

Technical Program



**Twentieth Annual
Solid State and Diode
Technology Review**

**Los Angeles, California
25 -28 June 2007**

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MONDAY

Short Courses

- 0700 Registration at Westin
- 0800 Short Courses Begin
Westin Hotel, Second Floor
- Fiber Lasers in Defense: Fibers,
Components and System Design
Considerations (Half Day Course)
Instructors:
- *Dr. Fabio Di'Teodoro*, Aculight
- *Dr. Michael O'Connor*, Nufern
- Beam Directors (Full Day Course)
Instructor:
- *Mr. Bill Decker*, Defense
Acquisition University
- 1200 Break for Lunch
- 1300 Full Day Course Resumes
Afternoon Course Begins
- Beam Quality Measures (Half Day Course)
Instructor:
- *Dr. Sean Ross*, Air Force Research
Laboratory/DELO
- 1700 Short Courses Adjourn

TUESDAY MORNING

Plenary Session:

Laser Radar: Past, Present and Future

Chair: *Dr. Iain McKinnie*, Lockheed Martin

- 0700 **Registration and Breakfast at Westin
Speakers Breakfast**
- 0800 **Welcome and Introduction**
Dr. Andrew Brown, Aculight
- 0815 **Air Force Laser Radar, Past, Present,
and Future**
Dr. Paul McMannon, Air Force Research
Laboratory, Sensors Directorate
- 0845 **Advanced Coherent Laser Radar
Systems**
Dr. Sammy Henderson, Lockheed Martin
Coherent Technologies
- 0915 **NASA Goddard's Application of Lasers in
Space**
Dr. Michael Krainak, NASA
- 0945 **Break**
- 1015 **25 years of LADAR Development in
NAVAIR**
Dr. Denton Marrs, NAVAIR
- 1045 **Tactical LADAR: Past, Present, and
Future**
Mr. Bruno Evans, Lockheed Martin Missiles
and Fire Control
- 1200 **Lunch**

**AUDIO AND VIDEO RECORDING IS
PROHIBITED AT ALL DEPS
SPONSORED EVENTS**

TUESDAY AFTERNOON

High Energy Lasers (FOUO)

- Chair: *Dr. David Mordaunt*, Northrop Grumman
- 1300 **Introductions**
Dr. David Mordaunt, Northrop Grumman
- 1310 **Joint High Power Solid State Laser Progress**
Mr. Jay Marmo, Northrop Grumman
- 1340 **J-HPPSL Nd:YAG Ceramic ThinZag Laser Program**
Dr. Alex Mandl, Textron Systems
- 1410 **Laser-Material Interaction Studies Utilizing the Solid-State Heat Capacity Laser**
Mr. Bob Yamamoto, Lawrence Livermore National Laboratory
- 1430 **Strategic Illuminator Laser (SILL) Multi-kilowatt, High Radiance Laser Packaging**
Mr. Glenn Brossus, Northrop Grumman
- 1450 **Break**
- 1520 **Power Scaling a Spectrally Beam Combined Fiber Laser to 1 kW and Beyond**
Dr. Eric Honea, Aculight Corporation
- 1540 **Scalable Diode Pumped Rubidium Vapor Laser**
Dr. Jason Zweiback, General Atomic
- 1600 **AFRL's Materials Efforts: Enabling Improved Laser Systems**
Dr. F. Kenneth Hopkins, Air Force Research Laboratory
- 1730 **Exhibitor Reception**

TUESDAY AFTERNOON

Thermal and Power Management

Chair: *Dr. Mysore Ramalingam, UES, Inc.*

- 1300 **Introductions**
Dr. Mysore Ramalingam, UES, Inc.
- 1310 **Diagnostics for Improving Performance and Lifetime in High Power Laser Diodes**
Dr. Rodney Petr, Science Research Laboratory
- 1330 **Advanced Programmable Power Forming System for Laser Applications**
Dr. Gary Grider, DRS Technologies
- 1350 **Multi-Evaporator Hybrid Two-Phase Loop Cooling System for Solid State Lasers**
Mr. David Bugby, Swales Aerospace
- 1410 **Advanced Cooling Technologies for Tactical Solid-State Lasers on Airborne Platforms**
Dr. Dan Rini, Rini Technologies Inc.
- 1430 **Break**
- 1520 **Mechanically Pumped Two-Phase System with Multiple Compact Evaporators**
Dr. Dmitry Khrustalev, Swales Aerospace
- 1540 **Power System and Thermal Management Evaluations for an Airborne Electrical Laser Power System Application**
Dr. Mysore Ramalingam, UES, Inc.
- 1730 **Exhibitor Reception**

