

AGENDA**Twenty-third Annual George Mason University Conference on
Atmospheric Transport and Dispersion Modeling**

June 18-20, 2019

Conference Chairs:Joseph Chang, RAND Corporation, Arlington, VA
Zafer Boybeyi, George Mason University, Fairfax, VA**Enterprise Hall, Room 80 (June 18-19)****Music Theater Building, Room 1005 (June 20)****George Mason University, Fairfax, VA****DAY 1 (June 18) Enterprise Hall, Room 80****Session 1-Laboratory Testing, Source Term Estimation, and Modeling System****Chair: Joe Chang, RAND Corporation**

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| 8:30 AM | 8:40 AM | Welcoming Remarks |
| 8:40 AM | 9:00 AM | 3D Scaled, Neutral Density Experimental Measurements and Simulations within the Jack Rabbit 2 Mock Urban Array
COL Michael Benson, COL Bret Van Poppel, Mark Owkes, and Chris Elkins
<i>United States Military Academy, West Point, NY</i> |
| 9:00 AM | 9:20 AM | Ensemble Behavior of Time-limited, Area Source Releases in a Wind Tunnel Study
Tom Spicer and Jessica Morris
<i>University of Arkansas, Fayetteville, AR</i> |
| 9:20 AM | 9:40 AM | Testing of a Fast Source Term Parameter Estimation Algorithm for Atmospheric Transport and Dispersion Applications
Stefano Alessandrini, Scott Meech, Jeff Weil, and Thomas Mazzola
<i>National Center for Atmospheric Research, Boulder, CO</i> |
| 9:40 AM | 10:00 AM | Casualty Estimation Workflow for Chemical and Biological Agents
Stuart Smith
<i>Institute for Defense Analyses, Alexandria, VA</i> |
| 10:00 AM | 10:30 AM | COFFEE BREAK |

Session 2-Meteorological Modeling and Analysis**Chair: Tom Spicer, University of Arkansas**

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| 10:30 AM | 10:50 AM | Developing the Weather Research and Forecasting Model for Multiscale Simulations of Transport and Dispersion
Robert S. Arthur, Katherine A. Lundquist, Jeffrey D. Mirocha, David J. Wiersema, and Yuliya Kanarska
<i>Lawrence Livermore National Laboratory, Livermore, CA</i> |
| 10:50 AM | 11:10 AM | Advancements in the Analog Ensemble Method for Downscaling
Christopher M. Rozoff and Stefano Alessandrini
<i>National Center for Atmospheric Research, Boulder, CO</i> |
| 11:10 AM | 11:30 AM | The Application of an Adaptive Programming Process to a Mesoscale Model for Use in Operational Dispersion Modeling
David Werth, and Robert Buckley |

Savannah River National Laboratory, Aiken, SC

11:30 AM 11:50 AM **Meteorological Analysis of the Humble Jasmine 1 Field Campaign**

Scott Meech

National Center for Atmospheric Research, Boulder, CO

11:50 AM 1:10 PM **LUNCH BREAK**

Session 3-Special OFCM Session (1)

HYSPLIT and IMAAC

Chair: Jeff McQueen, National Oceanic and Atmospheric Administration

1:10 PM 1:20 PM **OF CM Session Introduction**

David Chorney

Office of the Federal Coordinator for Meteorology, Silver Spring, MD

1:20 PM 1:40 PM **HYSPLIT Inverse Modeling**

Tianfeng Chai, Ariel Stein, Hyun Cheol Kim, Fong Ngan, Alice Crawford, Barbara Stunder, Shobha Kondragunta, and Michael J. Pavolonis

National Oceanic and Atmospheric Administration/Air Resources Laboratory, College Park, MD

1:40 PM 2:00 PM **Evaluation of Recently Added STILT Features into HYSPLIT**

Christopher P. Loughner, Ariel Stein, and John Lin

National Oceanic and Atmospheric Administration/Air Resources Laboratory, College Park, MD

2:00 PM 2:20 PM **Evaluating the Mixing Characteristics in HYSPLIT with Controlled Tracer Experiment**

Fong Ngan, Christopher Loughner, and Ariel Stein

National Oceanic and Atmospheric Administration/Air Resources Laboratory, College Park, MD

2:20 PM 2:40 PM **National Weather Service HYSPLIT and Working with Better Communication with IMAAC**

Chris Wamsley

National Weather Service Headquarter, Silver Spring, MD

2:40 PM 3:00 PM **IMAAC and We Support State and Local Response**

Leonard Willitts

Federal Emergency Management Agency, Department of Homeland Security, Washington, DC

