

Hyperspectral Imaging and Sensing of the Environment (HISE)

OSA Topical Meeting and Tabletop Exhibit

Collocated with

[Digital Holography and Three-Dimensional Imaging \(DH\)](#)
[Fourier Transform Spectroscopy \(FTS\)](#)
[Novel Techniques in Microscopy \(NTM\)](#)
[Optical Trapping Applications \(OTA\)](#)

Technical Conference: April 26-30, 2009

Exhibition: April 27-29, 2009

[Sheraton Vancouver Wall Centre Hotel](#)
[Vancouver, BC, Canada](#)

PDP Submissions Deadline: April 2, 2009, 12:00 p.m. noon, EDT (16.00 GMT)

[Housing Deadline](#): March 25, 2009

[Pre-Registration Deadline](#): April 1, 2009

2009 Meeting Chairs

Bryan Baum, *Univ. of Wisconsin-Madison, USA*, Chair

Ping Yang, *Texas A&M Univ., USA*, Chair

About Hyperspectral Imaging and Sensing of the Environment

The unprecedented advancement of remote sensing imaging and sounding by passive and active measurement technologies during and beyond this decade will provide unprecedented monitoring and understanding of our planetary system. The uniqueness of these new observations is already challenging scientists and users in all disciplinary areas and requires new approaches for managing, processing and using the data, including the integration of observations from different sensor constellations to better assess the information that these new sensors will provide.

Today, a number of advanced hyperspectral imaging and sounding instruments are on NASA and European aircraft and satellite platforms, and some of them will evolve in the near future into operational imaging and sounding systems, for example NPOESS, CLARREO, and GOES-R. Passive hyperspectral imaging and sounding data provide unique and independent sources of spatial and spectral information that are critical for studying the intricate characteristics of various weather and climate phenomena. Where sounding information is required to study the evolution of various atmospheric processes, imaging information is quite useful for the investigation of clouds and aerosols as well as land and coastal-ocean ecosystems. Additionally, active sensors such as Calipso and CloudSAT, currently operational as part of the NASA A-Train, provide a key role by providing additional insights into the vertical profiles of clouds and aerosols. They also provide an important source of information for assessing regional and global retrievals from passive sensors.

The focus of HISE 2009 is to increase the dialogue among various communities relating to new research and applications based on these unprecedented data sources to better understand weather and climate issues.

All relevant passive, active, imaging, and sounding hyperspectral remote sensing programs, missions, field campaigns, data processing, applications, validation approaches, basic research, educational outreach and users' feedback are welcome.

Topics to be Considered

- Algorithm development, research, and applications of current and planned advanced imager and sounders (e.g., NPOESS, GOES-R, MTG, CLARREO);
- Sensor system performance and new results of satellite capabilities from current observations;
- Determination of cloud and aerosol properties from active and passive remote sensing observations and atmospheric soundings of temperature, water vapor and other trace gas constituents;
- Assessment of cloud and aerosol properties derived from both active and passive sensors;
- Assimilation of data from hyperspectral sensors into numerical weather models;
- The development of new radiative transfer models necessary for the interpretation of the data;
- Environmental monitoring using imager and hyperspectral data; and
- Potential offered by new sensors under development.

About Hyperspectral Imaging and Sensing of the Environment

The unprecedented advancement of remote sensing imaging and sounding by passive and active measurement technologies during and beyond this decade will provide unprecedented monitoring and understanding of our earth (land and ocean)-atmosphere system (E-AS). The uniqueness of these new observations will challenge scientists and users in all disciplinary areas and require new approaches for managing, processing and utilizing the data, including the integration of observations from different sensor constellations to maximize the information which these new sensors will provide.

Today, a number of advanced hyperspectral imaging and sounding instruments are on NASA and European research instruments, and some of them will evolve in a few years into operational imaging and sounding systems, for example NPOESS, METOP and GOES-R. Passive hyperspectral imaging and sounding data provide a unique and independent scale of information, such as spatial resolution and spectral resolution required to measure and monitor the intricate characteristic of E-AS. Where sounding information is required to study atmosphere evolution, imaging information is necessary to investigate land and coastal-ocean ecosystems. Complementary active sensors, due to their high signal sensitivity, have a key role in E-AS monitoring because they provide additional microphysical insights into the small targets existing within the EAS. They also provide an important source of information for validating other retrievals from passive sensors.

Synergistic uses of imaging and sounding, and passive and active through collocation processing, in theory, will provide complementary information content to enhance knowledge about the state of E-AS.

Topics to Be Considered

- Algorithm development, research, and applications of current and planned advanced imager and sounders (e.g., NPOESS, GOES-R, MTG, CLARREO);
- Sensor system performance and new results of satellite capabilities from current observations;
- Determination of cloud and aerosol properties from active and passive remote sensing observations and atmospheric soundings of temperature, water vapor and other trace gas constituents;
- Assessment of cloud and aerosol properties derived from both active and passive sensors;
- Assimilation of data from hyperspectral sensors into numerical weather models;
- The development of new radiative transfer models necessary for the interpretation of the data;
- Environmental monitoring using imager and hyperspectral data; and
- Potential offered by new sensors under development.

General Theme

All relevant passive, active, imaging, and sounding hyperspectral remote sensing programs, missions, field campaigns, data processing, applications, validation approaches, basic research, educational outreach and users' feedback are welcome.

Program Committee

Program Chairs

Bryan Baum, *Univ. of Wisconsin-Madison, USA* **Chair**
Ping Yang, *Texas A&M Univ., USA* **Chair**

Committee Members

Andy Heidinger, *NOAA/NESDIS, USA*
Allen Larar, *NASA, USA*
Peter Pilewski, *Univ. of Colorado at Boulder, USA*
Rob Roebeling, *KNMI – Royal Netherlands Meteorological Inst., Netherlands*
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Heli Wei, *Chinese Academy of Science, China*
Manfred Wendisch, *Johannes Gutenberg Univ., Germany*
Fuzhong Weng, *NOAA/NESDIS, USA*

Exhibitor Listings

ADVANCES in IMAGING

2009 OSA OPTICS
AND PHOTONICS
CONGRESS

April 26-30, 2009
Vancouver, BC
Canada

Collated Meetings:

Digital Holography
and Three-
Dimensional Imaging
(DH)

Fourier Transform
Spectroscopy (FTS)

Hyperspectral Imaging
and Sensing of the
Environment (HISE)

Novel Techniques in
Microscopy (NTM)

Optical Trapping
Applications (OTA)

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The organizers of the Advances in Imaging Congress and Tabletop Exhibit wish to acknowledge the following for their support:

Grants:

- Air Force Office of Scientific Research (AFOSR)
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- National Institute of Biomedical Imaging and Bioengineering/Department of Health and Human Services / National Institutes of Health
- The OSA Foundation

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Special Events

Meet the Applied Optics Editors Dinner

Date: April 28, 2009

Time: 7:00 PM

Where: The Relish Restaurant & Lounge, 888 Nelson ST. (Between Hornby & Howe), Vancouver, BC, Canada
(Website: <http://www.relishrestaurants.com/relish/index.asp>).

Don't miss this great opportunity to meet Applied Optics Information Processing Editors:

Prof. T.-C. Poon (Division Editor, Virginia Tech)

Prof. Partha P. Banerjee (Topical Editor, Univ. of Dayton)

Prof. Byoung-ho Lee (Topical Editor, Seoul National Univ., Korea)

All conference attendees, especially students, are invited to this casual networking dinner. You can sign-up onsite at the OSA Registration Desk at the Grand Ballroom Foyer Coatroom. Please RSVP by Tuesday, April 28 by 1:00 pm. **Please note: Participants pay for their own dinners.**

**2009 OSA Optics & Photonics Congress
Advances In Imaging
April 26-30, 2009
Vancouver, British Columbia, Canada**

OSA GROUP DINNER

**Have Dinner with *Applied Optics* Editors
*Students are Welcome!***

**All OSA conference attendees are invited to a casual networking
dinner where you will have the opportunity to meet
Applied Optics Information Processing Editors:**

Prof. T.- C. Poon (Division Editor, Virginia Tech)

Prof. Partha P. Banerjee (Topical Editor, Univ. of Dayton)

Prof. ByoungHo Lee (Topical Editor, Seoul National Univ., Korea)

Tuesday, April 28, 2009, 7:00 p.m.

THE RELISH RESTAURANT & LOUNGE

888 Nelson St. (between Hornby & Howe) Vancouver, BC

Website: <http://www.relishrestaurants.com/relish/index.asp>

**Sign up at the OSA Registration Desk
[Grand Ballroom Foyer, Coat Room]
by 1:00 p.m. on Tuesday, April 28**

Note: Participants pay for their own dinners

Sponsored by the OSA External Relations Advisory Group

Invited Speakers

Hyperspectral Imaging and Sensing of the Environment (HISE) / Fourier Transform Spectroscopy (FTS) Joint Session

MIPAS Status and Latest Results, Herbert Fischer; *Inst. für Meteorologie und Klimaforschung, Univ. Karlsruhe, Germany.*

Hyperspectral and Multispectral Infrared Sounding of the Environment: A Brief Overview, Allen Huang; *Univ. of Wisconsin-Madison, USA.*

High Spectral Resolution IR Instrument Developments for CLARREO, Hank Revercomb; *Univ. of Wisconsin-Madison, USA.*

The Total Carbon Column Observing Network, Geoff Toon; *JPL, USA.*

Invited Speakers

High Accuracy Observations of Spectrally Resolved IR Radiance from Earth Orbit: Setting the Time Scale in the Energy-Climate Debate, James Anderson; *Harvard Univ., USA.*

On the Problem of Representing the General Scattering Properties of Ice Crystal Ensembles, Anthony Baran; *UK Meteorological Office, UK.*

Challenges in Deriving Greenhouse Gas Concentrations from Hyperspectral Thermal Sounders: Status of the NOAA Trace Gas Products from AIRS, IASI and CrIS, Christopher D. Barnet; *NOAA/NESDIS, USA.*

Remote Sensing of Greenhouse Gases: Analysis and Instrumentation, Peter Chylek; *Los Alamos Natl. Lab, USA.*

Parameterizations of Optical Properties of Nonspherical Particles in the Atmosphere: From Ice Crystals to Dust Aerosols, Qiang Fu; *Univ. of Washington, USA.*

AIRS Radiance Climatology to Detect Climate Change and Validate Atmospheric Model-derived Analyses, Mitchell D. Goldberg; *NOAA, USA.*

Satellite and Ground-Based Measurements of Aerosol and Cloud in East Asia, Tadahiro Hayasaka; *Ctr. for Atmospheric and Oceanic Studies, Graduate School of Science, Tohoku Univ., Japan.*

The Cloud Observing Potential Offered by the Advanced Baseline Imager on the GOES-R Satellite Series, Andy Heidinger; *NOAA/NESDIS, USA.*

How Have Kilochannel Infrared Instruments Improved Numerical Weather Forecasts?, Joanna Joiner; *NASA Goddard Space Flight Ctr., USA.*

Genesis and Evolution of the Use of Polarization in Remote Sensing of Atmospheres and Oceans, George Kattawar; *Texas A&M Univ., USA.*

Remote Sensing of Cloud and Aerosol over Cloud from Multi-Viewing Polarized Measurements, Laurent Labonnote; *Univ. des Sciences et Techniques de Lille, France.*

