

HANS MOOSMÜLLER

Research Professor and NSHE Regents' Researcher
Director, DRI Wildland Fire Science Center (WFSC)

Division of Atmospheric Sciences (DAS), Desert Research Institute (DRI)
Nevada System of Higher Education (NSHE)

EDUCATION

Ph.D.	Physics	1988	Colorado State University, Fort Collins, CO
DIPLOM (M.S.)	Physics	1982	Ludwigs-Maximilians Universität, München

RESEARCH EXPERIENCE

Dr. Moosmüller's interests include experimental and theoretical research in optical spectroscopy as well as its applications to atmospheric, aerosol, and climate physics. His research focuses on development and application of real time, *in situ* measurement methods for aerosol light absorption, scattering, extinction, and asymmetry parameter, and new optical remote sensing techniques. These measurement methods are being used for ambient air monitoring and vehicle, fugitive dust, and biomass burning emission studies. Specifically, he has recently focused on (1) fast, ultra-sensitive measurements of elementary mercury concentrations and fluxes, (2) aerosol optical properties and their origin in aerosol morphology and aerosol complex refractive index spectra, (3) measurement of surface albedo, and (4) the influence of aerosol deposition on snow surface albedo. Dr. Moosmüller has also participated in the planning, fieldwork, and data analysis of several major air quality studies. During his first three years at DRI, he was responsible for the airborne ozone lidar research program under a cooperative agreement with the USEPA.

Before joining DRI, Dr. Moosmüller was at Colorado State University where he investigated Brillouin light scattering of spin waves and millimeter-wave effective line widths in thin metal films. He also did research on high-spectral-resolution lidar and coherent light scattering techniques. This work included the development of supersonic flow measurement techniques and the investigations of spectral line shapes. His earlier work at the Ludwigs-Maximilians Universität in Munich, Germany and the Max Planck Institute for Quantum Optics in Garching, Germany focused on laser remote sensing.

PROFESSIONAL EXPERIENCE

2015 – Present	Director, DRI Wildland Fire Science Center (WFSC)
2013 – Present	NSHE Regents' Researcher Nevada System of Higher Education (NSHE)
2006 – Present	Graduate Faculty <i>Chemistry Department, University of Nevada, Reno, NV</i> <i>Chemical Physics Program, University of Nevada, Reno, NV</i>
2000 – Present	Research Professor <i>Desert Research Institute, University of Nevada System, Reno, NV</i>
1995 – Present	Graduate Faculty <i>Physics Department, University of Nevada, Reno, NV</i> <i>Atmospheric Sciences Program, University of Nevada, Reno, NV</i>

- 1995 – 2000 Associate Research Professor
Desert Research Institute, University of Nevada System, Reno, NV
- 1991 – 1995 Assistant Research Professor
Desert Research Institute, University of Nevada System, Reno/Las Vegas, NV
- 1988 – 1990 Postdoctoral Research Associate
Magnetics Laboratory, Colorado State University, Fort Collins, CO
- 1982 – 1988 Graduate Research and Teaching Assistant
Geoscience Center, Nonlinear Optics Laboratory, and Physics Department, Colorado State University, Fort Collins, CO
- 1980 – 1982 Graduate Research Assistant
Physics Department, Ludwigs-Maximilians Universität, München, Germany and Max Planck Institute for Quantum Optics, Garching, Germany
- Summer 1979 Intern
IBM München, Germany
- Summer 1977 Intern
Bayer Dormagen, Germany

PROFESSIONAL ACTIVITIES

Awards and Honors

- Moosmüller, H. (2013). Benjamin Y. H. Liu Award of the American Association for Aerosol Research (AAAR) “recognizing outstanding contributions to aerosol instrumentation and experimental techniques that have significantly advanced the science and technology of aerosols.”
- Moosmüller, H. (2013). Nevada Regents’ Researcher Award “given annually to one Nevada System of Higher Education (NSHE) faculty member at University of Nevada, Las Vegas (UNLV), University of Nevada, Reno (UNR), or Desert Research Institute (DRI) with a distinguished record in research.”
- Moosmüller, H. (2012). Nazir and Mary Ansari Medal for Excellence in Science “recognizing one Desert Research Institute (DRI) faculty member annually for outstanding contributions to science and entrepreneurship through (1) program building; (2) publications; and/or (3) patents and intellectual property.”
- Gillies, J. A., N. Lancaster, H. D. Kuhns, H. Moosmüller, E. McDonald, D. Gillette, and W. Nickling (2004). SERDP project (CP-1191) “Characterizing and Quantifying Local and Regional Particulate Matter Emissions from Department of Defense Installations”, SERDP Compliance Project of the Year.

Postdoctoral Advisor

- 2009 – 2010 Dr. Rajan K. Chakrabarty
Currently Assistant Professor, Department of Energy, Environmental, and Chemical Engineering, Washington University in Saint Louis.
- 2008 – 2010 Dr. Xavier Fain
Currently Researcher at the Comité National de la Recherche Scientifique (CNRS) Laboratoire de Glaciologie et Géophysique de l'Environnement (LGGE) in Grenoble, France.
- 2006 – 2007 Dr. Daniel Obrist
Currently Research Professor, Desert Research Institute, NSHE.
- 2003 - 2005 Dr. Claudio Mazzoleni
Currently Associate Professor, Physics Dept., Michigan Tech. University.

Graduate Student Advisor

- 2011 – Present Mr. Nicholas D. Beres (Ph.D. Program in Atmospheric Sciences; M.S. in Atmospheric Sciences, 2014).
- 2011 – 2014 Mr. Ian J. Arnold (M.S. in Physics, 2014).
Currently Ph.D. Graduate Student, College of Optical Sciences, University of Arizona, Tucson.
- 2009 – 2011 Dr. Guadalupe Paredes-Miranda (Ph.D. in Atmospheric Sciences, 2011).
Currently Instructor, Dept. of Physics, University of Nevada, Reno.
- 2007 – 2011 Dr. Guoxun Tian (Ph.D. in Physics, 2011).
Currently Postdoctoral Research Associate, Atmospheric Sciences and Mechanical Engineering Department, Colorado State University, Fort Collins.
- 2004 – 2008 Dr. Rajan K. Chakrabarty (Ph.D. in Chemical Physics, 2008; M.S. in Atmospheric Sciences, 2006).
Currently Assistant Professor, Dept. of Energy, Environmental, and Chemical Engineering, Washington University in Saint Louis.
- 1999 – 2003 Dr. Claudio Mazzoleni (Ph.D. in Atmospheric Sciences, 2003).
Currently Associate Professor, Physics Dept., Michigan Tech. University.
- 1999 – 2003 Dr. Ravi Varma (Ph.D. in Atmospheric Sciences, 2003).
Currently Associate Professor, Physics Dept., Nat. Inst. of Tech. Calicut, India.
- 1994 – 1997 Dr. Joseph D. Vance (M.S. in Atmospheric Sciences, 1997).
Currently CEO, Citruslaser LLC, Scotts Valley, CA.

Conferences

- Executive Committee, *11th International Conference on Carbonaceous Particles in the Atmosphere (ICCPA)*, Berkeley, CA, August 10-13, 2015.
- Chair, Session 5: Aerosol Optical Properties and Brown Carbon, *11th International Conference on Carbonaceous Particles in the Atmosphere (ICCPA)*, Berkeley, CA, August 10-13, 2015.
- Chair, Session 6: Contemporary and Historical Concentration Trends, *11th International Conference on Carbonaceous Particles in the Atmosphere (ICCPA)*, Berkeley, CA, August 10-13, 2015.
- Chair, Session 12: Carbonaceous Aerosols in the Atmosphere. *33rd Annual Conference of the American Association for Aerosol Research*, Orlando, FL, October 20-24, 2014.
- Chair, Session 2AP: Aerosol Physics. *33rd Annual Conference of the American Association for Aerosol Research*, Orlando, FL, October 20-24, 2014.

Chair, Session 2: Black Carbon Definition and Measurement Approaches. *International Council on Clean Transportation (ICCP) Technical Workshop on Marine Black Carbon Emissions: Identifying Research Gaps*. Ottawa, Canada, September 9-10, 2014.

Technical Program Committee, *Aerosol and Atmospheric Optics: Visibility and Air Pollution, A&WMA Visibility Specialty Conference*, Whitefish, MT, September 24-29, 2012.

Faculty, Tutorial on Contemporary Aerosol Optics (4 hour tutorial, jointly with R. K. Chakrabarty). *Aerosol and Atmospheric Optics: Visibility and Air Pollution*, Air & Waste Management Association, Whitefish, MT, September 24-28, 2012.

Panelist, Promise and Problems of Advanced Particulate Monitoring and Analysis Methods for Routine Networks. *Aerosol and Atmospheric Optics: Visibility and Air Pollution*, Air & Waste Management Association, Whitefish, MT, September 24-28, 2012.

Chair, Session 8: Aerosol – Optical Relationships, *Aerosol and Atmospheric Optics: Visibility and Air Pollution, A&WMA Visibility Specialty Conference*, Whitefish, MT, September 24-29, 2012.

Chair, Session 7: Satellite and Other Remote Sensing Applications to Haze/Aerosol Monitoring, *Aerosol and Atmospheric Optics: Visibility and Air Pollution, A&WMA Visibility Specialty Conference*, Whitefish, MT, September 24-29, 2012.

Chair, Poster Session PII. *Third Santa Fe Conference on Global and Regional Climate Change*, Santa Fe, NM, October 31 - November 3, 2011.

Conference Advisory Committee, *Optics'11: A Conference on Light*, National Institute of Technology Calicut and Optical Society of India (OSI), Calicut, India, May 23-25, 2011.

Chair, Session A23C. Biomass Burning: New Findings and Analyses from Multiple Perspectives III (7 presentations), *2010 Fall Meeting of the American Geophysical Union*, San Francisco, CA, December 13-17, 2010.

Chair, Session 4B. Recent Advances in Biomass Burning Emissions – Source Modeling and Measurement/Aerosol Exposure (7 presentations), *Annual Meeting of the American Association for Aerosol Research (AAAR)*, Minneapolis, MN, October 26-30, 2009.

Chair, Poster Session 3B. Recent Advances in Biomass Burning Emissions – Wildfire Emissions and Impacts (17 presentations), *Annual Meeting of the American Association for Aerosol Research (AAAR)*, Minneapolis, MN, October 26-30, 2009.

Chair, Session 2B. Recent Advances in Biomass Burning Emissions – Wildfire Emissions and Impacts (6 presentations), *Annual Meeting of the American Association for Aerosol Research (AAAR)*, Minneapolis, MN, October 26-30, 2009.

Chair, Session 1B. Recent Advances in Biomass Burning Emissions – Aerosol Characterization (7 presentations), *Annual Meeting of the American Association for Aerosol Research (AAAR)*, Minneapolis, MN, October 26-30, 2009.

Organizer, Special Symposium on Recent Advances in Biomass Burning Emission Measurement and Modeling, *Annual Meeting of the American Association for Aerosol Research (AAAR)*, Minneapolis, MN, October 26-30, 2009.

Technical Program Committee, *Annual Meeting of the American Association for Aerosol Research (AAAR)*, Minneapolis, MN, October 26-30, 2009.

Chair, Biomass Burning Emissions Session, *Aerosol and Atmospheric Optics: Visual Air Quality and Radiation Balance Conference*, Air & Waste Management Association, Moab, UT, April 28 - May 2, 2008.

Chair, Poster/Oral Session, *Aerosol Workshop on Climate Prediction Uncertainties, Second International Conference on Global Warming and the Next Ice Age*, Santa Fe, NM, July 17-21, 2006.

Chair, Aerosols and Climate Session, *Second International Conference on Global Warming and the Next Ice Age*, Santa Fe, NM, July 17-21, 2006.

Chair, Mercury Detection Session, *61st Northwest Regional Meeting of the American Chemical Society*, Reno, NV, June 25-28, 2006.

Chair, Atmospheric Science Session, *61st Northwest Regional Meeting of the American Chemical Society*, Reno, NV, June 25-28, 2006.

Chair, Session 2, Optical Monitoring Methods, *Regional and Global Perspectives on Haze: Causes, Consequences, and Controversies (Visibility Specialty Conference)*, Asheville, NC, October 25-29, 2004.

Topic Leader, Topic #8: What New and Innovative Sampling, Analytical, and Interpretive Techniques are Needed to Determine the Properties and Sources of Carbonaceous Aerosol in the Atmosphere? *International Workshop for the Development of Research Strategies for the Sampling and Analysis of Organic and Elemental Carbon Fractions in Atmospheric Aerosol (OC/EC Workshop)*, Durango, CO, March 4-5, 2003.

Chair, Session 106: Remote Sensing of Chemical Species in the Atmosphere, *87th Annual Meeting of the Air & Waste Management Association*, Cincinnati, OH, June 19-24, 1994.

Chair, Session 21: Atmospheric Spectroscopy and Source Emissions Characterization, *II, International Symposium on Optical Sensing for Environmental Monitoring*, Atlanta, GA, October 12-14, 1993.

Select Committees

Desert Research Institute's Sabbatical Leave Committee (2014-present).

Publication Committee, American Association for Aerosol Research (AAAR) (2014-present).

Nevada Space Grant Consortium (2014 – 2015).

External Review Committee Sandia National Laboratory SL12-SAM Solids, DOE's Defense Nuclear Nonproliferation Research and Development (2013).

Board of Directors, American Association for Aerosol Research (AAAR) (2012-2015).

Desert Research Institute's Promotion Committee (2011-2013).

Curriculum Committee, Atmospheric Sciences Program, University of Nevada, Reno (2012).

External Review Committee, Los Alamos National Laboratory (LANL) Laboratory Directed Research and Development (LDRD), Multi-Scale Science Framework for Climate Treaty Verification: Attributing and Tracking Greenhouse Gas Fluxes Using Co-Emitted Signatures (2011-2012).

External Review Committee, Los Alamos National Laboratory (LANL) Laboratory Capability Review of Sensors, Remote Sensing, and Sensor Systems (SRS³) (2011).

Science Team for NASA's GLORY Mission (2010 – 2014).

External Review Committee, Los Alamos National Laboratory (LANL) Laboratory Directed Research and Development (LDRD), Resolving the Aerosol-Climate-Water Puzzle (2005-2007).

Adjunct Science Team, Department of Energy's Atmospheric Science Program (2005-2010).

Chair, Bylaws Committee, Atmospheric Sciences Program, University of Nevada, Reno (2005-2008).

Chair, Desert Research Institute's Emeritus Committee (2008-2009).

