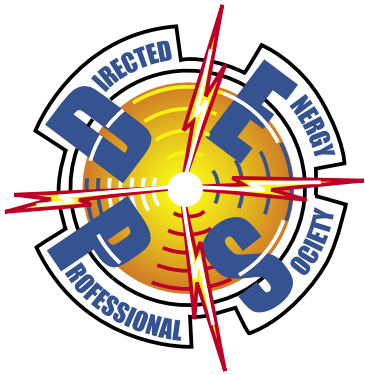
DIRECTED ENERGY PROFESSIONAL SOCIETY

Technical Program

Advanced High Power Lasers and Beam Control Conference



7th Annual Beam Control Conference

3rd Annual Free Electron Laser Conference

2nd Annual Gas Laser Conference

25th Annual Solid State and Diode Laser Technology Review

10th Annual Ultrashort Pulse Laser Workshop

11 - 14 June 2012
Broomfield, Colorado

All Conferences

Tuesday AM
Plenary Session 2
Wednesday AM
The Laser - Beam Control Interface (Limited C) 9
Wednesday Noon
Poster Session ..... see supplemental page

Beam Control Conference

Tuesday PM
Phased Arrays I (Limited D) 3
Atmospherics I (Limited D) 4
Wednesday PM
Acquisition, Tracking/Pointing and Aimpoint (Limited D) .. 11
Phased Arrays II (Limited C) 14
Atmospherics II (Open/Limited C) 15
Thursday AM
Coatings and Component Development (Limited D) 18
Adaptive Optics and Sensors (Limited D) 19
Thursday PM
Aero Optics Theory and Measurement (Limited D) 22

Free Electron Laser Conference

Tuesday PM
Conference Session (Open/Limited C) 5

Gas Laser Conference

Tuesday PM
Gas Laser Program (Limited C/Open) 6

Solid State and Diode Laser Technology Review

Tuesday PM
Laser Beam Combination (Limited C/Open) 7
Wednesday PM
High Energy Systems (Limited D/Open) 16
Thursday AM
Diode and Solid State Lasers (Limited D/Open) 20
Thursday PM
Fiber Lasers (Limited C/Open) 23
Materials and Power & Thermal Management (Limited D/Open) 24

Ultrashort Pulse Laser Workshop

Tuesday PM
Research with Universities (Open) 8
Wednesday AM
UPL Physics, Technology, and Diagnostics (Open) 10
Wednesday PM
UPL Physics, Novel Material Interaction and Measurements (Open/Limited C) 17
Thursday AM
Non-Linear Propagation Physics (Open) 21
Thursday PM
Measurements of Non-Linear Filament-Matter Interactions (Open) 25

MONDAY

Short Courses

0700 **Registration at Omni Resort**

0800 **Short Courses Begin**

1. Thermal Management Technologies
- Public Release *WEBCAST*
Instructor: *John Vetrovec*
Pine Room

2. Diode Pumped Alkali Lasers (DPALs)
- Public Release
Instructor: *Glen Perram*
Cedar Room

7. Ultra-Short Laser Induced Filaments
- Public Release
Instructor: *Miroslav Kolesik, Howard Milchberg*
Birch Room

4. Beam Directors 101
FULL DAY COURSE - Limited Distribution C
Instructor: *Bill Decker*
Spruce Room

5. Introduction to Free Electron Laser Systems
FULL DAY COURSE - Public Release *WEBCAST*
Instructor: *Dinh Nguyen*
Fir Room

1200 **Break for Lunch**

1300 **Afternoon Course Begins and Full Day Course Resumes**

6. Introduction to Laser Beam Quality Measures
- Public Release *WEBCAST*
Instructor: *Sean Ross*
Pine Room

3. Ultrashort Pulse Laser Bioeffects
- Public Release
Instructor: *Ben Rockwell, Bob Thomas*
Birch Room

8. Fused Fiber Laser Components
- Public Release
Instructor: *Baishi Wang*
Cedar Room

TUESDAY MORNING

JOINT SESSION

Plenary Session (Open) *WEBCAST*

Interlocken Rooms C&D

0700 **Registration at the Omni Resort Breakfast in the Exhibit Area**

0815 **Welcome**
Dr. Samuel Blankenship, DEPS

0830 **Advances in Crystals for High Energy Laser Applications**
John Ballato, Clemson University

0915 **The Extreme Nonlinear Optics of Gases and Femtosecond Optical Filamentation** *W*
Howard Milchberg, University of Maryland