Retrieval of Surface Emissivity from Hyperspectral and Multispectral IR Measurements, Jun Li; *Univ. of Wisconsin-Madison, USA.*

Ways to Explore Information Content of Hyperspectral Remote Sensing Data, Xu Liu; *NASA Langley Res. Ctr., USA.*

Merging High Spectral Resolution Sounder Data with High Spatial Resolution Imager Data to Infer Global Cloud Cover Properties, Paul Menzel; *SSEC, Univ. of Wisconsin-Madison, USA.*

Advances in Determining Cloud Composition from Infrared Radiances: Application to Advanced Geostationary Sensors, Michael Pavolonis; *NOAA/NESDIS, USA.*

The Earth-Reflected Solar Spectral Radiance for Climate Benchmarking, Peter Pilewskie; *Lab for Atmospheric and Space Physics, Univ. of Colorado at Boulder, USA.*

The MODIS Cloud Optical and Microphysical Product: An Evaluation of Effective Radius Retrieval Statistics and Model Simulations, Steven Platnick; *NASA, USA.*

Validation of Aerosol and Cloud Environmental Data Records Produced by the NPOESS Preparatory Project (NPP) - Approaches and Issues, David Starr; *NASA Goddard Space Flight Ctr., USA.*

Infrared Spectral Radiance Validation and Plans for the Cross-track Infrared Sounder, David C. Tobin; *Univ. of Wisconsin-Madison, USA.*

Combining AIRS and MODIS Measurements to Determine Cloud Characteristics, Elisabeth Weisz; *Univ. of Wisconsin-Madison, USA.*

Advances in Radiative Transfer Modeling in Support of Satellite Data Assimilation, Fuzhong Weng; *NOAA/NESDIS, USA.*

	<i>Grand Ballroom A</i>	<i>Junior Ballroom D</i>	<i>Junior Ballroom C</i>	<i>Grand Ballroom B</i>	<i>Junior Ballroom A/B</i>
Sunday, April 26					
3:00 p.m.–6:00 p.m.	Registration Open, Grand Ballroom Foyer Coatroom				
Monday, April 27					
7:30 a.m.–6:30 p.m.	Registration Open, Grand Ballroom Foyer Coatroom				
8:30 a.m.–10:30 a.m.	DMA • Advances in Digital Holography	JMA • FTS/HISE Joint Session		NMA • Superresolution I	OMA • Transport, Guiding and Sorting
10:30 a.m.–11:00 a.m.	Coffee Break, Grand Ballroom C/D				
10:30 a.m.–4:30 p.m.	Exhibits Open, Grand Ballroom C/D				
11:00 a.m.–12:30 p.m.	DMB • Novel Technologies in Holography (ends at 1:00 p.m.)	FMA • James W. Brault Memorial Session	HMA • Climate Absolute Radiance and Refractivity Observatory	NMB • Superresolution II	OMB • Physics Insights by Means of Optical Trapping I
12:30 p.m.–2:00 p.m.	Lunch Break (on your own)				
2:00 p.m.–4:00 p.m.	JMB • DH/OTA Joint Session	FMB • Combs and Static FTS	HMB • Clouds and Aerosols I	NMC • Nonlinear Microscopy I	
4:00 p.m.–4:30 p.m.	Coffee Break/Exhibits, Grand Ballroom C/D				
4:30 p.m.–6:00 p.m.	DMC • Metrology by Digital Holography and Profilometry (ends at 6:15 p.m.)	FMC • Space and Flight Projects	HMC • Future Missions and Sensor Calibration	NMD • Nonlinear Microscopy II	OMC • Physics Insights by Means of Optical Trapping II
6:30 p.m.–8:00 p.m.	Conference Reception, Junior Ballroom Foyer				
Tuesday, April 28					
7:30 a.m.–6:30 p.m.	Registration Open, Grand Ballroom Foyer Coatroom				
8:30 a.m.–10:30 a.m.	JTuA • DH/NTM Joint Session: Digital Holographic Microscopy	FTuA • FTS for Astronomy and Astrophysics	HTuA • Interpretation of Hyperspectral/Multi spectral Data Through Observations and Simulations		OTuA • Biophotonics Applications
10:30 a.m.–11:00 a.m.	Coffee Break, Grand Ballroom C/D				
10:30 a.m.–6:00 p.m.	Exhibits Open, Grand Ballroom C/D				
11:00 a.m.–12:30 p.m.	DTuA • Holographic Microscopy	FTuB • Combs, Optical Fiber and Fast-Scanning	HTuB • Particle Scattering Models	NTuA • Phase Microscopy and Tomography	OTuB • Novel Uses and Applications
12:30 p.m.–2:00 p.m.	Lunch Break (on your own)				
2:00 p.m.–4:00 p.m.	DTuB • Holography Applications	FTuC • Gosat and Akari	HTuC • New Remote Sensing Perspectives	NTuB • Optical Coherence Tomography	OTuC • Dynamics of Multiple and Parallel Trapping (ends at 3:30 p.m.)
4:00 p.m.–4:30 p.m.	Coffee Break/Exhibits, Grand Ballroom C/D				
4:30 p.m.–6:00 p.m.	JTuB • DH/FTS/HISE/NTM/OTA Joint Poster Session, Grand Ballroom C/D				
6:00 p.m.–6:45 p.m.	DTuC • Optical Scanning Holography				

	<i>Grand Ballroom A</i>	<i>Junior Ballroom D</i>	<i>Junior Ballroom C</i>	<i>Grand Ballroom B</i>	<i>Junior Ballroom A/B</i>
Wednesday, April 29					
7:30 a.m.–6:30 p.m.	Registration Open, Grand Ballroom Foyer Coatroom				
8:30 a.m.–10:30 a.m.	DWA • Three-Dimensional Imaging and Display	FWA • Earth Sensing	HWA • Hyperspectral IR and Imager Data Analyses (ends at 10:00 a.m.)	NWA • New Techniques I	
10:30 a.m.–11:00 a.m.	Coffee Break, Grand Ballroom C/D				
10:30 a.m.–12:30 p.m.	Exhibits Open, Grand Ballroom C/D				
11:00 a.m.–12:30 p.m.	DWB • DH Poster Session, Grand Ballroom C/D				
11:00 a.m.–12:30 p.m.		FWB • Visible and Ultra Violet	HWB • Clouds and Aerosols II	NWB • Superresolution III	
12:30 p.m.–2:00 p.m.	Lunch Break (on your own)				
2:00 p.m.–4:00 p.m.	DWC • Computer-Generated Holograms	FWC • Spatial Heterodyne	HWC • Validation of Cloud and Aerosol Products	NWC • Endomicroscopy	
4:00 p.m.–4:30 p.m.	Coffee Break, Grand Ballroom C/D				
4:30 p.m.–6:30 p.m.	DWD • Electro-Holography and Computer-Generated Holography	FWD • Laboratory and Miniature FTS (ends at 6:00 p.m.)	HWD • Hyperspectral Applications (ends at 6:00 p.m.)	NWD • New Techniques II (ends at 5:30 p.m.)	
Thursday, April 30					
7:30 a.m.–10:30 a.m.	Registration Open, Grand Ballroom Foyer Coatroom				
8:30 a.m.–10:30 a.m.	FThA • Spectral Imaging, Grand Ballroom A				

Key to Shading	
DH Sessions	No Shading
FTS Sessions	
HISE Sessions	
NTM Sessions	
OTA Sessions	

Hyperspectral Imaging and Sensing of the Environment (HISE) Abstracts

• Sunday, April 26, 2009 •

Grand Ballroom Foyer Coatroom

3:00 p.m.–6:00 p.m.

Registration Open

• Monday, April 27, 2009 •

Grand Ballroom Foyer Coatroom

7:30 a.m.–6:30 p.m.

Registration Open

JMA • FTS/HISE Joint Session

Junior Ballroom D

8:30 a.m.–10:30 a.m.

Peter Bernath; Univ. of York, UK, President

JMA1 • 8:30 a.m. Invited

Hyperspectral and Multispectral Infrared Sounding of the Environment: A Brief Overview, Allen Huang; Univ. of Wisconsin-Madison, USA. Hyperspectral and multispectral sensors are the backbone of the atmospheric and surface remote sensing community. Over the past few decades these sensors have provided crucial measurements of the Earth environment from multiple satellite platforms.

JMA2 • 9:00 a.m. Invited

MIPAS Aboard ENVISAT: Status and Latest Results, Herbert Fischer, MIPAS-Team; Inst. für Meteorologie und Klimaforschung, Univ. Karlsruhe, Germany. The status of the MIPAS experiment onboard ENVISAT will be described. The latest scientific results will be presented and an outlook will be given.

JMA3 • 9:30 a.m. Invited

Total Column Carbon Observing Network (TCCON), Geoff Toon¹, Jean-Francois Blavier¹, Rebecca Washenfelder^{2,3}, Debra Wunch³, Gretchen Keppel-Aleks³, Paul Wennberg³, Brian Connor⁴, Vanessa Sherlock⁴, David Griffith⁵, Nick Deutscher⁵, Justus Notholt⁶; ¹JPL, Caltech, USA, ²Earth System Res. Lab, NOAA, USA, ³Caltech, USA, ⁴Natl. Inst. of Water and Air, New Zealand, ⁵Univ. of Wollongong, Australia, ⁶Univ. of Bremen, Germany. A network of ground-based, sun-viewing, near-IR, Fourier transform spectrometers has been established to accurately measure atmospheric greenhouse gases such as CO₂, CO, N₂O, and CH₄.

JMA4 • 10:00 a.m. Invited

High Spectral Resolution IR Instrument Developments for CLARREO, Hank E. Revercomb¹, Fred A. Best¹, John A. Dykema², Joe Taylor¹, David C. Tobin¹, Robert O. Knuteson¹, Douglas Adler¹, Mark

Mulligan¹; ¹Univ. of Wisconsin-Madison, USA, ²Harvard Univ., USA.

The infrared component of the CLimate Absolute Radiance and Refractivity Observatory (CLARREO) benchmark climate system under development at NASA will include on-orbit standards and test equipment to directly verify very high end-to-end instrument accuracy on-orbit.

Grand Ballroom C/D

10:30 a.m.–11:00 a.m.

Coffee Break/ Exhibits

HMA • Climate Absolute Radiance and Refractivity Observatory

Junior Ballroom C

11:00 a.m.–12:30 p.m.

Bryan A. Baum; Space Science and Engineering Ctr., Univ. of Wisconsin-Madison, USA, President

HMA1 • 11:00 a.m. Invited

High Accuracy Observations of Spectrally Resolved IR Radiance from Earth Orbit: Setting the Time Scale in the Energy-Climate Debate, James Anderson, John Dykema, Stephen Leroy; Harvard Univ., USA. The development optical-systems capable of determining the absolute, spectrally-resolved, infrared-radiance emitted from the Earth to Space to an accuracy of 0.1 K from Earth-orbit are reviewed in the context of a national climate research strategy.

HMA2 • 11:30 a.m. Invited

The Earth-Reflected Solar Spectral Radiance for Climate Benchmarking, Peter Pilewskie, G. Kopp, Y. Roberts, B. Kindel, N. Shanbhag; Lab for Atmospheric and Space Physics, Univ. of Colorado at Boulder, USA. We present current results of a study that will aid in defining the requirements of an Earth-viewing spectrometer over the solar spectral domain for climate benchmarking, a driving imperative for CLARREO.

HMA3 • 12:00 p.m.

