

## **Workshop 15: Personal, Indoor, and Outdoor Exposures: Measurements and Modeling**

*Chair: Michael Kleinman, UC Irvine*

*Co-Chair: John Godleski, EPA*

**Tuesday, April 1, 2003**

**5:00 PM - 6:30 PM**

### **Oral Session**

**Location: Kings Garden North**

#### **OR15-01. THE ROLE OF SUBPOPULATION, DISEASE STATE, HOUSING, SEASON AND OTHER FACTORS UPON PERSONAL EXPOSURES TO PM OF AMBIENT ORIGIN.**

Ron Williams, Jack Suggs, Gary Evans, Anne Rea, Linda Sheldon, Alan Vette, Burke Janet, Carry Croghan, Kelly Leovic, John Creason, Debra Walsh, Charles Rodes, Jonathan Thornburg, Phil Lawless, Ademola Ejire, Margaret Herbst, William Sanders, Jr. *National Exposure Research Laboratory, U.S. Environmental Protection Agency, Research Triangle Park, NC; National Health and Environmental Effects Research Laboratory, U.S. Environmental Protection Agency, Research Triangle Park, NC; Research Triangle Institute International, Research Triangle Park, NC; Shaw University, Raleigh, NC; Department of Cardiology, University of North Carolina-Chapel Hill, Chapel Hill, NC.*

#### **OR15-02. ESTIMATING OUTDOOR CONTRIBUTIONS TO INDOOR AND PERSONAL PARTICULATE AIR EXPOSURES.**

L.-J. Sally Liu, Tim Larson, Lianne Sheppard. *Dept of Environmental Health, University of Washington, Seattle, WA; Dept of Civil and Environmental Engineering; Dept of Biostatistics.*

#### **OR15-03. INFILTRATION BEHAVIOR OF PM<sub>2.5</sub> CHEMICAL COMPONENTS: IMPLICATIONS FOR PM EXPOSURE ASSESSMENT AND EPIDEMIOLOGICAL ASSOCIATIONS.**

Christopher M. Long, Jeremy A. Sarnat. *Health Risk Assessment, Gradient Corporation, Cambridge, MA; Department of Environmental Health, Harvard School of Public Health, Boston, MA.*

#### **OR15-04. TIME-RESOLVED DETERMINATION OF INDOOR, OUTDOOR AND REGIONAL CONCENTRATION RELATIONSHIPS FOR PM<sub>2.5</sub> NITRATE, SULFATE AND CARBON.**

M M Lunden, T L Thatcher, M L Fischer, T W Kirchstetter, K L Revzan, R G Sextro, N J Brown, M R Stolzenburg, S V Hering, J Chow, J Watson. *Environmental Energy Technologies Division, Lawrence Berkeley National Laboratory, Berkeley, CA; Aerosol Dynamics Inc., Berkeley, CA; Northern Nevada Science Center, Desert Research Institute, Reno, NV.*

### **Poster Session**

**Location: Grand Ballroom 2-4**

#### **P15-01. REAL-TIME EXPOSURE MEASUREMENTS OF AEROSOL NUMBER, SURFACE-AREA AND MASS (PM<sub>2.5</sub>) CONCENTRATION IN THE SOUTHERN INDIAN CITY OF MYSORE.**

Belagur Prasad, Pramod Pai, Siddappa Belagali, Andrew D Maynard, Penny Andressen, Gurumurthy Ramachandran. *DOS in Environmental Science, University of Mysore, Mysore, India; National Institute for Occupational Safety and Health, Cincinnati, OH; University of Minnesota, Minneapolis, MN.*

#### **P15-02. FIELD EVALUATION OF A PERSONAL CASCADE IMPACTOR SAMPLER (PCIS).**

Manisha Singh, Chandan Misra, Constantinos Sioutas. *Department of Civil and Environmental Engineering, University of Southern California, Los Angeles, CA.*