1000 **Break**

1030 **Gas Lasers**
Kevin Hewett, Air Force Research Laboratory

1115 **Perspective on Tactical HEL Beam Control Technology** (D)
Paul Berger, MIT Lincoln Laboratory

1200 **Lunch**

SECURITY NOTE:
Letters listed in this agenda after presentation titles indicate distribution statements as follows:

A – information is open, public release

C - information is limited to U.S. citizens who are employees of the U.S. Federal Government or its contractors

D - information is limited to U.S. citizens who are employees of the U.S. Department of Defense or its contractors

TUESDAY AFTERNOON

BEAM CONTROL

Phased Arrays I: System Basics (Limited D)

Chair: *Dan Marker and Wes Green*, AFRL
Centennial Room B

1300 **A Comparison of Monolithic and Tiled Array High Power Beam Projection Performance for Ground-Based Horizontal Propagation (A)**
Robert Praus, MZA Associates Corp

1325 **Monolithic and Laser Array Performance Comparisons (C)**
Keith Bush, Schafer Corp

1350 **Evaluation Coherent and Incoherent Beam Combination for Tactical Fiber Laser Systems (C)**
Noah Van Zandt, AFIT/Center for DE

1415 **Beam Control Methods for Mission Requirements (C)**
Patrick Saunders, AFRL/RDS

1440 **Phased Laser Array Beam Control Scoring Metric (C)**
Doug Rigdon, AFRL/RDTA

1505 **Break**

1520 **Conformal PA Turbulent Boundary Layer Aero Optics (D)**
Matthew Whitely, MZA Associates Corp

1545 **Application of Phased Array Technologies to DE and LADAR Sensing (C)**
Kevin Probst, The CORE Group, Inc.

Phased Array Target Based Sensing (Limited C)

Chairs: *Dan Marker*, AFRL and *Kevin Probst*, The CORE Group, Inc.

1610 **Coherent Beam Combining on an Extended Target with Randomly Rough Surface: Approach and Experimental Demonstration (A)**
Mikhail Vorontsov, University of Dayton

1635 **Phasing an Array of Laser Beams on Extended Targets Using Target-Based Phasing (C)**
David Mann, the Optical Sciences Company

1730 **Exhibitor Reception - Omni Resort**

BEAM CONTROL

Atmospherics I: Deep Turbulence: Systems and Applications (Limited D)

Chair: *Albert Ogloza*, Naval Postgraduate School
Interlocken Room D

1300 **Adaptive Tactical Laser System (ATLAS) Test Results (C)**
Jeffrey Barchers, Nutronics, Inc.

1330 **Technology Transition in the ASALT Lab (D)**
Patrick Kelly, Air Force Research Laboratory/RDS

1400 **Characterizing Earth's Boundary Layer (CEBL): Goals and Efforts (C)**
Jason Holzman, Air Force Research Laboratory/RDS

1430 **Break**

1500 **Estimation of Key Turbulence Parameters from SOR Turbulence Sensor (SORTS) (C)**
Terry Brennan, the Optical Sciences Company

1530 **CEBL: Understanding the Physics of Optical Turbulence (C)**
Thomas Farrell, Air Force Research Laboratory

1600 **COMBAT: Experimental Results and Wave Optic Simulations (C)**
V.S. Rao Gudimetla, Air Force Research Laboratory/RDSM

1630 **Beam Control System for Aero-Mechanical LOS Stabilization (D)**
Robert Pawlak, NSWCDD

1730 **Exhibitor Reception - Omni Resort**

FEL

Free Electron Laser Conference (Open/Limited C)

Chair: *Dinh Nguyen*, Los Alamos National Laboratory
Interlocken Room C

Session is Open

1300 **Beam Instabilities**
Sandra Biedron, Colorado State University

1320 **The CSU Accelerator Laboratory**
Stephen Milton, Colorado State University

1340 **Defect Driven Laser Damage of Sc2O3**
Peter Langston, Colorado State University

Session is Now Limited

1400 **Break**

1420 **Development of a High Average Current FEL Injector Using a Gridded Thermionic Electron Gun (C)**
Steven Gold, Naval Research Laboratory

1440 **Longitudinal Pulse Shaping of APEX Drive Laser (C)**
Conor Pogue, Naval Postgraduate School

1500 **Technology Development Toward a MW-Class FEL (C)**
Dinh Nguyen, Los Alamos National Laboratory

1520 **Systems Optimization of High Average Power Free Electron Lasers (C)**
Michael Phillips, Advanced Energy Systems

