

Nicholas L. Wagner, Ph.D. – CIRES Research Scientist II

NOAA Earth System Research Laboratory
MS R/CSD2
325 Broadway
Boulder, CO 80305

Office: (303) 497-3924
Fax: (303) 497-5373
nick.wagner@noaa.gov

Experience: 10 years of experience as an atmospheric research scientist at NOAA Earth System Research Laboratory, Chemical Sciences Division focusing on instrument development, airborne field measurements, and interpretation of measurements.

May. 2013 – Present: Research Scientist II at NOAA ESRL, Responsible for the scientific planning and collection of measurements of aerosol optical properties of smoke from realistic fires during the FIREX firelab experiment at Missoula Fire Sciences Laboratory. Measurement and analysis of aerosol optical properties during DC3, SENEX, and SEAC⁴RS aircraft field campaigns. Designed and constructed a novel compact instrument (SOAP) measuring bulk aerosol optical properties from aircraft, which was deployed during the ATOM4 aircraft field campaign.

Aug. 2009 – May. 2013: Research Scientist I at NOAA ESRL, Responsible for the design, construction, and operation of ship-based and aircraft-based instruments and analysis of measurements of nocturnal nitrogen oxides during CalNEX. Performed unique measurements and analysis of nocturnal nitrogen oxides from a moveable platform on a tall tower (NACHTT).

Aug. 2008 – Aug. 2009: National Research Council Post-doctoral Fellow at NOAA ESRL, Responsible for measurements of nitrogen oxides during the ACCRONIM field campaign, which demonstrated the importance of nitryl chloride far from marine sources of chloride.

Education:

Ph.D., 2008, University of Colorado at Boulder, Physics
M.S., 2005, University of Colorado at Boulder, Physics
B.S., 2001, Case Western Reserve University, Physics

Publications:

- Kupc, A, C Williamson, NL Wagner, M Richardson and CA Brock (2018), Modification, calibration, and performance of the Ultra-High Sensitivity Aerosol Spectrometer for particle size distribution and volatility measurements during the Atmospheric Tomography Mission (ATom) airborne campaign. *Atmos. Meas. Tech.*, 11 (1) 369-383, doi: 10.5194/amt-11-369-2018
- Manfred, KM, RA Washenfelder, NL Wagner, G Adler, F Erdesz, CC Womack, KD Lamb, JP Schwarz, A Franchin, V Selimovic, RJ Yokelson and DM Murphy (2018), Investigating biomass burning aerosol morphology using a laser imaging nephelometer. *Atmos. Chem. Phys.*, 18 (3) 1879-1894, doi: 10.5194/acp-18-1879-2018
- Mason, B, NL Wagner, G Adler, E Andrews, CA Brock, TD Gordon, DA Lack, AE Perring, MS Richardson, JP Schwarz, MA Shook, KL Thornhill, LD Ziemba and DM Murphy (2018), An intercomparison of aerosol absorption measurements conducted during the SEAC(4)RS campaign. *Aerosol Sci. Technol.*, 52 (9) 1012-1027, doi: 10.1080/02786826.2018.1500012
- Brown, SS, H An, M Lee, JH Park, SD Lee, DL Fibiger, EE McDuffie, WP Dube, NL Wagner and KE Min (2017), Cavity enhanced spectroscopy for measurement of nitrogen oxides in the Anthropocene: results from the Seoul tower during MAPS 2015. *Faraday Discuss.*, 200 529-557, doi: 10.1039/c7fd00001d
- Palm, BB, P Campuzano-Jost, DA Day, AM Ortega, JL Fry, SS Brown, KJ Zarzana, W Dube, NL Wagner, DC Draper, L Kaser, W Jud, T Karl, A Hansel, C Gutierrez-Montes and JL Jimenez (2017), Secondary organic aerosol

