	407
<i>J. Miyazaki, Y. Kida, T. Kobayashi</i>	
<b>Vibronic Coupling in Excited Electronic States Investigated with Resonant 2D Raman Spectroscopy</b> .....	410
<i>T. Backup, J. Kraack, M. Marek, M. Motzkus</i>	
<b>Ultrafast IR Pump-probe and 2D-IR Photon Echo Spectroscopy of Adenosine-thymidine Base Pairs</b> .....	413
<i>C. Greve, N. Preketes, R. Costard, B. Koeppe, H. Fidder, E. Nibbering, F. Temps, S. Mukamel, T. Elsaesser</i>	
<b>Ultrafast Pump-Push Photocurrent Spectroscopy of Organic Photoconversion Systems</b> .....	416
<i>A. Bakulin, A. Rao, Y. Vaynzof, S. Gelinas, V. Pavelyev, P. Loosdrecht, M. Pshenichnikov, D. Niedzialek, J. Cornil, D. Beljoone, R. Friend</i>	
<b>Phase Relationships of Spectral Oscillations in 2D Molecular Spectroscopy</b> .....	419
<i>V. Butkus, D. Zigmantas, L. Valkunas, D. Abramavicius</i>	
<b>Two-Dimensional Heterodyne-Detected VSFG Spectroscopy of Water Molecules at Charged Interfaces</b> .....	422
<i>S. Nihonyanagi, P. Singh, S. Yamaguchi, T. Tahara</i>	
<b>Intramolecular Charge Transfer Dynamics of a Planarized Analogue of 4-(dimethylamino)benzonitrile (DMABN) by Time-Resolved Fluorescence</b> .....	425
<i>M. Park, S. Kim, D. Im, Y. Rhee, T. Joo</i>	
<b>Controlling Quantum Interferences in IR Vibrational Excitations in Metal Carbonyls</b> .....	428
<i>S. Ashihara, K. Enomoto, J. Tayama</i>	
<b>Mapping Chemical Bonding of Reaction Intermediates with Femtosecond X-ray Laser Spectroscopy</b> .....	431
<i>P. Wernet, M. Beye, F. Groot, S. Dusterer, K. Gaffney, S. Grubel, R. Hartsock, F. Hennies, I. Josefsson, B. Kennedy, K. Kunnus, T. Leitner, T. Mazza, M. Meyer, D. Nordlund, M. Odelius, W. Quevedo, P. Radcliffe, I. Rajkovic, B. Schlotter, M. Scholz, S. Schreck, E. Suljoti, S. Techert, J. Turner, C. Weniger, W. Zhang, A. Fohlisch</i>	
<b>Ultrafast Spectroscopy of Linear Carbon Chains: The Case of Dinaphthylpolyyenes</b> .....	434
<i>D. Fazzi, F. Scotognella, A. Milani, D. Brida, E. Cinquanta, L. Ravagnan, P. Milani, F. Cataldo, M. Negro, S. Stagira, C. Vozzi</i>	



