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EDUCATION

- 2006 **California Institute of Technology**, Pasadena, CA
Ph.D. in Environmental Science and Engineering
Thesis Title: Column Abundances of Carbon Dioxide and Methane Retrieved From Ground-Based Near-Infrared Solar Spectra
Advisor: Prof. Paul Wennberg
- 1999 **Pomona College**, Claremont, CA
B.A. in Chemistry, Magna Cum Laude
Thesis Title: Studies in the Kinetics of Cross Metathesis Using Grubbs' Ruthenium Catalyst
Advisor: Prof. Daniel O'Leary

RESEARCH EXPERIENCE

- 2007–2015 **National Oceanic and Atmospheric Administration**, Boulder, CO
University of Colorado CIRES, Research Scientist II
Advisor: Dr. Steven Brown
- Developed a new method to determine aerosol refractive indices as a function of wavelength.
 - Collaborated with Weizmann Institute scientists to measure refractive indices of organic aerosol.
 - Developed and deployed field instrument to measure aerosol optical extinction during SOAS 2013.
 - Developed instrumental method for laboratory measurements of atmospheric glyoxal.
 - Designed and constructed field instrument for glyoxal and nitrous acid.
 - Used field instrument and models to quantify glyoxal contribution to aerosol during CalNex 2010.
 - Developed and published new cavity ring-down method for ambient ozone measurements.
 - Analyzed urban air pollution data acquired during the TexAQS2006 field campaign.
 - Mentored undergraduate, graduate, and post-doctoral students.
- 2006–2007 **National Oceanic and Atmospheric Administration**, Boulder, CO
National Research Council Postdoctoral Fellow
Advisor: Dr. Thomas Ryerson
- Evaluated three instrumental techniques for elemental mercury measurements.
 - Operated the Whole Air Sampler during the 2006 TexAQS aircraft field campaign.
- 2000–2006 **California Institute of Technology**, Pasadena, CA
Graduate Research Assistant
- Constructed an automated solar observatory to measure column abundances of greenhouse gases.
 - Installed the observatory in Wisconsin and acquired sixteen month data record of CO₂ and CH₄.
 - Completed and published an instrumental intercomparison of CO₂ measurements.
 - Developed and published a method to retrieve CH₄ tropospheric column-average concentrations.
 - Supervised the construction of two additional observatories located in the U.S. and Australia.

- 1999–2000 **National Oceanic and Atmospheric Administration**, Boulder, CO
Professional Research Assistant
Supervisor: Dr. Charles Brock
- Participated in two aircraft field campaigns measuring aerosol size distribution and chemical composition.
 - Completed subsequent data analysis of particle growth in the plumes of coal-fired power plants.
 - Assembled, tested, and deployed an optical white light particle counter for aircraft measurements.
- 1998–1999 **Undergraduate Thesis Work at Pomona College**, Claremont, CA
1998 **Summer Undergraduate Research Fellow at Caltech**, Pasadena, CA
Senior Thesis Research, Department of Chemistry
Advisor: Prof. Daniel O'Leary
- Used GC-MS and NMR to investigate the kinetics of olefin metathesis reactions.

HONORS AND AWARDS

- 2014 **Colorado Governor's Award for High-Impact Research**
Governor's Office, State of Colorado
- 2012 **Presidential Early Career Award for Scientists and Engineers**
Office of Science and Technology Policy, Office of the President, Washington D. C.
- 2011-2015 **Selected to attend the Gordon Research Conference on Atmospheric Chemistry**
Mount Snow, VT
- 2008, 2009 **Best Presentation from NOAA and CIRES Chemical Sciences**
Boulder Postdoctoral Poster Symposium, Boulder, CO
- 2006–2007 **National Research Council Postdoctoral Fellowship**
The National Academies, Washington D.C.
- 2000–2004 **Gordon Moore Graduate Fellowship**
California Institute of Technology, Pasadena, CA
- 2000–2003 **National Science Foundation Graduate Research Fellowship**
National Science Foundation, Washington D.C.
- 2000–2001 **Vito Vanoni Graduate Fellowship**
California Institute of Technology, Pasadena, CA
- 1999 **John Stauffer Prize for Academic Merit in the Sciences**
Pomona College, Claremont, CA
- 1999 **Frank Parkhurst Brackett, Jr. and Davida Wark Brackett Prize in Chemistry**
Pomona College, Claremont, CA
- 1999 **Honorable Mention in Interdisciplinary Contest in Modeling (COMAP)**
The Consortium for Mathematics and its Applications, Lexington, MA
- 1999 **Phi Beta Kappa Honor Society and Sigma Xi Scientific Research Society**
- 1998–1999 **Barry M. Goldwater Scholarship**
Barry M. Goldwater Scholarship and Excellence in Education Foundation, Springfield, VA
- 1998 **Undergraduate Award in Analytical Chemistry**
American Chemical Society, Division of Analytical Chemistry, Washington D.C.
- 1994 **National Science Scholar, 4th Congressional District**
National Science Scholars Program, Secretary of Education, Washington D.C.
- 1994 **National Merit Scholar and Scholarship Recipient**
National Merit Scholarship Corporation, Evanston, IL