WEDNESDAY MORNING

Diode Pump Lasers

Chair: *Dr. Jeffrey Thomas*, Penn State University

- 0700 **Registration and Breakfast at Westin
Speakers Breakfast**
- 0810 **Spectral Stabilization of Diode Bar by
Volume Bragg Grating Incorporated in
Fast Axis Collimator**
Dr. Leonid Glebov, University of Central
Florida
- 0830 **Spectrally Narrowed and Wavelength-
Stabilized High-Power, High-Efficiency
808 nm and 975 nm Diode Laser Pumps**
Dr. Manoj Kanskar, Alfalight Inc.
- 0850 **Wavelength Stabilization and Beam
Combination of High Brightness Diode
Lasers**
Dr. S. David Roh, Nuvonyx, Inc.
- 0910 **High-Power, Fiber-Coupled, Diode-Laser
Sources**
Mr. Oscar Romero, Spectra-Physics
- 0930 **Fiber Coupled Diode Laser with More
Than 50 W From a 0.1mm Fiber**
Dr. Stefan Heinemann, Fraunhofer USA
- 1000 **Break**
- 1030 **High Brightness Single Mode and
Multimode Semiconductor Lasers in the
Near-Infrared**
Dr. R. Lammert, Quintessence Photonics
Corporation
- 1050 **Single Transverse Mode Grating Coupled
Surface Emitting Volume Bragg Laser**
Dr. George Venus, University of Central
Florida
- 1110 **Hard-Solder Packaging of High Power
Diode Bars for High Temperature
Applications**
Dr. David Schleuning, Coherent Inc.
- 1130 **Diffraction Limited Beam from a
Coherent Array with a Directional
Coupler**
Dr. Iulian Petrescu-Prahova, High Power
Devices
- 1200 **Lunch**

WEDNESDAY MORNING

Fiber and Waveguide

Chair: *Dr. Ramesh Shori*, Naval Air Warfare Center

- 0700 **Registration and Breakfast at Westin
Speakers Breakfast**
- 0800 **Introductions**
Dr. Ramesh Shori, Naval Air Warfare Center
- 0810 **Fiber Laser Review/ Overview**
Dr. Eric Honea, Aculight Corporation
- 0840 **Kilowatt Level, Monolithic Fiber
Amplifiers for Beam Combining
Applications at 1 micron**
Mr. J. Edgecumbe, Nufern
- 0900 **High Power Narrow Linewidth Amplifiers**
Dr. C. Headley, OFS Laboratories
- 0930 **Critical Ytterbium Doped DC LMA Fiber
Performance Measurements**
M.SC. Teemu Kokki, Liekki Corporation
- 0950 **Break**
- 1030 **Influence of Temperature on Yb-fiber
Laser and Amplifier Performance**
Dr. T.C. Newell, Air Force Research
Laboratory/DELO
- 1050 **Diode-Bar Side Pumping of Double-Clad
Fibers**
Dr. Jeffrey Koplou, Sandia National
Laboratories
- 1110 **50-W Chirped-Volume-Bragg-Grating
Based Fiber CPA at 1055-nm**
Dr. Almantas Galvanauskas, University of
Michigan
- 1200 **Lunch**

WEDNESDAY NOON

Poster Session

Chair: *Dr. Sean Ross*, Air Force Research Laboratory/DELO

- **Narrow-Band Volume Bragg Gratings in PTR Glass Under High-Power CW Laser Radiation**
Mr. Oleksiy Andrusyak, University of Central Florida
- **A Sub-Scale Demonstration of Photonic Laser Propulsion (PLP) Based on a Solid State Laser System**
Dr. Young Bae, Bae Institute
- **Steps Towards a Comprehensive Formulation of Phase Locking Dynamics of External Cavity Laser Arrays with Arbitrary Internal and External Coupling**
Dr. Erik Bochove, Air Force Research Laboratory/DELO
- **A Laser Pointing, Tracking and Imaging System Based on Nonlinear Phase Conjugation Amplifier**
Dr. Anatoliy Khizhnyak, MetroLaser Inc.
- **AFB® CVD Diamond/HR Coating/ Doped YAG as High Power Solid State Laser Components**
Dr. Huai-Chuan Lee, Onyx Optics, Inc.
- **Effect of Ionizing Radiation on Volume Diffractive Gratings in PTR Glass**
Dr. Vasile Rotar, University of Central Florida
- **Vertical-Cavity Surface-Emitting Laser Pumps for High-Power Solid-State Laser Pumping**
Dr. Jean-Francois Seurin, Princeton Optronics
- **Theoretical Description of a Novel Scintillation Suppression Technique**
Dr. Thomas Shay, Air Force Research Laboratory/DELO
- **Theoretical Model for a 100-Element Self-Synchronous Phase Locked Optical Amplifier Array**
Dr. Thomas Shay, Air Force Research Laboratory/DELO
- **Spectral Narrowing and Stabilization of High Power LD Stacks, Bars and Single Emitters by PTR-Glass Volume Bragg Gratings**
Dr. George Venus, University of Central Florida