Desert Research Institute's Emeritus Committee (2006-2009).

Desert Research Institute's Research Affairs Council (2003-2007).
Chair, Desert Research Institute, Division of Atmospheric Sciences' Promotion Committee (2003-2006).
Desert Research Institute, Division of Atmospheric Sciences' Promotion Committee (2001-present).
Desert Research Institute's Library Committee (2002-2008).
Desert Research Institute's Senior Research Council (2000-present).
Air & Waste Management Association's Technical Committee AB-2, Chemistry (1993-2002).
Desert Research Institute's Faculty Senate (1998-2001).
American Meteorological Society's Committee on Laser Atmospheric Studies (1995-1998).

Editor

2010 special issue of "Atmospheric Chemistry and Physics" entitled "Measurement and Modeling of Aerosol Emissions from Biomass Burning".

Manuscript Review

1. Aerosol and Air Quality Research
2. Aerosol Science and Technology
3. Analytical Chemistry
4. American Institute of Aeronautics and Astronautics (AIAA) Journal
5. Applied Optics
6. Atmosphere
7. Atmospheric Chemistry and Physics
8. Atmospheric Environment
9. Atmospheric Measurement Techniques
10. Bulletin of the American Meteorological Society
11. Computers and Electronics in Agriculture
12. Elementa: Science of the Anthropocene
13. Environmental Engineering Science
14. Environmental Monitoring and Assessment
15. Environmental Pollution
16. Environmental Research Letters
17. Environmental Science and Pollution Research
18. Environmental Science and Technology
19. Environmental Science and Technology Letters
20. European Journal of Remote Sensing
21. Geophysical Research Letters
22. Geoscientific Model Development
23. Geotechnical Testing Journal
24. Jordan Journal of Physics
25. Journal of Aerosol Science
26. Journal of Applied Meteorology
27. Journal of Atmospheric and Oceanic Technology
28. Journal of Colloid and Interface Science
29. Journal of Geophysical Research
30. Journal of Optics (IOP Publishing)
31. Journal of Physical Chemistry

32. Journal of Physics D: Applied Physics (IOP Publishing)
33. Journal of Quantitative Spectroscopy and Radiative Transfer
34. Journal of the Air & Waste Management Association
35. Measurement Science and Technology
36. Nature Geoscience
37. Nature Scientific Reports
38. Optics Express
39. Optics Letters
40. Particuology
41. Remote Sensing
42. Science of the Total Environment
43. Sensors and Actuators
44. Sensor Letters
45. Society of Automotive Engineers (SAE) Transactions
46. Tellus

Proposal Review

1. Army Research Office (ARO)
2. Austrian Science Fund (FWF)
3. Chilean National Commission for Scientific and Technological Research (CONICYT)
4. Czech Science Foundation (GAČR)
5. Department of Energy (DoE)
6. Department of Energy (DoE), SBIR
7. Department of Defense (DoD), EPSCoR Program
8. European Strategy Forum for Research Infrastructure (ESFRI), Strategic Working Group Environment (SWG ENV)
9. Global Center for Food Systems Innovation (GCFSI)
10. Los Alamos National Laboratory (LANL)
11. MacArthur Foundation, Fellows Program
12. Maryland Industrial Partnerships Program (MIPS)

National Aeronautics and Space Administration (NASA):

13. NASA Earth Science Fellowship Program
14. NASA EPSCoR Program
15. NASA Atmospheric Composition Modeling and Analysis Program (ACMAP) Review Panel
16. NASA Atmospheric Composition Campaign Data Analysis and Modeling (ACCDAM) Review Panel
17. NASA Laboratory Science ROSES Review Panel
18. NASA Space Grant Graduate Fellowships
19. NASA Space Grant RISE and HOP Scholarship Review Panel
20. NASA Space Grant Panel on Informal Education Programs
21. NASA Space Grant Panel on Research Infrastructure Building
22. National Oceanic and Atmospheric Administration (NOAA)
23. National Oceanic and Atmospheric Administration (NOAA), SBIR

National Science Foundation (NSF):

24. NSF Atmospheric Chemistry Program
25. NSF Major Research Instrumentation (MRI) Program

26. NSF Office of Polar Programs
27. NSF Physical and Dynamic Meteorology Program
28. NSF Postdoctoral Fellowships
29. NSF EPSCoR Program
30. Natural Environmental Research Council, UK
31. Polish National Science Center (Narodowe Centrum Nauki - NCN), Poland
32. Research Corporation
33. Sandia National Laboratories
34. Swedish Research Council
35. U.S. Civilian Research and Development Foundation

Membership

1. American Association for Aerosol Research
2. American Geophysical Union
3. Optical Society of America

RESEARCH GRANTS AND CONTRACTS (TOTAL FUNDING OF \$25,711,586)

Title (P71): Integrating Sphere-Based Nephelometer for UAS Application
Investigators: H. Moosmüller
Duration: February 22, 2016 – November 21, 2016
Sponsor: Department of Energy, SBIR through American Ecotech
Funding: \$ 28,101

Title (P70): Remote Sensing of Fire Workshop – Proposal Development
Investigators: H. Moosmüller and A. Watts
Duration: January 1, 2016 – March 31, 2016
Sponsor: Nevada System of Higher Education (NSHE), NASA EPSCoR
Funding: \$ 29,988

Title (P69): Detailed Analysis of Brown Carbon Constituents in Biomass Burning Emissions (Award Number AGS-1544425)
Investigators: V. Samburova, H. Moosmüller, and A. Khlystov
Duration: December 1, 2015 – November 30, 2018
Sponsor: National Science Foundation, Division of Atmospheric and Geospace Sciences
Funding: \$ 397,281

Title (P68): Toward a Nevada CubeSat: Exploring Aerosol Remote Sensing in the Twilight Zone with a Dawn-Dusk Orbiting Satellite
Investigators: H. Moosmüller and E. Wang
Duration: September 15, 2015 – September 14, 2016
Sponsor: Nevada NASA EPSCoR Research Infrastructure Development (RID)
Funding: \$ 99,956

Title (P67): NASA Space Grant Higher Education Graduate Student Fellowships
Investigator: H. Moosmüller
Duration: September 1, 2015 – May 5, 2016
Sponsor: Nevada System of Higher Education (NSHE), NASA Space Grant
Funding: \$ 24,780

Title (P66, R64): NASA Academy of Aerospace Satellite QA Workshop
Investigators: H. Moosmüller
Duration: July 1, 2015 – October 1, 2015
Sponsor: Nevada NASA EPSCoR
Funding: \$ 3,923

Title (P65, R63): Support for NASA AMES Meeting
Investigators: H. Moosmüller
Duration: July 1, 2015 – August 31, 2015
Sponsor: Nevada NASA EPSCoR
Funding: \$ 2,607

Title (P64): Measuring Absorption Spectra of Carbonaceous Combustion Aerosols to Enable their Identification and Quantification by Shortwave Remote Sensing (Grant Number NNX15AI48G)
Investigators: H. Moosmüller, A. Watts, and V. Samburova
Duration: April 14, 2015 – April 13, 2018
Sponsor: NASA ROSES A.18 Atmospheric Composition: Laboratory Research
Funding: \$ 500,000

Title (P63): Mineral Dust Deposition and Solar Cell Spectral Performance and Maintenance
Investigator: H. Moosmüller
Duration: March 15, 2015 – September 30, 2016
Sponsor: NSF EPSCoR through Nevada System of Higher Education
Funding: \$ 29,967

Title (P62): Building Capacity in Interdisciplinary Snow Sciences for a Changing World (Cooperative Agreement No. NNX14AN24A)
Investigators: D. Obrist, S. Tyler, G. Ferrell, E. Hausrath, A. E. Murray, H. Moosmüller, R. Schumer, I. McCubbin, and J. A. Raymond
Duration: November 1, 2014 – October 31, 2017
Sponsor: NASA EPSCoR through Nevada System of Higher Education
Funding: \$ 1,125,000

Title (P61, R57): Mentor for NSF Undergraduate Research Opportunity Program (UROP) – B. Siegel
Investigators: H. Moosmüller
Duration: May 1, 2014 – August 31, 2014
Sponsor: NSF EPSCoR through Nevada System of Higher Education
Funding: \$ 5,250

Title (P60, R60): Linking Fire Ecology and Particulate Microphysics to Explore Climatic Implications of Peat Fire Emissions
Investigators: A. Watts, R. K. Chakrabarty, and H. Moosmüller
Duration: September 5, 2013 – December 31, 2014
Sponsor: DRI DAS EDGES
Funding: \$ 36,831

Title (P59, R59): Aerosol Monitoring System for Department of Defense - Continuous Aerosol and Aerosol Optics Measurement in Theater (Award No. W81XWH-11-2-0220)

Investigators: J. P. Engelbrecht and H. Moosmüller

Duration: September 26, 2011 – September 25, 2014

Sponsor: Department of Defense

Funding: \$ 3,134,960

Title (P58, R55): Collaborative Research: Reno Atmospheric Mercury Intercomparison Experiment (AGS-1101924)

Investigators: D. Obrist and H. Moosmüller

Duration: May 1, 2011 – April 30, 2012

Sponsor: National Science Foundation, Division of Atmospheric and Geospace Sciences

Funding: \$ 50,023

Title (P57, R62): Characterization of Wavelength Dependent Mineral Dust and Biomass Burning Aerosol Single Scattering Albedo for GLORY Retrieval of Aerosol Parameters (Grant Number NNX11AB79G)

Investigators: H. Moosmüller, J. Engelbrecht, R. K. Chakrabarty, and W. P. Arnott

Duration: November 2, 2010 – December 31, 2014

Sponsor: NASA ROSES: GLORY SCIENCE TEAM

Funding: \$ 482,988

Title (P56, R61): MRI: Development of a Photoacoustic Aerosol Light Absorption and Albedo Spectrometer for the Characterization of Aerosol Radiative Transfer in the Solar Spectrum (AGS-1040046)

Investigators: H. Moosmüller, W. P. Arnott, and C. Mazzoleni

Duration: October 1, 2010 – September 30, 2014

Sponsor: National Science Foundation, Division of Atmospheric and Geospace Sciences, Major Research Instrumentation Program

Funding: \$ 928,322

Title (P55, R58): Building Research and Educational Capacity for Satellite Remote Sensing of Aerosols and their Radiative and Climate Change Impacts (Cooperative Agreement No. NNX10AR89A)

Investigators: H. Moosmüller, K. Ehlers, and W. P. Arnott

Duration: August 13, 2010 – August 12, 2014

Sponsor: NASA EPSCoR through Nevada System of Higher Education

Funding: \$ 1,125,000

Title (P54, R52): One Step Continuous Flame Synthesis of Aerogels

Investigators: R. K. Chakrabarty and H. Moosmüller

Duration: July 1, 2010 – June 30, 2011

Sponsor: DRI EVPR Research Enhancement Program

Funding: \$ 9,318

Title (P53, R56): MRI: Development of a Cavity Ring-Down Sensor for Real-Time Measurement of Atmospheric Mercury Concentrations and Fluxes (AGS-0923485)

Investigators: D. Obrist, H. Moosmüller, X. Fäin, and A. G. Hallar

Duration: September 1, 2009 – August 31, 2013

Sponsor: National Science Foundation, Division of Atmospheric Sciences
Major Research Instrumentation Program

Funding: \$ 933,776

Title (P52, R50): Infrastructure Building for Research and Education on the Role of Combustion Aerosols in Climate Change (SFFA 10-24)

Investigators: H. Moosmüller and R. K. Chakrabarty

Duration: August 1, 2009 – May 15, 2010

Sponsor: NASA EPSCoR through Nevada System of Higher Education

Funding: \$ 39,990

Title (P51, R54): Aerosol Characterization Equipment for Climate Change Monitoring Transects

Investigator: H. Moosmüller

Duration: July 1, 2009 – June 30, 2011

Sponsor: National Science Foundation EPSCoR Equipment Grant through Nevada System of Higher Education

Funding: \$ 184,000

Title (P50, R53): Aerosol Modification of Snow Albedo in Southern Nevada and its Influence on Snow Melt and Spring Runoff

Investigators: D. Dubois and H. Moosmüller

Duration: July 1, 2009 – June 30, 2011

Sponsor: National Science Foundation EPSCoR Seed Grant through Nevada System of Higher Education

Funding: \$ 47,446

Title (P49, R49): Nevada Infrastructure for Climate Change, Science Education, and Outreach – Graduate Research Fellowship: Mr. G. Tian

Investigator: H. Moosmüller

Duration: September 1, 2009 – August 31, 2010

Sponsor: National Science Foundation EPSCoR through Nevada System of Higher Education

Funding: \$ 36,665

Title (P48, R46): Nevada Infrastructure for Climate Change, Science Education, and Outreach – Task 3 (Graduate Research Assistantship: Mr. G. Tian)

Investigator: H. Moosmüller

Duration: January 1, 2009 – August 31, 2009

Sponsor: National Science Foundation EPSCoR through Nevada System of Higher Education

Funding: \$ 28,071

Title (P47, R43): Acquisition of Tekran Mercury Speciation Modules for Reactive Gaseous Mercury (Model 1130) and Particulate Mercury (Model 1135)

Investigators: H. Moosmüller and D. Obrist

Duration: February 1, 2008 – July 31, 2008

Sponsor: National Science Foundation EPSCoR through Nevada System of Higher Education

Funding: \$ 69,540

Title (P46, R42): Utilization and Testing of Cognitive Information Processing Techniques for the Optimized Real-Time Data Analysis and Instrument Control of a Cavity Ring-down Mercury Sensor (Student Fellowship)

Investigators: G. Tian, H. Moosmüller, and D. Koracin

Duration: August 1, 2007 – July 31, 2008

Sponsor: National Science Foundation EPSCoR through Nevada System of Higher Education

Funding: \$ 42,333

Title (P45, R36): Mexico SEM Analysis

Investigators: H. Moosmüller and W. P. Arnott

Duration: February 20, 2007 – August 31, 2007

Sponsor: Los Alamos National Laboratory – Department of Energy

Funding: \$ 8,000

Title (P44, R44): Development of an Optical Method for Sensing Mercury in Real Time with Below Background Sensitivity: Proof of Concept

Investigators: H. Moosmüller and W. P. Arnott

Duration: September 1, 2006 – November 30, 2008

Sponsor: National Science Foundation EPSCoR through Nevada System of Higher Education

Funding: \$ 74,951

Title (P43, R35): Algorithm Development and Implementation for Nevada EPSCoR Research