Short-Wave Instrument Development for CLARREO, Greg Kopp, Peter Pilewskie, Ginger Drake, Joey Espejo, Dave Harber, Karl Heuerman, Yolanda Roberts; Lab for Atmospheric and Space Physics, Univ. of Colorado, USA. Benchmarking Earth's climate via remote sensing from space, as planned by CLARREO, requires radiometry with high absolute accuracy and SI-traceability. We present an on-orbit radiometric calibration approach for hyperspectral imaging from 300 to 2400 nm.

HMA4 • 12:15 p.m.

CLARREO Science Applications: Infrared Spectra with on-Orbit SI Traceability for Climate, John A. Dykema, Stephen Leroy, Yi Huang, James G. Anderson; Harvard Univ., USA. This paper focuses on the climate science applications of the infrared sensor of the CLARREO mission. These applications are predicated on its on-orbit

traceability, with empirically proven uncertainty, to the international definition of radiometric units.

12:30 p.m.–2:00 p.m.

Lunch Break (on your own)

HMB • Clouds and Aerosols I

Junior Ballroom C

2:00 p.m.–4:00 p.m.

Rob Roebeling; KNMI – Royal Netherlands Meteorological Inst., Netherlands, *Presider*

HMB1 • 2:00 p.m.

Invited

The Cloud Observing Potential Offered by the Advanced Baseline Imager on the GOES-R Satellite Series, *Andy Heidinger*; NOAA/NESDIS, USA. Abstract not available.

HMB2 • 2:30 p.m.

Invited

How Have Kilochannel Infrared Instruments Improved Numerical Weather Forecasts? *Joanna Joiner*; NASA Goddard Space Flight Ctr., USA. This talk will cover the progress to date on assimilating data from hyper-spectral infrared sounders such as AIRS and IASI into global numerical weather prediction systems to improve forecasts and climate analyses.

HMB3 • 3:00 p.m.

Invited

Advances in Determining Cloud Composition from Infrared Radiances: Application to Advanced Geostationary Sensors, *Michael Pavolonis*; NOAA/NESDIS, USA. This work is aimed at developing advanced techniques for inferring information on cloud microphysics from infrared measurements, with a focus on cloud composition. The techniques are applicable to narrow band or hyperspectral.

HMB4 • 3:30 p.m.

Some New Progresses in the Optical Properties of Nonspherical Ice Crystals and Dust Aerosols, *Ping Yang¹, Lei Bi¹, Zhaokai Meng¹, George W. Kattawar¹, Bryan A. Baum², Hung-Lung (Allen) Huang²*; ¹Texas A&M Univ., USA, ²Univ. of Wisconsin-Madison, USA. Steady progress has been made in the simulation of the single-scattering properties of nonspherical ice particles and dust aerosols. An updated database is being built of the optical properties of ice crystals and dust particles.

HMB5 • 3:45 p.m.

Improvement of Ice Cloud Optical Models at Visible through Far-Infrared Wavelengths, *Bryan A. Baum¹, Ping Yang², Andrew J. Heymsfield³*; ¹Space Science and Engineering Ctr., Univ. of Wisconsin-Madison, USA, ²Texas A&M Univ., USA, ³Natl. Ctr. for Atmospheric Res., USA. Improvements are discussed regarding the development of ice cloud bulk scattering models based on a comprehensive set of

microphysical *in situ* measurements and a set of modeled ice particles used for light scattering calculations.

Grand Ballroom C/D

4:00 p.m.–4:30 p.m.

Coffee Break/ Exhibits

HMC • Future Missions and Sensor Calibration

Junior Ballroom C

4:30 p.m.–6:00 p.m.

Hank Revercomb; Univ. of Wisconsin-Madison, USA, *Presider*

HMC1 • 4:30 p.m.

Invited

Infrared Spectral Radiance Validation and Plans for the Cross-track Infrared Sounder, *David C. Tobin*; Space Science and Engineering Ctr., Univ. of Wisconsin-Madison, USA. This presentation will summarize the expected performance of CrIS based on analysis of pre-launch test data and describe plans for post-launch validation of Earth observations, with examples drawn from similar efforts for current sounders.

HMC2 • 5:00 p.m.

IASI L1 NRT Product Quality Monitoring at EUMETSAT: Results from 2 Years of Operations, *Lars Fiedler, Jörg Ackermann, Yakov Lioschitz, Francois Montagner*; European Organisation for the Exploitation of Meteorological Satellites, Germany. Results from the first 2 years of NWP based IASI L1 radiance monitoring and the comparison of IASI and HIRS/3 infrared channels using IASI based HIRS pseudo channels are presented.

HMC3 • 5:15 p.m.

On-Orbit Characterization of Blackbody Emissivity and Spectrometer Instrument Line-Shape Using Quantum Cascade Laser Based Reflectometry, *P. Jonathan Gero¹, John A. Dykema², James G. Anderson²*; ¹Space Science and Engineering Ctr., Univ. of Wisconsin-Madison, USA, ²Harvard Univ., USA. We present a method to characterize the emissivity of a spaceborne blackbody and the instrument line-shape of a spectrometer, on orbit, using a quantum cascade laser based reflectometer.

HMC4 • 5:30 p.m.

Sensitivity Analysis of MTG-IRS L2 Prototype Processor, *Xavier Calbet¹, Ed Pavelin², Stephen English², Jorge Bornemann², Stephen Tjemkes¹, Rolf Stuhlmann¹*; ¹European Organisation for the Exploitation of Meteorological Satellites, Germany, ²Met Office, UK. A sensitivity analysis of the MTG-IRS L2 prototype processor has been performed to document the performance and to understand the critical components. The outcome and application to real IASI observations will be presented.

HMC5 • 5:45 p.m.

NASA ESTO Instrument Incubator Program (IIP) Tropospheric Infrared Mapping Spectrometers (TIMS) Demonstration of Multi-Layer CO Retrieval from Atmospheric Data Acquired Simultaneously in the Solar Reflective Region near 2330 nm and the Thermal Emissive Region near 4680 nm, *John (Jack) B. Kumer¹, Aidan E. Roche¹, Rick L. Rairden¹, Sergio Desouza-Machado², Ron Blatherwick³, Toufic Hawat³, Robert Chatfield⁴; ¹Lockheed Martin ATC, USA, ²Consultant, USA, ³Denver Univ., USA, ⁴NASA Ames Res. Ctr., USA.* We present multi-layer CO retrieval from atmospheric data acquired simultaneously in the solar reflective region near 2330 nm and the thermal emissive region 4680 nm by the demonstration version IIP Tropospheric Infrared Mapping Spectrometers (TIMS).

Junior Ballroom Foyer

6:30 p.m.–8:00 p.m.

Conference Reception

NOTES

• Tuesday, April 28, 2009 •

Grand Ballroom Foyer Coatroom

7:30 a.m.–6:30 p.m.

Registration Open

HTuA • Interpretation of Hyperspectral/Multispectral Data Through Observations and Simulations

Junior Ballroom C

8:30 a.m.–10:30 a.m.

Christopher D. Barnet; NOAA/NESDIS, USA, *Presider*

HTuA1 • 8:30 a.m.

Invited

Ways to Explore Information Content of Hyperspectral Remote Sensing Data, Xu Liu¹, A. M. Larar¹, D. K. Zhou¹, W. L. Smith², D. F. Young¹, B. A. Wielicki¹; ¹NASA Langley Res. Ctr., USA, ²Hampton Univ., USA. A principal component (PC) analysis will be used to analyze the information content of hyperspectral remote sensing data based on a priori information, data error, and Jacobians.

HTuA2 • 9:00 a.m.

Invited

Retrieval of Surface Emissivity from Hyperspectral and Multispectral IR Measurements, Jun Li¹, Jinlong Li¹, Xin Jin¹, Lihang Zhou², Mitchell D. Goldberg²; ¹Univ. of Wisconsin-Madison, USA, ²Center for Satellite Applications and Res., NESDIS, USA. An algorithm has been developed for retrieving global map of emissivity spectra from AIRS. In order to retrieve surface emissivity from multispectral band instrument such as SEVIRI, the time continuity of measurements is used.

HTuA3 • 9:30 a.m.

Observations and Simulations of Small-Scale Variability of Temperature, Water Vapor, and Cloud Liquid and Ice Water Content, Brian H. Kahn, João Teixeira, Svetla Hristlova-Velleva, Seungwon Lee, Eric J. Fetzer; JPL, Caltech, USA. Small-scale variability of temperature, water vapor, and cloud water content observations from the AIRS and CloudSat instruments, and simulated fields from WRF for selected regimes, are compared and implications are discussed.

HTuA4 • 9:45 a.m.

Hyperspectral Retrieval of Surface Emissivities, Jean-Claude Thelen, S. Havemann, J. P. Taylor; Met Office, UK. We apply a fast radiative transfer code, based on empirical orthogonal functions, in conjunction with a 1D-VAR retrieval scheme to airborne hyperspectral radiance measurements in order to retrieve the emissivity spectra of the underlying surface.

HTuA5 • 10:00 a.m.

Evaluation of the Impact of Radiative Transfer Models on SEVIRI/ABI Profile Retrieval, Xin Jin¹, Jun Li¹, Timothy J. Schmit²,

Mitchell D. Goldberg²; ¹Univ. of Wisconsin-Madison, USA, ²Center for Satellite Applications and Res., NOAA, USA. The impacts of CRTM and RTTOV on atmospheric profile retrieval are evaluated using SEVIRI observations and radiosonde dataset. These two models have noticeable differences at some bands but the impact on profile retrieval is trivial.

HTuA6 • 10:15 a.m.

Comparison of Dust Detection by Using Reflected Solar Bands and Thermal Bands, Jhoon Kim¹, Jaehwa Lee¹, Mijin Kim¹, Sang Seo Park¹, Chul Han Song²; ¹Yonsei Univ., Republic of Korea, ²Gwangju Inst. of Science and Technology, Republic of Korea. Dust detection from solar and thermal bands is compared to investigate the performance of each algorithm. Three different algorithms show reasonable consistency to detect dust layer. The consistency increases with aerosol optical depth (AOD).

Grand Ballroom C/D

10:30 a.m.–11:00 a.m.

Coffee Break/ Exhibits

HTuB • Particle Scattering Models

Junior Ballroom C

11:00 a.m.–12:30 p.m.

Ping Yang; Texas A&M Univ., USA, *Presider*

HTuB1 • 11:00 a.m.

Invited

Genesis and Evolution of the Use of Polarization in Remote Sensing of Atmospheres and Oceans, George Kattawar; Texas A&M Univ., USA. We will give an overview of the importance of polarization sensing in the atmosphere and ocean. The Stokes vector/Mueller matrix formalism is used to show how the method gives distinct advantages over ordinary radiance sensing.

HTuB2 • 11:30 a.m.

Invited

On the Problem of Representing the General Scattering Properties of Ice Crystal Ensembles, Anthony Baran; Met Office, UK. Cirrus consists of differing crystal shapes and sizes making it difficult to theoretically represent their general scattering properties. This paper explores modeling approaches to this problem and how these models should be experimentally constrained.

HTuB3 • 12:00 p.m.

Discontinuous Galerkin Time-Domain Calculation of Single Particle Scattering: A Tutorial Example, R. L. Panetta, Guanglin Tang; Dept. of Atmospheric Sciences, Texas A&M Univ., USA. The elementary features of discontinuous Galerkin methods in calculating scattering properties of single particles are discussed in the context of a simple

1-dimensional problem. A comparison with finite difference methods is shown.

