WED2A • Frequency Combs and Waveform Synthesis

Auditorium
10:45–12:30
WED2A • Frequency Combs and Waveform Synthesis
Chair: Franz Kaertner, Massachusetts Institute of Technology, Cambridge, USA

WED2A.1 • 10:45 •Invited•

The evolving femtosecond laser frequency comb, •*Scott Diddams, Danielle Braje, Tara Fortier, Leo Hollberg, Matt Kirchner, Vela Mbele, Stephanie Meyer, Qudsia Quraishi,* and *Shijun Xiao*; *NIST, 325 Broadway, Boulder, Colorado, USA.*
The femtosecond laser frequency comb has evolved from the frequency-domain representation of a train of ultrashort pulses to an enabling tool for atomic timekeeping, high-resolution spectroscopy, and ultrafast optical waveform synthesis.

WED2A.2 • 11:15
CEO-Phase Stabilized Few-Cycle Waveform Synthesizer, •*Stefan Rausch*[1], *Thomas Binhammer*[1], *Anne Harth*[1], *Niels Meiser*[1], *Franz X. Kärtner*[2], and *Uwe Morgner*[1,3]; [1]*Institute for Quantum Optics, Leibniz Universität Hannover, Welfengarten 1, 30167 Hannover, Germany,* [2]*Department of Electrical Engineering and Computer Science, Massachusetts Institute of Technology (MIT), Cambridge, MA, USA,* [3]*Laserzentrum Hannover (LZH), 30419 Hannover, Germany.*
We present a waveform synthesizer consisting of a CEO-phase stabilized octave-spanning Ti:sapphire laser-oscillator and prism-based pulse shaper allowing for full control of the electric field on a sub-femtosecond time-scale.

WED2A.3 • 11:30
High-power, mHz linewidth Yb:fiber optical frequency comb for high harmonic generation, •*Thomas R. Schibli*[1], *Dylan C. Yost*[1], *Michael J. Martin*[1], *Jun Ye*[1], *Ingmar Hartl*[2], *Andrius Marcinkevičius*[2], and *Martin E. Fermann*[2]; [1]*JILA, National Institute of Standards and Technology and University of Colorado, Boulder, CO 80309, USA,* [2]*IMRA America, Inc., 1044 Woodridge Ave., Ann Arbor, MI 48105, USA.*
We present a fully phase-stabilized, high-power Yb:fiber frequency comb with record-low sub-mHz relative linewidths. Utilizing coherent pulse-addition inside a passive optical cavity, we achieve >3kW average power for HHG at a 136MHz pulse repetition rate.

WED2A.4 • 11:45
High Harmonic Frequency Combs for High Resolution Spectroscopy, •*Akira Ozawa*[1], *Jens Rauschenberger*[1,2], *Christoph Gohle*[1], *Maximilian Herrmann*[1], *David Walker*[1], *Volodymyr Pervak*[2], *Alma Fernandez*[1], *Alexander Apolonski*[2], *Ronald Holzwarth*[1], *Thomas Udem*[1], *Ferenc Krausz*[1,2], and *Theodor Hänsch*[1,2]; [1]*Max-Planck-Institut für Quantenoptik, Hans-Kopfermann-Strasse 1, 85748 Garching, Germany,* [2]*Department für Physik der Ludwig-Maximilians-Universität München, Am Coulombwall 1, 85748 Garching, Germany.*
Intracavity high harmonic generation was demonstrated with a Ti:sapphire mode-locked laser at a repetition rate of 10.8MHz. Harmonics up to 19th order at 43 nm were observed with plateau harmonics at the uW power level.

WED2A.5 • 12:00
Ultrafast double pulse parametric amplification for precision Ramsey metrology, •*Dominik Z. Kandula, Amendine Renault, Christoph Gohle, Anne Lisa Wolf, Stefan Witte, Wim Hogervorst, Wim Ubachs,* and *Kjeld S. E. Eikema*; *Laser Centre, Vrije Universiteit Amsterdam, De Boelelaan 1081, 1081HX Amsterdam, Netherlands.*
An optical parametric chirped pulse amplifier system for pulse pairs is presented. The differential phase stability of the pulse pairs is 20 mrad, giving good prospects for high resolution Ramsey spectroscopy in the extreme ultraviolet.

WED2A.6 • 12:15
Towards Versatile Coherent Pulse Synthesis using Femtosecond Laser and Optical Parametric Oscillator, •*Barry Gale, Jinghua Sun,* and *Derryck Reid*; *Heriot Watt University, Edinburgh, Scotland.*
Pulses from a femtosecond optical parametric oscillator and its Ti:sapphire pump laser were phase-locked as a prerequisite to coherent synthesis from different wavelengths. Mutual coherence was demonstrated using spectral interferometry and cross-correlation.