Investigator: H. Moosmüller

Duration: November 3, 2006 – May 31, 2007

Sponsor: National Science Foundation EPSCoR through Nevada System of Higher Education

Funding: \$ 7,968

Title (P42, R41): Characterization of Size, Structural and Fractal Properties of Atmospheric Particulate Matter Using Cognitive Information Processing (Student Fellowship)

Investigators: R. K. Chakrabarty, H. Moosmüller, and W. P. Arnott

Duration: July 1, 2006 – June 30, 2008

Sponsor: National Science Foundation EPSCoR through Nevada System of Higher Education

Funding: \$ 84,666

Title (P41, R34): Acquisition of a Tekran 2537A Mercury Vapor Analyzer
Investigators: D. Obrist and H. Moosmüller
Duration: May 1, 2006 – May 31, 2007
Sponsor: Desert Research Institute, Research Enhancement Program
Funding: \$ 35,000

Title (P40, R29): Remote Sensing of PM, CO, HC, and NO_x Vehicle Emissions
Investigators: H. Moosmüller and H. D. Kuhns
Duration: May 1, 2006 – April 30, 2007
Sponsor: California Air Resources Board, Research Division
Funding: \$ 69,273

Title (P39, R33): Atmospheric Mercury Emissions and Mercury Contamination due to Modern Gold Mining in Nevada
Investigators: D. Obrist and H. Moosmüller
Duration: April 1, 2006 – March 31, 2007
Sponsor: Desert Research Institute, Institute Project Assignment
Funding: \$ 12,142

Title (P38, R51): Saharan Dust Study – Mineralogy and Optical Properties
Investigators: J. Engelbrecht, H. Moosmüller, and J. A. Gillies
Duration: April 1, 2006 – March 31, 2011
Sponsor: Desert Research Institute, Research Enhancement Program
Funding: \$ 30,000

Title (P37, R32): Measuring the Asymmetry Parameter in Aerosol Scattering
Investigator: H. Moosmüller
Duration: July 1, 2005 – June 30, 2007
Sponsor: Desert Research Institute, Research Enhancement Program
Funding: \$ 30,000

Title (P36, R47): Characterizing Particulate Matter Emissions by Wildland Fires Relevant to Visibility Impairment and PM Non-Attainment (J8R07060005)
Investigators: H. Moosmüller and W. P. Arnott
Duration: November 1, 2005 – June 31, 2009
Sponsor: Joint Fire Science Program (JFSP) through US National Park Service (NPS)
Funding: \$ 329,793

Title (P35, R37): Laboratory Measurements of Aerosol Scattering and Extinction Properties
Investigator: H. Moosmüller
Duration: October 1, 2005 – September 30, 2008
Sponsor: National Institute for Global Environmental Change (NIGEC) of the Department of Energy (DOE) through Colorado State University
Funding: \$ 138,501

Title (P34, R30): Acquisition of an X-Ray Diffractometer (EAR-0521619)
Investigators: J. Engelbrecht, E. V. McDonald, H. Moosmüller, J. A. Gillies, and J. R. McConnell
Duration: September 15, 2005 – August 31, 2007
Sponsor: National Science Foundation, Division of Atmospheric Sciences
Major Research Instrumentation Program
Funding: \$ 269,163

Title (P33, R38): Developing Advanced Optical Methods for the Sensitive Detection of Mercury Concentrations in the Atmosphere and Mercury Fluxes into the Atmosphere
Investigator: H. Moosmüller
Duration: August 1, 2005 – June 30, 2008
Sponsor: National Science Foundation EPSCoR through Nevada System of Higher Education
Funding: \$ 286,222

Title (P32, R45): Aerosol Light Absorption and Climate: Quantification by the Photoacoustic Method (DE-FG02-05ER64008)
Investigators: W. P. Arnott, H. Moosmüller, and J. Xu
Duration: February 1, 2005 – January 31, 2009
Sponsor: Department of Energy, Atmospheric Sciences Program (DOE ASP)
Funding: \$ 428,270

Title (P31, No): Climate Change – Characterization of Black Carbon and Organic Carbon Air Pollution Emissions and Evaluation of Measurement Methods
Investigators: J. C. Chow, P. W. Barber, J. G. Watson, H. Moosmüller, W. P. Arnott, D. H. Lowenthal, M.-C. O. Chang, L. W. A. Chen, and K. K. Fung
Duration: January 1, 2005 – June 29, 2009
Sponsor: California Air Resources Board, Research Division
Funding: \$ 449,997

Title (P30, R48): Particulate Matter Emissions Factors for Dust from Unique Military Activities (CP-1399)
Investigators: J. A. Gillies, H. Moosmüller, V. Etyemezian, H. D. Kuhns, W. P. Arnott, and J. G. Watson
Duration: September 1, 2004 – January 31, 2010
Sponsor: Department of Defense, Strategic Environmental Research & Development Program (SERDP)
Funding: \$ 1,698,400

Title (P29, R40): Measurement, Modeling and Analysis Methods for Airborne Carbonaceous Fine Particulate Matter (PM_{2.5}) (R831086)
Investigators: J. C. Chow, J. G. Watson, H. Moosmüller, W. P. Arnott, P. W. Barber, and L.-W. Chen
Duration: October 1, 2003 – August 31, 2008
Sponsor: Environmental Protection Agency, Science to Achieve Results (STAR) Research Grants Program
Funding: \$ 449,456

Title (P28, R39): Measurements and Modeling of Diesel Exhaust Emissions from Engines Used by the U.S. Military (CP-1336)

Investigators: J. G. Watson, H. Moosmüller, H. D. Kuhns, and P. W. Barber

Duration: April 1, 2003 – August 31, 2007

Sponsor: Department of Defense, Strategic Environmental Research & Development Program (SERDP)

Funding: \$ 2,495,274

Title (P27, R27): Optical Properties of Particulate Matter Emitted by Fires (Pilot Study)

Investigators: H. Moosmüller and W. P. Arnott

Duration: March 31, 2003 – December 31, 2004

Sponsor: Department of Agriculture – Forest Service

Funding: \$ 58,708

Title (P26, R23): 2003 Aerosol IOP at DOE's ARM Site

Investigators: W. P. Arnott and H. Moosmüller

Duration: March 17, 2003 – December 31, 2003

Sponsor: Department of Energy, Pacific Northwest National Laboratory

Funding: \$ 126,489

Title (P25, R31): Development of an Instrument for Multi-Spectral Measurement of Atmospheric Light Absorption (ATM-0340423)

Investigators: W. P. Arnott and H. Moosmüller

Duration: August 15, 2002 – August 14, 2007

Sponsor: National Science Foundation, Division of Atmospheric Sciences, Major Research Instrumentation Program

Funding: \$ 835,490

Title (P24, R24): Use of Novel Infrared Light Emitting Diodes (LEDs) for the Remote Sensing of Automotive Emissions

Investigator: H. Moosmüller

Duration: July 1, 2002 - June 30, 2004

Sponsor: Desert Research Institute, Institute Project Assignment

Funding: \$ 11,500

Title (P23, R22): In Situ Aerosol Absorption Measurement Characterization Experiment

Investigators: W. P. Arnott and H. Moosmüller

Duration: May 2, 2002 – May 2, 2003

Sponsor: Department of Energy, Pacific Northwest National Laboratory

Funding: \$ 67,738

Title (P22, R28): Southern Nevada Air Quality Study: Phase III

Investigators: J. G. Watson, P. W. Barber, and H. Moosmüller

Duration: September 1, 2001 – September 30, 2005

Sponsor: Department of Transportation, Federal Transit Authority

Funding: \$ 777,000

Title (P21, R28): Southern Nevada Air Quality Study: Phase II
Investigators: J. G. Watson, P. W. Barber, H. Moosmüller, and R. E. Keislar,
Duration: May 1, 2001 - December 31, 2002
Sponsor: Department of Transportation, Federal Transit Authority
Funding: \$ 435,500

Title (P20, R20): Gasoline/Diesel PM Split Study: Chemical Analysis, Ambient Sampling, and Apportionment Phase (ACL-1-31046)
Investigators: E. M. Fujita, W. P. Arnott, H. Moosmüller, J. Sagebiel, J. Chow, and B. Zielinska
Duration: March 15, 2001 – September 30, 2002
Sponsor: Department of Energy, National Renewable Energy Laboratory
Funding: \$ 754,299

Title (P19, R26): Characterizing and Quantifying Local and Regional Particulate Matter Emissions from Department of Defense Installations (CP-1191)
Investigators: J. A. Gillies, N. Lancaster, H. D. Kuhns, H. Moosmüller, E. McDonald, D. Gillette, and W. Nickling
Duration: February 1, 2001 – January 31, 2004
Sponsor: Department of Defense, Strategic Environmental Research & Development Program (SERDP)
Funding: \$ 938,253

Title (P18, R18): Photoacoustic Instrument
Investigators: W. P. Arnott and H. Moosmüller
Duration: October 16, 2000 – December 31, 2000
Sponsor: Max Planck Institute for Chemistry, Germany
Funding: \$ 67,995

Title (P17, R19): CRC Project No. E-56: Instrumentation Field Demonstration
Investigators: R. E. Keislar, H. Moosmüller, and J. G. Watson
Duration: September 1, 2000 - March 31, 2001
Sponsor: Coordinating Research Council
Funding: \$ 32,604

Title (P16, R15): BRAVO: Special Aerosol Light Absorption and Extinction Measurements
Investigators: H. Moosmüller and W. P. Arnott
Duration: October 1, 1999 - September 30, 2000
Sponsor: CIASTA, National Park Service
Funding: \$ 77,800

Title (P15, R16): Aerosol Light Absorption Measurements
Investigators: W. P. Arnott and H. Moosmüller
Duration: July 15, 1999 - July 14, 2000
Sponsor: Department of Energy, Pacific Northwest National Laboratory
Funding: \$ 23,454

Title (P14, R17): Photoacoustics of Aerosols
Investigators: W. P. Arnott and H. Moosmüller
Duration: July 1, 1999 - June 30, 2000
Sponsor: Office of Naval Research through University of Mississippi, National Center for Physical Acoustics
Funding: \$ 27,343

Title (P13, R28): Southern Nevada Air Quality Study: Phase I
Investigators: J. G. Watson H. Moosmüller, R. E. Keislar, M. C. Green, and W. R. Stockwell
Duration: May 14, 1999 - December 31, 2002
Sponsor: Department of Transportation, Federal Transit Authority
Funding: \$ 999,742

Title (P12, NO): Characterization of Particulate Emissions: Size Fractionation and Chemical Characterization (CP-1106)
Investigators: E. Fujita, W. P. Arnott, H. Moosmüller, J. C. Sagebiel, B. Zielinska
Duration: May 1, 1998 – May 31, 2002
Sponsor: Department of Defense, Strategic Environmental Research & Development Program (SERDP) through University of Utah
Funding: \$ 565,118

Title (P11, R13): Simple Particulate Emission Measuring System
Investigators: H. Moosmüller and W. R. Pierson
Duration: September 30, 1998 - February 29, 2000
Sponsor: Department of Energy, Office of Transportation Technologies
Funding: \$ 269,002

Title (P10, R21): Development of Instrumentation to Measure Atmospheric Light Extinction and its Scattering and Absorption Components (ATM-9871192)
Investigators: H. Moosmüller and W. P. Arnott
Duration: August 28, 1998 - July 31, 2002
Sponsor: National Science Foundation, Division of Atmospheric Sciences, Major Research Instrumentation Program
Funding: \$ 804,645

Title (P9, R14): Atmospheric Aerosol Correction for Airborne Hyperspectral Measurements
Investigators: H. Moosmüller, D. Koracin, and M. Wetzel
Duration: May 26, 1998 - March 31, 2000
Sponsor: Department of Energy through Bechtel, Center for Excellence in Remote Sensing
Funding: \$ 178,862

Title (P8, R9): SCOS97 Quality Assurance Management
Investigators: E. Fujita, H. Moosmüller, M. Green, and J. Bowen
Duration: June 1, 1997 - December 31, 1997
Sponsor: Ventura County Air Pollution Control District
Funding: \$ 56,132

Title (P7, R12): CEDAR: An Operational CW Solid-State Laser System for Temperature and Wind Measurements in the Mesopause
Investigator: H. Moosmüller
Duration: January 1, 1997 - May 31, 1999
Sponsor: National Science Foundation, Division of Atmospheric Sciences, Upper Atmosphere Research Section
Funding: \$ 77,341

Title (P6, R10): An Interferometric Turbulence Sensor
Investigator: H. Moosmüller
Duration: January 1, 1996 - June 30, 1998
Sponsor: Desert Research Institute, Institute Project Assignment
Funding: \$ 11,783

Title (P5, R7): CEDAR: Approaching an Ultimate Lidar for Temperature and Wind Measurements in the Mesopause Region
Investigator: H. Moosmüller
Duration: July 1, 1994 - December 31, 1996
Sponsor: National Science Foundation, Division of Atmospheric Sciences, Upper Atmosphere Research Section
Funding: \$ 206,447

Title (P4, R2): Analysis of UV-DIAL Data Taken During the COAST Study
Investigator: H. Moosmüller
Duration: April 1, 1994 - December 31, 1994
Sponsor: Texas Natural Resource Conservation Commission
Funding: \$ 85,731

Title (P3, R3): A New Lidar Method Utilizing Elastic and Raman Scattering for the Measurement of Backscattering and Extinction Profiles
Investigator: H. Moosmüller
Duration: January 1, 1994 - June 30, 1994
Sponsor: Desert Research Institute, Institute Project Assignment
Funding: \$ 9,760

Title (P2, R6): Advanced Methods to Measure Light Absorption by Aerosol Particles
Investigators: W. P. Arnott, H. Moosmüller, and C. F. Rogers
Duration: November 1, 1993 - October 30, 1997
Sponsor: Environmental Protection Agency, Office of Exploratory Research
Funding: \$ 338,978

Title (P1, R1): Basic Research Cooperative in Remote Sensing (CR-816826)
Investigators: C. D. Elvidge, H. Moosmüller, and M. C. Green
Duration: August 1, 1990 - December 31, 1993
Sponsor: Environmental Protection Agency, Office of Research and Development
Funding: \$ 1,580,681

PUBLICATIONS (Google Scholar h-index = 39)