HTuB4 • 12:15 p.m.

Theory for Specular Scattering by Preferentially Oriented Ice Crystals, Anatoli Borovoi, Natalia Kustova; *Inst. of Atmospheric Optics, Russian Federation*. Specular patterns in the atmosphere caused by ice crystals with preferentially horizontal orientation are quantitatively described by use of a bidirectional phase function for a fluttering plate. Certain inverse scattering problems are discussed.

12:30 p.m.–2:00 p.m.

Lunch Break (on your own)

HTuC • New Remote Sensing Perspectives

Junior Ballroom C

2:00 p.m.–4:00 p.m.

Anthony Baran; *Met Office, UK, Presider*

HTuC1 • 2:00 p.m.

Invited

Remote Sensing of Greenhouse Gases: Analysis and Instrumentation, Steven P. Love, Petr Chylek, Tom Hale; *Los Alamos Natl. Lab, USA*. Hyperspectral remote sensing applied to the detection of Greenhouse Gases (GHG) will have to deal simultaneously with interference by water vapor, aerosols and clouds (especially an invisible cirrus and sub-pixel size clouds).

HTuC2 • 2:30 p.m.

Invited

Challenges in Deriving Greenhouse Gas Concentrations from Hyperspectral Thermal Sounders: Status of the NOAA Trace Gas Products from AIRS, IASI and CrIS, Christopher D. Barnes¹, Eric Maddy², Xiaozhen Xiong²; ¹NOAA/NESDIS, USA, ²Perot Systems Government Service at NOAA/NESDIS/Ctr. for Satellite Applications and Res., USA. We present measurements of mid-tropospheric atmospheric carbon derived from the Aqua Atmospheric Infrared Sounder and the EUMETSAT Infrared Atmospheric Sounding Interferometer and inter-comparisons with NOAA Earth System Research Laboratory/Global Monitoring Division CarbonTracker assimilation system.

HTuC3 • 3:00 p.m.

MTG-IRS L2 Prototype Processor, Stephen Tjemkes¹, Xavier Calbet¹, Sebastian Wagner², Alessio Lattanzio³, Rolf Stuhlmann¹; ¹European Organisation for the Exploitation of Meteorological Satellites, Germany, ²Wagner Consultancy, Germany, ³MakaluMedia, Germany. A full description of the end-to-end L2 prototype processor for the meteosat third generation hyperspectral sounder (MTG-IRS), including background physical principles, and the numerical implementation, input data, pre-processing steps, accuracy, efficiency, output data is proposed.

HTuC4 • 3:15 p.m.

Design and Characterization of the 4STAR Sun-Sky Spectrometer with Results from 4-Way Intercomparison of 4STAR, AATS-14, Prede, and Cimel Photometers at Mauna Loa Observatory, Connor J. Flynn¹, Jens Redemann², Beat Schmid¹, Steve Dunagan², Roy R. Johnson², Yohei Shinozuka², John M. Livingston², Phil B. Russell², Evgueni Kassianov¹, Alex K. Tran³, Aliaksandr Siniuk³, Brent N. Holben³; ¹Pacific Northwest Natl. Lab, USA, ²NASA Ames Res. Ctr., USA, ³NASA Goddard Space Flight Ctr., USA. The 4STAR concept combines capabilities of the Ames Airborne Tracking Sun Photometer (AATS-14) and Aeronet-like sky scanning capability with monolithic spectrometry. Results from extensive tests and recent results from an intercomparison on Mauna Loa Observatory will be presented.

HTuC5 • 3:30 p.m.

What's Going on around Cloud Edges: A View from Above and Below, Alexander Marshak¹, Yuri Knyazikhin², Jui-Yuan Christine Chiu³, Tamas Varnai³, Warren Wiscombe¹; ¹NASA Goddard Space Flight Ctr., USA, ²Boston Univ., USA, ³Univ. of Maryland, Baltimore County, USA. The paper studies the transition zone between cloud-free and cloudy air using spectral measurements of zenith and nadir radiance around cloud edges obtained from the ARM's Shortwave Spectrometer and Moderate-resolution Imaging Spectroradiometer, respectively.

HTuC6 • 3:45 p.m.

What Can We Expect to Learn about Clouds from the Space-Based O2 A-Band Spectrometer Aboard OCO? Anthony B. Davis; *Los Alamos Natl. Lab, USA*. In a striking illustration of the equivalence theorem, OCO A-band observations of reflected sunlight wield all the remote-sensing power of wide-footprint (multiple-scattering) lidar, viz. LITE. Beyond cloud-top pressure/altitude, geometrical and optical thicknesses are readily retrieved.

Grand Ballroom C/D

4:00 p.m.–4:30 p.m.

Coffee Break/ Exhibits

JTuB • DH/FTS/HISE/NTM/OTA Joint Poster Session

Grand Ballroom C/D

4:30 p.m.–6:00 p.m.

JTuB17

Hyperspectral Sounding Measurements-Specification of CLARREO FOV Size, William L. Smith, Henry Revercomb, Elisabeth Weisz, Steven Dutcher, Robert Knuteson, Jun Li; *Univ. of Wisconsin-Madison, USA*. AIRS data are used to perform global hyperspectral atmospheric sounding retrievals for different horizontal resolutions (15 km - 100 km). The purpose of this research is to optimize the CLARREO field of view size specification.

JTuB18

Validation of MODIS-Derived Aerosol Optical Thickness Using AERONET and SKYNET Measurements over East Asia, *Hyun-Sung Jang, Hwan-Jin Song, Byung-Ju Sohn; Seoul Natl. Univ., Republic of Korea.* AERONET and SKYNET measurements are used to validate MODIS-derived aerosol optical thickness over East Asia. MODIS-SKYNET and MODIS-AERONET collocated points hit in expected error lines but correlation between MODIS-AERONET is relatively higher than MODIS-SKYNET.

JTuB19

Infrared Spectral Signatures of Dust from Ground-Based FT-IR and Satellite in Anmyon, Korea, *Byung-Il Lee, Eun-Ha Sohn, Mi-Lim Ou, Kum-Lan Kim, Yoonjae Kim; Natl. Inst. of Meteorological Res., Republic of Korea.* Dust observation was performed during spring time in Korea. Measured up- and down-ward radiances from FT-IR and AIRS were compared with simulated radiances with RTM to estimate the hyper spectral properties of the dust.

JTuB20

Typhoon Case Analysis with Remote Sensing Data in the Southeast of China, *Ming Wei, Yan-an Liu, Ya-ting Zhan; Nanjing Univ. of Information Science and Technology, China.* Typhoon is analyzed with MODIS and atmospheric soundings data. The purpose is to understand the relationship between the temperature and humidity on cloud top, and to find the structure evolution information ahead of precipitation.

JTuB21

Transition of Cloud Products from MODIS to VIIRS, *Geoff P. Cureton; Space Science and Engineering Ctr., Univ. of Wisconsin-Madison, USA.* The activities of the Atmosphere PEATE are discussed with respect to the evaluation of MODIS and VIIRS cloud products within the LEOCAT development framework. The relevant properties of the MODIS and VIIRS sensors are compared.

Posters JTuB1–JTuB7 can be found in the DH abstracts section.

Posters JTuB8–JTuB16 can be found in the FTS abstracts section.

Posters JTuB22–JTuB29 can be found in the NTM abstracts section.

Posters JTuB30–JTuB35 can be found in the OTA abstracts section.

NOTES

• Wednesday, April 29, 2009 •

Grand Ballroom Foyer Coatroom

7:30 a.m.–6:30 p.m.

Registration Open

HWA • Hyperspectral IR and Imager Data Analyses

Junior Ballroom C

8:30 a.m.–10:00 a.m.

Allen Huang; Univ. of Wisconsin-Madison, USA, *Presider*

HWA1 • 8:30 a.m. Invited

Merging High Spectral Resolution Sounder Data with High Spatial Resolution Imager Data to Infer Global Cloud Cover Properties, Paul Menzel; Space Science and Engineering Center, Univ. of Wisconsin-Madison, USA. Upper tropospheric clouds have been studied with NOAA/HIRS and EOS/MODIS data from 1979 onwards using CO₂ slicing. Algorithm adjustments including AIRS data have been tested using CALIPSO measurements for verification.

HWA2 • 9:00 a.m. Invited

Combining AIRS and MODIS Measurements to Determine Cloud Characteristics, Elisabeth Weisz, Paul Menzel, Jun Li, Eva Borbas, Robert Holz; Cooperative Inst. for Meteorological Satellite Studies, Univ. of Wisconsin-Madison, USA. Synergistic use of AIRS and MODIS measurements enables accurate cloud characterization and provides improved cloud property retrievals as shown in this paper with a focus on cloud top height.

HWA3 • 9:30 a.m.

Progress in Infrared Cloud Phase Determination Using AIRS, Shaima L. Nasiri¹, Brian H. Kahn², Hongchun Jin¹; ¹Texas A&M Univ., USA, ²JPL, USA. Recent progress in the determination of cloud phase using infrared AIRS hyperspectral observations is presented. CALIPSO lidar products are used to create a database of manually classified AIRS pixels for algorithm development.

HWA4 • 9:45 a.m.

New Understanding of Split-Window Emissions Provides Insight on Small Ice Crystal Concentrations, David L. Mitchell; Desert Res. Inst., USA. The physics governing absorption by ice crystals at 11 and 12 microns can provide a means of remotely sensing the relative concentration of small ice crystals in cirrus clouds.

Grand Ballroom C/D

10:30 a.m.–11:00 a.m.

Coffee Break/ Exhibits

HWB • Clouds and Aerosols II

Junior Ballroom C

11:00 a.m.–12:30 p.m.

Peter Pilewskie; Lab for Atmospheric and Space Physics, Univ, USA, *Presider*

HWB1 • 11:00 a.m. Invited

The MODIS Cloud Optical and Microphysical Product: An Evaluation of Effective Radius Retrieval Statistics and Model Simulations, Steven Platnick¹, Paul A. Hubanks^{1,2}, Galina Wind^{1,3}, Michael D. King⁴, Steven A. Ackerman⁵, Brent Maddux⁵, Tobias Zimmer⁶, Andrew Ackerman¹; ¹NASA Goddard Space Flight Ctr., USA, ²Wyle Information Systems, USA, ³Science Systems and Applications Inc., USA, ⁴Lab for Atmospheric and Space Physics, Univ. of Colorado, USA, ⁵Cooperative Inst. for Meteorological Satellite Studies, Univ. of Wisconsin-Madison, USA, ⁶Inst. für Physik der Atmosphäre, Deutsches Zentrum für Luft- und Raumfahrt, Germany. Retrieved cloud optical and microphysical global statistics from the MODIS Collection 5 processing stream will be discussed. Evaluation includes algorithm sensitivities, aggregation sensitivities, and retrievals run on cloud resolving models of marine boundary layer clouds.

HWB2 • 11:30 a.m. Invited

Remote Sensing of Cloud and Aerosol over Cloud from Multi-Viewing Polarized Measurements, Laurent Labonnote, Jerome Riedi, Fabien Waquet, POLDER Aerosol/Cloud Teams; Univ. des Sciences et Techniques de Lille, France. We are revisiting the use of multi-viewing polarized reflectances to retrieve atmospheric component properties. We will focus first on cloud microphysical retrieval, then will demonstrate the potentiality of such measurements to detect aerosol above clouds.