1540 **Novel Outcoupling Techniques for Terahertz Free Electron Lasers (C)**
Steven Grey, Naval Postgraduate School

1600 **High Extraction Efficiency Free-Electron Lasers (C)**
Henry Freund, Los Alamos National Laboratory

1730 **Exhibitor Reception - Omni Resort**

GAS

Gas Laser Program (Limited C/Open)

Chair: *Kevin Hewett*, Air Force Research Laboratory
Cedar Room

Session is Limited C

1300 **Characterization of a Diode Pumped Alkali Laser with a Flowing Gain Medium (C)**
David Hostutler, Air Force Research Laboratory

1330 **Three Dimensional, Time Dependent Simulation of Diode Pumped Alkali Lasers (C)**
John Haiducek, Air Force Research Laboratory

1400 **Simulation of Ionization Processes in a Diode Pumped Alkali Laser (C)**
Benjamin Oliker, Air Force Research Laboratory

1430 **Break**

Session is Open

1530 **On the Mechanisms and Effects of Photoionization in Alkali Laser Gain Media**
M. K. Shaffer, U.S. Air Force Academy

1600 **Thermal Effects in Diode Pumped Alkali Lasers**
Salvatore Cusumano, Air Force Institute of Technology

1630 **Gain and Lasing of Optically Pumped Metastable Rare Gas Atoms**
Michael Heaven, Emory University

1730 **Exhibitor Reception - Omni Resort**

Agenda Subject to Change
Visit www.deps.org for Daily Updates

TUESDAY AFTERNOON

SSDLTR

Laser Beam Combination (Limited C/Open)

WEBCAST AT 1530

Chair: *Richard Berdine*, Air Force Research Laboratory
Interlocken Room B

Session is Limited C

1300 **High-Energy Pulsed Fiber Laser Beam Combination (C)**
Graham Allen, Lawrence Livermore National Laboratory

1330 **Recent Developments in Coherent Laser Combination Using a Self-Fourier Cavity (C)**
Christopher Corcoran, Corcoran Engineering

1400 **Filled-Aperture Beam Combining of High Power Yb Fiber Amplifiers (C)**
Charles Yu, MIT Lincoln Laboratory

Session is Now Open

1430 **Fiber Laser Beam Combining and Power Scaling Progress**
William Palm, Air Force Research Laboratory/RDLAF

1500 **Break**

1530 **Coherent Combining of Four Fiber Lasers by a Multiplexed Volume Bragg Grating** *W*
Apurva Jain, University of Central Florida

1600 **Solutions and Challenges to Beam Combining of Fiber Lasers and Amplifiers** *W*
Erik Bochove, Air Force Research Laboratory/RDLAF

1630 **Automated Co-Alignment of Phase-Locked Fiber Lasers** *W*
Gregory Goodno, Northrop Grumman Aerospace Systems

1700 **Coherent Beam Combining of 21 Semiconductor Gain Elements in a Common Cavity** *W*
Steven Augst, MIT Lincoln Laboratory

1730 **Exhibitor Reception - Omni Resort**

TUESDAY AFTERNOON

USPLW

Research with Universities for Ultrashort Laser Applications and Measurements (Open) *WEBCAST*

Chair: *Pete Latham,* Air Force Research Laboratory
Interlocken Room A

1300 **Ten Year Anniversary - The History and Evolution of the Ultrashort Pulse Laser Workshop** *W*
Pete Latham, Air Force Research Laboratory/RD

1310 **Invited - Opportunities for Scientific Partnership with the Air Force Office of Scientific Research (AFOSR)** *W*
Enrique Parra, Air Force Office of Scientific Research

1350 **Review of the Theoretical Component of the AFOSR-Supported MURI on Femtosecond Laser Filamentation in Transparent Media** *W*
Miroslav Kolesik, The University of Arizona

1420 **Review of the Experimental Component of the AFOSR-Supported MURI on Femtosecond Laser Filamentation in Transparent Media** *W*
Pavel Polynkin, The University of Arizona

1450 **The ARO MURI Program on Air Filamentation Science After One Year**
Lawrence Shah, University of Central Florida

1520 **Break**

1540 **A New Frontier for Nonlinear Optics: Bright Coherent Kiloelectronvolt Ultrafast X-Rays Generated on a Tabletop** *W*
Henry Kapteyn, University of Colorado

1610 **DoD Center of Excellence to Support Theory and Experiments on Filamentation Topics for DDR&E's Recent MURI Initiatives** *W*
Pat Roach, Air Force Research Laboratory/RDLA