WEDNESDAY AFTERNOON

Fiber and Waveguide

Chair: *Dr. Ramesh Shori*, Naval Air Warfare Center

1300 **Introductions**

Dr. Ramesh Shori, Naval Air Warfare Center

1310 **Re-Imaging Waveguide Lasers**

Dr. Bert Callicaott, Lockheed Martin Coherent Technologies

1340 **Chirally Coupled Core Fibers for High Power Effectively Single-Mode Core Size Scaling**

Dr. Almantas Galvanauskas, University of Michigan

1400 **Progress in High Power Single Emitter Fiber Sources**

Dr. Johan Nilsson, University of Southampton

1430 **Break**

Solid State Lasers

Chair: *Dr. L.D. Merkle*, Army Research Laboratory

1500 **Introductions**

Dr. L.D. Merkle, Army Research Laboratory

1510 **Strength Test Results of AFB® Single Crystal Composites for Solid State Laser Components**

Dr. Huai-Chuan Lee, Onyx Optics, Inc.

1530 **Novel Processing of High-Efficiency Nd:YAG Polycrystalline Laser Materials**

Dr. Sean Sweeney, GE Global Research

1550 **Fabrication and Properties of Ceramic Laser Materials**

Dr. J.S. Sanghera, Naval Research Laboratory

1610 **Multi-Color QCW Array for Uncolled Pumping of Nd:YAG Laser**

Dr. P. Thiagarajan, Lasertel, Inc.

1730 **Pre-Banquet Social**

1800 **Banquet**

WEDNESDAY AFTERNOON

Diode Pump Lasers

Chair: *Dr. Jeffrey Thomas*, Penn State University

1300 Introductions

Dr. Jeffrey Thomas, Penn State University

1310 High Power 2-D Diode Array

Dr. Keng Leong, SiMMtec, Inc.

1330 Recent Progress of Ultra-High-Power Diode Laser Bars and Stacks at Spectra-Physics

Dr. Hanxuan Li, Spectra-Physics

1350 High Temperature, High Efficiency QCW Bars at 808 nm

Dr. Rajiv Pathak, Lasertel Inc.

1410 Next Generation Microchannel Coolers

Dr. Ryan Feeler, Northrop Grumman / Cutting Edge Optronics

1430 Break

1500 Quantum Design of a Multi-Watt 1178 nm VECSEL

Dr. Jerome Moloney, University of Arizona

1520 High Power Semiconductor Lasers in the Eye-Safe Wavelength Regime

Dr. M. Osowski, Quintessence Photonics Corporation

1540 Enhanced Photon Recycling for High Efficiency Semiconductor Quantum Well Lasers

Dr. Yong-Hang Zhang, Arizona State University

1600 Advances in High Power, High Efficiency, High Brightness Fiber Coupled Diode Lasers from 635-nm to 1900-nm and Beyond