GRANTS AND CONTRACTS

- 2015–2018 Murphy, D. M, C. A. Brock, S. S. Brown, and R. A. Washenfelder, “Does Mie theory correctly describe the near-UV optical properties of smoke?”, NASA Earth Sciences Research Program, \$488,217
- 2012 Washenfelder, R. A., Presidential Early Career Award for Scientists and Engineers, \$50,000.
- 2010 Vaida, V., C. J. Young, R. A. Washenfelder, and G. J. Frost, “Measurements of Weak Absorptions by O₃ and O₃-H₂O Clusters Using Cavity Enhanced Spectroscopy,” CIRES Innovative Research Program, \$29,850.
- 2008 Brown, S. S. and R. A. Washenfelder, “The Next Generation of Optical Instrumentation to Further NOAA Research in Air Quality and Climate,” NOAA Assistant Administration’s Discretionary Fund, \$57,500.

SUPERVISORY RESPONSIBILITIES (2006 – Present)

- 2012–2014 Mentored post-doctoral fellow, Alexis Attwood
- Worked together to measure aerosol optical extinction during FLAME 2012 and SOAS 2013.
 - Co-authored a publication on aerosol hygroscopicity trends in *Geophysical Research Letters*.
 - Co-authored a publication on brown carbon absorption in *Geophysical Research Letters*.
- 2010–2011 Mentored post-doctoral fellow, Cora Young, 2 years
- Worked together to design and build a field instrument for CalNex 2010.
 - Co-authored a publication on glyoxal contribution to organic aerosol in *J. Geophysical Research*.
 - Co-authored a publication on radical budgets in *Environmental Science and Technology*.
 - Co-authored a publication on Cl oxidation of VOCs in *Atmospheric Chemistry and Physics*.
- 2010–2011 Mentored graduate student, Jessica Axson, 9 months
- Worked with Jessica to measure the weak absorption cross section of O₃.
 - Co-authored a publication in *Atmospheric Chemistry and Physics*.
- 2011 Mentored post-doctoral fellow, Tara Kahan, 9 months
- Worked with Tara on instrumentation to measure the hydrogen peroxide cross section.
 - Co-authored a publication in *Journal of Physical Chemistry*.
- 2011 Mentored undergraduate Hollings Scholar, Taylor Brownlee, 10 weeks
- 2008 Mentored graduate student, Ryan Thalman, 5 months

PUBLICATION METRICS

Total number of publications: 39	Number of first author publications: 10
Total number of citations: 1369	Researcher ID: E-7169-2010
Hirsch index: 19	

PEER-REVIEWED PUBLICATIONS

39. **Washenfelder, R. A.**, A. R. Attwood, J. M. Flores, Y. Rudich, and S. S. Brown. Broadband cavity enhanced spectroscopy in the ultraviolet spectral region for measurements of nitrogen dioxide and formaldehyde. *Atmospheric Measurement Techniques*, submitted.
38. Brock, C. A., N. L. Wagner, B. E. Anderson, A. R. Attwood, A. Beyersdorf, P. Campuzano-Jost, A. G. Carlton, D. A. Day, G. S. Diskin, T. D. Gordon, J. L. Jimenez, D. A. Lack, J. Liao, M. Markovic, A. M. Middlebrook, N. L. Ng, A. E. Perring, M. S. Richardson, J. P. Schwartz, **R. A. Washenfelder**, A. Welti, L. Xu, L. D. Ziemba, and D. M. Murphy. Aerosol optical properties in the southeastern United States in summer – Part 1: Hygroscopic growth. *Atmospheric Chemistry and Physics*, submitted.

