

# 7<sup>th</sup> GOES Users' Conference (GUC)

19-21 October 2011  
Wynfrey Hotel, Birmingham, Alabama

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## Wednesday, October 19, 2011

6:00-9:00 PM	<b>Registration, NWA/GUC Joint Poster Session and Reception (poster presentations listed below)</b>
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## Thursday, October 20, 2011

8:00 AM	<b>Welcome and Opening Remarks</b> James Gurka, NOAA/NESDIS, GOES-R Program Office, Greenbelt, MD
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8:05 AM	<b>Keynote Address</b> Gregory Mandt, NOAA/NESDIS, Director, GOES-R Program Office, Greenbelt, MD
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### **Joint NWA/GUC Session 1: Current and Future GOES** **Session Chair: Ken Carey (Chair, Professional Development Committee, 2011 NWA** **Abstract Committee, GUC Committee), Noblis, Inc., Falls Church, VA**

8:30 AM	<b>NOAA's GOES Satellites: Current Status, Operational Updates, Improvements and Short-Term Plans</b> Thomas Renkevans, NOAA/NESDIS/Office of Satellite and Product Operations, Camp Springs, MD
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9:00 AM	<b>The Tennessee Floods of May 2010: A Satellite Perspective</b> Sheldon Kusselson, NOAA/NESDIS/OSPO/Satellite Products and Services, Limin Zhao, NOAA/NESDIS/OSPO/Satellite Products and Services Camp Springs, MD, Stanley Kidder and John Forsythe, Cooperative Institute for Research in the Atmosphere, (CIRA)/Colorado State University, Ft. Collins, CO, and Robert Kuligowski, NOAA/NESDIS/Center for Satellite Applications and Research, Camp Springs, MD
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9:15 AM	<b>The ABI (Advanced Baseline Imager) on the GOES-R Series</b> Timothy J. Schmit, NOAA/NESDIS/STAR, Madison, WI, James Gurka, NOAA/NESDIS/GOES-R Program Office, Greenbelt, MD, and Mathew M. Gunshor, CIMSS, Madison, WI
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9:30 AM	<b>High Impact Weather Forecasts and Warnings with the GOES-R Geostationary Lightning Mapper (GLM)</b> Steven Goodman, NOAA/NESDIS/GOES-R Program Office, Greenbelt, MD, Richard Blakeslee and William Koshak, NASA/MSFC, Huntsville, AL and Douglas Mach, University of Alabama in Huntsville, AL
9:45 AM	<b>How AWIPS II will bring GOES-R Capabilities and Science to the Field</b> Jordan J. Gerth (Student Member, NWA Council), CIMSS/SSEC/University of Wisconsin at Madison, Madison, WI
10:00 AM	<b>Coffee Break and NWA Poster Session</b>
<b>Joint NWA/GUC Session 2: GOES-R Proving Ground</b> <b>Session Chair: Nezette Rydell (NWA Councilor), NOAA/National Weather Service, Denver/Boulder, CO</b>	
10:30 AM	<b>GOES-R Proving Ground Partnership</b> James Gurka and Steve Goodman, NOAA/NESDIS, GOES-R Program Office, Greenbelt, MD; Timothy Schmit, NOAA/NESDIS/STAR, Madison, WI; Anthony Mostek, NOAA/NWS, Boulder, CO and Mark DeMaria, NOAA/NESDIS/RAMMB, Fort Collins, CO
10:45 AM	<b>NWS Field Perspective of the GOES-R Proving Ground</b> Jeffrey P. Craven (NWA Treasurer), Marcia Cronce and Steve Davis, NOAA/NWS, Milwaukee/Sullivan, WI
11:00 AM	<b>GOES-R Proving Ground Activities at the National Hurricane Center</b> John L. Beven II and Michael Brennan, NOAA/NWS/National Hurricane Center, Miami, FL; Mark DeMaria and John Knaff, NOAA/NESDIS, Fort Collins, CO and Chris Velden, CIMSS, Madison, WI
11:15 AM	<b>The GOES-R Proving Ground at NOAA's Storm Prediction Center and Hazardous Weather Testbed</b> Christopher Siewert and Kristin Kuhlman, OU-CIMSS, Norman, OK, Steven Goodman, NOAA/NESDIS, GOES-R Program Office, Greenbelt, MD, Bonnie Reed, NOAA/NWS, Silver Spring, MD, and Russell Schneider, NOAA/NWS/SPC, Norman, OK
11:30 AM	<b>Advancements Toward Fused Satellite, Radar, NWP, and In Situ Aviation Weather Decision Support</b> Wayne Feltz, SSEC/CIMSS, University of Wisconsin-Madison, Madison, WI
11:45 AM	<b>Lunch</b>