- formation from in situ OH, O₃, and NO₃ oxidation of ambient forest air in an oxidation flow reactor. *Atmos. Chem. Phys.*, 17 (8) 5331-5354, doi: 10.5194/acp-17-5331-2017
- Pokhrel, RP, ER Beamesderfer, NL Wagner, JM Langridge, DA Lack, T Jayarathne, EA Stone, CE Stockwell, RJ Yokelson and SM Murphy (2017), Relative importance of black carbon, brown carbon, and absorption enhancement from clear coatings in biomass burning emissions. *Atmos. Chem. Phys.*, 17 (8) 5063-5078, doi: 10.5194/acp-17-5063-2017
- Zarzana, KJ, KE Min, RA Washenfelder, J Kaiser, M Krawiec-Thayer, J Peischl, JA Neuman, JB Nowak, NL Wagner, WP Dube, JM St Clair, GM Wolfe, TF Hanisco, FN Keutsch, TB Ryerson and SS Brown (2017), Emissions of Glyoxal and Other Carbonyl Compounds from Agricultural Biomass Burning Plumes Sampled by Aircraft. *Environ. Sci. Technol.*, 51 (20) 11761-11770, doi: 10.1021/acs.est.7b03517
- Brock, CA, NL Wagner, BE Anderson, A Beyersdorf, P Campuzano-Jost, DA Day, GS Diskin, TD Gordon, JL Jimenez, DA Lack, J Liao, MZ Markovic, AM Middlebrook, AE Perring, MS Richardson, JP Schwarz, A Welti, LD Ziemba and DM Murphy (2016), Aerosol optical properties in the southeastern United States in summer - Part 2: Sensitivity of aerosol optical depth to relative humidity and aerosol parameters. *Atmos. Chem. Phys.*, 16 (8) 5009-5019, doi: 10.5194/acp-16-5009-2016
- Brock, CA, NL Wagner, BE Anderson, AR Attwood, A Beyersdorf, P Campuzano-Jost, AG Carlton, DA Day, GS Diskin, TD Gordon, JL Jimenez, DA Lack, J Liao, MZ Markovic, AM Middlebrook, NL Ng, AE Perring, MS Richardson, JP Schwarz, RA Washenfelder, A Welti, L Xu, LD Ziemba and DM Murphy (2016), Aerosol optical properties in the southeastern United States in summer - Part 1: Hygroscopic growth. *Atmos. Chem. Phys.*, 16 (8) 4987-5007, doi: 10.5194/acp-16-4987-2016
- Chang, WL, SS Brown, J Stutz, AM Middlebrook, R Bahreini, NL Wagner, WP Dube, IB Pollack, TB Ryerson and N Riemer (2016), Evaluating N₂O₅ heterogeneous hydrolysis parameterizations for CalNex 2010. *J. Geophys. Res.-Atmos.*, 121 (9) 5051-5070, doi: 10.1002/2015JD024737
- Kim, SW, BC McDonald, S Baidar, SS Brown, B Dube, RA Ferrare, GJ Frost, RA Harley, JS Holloway, HJ Lee, SA McKeen, JA Neuman, JB Nowak, H Oetjen, I Ortega, IB Pollack, JM Roberts, TB Ryerson, AJ Scarino, CJ Senff, R Thalman, M Trainer, R Volkamer, N Wagner, RA Washenfelder, E Waxman and CJ Young (2016), Modeling the weekly cycle of NO_x and CO emissions and their impacts on O₃ in the Los Angeles-South Coast Air Basin during the CalNex 2010 field campaign. *J. Geophys. Res.-Atmos.*, 121 (3) 1340-1360, doi: 10.1002/2015JD024292
- Pokhrel, RP, NL Wagner, JM Langridge, DA Lack, T Jayarathne, EA Stone, CE Stockwell, RJ Yokelson and SM Murphy (2016), Parameterization of single-scattering albedo (SSA) and absorption Angstrom exponent (AAE) with EC / OC for aerosol emissions from biomass burning. *Atmos. Chem. Phys.*, 16 (15) 9549-9561, doi: 10.5194/acp-16-9549-2016
- Warneke, C, M Trainer, JA de Gouw, DD Parrish, DW Fahey, AR Ravishankara, AM Middlebrook, CA Brock, JM Roberts, SS Brown, JA Neuman, BM Lerner, D Lack, D Law, G Hubler, I Pollack, S Sjostedt, TB Ryerson, JB Gilman, J Liao, J Holloway, J Peischl, JB Nowak, KC Aikin, KE Min, RA Washenfelder, MG Graus, M Richardson, MZ Markovic, NL Wagner, A Welti, PR Veres, P Edwards, JP Schwarz, T Gordon, WP Dube, SA McKeen, J Brioude, R Ahmadov, A Bougiatioti, JJ Lin, A Nenes, GM Wolfe, TF Hanisco, BH Lee, FD Lopez-Hilfiker, JA Thornton, FN Keutsch, J Kaiser, JQ Mao and CD Hatch (2016), Instrumentation and measurement strategy for the NOAA SENEX aircraft campaign as part of the Southeast Atmosphere Study 2013. *Atmos. Meas. Tech.*, 9 (7) 3063-3093, doi: 10.5194/amt-9-3063-2016
- Yu, PF, OB Toon, CG Bardeen, A Bucholtz, KH Rosenlof, PE Saide, A Da Silva, LD Ziemba, KL Thornhill, JL Jimenez, P Campuzano-Jost, JP Schwarz, AE Perring, KD Froyd, NL Wagner, MJ Mills and JS Reid (2016), Surface dimming by the 2013 Rim Fire simulated by a sectional aerosol model. *J. Geophys. Res.-Atmos.*, 121 (12) 7079-7087, doi: 10.1002/2015JD024702,