<b>Femtosecond Two-photon Ionization of Fluid NH<sub>3</sub> at 9.3 eV</b> .....	437
<i>J. Urbanek, A. Dahmen, J. Torres-Alacan, P. Vohringer</i>	
<b>Femtosecond UV-pump Mid-IR Probe Spectroscopy of the Ultrafast Photodissociation of Azide Radicals from an Azidoiron(III) Complex</b> .....	440
<i>H. Vennekate, D. Schwarzer, J. Torres-Alacan, P. Vohringer</i>	
<b>Internal Conversion vs. Intersystem Crossing – What Drives the Dynamics of Cyclic <math>\alpha,\beta</math>-Enones?</b> .....	443
<i>O. Schalk, P. Lang, M. Schuurman, G. Wu, M. Bradler, E. Riedle, A. Stolow</i>	
<b>Ultrafast Slaving Dynamics at the Protein-water Interface Studied with 2D-IR Spectroscopy</b> .....	446
<i>J. King, K. Kubarych</i>	
<b>Towards Controlling Photochemical Reactivity in Small Polyatomic Molecules in Solution: Difluorodiodomethane</b> .....	449
<i>P. El-Khoury, S. Pal, A. Mereshchenko, A. Tarnovsky</i>	
<b>Two-Dimensional Electronic Spectroscopy of a Model Dimer System</b> .....	452
<i>A. Halpin, P. Johnson, R. Murphy, V. Prokhorenko, R. Miller</i>	
<b>Femtosecond Electron Diffraction Study of the Cyclization Reaction in Crystalline Diarylethene</b> .....	455
<i>H. Jean-Ruel, M. Gao, C. Lu, L. Liu, G. Morienna, R. Cooney, M. Kochman, C. Morrison, G. Sciaini, R. Miller</i>	
<b>Two-dimensional Electronic Femtosecond Stimulated Raman Spectroscopy</b> .....	458
<i>D. Wilcox, J. Ogilvie</i>	
<b>Observation of Two-Exciton States in Perylene Bisimide Aggregates</b> .....	461
<i>S. Wolter, M. Seidel, F. Wurthner, S. Lochbrunner</i>	
<b>Acceptor Energy Offset Manages Ultrafast Recombination Dynamics in Donor-Acceptor Mixtures</b> .....	464
<i>V. Pavelyev, O. Parashchuk, T. Orekhova, I. Perepichka, D. Paraschuk, P. Loosdrecht, M. Pshenichnikov</i>	
<b>Elucidating Charge Delocalization in the High-Spin State of Aqueous Fe<sup>II</sup> Spin-Crossover Compounds via Time-Resolved Spectroscopy in the X-ray Water Window</b> .....	467
<i>N. Huse, B. Kuiken, H. Cho, M. Strader, T. Kim, M. Khalil, R. Schoenlein</i>	
<b>Short-Time Events, Coherence, and Structural Dynamics in Photochemistry of Aqueous Halogenated Transition Metal Dianions</b> .....	470
<i>A. Tarnovsky, I. Zheldakov, P. El-Khoury, S. Pal, A. Mereshchenko, M. Ryazantsev, E. Butaeva, T. Pascher, J. Uhlig, C. Milne, S. Johnson</i>	
<b>Ballistic Energy Transport in PEG Oligomers</b> .....	473
<i>Z. Lin, N. Rubtsova, V. Kireev, I. Rubtsov</i>	
<b>Dissecting X-Ray Raman Resonances Using Four-Wave Mixing</b> .....	476
<i>J. Biggs, Y. Zhang, D. Healion, N. Govind, S. Mukamel</i>	
<b>Model-free Investigation of Ultrafast Bimolecular Chemical Reactions: Bimolecular Photo Induced Electron Transfer</b> .....	479
<i>B. Lang, A. Rosspeintner, E. Vauthey</i>	
<b>Wavepacket Splitting in the First 100 fs Determines the Products from the Bond Cleavage of Diphenylmethylchloride</b> .....	482
<i>C. Sailer, N. Krebs, B. Fingerhut, R. Vivie-Riedle, E. Riedle</i>	
<b>Molecular Wave Packet Dynamics Decelerated by Solvent Environment: A Theoretical Approach</b> .....	485
<i>S. Thallmair, M. Kowalewski, B. Fingerhut, C. Sailer, R. Vivie-Riedle</i>	
<b>Real-time Tracking of Phytochrome's Ring D Orientational Changes During Pr Photoisomerization: Two Pr Isoforms with Different Photoisomerization Yields</b> .....	488
<i>Y. Yang, M. Linke, T. Haimberger, J. Hahn, R. Matute, L. Gonzalez, P. Schmieder, K. Heyne</i>	
<b>Photoinduced Processes in Cobalt-Complexes: Condensed Phase and Gas Phase</b> .....	491
<i>F. Rupp, K. Chevalier, M. Wolf, H. Kruger, C. Wullen, Y. Nosenko, G. Niedner-Schatteburg, C. Riehn, R. Diller</i>	
<b>Ultrafast Inter-ionic Charge Transfer of Transition-metal Complexes Mapped by Femtosecond X-ray Powder Diffraction</b> .....	494
<i>F. Zamponi, B. Freyer, V. Juve, J. Singl, M. Woerner, M. Chergui, T. Elsaesser</i>	

## WATER, HYDROGEN BONDING AND HYDRATION

<b>Femtosecond Two-dimensional Infrared Spectroscopy of Synthetic Hydrogen-bonded Wires: From Homogeneous to Inhomogeneous Dynamics</b> .....	497
<i>S. Knop, M. Olschewski, P. Vohringer</i>	
<b>The Rotation of NO<sub>3</sub><sup>-</sup> as a Probe of Molecular Ion - Water Interactions</b> .....	500
<i>J. Thogersen, J. Nielsen, S. Jensen, S. Keiding, M. Odellius, T. Ogden, J. Rehault, J. Helbing</i>	
<b>Ultrafast Vibrational Dynamics of Water Confined in Phospholipid Reverse Micelles</b> .....	503
<i>R. Costard, C. Greve, N. Levinger, E. Nibbering, T. Elsaesser</i>	
<b>Ultrafast Structural and Vibrational Dynamics of the Hydration Shell Around DNA</b> .....	506
<i>T. Elsaesser, L. Szyc, M. Yang</i>	