HWB3 • 12:00 p.m.

Simulation of Fifteen MODIS Bands for the Assessment of MODIS Cloud Products, Byung-Ju Sohn¹, Seung-Hee Ham¹, Ping Yang², Bryan A. Baum³; ¹Seoul Natl. Univ., Republic of Korea, ²Texas A&M Univ., USA, ³Univ. of Wisconsin-Madison, USA. Radiance at fifteen bands are simulated from the operational MODIS-retrieved cloud optical thickness, effective radius, and cloud top pressure collocated with the AIRS-retrieved temperature and humidity profiles for the assessments of MODIS cloud products.

HWB4 • 12:15 p.m.

MODIS Thin Cirrus Retrievals Using the 1.38 μ m Channel, Kerry Meyer, Steven Platnick; NASA Goddard Space Flight Ctr., USA. Retrievals of ice cloud optical thickness using the 1.38 μ m MODIS channel will be discussed. In particular, this will focus on the case of thin cirrus, in which the current MODIS retrievals have difficulty detecting.

12:30 p.m.–2:00 p.m.

Lunch Break (on your own)

HWC • Validation of Cloud and Aerosol Products

Junior Ballroom C

2:00 p.m.–4:00 p.m.

Steven Platnick; NASA, USA, *Presider*

HWC1 • 2:00 p.m. Invited

Validation of Aerosol and Cloud Environmental Data Records Produced by the NPOESS Preparatory Project (NPP)— Approaches and Issues, David Starr; NASA Goddard Space Flight Ctr., USA.

Current plans to validate the aerosol and cloud environmental data records (EDR's) to be operationally produced from the NPOESS Preparatory Project (NPP) satellite observations will be described, including the planned approaches and issues.

HWC2 • 2:30 p.m. Invited

Satellite and Ground-Based Measurements of Aerosol and Cloud in East Asia, Tadahiro Hayasaka; Ctr. for Atmospheric and Oceanic Studies, Tohoku Univ., Japan. Observational studies of aerosol and cloud in East Asia are reviewed focusing on the comparison and collaboration between ground-based measurements and satellite remote sensing.

HWC3 • 3:00 p.m.

Towards a Standard Procedure for Validation of Satellite Derived Cloud Properties with Ground-Based Observations, Rob A.

Roebeling¹, Hartwig M. Deneke¹, Wouter Greuell¹, Nick Schutgens²; ¹Royal Netherlands Meteorological Inst., KNMI, Netherlands, ²Ctr. for Climate System Res., Tokyo Univ., Japan. A standard procedure for validation of cloud properties retrievals is presented. We use cloud properties datasets from synthetic simulations and ground-based observations to disentangle validation uncertainties from retrieval errors, and suggest an optimum validation procedure.

HWC4 • 3:15 p.m.

A Characterization of Cirrus OD Retrievals from Active and Passive A-Train Measurements, Robert E. Holz¹, Andrew Heidinger¹, Daved Turner¹, Steve Ackerman¹, Ralph Kuehn², Mark Vaughan², Steven Platnick³; ¹Univ. of Wisconsin-Madison, USA, ²NASA Langley Space Flight Ctr., USA, ³NASA Goddard Space Flight Ctr., USA. We compare retrievals of cirrus cloud optical depth from active (CALIOP) and passive (MODIS) measurements. Systematic differences are found and investigated using TOA radiative closure.

HWC5 • 3:30 p.m.

Validation of AIRS and IASI Temperature and Water Vapor Retrievals with Global Radiosonde Measurements and Model Forecasts, Murty G. Divakarla¹, Christopher Barnet², Mitchell Goldberg², Tom King³, Eric Maddy³, Xingpin Liu³, Fengying Sun³, Zhaohui Cheng³, Antonia Gambacorta³, Lihang Zhou³; ¹IM Systems Group, Inc., USA, ²Ctr. for Satellite Applications and Res., NESDIS, NOAA, USA, ³QSS, Group Inc., USA. Atmospheric temperature and water vapor profiles

retrieved from the Aqua-Atmospheric Infrared Sounder instrument and the MetOp-Infrared Atmospheric Sounding Interferometer instrument are validated with global radiosonde measurements and forecasts.

HWC6 • 3:45 p.m.

The Recent Field Measurement Campaign of the Continuum Absorption by Visible and Infrared Radiation and Its Atmospheric Relevance (CAVIAR) Project, Paul D. Green¹, Ralph Beeby¹, Alan Last¹, John E. Harries¹, Juliet C. Pickering¹, Stuart Newman²; ¹Imperial College London, UK, ²Met Office, UK. The objectives and component parts of the CAVIAR consortium are described. Preliminary data from the recent UK-based airborne field campaign are discussed, with a description of the analysis method and its expected scientific merit.

Grand Ballroom C/D

4:00 p.m.–4:30 p.m.

Coffee Break/ Exhibits

HWD • Hyperspectral Applications

Junior Ballroom C

4:30 p.m.–6:00 p.m.

Joanna Joiner; NASA Goddard Space Flight Ctr., USA, *Presider*

HWD1 • 4:30 p.m. Invited

Advances in Radiative Transfer Modeling in Support of Satellite Data Assimilation, Fuzhong Weng; NOAA/NESDIS, USA. This paper presents an overview of the development of the Community Radiative Transfer Model (CRTM), an effort led by the Joint Center for Satellite Data Assimilation (JCSDA) program in the United States of America.

HWD2 • 5:00 p.m. Invited

AIRS Radiance Climatology to Detect Climate Change and Validate Atmospheric Model-Derived Analyses, Mitchell D. Goldberg, Lihang Zhou; NOAA, USA. This study uses the raw AIRS data to generate the first ever spectrally resolved infrared radiance (SRIR) dataset (2002- 2006) for monitoring changes in atmospheric temperature and constituents, for assessing the accuracy of climate/weather models.

HWD3 • 5:30 p.m.

Sensor System Performance Evaluation and Benefits from the NPOESS Airborne Sounder Testbed - Interferometer (NAST-I), Allen M. Larar¹, Daniel K. Zhou¹, Xu Liu¹, William L. Smith^{2,3}; ¹NASA Langley Res. Ctr., USA, ²Hampton Univ., USA, ³Univ. of Wisconsin-Madison, USA. Advanced satellite sensors are tasked with improving global Earth-system measurements benefiting weather prediction, climate monitoring, and environmental change detection. Validation

of the entire measurement system by including airborne-FTS sensors is crucial to achieving this goal.

HWD4 • 5:45 p.m.

Developing a Geosynchronous Microwave Sounder, *Bjorn Lambrigtsen, Todd Gaier, Pekka Kangaslahti, Alan Tanner; JPL, Caltech, USA.* The Precipitation and All-weather Temperature and Humidity (PATH) “decadal-survey” mission will place a microwave sounder - GeoSTAR - in geostationary orbit. We discuss technology development, applications and mission plans.

NOTES

Key to Authors and Presiders

(**Bold** denotes Presider or Presenting Author)

A

Achilefu, Samuel—NTuB5
Ackerman, Andrew—HWB1
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Afanasiev, Kirill—JTUB34, **OTuA5**
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Alvarez-Palacio, Diana—DWB9
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Asundi, Anand—DTuB6, **JTuA2**
Awatsuji, Yasuhiro—**JTuB2**

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Bernhardt, Birgitta—FMB2
Best, Fred A.—FMA2, FMA4, JMA4
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Bierhoff, Walter C. J.—NWC5
Bifano, Thomas G.—NMD3
Biteen, Julie S.—NMA5
Bjoraker, G. L.—FMA3
Blackie, Douglas—**FWB3**
Blackwell-Whitehead, Richard—
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Blanche, Pierre-Alexander—DWB36
Blatherwick, Ron—HMC5
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Camy-Peyret, C.—FMC2

Canales, Vidal F.—JTUB23
Cansot, E.—FMB5
Carberry, David M.—**OMA5**
Carl, Daniel—**DWD6**
Carlson, Ronald C.—FMA3, **FTuA5**
Carriles, Ramon—NMD4
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Cauwenberghs, Gert—NWA6
Cenko, Andrew—**FWC4**
Chamberland, Martin—**FThA2**,
FThA3, JTUB14
Chan, Robert K. Y.—FWB4
Chandler, Eric V.—**NMD4**
Chang, Chi-Ching—DWB35
Chang, Yuan-Shuo—JTUB29
Charron, Luc G.—**OMA4**
Chatfield, Robert—HMC5
Chen, Chiung-Liang—**DWB29**
Chen, Gang—DWB23
Chen, George C. K.—JTUA4
Chen, Jocelyn S. Y.—OMA6
Chen, Nanguang—**NWA5**
Chen, Xin-Chang—JTUB29
Cheng, Chau-Jern—**DTuB2**
Cheng, Zhaohui—HWC5
Chestukhin, Anton—NTuB5
Cheung, Wai Keung—DWC2
Chi, Yu M.—NWA6
Chia, Thomas H.—NMD2
Chiang, Chung-Sheng—DWB35
Chiang, Jen-Shiun—DTuB2
Chiou, Linda—FWA3
Chiu, Daniel—**OMA2**
Chiu, Jui-Yuan C.—HTuC5
Chmyrov, Andriy—**NMB2**
Choi, Wonshik—**NTuA1**, NTuA2,
NTuB
Chong, Shau Poh—NWA5
Chou, Jin-Wen—DTuB2
Christenson, Todd C.—NWC7
Chu, Kengyeh K.—**NMD3**, NWA4,
NWC3
Chumbley, Scott—DMC3
Chylek, Petr—HTuC1
Čižmár, Tomáš—OTuC3, OTuA4
Coddington, Ian R.—**FMB1**, **FTuB**
Colomb, Tristan—DTuA3, DWB5
Connor, Brian—JMA3
Contag, Christopher H.—NWC1,
NWC2
Corliss, Jason—FWC5
Couillard, Benjamin—JTUB14
Courau, E.—FMB5
Cox, Caroline V.—**FMC4**

Crawford, James M.—NWC2
Crozet, Patrick—FWD2
Cui, Meng—NMC4
Cureton, Geoff P.—**JTuB21**
Curtis, Jennifer—**OTuA2**
Custillon, Guillaume—JTUB9

D

D'Odorico, Sandro—JTUB12
Dainty, Chris—NTuA6
Dallas, William—**DTuB**, **DWB36**
Damania, Dhwanil—NTuB6
Darakis, Emmanouil—**DTuB6**
Darcie, Thomas E.—DMA5
Dasari, Ramachandra R.—NTuA1,
NTuA2
Davis, Anthony B.—**HTuC6**
Day, Daniel—OMC4
de Oliveria, Nelson—**FWB1**
Debarre, Delphine—NWA1
Dee, Nick—NMC6
Deneke, Hartwig M.—HWC3
Depeursinge, Christian—DTuA2,
DTuA3, DWB5, **JMB**,
JTU3
Desbiens, Raphaël—**FTuC**, FTuC3,
JTUB13, FThA5
Deschênes, Jean-Daniel—FTuB1,
FTuB3
Descour, Michael R.—NWC7
Desjardins, Adrien E.—NWC5
Desouza-Machado, Sergio—HMC5
Desroches, Jérôme—**NWC6**
Desyatnikov, Anton S.—OMB4,
OTuB2, OTuC4
Deutscher, Nick—JMA3
Dewhirst, Mark—NTuB2
Dholakia, Kishan—OTuC3
Dineen, Colm—**OTuB5**
Divakarla, Murty G.—**HWC5**
Dominguez-Caballero, Jose A.—
DWB3
Dong, L.—FMB3
Downing, Benjamin P. B.—OMB3,
OTuA3
Drake, Ginger—HMA3
Drexhage, Karl-Heinz—NMB2
Drissen, Laurent—**FTuA2**
Drummond, James R.—JTUB11
Dubois, Patrick—FThA2
Dufresne, Eric—**JMB3**
Dunagan, Steve—HTuC4
Duquette, Dominique—FTuC3
Dutcher, Steve—FMA2, JTUB17
Dykema, John—JMA4, HMA1,
HMA4, HMC3
Dylov, Dmitry V.—**DMB3**

