



2021 Advanced High-Power Laser & Beam Control Conference

August 2 – 5, 2021 | Mountain Daylight Time (MDT)

Monday PM- August 2 (MDT)

1245- Conference Welcome- *Dr. Sean Ross and Mr. Mark Neice*

Beam Control- Automated, Beam Pointing & Target Tracking

Session Chair: Tommy Lum

1300- Active Tracking Using ETEM (D) *Spencer Nyquist, AFRL Laser Modeling/Simulation*

1330- A high energy 1.5-micron laser system for target illumination applications (C) *Nathan Bodnar, Laser Plasma Laboratory, CREOL, University of Central Florida Center for Directed Energy Systems*

1400- Eyesafe Variable PRF Track Illuminator Laser (C) *David Mordaunt, Ball Aerospace*

1430- Faint Target Detection in Heavy and Varying Clutter and Stable Track Initiation (C) *Omar Aboutalib, Northrop Grumman Aerospace Systems*

1500- BREAK

1530- Phase Mismatch in Optical Coatings for Multi-Wavelength Adaptive Optics (A) *Dr. Joseph Talghader, University of Minnesota*

1600- High-Power Photonic Lantern for Beam Combining and Fine Tracking (A) *Juan Carlos Zacarias, UCF/CREOL*

1630- Long-distance indoor propagation study of coherent and incoherent propagation-invariant space-time fields (A) *Kenneth Schepler, CREOL University of Central Florida*

1700- Session Concludes

Tuesday AM- August 3 (MDT)

0800- Tuesday Welcome & Conference Reminders – *DEPS Staff and Dr. Sean Ross*

Beam Control- Wavefront Compensation

Session Chair: Carrie Noren

0815- Measurements of Optical Turbulence Using the MZA DELTA and Point Sensors (D) *Joseph Blau, Physics Department Naval Postgraduate School*

0845- Observation and Simulation of Convective Blooming at 1 & 2 μm (C) *Justin Cook, Laser Plasma Laboratory, University of Central Florida/CREOL*

0915- Deep Learning Wavefront Sensing using Beacon-Based and Scene-Based Imagery Data (A) *Jae Jun Kim, Naval Postgraduate School MAE Department*

0945- Laser Annealing of Optical Coatings for Post-Assembly Deformable Mirror Processing (A) *John Hunt, University of Minnesota*

1015- BREAK

1030- Photonic Lantern Wavefront Sensor for Adaptive Optics (A) *Daniel Delgado, UCF/CREOL*

1100- Pyramid Wavefront Sensor Performance with the Low Latency Adaptive Mirror System (A) *Stephen Ammons, Lawrence Livermore National Laboratory*

1130- Effects of Kolmogorov Turbulence on Optical Cavity-Based Measurement (A) *Merlin Mah, University of Minnesota*

1200- LUNCH

Tuesday PM- August 3 (MDT)

Laser Architectures and Technologies for Low SWaP Systems

Session Chair: Dana Teague

1300- Hybrid high-rep-rate low SWAP ultrafast laser systems (D) *Nathan Bodnar, CREOL, University of Central Florida*

1330- A Size Weight and Performance Model for HEL Systems (D) *Arturo Gutierrez, Gryphon Technologies*

1400- QinetiQ US Turbo-Gen: Ultra-Compact, Aircraft Turbine based Power Generation and Thermal Management Designed for High Transient Loads (C) *Dana Teague for Eric Lewis of QinetiQ*

1430- LibertyWorks® ColdFire Solutions for Directed Energy Power and Thermal Management (A) *Timothy Unton, Rolls-Royce LibertyWorks*

1500- BREAK

Diode Pump Lasers
Session Chair: Tony Hostutler

1515- High Temperature Diode Pump Modules for Directed Energy (D) *Jenna Campbell, Freedom Photonics*

1545- High Brightness, High Efficiency Low SWaP Diode Laser Pumps for Directed Energy Fiber Amplifiers (D) *Manoj Kanskar, nLight, Inc.*

1615- SWaP Saver Diode Pump Module (SS-DPM) for High Energy Lasers in Mobile Military Platforms (D) *Tadej Semenic, Teledyne Scientific Company*

1645- New FACTOR Diodes for Defense Applications (A) *Keeley Hurley, Coherent, Inc.*

1715- Session Concludes

Wednesday AM- August 4 (MDT)

0800- Wednesday Welcome & Conference Reminders - *DEPS Staff and Dr. Sean Ross*

Fiber Lasers and Amplifiers
Session Chair: Brittany Lynn

0815- Mutli-kW laser gain competition and potential applications for spectral beam combination (D) *Brian Anderson, AFRL*

0845- Updates on Fiber Amplifiers to kW Class Powers (D) *Benjamin Johnson, Coherent*

0915- Monolithic Microstructured Fiber Amplifiers and Arrays for Ultrafast Applications (C) *Donald Sipes, Optical Engines, Inc.*

0945- Multi-kW Tm fiber lasers – the potential and challenges (C) *Nicholas Vail, Laser Plasma Laboratory, CREOL/University of Central Florida*