<b>Azide-water Intermolecular Coupling Measured by 2-color 2D IR Spectroscopy</b> .....	509
<i>J. Borek, F. Perakis, P. Hamm</i>	
<b>Excited State Dynamics of Liquid Water Near the Surface</b> .....	512
<i>F. Buchner, H. Ritze, M. Beutler, T. Schultz, I. Hertel, A. Lubcke</i>	
<b>Ultrafast OH-stretching Frequency Shifts of Hydrogen-bonded 2-naphthol Photoacid-base Complexes in Solution</b> .....	515
<i>M. Premont-Schwarz, D. Xiao, S. Sekharan, V. Batista, E. Nibbering</i>	
<b>Hydrophobic Hydration of Globular Proteins Studied with 2D-IR Spectroscopy</b> .....	518
<i>J. King, E. Arthur, C. Brooks, K. Kubarych</i>	
<b>Photophysical Processes of the Spectroscopic RNA Probe 2-(1-ethynylpyrene)-adenosine (PyA)</b> .....	521
<i>P. Trojanowski, J. Plotner, C. Grunewald, M. Braun, A. Reuss, J. Engels, J. Wachtveitl</i>	
<b>pH Jump Induced <math>\alpha</math>-helix Folding</b> .....	524
<i>M. Donten, P. Hamm</i>	
<b>Ultrafast Absorption Kinetics of NADH in Folded and Unfolded Conformations</b> .....	527
<i>Z. Heiner, T. Roland, J. Leonard, S. Haacke, G. Groma</i>	
<b>Probing Nucleobase Photoprotection with Soft X-rays</b> .....	530
<i>B. McFarland, J. Farrell, N. Berrah, C. Bostedt, J. Bozek, P. Bucksbaum, R. Coffee, J. Cryan, L. Fang, R. Feifel, J. Gaffney, J. Glowonia, T. Martinez, M. Mucke, B. Murphy, S. Miyabe, A. Natan, T. Osipov, V. Petrovic, S. Schorb, T. Schultz, L. Spector, F. Tarantelli, I. Tenney, S. Wang, W. White, J. White, M. Guhr</i>	
<b>Ultrafast Spectroscopy of UV-induced DNA-lesions — on the Search for Strategies Which Keep DNA Alive</b> .....	533
<i>W. Zinth, B. Fingerhut, T. Herzog, G. Ryseck, K. Haiser, F. Graupner, K. Heil, P. Gilch, W. Schreier, T. Carell, R. Vivie-Riedle</i>	
<b>Ultrafast Dynamics and Raman Imaging of Metal Complexes of Tetrasulphonated Phthalocyanines in Human Cancerous and Noncancerous Breast Tissues</b> .....	536
<i>H. Abramczyk, A. Jarota, B. Brozek-Pluska, M. Tondusson, E. Freysz, J. Musial, R. Kordek</i>	

## **BIOLOGICAL SYSTEMS**

<b>Photoexcitation Dynamics of Nitric Oxide Bound Ferric Myoglobin Probed by Femtosecond IR Spectroscopy</b> .....	539
<i>J. Park, T. Lee, M. Lim</i>	
<b>Structural Evolution in Photoactive Yellow Protein Studied by Femtosecond Stimulated Raman Spectroscopy</b> .....	542
<i>R. Nakamura, N. Hamada, K. Abe, M. Yoshizawa</i>	
<b>Transient IR Study of Blue Light Sensing Proteins</b> .....	545
<i>A. Lukacs, A. Haigney, R. Brust, R. Zhao, G. Greetham, M. Towrie, P. Tonge, S. Meech</i>	
<b>Ultrafast Geminate Electron-radical Recombination Dynamics in Photoactive Yellow Protein</b> .....	548
<i>J. Zhu, L. Paparelli, M. Hospes, J. Arents, K. Hellingerwerf, J. Kennis, I. Stokkum, M. Groot</i>	
<b>Configurational Fluctuations and Flavin-substrate Interactions in the Flavoenzyme ThyX Studied by Time- and Spectrally Resolved Fluorescence</b> .....	551
<i>S. Liptenok, L. Bouzhir-Sima, H. Myllykallio, U. Liebl, M. Vos</i>	
<b>Optimal Dynamic Discrimination in Tryptophan-Containing Dipeptides</b> .....	554
<i>S. Afonina, O. Nenadl, A. Rondi, D. Kiselev, J. Extermann, L. Bonacina, J. Wolf</i>	
<b>Measuring Enzyme Binding Using Shaped Ultrafast Laser Pulses</b> .....	557
<i>B. Pearson, C. Tseng, T. Weinacht</i>	
<b>Selective Assignment of Energy Transfer and Charge Separation Pathways in Reaction Centers by Pulse Polarized 2-D Photon Echo Spectroscopy</b> .....	560
<i>B. Fingerhut, K. Bennett, O. Roslyak, S. Mukamel</i>	
<b>Coherent Nuclear Wave Packet Dynamics of Laurdan Launched by Intramolecular Charge Transfer</b> .....	563
<i>S. Kim, T. Joo</i>	
<b>Oscillatory Dynamics in Bacterial Reaction Centres Studied by Electronic 2D Spectroscopy</b> .....	566
<i>D. Palecek, S. Westenhoff, P. Edlund, P. Smith, D. Zigmantas</i>	
<b>Optical Response of Fluorescent Molecules Studied by Synthetic Femtosecond Laser Pulses</b> .....	569
<i>A. Konar, J. Shah, V. Lozovoy, M. Dantus</i>	
<b>Probing How Initial Retinal Configuration Controls Photochemical Dynamics in Retinal Proteins</b> .....	572
<i>A. Wand, R. Rozin, T. Eliash, N. Friedman, K. Jung, M. Sheves, S. Ruhman</i>	
<b>Resonant Two-Photon Excitation Pathways During Retinal-Isomerization in Bacteriorhodopsin</b> .....	575
<i>J. Kraack, T. Buckup, M. Motzkus</i>	
<b>Mixed Potential Energy Surfaces of the Ultrafast Isomerization of Retinal in Bacteriorhodopsin</b> .....	578
<i>P. Johnson, A. Halpin, T. Morizumi, V. Prokhorenko, O. Ernst, R. Miller</i>	

