Optical Science & Engineering Conference

Sponsored by the MSU Optical Technology Center
MSU Foundation & Alumni Center
Montana State University
Bozeman, Montana

Conference Agenda
Wednesday, 27 August 2008

Conference Chair, Dr. Joseph Shaw
OpTeC Director & ECE Professor, MSU

Conference Assistant, Sue Martin
OpTeC Administrative Assistant, MSU

8:00 am **MORNING REFRESHMENTS**

8:30 am Joseph Shaw - OpTeC Director, MSU
Welcome and opening remarks

Session 1 – Optical Remote Sensing I Session Chair: TBD

8:40 am Upendra Singh – NASA Langley Research Center, Hampton, VA
Overview of NASA's laser risk reduction program towards technology maturation for Earth and Mars active optical remote sensing application from space

9:20 am Amin Nehrir – ECE Dept., MSU
Diode laser based water vapor differential absorption lidar

9:40 am David Hoffman – ECE Dept., MSU
Two color lidar for aerosol studies

10:00 am Andrew Dahlberg, Nathan J. Pust, Joseph A. Shaw – ECE Dept., MSU
All-sky polarization imager deployment at Mauna Loa, Hawaii

10:20 am **BREAK & REFRESHMENTS**

Session 2 – Optical Communication Session Chair: Dr. Richard Wolff

10:40 am Paul W. Nugent (1), Joseph A. Shaw (1), Sabino Piazzolla (2)
(1) Electrical and Computer Engineering Dept., MSU
(2) NASA Jet Propulsion Laboratory, Pasadena, CA
Infrared cloud imaging in support of earth-space optical communication

11:00 am Wenhao Lin – ECE Dept., MSU
A new QoS framework for all-optical networks

11:20 am Tim Hahn – ECE Dept., MSU
Routing and wavelength assignment in all-optical networks

11:40 am Trent Jackson – ECE Dept., MSU
EDFA transient reduction using power shaping

12:00 pm **LUNCH BREAK** (on your own)

Session 3 – Micro, nano and bio optics Session Chair: TBD

1:20 pm Andras Guttman (1), E. Ray Stoller (2), A. Monzo (1), and L. Szekely (2)
(1) Horvath Laboratory of Bioseparation Sciences, University of Innsbruck, Austria
(2) Chemistry & Biochemistry Department, MSU
Microchannel and microreactor fabrication methods for separation microchips

1:40 pm Elizabeth Stoller (1), Andras Guttman (2), David Dickensheets (3), Edward Dratz (1)
(1) Chemistry & Biochemistry Dept., MSU
(2) Horvath Laboratory of Bioseparation Sciences, University of Innsbruck, Austria
(3) Electrical and Computer Engineering Dept., MSU
Lab-on-a-chip (LOC) designs for enhanced protein recovery from 2D gels, using electroelution and microfluidic digestion

2:00 pm Nikolay S. Makarov (1), Erich Beuerman (1), Mikhail Drobizhev (1), Jean Starkey (2), Aleksander Rebane (1)
(1) Physics Dept., MSU
(2) Microbiology Dept., MSU
Environment-sensitive two-photon dye

2:20 pm David Dickensheets – ECE Dept., MSU
Fabrication and testing of blazed 2-D sub-wavelength gratings in silicon

2:40 pm Chris Arrasmith – ECE Dept., MSU
Handheld confocal microscope with Raman spectroscopy for skin cancer diagnosis

3:00 pm **BREAK & REFRESHMENTS**

3:20 pm Wataru Nakagawa – ECE Dept., MSU
Nanoscale optics: overview and applications

Session 4 – Optical Remote Sensing II Session Chair: TBD

3:40 pm Charles Kankelborg – Physics Dept., MSU
Solar coronal tomography

4:00 pm Seth Humphries – ECE Dept., MSU
Carbon sequestration site monitoring using laser based instruments

4:20 pm Josh Rouse (1), Joseph A. Shaw (1), Kevin S. Repasky (1), Rick L. Lawrence (2)
(1) ECE Dept., MSU
(2) Land Resources & Environmental Sciences Dept., MSU
Multispectral imaging for detection of CO_2 leakage at a carbon sequestration test site

4:40 pm Brant M. Kaylor (1), Trenton J. Berg (1,2), Randy R. Reibel (1,2), Peter A. Roos (1,2), W. Randall Babbitt (1)
(1) Bridger Photonics, Bozeman, MT
(2) Spectrum Lab, MSU
High-performance, micro-resolution FMCW LADAR