Peer Reviewed Publications

- 109) Samburova, V., J. Connolly, M. Gyawali, R. L. N. Yatavelli, A. C. Watts, R. K. Chakrabarty, Barbara Zielinska, H. Moosmüller, and A. Khlystov (2016). Polycyclic Aromatic Hydrocarbons in Biomass-Burning Emissions and Their Contribution to Light Absorption and Aerosol Toxicity. *Sci. Total Environ.*, submitted.
- 108) Engelbrecht, J. P., H. Moosmüller, S. Pincock, R. K. M. Jayanty, T. Lersch, and G. Casuccio (2016). Technical Note: Mineralogical, Chemical, Morphological, and Optical Interrelationships of Mineral Dust. *Atmos. Chem. Phys. Discuss.*, doi:10.5194/acp-2016-286, *Atmos. Chem. Phys.*, submitted.
- 107) Loría-Salazar, S. M., W. P. Arnott, H. Moosmüller, J. C. Bernard, and H. A. Holmes (2016). An Evaluation of Techniques for Evaluating Aerosol Pollution from MODIS Retrievals Using AERONET Sunphotometer Measurements Made in Semi-Arid Nevada and California, USA. *Atm. Env.*, submitted.
- 106) Chakrabarty, R. K., M. Gyawali, R. L. N. Yatavelli, A. Pandey, A. C. Watts, J. Knue, L.-W. A. Chen, R. R. Pattison, A. Tsibart, V. Samburova, and H. Moosmüller (2016). Brown Carbon Aerosols from Burning of Boreal Peatlands: Microphysical Properties, Emission Factors, and Implications for Direct Radiative Forcing. *Atmos. Chem. Phys.*, **16**, 3033-3040.
- 105) Cheng, Y., G. Engling, H. Moosmüller, W. P. Arnott, A. L. W. Chen, C. E. Wold, W. M. Hao, and K.-B. He (2016). Light Absorption by Biomass Burning Source Emissions. *Atm. Env.*, **127**, 347-354.
- 104) Tian, J., J. C. Chow, J. Cao, Y. Han, H. Ni, L.-W. A. Chen, X. Wang, R. Huang, H. Moosmüller, and J. G. Watson (2015). A Biomass Combustion Chamber: Design, Evaluation, and a Case Study of Wheat Straw Combustion Emission Tests. *Aerosol Air Qual. Res.*, **15**, 2104-2114.
- 103) Hassan, T., H. Moosmüller, and C. E. Chung (2015). Coefficients of an Analytical Aerosol Forcing Equation Determined with a Monte-Carlo Radiation Model. *J. Quant. Spectrosc. Radiat. Transfer*, **164**, 129-136.
- 102) Loría-Salazar, S. M., W. P. Arnott, and H. Moosmüller (2014). Accuracy of Near-Surface Aerosol Extinction Determined from Columnar Aerosol Optical Depth Measurements in Reno, NV, USA. *J. Geophys. Res.*, doi:10.1002/2014JD022138 (20 pages).
- 101) Chakrabarty, R. K., N. D. Beres, H. Moosmüller, S. China, C. Mazzoleni, M. K. Dubey, L. Liu, M. I. Mishchenko (2014). Soot Superaggregates from Flaming Wildfires and Their Direct Radiative Forcing. *Nature Sci. Rep.*, **4**, doi:10.1038/srep05508 (8 pages).
Chakrabarty, R. K., N. D. Beres, H. Moosmüller, S. China, C. Mazzoleni, M. K. Dubey, L. Liu, M. I. Mishchenko (2016). Corrigendum: Soot Superaggregates from Flaming Wildfires and Their Direct Radiative Forcing. *Nature Sci. Rep.*, **4**, doi:10.1038/srep05508 (1 page).
- 100) Chakrabarty, R. K., I. V. Novosselov, N. D. Beres, H. Moosmüller, C. M. Sorensen, and C. B. Stipe (2014). Trapping and Aerogelation of Nanoparticles in Negative Gravity Hydrocarbon Flames. *Appl. Phys. Lett.* **104**, 243103 (4 pages).

- 99) Arnold, I. J., H. Moosmüller, N. Sharma, and C. Mazzoleni (2014). Beam Characteristics of Fiber-Based Supercontinuum Light Sources with Mirror- and Lens-Based Beam Collimators. *Opt. Express*, **22**, 13860-13869.
- 98) Ehlers, K., R. K. Chakrabarty, and H. Moosmüller (2014). Blue Moons and Martian Sunsets. *Appl. Opt.*, **53**, 1808-1819.
- 97) Arnold, I. J., C. Berger, R. K. Chakrabarty, H. Moosmüller, N. Sharma, and C. Mazzoleni (2014). The Iron Lung: A Device for the Continuous Delivery of Fine Particulate Matter. *Rev. Sci. Instrum.*, **85**, 025105 (4 pages).
- 96) Lack, D., H. Moosmüller, G. R. McMeeking, R. K. Chakrabarty, and D. Baumgardner (2014, **invited**). Characterizing Elemental, Equivalent Black, and Refractory Black Carbon Aerosol Particles: A Review of Techniques, Their Limitations and Uncertainties. *Anal. Bioanal. Chem.*, **406**, 99-122.
- 95) Sharma, N., I. J. Arnold, H. Moosmüller, W. P. Arnott, and C. Mazzoleni (2013). Photoacoustic and Nephelometric Spectroscopy of Aerosol Optical Properties with a Supercontinuum Light Source. *Atmos. Meas. Tech.*, **6**, 3501-3513.
- 94) Tian, G., H. Moosmüller, and W. P. Arnott (2013). Influence of Photolysis on Multispectral Photoacoustic Measurement of Nitrogen Dioxide Concentration. *J. Air & Waste Manage. Assoc.*, **63**, 1091-1097.
- 93) Pierce, A., D. Obrist, H. Moosmüller, X. Fäin, and C. Moore (2013). Cavity Ring-Down Spectroscopy Sensor Development for High-Time Resolution Measurements of Gaseous Elemental Mercury in Ambient Air. *Atmos. Meas. Tech.*, **6**, 1477-1489.
- 92) Paredes-Miranda, G., W. P. Arnott, H. Moosmüller, M. C. Green, and M. Gyawali (2013). Black Carbon Aerosol Concentration in Five Cities and its Scaling with City Population. *Bull. Amer. Meteor. Soc.*, **94**, 41-50.
- 91) Moosmüller, H., J. P. Engelbrecht, M. Skiba, G. Frey, R. K. Chakrabarty, and W. P. Arnott (2012). Single Scattering Albedo of Fine Mineral Dust Aerosols Controlled by Iron Concentration. *J. Geophys. Res.*, **117**, doi:10.1029/2011JD016909 (10 pages).
- 90) Chakrabarty, R. K., M. A. Garro, E. M. Wilcox, and H. Moosmüller (2012). Strong Radiative Heating due to Wintertime Black Carbon Aerosols in the Brahmaputra River Valley. *Geophys. Res. Lett.*, **39**, doi:10.1029/2012GL051148 (5 pages).
- 89) Gyawali, M., W. P. Arnott, R. A. Zaveri, C. Song, H. Moosmüller, L. Liu, M. I. Mishchenko, L.-W. A. Chen, M. C. Green, J. G. Watson, and J. C. Chow (2012). Photoacoustic Optical Properties at UV, VIS, and Near IR Wavelengths for Laboratory Generated and Winter Time Ambient Urban Aerosols. *Atmos. Chem. Phys.*, **12**, 2587-2601.
- 88) Chakrabarty, R. K., H. Moosmüller, M. A. Garro, and C. B. Stipe (2012). Observation of Superaggregates from a Reversed Gravity Low-Sooting Flame. *Aerosol Sci. Tech.*, **46**, i-iii (published as *Aerosol Research Letter*).
- 87) Moosmüller, H. and R. K. Chakrabarty (2011). Technical Note: Simple Analytical Relationships between Ångström Coefficients of Aerosol Extinction, Scattering, Absorption, and Single Scattering Albedo. *Atmos. Chem. Phys.*, **11**, 10677-10680.

- 86) Watson, J. G., J. C. Chow, L.-W. A. Chen, D. H. Lowenthal, E. M. Fujita, H. D. Kuhns, D. A. Sodeman, D. E. Campbell, H. Moosmüller, D. Zhu, and N. Motallebi (2011). Particulate Emission Factors for Mobile Fossil Fuel and Biomass Combustion Sources. *Sci. Total Environ.*, **409**, 2384-2396.
- 85) Chakrabarty, R. K., M. A. Garro, B. A. Garro, S. Chancellor, H. Moosmüller, and C. M. Herald (2011). Simulation of Aggregates with Point-Contacting Monomers in the Cluster–Dilute Regime. Part 2: Comparison of Two- and Three-Dimensional Structural Properties as a Function of Fractal Dimension. *Aerosol Sci. Tech.*, **45**, 893-898.
- 84) Zhu, D., N. J. Nussbaum, H. D. Kuhns, M.-C. O. Chang, D. Sodeman, H. Moosmüller, and J. G. Watson (2011). Real-World PM, NO_x, CO, and Ultrafine Particle Emission Factors for Military Non-Road Heavy Duty Diesel Vehicles. *Atmos. Env.*, **45**, 2603-2609.
- 83) Moosmüller, H., R. K. Chakrabarty, K. M. Ehlers, and W. P. Arnott (2011). Absorption Ångström Coefficient, Brown Carbon, and Aerosols: Basic Concepts, Bulk Matter, and Spherical Particles. *Atmos. Chem. Phys.*, **11**, 1217-1225.
- 82) Chakrabarty, R. K., M. A. Garro, B. A. Garro, S. Chancellor, H. Moosmüller, and C. M. Herald (2011). Simulation of Aggregates with Point-Contacting Monomers in the Cluster–Dilute Regime. Part 1: Determining the Most Reliable Technique for Obtaining Three-Dimensional Fractal Dimension from Two-Dimensional Images. *Aerosol Sci. Tech.*, **45**, 75-80.
- 81) Mack, L. A., E. J. T. Levin, S. M. Kreidenweis, D. Obrist, H. Moosmüller, K. A. Lewis, W. P. Arnott, G. R. McMeeking, A. P. Sullivan, C. E. Wold, W. M. Hao, J. L. Collett, Jr., and W. C. Malm (2010). Optical Closure Experiments for Biomass Smoke Aerosols. *Atmos. Chem. Phys.*, **10**, 9017-9026.
- 80) Levin, E. J. T., G. R. McMeeking, C. M. Carrico, L. E. Mack, S. M. Kreidenweis, C. E. Wold, H. Moosmüller, W. P. Arnott, W. M. Hao, J. L. Collett, Jr., and W. C. Malm (2010). Biomass Burning Smoke Aerosol Properties Measured during FLAME. *J. Geophys. Res.*, **115**, doi:10.1029/2009JD013601 (15 pages).
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- 78) Lewis, J. M., D. W. Martin, R. M. Rabin, and H. Moosmüller (2010). Suomi: Pragmatic Visionary. *Bull. Amer. Meteor. Soc.*, **91**, 559-577.
- 77) Mazzoleni, C., H. D. Kuhns, and H. Moosmüller (2010, **invited**) Monitoring Automotive Particulate Matter Emissions with LiDAR: A Review. *Remote Sens.*, **2**, 1077-1119.
- 76) Faïn, X., H. Moosmüller, and D. Obrist (2010). Toward a Real-Time Measurement of Atmospheric Mercury Concentrations Using Cavity Ring-Down Spectroscopy. *Atmos. Chem. Phys.*, **10**, 2879-2892.
- 75) Chan, T. W., L. Huang, W. R. Leitch, S. Sharma, J. R. Brook, J. G. Slowik, J. P. D. Abbatt, P. C. Brickell, J. Liggio, S.-M. Li, and H. Moosmüller (2010). Observations of OM/OC and Specific Attenuation Coefficients (SAC) in Ambient Fine PM at a Rural Site in Central Ontario, Canada. *Atmos. Chem. Phys.*, **10**, 2393-2411.

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- 73) Nussbaum, N. J., D. Zhu, H. D. Kuhns, C. Mazzoleni, M.-C. O. Chang, H. Moosmüller, and J. G. Watson (2009). The In-Plume Emissions Test-Stand: An Instrument Platform for the Real-Time Characterization of Fuel-Based Combustion Emissions. *J. Air & Waste Manage. Assoc.*, **59**, 1437-1445.
- 72) Lewis, K. A., W. P. Arnott, H. Moosmüller, R. K. Chakrabarty, C. M. Carrico, S. M. Kreidenweis, D. E. Day, W. C. Malm, A. Laskin, J. L. Jimenez, I. M. Ulbrich, J. A. Huffman, T. B. Onasch, A. Trimborn, L. Lui, and M. I. Mishchenko (2009). Reduction in Biomass Burning Aerosol Light Absorption upon Humidification: Roles of Inorganically-Induced Hygroscopicity, Particle Collapse, and Photoacoustic Heat and Mass Transfer. *Atmos. Chem. Phys.*, **9**, 8949-8966.
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- Knue, A. Cunningham, J. Connolly, A. Khlystov, H. Moosmüller, and B. Zielinska (2014). Analysis of polycyclic aromatic hydrocarbons in gaseous- and particle- phase emissions from peat fuel combustion under controlled conditions. *108th Annual Conference of the Air & Waste Management Association (A&WMA)*, Raleigh, NC, June 22-25, 2015.
- 367) Engelbrecht, J. P., H. Moosmüller, S. L. Pincock, D. E. Campbell, R. K. M. Jayanty, and G. Casuccio. Optical Properties of Suspended Mineral Dusts from Desert Source Regions. *15th Electromagnetic and Light Scattering (ELS) Conference*, Leipzig, Germany, June 21-26, 2015.
- 366) Gyawali, M., R. L. N. Yatavelli, A. C. Watts, V. Samburova, R. K. Chakrabarty, J. D. Knue, L.-W. A. Chen, I. J. Arnold, X. Wang, A. Y. Khlystov, J. C. Chow, B. K. Zielinska, J. G. Watson, and H. Moosmüller. Optical Properties of Emissions from Laboratory Peat Combustion. *15th Electromagnetic and Light Scattering (ELS) Conference*, Leipzig, Germany, June 21-26, 2015.
- 365) Hassan, T., H. Moosmüller, and C. E. Chung (2015). Using Monte-Carlo Radiation Model to Determine the Coefficients of an Analytical Aerosol Forcing Equation. *15th Electromagnetic and Light Scattering (ELS) Conference*, Leipzig, Germany, June 21-26, 2015.
- 364) Moosmüller, H. (2015, **invited**). Aerosol Optics, Radiative Forcing, and Climate Change. *15th Electromagnetic and Light Scattering (ELS) Conference*, Leipzig, Germany, June 21-26, 2015.
- 363) Piedra, P. and H. Moosmüller, (2015). Discrete Dipole Approximation Estimating Solar Panel Degradation due to Dust Deposition. *Desert Research Institute Graduate Student Poster Competition*, Reno, NV, May 20, 2015.
- 362) Loria, S. M., H. Holmes, W. P. Arnott, H. Moosmüller, B. Echevarria, and A. Limming (2015, **third prize**). Spatial Investigation of Columnar AOD and Near-Surface PM_{2.5} Concentrations During the 2013 American and Yosemite Rim Fires. *Desert Research Institute Graduate Student Poster Competition*, Reno, NV, May 20, 2015.
- 361) Fenstermaker, L., D. Obrist, S. Tyler, E. M. Hausrath, G. Ferrell, I. McCubbin, H. Moosmüller, A. E. Murray, R. Schumer (2015, **invited**). Building Capacity in Interdisciplinary Snow Sciences for a Changing World. *Nevada NASA EPSCoR and Space Grant Consortium Annual Meeting*, Las Vegas, NV, April 30 - May 1, 2015.
- 360) Beres, N. D. and H. Moosmüller (2015). New Instrumentation for Snow Radiative Properties. *Nevada NASA EPSCoR and Space Grant Consortium Annual Meeting*, Las Vegas, NV, April 30 - May 1, 2015.
- 359) Bartlett, C. L., E. M. Hausrath, A. E. Murray, O. Tschauer, and H. Moosmüller (2015). Mineralogy of Mineral Dust and Biominerals in Snow and Implications for Potential Biosignatures. *Nevada NASA EPSCoR and Space Grant Consortium Annual Meeting*, Las Vegas, NV, April 30 - May 1, 2015.
- 358) Beres, N. D., J. Dozier, and H. Moosmüller (2015). Aerosol Characterization for Studying Changes in Snow Albedo. *Nevada NASA EPSCoR and Space Grant Consortium Annual Meeting*, Las Vegas, NV, April 30 - May 1, 2015.