1640 **Filament Ablation of Thick Metal and Polymer Targets and Electron Density Characterization** *W*
Tony Valenzuela, Army Research Laboratory

1730 **Exhibitor Reception - Omni Resort**

WEDNESDAY MORNING

JOINT SESSION

The Laser - Beam Control Interface (Limited C)

Chair: *John Albertine*, Consultant
Interlocken Rooms C&D

0700 **Registration at the Omni Resort Breakfast in the Exhibit Area**

0800 **Introduction to Session**
John Albertine, Consultant

0810 **Transitioning to Electric Lasers (C)**
Jack Slater, Schafer

0830 **Evolution of Beam Control Systems (C)**
John Albertine, Consultant

0850 **Maritime Laser Demonstration, Integration of a Basic System (C)**
Chris Lieto, Northrop Grumman

0920 **Break**

0950 **Airborne Laser Test Bed, Integration of a Complex System (C)**
Dave Morris, Boeing

1020 **Phased Arrays, Integration of a Future System (C)**
Kevin Probst, Coregroup

1050 **Conclusions**
John Albertine, Consultant

1100 **Poster Session (to 1300)**
See Supplemental Page

1200 **Lunch**

WEDNESDAY MORNING

USPLW

Ultrashort Pulse Laser Physics, Technology, and Diagnostics (Open) *WEBCAST*

Chair: *Pat Roach*, Air Force Research Laboratory/RD
Interlocken Room A

0700 **Registration at the Omni Resort Breakfast in the Exhibit Area**

0800 **Invited – Petawatt to Exawatt Lasers: The Science and Technology of the Highest Power Lasers Ever Built** *W*
Todd Ditmire, University of Texas

0840 **Design and Status of the Multi TW OPCPA Front End for the Z-Petawatt Laser** *W*
Patrick Rambo, Sandia National Laboratories

0910 **The OPCPA Approach to High-Repetition-Rate Ultra-Fast Lasers**
Lawrence Shah, University of Central Florida

0940 **High Energy, High Repetition-Rate, Mid-IR OPCPA Source** *W*
Michael Gerrity, University of Colorado at Boulder

1010 **Break**

1030 **Femtosecond Pulse Spectral Synthesis in Coherently Combined Parallel-Channel Fiber Chirped Pulse Amplifiers** *W*
Almantas Galvanauskas, University of Michigan

1100 **fs Direct Diode Pumped Ti:Sapphire Laser** *W*
Sterling Backus, KM Labs

1130 **Table-Top, High Energy, Short Pulse Laser Driven by a Frequency Doubled Slab MOPA** *W*
Brad Luther, Colorado State University

1200 **Lunch**

WEDNESDAY AFTERNOON

BEAM CONTROL

Acquisition, Tracking & Pointing and Aimpoint Maintenance (Limited D)

Chair: *Jim Lasche*, Air Force Research laboratory/RDSEW
Centennial Room A

1300 **Tiled-Aperture Coherent Beam Combining Using SBS-PCMs for LIFE Driver (A)**
Hong Jin Kong, KAIST

1330 **An Adaptive H-Infinity Control Algorithm for Jitter Control and Target Tracking in a Directed Energy System (A)**
Joe Watkins, US Naval Academy

1400 **Simulation Evaluations of a Hybrid Bayesian/Correlation Tracking Technique (D)**
Jim Lasche, Air Force Research laboratory/RDSEW

1430 **Reference Library of Synthetic Scenes for Development and Evaluation of Tactical Track Algorithms (D)**
Aaron Dalbey, Air Force Research laboratory/RDSEH

Conference Overview by Room Assignment

	Tues AM	Tues PM	Wed AM	Wed 1100	Wed PM	Thurs AM	Thurs PM
Interlocken Rooms C&D	Plenary Session		Joint Technical Session	Unclass Posters (FOYER)			
Interlocken Room A		Ultrashort	Ultrashort		Ultrashort	Ultrashort	Ultrashort
Interlocken Room B		SSDLTR		Limited Posters	SSDLTR	SSDLTR	SSDLTR
Interlocken Room C		Free Electron Lasers				Beam Control	SSDLTR
Interlocken Room D		Beam Control			Beam Control	Beam Control	Beam Control
Centennial A					Beam Control		
Centennial B		Beam Control			Beam Control		
Cedar		Gas Lasers					

Phased Array II: Target Based Phase Sensing (Limited C)

Chairs: *Dan Marker*, Air Force Research Laboratory, and *Kevin Probst*, The CORE Group, Inc.
Centennial Room B

1300 **End to End Phased Array Beam Control (C)**
Richard Hutchin, Optical Physics Company

1325 **Conformal Laser Weapon System (CLAWS) Development (C)**
Jeffrey Barchers, Nutronics, Inc.