- Gordon, TD, NL Wagner, MS Richardson, DC Law, D Wolfe, EW Eloranta, CA Brock, F Erdesz and DM Murphy (2015), Design of a Novel Open-Path Aerosol Extinction Cavity Ringdown Spectrometer. *Aerosol Sci. Technol.*, 49 (9) 716-725, doi: 10.1080/02786826.2015.1066753
- Kim, PS, DJ Jacob, JA Fisher, K Travis, K Yu, L Zhu, RM Yantosca, MP Sulprizio, JL Jimenez, P Campuzano-Jost, KD Froyd, J Liao, JW Hair, MA Fenn, CF Butler, NL Wagner, TD Gordon, A Welti, PO Wennberg, JD Crouse, JM St Clair, AP Teng, DB Millet, JP Schwarz, MZ Markovic and AE Perring (2015), Sources, seasonality, and trends of southeast US aerosol: an integrated analysis of surface, aircraft, and satellite observations with the GEOS-Chem chemical transport model. *Atmos. Chem. Phys.*, 15 (18) 10411-10433, doi: 10.5194/acp-15-10411-2015
- Wagner, NL, CA Brock, WM Angevine, A Beyersdorf, P Campuzano-Jost, D Day, JA de Gouw, GS Diskin, TD Gordon, MG Graus, JS Holloway, G Huey, JL Jimenez, DA Lack, J Liao, X Liu, MZ Markovic, AM Middlebrook, T Mikoviny, J Peischl, AE Perring, MS Richardson, TB Ryerson, JP Schwarz, C Warneke, A Welti, A Wisthaler, LD Ziemba and DM Murphy (2015), In situ vertical profiles of aerosol extinction, mass, and composition over the southeast United States during SENEX and SEAC(4)RS: observations of a modest aerosol enhancement aloft. *Atmos. Chem. Phys.*, 15 (12) 7085-7102, doi: 10.5194/acp-15-7085-2015
- Attwood, AR, RA Washenfelder, CA Brock, W Hu, K Baumann, P Campuzano-Jost, DA Day, ES Edgerton, DM Murphy, BB Palm, A McComiskey, NL Wagner, SS de Sa, A Ortega, ST Martin, JL Jimenez and SS Brown (2014), Trends in sulfate and organic aerosol mass in the Southeast U.S.: Impact on aerosol optical depth and radiative forcing. *Geophys. Res. Lett.*, 41 (21) 7701-7709, doi: 10.1002/2014GL061669
- Kim, S, TC VandenBoer, CJ Young, TP Riedel, JA Thornton, B Swarthout, B Sive, B Lerner, JB Gilman, C Warneke, JM Roberts, A Guenther, NL Wagner, WP Dube, E Williams and SS Brown (2014), The primary and recycling sources of OH during the NACHTT-2011 campaign: HONO as an important OH primary source in the wintertime. *J. Geophys. Res.-Atmos.*, 119 (11) 6886-6896, doi: 10.1002/2013JD019784