1015- BREAK

1030- Update on 100W Isolator Developments (C) *Joseph Mambourg, Coherent | EOT*

1100- Anti-Resonant Hollow Core Fiber for High-Power Beam Delivery (A) *Matthew Cooper, UCF/CREOL*

1130- LUNCH

Wednesday PM- August 4 (MDT)

Ultra-Short Pulsed Lasers: Sources

Session Chair: Joe Penano / Quentin Saulter

1230- Ultrashort LWIR Source for Remote Double Resonance Spectroscopy (D) *Danielle Reyes, Laser Plasma Laboratory, University of Central Florida*

1300- High-power USP CO2 lasers: status and applications (A) *Sergei Tochitsky, Department of Electrical Engineering, UCLA*

1330- Developments in ultra-short pulse gas lasers (A) *Daniel Gordon, NRL*

1400- Concepts for High-Power, Ultrashort Pulse Frequency Conversion to the Long-Wave and Mid-Wave IR in Hollow Optical Fibers (A) *Jeffrey Moses, Cornell University Applied & Engineering Physics*

1430- Carrier-envelope phase of high-power few-cycle laser pulses: measurement, control, and influence on system design (A) *Vitaly Gruzdev, University of New Mexico*

1500- Potential Impact of High-Power Blue Diode Laser Technology for Underwater Communications (A) *Yehuda Braiman, CREOL, University of Central Florida*

1530- BREAK

Ultra-Short Pulsed Lasers: Propagation

Session Chair: Joe Penano / Quentin Saulter

1545- Laser filamentation with SWIR and MIR USPLs and associated phenomena (A) *Pavel Polykin, College of Optical Sciences, University of Arizona*

1615- Space-time wave packets: Recent breakthroughs in a four-decade-long quest for propagation-invariant pulsed optical beams (A) *Kenneth Schepler, CREOL University of Central Florida*

1635- Initial results from outdoor laser-range tests of space-time wave packets (A) *Layton Hall, University of Central Florida*

1700- Generation and air propagation of high energy ultrafast laser pulses at 1 kHz (A) *Jorge Rocca, Colorado State University Department of Electrical & Computer Engineering and Department of Physics*

1730- Adjourn

Thursday AM- August 5 (MDT)

0800- Thursday Welcome & Conference Reminders - *DEPS Staff and Dr. Sean Ross*

Novel Laser Sources *Session Chair: Mark Dubinskiy*

0815- Direct Diode Lasers for Directed Energy Weapons (D) *Dr. Jeff Shattuck, Forward Photonics, LLC.*

0845- AFRL's Recent Advances in Diode Pumped Alkali Lasers (D) *Greg Pitz, AFRL/RDL*

0915- DPAL Ionization Model Development and Results (D) *Ryan Lane, Laser Division Air Force Research Laboratory*

0945- Edge-Pumped Disk Laser for Compact and Modular Systems (D) *Jan Vetrovec, Aqwest LLC*

1015- BREAK

1030- System study of a Novel Blue Laser HEL (D) *Mark Zediker, NUBURU Inc.*

1100- Additively Manufactured Ceramic Gain Media (A) *Stephen Payne, Lawrence Livermore National Laboratory*

1130- LUNCH

Thursday PM- August 5 (MDT)

Ultra-Short Pulsed Lasers: Propagation *Session Chair: Joe Penano / Quentin Saulter*

1230- Advanced Adaptive Optics for Long-Distance Ultrashort Pulse Laser Beam Control (D) *Michael Helle, US Naval Research Lab*

1300- Filament Propagation and Material Interaction at High Altitudes (C) *Jessica Pena, Laser Plasma Laboratory, Center for Directed Energy (CDE)*

1330- Nonlinear Propagation of Orbital Angular Momentum Beams in Turbulence (A) *Henry Elder, Naval Surface Warfare Center, Carderock Division; University of Maryland, College Park*

1400- Demonstration of air waveguides over tens of meters using filamenting LG beams (A) *Iliia Larkin, Institute for Research in Electronics and Applied Physics, University of Maryland, College Park*

1430- Measurement of water droplet dynamics near a femtosecond filament (A) *Andrew Goffin, Institute for Research in Electronics and Applied Physics, University of Maryland, College Park*

1450- BREAK

Ultra-Short Pulsed Lasers: Effects

Session Chair: Joe Penano / Quentin Saulter

1505- Coatings for femtosecond and continuous wave lasers: applications for directed energy (D)
Sandeep Kohli, Zygo Corporation

1535- Benefits of Burst-Mode USPs (C) *Haley Kerrigan, Laser Plasma Laboratory, C-DESST, University of Central Florida*

1605- Ultrafast Marcuse effect in semiconductors as a novel principle of parametric amplification of ultrashort mid-infrared laser pulses (A) *Vitaly Gruzdev, University of New Mexico*

1635- Numerical modeling of target heating and ablation from ultrashort pulse lasers in the Warm-Dense-Matter Regime (A) *George Petrov, Naval Research Laboratory*

1705- Session concludes