#### **P15-03. INDIVIDUAL PARTICLE ANALYSIS OF PERSONAL SAMPLES FROM THE 1998 BALTIMORE PARTICULATE MATTER STUDY.**

Teri L Conner, Ronald W Williams. *National Exposure Research Laboratory, U.S. Environmental Protection Agency, Research Triangle Park, NC.*

**P15-04. INDOOR AND OUTDOOR ORGANIC PM<sub>2.5</sub>: ANALYSIS OF RIOPA DATA.**

Andrea Polidori, Barbara Turpin, Sandra Lake, Robert Giovannetti, Clifford Weisel, Maria Morandi, Steven Colome, Thomas Stock, Arthur Winer, Jay Min Kwon, Shahnaz Alimokhtari, Derek Shendell, Jennifer Jones, Corice Farrar, Silvia Maberti. *Environmental Sciences, Rutgers University, New Brunswick, NJ; Environmental and Occupational Health Sciences Institute, Piscataway, NJ; School of Public Health, University of Texas, Houston, TX; Integrated Environmental Sciences, Irvine, CA; Environmental Science and Engineering Program, University of California, Los Angeles, CA.*

**P15-05. THE EFFECTS OF OZONE AND FINE PARTICULATE MATTER ON THE PULMONARY HEALTH OF ADULT HIKERS IN THE GREAT SMOKY MOUNTAINS NATIONAL PARK.**

Steven P Girardot, Catherine C Collins, Ryan W Malone, Cynthia A Atterholt, Wayne T Davis, Charles B Hamilton, James R Renfro, P. Barry Ryan, Susan M Smith, Gregory D Reed. *Department of Chemistry, Emory University, Atlanta, GA; Department of Health and Safety Sciences, University of Tennessee, Knoxville, TN; Department of Civil and Environmental Engineering, University of Tennessee, Knoxville, TN; Department of Chemistry and Physics, Western Carolina University, Cullowhee, NC; National Park Service, Great Smoky Mountains National Park, Gatlinburg, TN; Rollins School of Public Health, Emory University, Atlanta, GA.*

**P15-06. COMPARISON OF COLLOCATED PERSONAL MULTI-POLLUTANT SAMPLERS VS. A CENTRAL AMBIENT AIR MONITORING STATION IN STEUBENVILLE, OHIO.**

Stephen E Winter, Vincent B Conrad, Jeffrey A Withum, Robert M Statnick, Richard A Bilonick, Petros Koutrakis, Helen H Suh, Stefanie T Ebelt. *Research and Development, CONSOL Energy Inc., South Park, PA; Department of Environmental Health, Harvard School of Public Health, Boston, MA.*

**P15-07. EIGHT YEAR TRENDS IN FINE PARTICLE CONCENTRATIONS, COMPOSITION, AND GASEOUS CO-POLLUTANTS IN THE SOUTHERN CALIFORNIA CHILDREN'S HEALTH STUDY.**

Frederick W. Lurmann, Siana H. Alcorn, Clint A. Taylor. *Sonoma Technology, Inc., Petaluma, CA; California Air Resources Board, Sacramento, CA.*

**P15-08. AIR QUALITY AND COMPARATIVE EXPOSURE: A PARCEL-LEVEL CUMULATIVE RISK ANALYSIS.**

Amanda B Aretz, Rachael E Moeller-Gorman. *Center for Environmental Studies, Brown University, Providence, RI.*

**P15-09. WOMEN'S PERSONAL AND INDOOR EXPOSURES TO PM<sub>2.5</sub> IN MYSORE, INDIA - IMPACT OF DOMESTIC FUEL USAGE.**

Penny Andresen, Pramod Pai, Gurumurthy Ramachandran, Andrew Maynard, Belagur Prasad, Sidappa Belagali. *Division of Environmental and Occupational Health, University of Minnesota, Minneapolis, MN; DOS in Environmental Science, University of Mysore, Mysore, Karnataka, India; National Institute for Occupational Safety and Health, Cincinnati, OH.*