12:15 PM	<p><b>GUC Lunch Panel – “The Path Forward to Ensure User Readiness for GOES-R”</b>  Moderator: Steven Goodman (NOAA/NESDIS, GOES-R Program Office, Greenbelt, MD)  Panelists: Michael Johnson (NOAA/NWS/OST, Silver Spring, MD), Vanessa Griffin (NOAA/NESDIS, GOES-R Project, Greenbelt, MD), Anthony Mostek (NOAA/NWS/OCWWS/Training Division, Boulder, CO), Rusty Billingsley (NOAA/NWS/SR, Fort Worth, TX), Dan Satterfield (WHNT NEWS 19, Huntsville, AL)</p>
<p><b>GUC Session 3: Benefits of GOES-R Products for Forecasters/Broadcasters - Part I</b>  <b>Session Chair: Dan Satterfield, WHNT NEWS 19, Huntsville, AL</b></p>	
1:30 PM	<p><b>Overview of GOES-R Proving Ground Activities at SPoRT</b>  Gary Jedlovec, NASA/Earth Science Office, Huntsville, AL, Kevin Fuell, UA-Huntsville, Huntsville, Alabama, Andrew Molthan, NASA/ Earth Science Office, Huntsville, AL, Matthew Smith, UA-Huntsville, Huntsville, Alabama, and Geoffrey Stano, ENSCO, Huntsville, AL</p>
1:45 PM	<p><b>Training in the NOAA Satellite Proving Ground – Focus on User Readiness and Decision Support Services</b>  Anthony Mostek, NOAA/NWS/OCWWS/Training Division/COMET, Boulder, CO, James Gurka, NOAA/NESDIS, GOES-R Program Office, Greenbelt, MD, and Timothy J. Schmit, NOAA/NESDIS/STAR, Madison, WI</p>
2:00 PM	<p><b>GOES Data and Products in the Space Weather Forecast Office</b>  Rodney Viereck, Steven Hill, Josh Rigler, Juan Rodriguez, and Paul Lotoaniu, NOAA/NWS/Space Weather Prediction Center, Boulder, CO</p>
2:15 PM	<p><b>GOES-R for Broadcast Meteorologists – Going from a Trickle to a Fire Hose</b>  Dan Satterfield, WHNT NEWS 19, Huntsville, AL</p>
2:30 PM	<p><b>Coffee Break and NWA/GUC Joint Poster Session (poster presentations listed below)</b></p>
<p><b>GUC Session 4: Benefits of GOES-R Products for Forecasters/Broadcasters - Part II</b>  <b>Session Chair: Jeffrey Craven, NOAA/NWS, Milwaukee/Sullivan, WI</b></p>	
3:30 PM	<p><b>Developing and Evaluating RGB Composite MODIS Imagery for Applications in NWS Forecast Offices</b>  Andrew L. Molthan, NASA Short-term Prediction Research and Transition (SPoRT) Center, NASA/MSFC, Huntsville, AL, Hayden K. Oswald, USRP/NASA Summer Intern Program, University of Missouri, Columbia, MO, Kevin K. Fuell, University of Alabama Huntsville/NASA SPoRT Center, Huntsville, AL</p>

