Optical Science & Engineering Conference
Ballroom A – Strand Union Building
Montana State University
Bozeman, Montana

Presented by the MSU Optical Technology Center (OpTeC), with support from the MSU Vice-President for Research and Economic Development and the City of Bozeman, and in cooperation with the Montana Photonics Industry Alliance.

Conference Agenda
Monday, September 25, 2017

Conference Organizers:
Dr. Joseph Shaw – OpTeC Director
Dr. Larry Johnson – Montana Photonics Industry Alliance President
Diane Harn – Conference Coordinator

8:00 am CHECK-IN and MORNING REFRESHMENTS

8:30 am Joseph Shaw
MSU Optical Technology Center Director
Welcoming comments

Session 1 Technical talks Session chair: Rufus Cone

8:40 am Louis Oberto and Zeb Barber
MSU Spectrum Lab
Nonlinear Recovery for Spectral Hole-burning Readout

9:00 am Casey L. Kennedy¹, Andrew H. Hill², Eric S. Massaro¹, Erik M. Grumstrup¹,²
¹MSU Chemistry & Biochemistry Department
²MSU Materials Science Program
Ultrafast Excited State Transport and Decay Dynamics in Cesium Lead Mixed-Halide Perovskites.

9:20 am Charles Kankelborg¹, Philip Judge², Amy Winebarger³, Ken Kobayashi ³, Laurel Rachmeier³, Roy Smart¹
¹MSU Physics Department
High Altitude Observatory/National Center for Atmospheric Research
NASA Marshall Space Flight Center

The FURST Mission: VUV Spectroscopy of the Sun as a Star

9:40 am  Thomas Rust and Charles Kankelborg
MSU Physics Department

Simultaneous Imaging and Spectroscopy of the Extreme Ultraviolet Sun with the MOSES Sounding Rocket

10:00 am  **BREAK & REFRESHMENTS**

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Session 2  Technical talks  Session chair: Randy Babbitt

10:30 am  Ioannis Roudas$^1$ and Jaroslaw Kwapisz$^2$
$^1$MSU Electrical and Computer Engineering Department
$^2$MSU Mathematical Sciences Department

Modal dispersion characterization of multimode fibers

10:50 am  Laura M. Dahl, Martin Jan Tauc, and Joseph A. Shaw
MSU Electrical and Computer and Computer Engineering Department

Measuring cloud thermodynamic phase with all-sky polarization imaging

11:10 am  Joseph Shaw, Rufus Cone, Charles Thiel, Kevin Repasky, Zeb Barber, Rob Walker, Ross Snider, Ed Dratz
$^1$MSU Optical Technology Center
$^2$MSU Electrical and Computer Engineering Department
$^3$MSU Physics Department
$^4$MSU Chemistry and Biochemistry Department

Summary of accomplishments from the Montana Research and Economic Development Initiative (MREDI)

11:50 am  **Lunch** on your own

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Session 3  Session chair: Rob Walker

1:20 pm  Ryan Galloway$^1$, Zeb Barber$^1$, Dave Rabb$^2$, Jason Stafford$^2$
$^1$MSU Spectrum Lab
$^2$Air Force Research Lab, Laser Radar Branch

Self-Referencing Lidar

1:40 pm  Christine Gobrogge and Robert Walker
MSU Chemistry and Biochemistry Department

Using Time-Resolved Fluorescence Emission to Investigate Solute Partitioning in Phospholipid Membranes
2:00 pm  Martin Jan Tauc¹, Kurt M. Fristrup², and Joseph A. Shaw³
¹MSU Electrical and Computer Engineering Department
²Natural Sounds and Night Skies Division, National Park Service, Fort Collins, CO
³Wing-beat-modulation scanning lidar for insect studies

2:20 pm  Bradley R. Slezak, Charles W. Lewandowski, and Brian D’Urso
MSU Physics Department
Measurement on a Particle in a Magneto-Gravitational Trap

2:40 pm  Break

Session 4  Commercialization of Optics & Photonics Technology  Session Chair: Larry Johnson

3:00 pm  Larry Johnson
Montana Photonics Industry Alliance

3:10 pm  Trevor Huffmaster
406 Labs Accelerator

3:30 pm  Chris Arrasmith
Revibro Optics

3:50 pm  Zachary Cole
FLIR Scientific Materials Corp.

4:10 pm  Joe Sawyer
Quantel USA

4:30 pm  Room transition

5:10 pm  Hors d’oeuvres & poster setup

6:00 – 8:00 pm  POSTER SESSION & Hors d’oeuvres

6:00 pm  Welcome to Evening Session & presentation of the 2017 Montana Optics Innovator Award to Steve Birrell: for pioneering work in the test and measurement market place with the design and production of laser systems and precision pulse generator instrumentation products.