<b>Fluorescence Kinetics of Flavin Adenine Dinucleotide in Different Microenvironments</b> .....	581
<i>Z. Heiner, A. Makai, F. Sarlos, C. Bagyinka, A. Toth, G. Rakhely, G. Groma</i>	
<b>Time-Resolved Down-Conversion of 2-Aminopurine in a DNA Hairpin: Fluorescence Anisotropy and Solvent Effects</b> .....	584
<i>P. Touceda, T. Gelot, O. Cregut, J. Leonard, S. Haacke</i>	

## **MOLECULAR LIGHT HARVESTING AND CHARGE-TRANSFER COMPLEXES**

<b>Ultrafast Charge Separation Dynamics of Twisted Intramolecular Charge Transfer State (TICT) in Coumarin Dye Sensitized TiO<sub>2</sub> Film: A New Route to Achieve Higher Efficient Dye-Sensitized Solar Cell</b> .....	587
<i>S. Verma, H. Ghosh</i>	
<b>Ultraviolet-resonance Femtosecond Stimulated Raman Study of the Initial Events in Photoreceptor Chromophore</b> .....	590
<i>S. Takeuchi, H. Kuramochi, T. Tahara</i>	
<b>Ultrafast Proton Coupled Electron Transfer (PCET) Dynamics in 9-anthranol-aliphatic Amine System</b> .....	593
<i>H. Ghosh, K. Adamczyk, S. Verma, J. Dreyer, E. Nibbering</i>	
<b>Electronic and Vibrational Coherences in Algal Light-Harvesting Proteins</b> .....	596
<i>D. Turner, G. Scholes</i>	
<b>Broadband 2D Electronic Spectroscopy Reveals Coupling Between Dark 1B<sub>u</sub><sup>-</sup> State of Carotenoid and Q<sub>x</sub> State of Bacteriochlorophyll</b> .....	599
<i>E. Ostroumov, C. Jumper, R. Mulvaney, R. Cogdell, G. Scholes</i>	
<b>Femtosecond Transient Absorption Spectroscopy on the Light-Adaptation of Living Plants</b> .....	602
<i>M. Muller, P. Jahns, A. Holzwarth</i>	
<b>Dark Excited States of Carotenoid in Light Harvesting Complex Probing with Femtosecond Stimulated Raman Spectroscopy</b> .....	605
<i>O. Yoshimatsu, K. Abe, S. Sakai, T. Horibe, R. Fujii, M. Nango, H. Hashimoto, M. Yoshizawa</i>	
<b>Comparing the Photophysics of the Two Forms of the Orange Carotenoid Protein using 2D Electronic Spectroscopy</b> .....	608
<i>E. Re, G. Schlau-Cohen, V. Huxter, R. Leverenz, R. Mathies, G. Fleming</i>	
<b>Coherence Dynamics in Light-harvesting Complexes with Two-colour Spectroscopy</b> .....	611
<i>G. Richards, P. Curmi, K. Wilk, H. Quiney, J. Davis</i>	
<b>Ultrafast Energy Transfer in an Artificial Photosynthetic Antenna</b> .....	614
<i>M. Maiuri, J. Snellenburg, I. Stokkum, S. Pillai, D. Gust, T. Moore, A. Moore, R. Grondelle, G. Cerullo, D. Polli</i>	
<b>Tracing of Backward Energy Transfer from LH1 to LH2 in Photosynthetic Membranes Grown under High and Low Irradiation</b> .....	617
<i>L. Luer, V. Moulisova, S. Henry, D. Polli, T. Brotsudarmo, S. Hoseinkhani, D. Brida, G. Lanzani, G. Cerullo, R. Cogdell</i>	
<b>B-side Electron Transfer in Bacterial Photosynthetic Reaction Centers Revealed by a Few-Cycle Pulse Laser</b> .....	620
<i>J. Du, T. Kobayashi, K. Watanabe, H. Tamiaki</i>	
<b>π-π-Conjugated Donor-Acceptor Systems as Metal-Free Sensitizers for Dye-Sensitized Solar Cell Applications</b> .....	623
<i>M. Wielopolski, J. Moser, M. Marszalek, S. Zakeeruddin, M. Gratzel</i>	
<b>Nonclassical Energy Transfer in Photosynthetic FMO Complex</b> .....	626
<i>V. Abramavicius, D. Abramavicius</i>	
<b>Fast Exciton Dynamics and Coherent Oscillations Revealed by Coherent 2D Spectroscopy in Chlorosomes</b> .....	629
<i>J. Dostal, T. Mancal, F. Vacha, R. Augulis, J. Psencik, D. Zigmantas</i>	
<b>Time Domain Characterization of Light Trapping States in Thin Film Solar Cells</b> .....	632
<i>M. Birlo, D. Differt, F. Lukermann, W. Pfeiffer, H. Stiebig</i>	
<b>Quantum Coherence Controls the Charge Separation in a Prototypical Artificial Light Harvesting System</b> .....	635
<i>S. Falke, C. Rozzi, N. Spallanzani, A. Rubio, E. Molinari, D. Brida, M. Maiuri, G. Cerullo, H. Schramm, J. Christoffers, C. Lienau</i>	
<b>Continuum Probe Two-dimensional Electronic Spectroscopy of the Photosystem II Reaction Center</b> .....	638
<i>F. Fuller, J. Ogilvie</i>	
<b>Ultrafast Charge Transfer Visualized by Two-Dimensional Electronic Spectroscopy</b> .....	641
<i>O. Bixner, N. Christensson, J. Hauer, F. Milota, T. Mancal, V. Lukes, H. Kauffmann</i>	