3:45 PM	<b>Improving Short-Term Predictions and the Identification of Hazardous Weather</b> Deirdre Kann, Brian Guyer, and Annette Mokry, NOAA/NWS WFO, Albuquerque, NM
4:00 PM	<b>Meteosat Third Generation (MTG): An Innovative Approach to Advanced Observations from the Geostationary Orbit</b> Rolf Stuhlmann, Sergio Rota, Lothar Schwarz, and Chris Hartley, EUMETSAT, Darmstadt, Germany
4:15 PM	<b>Optimizing the Lightning Forecast Algorithm within the Weather Research and Forecasting Model</b> Eugene W. McCaul, NASA SPoRT Center/USRA, Huntsville, AL, Jonathan L. Case, NASA SPoRT Center/ENSCO, Inc., Huntsville, AL, Steven J. Goodman, NOAA/NESDIS/GOES-R Program Office, Greenbelt, MD, Scott R. Dembek, USRA/CIMMS, Kennett Square, PA, and Fanyou Kong, Center for Analysis and Prediction of Storms, Norman, OK
4:30 PM	<b>An Overview of New and Unique GOES-R Products for Hazard Assessments</b> Michael Pavolonis, NOAA/NESDIS/Center for Satellite Applications and Research, Madison, WI, Daniel C. Hartung and Justin Sieglaff, UW-CIMSS, Madison, WI
4:45 PM	<b>GOES-R Post Launch Activities</b> Vanessa Griffin, Satya Kalluri and Christopher Wheeler, NOAA/NESDIS, GOES-R Project, Greenbelt, MD
5:00 PM	<b>User Input from Past GOES Users' Conferences</b> James Gurka, NOAA/NESDIS, GOES-R Program Office, Greenbelt, MD
5:15 PM	<b>Question and Answer Session</b>
6:00 PM	<b>GUC Dinner – "Reconnect With Your Passion Now!"</b> James Spann, Chief Meteorologist, WBMA-TV, Birmingham, AL

## **Friday, October 21, 2011**

7:30 AM	<b>Continental Breakfast</b>
<b>GUC Session 5: User Discussion and Recommendations</b> <b>Session Chair: James Spann (NWA Annual Meeting Program Committee), WBMA-TV, Birmingham, AL</b>	
8:00 AM	<b>Introductions to Group Topics; Discussion on Purpose and Logistics</b> James Gurka, NOAA/NESDIS, GOES-R Program Office, Greenbelt, MD

8:10 AM	<b>Group Discussion I--Exploiting GOES Data/Products:</b> Share and discuss methods to better exploit current GOES data and products for your applications area (e.g., Are there operational products that you do not currently have access to in your system?). Are there "best practices/lessons learned" for transition to the GOES-R system?
9:05 AM	<b>Group Discussion II--Operational Enhancements by Leveraging the GOES-R Proving Ground:</b> How might satellite resources be more effective in helping provide operational products/services? Do you have any recommendations on better use of satellite resources (including the GOES-R Lightning Mapper) in the Proving Ground exercises? What actions do you recommend to ensure the Proving Ground is more effective in using future satellite data for decision support?
10:00 AM	<b>Break</b>
10:20 AM	<b>Group Discussion III--Maximizing Operational User Readiness/Decision Support:</b> What training and education is needed for users to maximize GOES-R data and products? What methods (e.g., delivery, user involvement) would be most beneficial to operational forecasters and broadcasters?
11:15 AM	<b>Group Topical Discussion Summaries</b>
11:45 AM	<b>Closing Remarks</b> James Gurka, NOAA/NESDIS, GOES-R Program Office, Greenbelt, MD

## NWA/GUC Joint Satellite Poster Sessions

**Poster presenters available Wednesday, 6:00-9:00 p.m., and Thursday, 2:30-3:30 p.m.**

- P4.1 **ABI Flight Performance Predictions Based on PTM Test Results.** Dr. Paul C. Griffith, Alan Bell, John Van Naarden, Erik Hoffman and Chris Ellsworth, ITT Geospatial Systems, Fort Wayne, IN
- P4.2 **A Grobner Basis Solution for Lightning Ground Flash Fraction Retrieval.** Richard Solakiewicz and Rohan Attele, Chicago State University, Chicago, IL and William Koshak, NASA Marshall Space Flight Center, Huntsville, AL
- P4.3 **Assimilation of Atmospheric Infrared Sounder (AIRS) Data into the Prototype High Resolution Rapid Refresh for Alaska (HRRRAK).** Don Morton, Arctic Region Supercomputing Center, University of Alaska at Fairbanks, Fairbanks, AK and Developmental Testbed Center, NCAR, Boulder, CO; Kayla Harrison, Arctic Region Supercomputing Center, University of Alaska at Fairbanks, Fairbanks, AK and Brad Zavodsky and Gary Jedlovec, NASA/Short-term Prediction Research and Transition Center, Huntsville, AL
- P4.4 **Demonstration of RGB Composite Imagery at NOAA National Centers in Preparation for GOES-R.** Kevin Kenneth Fuell, University of Alabama in Huntsville & NASA/SPoRT Center and Dr. Andrew Molthan, NASA/SPoRT Center and MSFC, Huntsville, AL
- P4.5 **Development of GOES-R Algorithms Using a Common Framework and Data Model Design Approach.** Scott Zaccheo, Craig Richard, David B. Hogan and Edward Kennelly, Atmospheric and Environmental Research, Inc., Lexington, MA
- P4.6 **End-to-End Design and Development of GOES-R Level 2 Algorithms: Cloud Pathfinder Algorithm Case Study.** Andra Ivan, P. A. Van Rompay, L. Belvin, and X. Papadakis, Atmospheric and Environmental Research, Inc., Lexington, MA