E

Edelstein, Jerry—FTuA4
Eisenmann, David—DMC3
Emery, Yves—DWB5
Englert, Christoph R.—FThA6, **FWC**,
FWC1, FWC3
English, Stephen—HMC4
Engström, David—**DWB13**, DWC3
Erskine, David J.—**FTuA4**
Espejo, Joey—HMA3
Eun, Jae-Jeong—DWB31
Euser, Tijmen G.—OMA6
Evans, Wayne F.—**FWA4**
Evstrapov, Anatoly—JTUB27

F

Faber, C—DMC4
Fan, Jinda—NTuB5
Fang-Yen, Christopher—NTuA1,
NTuA2
Farbiz, Farzam—DWB32
Fargeix, Alain—DWD5
Farley, Vincent—FThA2
Farré, Arnau—**JTuB33**
Faulk, Ben—OTuA1
Feld, Michael S.—NTuA1, NTuA2
Feldkhun, Daniel—**NWA3**
Fermann, M. E.—FMB3
Ferrand, Jerome—**JTuB9**
Ferrec, Yann—**FMB6**
Fetzer, Eric J.—HTuA3
Fiedler, Lars—**HMC2**
Field, Jeff—NMD4
Fienup, James R.—JTU5
Finikova, Olga S.—NMC7
Fischer, Herbert—**JMA2**
Fischer, Martin—NMC1
Fischer, Peer—DMB5
Flasar, F. M.—FMA3, FTuA1
Flavin, Dónal A.—FWD5
Fleischer, Jason W.—DMA4, DMB3
Flezar, Matjaz—DWB2
Flynn, Connor J.—HTuC4
Fontanella, Andrew—NTuB2
Ford, Tim N.—NWC3
Forde, Nancy—OMB3, OTuA3,
OTuB
Frank, Anders—DWB13, DWC3
Fratz, Markus—**DMB5**, DWD6
Friedl-Vallon, Felix—**FThA1**, **FWA**,
JTUB10, JTUB16
Friedman, Arnold C.—DWB36
Fu, Dan—NMC1
Furlan, Walter D.—**JTuB35**

G

Gagnon, Jean-Philippe—FThA2
Gaier, Todd—HWD4
Gambacorta, Antonia—HWC5
Ganz, T.—FTuB2

Gao, Xiaohui—FTuB5
Garbos, Martin K.—**OMA6**
Garcés-Chávez, Veneranda—OTuC3
Garcia-Sucercua, Jorge—DWB15,
DWB9
Geissbühler, Stefan—NMB3
Gelsinger, Paul—DTuB5
Genest, Jérôme—**FMA**, **FTuB1**,
FTuB3, JTUB14
Gerhardt, Nils C.—DMB6
Gero, P. J.—**HMC3**
Giaccari, Philippe—FMC3
Giaccari, P.—FTuB1
Gibson, Graham M.—OMA5, OMC3
Giel, Dominik M.—DMB5, DWD6
Giménez, F.—JTUB35
Giménez, M. H.—JTUB35
Giroux, Jacques—JTUB11
Gmitro, Arthur F.—**NWC4**, **NWD4**
Goda, Keisuke—**NWC8**
Goksör, Mattias—DWB13, DWC3
Goldberg, Mitchell D.—HTuA2,
HTuA5, HWC5,
HWD2
Gom, Brad G.—JTUB15
Gonzalez, Emilio—NWC1
González, Francisco—JTUB25
Grange, Rachel—DTuA1
Green, Paul—FMC4, **HWC6**
Greuell, Wouter—HWC3
Griebner, Uwe—DMA6
Grier, David G.—OMC1
Grieve, James A.—OMA5
Grieve, Kate—NWA1
Griffith, David—JMA3
Griffiths, Peter R.—**FWA5**
Grille, Romain—**FTuB4**
Grunwald, Ruediger—DMA6
Gu, Min—NWD1, NWD2, NWD3,
OMC4
Guandique, Ever A.—FTuA5
Guelachvili, Guy—**FMB2**, **FWD**
Guérineau, Nicolas—FMB6
Gulde, Thomas—JTUB10
Guo, Shuguang—FWD4, **NTuB3**
Gustafsson, Mats—**NMA4**

H

Ha, Woosung—OTuA6
Hack, Erwin—NWB4
Hahn, Joonku—JTUB1, JTUB7
Hajian, Arsen R.—FWC4
Halas, Naomi J.—OMB2
Hale, Tom—HTuC1
Haliyo, D. Sinan—OMC3
Ham, Seung-Hee—HWB3
Hamazaki, Takashi—FTuC2
Hammer, Daniel—NTuB5
Hanna, Simon—OMA3, OMA5,
OMC2

Hänsch, Theodor W.—FMB2
Hansel, Thomas—DMA6
Harber, Dave—HMA3
Harbers, Rik—NWC5
Harlander, John M.—FThA6, FWC1,
FWC2, FWC3
Harries, John E.—FMC4, HWC6
Harris, Walter—FWC5
Hartl, Ingmar—FMB3
Hartmann, Henrik—FTuA3
Hasegawa, Satoshi—DWB10
Häusler, Gerd—DMC4
Havemann, S.—HTuA4
Hawat, Toufic—HMC5
Hawthorne, Benjamin—NWA2
Hayasaka, Tadahiro—HWC2
Hayasaki, Yoshio—DWB10, DWC
Hébert, Philippe—FMB5, FMC2
Heidinger, Andrew—HMB1, HWC4
Heintzmann, Rainer—NWA, NWB1
Hell, Stefan W.—NMA1
Helmerson, Kristian—OMB2
Helms, Mike W.—NWC2
Henaio, Rodrigo—JTUB3
Hendargo, Hansford C.—NTuA3,
NTuB2
Hendriks, Benno H. W.—NWC5
Hennelly, Bryan M.—DWB12
Henry, Didier—FMB6
Hester, Brooke C.—OMB2, OMC
Heuerman, Karl—HMA3
Heymsfield, Andrew J.—HMB5
Hezemans, Cees A.—NWC5
Höfler, Heinrich—DWD6
Hofmann, Martin R.—DMB6
Holben, Brent N.—HTuC4
Holz, Robert—FMA2, HWA2,
HWC4
Holzwarth, Ronald—FMB2
Hong, Jisoo—DWB1, DWB27
Hong, Keehoon—DWB1
Hoover, Erich E.—NMD4
Horikk, Jeroen J. L.—NWC5
Hourtoule, Claire—NWC3
Hristlova-Veleva, Svetla—HTuA3
Hsieh, Chia-Lung—DTuA1
Hsieh, Wang-Ta—DWB35
Hsu, Ken—NWB2
Hu, Cuiying—DWB16
Huang, Allen—HWA, JMA1
Huang, Hung-Lung (Allen)—HMB4
Huang, Kui-Teng—JTUB30
Huang, Yi—HMA4
Huang, Zhiwei—NMC5
Hubanks, Paul A.—HWB1
Hur, Nam-Ho—DWB21

I

Iftimia, Nicusor V.—NTuB5
Ikin, Leo—OMA5

Ito, Kenichi—JTUB2
Ito, Tomoyoshi—DWB6, DWD1
Ivey, Peter A.—DWB28
Iwai, Hidenao—NTuA4
Iwaniuk, Daniel—NWB4
Izatt, Joseph—NTuA, NTuA3,
NTuB1, NTuB2
Izdebskaya, Yana V.—OMB4,
OTuC4

J

Jacquet, Patrick—FMB2
Jalali, Bahram—NWC8
Jang, Hyun-Sung—JTUB18
Jennings, Donald E.—FMA3, FThA,
FTuA1, FTuA5
Jeong, Yoonseob—OTuA6
Jeromin, Andreas—NMC6
Jesacher, Alexander—NWA1
Jezersek, Matija—DWB2
Ji, Won-Soo—JTUB28
Jia, Baohua—NWD2
Jin, Hongzhen—DWB7
Jin, Hongchun—HWA3
Jin, Xin—HTuA2, HTuA5
Jing, Juanjuan—FTuB5
Jofre, Ana—OTuA1
Johnson, Roy R.—HTuC4
Johnson, Timothy—FWA6
Joiner, Joanna—HMB2, HWD
Jones, Scott C.—JTUB15
Joseph, Joby—DTuB1
Jourdain, Pascal—DTuA2
Jung, Jae-Hyun—DWB1
Jung, Yongmin—OTuA6
Junio, Joseph—OTuB4

K

Kahn, Brian H.—HTuA3, HWA3
Kamin, Dirk—NMA1
Kaneda, Hidehiro—FTuC1
Kaneko, Atsushi—JTUB2
Kang, Hoonjong—DTuB7, DWA4
Kang, Hong—NWD2
Kang, Jin-mo—DWB1
Kangaslahti, Pekka—HWD4
Karásek, Vítězslav—OTuC3
Kariwala, Vinay—DTuB6
Kaspar, Roger—NWC1
Kasseck, Christoph—DMB6
Kassianov, Evgueni—HTuC4
Kattawar, George—HMB4, HTuB1
Katz, Barak—DMC2
Katzir, Abraham—FTuB4
Kawada, Mitsunobu—FTuC1
Kawashima, Takahiro—FTuC3
Keeley, Fred W.—OTuA3
Keilmann, Fritz—FTuB2
Kelly, Damien P.—DWB12
Kemper, Björn—JMB5

Kempkes, Michel—DTuB6
Kendrick, Mark J.—OMC5
Keppel-Aleks, Gretchen—JMA3
Kerber, Florian—JTUB12
Kern, Pierre—FTuB4
Kester, Robert T.—NWC7
Ketelhut, Steffi—JMB5
Khanam, Taslima—DTuB6
Kiire, Tomohiro—DWB11
Kikuchi, Yuichi—DWD4
Kim, Dong-Jin—DWB18
Kim, Dong-Wook—DWB21, DWB30
Kim, Dae-Chan—JTUB28
Kim, Eun-Soo—DWA3, DWB17,
DWB19, DWB20
Kim, Eun-Hee—JTUB7
Kim, Joohwan—DWB25
Kim, Jhoon—HTuA6
Kim, Jongki—OTuA6
Kim, Junki—OTuA6
Kim, Kum-Lan—JTUB19
Kim, Mijin—HTuA6
Kim, Myung K.—DMA, DTuA4,
DTuB4
Kim, Nam—DWB14, DWB31
Kim, Sung-Kyu—DWA
Kim, Seung-Cheol—DWB19,
DWB20
Kim, Sung-Kyu—DWB21, DWB24,
DWB30
Kim, Taegeun—DMB7
Kim, Younghoon—DWB25
Kim, Yunhee—DWB27
Kim, Yoonjae—JTUB19
Kimura, Kouhei—DWB10
Kindel, B.—HMA2
King, Michael D.—HWB1
King, Tom—HWC5
Kino, Gordon S.—NWC1, NWC2
Kishore, Rani—OMB2
Kitayama, Ryo—DWC4
Kivshar, Yuri S.—OMB4, OTuB2,
OTuC4
Kleinert, Anne—JTUB10, JTUB16
Knauer, M. C.—DMC4
Knuteson, Robert—JMA4, FMA2,
FMA4, JTUB17
Knyazikhin, Yuri—HTuC5
Köber, Sebastian—DMB6
Koch, S. W.—OTuB5
Kopp, Greg—HMA2, HMA3
Korobtsov, Alexander—JTUB34,
OTuA5
Kosmeier, Sebastian—JMB5
Kostuk, Raymond—DTuB5
Kotlarchyk, Maxwell—OMA1
Kotova, Svetlana—JTUB34, OTuA5
Kou, Shan S.—JTU1
Koukourakis, Nektarios—DMB6
Kovacev, Milutin—JTUB8