37. Pusede, S. E., T. C. VandenBoer, J. G. Murphy, M. Z. Markovic, C. J. Young, P. R. Veres, J. M. Roberts, **R. A. Washenfelder**, S. S. Brown, X. Ren, C. Tsai, J. Stutz, W. H. Brune, E. C. Browne, P. J. Wooldridge, A. R. Graham, R. Weber, A. H. Goldstein, S. Dusanter, S. M. Griffith, P. S. Stevens, B. L. Lefer, and R. C. Cohen. An atmospheric constraint on the NO₂ dependence of daytime near-surface nitrous acid (HONO). *Geophysical Research Letters*, submitted.
36. **Washenfelder, R. A.**, A. R. Attwood, C. A. Brock, H. Guo, L. Xu, R. J. Weber, N. L. Ng, H. M. Allen, B. R. Ayres, K. Baumann, R. C. Cohen, D. C. Draper, K. C. Duffey, E. Edgerton, J. L. Fry, W. W. Hu, J. L. Jimenez, B. B. Palm, P. Romer, E. A. Stone, P. J. Wooldridge, and S. S. Brown. Biomass burning dominates brown carbon absorption in the rural southeastern United States. *Geophysical Research Letters*, 42, 653-664, 2015.
35. Kaiser, J., G. M. Wolfe, K. E. Min, S. S. Brown, C. C. Miller, D. J. Jacob, J. A. de Gouw, M. Graus, T. F. Hanisco, J. Holloway, J. Peischl, I. B. Pollack, T. B. Ryerson, C. Warneke, **R. A. Washenfelder**, and F. N. Keutsch. Reassessing the ratio of glyoxal to formaldehyde as an indicator of hydrocarbon precursor speciation. *Atmospheric Chemistry and Physics*, 15, 7571-7583, 2015.
34. Hayes, P. L., A. G. Carlton, K. R. Baker, R. Ahmadov, **R. A. Washenfelder**, S. Alvarez, B. Rappenglück, J. B. Gilman, W. C. Kuster, J. A. de Gouw, P. Zotter, A. S. H. Prévôt, S. Szidat, T. E. Kleindienst, J. H. Offenberg, and J. L. Jimenez. Modeling the formation and aging of secondary organic aerosols in Los Angeles during CalNex 2010. *Atmospheric Chemistry and Physics*, 15, 5773-5801, 2015.
33. Edwards, P. M., S. S. Brown, J. M. Roberts, R. Ahmadov, R. M. Banta, J. A. deGouw, W. P. Dubé, R. A. Field, J. H. Flynn, J. B. Gilman, M. Graus, D. Helmig, A. Koss, A. O. Langford, B. L. Lefer, B. M. Lerner, R. Li, S.-M. Li, S. A. McKeen, S. M. Murphy, D. D. Parrish, C. J. Senff, J. Soltis, J. Stutz, C. Sweeney, C. R. Thompson, M. K. Trainer, C. Tsai, P. R. Veres, **R. A. Washenfelder**, C. Warneke, R. J. Wild, C. J. Young, B. Yuan, and R. Zamora. High winter ozone pollution from carbonyl photolysis in an oil and gas basin. *Nature*, 514, 351-354, 2014.