- 357) Kreidberg, R. and H. Moosmüller (2015, **invited**). Planning, Poetry, and Pots of Gold: A Proposal Development Workshop. *Nevada NASA EPSCoR and Space Grant Consortium Annual Meeting*, Las Vegas, NV, April 30 - May 1, 2015.
- 356) Liddle, M. B., H. Moosmüller, and J. M. Lewis (2015). Persistent Wave Structures and Western Droughts. *83rd Western Snow Conference*, Grass Valley, CA, April 20-23, 2015.
- 355) Beres, N. D. and H. Moosmüller (2015). New Instrumentation for Snow Radiative Properties. *83rd Western Snow Conference*, Grass Valley, CA, April 20-23, 2015.
- 354) Moosmüller, H. (2015). Snow Albedo, Radiative Forcing, and Climate Change. *83rd Western Snow Conference*, Grass Valley, CA, April 20-23, 2015.
- 353) Beres, N. D., J. Dozier, and H. Moosmüller (2015). Aerosol Characterization for Studying Changes in Snow Albedo. *83rd Western Snow Conference*, Grass Valley, CA, April 20-23, 2015.
- 352) Hausrath, E. M., C. L. Bartlett, A. E. Murray, H. Moosmüller, and O. Tschauner (2015, **invited**). Dust on Snow — Implications for Nutrients and Albedo. *University of Nevada Reno (UNR) Snow Hydrology Seminar (GEOL 701Z)*, Reno, NV, March 25, 2015.
- 351) Moosmüller, H. (2015, **invited**). Snow Albedo, Radiative Forcing, and Climate Change. *University of Nevada Reno (UNR) Snow Hydrology Seminar (GEOL 701Z)*, Reno, NV, February 11, 2015.
- 350) Gyawali, M., R. K. Chakrabarty, R. L. N. Yatavelli, L.-W. A. Chen, J. Knue, V. Samburova, A. C. Watts, H. Moosmüller, W. P. Arnott, X. Wang, B. Zielinska, J. C. Chow, J. G. Watson, A. Tsibart (2014). Strong Wavelength Dependence of Aerosol Light Absorption from Peat Combustion. *2014 Fall Meeting of the American Geophysical Union*, San Francisco, CA, December 15-19, 2014.
- 349) Johnson, M. M., R. L. N. Yatavelli, L.-W. A. Chen, M. Gyawali, W. P. Arnott, X. Wang, R. K. Chakrabarty, H. Moosmüller, J. G. Watson, and J. C. Chow (2014). Multi-Wavelength Characterization of Brown and Black Carbon from Filter-Based Samples. *2014 Fall Meeting of the American Geophysical Union*, San Francisco, CA, December 15-19, 2014.
- 348) Knue, J., R. L. N. Yatavelli, L.-W. A. Chen, V. Samburova, M. Gyawali, A. C. Watts, R. K. Chakrabarty, H. Moosmüller, X. Wang, B. Zielinska, J. C. Chow, J. G. Watson, and A. Tsibart (2014). A Comparison of Mass-based Emission Factors from Laboratory Combustion of Boreal and Sub-Tropical Peat. *2014 Fall Meeting of the American Geophysical Union*, San Francisco, CA, December 15-19, 2014.
- 347) Engelbrecht, J. P., H. Moosmüller, S. L. Pincock, R. K. M. Jayanty, and Gary Casuccio (2014). Mineralogical, Chemical, and Optical Interrelationships of Airborne Mineral Dusts. *2014 Fall Meeting of the American Geophysical Union*, San Francisco, CA, December 15-19, 2014.
- 346) Loria, S. M., H. Holmes, W. P. Arnott, H. Moosmüller, B. Echevarria, and A. Limming (2014). Spatial Investigation of Columnar AOD and Near-Surface PM_{2.5} Concentrations During the 2013 American and Yosemite Rim Fires. *2014 Fall Meeting of the American Geophysical Union*, San Francisco, CA, December 15-19, 2014.
- 345) Lee, J. and H. Moosmüller (2014). Light Absorption Measurement Using Non-Filter Techniques: Interferometric & Photoacoustic Techniques. *International Workshop on Environment & Engineering (IWEE2014)*, Tsukuba City, Ibaraki, Japan, November 19-

- 20, 2014.
- 344) Chakrabarty, R. K., I. V. Novosselov, N. D. Beres, H. Moosmüller, C. B. Stipe, and C. M. Sorensen (2014). Gravity-Induced Trapping and Aerogelation of Nanoparticles in Flame Reactors. *33rd Annual Conference of the American Association for Aerosol Research*, Orlando, FL, October 20-24, 2014.
- 343) Yatavelli, R. L. N., R. K. Chakrabarty, M. Gyawali, J. Knue, G. Engling, H. Moosmüller, D. E. Rhode, L.-W. A. Chen, X. Wang, J. C. Chow, and J. G. Watson (2014). Emissions from Burning Incense and Dung: Two Unregulated Sources of Brown Carbon in Asia. *33rd Annual Conference of the American Association for Aerosol Research*, Orlando, FL, October 20-24, 2014.
- 342) Drinovec, L., G. Močnik, I. Arnold, R. K. Chakrabarty, A. D. A. Hansen, and H. Moosmüller (2014). Optical Properties of Primary Combustion Aerosols. *33rd Annual Conference of the American Association for Aerosol Research*, Orlando, FL, October 20-24, 2014.
- 341) Yatavelli, R. L. N., L.-W. A. Chen, J. Knue, V. Samburova, M. Gyawali, A. Watts, R. K. Chakrabarty, H. Moosmüller, X. Wang, B. Zielinska, J. C. Chow, and J. G. Watson (2014). Mass- and Energy-Based Emission Factors and Gas-Particle Partitioning of Intermediate-Volatility and Semi-Volatile Organic Compounds from Laboratory Combustion of Boreal and Sub-Tropical Peat. *33rd Annual Conference of the American Association for Aerosol Research*, Orlando, FL, October 20-24, 2014.
- 340) Watts, A. C., R. K. Chakrabarty, V. Samburova, and H. Moosmüller, (2014). Climatic Implications of Peat Fire Emissions. *33rd Annual Conference of the American Association for Aerosol Research*, Orlando, FL, October 20-24, 2014.
- 339) Engelbrecht, J. P., H. Moosmüller, S. L. Pincock, D. E. Campbell, R. K. Chakrabarty, R. K. M. Jayanty, and Gary Casuccio (2014). Optical Properties of Suspended Mineral Dusts from Desert Source Region. *33rd Annual Conference of the American Association for Aerosol Research*, Orlando, FL, October 20-24, 2014.
- 338) Chakrabarty, R. K., N. D. Beres, H. Moosmüller, S. China, C. Mazzoleni, M. K. Dubey, L. Liu, M. I. Mishchenko (2014). How Well Do Laboratory Studies Represent Microphysical Properties of Soot Emitted from Wildfires? *33rd Annual Conference of the American Association for Aerosol Research*, Orlando, FL, October 20-24, 2014.
- 337) Siegel, B., N. D. Beres, J. P. Engelbrecht, and H. Moosmüller (2014). Light Extinction Caused by Dust Deposition on Photovoltaic Cells. *Desert Research Institute, NSHE Bright Stars Undergraduate Presentations*, Reno, NV, September 10, 2014.
- 336) Moosmüller, H. (2014, **invited**). Black Carbon Definition and Measurement Approaches: Background and Overview. *International Council on Clean Transportation (ICCP) Technical Workshop on Marine Black Carbon Emissions: Identifying Research Gaps*. Ottawa, Canada, September 9-10, 2014.
- 335) Drinovec, L., G. Močnik, I. Arnold, R. Chakrabarty, and H. Moosmüller (2014). Optical Properties of Primary Combustion Aerosols. *2014 International Aerosol Conference (IAC2014)*. Busan, Korea, August 28 – September 2, 2014.
- 334) Siegel, B., N. D. Beres, J. P. Engelbrecht, and H. Moosmüller (2014). Light Extinction Caused by Dust Deposition on Photovoltaic Cells. *University of Nevada, Reno 2014 Undergraduate Research Summer Poster Session*, Reno, NV, August 13, 2014.

- 333) Chakrabarty, R. K., N. D. Beres, H. Moosmüller, S. China, C. Mazzoleni, M. K. Dubey, L. Liu, M. I. Mishchenko (2014). The Superaggregates Form of Soot from Wildfires and its Impact on Direct Radiative Forcing. *Goldschmidt2014*, Sacramento, CA, June 8-13, 2014.
- 332) Engelbrecht, J. P., H. Moosmüller, S. L. Pincock, R. K. M. Jayanty, and G. Casuccio (2014). Mineralogical, Chemical, and Optical Interrelationships of Re-Suspended Mineral Dusts from Global Source Regions. *DUST 2014, International Conference on Atmospheric Dust*, Castellaneta Marina, Taranto, Italy, June 1-6, 2014.
- 331) Lee, J. and H. Moosmüller (2014). Optical Homodyne Interferometry for Sensitive Detection of Refractive Index Change. *9th International Conference on Optics-Photonics Design & Fabrication (ODF '14)*, Itabashi, Tokyo, Japan, February 12-14, 2014.
- 330) Mazzoleni, C., S. China, N. Sharma, K. Gorkowski, M. K. Dubey, A. C. Aiken, R. A. Zaveri, N. Salvadori, R. K. Chakrabarty, H. Moosmüller, T. B. Onasch, S. Herndon, L. R. Williams, S. Liu, K. Dzepina, D. Helmig, J. Hueber, P. J. Fialho, L. R. Mazzoleni, S. Kumar, M. Dziobak, K. Wright (2013). Evolution of Soot Morphology and Mixing State in the Atmosphere. *2013 Fall Meeting of the American Geophysical Union*, San Francisco, CA, December 9-13, 2013.
- 329) Engelbrecht, J. P., H. Moosmüller, S. L. Pincock, R. K. M. Jayanty, and G. Casuccio (2013). Mineralogical, Chemical, and Optical Interrelationships of Mineral Dusts from Desert Source Regions. *2013 Fall Meeting of the American Geophysical Union*, San Francisco, CA, December 9-13, 2013.
- 328) Beres, N. D., R. K. Chakrabarty, H. Moosmüller, L. Liu, and M. I. Mishchenko (2013). Atmospheric Soot Superaggregates: Implications for Health and Radiative Forcing. *DRI's Division of Atmospheric Sciences Science Talks*, Desert Research Institute, Reno, NV, November 13, 2013.
- 327) Kleinman, L., A. J. Sedlacek, W. P. Arnott, P. Buseck, P. Davidovits, E. Lewis, W. Lin, H. Moosmüller, T. Onasch, J. Shilling, J. Wang, R. Yokelson, R. Zaveri (2013). Biomass Burn Observation Project (BBOP). *Annual Fall Working Group Meeting of the Department of Energy Atmospheric System Research Program*, Rockville, MD, November 4-8, 2013.
- 326) Arnold, I. J., H. Moosmüller, N. Sharma, and C. Mazzoleni (2013). Development of a Supercontinuum-Based Photoacoustic Spectrometer for Characterization of Atmospheric Aerosol Optics. *Optical Society of America (OSA) Meeting on Optical Instrumentation for Energy and Environmental Applications (E2)*, Tucson, AZ, November 3 – 6, 2013.
- 325) Beres, N. D., I. J. Arnold, R. K. Chakrabarty, H. Moosmüller, P. S. Praveen, V. Ramanathan, W. P. Arnott, J. Schauer, and Ö. Gustafsson (2012). Properties of Carbonaceous Aerosols during CARDEX 2012: An Instrument Intercomparison. *32nd Annual Conference of the American Association for Aerosol Research*, Portland, OR, September 30 - October 4, 2013.
- 324) Novosselov, I., C. Stipe, R. K. Chakrabarty, and H. Moosmüller (2013). Modeling of Nanoparticle Synthesis in Inverted Flames. *32nd Annual Conference of the American Association for Aerosol Research*, Portland, OR, September 30 - October 4, 2013.
- 323) China, S., C. Mazzoleni, M. Dubey, R. Chakrabarty, H. Moosmüller, P. Arnott, T. Onasch, and S. Herndon (2013). Morphology and Mixing State of Atmospheric Aerosol