Koyama, Takamasa—JTB2
Kozawa, Yuichi—**JTuB32**, NMA3
Kranitzky, C.—DMC4
Kreuzer, Jurgen—DWB9
Krolikowski, Wieslaw Z.—OMB4,
OTuB2, OTuC4
Krupinski, Elizabeth A.—DWB36
Kubasik-Thayil, Anisha—NWA1
Kubota, Toshihiro—JTB2
Kuehn, Ralph—HWC4
Kühn, Jonas—**DTuA3**, JTA3
Kukhtarev, Nickolai V.—**DMB1**,
DTuB3
Kukhtareva, T.—DMB1
Kumer, John (Jack) B.—**HMC5**
Kunde, V. G.—FMA3
Kunde, Virgil G.—FTuA5
Kuo, Ming-Kuei—DWB35
Kuporosov, Yury—**JTuB27**
Kustova, Natalia—HTuB4
Kuze, Akihiko—**FMC**, **FTuC2**
Kwon, Ki-Chul—DWB14
Kwon, Yong-Moo—DWB21, DWB30

L

Labby, Z.—FWC2
Labonnote, Laurent—**HWB2**
Lagueux, Philippe—FThA2
Lai, Xin-Ji—DTuB2
Lam, Edmund Y.—DMA3
Lambriqtsen, Bjorn—**HWD4**
Landau, Sara M.—**NWC7**
Langehanenberg, Patrik—JMB5
Lanman, Douglas—JTB5
LaPorte, Dan—FMA2
Lara, David—NTuA6
Larar, Allen M.—HTuA1, **HWD3**
Larigauderie, C.—FMC2
Lasser, Theo—NMB3
Last, Alan—FMC4, HWC6
Lattanzio, Alessio—HTuC3
Lauterbach, Marcel A.—NMA1
Lawler, James E.—**FWC2**
Lazarz, Evan—NMC6
Le Coarer, Étienne—**FMB4**, JTB9
Leblanc, Lisa—JTB11
Lee, Byoung-ho—DWB1, DWB25,
DWB27, JTB1, JTB7
Lee, Byung-Gook—DWB17, DWB18
Lee, Byung-II—**JTuB19**
Lee, El-Hang—JTB28
Lee, Eun S.—**JTuB22**, **JTuB24**
Lee, Hyesog—NMA6
Lee, Jaehwa—HTuA6
Lee, Jae Y.—JTB22, JTB24
Lee, Kwang - Hoon—**DWB21**
Lee, Seungwon—HTuA3
Lee, Seung Gol—JTB28
Lee, Sejin—OTuA6
Lee, Sung J.—DWB3

Lee, Wai-Hon—**DWC5**
Lee, Yi-Ta—DTuB2
Lemonnier, Olivier—DWD5
Lengel, Anton—JTB16
Leroy, Stephen—HMA1, HMA4
Levene, Michael J.—**NMD2**
Levesque, Luc—FTuC3
Levin, Carly—OMB2
Lewi, Tomer—FTuB4
Li, Jianping—**FWB4**
Li, Jun—**HTuA2**
Li, Jinlong—HTuA2
Li, Jun—HTuA5, HWA2, JTB17
Li, Jingliang—NWD2, NWD3
Li, Siyuan—FTuB5
Li, Yong—**DWB7**
Liang, Xinan—DWB32
Liao, Ho-En—DWA2
Liddle, J. A.—NWB5
Lien, Chen-Hui—DWB29
Lilge, Lothar—OMA4
Liliana, L.—DWA3, DWB17
Lim, Daryl—**NWA4**, NWC3
Lim, Young-Tae—**DWB14**
Lim, Yongjun—**JTuB1**
Lin, Hermann—JTB26
Lin, Kuo-Kuei—DWA2
Lin, Li-Chien—**DWA2**, DWB29
Lin, Yuxiang—NWD4
Lin, Zhiping—JTA4
Liu, Jung-Ping—DWC2, **JTuB4**
Liu, Jonathan T. C.—NWC1, **NWC2**
Liu, Lin—NTuB3
Liu, Xu—**HTuA1**, HWD3
Liu, Xingpin—HWC5
Liu, Yan-an—JTB20
Liu, Zhihai—OTuC2, **JTuB31**
Liu, Zhaowei—**NMA6**
Livingston, John M.—HTuC4
Livschitz, Yakov—HMC2
Lloyd, James P.—FTuA4
Lobera, Julia—DWD3
Loesel, J.—FMB5
Loomis, Nick—**DMB4**
Lopez-Mariscal, Carlos—**OMA**
López-Quesada, Carol—JTB33
Losevsky, Nikolay—JTB34, OTuA5
Louradour, Frederic—NWC6
Love, Steven P.—**HTuC1**
Lu, Fake—NMC5
Luo, Yuan—**DTuB5**

M

Maddux, Brent—HWB1
Maddy, Eric—HTuC2, HWC5
Maejima, Kohei—**DMA2**
Magistretti, Pierre—DTuA2
Maheshwari, Sameer—NTuB6
Mahgoub, Ahmed—JTB13, **FThA5**
Maillard, Jean-Pierre—**FThA4**, **FTuA**

Makhlouf, Houssine—NWC4
Malinovskaya, Svetlana A.—**NMC2**
Mamoutkine, A. A.—FMA3
Mandella, Michael J.—NWC1,
NWC2
Mandon, Julien—FMB2
Märki, Iwan—**NMB3**
Marquet, Pierre—**DTuA2**, DTuA3
Marshak, Alexander—**HTuC5**
Marston, Philip L.—**OMB5**
Martin, Brigitte—DWD5
Martin, Guillermmo—FTuB4
Martin-Badosa, Estela—JTB33
Martinez, Christophe—**DWD5**
Matoba, Osamu—JTB2
Matthews, Thomas—NMC1
Maucher, Guido—JTB10
Maussang, I.—FMB5
Mazzotti, Marco—DTuB6
McClelland, Jabez J.—NWB5
McGloin, David—**OMB**, **OTuB3**
McIntyre, David H.—OMC5
McKay, H. A.—FMB3
McMahon, Matthew D.—NWB5
McMillan, Robert S.—FWC4
McWilliam, Richard—**DWB28**
Meade, Jeff—FWC4
Meerholz, Klaus—DMB6
Mehta, Shalin B.—**NTuA5**
Meng, Zhaokai—HMB4
Menon, Rajesh—NMA2
Menzel, Paul—**HWA1**, HWA2
Merenda, Fabrice—OTuA6
Mertz, Jerome—NMD3, NWA4,
NWC3, **NWD**
Meyer, Kerry—**HWB4**
Meyer, Michael—NWA2
Miao, Ming—OTuA3
Miao, Qin—**NWA2**
Michaelian, Kirk H.—FWD3
Mihajlovic, Nenad—**NWC5**
Miles, Mervyn J.—OMA5, OMC2
Milster, Tom D.—DWB36
Min, Sung-Wook—DWB25, **DWB26**
MIPAS-Team—JMA2
Mishina, Tomoyuki—DWA5
Mitchell, David L.—**HWA4**
Mo, Xiaoli—JMB5
Moerner, W. E.—NMA5
Moloney, Jerome V.—OTuB5
Monsoriu, Juan A.—JTB35
Montagner, Francois—HMC2
Montes-Usategui, Mario—JTB33
Montfort, Frédéric—DTuA3
Moon, Euclid E.—NMA2
Morand, Alain—JTB9
Moratal, Corinne—DTuA3
Moreau, Louis M.—**FMC3**, **FTuC3**,
JTuB11
Moreno, Fernando—JTB25

Morgner, Uwe—JTB8
Morrish, Dru—**NWD1**, NWD2
Mozina, Janez—DWB2
Mu, Yu-Hong—JTB30
Muirhead, Philip S.—FTA4
Mujat, Mircea—NTB5
Mulligan, Mark—JMA4
Murakami, Noriko—FTC1
Murata, Osamu—**DTA5**
Murison, Marc—FWC4
Murphy, Dominic F.—**FWD5**
Murray, Jon—FMC4
Muterspaugh, Matthew W.—FTA4

N

Nagle, Fred—FMA2
Nakadate, Suezou—**DWB11**
Nakagawa, Takao—FTC1
Nakajima, Masakatsu—FTC2
Nasiri, Shaima L.—**HWA3**
Naughton, Thomas J.—DTB6,
DWB12
Nave, Gillian—**FWB**, FWB2, **FWB5**,
JTB12
Naylor, David A.—FTC4, JTB15
Nehmetallah, George—DTB3
Nelleri, Anith—DTB1
Nelson, Alan C.—NWA2
Neubert, Tom—**JTuB10**
Neumann, Thomas—NWA2
Newbury, Nathan R.—FMB1
Newman, Stuart—HWC6
Nguyen, Thanh—FTA5, **JTuB13**
Nichols, Sarah R.—NMC4
Nilsson, Hampus—FTA3
Nishio, Kenzo—JTB2
Nitanai, Eiji—DWB33
Nixon, C. A.—FMA3
Nolte, David D.—**JMB4**
Nomura, Takanori—**DWB33**, **DWD**
Notholt, Justus—JMA3
Numata, Takuhisa—DWB33

O

O, Beom-Hoan—JTB28
Ogilvie, Jennifer P.—**NMC4**
Oh, K.—OTA6
Oh, Se Baek—**DWB4**, **JTuB5**
Okada, Yoko—FTC1
Okui, Makoto—DWA5
Olsson, Erik—**JTuB6**
Ono, Yuzo—**DMB2**
Onural, Levent—DTB7, DWA4
Ootsubo, Takafumi—FTC1
Orphal, Johannes—**FWA2**
Osten, Wolfgang—**DMC1**
Ostroverkhova, Oksana—OMC5
Ou, Mi-Lim—JTB19
Ou-Yang, H. Daniel—**OTuB4**

P

Pacoret, Cécile—OMC3
Padgett, Miles J.—OMA5, OMC3
Pagnoux, Dominique—NWC6
Pais, Andrea—FWD4
Palero, Virginia—DWD3
Pandey, Nitesh—DWB12
Panetta, R. L.—**HTuB3**
Pardo, Juan R.—**FTuA6**
Park, Gilbae—DWB25, **DWB27**
Park, Jae-Hyeung—**DMC**, **DWA1**,
DWB1, DWB14, DWB31
Park, Kyoung-Duck—**JTuB28**
Park, Soon-gi—DWB26
Park, Sang Seo—HTA6
Park, Se-Geun—JTB28
Park, Yongkeun—NTA1
Patlan, Vsevolod—OTA5
Pavani, Sri Rama Prasanna—**NMA5**
Pavelin, Ed—HMC4
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UPDATE SHEET

Withdrawals:

NMC6	JTuB34
FTuA4	JTuB35
OTuA5	HTuC6
JTuB23	DWA3
JTuB29	DWB2
JTuB30	HWD4

Substituted Papers:

The paper **HTuC6** that is in your program will not be presented. During this time slot, the following postdeadline paper will be presented in its place: **PHTuC6, Airborne Radiometer Measurements of Above Cloud Reflectance in the Presence and Absence of Aerosols**, *Odele Coddington¹, Peter Pilewski¹, Tomislava Vukicevic¹, John Livingston², Steve Platnick³, Gala Wind³, Jens Redemann⁴, Philip B. Russell⁴*; ¹Univ. of Colorado at Boulder, USA, ²SRI Intl., USA, ³NASA GSFC, USA, ⁴NASA AMES, USA.