3:00 PM 3:30 PM **COFFEE BREAK**

Session 4-Special OFCM Session (2)

HPAC

Chair: David Chorney, Office of the Federal Coordinator for Meteorology

3:30 PM 3:50 PM **HPAC 6.5 Model Validation: A Look into EPA Sensor Data Collected During the Lackawanna Steel Fire**

Leann Anthony, Yaitza Luna-Cruz, and Scott Runyon

Defense Threat Reduction Agency, Fort Belvoir, VA

3:50 PM 4:10 PM **Comparisons of HPAC Transport and Dispersion Model Predictions of Planetary Boundary Layer Depth**

Joshua Boden

Defense Threat Reduction Agency, Fort Belvoir, VA

4:10 PM 4:30 PM **Hazard Dispersion via Unmanned Aerial Vehicles: Considerations in Modeling Downwash**

Chia-Wei Tsai

- 4:30 PM 4:50 PM *Defense Threat Reduction Agency, Fort Belvoir, VA*
The Use of NCAR SOM Data for DTRA Reachback Planning Products
 Jonathan M. Vogel and Jimmie Trigg
Defense Threat Reduction Agency, Fort Belvoir, VA
- 4:50 PM 5:10 PM **Discussions**
 David Chorney¹ and Jeff McQueen²
¹ *Office of the Federal Coordinator for Meteorology, Silver Spring, MD;* ² *National Oceanic and Atmospheric Administration, College Park, MD*
- 5:10 PM **DAY 1 ADJOURNS**

DAY 2 (June 19) Enterprise Hall, Room 80

Session 5-Jack Rabbit II (1)

Chair: Steve Hanna, Hanna Consultants

- 8:40 AM 9:00 AM **Jack Rabbit II Inter-model Comparison Exercise**
 Joseph C. Chang, Steven R. Hanna, and Thomas Mazzola
RAND Corporation, Arlington, VA
- 9:00 AM 9:20 AM **HPAC Model Studies Relative to Jack Rabbit II Model Inter-comparisons**
 Steven Simpson, Ron Meris, Sean Miner, and Thomas Mazzola
Applied Research Associates, Kirtland Air Force Base, NM
- 9:20 AM 9:40 AM **Britter and McQuaid (B&M) 1988 Handbook Nomograms for Dense Gas Modeling Applied to the Jack Rabbit II Chlorine Release Trials**
 Steven R. Hanna
Hanna Consultants, Kennebunkport, ME
- 9:40 AM 10:00 AM **Results from the Integral Dense-gas Dispersion Model (IDDM) for the Jack Rabbit II Model Inter-Comparison**
 Jeffrey C. Weil and Stefano Alessandrini
National Center for Atmospheric Research, Boulder, CO
- 10:00 AM 10:20 AM **Simulation of Jack Rabbit II Chlorine release trials with the PMSS Lagrangian Particle Dispersion Model (LPDM)**
 Félix Gomez, Bruno Ribstein, Laurent Makké, Patrick Armand, Jacques Moussafir, and Maxime Nibart
ARIA Technologies, Boulogne-Billancourt, France
- 10:20 AM 10:50 AM **COFFEE BREAK**

Session 6-Jack Rabbit II (2) and Model Evaluation

Chair: Stefano Alessandrini, National Center for Atmospheric Research

- 10:50 AM 11:10 AM **Jack Rabbit II Analysis of Cloud Dimensions and Inter-model Comparisons**
 Thomas A. Mazzola
SAIC, Lorton, VA
- 11:10 AM 11:30 AM **A Recommended Approach to Model Chlorine Reactivity with Environmental Materials in Atmospheric Dispersion Models**
 Tom Spicer, Bruce Hicks, and Shannon Fox
University of Arkansas, Fayetteville, AR
- 11:30 AM 11:50 AM **Progress on IV&V of the JEM 2 modules for Source Term Estimation (STE), Internal Building Hazard (IBH) and Shelter Stay Time (SST)**
 Steven R. Hanna and Joseph C. Chang
Hanna Consultants, Kennebunkport, ME

- 11:50 AM 12:10 PM **An Evaluation of the Joint Outdoor-indoor Urban Large Eddy Simulation (Joules) Atmospheric Transport and Dispersion (AT&D) Modeling System**
 Paul E. Bieringer, Aaron J. Piña, Harm J. J. Jonker, David M. Lorenzetti, Michael D. Sohn, George Bieberbach, and Richard N. Fry, Jr
Aeris LLC, Louisville, CO