<b>A New Mechanism for Photosynthetic Energy Transfer</b> .....	644
<i>V. Tiwari, W. Peters, D. Jonas</i>	

## **THZ SCIENCE AND TECHNOLOGY, NANO-OPTICS, PLASMONICS AND META MATERIALS**

<b>Generation and Detection of Ultrabroadband Infrared Wave Exceeding 200 THz</b> .....	647
<i>E. Matsubara, M. Nagai, M. Ashida</i>	
<b>Spatiotemporal Ultrafast-Plasmon Control Based on Response Functions of Nanostructures Measured by Interferometric Cross-Correlation Microscopy</b> .....	650
<i>F. Kannari, S. Onishi, M. Kusaba, J. Oi</i>	
<b>Self-phase Modulation of a Single-cycle THz Pulse</b> .....	653
<i>D. Turchinovich, J. Hvam, M. Hoffmann</i>	
<b>Lower Frequency Region Mid-infrared Spectroscopy by Chirped Pulse Upconversion</b> .....	656
<i>J. Zhu, T. Mathes, A. Stahl, J. Kennis, M. Groot</i>	
<b>Metamaterial-Enhanced Nonlinear Terahertz Spectroscopy</b> .....	659
<i>H. Hwang, M. Liu, K. Fan, J. Zhang, A. Strikwerda, A. Sternbach, N. Brandt, B. Perkins, X. Zhang, R. Averitt, K. Nelson</i>	
<b>Near-field Terahertz Imaging of a Discontinuity in Split Ring Resonator Array</b> .....	662
<i>F. Blanchard, K. Ooi, T. Tanaka, A. Doi, K. Tanaka</i>	
<b>Third- and Fifth-harmonic Generation by Mid-infrared Ultrashort Pulses: Beyond the Fifth-order Nonlinearity</b> .....	665
<i>D. Kartashov, S. Alisauskas, A. Pugzlys, A. Voronin, A. Zheltikov, A. Baltuska</i>	
<b>Second Harmonic Generation in NLO Polymers Excited by Surface Plasmon Enhanced Electric Field Induced by Femtosecond Optical Pulses</b> .....	668
<i>A. Sugita, K. Suto, A. Ono, W. Inami, Y. Kawata</i>	
<b>Sub-cycle Switching of a Photonic Bandstructure via Ultrastrong Light-matter Coupling</b> .....	671
<i>J. Menard, M. Porer, A. Leitenstorfer, R. Huber, R. Degl'Innocenti, S. Zanotto, G. Biasiol, L. Sorba, A. Tredicucci</i>	
<b>Femtosecond Optical Control on the Nanoscale</b> .....	674
<i>S. Berweger, J. Atkin, X. Xu, M. Raschke</i>	
<b>Recovery of Ultra-broadband Terahertz Pulses from Sum-frequency Spectrograms using a Generalized Deconvolution Method</b> .....	677
<i>M. Thomson, V. Blank, H. Roskos</i>	
<b>Influencing the Ultrafast Plasmon Damping Time using Fano Resonances for Nonlinear Plasmonics</b> .....	680
<i>K. Thyagarajan, O. Martin</i>	
<b>Strong-field Photoemission from Nanostructures driven by Few-cycle Mid-infrared Fields</b> .....	683
<i>G. Herink, D. Solli, M. Gulde, C. Ropers</i>	
<b>Ultrafast Infrared Near-field Molecular Nano-spectroscopy</b> .....	686
<i>X. Xu, I. Craig, M. Rang, M. Raschke</i>	
<b>Nonlinear Terahertz Spectroscopy in Solids with Single-Cycle Terahertz Pulses</b> .....	689
<i>K. Tanaka</i>	
<b>Photomixing for Coherent Retrieval of THz Waveforms from a Frequency Multiplier</b> .....	692
<i>F. Constantin</i>	
<b>Coherent Spectroscopies on Ultrashort Time and Length Scales</b> .....	695
<i>T. Brixner, M. Aeschlimann, A. Fischer, P. Geisler, S. Goetz, B. Hecht, J. Huang, T. Keitzl, C. Kramer, P. Melchior, W. Pfeiffer, G. Razinskas, C. Rewitz, C. Schneider, C. Stuber, P. Tuchscherer, D. Voronine</i>	
<b>Real-time Observation of Ultrafast Rabi Oscillations Between Excitons and Plasmons in Metal/molecular Aggregate Hybrid Nanostructures</b> .....	698
<i>P. Vasa, W. Wang, R. Pomraenke, M. Lammers, M. Maiuri, C. Manzoni, G. Cerullo, C. Lienau</i>	