32. Attwood, A. R., **R. A. Washenfelder**, C. A. Brock, W. Hu, K. Baumann, P. Campuzano-Jost, D. A. Day, E. S. Edgerton, D. M. Murphy, B. B. Palm, A. McComiskey, N. L. Wagner, S. S. de Sa, A. Ortega, S. T. Martin, J. L. Jimenez, and S. S. Brown. Trends in sulfate and organic aerosol mass in the Southeast U.S.: Impact on aerosol optical depth and radiative forcing. *Geophysical Research Letters*, 41, 7701-7709, 2014.
31. Knote, C., A. Hodzic, J. L. Jimenez, R. Volkamer, J. J. Orlando, S. Baidar, J. Brioude, J. Fast, D. R. Gentner, A. H. Goldstein, P. L. Hayes, W. B. Knighton, H. Oetjen, A. Setyan, H. Stark, R. Thalman, G. Tyndall, **R. A. Washenfelder**, E. Waxman, and Q. Zhang. Simulation of semi-explicit mechanisms of SOA formation from glyoxal in aerosol in a 3-D model. *Atmospheric Chemistry and Physics*, 14, 6213-6239, 2014.
30. Young, C. J., **R. A. Washenfelder**, P. M. Edwards, D. D. Parrish, J. B. Gilman, W. C. Kuster, L. H. Mielke, H. D. Osthoff, C. Tsai, O. Pikelnaya, J. Stutz, P. R. Veres, J. M. Roberts, S. Griffith, S. Dusanter, P. S. Stevens, J. Flynn, N. Grossberg, B. Lefer, J. S. Holloway, J. Peischl, T. B. Ryerson, E. L. Atlas, D. R. Blake, and S. S. Brown. Chlorine as a primary radical: Evaluation of methods to understand its role in initiation of oxidative cycles. *Atmospheric Chemistry and Physics*, 14, 3427-3440, 2014.
29. Flores J. M., **R. A. Washenfelder**, G. Adler, H. J. Lee, L. Segev, J. Laskin, A. Laskin, S. A. Nizkorodov, S. S. Brown, and Y. Rudich. Complex refractive indices in the near-ultraviolet spectral region of biogenic secondary organic aerosol aged with ammonia. *Physical Chemistry Chemical Physics*, 16, 10629-10642, 2014.
28. Brown, S. S., W. P. Dubé, R. Bahreini, A. M. Middlebrook, C. A. Brock, C. Warneke, J. A. de Gouw, **R. A. Washenfelder**, E. Atlas, J. Peischl, T. B. Ryerson, J. S. Holloway, J. P. Schwarz, R. Spackman, M. Trainer, D. D. Parrish, F. C. Fehsenfeld, and A. R. Ravishankara. Biogenic VOC oxidation and organic aerosol formation in an urban nocturnal boundary layer: aircraft vertical profiles in Houston, TX. *Atmospheric Chemistry and Physics*, 13, 11317-11337, 2013.