1350 **Coherent Laser Array Weapon Partial Phasing by Single Mode Correction (C)**
Wesley Green, Air Force Research Laboratory

1415 **Experimental Simulation of Phased Array Laser Systems Using Spatial Light Modulators (C)**
Sami Shakir, Air Force Research Laboratory

1440 **MAPS (Multi-Aperture Phase Synthesis) for Beam Control (C)**
Joseph Marron, Lockheed Martin

1505 **Break**

Phased Array Components, Modeling, and Beam Directors (Limited C)

Chairs: *Dan Marker* and *Larry Huntley*, Air Force Research Laboratory

1520 **Active Multi-Aperture Imaging Through Turbulence (A)**
Paul McManamon, LOCI

1545 **Bandwidth and Control Considerations for Target-Based Phasing Approaches (C)**
David Mann, the Optical Sciences Company

1610 **High Power Routers and Combiners for Phased Arrays (C)**
Terry Dorschner, Raytheon Company

1635 **TASAT –Based Target Model for Phased Array Concept Evaluation (D)**
Robin Ritter, Tau Technologies

WEDNESDAY AFTERNOON

BEAM CONTROL

Atmospherics II: Deep Turbulence: Novel Concepts for Turbulence Compensation (Open/Limited C) *WEBCAST AT 1300*

Chair: *Brian Hankla*, HEL Joint Technology Office
Interlocken Room D

Session is Open

1300 **Comparison of Wavefront Reconstruction Techniques for Extended Turbulence Beam Projection Applications** *W*
Michael Steinbock, Air Force Institute of Technology

1330 **Deep Horizontal Path Atmospheric Turbulence Modeling and Simulation with a Liquid Crystal Spatial Light Modulator** *W*
Peter Jacquemin, Naval Postgraduate School

1400 **Cascaded High-resolution Adaptive Optics System (CHAOS) for Phase Aberration Mitigation in HEL Systems: Concept Development and Performance Analysis** *W*
Mikhail Vorontsov, University of Dayton

1430 **Break**

Session is Now Limited C

1500 **Laser Horizontal Propagation Atmospheric Performance Estimates for 1 and 2 Micron Wavelengths (C)**
Keith Bush, Schafer Corporation

1530 **Simulation of Phase Control for Deep Turbulence Compensation (C)**
Donald Link, MZA Associates Corporation

1600 **Analysis of Whole Beam and Fine Scale Stability and Performance for Compensation of Thermal Blooming (C)**
Jeffrey Barchers, Nutronics, Inc.

1630 **Reducing Atmospheric Modeling Uncertainties for BC Testing with Full-Path Turbulence Profiling (D)**
Matthew Whitely, MZA Associates Corporation

SSDLTR

High Energy Systems (Limited D/Open)

WEBCAST AT 1430

Chair: *Greg Quarles*, B.E. Meyers & Co.
Interlocken Room B

Session is Limited D

1330 **Beacon Illuminator Laser (BILL) Development for BCID Program (C)**
Imtiaz Majid, Nufern

1400 **RELI Spectral Beam Combining of Fiber Lasers (D)**
Eric Honea, Lockheed Martin

Session is Now Open

1430 **Recent Results for the Raytheon RELI Program** *W*
David Mordaunt, Raytheon Space and Airborne Systems

1500 **Break**

1530 **Progress Towards an Absolute Reference for 100 kW Laser Power Measurements** *W*
Marla Dowell, NIST

1600 **High-Repetitive Laser System by Tiled-Aperture Coherent Beam Combining Using Stimulated Brillouin Scattering Phase Conjugation Mirrors (SBS-PCMs)** *W*
Hong Jin Kong, KAIST

1630 **Polarization Locking of Coherently Combined Laser Arrays Using a Single Detector** *W*
Gregory Goodno, Northrop Grumman Aerospace Systems

WEDNESDAY AFTERNOON

USPLW

Ultrashort Laser Physics, Novel Material Interactions and Measurements (Open/ Limited C)