- in Mexico City. *32nd Annual Conference of the American Association for Aerosol Research*, Portland, OR, September 30 - October 4, 2013.
- 322) Arnold, I. J., H. Moosmüller, N. Sharma, and C. Mazzoleni (2013). Beam Characteristics of Fiber-Based Supercontinuum Light Sources with Mirror- and Lens-Based Beam Collimators. *32nd Annual Conference of the American Association for Aerosol Research*, Portland, OR, September 30 - October 4, 2013.
- 321) Moosmüller, H. and J. P. Engelbrecht (2013). Complex Refractive Index of Hematite in the Visible and Near Visible: A Review. *32nd Annual Conference of the American Association for Aerosol Research*, Portland, OR, September 30 - October 4, 2013.
- 320) Sharma, N., I. Arnold, H. Moosmüller, W. P. Arnott, and C. Mazzoleni (2013). A Novel Multi-Wavelength Photoacoustic-Nephelometer Instrument Using a Supercontinuum Light Source for Absorption and Scattering Measurements of Atmospheric Aerosols. *32nd Annual Conference of the American Association for Aerosol Research*, Portland, OR, September 30 - October 4, 2013.
- 319) Arnold, I. J., C. Berger, H. Moosmüller, N. Sharma, and C. Mazzoleni (2013). The Iron Lung: A Device for the Continuous Delivery of Fine Particulate Matter. *32nd Annual Conference of the American Association for Aerosol Research*, Portland, OR, September 30 - October 4, 2013.
- 318) Moosmüller, H. and J. P. Engelbrecht (2013). Dust Direct Radiative Forcing and the Complex Refractive Index of Hematite. *Goldschmidt2013*, Florence, Italy, August 25-30, 2013.
- 317) Pierce, A., D. Obrist, C. W. Moore, and H. Moosmüller (2013). Atmospheric Mercury Concentration Measurements and Eddy Covariance Flux Measurements Using Cavity Ring-Down Spectroscopy. *11th International Conference on Mercury as a Global Pollutant*, Edinburgh, Scotland, July 28-August 2, 2013.
- 316) Venables, D. S., S. B. Darby, A. Pierce, C. W. Moore, H. Moosmüller, and D. Obrist (2013). The Role of BrO in the Oxidation of GEM: A Chamber Investigation at Close-to-Representative Concentrations. *11th International Conference on Mercury as a Global Pollutant*, Edinburgh, Scotland, July 28-August 2, 2013.
- 315) Darby, S. B., A. Pierce, C. W. Moore, H. Moosmüller, D. S. Venables, and D. Obrist (2013). An Atmospheric Simulation Chamber Study of the Temperature Dependence of Bromine-Initiated Mercury Oxidation. *11th International Conference on Mercury as a Global Pollutant*, Edinburgh, Scotland, July 28-August 2, 2013.
- 314) Loria, S. M., W. P. Arnott, H. Moosmüller, and D. Colucci (2013). Evaluation of Air Pollution Applications of AERONET and MODIS Aerosol Column Optical Depth by Comparison with In Situ Measurements of Aerosol Light Scattering and Absorption for Reno, NV, USA. *DRI Graduate Student Poster Competition*, Reno, NV, May 23, 2013.
- 313) Kleinman, L., A. J. Sedlacek, W. P. Arnott, P. Buseck, P. Davidovits, E. Lewis, J. Gaffney, W. Lin, H. Moosmüller, T. Onasch, J. Shilling, J. Wang, R. Yokelson, R. Zaveri (2013). Biomass Burn Observation Project (BBOP). *Annual Science Team Meeting of the Department of Energy Atmospheric System Research Program*, Potomac, MD, March 18-21, 2013.
- 312) Rainwater, B., W. P. Arnott, H. Moosmüller, and D. Karr (2012). Automated Solar Tracking Spectrophotometer for Remote Sensing of Column Aerosol Optical Depth.

- 2012 Fall Meeting of the American Geophysical Union*, San Francisco, CA, December 3-7, 2012.
- 311) Sumlin, B., W. P. Arnott, and H. Moosmüller (2012). Evaluating the Use of MODIS AOD for Air Quality Determination by Comparison with the Vertical Distribution of Aerosol Light Scattering Coefficient Obtained with a Balloon-Borne Nephelometer. *2012 Fall Meeting of the American Geophysical Union*, San Francisco, CA, December 3-7, 2012.
- 310) Loria, S. M., W. P. Arnott, H. Moosmüller, and D. Colucci (2012). Evaluation of Air Pollution Applications of AERONET and MODIS Aerosol Column Optical Depth by Comparison with In Situ Measurements of Aerosol Light Scattering and Absorption for Reno, NV, USA. *2012 Fall Meeting of the American Geophysical Union*, San Francisco, CA, December 3-7, 2012.
- 309) Sharma, N., I. J. Arnold, H. Moosmüller, W. P. Arnott, and C. Mazzoleni (2012). Broadband Measurement of Black Carbon Absorption and Scattering Using a Supercontinuum Integrated Photoacoustic and Nephelometer Instrument. *2012 Fall Meeting of the American Geophysical Union*, San Francisco, CA, December 3-7, 2012.
- 308) Moosmüller, H., A. Aiken, M. K. Dubey, G. Frey, B. Garro, and J. P. Engelbrecht (2012). Laboratory Measurement of the Optical Properties of Hematite and Desert Dust Aerosols to Assess Their Climate Forcing. *2012 Fall Meeting of the American Geophysical Union*, San Francisco, CA, December 3-7, 2012.
- 307) Chakrabarty, R. K., N. D. Beres, H. Moosmüller, F. Bender, V. Ramanathan (2012). Radiative Properties of Black Carbon Superaggregates in South East Asian Outflow. *2012 Fall Meeting of the American Geophysical Union*, San Francisco, CA, December 3-7, 2012.
- 306) Beres, N. D., I. J. Arnold, R. K. Chakrabarty, H. Moosmüller, P. S. Praveen, V. Ramanathan, W. P. Arnott, J. Schauer, and Ö. Gustafsson (2012). Absorption of Carbonaceous Aerosols during CARDEX 2012: An Instrument Intercomparison. *2012 Fall Meeting of the American Geophysical Union*, San Francisco, CA, December 3-7, 2012.
- 305) Moosmüller, H. (2012, **invited**). Beyond the Greenhouse Effect: How Aerosol and Snow Albedo Affects Climate Change. *Nevada NSF EPSCoR Climate Change Seminar*, Las Vegas, NV, October 31, 2012.
- 304) Moosmüller, H., A. Aiken, M. K. Dubey, G. Frey, B. Garro, and J. P. Engelbrecht (2012). Optical Properties of Hematite and Fine Desert Dust Aerosols. *31th Annual Conference of the American Association for Aerosol Research*, Minneapolis, MN, October 8-12, 2012.
- 303) Arnold, I., H. Moosmüller, N. Sharma, C. Mazzoleni, and W. P. Arnott (2012). Toward In-Situ Characterization of Aerosol Optics with a Supercontinuum Light Source Covering Most of the Solar Spectrum. *31th Annual Conference of the American Association for Aerosol Research*, Minneapolis, MN, October 8-12, 2012.
- 302) Beres, N. D., R. K. Chakrabarty, H. Moosmüller, F. Bender, V. Ramanathan (2012). Carbonaceous Superaggregates in South East Asian Outflow. *31th Annual Conference of the American Association for Aerosol Research*, Minneapolis, MN, October 8-12, 2012.
- 301) Chakrabarty, R. K., C. B. Stipe, and H. Moosmüller (2012). Flame Synthesis of Aerosol

- Gels. *31th Annual Conference of the American Association for Aerosol Research*, Minneapolis, MN, October 8-12, 2012.
- 300) Moosmüller, H. and R. K. Chakrabarty (2012, **invited**). Tutorial on Contemporary Aerosol Optics (4 hour tutorial). *Aerosol and Atmospheric Optics: Visibility and Air Pollution*, Air & Waste Management Association, Whitefish, MT, September 24-28, 2012.
- 299) Moosmüller, H. (2012, **invited**). Possibilities and Potential for Additional Optical Characterization of Particulate Matter. Panel Discussion: Promise and Problems of Advanced Particulate Monitoring and Analysis Methods for Routine Networks. *Aerosol and Atmospheric Optics: Visibility and Air Pollution*, Air & Waste Management Association, Whitefish, MT, September 24-28, 2012.
- 298) Chakrabarty, R. K., M. A. Garro, E. M. Wilcox, and H. Moosmüller (2012). The Brahmaputra River Valley: A Regional Hotspot of Black Carbon Emissions. *Aerosol and Atmospheric Optics: Visibility and Air Pollution*, Air & Waste Management Association, Whitefish, MT, September 24-28, 2012.
- 297) Moosmüller, H. and W. P. Arnott (2012). Photoacoustic Measurements for the IMPROVE Program. *Aerosol and Atmospheric Optics: Visibility and Air Pollution*, Air & Waste Management Association, Whitefish, MT, September 24-28, 2012.
- 296) Moosmüller, H., J. P. Engelbrecht, M. Skiba, G. Frey, R. K. Chakrabarty, and W. P. Arnott (2012). Single Scattering Albedo of Fine Mineral Dust Aerosols Controlled by Iron Concentration. *Aerosol and Atmospheric Optics: Visibility and Air Pollution*, Air & Waste Management Association, Whitefish, MT, September 24-28, 2012.
- 295) Arnold, I., H. Moosmüller, N. Sharma, C. Mazzoleni, and W. P. Arnott (2012). Development of a Supercontinuum Photoacoustic Aerosol Absorption and Albedo Spectrometer for the Characterization of Aerosol Optics. *Aerosol and Atmospheric Optics: Visibility and Air Pollution*, Air & Waste Management Association, Whitefish, MT, September 24-28, 2012.
- 294) Moosmüller, H., R. K. Chakrabarty, and W. P. Arnott (2012, **invited**). Review of Aerosol Light Absorption Measurement. *Aerosol and Atmospheric Optics: Visibility and Air Pollution*, Air & Waste Management Association, Whitefish, MT, September 24-28, 2012.
- 293) Colucci, D., W. P. Arnott, H. Moosmüller, and S. M. Loria (2012). Using HYSPLIT Back Trajectories to Help Understand Aerosol Optical Depth Measurements: A Case Study of Shifting Winds. *University of Nevada Reno, Annual Undergraduate Research Summer Poster Session*, Reno, NV, August 13, 2012.
- 292) Sumlin, B., W. P. Arnott, and H. Moosmüller (2012). Atmospheric Aerosol Characterization via Autonomous Airborne Instrumentation. *University of Nevada Reno, Annual Undergraduate Research Summer Poster Session*, Reno, NV, August 13, 2012.
- 291) Loria, S. M., W. P. Arnott, H. Moosmüller, and D. Colucci (2012). Worldwide Aerosol Optical Depth Assessed Using the Aerosol Robotic Network (AERONET) Measurements. *2012 Unidata Users Workshop: Navigating Earth System Science Data*, NCAR, Boulder, CO, July 9-13, 2012.
- 290) Pierce, A., D. Obrist, H. Moosmüller, and C. Moore (2012). Cavity Ring-Down Spectroscopy (CRDS) System for Measuring Atmospheric Mercury Using Differential

- Absorption. *DRI's Division of Atmospheric Sciences Science Talks*, Desert Research Institute, Reno, NV, May 16, 2012.
- 289) Pierce, A., D. Obrist, H. Moosmüller, and C. Moore (2012). Cavity Ring-Down Spectroscopy (CRDS) System for Measuring Atmospheric Mercury Using Differential Absorption. *2012 General Assembly of the European Geosciences Union (EGU)*, Vienna, Austria, April 22-27, 2012.
- 288) Chakrabarty, R. K., M. Gallaspy, and H. Moosmüller (2012, **invited**). Interpreting the Far-Field Scattering Pattern of a Homogeneous Sphere in Q -Space. *LIP 2012 – Laser Interactions with Particles*, Rouen, France, March 26-30, 2012.
- 287) Loria, S. M., W. P. Arnott, H. Moosmüller, B. Sumlin, and D. Karr (2011). Comparison of Atmospheric Column Optical Depth Measurements for Urban Reno, NV with Three Different Sun Photometers and In Situ Measurements Combined with Boundary Layer Height Estimation. *2011 Fall Meeting of the American Geophysical Union*, San Francisco, CA, December 5-9, 2011.
- 286) Sumlin, B., D. Karr, S. M. Loria, M. Gyawali, W. P. Arnott, and H. Moosmüller (2011). Boundary Layer Aerosol Characterization via Autonomous Airborne Instrumentation. *University of Nevada, Reno, College of Science Student Poster Competition*, Reno, NV, November 28, 2011.
- 285) Moosmüller, H., C. Mazzoleni, I. Arnold, R. K. Chakrabarty, and W. P. Arnott (2011). Development of a Supercontinuum Photoacoustic Aerosol Absorption and Albedo Spectrometer for the Characterization of Aerosol Optics. *Third Santa Fe Conference on Global and Regional Climate Change*, Santa Fe, NM, October 31 - November 3, 2011.
- 284) Moosmüller, H. (2011, **invited**). Aerosol Optics, Radiative Forcing, and Climate Change. *Third Santa Fe Conference on Global and Regional Climate Change*, Santa Fe, NM, October 31 - November 3, 2011.
- 283) Moosmüller, H., R. K. Chakrabarty, and W. P. Arnott (2011). Measurement of Mineral Dust Light Absorption. *First International Workshop on the Long-Range Transport and Impacts of African Dust on the Americas*, San Juan, Puerto Rico, October 6-7, 2011.
- 282) Moosmüller, H., J. Engelbrecht, W. P. Arnott, G. Frey, R. K. Chakrabarty, and M. Skiba (2011). Single Scattering Albedo of Fine Mineral Dust Aerosols Controlled by Iron Concentration. *First International Workshop on the Long-Range Transport and Impacts of African Dust on the Americas*, San Juan, Puerto Rico, October 6-7, 2011.
- 281) Garro, M. A., R. K. Chakrabarty, H. Moosmüller, S. Chancellor, and C. M. Herald (2011). Demonstration of *FracMAP*: A Graphical User-Interactive Package for Performing Simulation and Morphological and Optical Microanalysis of Fractal-Like Aerosol Agglomerates. *30th Annual Conference of the American Association for Aerosol Research*, Orlando, FL, October 3-7, 2011.
- 280) Chakrabarty, R. K., M. A. Garro, S. Chancellor, H. Moosmüller, C. M. Herald, and K. M. Ehlers (2011). Obtaining Three-Dimensional Fractal Properties of Aggregates from their Two-Dimensional Images: Determining the Most Reliable Techniques. *30th Annual Conference of the American Association for Aerosol Research*, Orlando, FL, October 3-7, 2011.
- 279) Gallaspy, M., R. K. Chakrabarty, and H. Moosmüller (2011). Mie Scattering in Q -Space: Interpreting the Patterns Using Debye Series Analysis. *30th Annual Conference of the*