- P4.7 **Enhanced Use of GOES for Estimating Land Surface Wetness with Application to Wildfire Forecasting at the NOAA Storm Prediction Center.** Robert Rabin, NOAA/OAR/National Severe Storms Laboratory and Phillip Bothwell, NOAA/NWS/Storm Prediction Center, Norman, OK
- P4.8 **Evaluation of NASA SPoRT's Pseudo-Geostationary Lightning Mapper Products in the 2011 Spring Program.** Geoffrey T. Stano, NASA SPoRT Center/ENSCO, Inc., Huntsville, AL, Christopher Siewert, CIMMS University of Oklahoma, Norman, OK and Kristin M. Kuhlman, NOAA/OAR/LCI & CIMMS University of Oklahoma, Norman, OK
- P4.9 **Geospatial Assessment of the Reconstruction of the 1999 Moore, Oklahoma Tornado.** Melissa A. Wagner, Randy S. Cerveny and Soe W. Myint, Arizona State University, Tempe, AZ
- P4.10 **GOES Imager Stray Light Correction.** Hyre Bysal, NOAA/NESDIS/OSPO, Suitland, MD; Steven Buford, ITT Geospatial Systems; Timothy J. Schmit, NOAA/NESDIS/STAR, Madison, WI; Grant Matthews, ITT Geospatial Systems and Xiangqian (Fred) Wu, NOAA/NESDIS/STAR, Camp Springs, MD
- P4.11 **GOES Playback and Display: Interacting with Movies.** James L. Carr, Michael D. Smith and David M. Zakar, Carr Astronautics, Greenbelt, MD
- P4.12 **GOES-R AWG Product Processing System Framework: System Design.** Walter Wolf, NOAA/NESDIS/STAR, Camp Springs, MD; Shanna Sampson, IMMSG, Ray Garcia, CIMMS, Graeme Martin, CIMSS, and Xinpin Liu, Dell, Camp Springs, MD
- P4.13 **GOES-R Ground System and Algorithm Implementation Design.** Alexander Werbos and Elizabeth Lundgren, Atmospheric and Environmental Research, Inc., Lexington, MA and Robert Kaiser, Harris Corporation, Melbourne, FL
- P4.14 **GOES-R GS Product Generation Infrastructure Operations.** Mike Blanton, Harris Corporation, Melbourne, FL
- P4.15 **GOES-R Product Definition and Users' Guide - Work in Progress.** Christa C. Hornbaker and Michelle Burch, GOES-R Ground Segment Project/Boeing, Fort Walton Beach, FL
- P4.16 **GOES-R Products List and Planned Availability.** Donald Gray, NOAA/NESDIS, Goddard Space Flight Center, Greenbelt, MD