- Roberts, JM, PR Veres, TC VandenBoer, C Warneke, M Graus, EJ Williams, B Lefer, CA Brock, R Bahreini, F Ozturk, AM Middlebrook, NL Wagner, WP Dube and JA de Gouw (2014), New insights into atmospheric sources and sinks of isocyanic acid, HNCO, from recent urban and regional observations. *J. Geophys. Res.-Atmos.*, 119 (2) 1060-1072, doi: 10.1002/2013JD019931
- Brown, SS, JA Thornton, WC Keene, AAP Pszenny, BC Sive, WP Dube, NL Wagner, CJ Young, TP Riedel, JM Roberts, TC VandenBoer, R Bahreini, F Ozturk, AM Middlebrook, S Kim, G Hubler and DE Wolfe (2013), Nitrogen, Aerosol Composition, and Halogens on a Tall Tower (NACHTT): Overview of a wintertime air chemistry field study in the front range urban corridor of Colorado. *J. Geophys. Res.-Atmos.*, 118 (14) 8067-8085, doi: 10.1002/jgrd.50537
- Chen, D, QB Li, JC Stutz, YH Mao, L Zhang, O Pikelnaya, JY Tsai, C Haman, B Lefer, B Rappengluck, SL Alvarez, JA Neuman, J Flynn, JM Roberts, JB Nowak, J de Gouw, J Holloway, NL Wagner, P Veres, SS Brown, TB Ryerson, C Warneke and LB Pollack (2013), WRF-Chem simulation of NO_x and O₃ in the LA basin during CalNex-2010. *Atmos. Environ.*, 81 421-432, doi: 10.1016/j.atmosenv.2013.08.064
- Ozturk, F, R Bahreini, NL Wagner, WP Dube, CJ Young, SS Brown, CA Brock, IM Ulbrich, JL Jimenez, OR Cooper and AM Middlebrook (2013), Vertically resolved chemical characteristics and sources of submicron aerosols measured on a Tall Tower in a suburban area near Denver, Colorado in winter. *J. Geophys. Res.-Atmos.*, 118 (24) 13591-13605, doi: 10.1002/2013JD019923
- Riedel, TP, NL Wagner, WP Dube, AM Middlebrook, CJ Young, F Ozturk, R Bahreini, TC VandenBoer, DE Wolfe, EJ Williams, JM Roberts, SS Brown and JA Thornton (2013), Chlorine activation within urban or power plant plumes: Vertically resolved ClNO₂ and Cl₂ measurements from a tall tower in a polluted continental setting. *J. Geophys. Res.-Atmos.*, 118 (15) 8702-8715, doi: 10.1002/jgrd.50637
- VandenBoer, TC, SS Brown, JG Murphy, WC Keene, CJ Young, AAP Pszenny, S Kim, C Warneke, JA de Gouw, JR Maben, NL Wagner, TP Riedel, JA Thornton, DE Wolfe, WP Dube, F Ozturk, CA Brock, N Grossberg, B Lefer, B