- American Association for Aerosol Research*, Orlando, FL, October 3-7, 2011.
- 278) Loria, S. M., W. P. Arnott, H. Moosmüller, and J. L. Molzan (2011). Comparison of Atmospheric Column Optical Depth for Urban Reno NV Measured In Situ by Photoacoustic and Nephelometer Instruments, Ground Based Sun Photometers, and Retrievals Using the MODIS Instrument Data from the Terra and Aqua Satellites. *30th Annual Conference of the American Association for Aerosol Research*, Orlando, FL, October 3-7, 2011.
- 277) Moosmüller, H., R. K. Chakrabarty, and W. P. Arnott (2011). Aerosols Emitted from Open Biomass Burning: Optical and Structural Properties. *DRI's Division of Atmospheric Sciences Science Talks*, Desert Research Institute, Reno, NV, August 16, 2011.
- 276) Sumlin, B., D. Karr, W. P. Arnott, G. Tian, and H. Moosmüller (2011). Theory, Design, and Potential Commercial and Industrial Applications of Microcontroller-Based Photoacoustic Trace Gas and Aerosol Sensors. University of Nevada Reno, Annual Undergraduate Research Summer Poster Session, Reno, NV, August 11, 2011.
- 275) Karr, D., B. Sumlin, S. M. Loria, W. P. Arnott, and H. Moosmüller (2011). Measurement Accuracy and Potential Commercial Application of Handheld Sun Photometers. University of Nevada Reno, Annual Undergraduate Research Summer Poster Session, Reno, NV, August 11, 2011.
- 274) Moosmüller, H., J. Engelbrecht, R. K. Chakrabarty, and W. P. Arnott (2011, **invited**). Laboratory Aerosol Characterization and More. *NASA GLORY Mission Science Team Meeting*, NASA Goddard Institute for Space Studies (GISS), New York, NY, August 10-12, 2011.
- 273) Pierce, A., X. Fäin, D. Obrist, and H. Moosmüller (2011). Atmospheric Mercury Concentration Measurements Using Cavity Ring-Down Spectroscopy. *10th International Conference on Mercury as a Global Pollutant*, Halifax, Nova Scotia, Canada, July 24-29, 2011.
- 272) Chakrabarty, R. K., H. Moosmüller, L.-W. A. Chen, K. Lewis, W. P. Arnott, C. Mazzoleni, M. Dubey, C. E. Wold, W. M. Hao, and S. M. Kreidenweis (2011). Brown Carbon Emissions from Smoldering Biomass Combustion. *10th International Conference on Carbonaceous Particles in the Atmosphere*, Vienna, Austria, June 26-29, 2011.
- 271) Moosmüller, H., C. Mazzoleni, I. Arnold, R. K. Chakrabarty, and W. P. Arnott (2011). Supercontinuum Photoacoustic Aerosol Absorption and Albedo Spectrometer for Characterizing Carbonaceous Aerosol Optics. *10th International Conference on Carbonaceous Particles in the Atmosphere*, Vienna, Austria, June 26-29, 2011.
- 270) Moosmüller, H., R. K. Chakrabarty, K. M. Ehlers, and W. P. Arnott (2011). Absorption Ångström Coefficient, Brown Carbon, and Aerosols: Basic Concepts, Bulk Matter, and Spherical Particles. *10th International Conference on Carbonaceous Particles in the Atmosphere*, Vienna, Austria, June 26-29, 2011.
- 269) Chakrabarty, R. K., H. Moosmüller, L. Liu, M. I. Mishchenko, and W. P. Arnott (2011). Fractal Morphology of Carbonaceous Aerosols and Global Radiative Forcing. *10th International Conference on Carbonaceous Particles in the Atmosphere*, Vienna, Austria, June 26-29, 2011.
- 268) Chakrabarty, R. K., M. A. Garro, S. Chancellor, H. Moosmüller, C. M. Herald, and K. M.

- Ehlers (2011). Determining the Most Reliable Technique for Obtaining Three-Dimensional Fractal Dimension of Soot Aggregates from their Two-Dimensional Images. *10th International Conference on Carbonaceous Particles in the Atmosphere*, Vienna, Austria, June 26-29, 2011.
- 267) Chakrabarty, R. K., H. Moosmüller, and C. B. Stipe (2011). One-Step Continuous Flame Synthesis of Carbon Aerogels. *10th International Conference on Carbonaceous Particles in the Atmosphere*, Vienna, Austria, June 26-29, 2011.
- 266) Moosmüller, H. (2011, **invited**). Measurements Needs and Capabilities for Aerosol Optics. *Department of Physics and Joint Center for Earth Systems Technology, University of Maryland, Baltimore County (UMBC)*, Baltimore, MD, March 31, 2011.
- 265) Moosmüller, H. (2011, **invited**). Aerosol Optics, Radiative Forcing, and Visibility Impairment: Measurement Needs and Capabilities. *National Institute of Standards and Technology (NIST)*, Gaithersburg, MD, March 30, 2011.
- 264) Moosmüller, H. (2011, **invited**). Aerosol Optics, Satellite Remote Sensing, and Climate Change: Properties of Combustion and Mineral Dust Aerosols. *NASA Goddard Space Flight Center (GSFC) AeroCenter Seminar*, Greenbelt, MD, March 29, 2011.
- 263) Frey, G., K. M. Ehlers, R. K. Chakrabarty, and H. Moosmüller (2011). Morphology and Optical Properties of Combustion Aerosols: Experiment, Theory, and Mathematics. *2011 Mathematical Association of America, Northern California, Nevada, and Hawaii Section Meeting*, Santa Rosa, CA, February 26, 2011.
- 262) Moosmüller, H. (2011, **invited**). Aerosol Light Absorption and Climate Change: Properties of Combustion and Mineral Dust Aerosols. *Scripps Institution of Oceanography, University of California, San Diego*, La Jolla, CA, January 21, 2011.
- 261) Moosmüller, H. (2011, **invited**). Measurements of Aerosol Optical Properties for Radiative Forcing and Visibility Research. *Crocker Nuclear Laboratory, University of California, Davis*, Davis, CA, January 13, 2011.
- 260) Kreidenweis, S. M., J. L. Collett, Jr., H. Moosmüller, W. P. Arnott, W. M. Hao, W. C. Malm (2010). Overview of the Fire Lab at Missoula Experiments (FLAME). *2010 Fall Meeting of the American Geophysical Union*, San Francisco, CA, December 13-17, 2010.
- 259) Pierce, A., X. Faïn, H. Moosmüller, and D. Obrist (2010). Atmospheric Mercury Concentration Measurements Using Cavity Ring-Down Spectroscopy. *2010 Fall Meeting of the American Geophysical Union*, San Francisco, CA, December 13-17, 2010.
- 258) Paredes-Miranda, G., W. P. Arnott, and H. Moosmüller (2010). Characterization and Scaling of Black Carbon Aerosol Concentration with City Population Based on In-Situ Measurements and Analysis. *2010 Fall Meeting of the American Geophysical Union*, San Francisco, CA, December 13-17, 2010.
- 257) Chakrabarty, R. K., H. Moosmüller, M. A. Garro, B. A. Garro, S. Chancellor, and C. M. Herald (2010). Best Practices for Accurate Characterization of Morphological and Optical Properties of Fractal-Like Black Carbon Aggregates. *2010 Fall Meeting of the American Geophysical Union*, San Francisco, CA, December 13-17, 2010.
- 256) China, S., C. Mazzoleni, M. Dubey, R. K. Chakrabarty, H. Moosmüller, T. Onasch, S. Herndon (2010). Temporal and Spatial Variation of Morphological Descriptors for Atmospheric Aerosols Collected in Mexico City. *2010 Fall Meeting of the American Geophysical Union*, San Francisco, CA, December 13-17, 2010.

- 255) Salvadori, N., S. China, J. Cook, H. Moosmüller, H. D. Kuhns, C. Mazzoleni (2010). On-Road Measurement of Particulate Matter Emissions from Vehicles: Particle Concentration, Size Distribution, and Morphology. *2010 Fall Meeting of the American Geophysical Union*, San Francisco, CA, December 13-17, 2010.
- 254) Moosmüller, H., R. K. Chakrabarty, K. Lewis, M. Gyawali, C. Mazzoleni, M. Dubey, S. M. Kreidenweis, and W. P. Arnott (2010, **invited**). Optical and Structural Properties of Aerosols Emitted from Open Biomass Burning. *2010 Fall Meeting of the American Geophysical Union*, San Francisco, CA, December 13-17, 2010.
- 253) Chakrabarty, R. K., M. A. Garro, B. Garro, S. Chancellor, H. Moosmüller, and C. Herald (2010). Two-Dimensional Fractal Dimension Analysis of Agglomerates: Determining the Most Reliable Technique. *29th Annual Conference of the American Association for Aerosol Research*, Portland, OR, October 25-29, 2010.
- 252) Gyawali, M., W. P. Arnott, R. Zavari, C. Song, H. Moosmüller, L. Liu, M. I. Mishchenko (2010). First Photoacoustic Aerosol Optics Measurements at 355 nm; Comparison with Visible and Near IR for Laboratory Generated and Winter Time Urban Ambient Aerosols. *29th Annual Conference of the American Association for Aerosol Research*, Portland, OR, October 25-29, 2010.
- 251) Moosmüller, H. (2010, **invited**). Aerosols and Climate Change: Beyond the Whitehouse Effect. *Colloquium of the Physics Department, Michigan Technological University*, Houghton, MI, September 30, 2010.
- 250) Frey, G., R. K. Chakrabarty, K. M. Ehlers, and H. Moosmüller (2010, **Award for Best Poster Presentation**). Morphology of Carbonaceous Aerosols Emitted from the Combustion of Various Mid-Latitudinal Wildland Fuels. *Nevada Undergraduate Research Symposium 2010 (NURS-10) of the Nevada National Science Foundation's EPSCoR Climate Change Project*, Reno, NV, April 13-14, 2010.
- 249) Chakrabarty, R. K., H. Moosmüller, M. A. Garro, J. G. Slowik, E. S. Cross, J.-H. Han, and P. Davidovits (2010). Comparison of *In Situ* Measurements and Rayleigh-Debye-Gans Theory for Optical Properties of Flame Generated Monodisperse Soot Particles. *U.S. EPA Workshop on Addressing Black Carbon and Ozone as Short-Lived Climate Forcers*, Chapel Hill, NC, March 3-4, 2010.
- 248) Moosmüller, H., W. P. Arnott, L.-W. A. Chen, D. Obrist, R. K. Chakrabarty, C. E. Wold, W. M. Hao, and S. M. Kreidenweis (2010). Particle Emissions from Flaming and Smoldering Laboratory Combustion of Wildland Fuels. *U.S. EPA Workshop on Addressing Black Carbon and Ozone as Short-Lived Climate Forcers*, Chapel Hill, NC, March 3-4, 2010.
- 247) Lewis, K., W. P. Arnott, and H. Moosmüller (2010). Multiwavelength Photoacoustic Measurements of Light Absorption and Scattering by Biomass Smoke. *U.S. EPA Workshop on Addressing Black Carbon and Ozone as Short-Lived Climate Forcers*, Chapel Hill, NC, March 3-4, 2010.
- 246) Chakrabarty, R. K., H. Moosmüller, H., L.-W. A. Chen, C. Mazzoleni, P. Chylek, M. Dubey, W. P. Arnott, K. Lewis, and W. M. Hao (2010). Determination of Effective Refractive Indices of Aerosols Emitted from High-Moisture-Content Biomass Combustion Using Mie Theory. *U.S. EPA Workshop on Addressing Black Carbon and Ozone as Short-Lived Climate Forcers*, Chapel Hill, NC, March 3-4, 2010.

- 245) Tian, G., H. Moosmüller, and W. P. Arnott (2010). Calibration of Photoacoustic Aerosol Absorption Measurements with Oxygen A-Band Spectroscopy. *U.S. EPA Workshop on Addressing Black Carbon and Ozone as Short-Lived Climate Forcers*, Chapel Hill, NC, March 3-4, 2010.
- 244) Chakrabarty, R. K., M. A. Garro, H. Moosmüller, and C. Herald (2010). *FracMAP: A Graphical User-Interactive Package for Performing Simulation and Morphological Analysis of Fractal-Like Aerosol Agglomerates*. *U.S. EPA Workshop on Addressing Black Carbon and Ozone as Short-Lived Climate Forcers*, Chapel Hill, NC, March 3-4, 2010.
- 243) Moosmüller, H. (2010, **invited**). Emission of Light Absorbing Carbonaceous Particles from Biomass Burning. *U.S. EPA Workshop on Addressing Black Carbon and Ozone as Short-Lived Climate Forcers*, Chapel Hill, NC, March 3-4, 2010.
- 242) Moosmüller, H. and R. K. Chakrabarty (2010). Measurement of Physical Aerosol Properties: Motivation, Aerosol Types, and Instruments. *Scope of Work Meeting with USACHPPM for Federal Initiative on Mineral Dust Monitoring*, Desert Research Institute, Nevada System of Higher Education, Reno, NV, February 24-25, 2010.
- 241) Moosmüller, H., X. Fäin, and D. Obrist (2010). Sensitive and Time-Resolved Measurement of Gaseous Elemental Mercury Concentrations and Fluxes with Cavity Ring-Down Spectroscopy. *Science Talk, Division of Atmospheric Sciences, Desert Research Institute, Nevada System of Higher Education*, Reno, NV, February 9, 2010.
- 240) Tian, G., H. Moosmüller, and W. P. Arnott (2010). Aerosol Asymmetry Parameter g : Instrument Description and Initial Measurements. *Annual State of Nevada NSF EPSCoR Climate Change Conference*, Las Vegas, NV, February 2, 2010.
- 239) Moosmüller, H. and D. Dubois (2010, **invited**). Modification of Snow Albedo by Aerosol Deposition. *Annual State of Nevada NSF EPSCoR Climate Change Conference*, Las Vegas, NV, February 2, 2010.
- 238) Kreidenweis, S. M., P. J. DeMott, M. D. Petters, A. J. Prenni, C. M. Carrico, C. E. Wold, J. L. Collett, Jr., H. Moosmüller, W. C. Malm, and W. M. Hao (2010). Ice nucleation Behavior of Particles Generated in Open Burning of Biomass. *90th American Meteorological Society Annual Meeting*, Atlanta, GA, January 17-21, 2010.
- 237) Arnott, W. P., M. Gyawali, K. Lewis, and H. Moosmüller (2009). Wavelength Dependence of Aerosol Light Absorption in Urban and Biomass Burning Impacted Conditions: An Integrative Perspective. *2009 Fall Meeting of the American Geophysical Union*, San Francisco, CA, December 14-18, 2009.
- 236) Kreidenweis, S. M., G. R. McMeeking, W. P. Arnott, S. Baker, C. M. Carrico, J. C. Chow, J. L. Collett, Jr., W. M. Hao, A. S. Holden, T. W. Kirchstetter, E. J. T. Levin, K. A. Lewis, L. Mack, W. C. Malm, H. Moosmüller, A. P. Sullivan, and C. E. Wold (2009). The Fire Lab at Missoula Experiment (FLAME): Measurements of Trace Gases and Aerosols during the Open Combustion of Biomass in the Laboratory. *4th International Fire Ecology and Management Congress: Fire as a Global Process*, Savannah, GA, November 30 - December 4, 2009.
- 235) Lewis, J. M., D. W. Martin, R. M. Rabin, and H. Moosmüller (2009, **invited**). Verner Suomi: Pragmatic Visionary. *50th Anniversary Meteorological Satellite Experiment Symposium*, Madison, WI, November 2, 2009.