## **NOVEL PULSED SOURCES: OSCILLATORS, AMPLIFIERS, NONLINEAR MIXING, ELECTRONS, X-RAYS**

<b>Sub-picosecond Graphene-based Harmonically Mode-Locked Fiber Laser With Repetition Rates up to 2.22 GHz</b> .....	701
<i>G. Sobon, J. Sotor, K. Abramski</i>	
<b>Coherent Synthesis of Ultra-broadband Optical Parametric Amplifiers</b> .....	704
<i>C. Manzoni, S. Huang, G. Cirmi, P. Farinello, J. Moses, S. Silvestri, F. Kartner, G. Cerullo</i>	
<b>Mid-Infrared Femtosecond Filament and Three Octaves Continuum Generation in Gases</b> .....	707
<i>S. Alisauskas, D. Kartashov, A. Pugzlis, A. Voronin, A. Zheltikov, M. Petrarca, P. Bejot, J. Kasparian, A. Baltuska</i>	

<b>Intense, Directional UV Emission from Molecular Nitrogen Ions in an Adaptively Controlled Femtosecond Filament.....</b>	<b>710</b>
<i>G. Andriukaitis, J. Mohring, D. Kartashov, A. Pugzlys, A. Zheltikov, M. Motzkus, A. Baltuska</i>	
<b>Towards Optical Attosecond Pulses: Broadband Phase Coherence Between an Ultrafast Laser and OPO using Lock-to-zero CEO Stabilization .....</b>	<b>713</b>
<i>R. McCracken, J. Sun, C. Leburn, D. Reid</i>	
<b>Air-clad Chirally-coupled-core Yb-fiber Femtosecond Oscillator with &gt;10W Average Power .....</b>	<b>716</b>
<i>H. Chen, G. Chang, C. Zhu, X. Ma, A. Galvanauskas, F. Kartner</i>	
<b>Coherent Electron Source for Ultrafast Electron Diffraction and Imaging .....</b>	<b>719</b>
<i>M. Muller, A. Paarmann, C. Xu, R. Ernstorfer</i>	
<b>Asynchronous Mid-infrared Broadband Optical Parametric Oscillator for Dual-comb Spectroscopy .....</b>	<b>722</b>
<i>Z. Zhang, C. Gu, J. Sun, C. Wang, T. Gardiner, D. Reid</i>	
<b>Ultrafast Thin Disk Lasers: Sub-100 fs Pulse Duration and Carrier Envelope Offset Detection .....</b>	<b>725</b>
<i>C. Saraceno, S. Pekarek, O. Heckl, C. Baer, C. Schriber, M. Golling, K. Beil, C. Krankel, G. Huber, T. Sudmeyer, U. Keller</i>	
<b>Multi-octave Supercontinuum Generation from Mid-infrared Filamentation in a Bulk Crystal.....</b>	<b>728</b>
<i>D. Austin, F. Silva, A. Thai, M. Baudisch, M. Hemmer, D. Faccio, A. Couairon, J. Biegert</i>	
<b>Continuum Generation in Bulk Materials from the Deep UV to the Infrared with Pump Pulse Durations over the Entire Femtosecond Regime.....</b>	<b>731</b>
<i>M. Bradler, E. Riedle</i>	
<b>Generation of sub-two-cycle Pulses Tunable Around 1.8 <math>\mu\text{m}</math> with Passively Stabilized Carrier-envelope Phase at 100 kHz Repetition Rate.....</b>	<b>734</b>
<i>C. Homann, M. Bradler, M. Forster, P. Hommelhoff, E. Riedle</i>	
<b>Femtosecond Pulse Generation at 50 W Average Powers from an Yb:KYW-Yb:YAG Planar-waveguide MOPA .....</b>	<b>737</b>
<i>C. Ramirez-Corral, I. Thomson, C. Leburn, D. Hall, D. Reid, H. Baker</i>	
<b>Optical Parametric Chirped Pulse Amplifier at 1600 nm with All-optical Synchronization .....</b>	<b>740</b>
<i>E. Pelletier, A. Leitenstorfer, R. Miller</i>	
<b>Fully Coherent Spectral Broadening of Femtosecond Pulses from an Er: Fiber System .....</b>	<b>743</b>
<i>S. Kumkar, G. Krauss, D. Brida, A. Leitenstorfer</i>	
<b>Ultrafast Time Resolved Reflection High Energy Electron Diffraction with Tilted Pump Pulse Fronts .....</b>	<b>746</b>
<i>P. Zhou, C. Streubuhr, A. Kalus, T. Frigge, S. Wall, A. Hanisch-Blicharski, M. Kammler, M. Ligges, U. Bovensiepen, D. Linde, M. Hoegen</i>	