**P15-10. ASSESSING HUMAN EXPOSURES OF COPD-DIAGNOSED INDIVIDUALS TO PARTICULATE MATTER IN LOS ANGELES COUNTY.**

Gavin Lau, Barbara Turpin, Amanda Wheeler, Helen Suh, Steven Colome, Dalia Spektor. *Environmental Sciences, Rutgers University, New Brunswick, NJ; School of Public Health, Harvard University, Boston, MA; Integrated Environmental Sciences, Irvine, CA; Rand Corporation, Santa Monica, CA.*

**P15-11. PERSONAL EXPOSURES TO PARTICULATE MATTER AND ITS COMPONENTS AMONG CHILDREN WITH ASTHMA.**

Fuyuen Y Yip, Gerald J Keeler, J. Timothy Dvonch, Thomas G Robins, Edith A Parker, Wilma Brakefield-Caldwell. *Environmental Health Sciences, University of Michigan, Ann Arbor, MI; Health Behavior and*

*Health Education, University of Michigan, Ann Arbor, MI; Steering Committee Member, Community Action Against Asthma, Detroit, MI.*

**P15-12. HOURLY PERSONAL EXPOSURE TO INDOOR- AND OUTDOOR-GENERATED PARTICLES AMONG SENSITIVE POPULATIONS IN SEATTLE.**

Ryan Allen, Tim Larson, L.J.-Sally Liu. *Dept. of Env. Health, University of Washington; Dept. of Civil and Env. Engineering, University of Washington, Seattle, WA.*

**P15-13. SPATIAL VARIABILITY OF PM EXPOSURES AS DETERMINED IN THE THE FRESNO ASTHMATIC CHILDREN'S ENVIRONMENT STUDY (FACES).**

Frederick W. Lurmann, Nicole Pauly Hyslop, Paul T. Roberts, David L. Vaughn, S. Katharine Hammond. *Sonoma Technology, Inc., Petaluma, CA; School of Public Health, University of California, Berkeley, CA.*

**P15-14. INVESTIGATIONS OF THE SENSITIVITY OF A PREDICTIVE MODEL OF INDOOR CONCENTRATIONS OF OUTDOOR PM-2.5 TO CHANGES IN HOUSE OPERATIONAL AND ENVIRONMENTAL PARAMETERS.**

Marc L Fischer, Melissa M Lunden, Tracy L Thatcher, David Littlejohn, Thomas W Kirchstetter, Susanne V Hering, Richard G Sextro, Nancy J Brown. *Environmental Energy Technologies Division, Lawrence Berkeley National Laboratory, Berkeley, CA; Research and Development, Aerosol Dynamics Incorporated, Berkeley, CA.*

**P15-15. COMMUTERS' EXPOSURE TO PM<sub>2.5</sub>, CO AND BENZENE INSIDE THE PUBLIC TRANSPORT IN MEXICO CITY:**

Jorge E. Gómez-Perales, Roy N. Colvile, Mark J. Nieuwenhuijsen, Adrián A. Fernández-Bremauntz, Víctor J. Gutiérrez-Avedoy, Víctor H. Páramo-Figueroa, Salvador Blanco-Jiménez, Francisco Mandujano, Rosa Bernabe, Elbagris Segovia-Estrada, Emma Bueno-López. *Dept. Environmental Science and Technology, Imperial College of Science, Technology and Medicine, London, United Kingdom; CENICA and Dirección General de Investigación sobre la Contaminación Urbana, Regional y Global, Instituto Nacional de Ecología, SEMARNAT, Mexico, DF, Mexico; Dirección General de Gestión Ambiental del Aire, Secretaria del Medio Ambiente, GDF, México, DF, Mexico.*

**P15-16. CHARACTERIZING PERSONAL EXPOSURES TO AMBIENT AND NON-AMBIENT PM<sub>2.5</sub> FOR THREE SENSITIVE COHORTS IN BOSTON AND BALTIMORE.**