Chair: *Thomas Nelson*, Sandia National Laboratories
Interlocken Room A

Session is Open

1300 **Generation of Mid-IR Radiation from 4-Wave Mixing of Spectrally Broadened Ultrashort Laser Pulses**
Joe Penano, Naval Research Laboratory

1325 **Femtosecond Pulse Shaping Using a Single Specialized Mirror**
Thomas Lanier, University of Georgia

1350 **Break**

Session is Now Limited C

1405 **JTO Military Utility Study for Ultrashort High Power Laser Systems) (C)**
Pat Roach, Air Force Research Laboratory/RD

1430 **Coupling of External Electromagnetic Fields to Filaments (C)**
Andreas Schmitt-Sody, Air Force Research Laboratory/RD

1455 **Break**

1515 **Free Space Optical Communication Using a Broadband Short Pulsed Laser (C)**
Junji Urayama, Sandia National Laboratories

1540 **Ultra-Short Pulse Laser (USPL) Sensor Countermeasures (C)**
Matthew Fisher, Lockheed Martin

1605 **Investigation of Ultrashort Pulsed Laser Damage in Silicon Photodiodes (C)**
Daniel Bender, Sandia National Laboratories

1630 **Technologies for High Energy Ultrafast Fiber Lasers (C)**
Mike Mielke, Raydiance

BEAM CONTROL

Coatings and Component Development (Limited D)

Chair: *Chris Washer*, Schafer Corporation
Interlocken Room C

0700 **Registration at the Omni Resort Breakfast in the Exhibit Area**

0800 **Development and Test of BC Subsystem for US Army HELMD (D)**
Jenny Niles, US Army SMDC/ARSTRAT

0830 **A Very Fast Steering "Mirror" (C)**
Andrew McKie, Raytheon Network Centric Systems

0900 **Laboratory Testing of a Curved Deformable Mirror (C)**
Marc Jacoby, Optical Physics Company

0930 **SMDC Light Weight Beam Director Update (C)**
Edward Montgomery, Science Applications International Corporation

1000 **Break**

1030 **Power and Slew Rate Requirements for Deformable Mirror Drive Electronics in Kolomogorov Turbulence (A)**
Justin Mansell, MZA Associates Corporation

1100 **Optimized Thermal Capability of Cooled Lightweight Silicon Carbide for HEL Systems (C)**
Marc Jacoby, Optical Physics Company

1130 **Improved High Power Deformable Mirrors for HEL Weapons Systems (D)**
Justin Mansell, MZA Associates Corporation

1200 **Lunch**

THURSDAY MORNING

BEAM CONTROL

Adaptive Optics and Sensors (Limited D)

Chair: *Richard Carreras,* NSWCDD
Interlocken Room D

0700 **Registration at the Omni Resort Breakfast in the Exhibit Area**

0800 **Comparison of the Performance of Modal Control Schemes for an AO System and Analysis of the Effect of Actuator Limitations (A)**
Jae Jun Kim, Naval Postgraduate School

0830 **Field Demonstration of Adaptive Optics on the US Army HELMD (C)**
Edward Montgomery, USASMDC/ARSTRAT

0900 **Spatial-Temporal AO for C-130 Open-Port Beam Projection (D)**
David Goorskey, MZA Associates Corporation

0930 **Orthogonal Gradient AO through Least-Mean-Squares-Only Phase Compensation (D)**
Denis Oesch, Science Applications International Corporation

1000 **Tip/Tilt Adaptive Optics Correction for Incoherently Combined Lasers in a Maritime Environment (C)**
Matthew Leigh, NSWCCD

1030 **Aero-Optic Results from the ABC Full-Scale Wind Tunnel Test with Adaptive Optics (D)**
Lawton Lee, Lockheed Martin

1100 **Segmented Deformable Mirror for HEL Applications (C)**
Allan Wirth, Northrop Grumman

1200 **Lunch**

SSDLTR

Diode and Solid State Lasers (Limited D/Open) *WEBCAST AT 1030*

Chair: *Paul Rudy*, Laser Light Solutions
Interlocken Room B

0700 **Registration at the Omni Resort Breakfast in the Exhibit Area**

Session is Limited D

0800 **High Power, High Brightness Direct Diode Lasers for HEL Applications (C)**
Robin Huang, TeraDiode, Inc.

0830 **Initial Performance of a Ceramic Yb:YAG Edge-Pumped Disk Laser Amplifier (D)**
John Vetrovec, Aqwest LLC

Session is Now Open

0900 **Advancements in High Power Diode Laser for Defense Applications**
Rajiv Pandey, DILAS Diode Laser Inc.