- Lerner, AM Middlebrook and JM Roberts (2013), Understanding the role of the ground surface in HONO vertical structure: High resolution vertical profiles during NACHTT-11. *J. Geophys. Res.-Atmos.*, 118 (17) 10155-10171, doi: 10.1002/jgrd.50721
- Vicars, WC, S Morin, J Savarino, NL Wagner, J Erbland, E Vince, JMF Martins, BM Lerner, PK Quinn, DJ Coffman, EJ Williams and SS Brown (2013), Spatial and diurnal variability in reactive nitrogen oxide chemistry as reflected in the isotopic composition of atmospheric nitrate: Results from the CalNex 2010 field study. *J. Geophys. Res.-Atmos.*, 118 (18) 10567-10588, doi: 10.1002/jgrd.50680
- Wagner, NL, TP Riedel, CJ Young, R Bahreini, CA Brock, WP Dube, S Kim, AM Middlebrook, F Ozturk, JM Roberts, R Russo, B Sive, R Swarthout, JA Thornton, TC VandenBoer, Y Zhou and SS Brown (2013), N₂O₅ uptake coefficients and nocturnal NO₂ removal rates determined from ambient wintertime measurements. *J. Geophys. Res.-Atmos.*, 118 (16) 9331-9350, doi: 10.1002/jgrd.50653
- Bahreini, R, AM Middlebrook, JA de Gouw, C Warneke, M Trainer, CA Brock, H Stark, SS Brown, WP Dube, JB Gilman, K Hall, JS Holloway, WC Kuster, AE Perring, ASH Prevot, JP Schwarz, JR Spackman, S Szidat, NL Wagner, RJ Weber, P Zotter and DD Parrish (2012), Gasoline emissions dominate over diesel in formation of secondary organic aerosol mass. *Geophys. Res. Lett.*, 39, Art. No. L06805, doi: 10.1029/2011GL050718
- Neuman, JA, M Trainer, KC Aikin, WM Angevine, J Brioude, SS Brown, JA de Gouw, WP Dube, JH Flynn, M Graus, JS Holloway, BL Lefer, P Nedelec, JB Nowak, DD Parrish, IB Pollack, JM Roberts, TB Ryerson, H Smit, V Thouret and NL Wagner (2012), Observations of ozone transport from the free troposphere to the Los Angeles basin. *J. Geophys. Res.-Atmos.*, 117, Art. No. D00V09, doi: 10.1029/2011JD016919
- Pollack, IB, TB Ryerson, M Trainer, DD Parrish, AE Andrews, EL Atlas, DR Blake, SS Brown, R Commane, BC Daube, JA de Gouw, WP Dube, J Flynn, GJ Frost, JB Gilman, N Grossberg, JS Holloway, J Kofler, EA Kort, WC Kuster, PM Lang, B Lefer, RA Lueb, JA Neuman, JB Nowak, PC Novelli, J Peischl, AE Perring, JM Roberts, G Santoni, JP Schwarz, JR Spackman, NL Wagner, C Warneke, RA Washenfelder, SC Wofsy and B Xiang (2012), Airborne and ground-based observations of a weekend effect in ozone, precursors, and oxidation products in the California South Coast Air Basin. *J. Geophys. Res.-Atmos.*, 117, Art. No. D00V05, doi: 10.1029/2011JD016772
- Riedel, TP, TH Bertram, TA Crisp, EJ Williams, BM Lerner, A Vlasenko, SM Li, J Gilman, J de Gouw, DM Bon, NL Wagner, SS Brown and JA Thornton (2012), Nitryl Chloride and Molecular Chlorine in the Coastal Marine Boundary Layer. *Environ. Sci. Technol.*, 46 (19) 10463-10470, doi: 10.1021/es204632r, PubMed_id: 22443276
- Wagner, NL, TP Riedel, JM Roberts, JA Thornton, WM Angevine, EJ Williams, BM Lerner, A Vlasenko, SM Li, WP Dube, DJ Coffman, DM Bon, JA de Gouw, WC Kuster, JB Gilman and SS Brown (2012), The sea breeze/land breeze circulation in Los Angeles and its influence on nitryl chloride production in this region. *J. Geophys. Res.-Atmos.*, 117, Art. No. D00V24, doi: 10.1029/2012JD017810
- Stark, H, SS Brown, KW Wong, J Stutz, CD Elvidge, IB Pollack, TB Ryerson, WP Dube, NL Wagner and DD Parrish (2011), City lights and urban air. *Nat. Geosci.*, 4 (11) 730-731, doi: 10.1038/ngeo1300
- Wagner, NL, WP Dube, RA Washenfelder, CJ Young, IB Pollack, TB Ryerson and SS Brown (2011), Diode laser-based cavity ring-down instrument for NO₃, N₂O₅, NO, NO₂ and O₃ from aircraft. *Atmos. Meas. Tech.*, 4 (6) 1227-1240, doi: 10.5194/amt-4-1227-2011
- Washenfelder, RA, NL Wagner, WP Dube and SS Brown (2011), Measurement of Atmospheric Ozone by Cavity Ring-down Spectroscopy. *Environ. Sci. Technol.*, 45 (7) 2938-2944, doi: 10.1021/es103340u
- Thornton, JA, JP Kercher, TP Riedel, NL Wagner, J Cozic, JS Holloway, WP Dube, GM Wolfe, PK Quinn, AM Middlebrook, B Alexander and SS Brown (2010), A large atomic chlorine source inferred from mid-continental reactive nitrogen chemistry. *Nature*, 464 (7286) 271-274, doi: 10.1038/nature08905