27. Washenfelder, R. A., J. M. Flores, C. A. Brock, S. S. Brown, and Y. Rudich. Broadband measurements of aerosol extinction in the ultraviolet spectral region. *Atmospheric Measurement Techniques*, 6, 861-877, 2013.
26. Mielke, L. H., J. Stutz, C. Tsai, S. C. Hurlock, J. M. Roberts, P. R. Veres, K. D. Froyd, P. L. Hayes, M. J. Cubison, J. L. Jimenez, R. A. Washenfelder, C. J. Young, J. B. Gilman, J. A. de Gouw, J. H. Flynn, N. Grossberg, B. L. Lefer, J. Liu, R. J. Weber, and H. D. Osthoff. Heterogeneous formation of nitryl chloride and its role as a nocturnal NO_x reservoir species during CalNex-LA 2010. *Journal of Geophysical Research*, 118, 10638-10652, 2013.
25. Young, C. J., R. A. Washenfelder, J. M. Roberts, L. H. Mielke, H. D. Osthoff, C. Tsai, O. Pikelnaya, J. Stutz, P. R. Veres, A. K. Cochran, T. C. VandenBoer, J. Flynn, N. Grossberg, C. L. Haman, B. Lefer, H. Stark, M. Graus, J. de Gouw, J. B. Gilman, W. C. Kuster, S. S. Brown. Vertically resolved measurements of nighttime radical reservoirs in Los Angeles and their contribution to the urban radical budget. *Environmental Science and Technology*, 46, 10965-10973, 2012.
24. Brown, S. S., W. P. Dube, P. Karamchandani, G. Yarwood, J. Peischl, T. B. Ryerson, J. A. Neuman, J. B. Nowak, J. S. Holloway, R. A. Washenfelder, C. A. Brock, G. J. Frost, M. Trainer, D. D. Parrish, F. C. Fehsenfeld, and A. R. Ravishankara. The effects of NO_x control and plume mixing on nighttime chemical processing of plumes from coal-fired power plants. *Journal of Geophysical Research*, 117, D07304, 2012.
23. Kahan, T. F., R. A. Washenfelder, V. Vaida, and S. S. Brown, Cavity-enhanced measurements of hydrogen peroxide absorption cross sections from 353 to 410 nm. *Journal of Physical Chemistry*, 116, 5941-5947, 2012.
22. Keppel-Aleks, G., P. O. Wennberg, R. A. Washenfelder, D. Wunch, T. Schneider, G. C. Toon, R. J. Andres, J.-F. Blavier, B. Connor, K. J. Davis, A. R. Desai, J. Messerschmidt, J. Notholt, C. M. Roehl, V. Sherlock, B. B. Stephens, S. A. Vay, and S. C. Wofsy. The imprint of surface fluxes and transport on variations in total column carbon dioxide. *Biogeosciences*, 9, 875-891, 2012.
21. Parrish, D. D., T. B. Ryerson, J. Mellqvist, J. Johansson, A. Fried, D. Richter, J. G. Walega, R. A. Washenfelder, J. A. de Gouw, J. Peischl, K. C. Aikin, S. A. McKeen, G. J. Frost, F. C. Fehsenfeld, and S. C. Herndon, Primary and secondary sources of formaldehyde in urban atmospheres: Houston Texas region. *Atmospheric Chemistry and Physics*, 12, 3272-3288, 2012.
20. Pollack, I. B., T. B. Ryerson, M. Trainer, D. D. Parrish, A. E. Andrews, E. L. Atlas, D. R. Blake, S. S. Brown, R. Commane, B. C. Daube, J. A. de Gouw, W. P. Dub J. Flynn, G. J. Frost, J. B. Gilman, N. Grossberg, J. S. Holloway, J. Kofler, E. A. Kort, W. C. Kuster, P. M. Lang, B. Lefer, R. A. Lueb, J. A. Neuman, J. B. Nowak, P. C. Novelli, J. Peischl, A. E. Perring, J. M. Roberts, G. Santoni, J. P. Schwarz, J. R. Spackman, N. L. Wagner, C. Warneke, R. A. Washenfelder, S. C. Wofsy, and B. Xiang. Airborne and ground-based observations of a weekend effect in ozone, precursors, and oxidation products in the California South Coast Air Basin. *Journal of Geophysical Research*, 117, D00V05, 2012.
19. Washenfelder, R. A., C. J. Young, S. S. Brown, W. M. Angevine, E. L. Atlas, D. R., Blake, D. M. Bon, M. J. Cubison, J. A. de Gouw, S. Dusanter, J. Flynn, J. B., Gilman, M. Graus, S. Griffith, N. Grossberg, P. L. Hayes, J. L. Jimenez, W. C., Kuster, B. L. Lefer, I. B. Pollack, T. B. Ryerson, H. Stark, P. S. Stevens, and M. K. Trainer. The glyoxal budget and its contribution to organic aerosol for Los Angeles, California during CalNex 2010. *Journal of Geophysical Research*, 116, D00V02, 2011.
18. Washenfelder, R. A., N. L. Wagner, W. P. Dube, and S. S. Brown. Measurement of atmospheric ozone by cavity ring-down spectroscopy. *Environmental Science and Technology*, 45, 2938-2944, 2011.
17. Axson, J. L., R. A. Washenfelder, T. F. Kahan, C. J. Young, V. Vaida, and S. S. Brown. Absolute ozone absorption cross section in the Huggins Chappuis minimum (350 - 470 nm) at 296 K. *Atmospheric Chemistry and Physics*, 11, 11581-11590, 2011.