0930 **Break**

1000 **Wavelength Stabilization of Diode Laser with Volume Bragg Grating**
Stefan Heinemann, Fraunhofer USA, Center Laser Technology

1030 **High-Brightness and Narrow-Linewidth Laser Diode Pumps in 780 nm to 2000 nm Wavlength Range** *W*
Manoj Kanskar, nLIGHT

1100 **Transverse Mode Selection in a Thin Rod Yb: YAG Laser by Transmitting Volume Bragg Gratings** *W*
Brian Anderson, University of Central Florida

1130 **Resonantly Pumped Er:YVO4 and Er:GdVO4 Crystals: Comparative Study**
Nikolay Ter-Gabrielyan, Army Research Laboratory

1200 **Lunch**

USPLW

Non-Linear Propagation Physics (Open) *WEBCAST AT 0910*

Chair: *Jerry Manke*, NSWC-Crane
Interlocken Room A

0700 **Registration at the Omni Resort Breakfast in the Exhibit Area**

0820 **Competing Nonlinearities in fs Laser Pulse Propagation Leading To Filamentation**
Pat Roach, Air Force Research Laboratory/RD

0845 **Computational Aspects of Competing Nonlinearities**
Mohammad Zunoubi, Air Force Research Laboratory/RD-NRC

0910 **Toward Self-Consistent Models of Light-Matter Interactions on Femtosecond Time-Scales** *W*
Miro Kolesik, The University of Arizona

0935 **Kramers-Kronig Calculations and Measurements of the High Field Optical Nonlinearity in Gases** *W*
Jared Wahlstrand, University of Maryland

1000 **Break**

1020 **Propagation Dynamics of Ultraintense Femtosecond Optical Vortices in Air** *W*
Pavel Polynkin, The University of Arizona

1045 **Transient Birefringence Induced by a Plasma Grating: Effect on Pump-Probe Measurements of the Optical Nonlinearity** *W*
Jared Wahlstrand, University of Maryland

1110 **Failure of the Drude Model as Applied to Filamentation in Air** *W*
Ladan Arissan, University of New Mexico

1135 **Femtosecond Sensitivity of Plasma Filaments in Atmosphere with Delayed Ultrashort Laser Pulses** *W*
John Palastro, University of Maryland

1200 **Lunch**

BEAM CONTROL

Aero Optics Theory and Measurement: (Limited D)

Chair: *D.J. Wittich*, Air Force Research Laboratory
Interlocken Room D

1300 **Statistical Analysis and Predictive Estimation of Aero-Optics Data (C)**
Terry Brennan, the Optical Sciences Company

1330 **Parametric Investigation of Aero-Optical Effects Around Turrets at Forward-Looking Angles (C)**
Stanislav Gordeyev, University of Notre Dame

1400 **Comparison of CFD and Flight Test Aero-Optic Data for the Airborne Aero-Optics Lab (D)**
William Coirier, Kratos/Digital Fusion Inc.

1430 **Predictive Modeling for Aero-Mechanical Line-of-Sight Stabilization (D)**
Matthew Whitely, MZA Associates Corporation

1500 **Laser Induced Air Breakdown Beacon for Aero-Effects Mitigation: Characterization, System Requirements, and Engagement Modeling (D)**
David Goorskey, MZA Associates Corporation

SSDLTR

Fiber Lasers (Limited C/Open)

Chair: *Tim Newell*, Air Force Research Laboratory/RDLA
Interlocken Room C

Session is Limited C

1300 **Resonantly Pumped Ho Based kW-Class Fiber Amplifier (C)**
Thomas Ehrenreich, Nufern

1330 **Tm Doped Tunable Eye-Safe Fiber Lasers at ~2µm (C)**
Ye Huang, Nufern

Session is Now Open

1400 **High Power Thulium Fiber Lasers for High Power Atmospheric Propagation Testing**
Lawrence Shah, The University of Central Florida

1430 **Break**

1500 **High Power Operation of Tm-Doped Photonic Crystal Fiber Laser Systems**
Lawrence Shah, The University of Central Florida

1530 **"Rogue Lasing" in Fiber Amplifier Arrays**
Erik Bochove, Air Force Research Laboratory/RDLAF

1600 **Robust Single-Mode Operation of 55µm and 60µm Core CCC Fibers**
Almantas Galvanauskas, University of Michigan

SSDLTR

Materials and Power & Thermal Management (Limited D/Open)