5:00 pm **POSTER SETUP**

6:00 – 8:00 pm **POSTER SESSION & DINNER**

Session 5 – Poster Session Session Chair: Dr. Joseph Shaw

1. Zeb Barber
Spectrum Lab, MSU
High-performance laser stabilization: ultra-stable cavities vs. spectral holes

2. Jamie Barr
ECE Dept., MSU
Fiber optic gas sensor

3. Erich Beuerman, Nikolay Makarov, Mikhail Drobizhev, Aleks Rebane
Physics Dept., MSU
Measuring Stokes shifts in rhodamines: towards quantitative description of vibronic two-photon absorption

4. Eric Carlsten
ECE Dept., MSU
Lidar instrument for honeybee detection

5. David Coll Segarra (1), Nikolay Makarov (1), Jean Starkey (2), Mikhail Drobizhev (1), Aleks Rebane (1)
(1) Physics Dept., MSU
(2) Biochemistry Dept., MSU
Developing fully automated small animal near-IR photodynamic therapy testbed

6. Erwin Dunbar, Matt Leone, Sarah Lukes, David Dickensheets
   ECE Dept., MSU
   Polymer deformable membrane mirrors for focus control using SU-8 2002

7. Steven Jay
   Land Resources and Environmental Sciences Dept., MSU
   Noxious weed mapping using hyperspectral imagery

8. Charlie Keith
   ECE Dept., MSU
   Hyperspectral imaging of plant stress

9. Sriharsha Kota Poven, Richard Wolff
   ECE Dept., MSU
   Calculating the Q factor for soliton and Gaussian optical pulses

10. Nicole Lerner (1), Joseph A. Shaw (1), James H. Churnside (2), James J. Wilson (2), Pat Bigelow (3), Todd Koel (3)
    (1) ECE Dept., MSU
    (2) NOAA Earth Systems Research Lab, Boulder, CO
    (3) Yellowstone National Park, WY

11. Kerry Neal
    ECE Dept., MSU
    Modeling a confocal optical filter

12. Charles Ostrander
    Spectrum Lab, MSU
    Phase alignment of asynchronous, externally clockable devices to periodic master control signals

13. Jiong Qiu
    Physics Dept., MSU
    Earthshine observation and measurement

14. Kristie Simpson, Paul W. Nugent, Joseph A. Shaw
    ECE Dept., MSU
    Microcontroller for a new-generation infrared cloud imager

15. Ben Staal (1), Jennifer Johnson (1), Paul W. Nugent (2), Joseph A. Shaw (2)
    (1) Mechanical Engineering Dept., MSU
    (2) Electrical & Computer Engineering Dept., MSU
    Mechanical design for a new-generation infrared cloud imager

16. Elizabeth Stoller (1), Andras Guttman (2), David Dickensheets (3), and Edward Dratz (1),
    (1) Chemistry and Biochemistry Dept., MSU
    (2) Horvath Lab, University of Innsbruck, Austria
    (3) ECE Dept., MSU
    Enhanced protein recovery from 2D gels, using electroelution and microfluidic digestion

17. Charles W. Thiel (1), Y. Sun (2), T. Böttger (3), W. R. Babbitt (1,4), R. L. Cone (4)
    (1) Spectrum Lab, MSU
    (2) Physics Dept., Univ. South Dakota
    (3) Physics Dept., Univ. California San Francisco
    (4) Physics Dept., MSU
    Optical decoherence, spectral diffusion, and 169Tm hyperfine structure of Tm3+:LiNbO3 at 794 nm for quantum computing and signal processing applications

18. Charles W. Thiel (1), R. L. Cone (2), T. Böttger (3), Y. Sun (4), W. R. Babbitt (1,2),
    K. D. Merkel (5)
    (1) Spectrum Lab, MSU
    (2) Physics Dept., MSU
    (3) Physics Dept., Univ. California San Francisco
    (4) Physics Dept., Univ. South Dakota
    (5) S2 Corp., Bozeman, MT
    Persistent spectral hole burning, spectral diffusion, and super-hyperfine interactions of Er3+:LiNbO3 at 1.5 microns for quantum computing and signal processing applications

19. SPIE Student Chapter
    Poster summarizing the SPIE student chapter of SPIE – the Int'l Society of Optical Engineering

Local Optics Company Posters and Exhibits

A. **AdvR, Inc**. - Elizabeth Noonan, Melissa McIntyre, Cooper McCann

B. **Altos Photonics** - Lucian Hand, Jurgita Meiliute, Laurie Dewar, Emily Bates

C. **Quantel USA** - Neal Montgomery, Jason Yager, Kris Goldizen, Brad Thompson, Michael Barrett

D. **ILX Lightwave** - Thad Orosz

E. **Resonon, Inc.** - Rand Swanson

F. **S2 Corporation** - Kris Merkel, Pete Sellin

G. **Scientific Materials Corp., a division of FLIR** - Zach Cole, Brad Killgore

Thank you for Participating