- 234) Malm, W. C., J. L. Collett, Jr., S. M. Kreidenweis, B. A. Schichtel, H. Moosmüller, W. M. Hao, and C. M. Carrico (2009, **invited**). Measurements Needed to Understand the Role of Biomass Burning within the Regulatory Framework of the Environmental Protection Agency and the Federal Land Managing Community. *28th Annual Conference of the American Association for Aerosol Research*, Minneapolis, MN, October 26-30, 2009.
- 233) Moosmüller, H., J. Engelbrecht, W. P. Arnott, J. A. Gillies, and M. Skiba (2009). Single Scattering Albedo of Fine Mineral Dust Aerosols Controlled by Iron Concentration. *28th Annual Conference of the American Association for Aerosol Research*, Minneapolis, MN, October 26-30, 2009.
- 232) Tian, G., H. Moosmüller, and W. P. Arnott (2009). Measuring the Aerosol Asymmetry Parameter g : Instrument Description and Initial Measurements. *28th Annual Conference of the American Association for Aerosol Research*, Minneapolis, MN, October 26-30, 2009.
- 231) Tian, G., H. Moosmüller, and W. P. Arnott (2009). Calibration of Photoacoustic Aerosol Absorption Measurements with Simultaneous Spectroscopy of the Oxygen A-Band. *28th Annual Conference of the American Association for Aerosol Research*, Minneapolis, MN, October 26-30, 2009.
- 230) Gyawali, M., W. P. Arnott, and H. Moosmüller (2009). Wavelength Dependence of Aerosol Light Absorption: Diurnal and Seasonal Variation in Reno, NV. *28th Annual Conference of the American Association for Aerosol Research*, Minneapolis, MN, October 26-30, 2009.
- 229) Chakrabarty, R. K., H. Moosmüller, W. P. Arnott, M. A. Garro, G. Tian, J. G. Slowik, E. S. Cross, J.-H. Han, P. Davidovits, T. B. Onasch, and D. R. Worsnop (2009). Low Fractal Dimension Carbonaceous Aggregates from a Premixed Flame. *28th Annual Conference of the American Association for Aerosol Research*, Minneapolis, MN, October 26-30, 2009.
- 228) Chakrabarty, R. K., H. Moosmüller, L.-W. A. Chen, W. P. Arnott, K. A. Lewis, C. Mazzoleni, M. Dubey, C. E. Wold, W. M. Hao, and S. M. Kreidenweis (2009). Brown Carbon in Smoldering Biomass Aerosols. *28th Annual Conference of the American Association for Aerosol Research*, Minneapolis, MN, October 26-30, 2009.
- 227) Chakrabarty, R. K., S. Chancellor, H. Moosmüller, C. M. Herald, and K. M. Ehlers (2009). Morphological Analysis of Fractal-Like Aerosol Agglomerates in Two and Three Dimensions. *28th Annual Conference of the American Association for Aerosol Research*, Minneapolis, MN, October 26-30, 2009.
- 226) Mack, L., T. Lee, J.-L. Jimenez, S. M. Kreidenweis, J. L. Collett, Jr., H. Moosmüller, C. E. Wold, J. R. Kimmel, T. B. Onasch, W. M. Hao, and W. C. Malm (2009). Elemental Analysis of Aerosol Mass Spectrometer Measurements of Laboratory Biomass Burning Aerosols. *28th Annual Conference of the American Association for Aerosol Research*, Minneapolis, MN, October 26-30, 2009.

- 225) Levin, E. J. T., L. Mack, C. M. Carrico, G. R. McMeeking, S. M. Kreidenweis, C. E. Wold, H. Moosmüller, W. P. Arnott, W. M. Hao, J. L. Collett, Jr., and W. C. Malm (2009). Optical Properties of Biomass Burning Smoke Aerosols. *28th Annual Conference of the American Association for Aerosol Research*, Minneapolis, MN, October 26-30, 2009.
- 224) Arnott, W. P. and H. Moosmüller (2009). Multispectral Photoacoustic Analysis of Atmospheric Aerosol. *15th International Conference on Photoacoustic and Photothermal Phenomena*, Leuven, Belgium, July 19-23, 2009.
- 223) Moosmüller, H., X. Faïn, and D. Obrist (2009). Cavity Ring-Down Spectroscopy for Measurement of Gaseous Elemental Mercury Concentrations and Fluxes. *9th International Conference on Mercury as a Global Pollutant*, Guiyang, China, June 7-12, 2009.
- 222) Gyawali, M., W. P. Arnott, I. Arnold, K. A. Lewis, G. Paredes-Miranda, H. Moosmüller, R. K. Chakrabarty, G. Kok, J. W. Walker, and D. Baumgardner (2009). Wavelength Dependence of Aerosol Light Absorption. *Annual Science Team Meeting of the Department of Energy Atmospheric Science Program (DOE ASP)*, Santa Fe, NM, February 25–27, 2009.
- 221) Moosmüller, H. (2009, **invited**). Measurement of Aerosol Optical Properties: Principles and Applications. *Seminar, National Space Science and Technology Center, University of Alabama in Huntsville*, Huntsville, AL, February 18, 2009.
- 220) Obrist, D., J. Fritsche, X. Fain, and H. Moosmüller (2008). Ecosystem Level Mercury Exchange. *National Science Foundation (NSF) Workshop on Reducing the Uncertainty in Measurements of Atmospheric Mercury*, Seattle, WA, October 23-25, 2008.
- 219) Mack, L., D. Obrist, H. Moosmüller, K. A. Lewis, W. P. Arnott, G. R. McMeeking, E. J. T. Levin, S. M. Kreidenweis, C. E. Wold, W. M. Hao, J. L. Collett, Jr., and W. C. Malm (2008). Optical Closure Experiments for Biomass Smokes Aerosols. *27th Annual Conference of the American Association for Aerosol Research*, Orlando, FL, October 20-24, 2008.
- 218) Paredes-Miranda, G., W. P. Arnott, and H. Moosmüller (2008). Photoacoustic and Aethalometer Measurements of Aerosol Light Absorption in the Presence of Secondary Organic Aerosol: Mexico City, Las Vegas and Reno, Nevada, and the DOE ARM Site In Oklahoma. *9th International Conference on Carbonaceous Particles in the Atmosphere (ICCPA)*, Berkeley, CA, August 12-14, 2008.
- 217) Chakrabarty, R. K., H. Moosmüller, H., L.-W. A. Chen, C. Mazzoleni, P. Chylek, M. Dubey, W. P. Arnott, K. Lewis, and W. M. Hao (2008). Morphology and Effective Refractive Indices of Aerosols Emitted from High-Moisture-Content Biomass Combustion. *9th International Conference on Carbonaceous Particles in the Atmosphere (ICCPA)*, Berkeley, CA, August 12-14, 2008.
- 216) Chakrabarty, R. K., M. A. Garro, H. Moosmüller, and C. Herald (2008). *FracMAP: A Graphical User-Interactive Package for Performing Simulation and Morphological Analysis of Fractal-Like Aerosol Agglomerates*. *9th International Conference on Carbonaceous Particles in the Atmosphere (ICCPA)*, Berkeley, CA, August 12-14, 2008.
- 215) Tian, G., H. Moosmüller, and W. P. Arnott (2008). Calibration of Photoacoustic Aerosol Absorption Measurements with Oxygen A-Band Spectroscopy. *9th International*

- Conference on Carbonaceous Particles in the Atmosphere (ICCPA)*, Berkeley, CA, August 12-14, 2008.
- 214) Lewis, K., W. P. Arnott, and H. Moosmüller (2008). Photoacoustic Evidence for Strong Spectral Variation of Biomass Smoke Light Absorption and Single Scattering Albedo. *9th International Conference on Carbonaceous Particles in the Atmosphere (ICCPA)*, Berkeley, CA, August 12-14, 2008.
- 213) McMeeking, G. R., A. P. Sullivan, P. J. DeMott, S. M. Kreidenweis, J. L. Collett, Jr., T. W. Kirchstetter, M. M. Lunden, H. Moosmüller, W. P. Arnott, K. Lewis, W. M. Hao, and W. C. Malm (2008). The Light Attenuation Spectral Dependence of Organic Carbon Emitted by Biomass Burning. *9th International Conference on Carbonaceous Particles in the Atmosphere (ICCPA)*, Berkeley, CA, August 12-14, 2008.
- 212) McMeeking, G. R., C. M. Carrico, M. D. Petters, M. Parsons, A. J. Prenni, A. P. Sullivan, P. J. DeMott, S. M. Kreidenweis, J. L. Collett, Jr., T. W. Kirchstetter, M. M. Lunden, H. Moosmüller, W. P. Arnott, K. Lewis, S. Baker, C. E. Wold, W. M. Hao, and W. C. Malm (2008). Characterization of Emissions from the Laboratory Combustion of Wildland Plant Species. *9th International Conference on Carbonaceous Particles in the Atmosphere (ICCPA)*, Berkeley, CA, August 12-14, 2008.
- 211) Moosmüller, H. (2008). Mercury and Chemical Imaging Sensor Research at the Desert Research Institute. *Advisory Board Meeting of NSF EPSCoR RING-TRUE III Sensor Technology*, Reno, NV, July 30, 2008.
- 210) Moosmüller, H. (2008, **invited**). Light Absorption. *Conference on “Light Scattering: Mie and More – Commemorating 100 Years Mie’s 1908 Publications”*, *Gesellschaft für Aerosol Forschung (GAeF) Annual Meeting*, Karlsruhe, Germany, July 3-4, 2008.
- 209) Chakrabarty, R. K., H. Moosmüller, H., L.-W. A. Chen, C. Mazzoleni, P. Chylek, M. Dubey, W. P. Arnott, K. Lewis, and W. M. Hao (2008). Determination of Effective Refractive Indices of Aerosols Emitted from High-Moisture-Content Biomass Combustion Using Mie Theory. *Conference on “Light Scattering: Mie and More – Commemorating 100 Years Mie’s 1908 Publications”*, *Gesellschaft für Aerosol Forschung (GAeF) Annual Meeting*, Karlsruhe, Germany, July 3-4, 2008.
- 208) Lewis, K., W. P. Arnott, and H. Moosmüller (2008). Multiwavelength Photoacoustic Measurements of Light Absorption and Scattering by Biomass Smoke. *Conference on “Light Scattering: Mie and More – Commemorating 100 Years Mie’s 1908 Publications”*, *Gesellschaft für Aerosol Forschung (GAeF) Annual Meeting*, Karlsruhe, Germany, July 3-4, 2008.
- 207) Moosmüller, H., W. P. Arnott, L.-W. A. Chen, R. K. Chakrabarty, D. Obrist, K. Lewis, C. Mazzoleni, C. E. Wold, E. N. Lincoln, and W. M. Hao (2008). Aerosol Optical Properties During Flaming and Smoldering Phases of Laboratory Combustion of Wildland Fuels. *Conference on “Light Scattering: Mie and More – Commemorating 100 Years Mie’s 1908 Publications”*, *Gesellschaft für Aerosol Forschung (GAeF) Annual Meeting*, Karlsruhe, Germany, July 3-4, 2008.
- 206) Tian, G., H. Moosmüller, and W. P. Arnott (2008). Simultaneous Photoacoustic Measurements of Aerosol and Oxygen A-Band Light Absorption. *Conference on “Light Scattering: Mie and More – Commemorating 100 Years Mie’s 1908 Publications”*,

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- 205) Moosmüller, H., L.-W. A. Chen, W. P. Arnott, G. R. McMeeking, and S M. Kreidenweis (2008). Repeatability of PM Emissions during Laboratory Combustion of Wildland Fuels. *Aerosol and Atmospheric Optics: Visual Air Quality and Radiation Balance Conference*, Air & Waste Management Association, Moab, UT, April 28 - May 2, 2008.
- 204) Moosmüller, H., L. Mack, D. Obrist, W. P. Arnott, and S M. Kreidenweis (2008). Cavity Ring Down Measurements of Extinction from Smoke Generated through Laboratory Combustion of Wildland Fuels. *Aerosol and Atmospheric Optics: Visual Air Quality and Radiation Balance Conference*, Air & Waste Management Association, Moab, UT, April 28 - May 2, 2008.
- 203) Moosmüller, H. and D. DuBois (2008, **invited**). Aerosol Optical Properties and Visibility Impairment in the Southwestern US. *DRI's Environmental Seminar Series*, Desert Research Institute, Reno, NV, April 25, 2008.
- 202) Moosmüller, H. (2008, **invited**). Optical Properties of Aerosols. *Seminar, Department of Chemistry, University of Nevada, Reno*, Reno, NV, April 18, 2008.
- 201) Moosmüller, H., W. P. Arnott, L.-W. A. Chen, D. Obrist, R. K. Chakrabarty, C. E. Wold, W. M. Hao, and S. M. Kreidenweis (2008). Particle Emissions from Flaming and Smoldering Laboratory Combustion of Wildland Fuels. *NASA Fire Science Workshop*, Adelphi, MD, February 20-22, 2008.
- 200) Chakrabarty, R. K., H. Moosmüller, M. A. Garro, W. P. Arnott, J. G. Slowik, E. S. Cross, J.-H. Han, P. Davidovits, T. B. Onasch, and D. R. Worsnop (2007). Experimental Validation of Light Scattering and Absorption Theories of Fractal-Like Carbonaceous Aerosol Agglomerates. *2007 Fall Meeting of the American Geophysical Union*, San Francisco, CA, December 10-14, 2007.
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