WEBCAST AT 1330

Chair: *Mark Dubinskiy*, Army Research Laboratory
Interlocken Room B

Session is Limited D

1300 **Liquid Metal Cooling for High-Power and High Heat Flux Applications (D)**
John Vetrovec, Aqwest LLC

Session is Now Open

1330 **Lifetime of Enhanced Lateral-Flow Coolers for High-Power Laser-Diode Bars** *W*
Aland Chin, Somerville Laser Technology, LLC

1400 **High Power Fiber Laser Technology Developed for use in High G, Remote Environments**
Mark Zediker, Foro Energy

1430 **Progress in Materials Development for Laser Sources** *W*
Darnell Diggs, Air Force Research Laboratory

1500 **Break**

1530 **Thermo-Optic Investigation of Mid-IR Optical Materials** *W*
Joshua Bradford, Laser Plasma Laboratory

1600 **Crystalline Er3+:Al2O3 – From Powders to Ceramics to a Single Crystal** *W*
Tigran Sanamyan, Army Research Laboratory

1630 **Transparent Ho3+ :Lu2O3 Ceramic for Eye-Safe Solid State Laser Materials**
Woohong (Rick) Kim, Naval Research Laboratory

1700 **Analysis and Modeling of Pump-Induced Thermal Distortions in Transparent Ceramic Gain Media**
Christina Willis, University of Central Florida

USPLW

Measurements of Non-Linear Filament-Matter Interactions (Open)

WEBCAST

Chair: *Tony Valenzuela*, Army Research Laboratory
Interlocken Room A

1300 **Absolute Measurement of the Electronic and Rotational Optical Nonlinearity in Molecular Gases** *W*
Yu-Hsiang Cheng, University of Maryland

1300 **Measurement of Nonlinear Refractive Index and MPI Coefficients in Gases Using a Wavefront Sensor** *W*
Patrick Rambo, Sandia National Laboratory

1400 **Imaging Gas Phase and Biological Molecules Using Ultra-Intense Laser Filamentation and Ultra-Short Laser Vaporization** *W*
Robert Levis, Temple University

1430 **Break**

1500 **Enhancement of Microwave Emission from Targets Irradiated by Ultrashort Laser Pulses** *W*
Sanjay Varma, JHU, Applied Physics Lab

1530 **Propagation Effects on THz Generation from Ionizing Two Color Laser Pulses** *W*
Luke Johnson, University of Maryland

1600 **3D Composition Imaging by Extreme Ultraviolet Laser Ablation Mass Spectrometry** *W*
Ilya Kutnetsov, Colorado State University

Conference Organizers

Beam Control Conference

Albert Ogloza, Naval Postgraduate School

Free Electron Lasers Conference

Roger McGinnis, Office of Naval Research

Dinh Nguyen, Los Alamos National Laboratory

Gas Laser Conference

Kevin Hewett, Air Force Research Laboratory

Michael Heaven, Emory University

Solid State and Diode Laser Technology Review

Greg Quarles, B.E. Meyers

Mark Dubinskiy, US Army Research Laboratory

Ultrashort Pulse Laser Workshop

Pete Latham, Air Force Research Laboratory

Thomas Nelson, Sandia National Laboratories

Event Coordinator and Short Courses

Cynnamon Spain, DEPS

Security and Registration

Tiffany Bjelke, DEPS

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WEDNESDAY NOON

JOINT SESSION

Poster Session (Open)

Interlocken Foyer

Non-Invasive Detection and Characterization of Beams
Theodore Burleson, Colorado State University

Novel Guns for Light Sources
Jonathan Edelen, Colorado State University

High Performance BC System Leveraging COTS Components
Brian Henderson, MZA Associates Corporation

Nonlinear Harmonic Selection in an FEL Undulator System
Karen Horovitz, Colorado State University

Femtosecond Pulse Shaping Using a Single Specialized Mirror
Thomas Lanier, University of Georgia

Simplified Software for BC System Evaluation and Development
Justin Mansell, MZA Associates Corporation

Neural Network Control Systems for Energy Recovery Linacs
Auralee Morin, Colorado State University

Electride Photocathode for Free Electron Lasers
Lauren Rand, Colorado State University

Progress Toward High Brightness Cathodes Based on Quantum Properties of Combined Carbon Allotropes
Roger Shurter, Los Alamos National Laboratory

Poster Session (Limited D)

Interlocken Room B

Design Constraints of a Distributed Volume Beam Control System (D)
Darryl Sanchez, Air Force Reseach Laboratory/RDS