- Arpin, P, T Popmintchev, NL Wagner, AL Lytle, O Cohen, HC Kapteyn and MM Murnane (2009), Enhanced High Harmonic Generation from Multiply Ionized Argon above 500 eV through Laser Pulse Self-Compression. *Phys. Rev. Lett.*, 103 (14), Art. No. 143901, doi: 10.1103/PhysRevLett.103.143901
- Fuchs, H, WP Dube, BM Lerner, NL Wagner, EJ Williams and SS Brown (2009), A Sensitive and Versatile Detector for Atmospheric NO₂ and NO_x Based on Blue Diode Laser Cavity Ring-Down Spectroscopy. *Environ. Sci. Technol.*, 43 (20) 7831-7836, doi: 10.1021/es902067h
- Zhou, X, R Lock, W Li, NL Wagner, MM Murnane, and HC Kapteyn (2008), Molecular recollision interferometry in high harmonic generation. *Phys. Rev. Lett.*, 102, 073902, doi: 10.1103/PhysRevLett.100.073902
- Wagner, NL, X Zhou, R Lock, W Li, A Wüest, MM Murnane, and HC Kapteyn (2007), Extracting the phase of high-order harmonic emission from a molecule using transient alignment in mixed samples. *Phys. Rev. A* 76, 061403(R). doi: 10.1103/PhysRevA.76.061403
- Wagner, NL, A Wüest, IP Christov, T Popmintchev, X Zhou, MM Murnane, and HC Kapteyn (2006), Monitoring molecular dynamics using coherent electrons from high harmonic generation. *PNAS* 103, 13279-13285, doi: 10.1073/pnas.0605178103
- Zhang X, A Lytle, T Popmintchev, A Paul, NL Wagner, MM Murnane, HC Kapteyn, and IP Christov (2005), Phase matching, quasi-phase matching, and pulse compression in a single waveguide for enhanced high harmonic generation. *Optics Lett.* 30, 1971-1973, doi: 10.1364/OL.30.001971
- Wagner, NL, EA Gibson, T Popmintchev, IP Christov, MM Murnane and HC Kapteyn (2004), Self-compression of ultrashort pulses through ionization induced spatio-temporal reshaping, *Phys. Rev. Lett.* 93, 173902, doi: 10.1103/PhysRevLett.93.173902
- Gibson, EA, X Zhang, T Popmintchev, AJ Paul, NL Wagner, AL Lytle, IP Christov, MM Murnane and HC Kapteyn (2004), Extreme nonlinear optics: attosecond photonics at short wavelengths. *IEEE J. Quant. Elect.* 10(6), 1339-1350, doi: 10.1109/JSTQE.2004.838078
- Gibson, EA, AJ Paul, NL Wagner, RI Tobey, S Backus, IP Christov, MM Murnane and HC Kapteyn (2004), High harmonic generation up to 250 eV from highly ionized argon. *Phys. Rev. Lett.* 92, 033001, doi: 10.1103/PhysRevLett.92.033001
- Gibson, EA, AJ Paul, NL Wagner, RI Tobey, DM Gaudiosi, S Backus, IP Christov, A Aquila, DT Attwood, EM Gullikson, MM Murnane and HC Kapteyn (2003), Coherent soft x-ray generation in the water window with quasi-phase matching," *Science* 302, 95-98, doi:10.1126/science.1088654
- Bartels RA, NL Wagner, MD Baertschy, J Wyss, MM Murnane, and HC Kapteyn (2003), Phase-matching conditions for nonlinear frequency conversion by use of aligned molecular gases, *Optics Lett.* 28, 346-348, doi: 10.1364/OL.28.000346
- Bartels RA, TC Weinacht, NL Wagner, M Baertschy, CH Greene, MM Murnane and HC Kapteyn (2002), Phase modulation of ultrashort light pulses using molecular rotational wavepackets. *Phys. Rev. Lett.* 88, 013903, doi: 10.1103/PhysRevLett.88.013903