Dr. Steve Patterson, nLight

1620 CW Rb Vapor Lasers Pumped by Commercial, Line-Narrowed Diode Laser Arrays

Dr. Allan Peterson, Spectra-Physics

1730 Pre-Banquet Social

1800 Banquet

THURSDAY MORNING

Beam Combination and Control

Chair: *Dr. Tom Shay*, Air Force Research Laboratory

- 0700 **Registration and Breakfast at Westin
Speakers Breakfast**
- 0800 **Introductions**
Dr. Tom Shay, Air Force Research Laboratory/DELO
- 0810 **Passive Phasing of Fiber Lasers**
Dr. Sami Shakir, Northrop Grumman
- 0830 **Four-Channel, High Power, Passively
Phase Locked Fiber Array**
Dr. Eric Honea, Aculight Corporation
- 0850 **Supermode Selection of a Multicore
Fiber Laser Array in an External Self-
Fourier Cavity**
Dr. Erik Bochove, Air Force Research Laboratory/DELO
- 0920 **Coherent Array of High-Power Fiber
Lasers**
Dr. Christopher Corcoran, Corcoran Engineering
- 0940 **Break**
- 1010 **Coherent Fiber Beam Combiner**
Dr. Michael Wickman, Northrop Grumman
- 1030 **Coherent Beam Combining of a Large
Number of PM Fibers in a 2D Fiber Array**
Dr. Charles Yu, MIT Lincoln Laboratory
- 1100 **Self-Synchronous Phase Locking and
Beam Steering of a Nine Element 100-W
Fiber Amplifier Array**
Dr. Thomas Shay, Air Force Research Laboratory/DELO
- 1120 **2-Dimensional Re-imaging Assisted
Phased Array Progress**
Dr. Scott Christensen, Lockheed Martin Coherent Technologies
- 1200 **Lunch**

THURSDAY MORNING

Solid State Lasers

Chair: *Dr. L.D. Merkle*, Army Research Laboratory

- 0700 **Registration and Breakfast at Westin**
Speakers Breakfast
- 0800 **Introductions**
Dr. L.D. Merkle, Army Research Laboratory
- 0810 **2-kW Average Power CW Phase-Conjugate Solid-State Laser**
Dr. T.O. Clatterbuck, Raytheon
- 0840 **Rotary Disk Laser Reaches 250-W Milestone in 3 Years**
Dr. Santanu Basu, Sparkle Optics Corporation
- 0900 **Study of Yb-Doped Sesquioxides for Cryogenic HEL**
Dr. L.D. Merkle, Army Research Laboratory
- 0920 **Break**
- 1010 **Domestically Produced Ceramic YAG Laser Gain Material for High Power SSLs**
Ms. Jean Huie, Raytheon
- 1030 **Depolarization Loss in Ceramic Crystal Lasers**
Dr. Michael Bass, University of Central Florida
- 1200 **Lunch**

THURSDAY AFTERNOON

Beam Combination and Control

Chair: *Dr. Tom Shay*, Air Force Research Laboratory/DELO

1300 **Introductions**

Dr. Tom Shay, Air Force Research Laboratory/DELO

1310 **High Power Scalable Spectral Beam Combining Enabled by Volume Bragg Gratings**

Dr. B.L. Volodin, PD-LD Inc.

1330 **Spectral Beam Combining by Stack of Volume Bragg Gratings in PTR Glass**

Dr. Leonid Glebov, University of Central Florida

1350 **Concept of Operation, Design and Field Test Results of an Active Laser Tracking System**

Dr. Vladimir Markov, MetroLaser Inc.

1410 **A Novel Scintillation Suppression Technique**

Mr. Craig Robin, Air Force Research Laboratory/DELO

1430 **Break**

1510 **The Effect of Aperturing on Laser Beam Quality**

Dr. Sean Ross, Air Force Research Laboratory/DELO

1610 **Conference Adjourns**

SWIR/MIR Lasers

- Chair: *Dr. Ish Aggarwal*, Naval Research Laboratory
- 1300 **Introductions**
Dr. Ish Aggarwal, Naval Research Laboratory
- 1310 **Efficient, High-Power, Tm-Doped Silica Fiber Laser**
Dr. Peter Moulton, Q-Peak, Inc.
- 1340 **Highly Efficient, Monolithic Fiber Amplifiers Operating at 2 μm**
Dr. Michael O'Connor, Nufern, Inc.
- 1400 **Mid-Infrared Generation Via Wavelength Conversion of High-Power, High-Repetition-Frequency Pulsed Fiber Lasers**
Dr. Fabio Di Teodoro, Aculight
- 1420 **High Energy 2-micron Laser Developments**
Dr. Jirong Yu, NASA Langley Research Center
- 1440 **Break**
- 1510 **High Power Eyesafe Er:YAG Laser Amplifier**
Dr. Robert Stoneman, Lockheed Martin Coherent Technologies.
- 1530 **Resonant Pumping and Upconversion in 1.6 μm Er³⁺ Lasers at 77K**
Dr. N. Ter-Gabrielyan, Army Research Laboratory
- 1550 **Multi-Watt, Single Frequency, Tunable Mid IR Source**
Dr. Angus Henderson, Aculight
- 1610 **Conference Adjourns**

SSDLTR 2007 Advisory Board

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