<b>All-fiber Femtosecond Cherenkov Source .....</b>	<b>749</b>
<i>X. Liu, J. Laegsgaard, U. Moller, H. Tu, S. Boppert, D. Turchinovich</i>	
<b>Strong Field Acceleration of Attosecond Electron Pulses emitted by a Sharp Metallic Nanoprobe.....</b>	<b>752</b>
<i>D. Park, S. Schmidt, B. Piglosiewicz, C. Lienau</i>	
<b>Highly-efficient 1-GHz-repetition-frequency Femtosecond Yb<sup>3+</sup>:KY(WO<sub>4</sub>)<sub>2</sub> Laser for Super-continuum Generation.....</b>	<b>755</b>
<i>T. Schratwieser, C. Leburn, D. Reid</i>	
<b>Optimization of Ultrafast Yb-doped Fiber Amplifiers to Achieve High-quality Compressed Pulses.....</b>	<b>758</b>
<i>J. Lim, H. Chen, A. Calendron, G. Chang, F. Kartner</i>	
<b>Terawatt Post Compression of High Energy fs Pulses using Ionization: A way to Overcome the Conventional Limitation in Energy of Few Optical Cycle Pulses .....</b>	<b>761</b>
<i>O. Hort, A. Dubrouil, C. Fourcade-Dutin, S. Petit, E. Mevel, D. Descamps, E. Constant</i>	
<b>Measuring the Suppression of Ultrashort Pulses into Airy-Bessel Light Bullets with Almost Single-cycle Temporal Resolution.....</b>	<b>764</b>
<i>P. Piksarv, H. Valtna-Lukner, A. Valdmann, M. Lohmus, R. Matt, P. Saari</i>	
<b>Generation of Coherent sub-20 nm XUV Radiation at 78 MHz via Cavity-Based HHG .....</b>	<b>767</b>
<i>I. Pupeza, S. Holzberger, T. Eidam, D. Esser, J. Weitenberg, H. Carstens, P. Rubbuldt, J. Limpert, T. Udem, A. Tunnermann, T. Hansch, F. Krausz, E. Fill</i>	

## **FREQUENCY COMBS, WAVEFORM SYNTHESIS, PULSE SHAPING AND APPLICATIONS**

<b>Spatial and Spectral Coherent Control over Direct Frequency Comb Excitation .....</b>	<b>770</b>
<i>I. Barmes, S. Witte, K. Eikema</i>	
<b>Programmable Broadband Ultra-fine Resolution 2-D Pulse Shaping.....</b>	<b>773</b>
<i>A. Metcalf, V. Torres-Company, V. Supradeepa, D. Leaird, A. Weiner</i>	
<b>Generation of Phase-stable Half-cycle Mid-infrared Pulses through Filamentation in Gases .....</b>	<b>776</b>
<i>Y. Nomura, T. Fuji, H. Shirai, N. Tsurumachi, A. Voronin, A. Zheltikov</i>	

<b>Two-dimensional Spectroscopy using Dual Acousto-optic Pulse Shapers for Complete Polarization, Phase and Amplitude Control</b> .....	779
<i>P. Tyagi, J. Saari, V. Crozatier, N. Forget, P. Kambhampati</i>	
<b>Pulse Shaping of on-chip Microresonator Frequency Combs: Investigation of Temporal Coherence</b> .....	782
<i>F. Ferdous, H. Miao, D. Leaird, K. Srinivasan, L. Chen, V. Aksyuk, A. Weiner</i>	
<b>High Brightness XUV Frequency Combs via Intracavity High Harmonic Generation</b> .....	785
<i>T. Allison, A. Cingoz, C. Benko, D. Yost, A. Ruehl, M. Fermann, I. Hartl, J. Ye</i>	
<b>Shaper-based Approach to Real-time Correction of Ultrashort Pulse Phase Drifts and Transient Pulse Dispersion Measurements</b> .....	788
<i>D. Pestov, G. Rasskazov, A. Ryabtsev, I. Pastirk, M. Dantus</i>	
<b>Generation of Trains of Arbitrary Waveforms and their Repeated Revivals</b> .....	791
<i>M. Katsuragawa, T. Suzuki, K. Pandiri</i>	
<b>Pulse-shaping-based Two-photon FRET Microscopy</b> .....	794
<i>M. Brenner, D. Cai, S. Straight, J. Swanson, J. Ogilvie</i>	
<b>Carrier-envelope Phase Drift Detection of Picosecond Pulses</b> .....	797
<i>A. Borzsonyi, P. Jofart, R. Chiche, V. Soskov, F. Zomer, E. Cormier, K. Osvay</i>	