12:10 PM 1:30 PM **LUNCH BREAK**

Session 7-HPAC/JEM Reconciliation

Chair: Tom Mazzola, SAIC

- 1:30 PM 1:50 PM **Joint Effects Model (JEM) and Hazard Prediction and Assessment Capability (HPAC) Program Reconciliation**
 Eric Rial, Brian Smith, George Bieberbach, and Russell Mills
Joint Program Manager for Information Systems, San Diego, CA

- 1:50 PM 2:10 PM **Joint Effects Model (JEM) and Hazard Prediction and Assessment Capability (HPAC) Program Reconciliation Architecture and Science and Technology (S&T) Developer Benefits**
 Brian Smith, Eric Rial, George Bieberbach, and Russell Mills
General Dynamics Information Technology, Middletown, RI

- 2:10 PM 2:30 PM **Joint Effects Model (JEM) and Hazard Prediction and Assessment Capability (HPAC) Program Reconciliation Verification and Validation (V&V)**
 George Bieberbach, Ian Sykes, Doug Henn, and Brian Smith
Aeris LLC, Louisville, CO

- 2:30 PM 2:50 PM **Joint Effects Model (JEM) and Hazard Prediction and Assessment Capability (HPAC) Program Reconciliation System Demonstration**
 George Bieberbach, Brian Smith, Eric Rial, and Russell Mills
Aeris LLC, Louisville, CO

2:50 PM 3:20 PM **COFFEE BREAK**

Session 8-Algorithm and Database Development

Chair: George Bieberbach, Aeris LLC

- 3:20 PM 3:40 PM **Update on the Development of Database/Website for DTRA Programs MUST, JU03, FFT07 and Jack Rabbit II**
 Eugene L. Vickers, Jarell Johnson, Don Fazenbaker, and Charles Anderson
U.S. Army Combat Capabilities Development Command - Chemical Biological Center, Aberdeen Proving Ground, MD

- 3:40 PM 4:00 PM **Large-eddy Simulations of Urban Turbulent Flows Using a GPU Accelerated ABLE-LBM (Atmospheric Boundary Layer Environment-Boltzmann Model)**
 Yansen Wang and Jonathon Decker
U.S. Army Research Laboratory, Adelphi, MD

- 4:00 PM 4:20 PM **AERMOD System Updates, Current Research, Collaboration, and the 12th Modeling Conference**
 Clint Tillerson
U.S. Environmental Protection Agency, Research Triangle Park, NC

- 4:20 PM 4:40 PM **Incorporation of Concentration Fluctuations into a Gaussian Puff Ensemble Average Plume**
 Scott L. Weinrich, Stuart W. Smith, and Alison E. Lawrence
Institute for Defense Analyses, Alexandria, VA

4:40 PM 5:00 PM **DAY 2 ADJOURNS**

7:00 PM **NO-HOST SOCIAL DINNER, LOCATION TBD**

DAY 3 (June 20) Music Theater Building, Room 1005

Session 9-Nuclear Applications, Source Term Modeling, and Urban Air Quality Platform

Chair: Zafer Boybeyi, George Mason University

- 9:00 AM 9:20 AM **DELFIc Fallout Planning Tool**
Ronald W. Lee, Vincent J. Jodoin, and David A. Hooper
Oak Ridge National Laboratory, Oak Ridge, TN
- 9:20 AM 9:40 AM **The Importance of Particle Size for Energetic Dispersion Source Terms and How to Experimentally Determine Particle Size**
John Shaw, David Parkes, I. Laurie, P. Brent, and K. Clark
Nuclear Threat Reduction, Atomic Weapons Establishment, Reading, United Kingdom
- 9:40 AM 10:00 AM **A Vortex-ring Source Term for Instantaneous Buoyant Releases**
Pablo Moresco
Oak Ridge National Laboratory, Oak Ridge, TN
- 10:00 AM 10:20 AM **Marine Source Estimation Using a Time-reversed Lagrangian Particle Tracking Approach**
Siân Jenkins, Steven Reece, Ben Rawlings, and Tim Culmer
Riskaware, Bristol, United Kingdom
- 10:20 AM 10:40 AM **FAIRCITY Project : a “Real-Time” Very High-Resolution Urban Air Quality Platform Based on the PMSS Model, Assimilating Mobile Sensors – The PARIS 2018 Case Study**
Marcia Otalora, Maxime Nibart, Laurent Makké, Bruno Ribstein, Jacques Moussafir and Claude Dérognat
ARIA Technologies, Boulogne-Billancourt, France
- 10:40 AM **DAY 3/CONFERENCE ADJOURNS**