- P4.17 **GOES-R Proving Ground Product Development at CIRA.** Daniel T. Lindsey, Don Hillger, Deb Molenaar, John A. Knaff and Mark DeMaria, NOAA/NESDIS/RAMMB, Fort Collins, CO and Steve Miller, Renate Brummer, Louie Grasso, Stan Kidder, Dan Bikos, Jeff Braun, Bernie Connell, Ed Szoke, Hiro Gosden, Kevin Micke and Robert DeMaria. Cooperative Institute for Research of the Atmosphere, Fort Collins, CO
- P4.18 **GOES-R Sectorized Cloud and Moisture Imagery Products.** William H. Campbell, NOAA/NWS/OST, Silver Spring, MD; Marge M. Ripley and Jean-Jacques P. Bedet, NOAA/NESDIS/GOES-R Program Office, Greenbelt, MD; James N. Heil, NOAA/NWS/OCWWS and Brian S. Gockel, NOAA/NWS/OST, Silver Spring, MD
- P4.19 **How GOES-R Will Limit Outages and Breaks In Continuity.** Les Spain, Harris Corporation, Melbourne, FL
- P4.20 **Improved Forecasts of Convective Initiation Associated with the North American Monsoon System.** Brian Guyer and Deirdre Kann, NOAA/National Weather Service, Albuquerque, NM
- P4.21 **Improving High Impact Weather Forecasts with Combined GOES-R Measurement and Advanced Infrared Soundings from JPSS.** Jun Li, Cooperative Institute for Meteorological Satellite Studies, University of Wisconsin-Madison, Madison, WI
- P4.22 **Investigating the Impact of AIRS Thermodynamic Profiles on Convective Forecasts for the April 25-27, 2011 Severe Weather Events in the Southeastern United States.** Bradley T. Zavodsky, NASA SPoRT Center and MSFC, Huntsville, AL; Danielle M. Kozlowski, USRP/NASA Summer Intern Program, University of Missouri at Columbia, Columbia, MO; Andrew L. Molthan, NASA SPoRT Center and MSFC, Huntsville, AL and Jonathan L. Case, ENSCO Inc./ NASA SPoRT Center, Huntsville, AL
- P4.23 **Nighttime Oil Spills Detection and Monitoring by Infrared Satellite Remote Sensing.** Sungwook Hong, In-Chul Shin, Su-Mi Koh and Jong-Seo Park, National Meteorological Satellite Center (NMSC) / Korea Meteorological Administration (KMA), Republic of Korea
- P4.24 **NOAA's 2011 Satellite Direct Readout Conference: Summary and Outcomes.** Marlin O. Perkins, NOAA/NESDIS/Office of Satellite and Product Operations, NSOF, Suitland, MD
- P4.25 **NOAA's Suite of Operational Geostationary Sea Surface Temperature Products Current and Future.** Eileen Maturi, NOAA/NESDIS/STAR, Camp Springs, MD, Andy Harris and Jon Mittaz, University of MD, CICS, College Park, MD, and John Sapper and Robert Potash, NOAA/NESDIS/OSPO, Camp Springs, MD

- P4.26 **NREPS Applications for Water Supply and Management in California and Tennessee.** Patrick Gatlin, Mariana Felix Scott and Lawrence D. Carey, Earth System Science Center, University of Alabama in Huntsville, and Walter A. Petersen, NASA Marshall Space Flight Center, Huntsville, AL
- P4.27 **Objective Validation of Satellite-Based Convective Initiation Algorithms Using Radar.** Valliappa Lakshmanan, University of Oklahoma & NOAA/OAR/NSSL, Norman, OK; Robert Rabin, NOAA/OAR/NSSL, Norman, OK; Justin Sieglaff, CIMSS University of Wisconsin at Madison, Madison, WI; John Walker, University of Alabama in Huntsville and Gary Wade, NOAA/NESDIS/STAR, Madison, WI
- P4.28 **Operational Applications of New Satellite Data Sets in NWS Eastern Region.** Dave Radell, NOAA/NWS Eastern Region Headquarters, Bohemia, NY and Frank Alsheimer, NOAA/National Weather Service, Charleston, SC
- P4.29 **Severe Storm Identification with the Advanced Microwave Sounding Unit (AMSU).** Ralph Ferraro (Chair, NWA Remote Sensing Committee) and Chi Quinn, NOAA/NESDIS, College Park, MD and Daneld Cecil, University of Alabama in Huntsville, Huntsville, AL
- P4.30 **The GOES-R Product Generation Architecture.** Gerald Dittberner, Harris Corporation, Greenbelt, MD, Satya Kalluri, NOAA/NESDIS/GOESPO, Greenbelt, MD and Allan Weiner and Anderson Tarpley, Harris Corporation, Melbourne, FL
- P4.31 **The GRB Simulator: A System for Testing GOES-R Rebroadcast (GRB) Data Streams.** Kevin Gibbons, Harris Corporation, Melbourne, FL; Randall Race, SGT, Inc., Greenbelt, MD; Cliff Miller and Ken Barnes, Harris Corporation, Melbourne, FL and Gerald Dittberner, Harris Corporation, Greenbelt, MD
- P4.32 **The Ground Segment Architecture for GOES-R.** Dennis Hansen and Allan Weiner, Harris Corporation, Melbourne, FL; Satya Kalluri, NOAA/NESDIS/GOESPO, Greenbelt, MD; Gerald Dittberner, Harris Corporation, Greenbelt, MD and J. Bistrow, NASA/GSFC, Greenbelt, MD
- P4.33 **The Reproducibility of Research Baseline Results in Implemented Algorithms.** Rajiv Khanna, Noblis, Inc., Falls Church, VA and Ted Kennelly, Atmospheric and Environmental Research, Lexington, MA
- P4.34 **The Satellite Analysis Branch Hazard Mitigation Programs.** Jamie Kibler, NOAA/NESDIS/OSPO/SPSD/Satellite Analysis Branch, Camp Springs, MD