Kathleen W Brown, Jeremy A Sarnat, Petros Koutrakis. *Environmental Health, Harvard School of Public Health, Boston, MA.*

**P15-17. FACTORS AFFECTING PERSONAL AND INDOOR CONCENTRATIONS OF PM<sub>2.5</sub>, PARTICULATE NITRATE, AND ELEMENTAL CARBON FOR INDIVIDUALS WITH COPD IN LOS ANGELES, CA.**

Li-Te Chang, Amanda Wheeler, Helen H Suh. *Environmental Science & Engineering Program, Harvard School of Public Health, Boston, MA.*

**P15-18. MICROENVIRONMENTAL MODELING OF PERSONAL EXPOSURES TO PARTICULATE MATTERS AMONG ASTHMATIC CHILDREN.**

Chang-Fu Wu, Ralph J. Delfino, Joshua N. Floro, Behzad S. Samimi, Penelope J.E. Quintana, Michael T. Kleinman, Lee-Jane S. Liu. *Department Environmental Health, University of Washington, Seattle, WA; Department of Medicine, University of California at Irvine, Irvine, CA; Division of Occupational and Environmental Health, San Diego State University, San Diego, CA; Department of Community and Environmental Medicine, University of California at Irvine, Irvine, CA.*

**P15-19. EXAMINING FACTORS THAT INFLUENCE THE POTENTIAL FOR CONFOUNDING IN PM EPIDEMIOLOGY.**

Stefanie T Ebelt, Joel Schwartz, Brent Coull, Petros Koutrakis, Helen H Suh. *Environmental Health, Harvard School of Public Health, Boston, MA; Biostatistics, Harvard School of Public Health, Boston, MA.*

**P15-20. RELATION BETWEEN AMBIENT AND EXPOSURE CONCENTRATIONS FOR PARTICULATE MATTER AND ITS TOXIC CONSTITUENTS IN AN INDIAN METROPOLITAN REGION.**

Rashmi S. Patil, Milind M. Kulkarni. *Centre for Environmental Science and Engineering, Indian Institute of Technology, Bombay, Mumbai, Maharashtra, India; Civil Engineering Department, Sardar Patel College of Engineering, Mumbai, Maharashtra, India.*

**P15-21. WILDFIRES AND PRESCRIBED BURNS IN COLORADO: IMPACT ON AIR QUALITY.**

David Tanner, Toni Newville, Michael Hannigan, Jana Milford, Shelly Miller. *Mechanical Engineering Department, University of Colorado, Boulder, CO.*

**P15-22. CHARACTERIZATION OF RESUSPENDED HOUSE DUST AS A SOURCE OF PM EXPOSURE.**

Andrea R. Ferro, Royal J. Kopperud, Lynn M. Hildemann. *Civil and Environmental Engineering, Clarkson University, Potsdam, NY; Civil and Environmental Engineering, Stanford University, Stanford, CA.*

**P15-23. ANALYSIS OF INDOOR, OUTDOOR AND PERSONAL PM<sub>2.5</sub> SPECIES TO ASSESS THE SOURCES OF EXPOSURE: RESULTS FROM RIOPA.**

Qing Yu Meng, Barbara J Turpin, Andrea Polidori, Brian Buckley, Clifford Weisel, Maria Morandi, Steven Colome, Thomas Stock, Arthur Winer, Jong Hoon Lee, Robert Giovanetti, William Cui, Jay Min Kwon, Shahnaz Alimokhtari, Shendell Derek, Jones Jennifer, Corice Farrar, Sylvia Maberti. *Environmental Sciences, Rutgers University, New Brunswick, NJ; Environmental and Occupational Health Institute, Piscataway, NJ; School of Public Health, University of Texas, Houston, TX; Integrated Environmental Sciences, Irvine, CA; Environmental Science and Engineering Program, University of California, Los Angeles, CA.*