Presentations:

- Examining light-absorbing aerosol layers encountered during the ATOM4 mission, ATOM Science Meeting. (2018)
- Attribution of Aerosol Absorption in Realistic Fresh Smoke Sampled at the Missoula Fire Sciences Laboratory, American Geophysical Union, Fall Meeting. (2017)
- Absorption Budget of Fresh Biomass Burning Aerosol from Realistic Laboratory Fires, FIREX Firelab Data Meeting. (2017)

- In situ vertical profiles of aerosol extinction, mass, and composition over the southeast United States during SENEX and SEAC4RS: Observations of a modest aerosol enhancement aloft, SAS Modeling Workshop. (2015)
- Vertical Profiles of Aerosol Extinction over the Southeastern US during the summer, American Geophysical Union, Fall Meeting. (2014)
- Vertical Profiles of Aerosol Extinction over the Southeastern US during summer 2013, American Association for Aerosol Research Annual Conference. (2014)
- Profiles of Aerosol Extinction over the Southeast US, American Geophysical Union, Fall Meeting. (2013)
- The effect of aerosol thermodynamics on ClNO₂ production: vertically resolved measurements of ClNO₂ and its precursors, American Geophysical Union, Fall Meeting. (2011)
- Nighttime chemistry: Field measurements N₂O₅ uptake and ClNO₂ production, invited seminar, University of Colorado. (2011)
- The land breeze and ClNO₂ production over Santa Monica Bay, CalNex Data Meeting, California Environmental Protection Agency. (2011)
- ClNO₂ yields and N₂O₅ uptake coefficients determined from field data, Atmospheric Chemical Mechanisms. (2010)
- A study of mid-continent halogen activation: wintertime measurements of N₂O₅ and ClNO₂, American Geophysical Union, Fall Meeting. (2009)
- Measurement of nitrogen dioxide by cw cavity ringdown spectroscopy, American Geophysical Union, Fall Meeting. (2008)
- Monitoring molecular dynamics using high-harmonic generation as a probe, 37th Winter Colloquium on the Physics of Quantum Electronics. (2007)
- Vibrational wave packets probed using high harmonic generation, Division of Atomic, Molecular, and Optical Physics, annual meeting. (2006)
- Observation of intra-molecular vibrational dynamics using high-harmonic generation, 10th International Conference on Multiphoton Processes. (2005)
- High harmonic generation from aligned molecules, Conference on Laser and Electro-Optics. (2005)
- Self-compression of femtosecond pulses in ionizing argon, Nonlinear Optics Topical Meeting. (2004)
- Compressing light pulses with coherently spinning molecules, Division of Atomic, Molecular, and Optical Physics, annual meeting. (2004)
- Compression of light pulses using molecular phase modulation, Ultrafast Phenomena. (2002)

Honors and Awards

- National Research Council Post-Doctoral Fellowship, NOAA ESRL. (2009)
- Colorado Photonics Industry Association Poster Competition Award. (2005)
- Leslie Foldy Award, Case Western Reserve University. (2001)
- Dayton Miller Thesis Prize, Case Western Reserve University. (2001)
- Phi Beta Kappa (2001)