- P4.35 **The SUVI On-Orbit Calibration Underflight Program: A Feasibility Study.** Linda Habash Krause, Amy R. Winebarger, and Jonathan W. Cirtain, NASA Marshall Space Flight Center; Ken Kobayashi and Brian M. Robinson, University of Alabama in Huntsville, and Steven D. Pavelitz, NASA Marshall Space Flight Center, Huntsville, AL
- P4.36 **Tornado Path Details Obtained from Airborne, High Resolution Remote Sensing.** Kevin Knupp, Todd Murphy, Tim Coleman and Ryan Wade, University of Alabama in Huntsville, Huntsville, AL
- P4.37 **Transitioning Improvements in the GOES Sounder Profile Retrieval Algorithm into Operations.** Gary S. Wade, NOAA/NESDIS/StAR/CoRP/ASPB, Madison, WI; James P. Nelson III, CIMSS University of Wisconsin at Madison, Madison, WI; Amerigo S. Allegrino, IM Systems Group, Inc., Rockville, MD; Seth I. Gutman and Daniel L. Birkenheuer, NOAA/ESRL/GSD, Boulder, CO; Zhenglong Li and Anthony J. Schreiner, CIMSS University of Wisconsin at Madison, Madison, WI; Timothy J. Schmit, NOAA/NESDIS/StAR/CoRP/ASPB, Madison, WI; Jaime Daniels, NOAA/NESDIS/StAR/SMCD/OPDB, Suitland, MD and Jun Li, CIMSS University of Wisconsin at Madison, Madison, WI
- P4.38 **Updated Analysis of Lossless Compression Techniques for the GOES-R Rebroadcast (GRB) Sub-System.** Peter Finocchio, Bobby H. Braswell, Yuguang He, David B. Hogan and Daniel Hunt, Atmospheric and Environmental Research, Inc., Lexington, MA
- P4.39 **NOAA/NESDIS Satellite and Product Operations: User Services, Outreach and Help Desk Overview.** Matthew Seybold and Natalia Donoho, NOAA/NESDIS, Camp Springs, MD
- P4.40 **Using High-Resolution Sea Surface Temperature Data and a NASA Land Information System to Initialize a Local Weather Forecast Model at NWS Houston/Galveston.** Lance Wood and Scott Overpeck, NOAA/National Weather Service, Houston/Galveston, TX
- P4.41 **Using the Water Body Database for GOES-R Landmarking.** James L. Carr, David J. Herndon and Sarah Reehl, Carr Astronautics, Greenbelt, MD
- P4.42 **Validation of a Convective Storm Growth Detection Algorithm using a Satellite-Based Object Tracking Methodology.** Lee M. Counce, Justin M. Sieglaff, Daniel C. Hartung and Wayne F. Feltz, SSEC/CIMSS, University of Wisconsin at Madison, Madison, WI

- P4.43 **Advances in Technology to Optimize Use of DCS on GOES-R.** Kay Metcalf, NOAA/NESDIS/Office of Satellite & Product Operations, Suitland, MD
- P4.44 **HRIT/EMWIN: The Evolution of LRIT and EMWIN.** Paul Seymour, NOAA/NESDIS, Suitland, MD; Robert Wagner and Santos Rodriguez, NOAA/NWS/OOS, Silver Spring, MD; Craig Keeler, NOAA/NESDIS/GOESPO, Greenbelt, MD and Kevin McMahon, Washington Consulting, Inc., Vienna, VA