**P15-24. MECHANISTIC ANALYSIS OF FTIR SPECTRA FROM OUTDOOR, INDOOR AND PERSONAL PM<sub>2.5</sub> SAMPLES COLLECTED DURING RIOPA.**

Adam Reff, Barbara Turpin, Robert Porcja, Jong Hoon Lee, William Cui, Silvia Maberti, Jay Min Kwon, Shahnaz Alimokhtari, Derek Shendell, Jennifer Jones, Corice Farrar, Clifford Weisel, Maria Morandi, Steven Colome, Thomas Stock, Arthur Winer. *Department of Environmental Sciences, Rutgers University, New Brunswick, NJ; School of Public Health, University of Texas, Houston, TX; Environmental and Occupational Health Sciences Institute, Piscataway, NJ; Environmental Science and Engineering Program, University of California, Los Angeles, CA; Integrated Environmental Sciences, Irvine, CA.*

**P15-25. CONTROLLED EXPOSURE CHAMBER STUDIES AND THE IMPACT OF PM<sub>2.5</sub> ON HUMAN HEALTH.**

Brett D Grover, Delbert J Eatough, Norman L Eatough, Jeremy S Richards, C. Arden Pope. *Department of Chemistry and Biochemistry, Brigham Young University, Provo, UT; Department of Economics, Brigham Young University, Provo, UT.*

**P15-26. CHEMISTRY AS A SOURCE OF INDOOR PARTICLES.**

Charles J Weschler. *EOHSI, UMDNJ-Robert Wood Johnson Medical School/Rutgers, Piscataway, NJ.*

**P15-27. CONTINUOUS MONITORING OF FINE PARTICLES FROM SHOWERING.**

Kenneth A Cowen, Will M Ollison. *Atmospheric Science and Applied Technology, Battelle, Columbus, OH; Regulatory Analysis and Scientific Affairs, American Petroleum Institute, Washington, DC.*

**P15-28. CHARACTERIZATION OF FINE PARTICULATE MATTER IN OHIO: INDOOR, OUTDOOR, AND PERSONAL EXPOSURES.**

Bian Liu, Kevin C Crist, Kuruvilla John. *Health Science, Ohio University, Athens, OH; Environmental Engineering, Texas A&M University-Kingsville, Kingsville, TX.*

**P15-29. INFILTRATION BEHAVIOR OF PM<sub>2.5</sub> CHEMICAL COMPONENTS: IMPLICATIONS FOR PM EXPOSURE ASSESSMENT AND EPIDEMIOLOGICAL ASSOCIATIONS.**

Christopher M. Long, Jeremy A. Sarnat. *Health Risk Assessment, Gradient Corporation, Cambridge, MA; Department of Environmental Health, Harvard School of Public Health, Boston, MA.*

**P15-30. THE ROLE OF SUBPOPULATION, DISEASE STATE, HOUSING, SEASON AND OTHER FACTORS UPON PERSONAL EXPOSURES TO PM OF AMBIENT ORIGIN.**

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**P15-31. ESTIMATING OUTDOOR CONTRIBUTIONS TO INDOOR AND PERSONAL PARTICULATE AIR EXPOSURES.**

L.-J. Sally Liu, Tim Larson, Lianne Sheppard. *Dept of Environmental Health, University of Washington, Seattle, WA; Dept of Civil and Environmental Engineering; Dept of Biostatistics.*

**P15-33. TIME-RESOLVED DETERMINATION OF INDOOR, OUTDOOR AND REGIONAL CONCENTRATION RELATIONSHIPS FOR PM<sub>2.5</sub> NITRATE, SULFATE AND CARBON.**

M M Lunden, T L Thatcher, M L Fischer, T W Kirchstetter, K L Revzan, R G Sextro, N J Brown, M R Stolzenburg, S V Hering, J Chow, J Watson. *Environmental Energy Technologies Division, Lawrence Berkeley National Laboratory, Berkeley, CA; Aerosol Dynamics Inc., Berkeley, CA; Northern Nevada Science Center, Desert Research Institute, Reno, NV.*