## **OPTICS, OPTOELECTRONICS, MEASUREMENT, DIAGNOSTIC, AND APPLICATIONS**

<b>Frequency-resolved Optical Gating with Electro-optic Sampling</b> .....	800
<i>T. Fuji, Y. Nomura, H. Shirai, N. Tsurumachi</i>	
<b>Self-referenced Spectral Interferometry for Ultra-short Infrared Pulse Characterization</b> .....	803
<i>A. Trisorio, S. Grabielle, M. Divall, N. Forget, C. Hauri</i>	
<b>Spatio-temporal Characterization and Control of Ultrashort Pulses through a Multiply Scattering Medium</b> .....	806
<i>A. Tajalli, D. McCabe, D. Austin, S. Gigan, I. Walmsley, B. Chatel</i>	
<b>Femtosecond X-ray Diffraction using the Rotating Crystal Method</b> .....	809
<i>B. Freyer, J. Stingl, F. Zamponi, M. Woerner, T. Elsaesser</i>	
<b>First Measurement of the Non-instantaneous Response Time of a <math>\chi^{(3)}</math> Nonlinear Optical Effect</b> .....	812
<i>S. Das, M. Bock, R. Grunwald, B. Borchers, J. Hyyti, G. Steinmeyer, D. Ristau, A. Harth, T. Vockerodt, T. Nagy, U. Morgner</i>	
<b>Nonlinear Spectroscopy of Chromophore Aggregates with Entangled Photon Pulses</b> .....	815
<i>F. Schlavin, K. Dorfman, B. Fingerhut, S. Mukamel</i>	
<b>Higher-order Kerr Effects Improve Quantitative Modelling of Harmonics Generation and Laser Filamentation</b> .....	818
<i>J. Kasparian, P. Bejot, M. Petrarca, E. Hertz, B. Lavorel, O. Faucher, J. Wolf</i>	
<b>Laser Filament Induced Water Condensation</b> .....	821
<i>S. Henin, K. Stelmaszczyk, M. Petrarca, P. Rohwetter, Z. Hao, J. Luder, Y. Petit, A. Vogel, K. Weber, J. Kasparian, L. Woste, J. Wolf</i>	
<b>Ultrafast-Laser-Induced Backward Stimulated Raman Scattering for Tracing Atmospheric Gases</b> .....	824
<i>P. Malevich, D. Kartashov, Z. Pu, S. Alisaukas, A. Pugzlys, A. Baltuska, L. Giniunas, R. Danielius, A. Zheltikov, M. Maranoni, G. Cerullo</i>	
<b>Tunable Ultrafast Nonlinear Optofluidic Coupler</b> .....	827
<i>M. Vieweg, S. Pricking, T. Gissibl, Y. Kartashov, L. Torner, H. Giessen</i>	
<b>Precise and Rapid Detection of Optical Activity for Accumulative Femtosecond Spectroscopy</b> .....	830
<i>A. Steinbacher, J. Buback, P. Nuernberger, T. Brixner</i>	
<b>Heterodyne Detection of Electronic Optical Activity in Time-Domain: Single-Shot Chiroptical Spectrometry</b> .....	833
<i>I. Eom, S. Ahn, H. Rhee, M. Cho</i>	
<b>Correlated Rotational Alignment Spectroscopy of Isolated Molecules and Molecular Mixtures</b> .....	836
<i>C. Schroter, K. Kosma, T. Schultz</i>	
<b>Coherent Lensless Imaging with Ultra-Broadband Light Sources</b> .....	839
<i>S. Witte, V. Tenner, D. Noom, K. Eikema</i>	
<b>Temporal Coherence Effects on Coherent Diffractive Imaging of a Binary Sample by a High Harmonic Source</b> .....	842
<i>A. Parsons, R. Chapman, B. Mills, S. Bajt, J. Frey, W. Brocklesby</i>	
<b>Ultrafast Dynamics of Water at the Water-air Interface Studied by Femtosecond Surface Vibrational Spectroscopy</b> .....	845
<i>M. Bonn, C. Hsieh, L. Piatkowski, H. Bakker, Z. Zhang</i>	
<b>Author Index</b>	