Session 5 – Poster Session

Company exhibits

AdvR, Inc  FLIR/Scientific Materials Corp.  Ophir-Spirocon  Resonon, Inc  Altos Photonics  Montana Instruments  Quantel, USA  Zygo/AMTEK Ultra Precision Technologies
Research Posters

1. Andrew H. Hill¹, Casey L. Kennedy², Saranyan Ragunath², Alexander Hathaway³, and Erik M. Grumstrup¹,²
   ¹ MSU Chemistry and Biochemistry Department
   ² MSU Material Science Program
   Direct Determination of Perovskite Carrier Scattering Times Using Pump-Probe Microscopy

2. Eric Massaro¹, Andrew Hill², Casey Kennedy¹ and Erik Grumstrup¹,²
   ¹ MSU Department of Chemistry and Biochemistry, Montana State University, Bozeman, Montana 59717, United States
   ² Montana Materials Science Program, Montana State University, Bozeman, Montana 59717, United States
   Diffraction Limited Ultrafast Spectroscopy Sheds Light on Unprecedented Exciton Diffusion in PCDTBT Thin Films

3. Robert W. Hutchinson¹, Norbert Jakubowski², Heike Traube², Diego Esteban-Fernandez², Jay Wilkins³, Leif Summerfield³, Ciaron O'Connor³, Katherine McLachlin³
   ¹ Electro Scientific Industries, Ltd. – Huntingdon, UK
   ² BAM – Berlin, Germany
   ³ Electro Scientific Industries, Inc. – Bozeman, MT
   The NWR IMAGE-an Elemental Microscope

4. Aislinn Daniels¹ and Wm. Randall Babbitt³
   MSU Physics Department
   Characterizing Vibration-Induced Coherence Loss in a Closed-Cycle Cryostat

5. Demi St. John, David P. Atherton, Charles Thiel, Zeb Barber, and Wm. Randall Babbitt
   MSU Physics Department and Spectrum Lab
   Solid-State Laser Cooling and Functionalization of Optically Levitated Particles

6. Eric Mitchell¹, Esther Baumann², Matthew Hoehler², and Zeb Barber¹
   ¹ MSU Spectrum Lab
   ² National Institute of Standards and Technology
   Multi-wavelength coherent lidar through fire

7. Kora Barnes, Elizabeth Corbin, Robert Usselman, Renee Reijo-Pera, Rand Swanson, Ross Snider, and Edward Dratz
   MSU Chemistry and Biochemistry Department
   Developing hyperspectral imaging, optogenetics, and high-performance image processing for monitoring metabolic states of live cells in culture

8. Benjamin Gold, Josh Sinrud, and Robert A. Walker
   MSU Department of Chemistry and Biochemistry
   High Temperature Optical Studies of Nickel Aluminate as a Catalyst and Anti-sintering Agent in Energy Conversion Technologies
9. Tristan Gray, Jacob Fleming, James Dilts, Benjamin Moon, and Wataru Nakagawa
   MSU Department of Electrical and Computer Engineering
   *Optical Pressure Sensing Using Deformable Waveguides*

10. Dario Scotto and Alan Craig
    MSU Physics Department
    *Novel Quadrupole RF Ring Trapping and Cooling of Electrons via Sympathetic Cooling with a Magneto-optically Trapped Atomic Buffer*

11. Katie Link and Robert A. Walker
    MSU Chemistry & Biochemistry Department
    *Cooperative Adsorption in Model Sea Spray Aerosols with Vibrational Sum Frequency Generation*

12. Torrey McLoughlin¹, Carol Baumbauer², Wm. Randall Babbitt¹, Wataru Nakagawa², Phil Himmer³, Dustin Blagg⁴, and Ioannis Roudas²
    ¹MSU Physics Department
    ²MSU Electrical and Computer Engineering Department
    ³MSU Montana Microfabrication Facility
    ⁴Chemical & Biological Engineering
    *Nanoscale grating electrodes for nonlinear optics applications*

13. Connor Beck¹, Clark Hickman¹,² and Anja Kunze¹
    ¹MSU Electrical and Computer Engineering Department
    ²Gustavus Adolphus College
    *Prototyping a portable incubator-fluorescent imaging system*

    MSU Physics Department
    *Scanning Fabry-Perot Interferometers for High-resolution Laser Systems*

    MSU Physics Department
    *Characterization of Tm:YAG Waveguides for Optical and Quantum Signal Processing Applications*

16. Laura M. Dahl¹, Martin Jan Tauc¹, Taiga Hashimoto³, Preston Hooser¹, Kendra Gillis³, William Weiss³, Bryan Stanley⁴, and Joseph A. Shaw¹
    ¹MSU Electrical and Computer Engineering Department
    ³Hokkaido University, Japan – Applied Physics Department
    ³BYU Idaho Physics Department
    ⁴Colorado State University Physics Department
    *Skylight polarization measurements at the 2017 solar eclipse: preparations and preliminary results*

17. Ryan Galloway¹, Zeb Barber¹, Dave Rabb², Jason Stafford²
    ¹MSU Spectrum Lab
    ²Air Force Research Lab, Laser Radar Branch
    *Self-Referencing Lidar*
18. Eric S. Massaro, Andrew H. Hill, and Erik M. Grumstrup
Department of Chemistry & Biochemistry
& Department of Material Science
Montana State University

Label-Free Sub-Diffraction Limited Imaging