The poster **JTuB17** will be presented during the session **HWA • Hyperspectral IR and Imager Data Analyses** (April 29, 2009, 8:30 a.m.–10:30 a.m., Junior Ballroom C) as oral presentation **HWA5**.

Presider Updates:

Nickolai V. Kukhtarev; Alabama A&M Univ., USA, will preside over session **DMB • Novel Technologies in Holography**, on Monday, April 27, 2009, 11:00 a.m. –1:00 p.m. in Grand Ballroom A.

Yoshio Hayasaki; Utsunomiya Univ., Japan, will preside over session **DWC • Computer-Generated Holograms**, on Wednesday, April 29, 2009, 2:00 p.m.–4:00 p.m. in Grand Ballroom A.

Presenter Changes:

DTuA1, Harmonic Holography will now be presented by *Chia-Lung Hsieh^{1,2}*, ¹Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland, ²Caltech, USA.

NTuA5, Linear Phase-Gradient Imaging with Asymmetric Illumination Based Differential Phase Contrast (AIDPC), will now be presented by *Colin J. R. Sheppard, Natl. Univ. of Singapore, Singapore*.

Time Changes:

HWA will end a half hour later at 10:30 a.m.

Exhibits will end at 12:30 p.m. on Wednesday, April 29, 2009.

Postdeadline Paper Programs:

Post deadline Paper Programs are available at Registration.

Special Events:

Meet the Applied Optics Editors Dinner on Tuesday, April 28, 2009, 7:00 p.m. All conference attendees, especially students, are invited to this casual networking dinner. More information is available at Registration.

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POSTDEADLINE PAPERS

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•Tuesday, April 28, 2009•

Junior Ballroom C

2:00 p.m.–4:00 p.m.

HTuC • New Remote Sensing Perspectives

Anthony Baran; Met Office, UK, Presider

PHTuC6 • 3:45 p.m.

Airborne Radiometer Measurements of above Cloud Reflectance in the Presence and Absence of Aerosols, *Odele Coddington¹, Peter Pilewskie¹, Tomislava Vukicevic¹, John Livingston², Steve Platnick³, Gala Wind³, Jens Redemann⁴, Philip B. Russell⁴*; ¹Univ. of Colorado at Boulder, USA, ²SRI Intl., USA, ³NASA GSFC, USA, ⁴NASA AMES, USA. We present cloud retrieval results from SSFR measurements made in the presence and absence of aerosols and show comparisons to MODIS. A method for treating aerosol bias in retrievals as systematic model uncertainty is described.

Grand Ballroom C/D

4:30 p.m.–6:00 p.m.

JTuB • DH/FTS/HISE/NTM/OTA Joint Poster Session

PJTuB36

Automated Particle Characterization Using Holographic Video Microscopy, *Fook Chiong Cheong, David G. Grier; New York Univ., USA*. With an efficient particle identification algorithm, combine with hardware acceleration and software optimization, holographic microscopy data can be analysis in near real time with sufficient accuracy to enable unattended holographic tracking and particle characterization.

PJTuB37

Incoherent Optical Imaging Using Synthetic Aperture with Fresnel Elements, *Barak Katz, Joseph Rosen; Ben-Gurion Univ. of the Negev, Israel*. We present a new lensless incoherent holographic system operating in a synthetic aperture mode. Spatial resolution exceeding the Rayleigh limit is obtained by tiling several holographic elements into a complete Fresnel hologram of observed objects.

PJTuB38

CrIS Radiance Spectra Modeling and End-to-End Error Analysis, *Nikita Pougatchev, Gregory Cantwell, Gail Bingham; Space Dynamics Lab, Utah State Univ., USA*. We present the Cross-track Infrared Sounder (CrIS) end-to-end error model consisting of instrument model and Validation Assessment Model. Models' descriptions along with examples of application are presented.

PJTuB39

SPDM - Single Molecule Superresolution of Receptor Clusters in *E. coli* Bacteria, *Thomas Ruckelshausen¹, Paul Lemmer¹, Victor Sourjik², Christoph Cremer^{1,3,4}*; ¹Kirchhoff-Inst. for Physics, Univ. of Heidelberg, Germany, ²Ctr. for Molecular Biologie Heidelberg, Univ. of Heidelberg, Germany, ³Inst. for Pharmacy and Molecular Biotechnology, Univ. of Heidelberg, Germany, ⁴Inst. for Molecular Biophysics, The Jackson Lab, USA. In *E. coli* bacteria the chemotaxis phosphatase protein CheZ was labeled with YFP (yellow fluorescent protein). Their reversible photobleaching is used for an optical isolation in time. An average localization precision of 22nm was achieved.

•Wednesday, April 29, 2009•

Junior Ballroom C

8:30 a.m.–10:30 a.m.

HWA • Hyperspectral IR and Imager Data Analyses

Allen Huang; Univ. of Wisconsin at Madison, USA, Presider

PHWA6 • 10:15 a.m.

Investigations of Cirrus in the Far Infrared with the Tropospheric Airborne Fourier Transform

Spectrometer (TAFTS), *Caroline Cox¹, Neil Humpage¹, Paul Green¹, Juliet Pickering¹, John Harries¹, Jonathan Taylor², Anthony Baran², Alan Last¹, Jon Murray¹; ¹Imperial College London, UK, ²Met Office, UK*. An overview of the results of recent field campaigns performed with the Tropospheric Airborne Fourier Transform Spectrometer (TAFTS) to study the radiative properties of cirrus in the far infrared spectral region is presented.

Grand Ballroom C/D

11:00 a.m.–12:30 p.m.

DWB • DH Poster Session

PDWB37

Femtosecond Time-Resolved Off-Axis Digital Holography, *Tadas Balciunas, Andrius Melninkaitis, Andrius Vanagas, Valdas Sirutkaitis; Laser Res. Ctr., Vilnius Univ., Lithuania*. We present time-resolved off-axis digital holography for investigation of laser-induced plasma filaments in condensed media. An experimental setup with tilted reference pulse allows larger crossing angles to be used for recording of digital holograms.

PDWB38

A High-Definition Full-Parallax CGH Created by the Polygon-Based Method, *Kyoji Matsushima, Sumio Nakahara; Kansai Univ., Japan*. A large-scaled full-parallax CGH with 4 billion pixels is produced by a polygon-based method. The CGH reconstructs a fine 3-D image and gives a large sensation of depth owing to the silhouette-masking technique.

Key to Authors and Presiders
(**Bold** denotes Presider or Presenting Author)

B

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Baran, Anthony—**HTuC**, PHWA6
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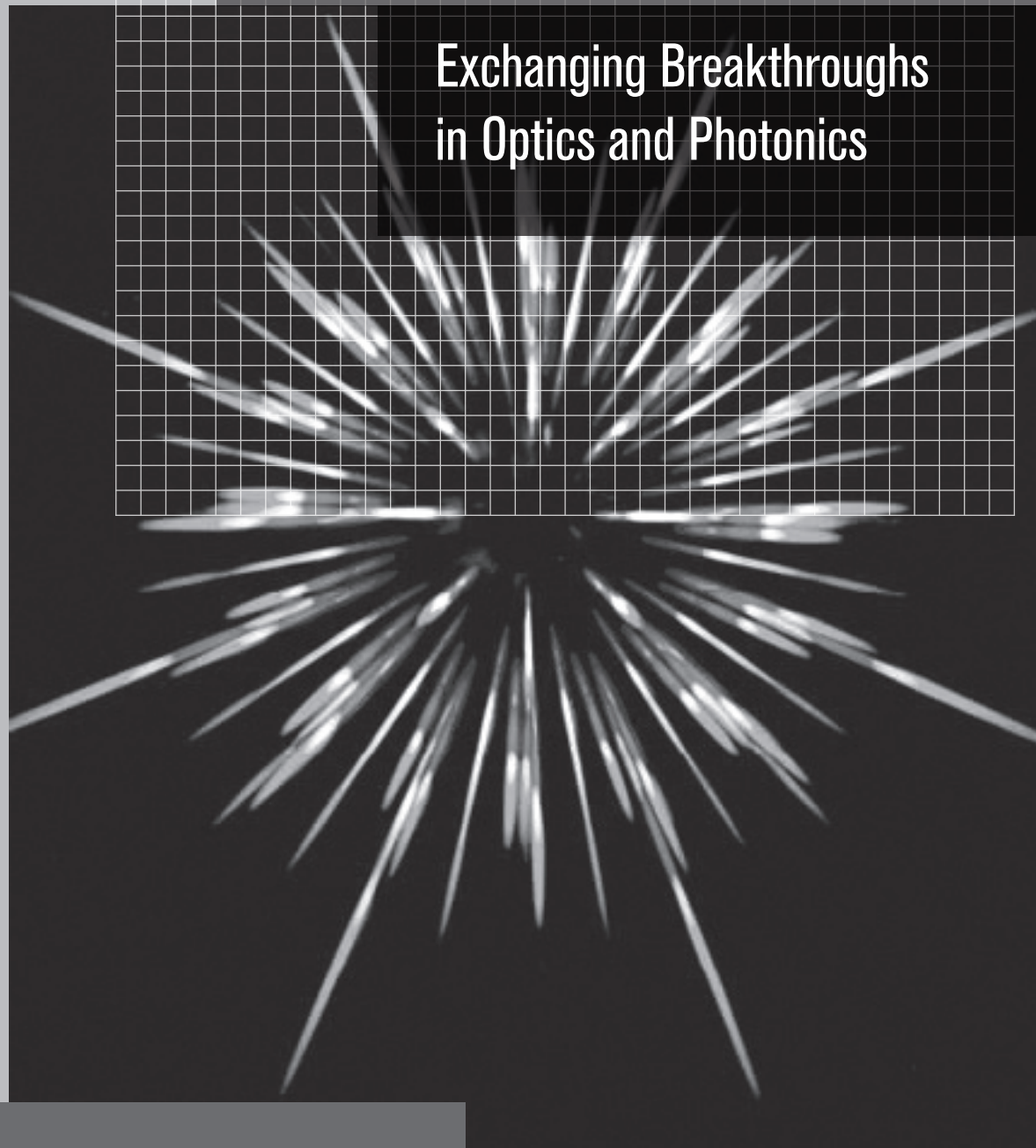
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