16. Wagner, N. L., W. P. Dube, **R. A. Washenfelder**, C. J. Young, I. B. Pollack, T. B. Ryerson, and S. S. Brown. Diode laser-based cavity ring-down instrument for NO₃, N₂O₅, NO, NO₂ and O₃ from aircraft. *Atmospheric Measurement Techniques*, 4, 1227-1240, 2011.
15. Wunch, D., G. C. Toon, J.-F. L. Blavier, **R. A. Washenfelder**, J. Notholt, B. Connor, D. Griffith, and P. O. Wennberg. The Total Carbon Column Observing Network (TCCON). *Philosophical Transactions of the Royal Society A*, 369, 2087-2112, 2011.
14. **Washenfelder, R. A.**, M. Trainer, G. J. Frost, T. B. Ryerson, E. L. Atlas, J. A. deGouw, F. M. Flocke, A. Fried, J. S. Holloway, D. D. Parrish, J. Peischl, D. Richter, S. M., Schauffler, J.G. Walega, C. Warneke, P. Weibring, and W. Zheng. Characterization of NO_x, SO₂, ethene, and propene from industrial emission sources in Houston, Texas. *Journal of Geophysical Research*, 115, D16311, 2010.
13. Deutscher, N. M., D. W. T. Griffith, G. W. Bryant, P. O. Wennberg, G. C. Toon, **R. A. Washenfelder**, G. Keppel-Aleks, D. Wunch, Y. Yavin, N. T. Allen, J.-F. Blavier, R. Jimenez, B. C. Daube, A. V. Bright, D. M. Matross, S. C. Wofsy, and S. Park. Total column CO₂ measurements at Darwin, Australia - Site description and calibration against in situ aircraft profiles. *Atmospheric Measurement Techniques*, 3, 947-958, 2010.
12. Roberts, J. M., P. Veres, C. Warneke, J. A. Neuman, **R. A. Washenfelder**, S. S. Brown, M. Baasandorj, J. B. Burkholder, I. R. Burling, T. J. Johnson, R. J. Yokelson, and J. de Gouw. Measurement of HONO, HNCO, and other inorganic acids by negative-ion proton-transfer chemical-ionization mass spectrometry (NI-PT-CIMS): Application to biomass burning emissions. *Atmospheric Measurement Techniques*, 3, 981-990, 2010.
11. de Gouw, J. A., S. te Lintel Hekkert, J. Mellqvist, C. Warneke, E. L. Atlas, F. C. Fehsenfeld, A. Fried, G. J. Frost, F. J. M. Harren, J. S. Holloway, B. Lefer, R. Lueb, J. F. Meagher, D. D. Parrish, M. Patel, L. Pope, D. Richter, C. Rivera, T. B. Ryerson, J. Samuelsson, J. Walega, **R. A. Washenfelder**, P. Weibring, and X. Zhu. Airborne measurements of ethene from industrial sources using laser photo-acoustic spectroscopy. *Environmental Science and Technology*, 43, 2087-2112, 2009.
10. **Washenfelder, R. A.**, A. O. Langford, H. Fuchs, and S. S. Brown. Measurement of glyoxal using incoherent broadband cavity enhanced absorption spectroscopy. *Atmospheric Chemistry and Physics*, 8, 7779-7793, 2008.
9. Yang, Z., **R. A. Washenfelder**, G. Keppel-Aleks, P. O. Wennberg, N. Y. Krakauer, J. T. Randerson, P. P. Tans, and C. Sweeney. New constraints on Northern Hemisphere growing season net flux. *Geophysical Research Letters*, 34, L12807, 2007.
8. **Washenfelder, R. A.**, G. C. Toon, J.-F. Blavier, Z. Yang, N. T. Allen, P. O. Wennberg, S. A. Vay, D. M. Matross, and B. C. Daube. Carbon dioxide column abundances at the Wisconsin Tall Tower site. *Journal of Geophysical Research*, 111, D22305, 2006.
7. Bosch, H., G. C. Toon, B. Sen, **R. A. Washenfelder**, P. O. Wennberg, M. Buchwitz, R. de Beek, J. P. Burrows, D. Crisp, M. Christi, B. J. Connor, V. Natraj, and Y. L. Yung. Space-based near-infrared CO₂ measurements: Testing the Orbiting Carbon Observatory retrieval algorithm and validation concept using SCIAMACHY observations over Park Falls, Wisconsin. *Journal of Geophysical Research*, 111, D23302, 2006.
6. **Washenfelder, R. A.**, P. O. Wennberg, and G. C. Toon. Tropospheric methane retrieved from ground-based near-IR solar absorption spectra. *Geophysical Research Letters*, 30, L017969, 2003.
5. **Washenfelder, R. A.**, C. M. Roehl, K. A. McKinney, R. R. Julian, and P. O. Wennberg. A compact, lightweight gas standards generator for permeation tubes. *Review of Scientific Instruments*, 74, 3151-3154, 2003.
4. Brock, C. A., **R. A. Washenfelder**, M. Trainer, T. B. Ryerson, J. C. Wilson, J. M. Reeves, L. G. Huey, J. S. Holloway, D. D. Parrish, G. Hubler, and F. C. Fehsenfeld. Particle growth in the plumes of coal-fired power plants. *Journal of Geophysical Research*, 107, 001062, 2002.

3. Blackwell, H. E., D. J. O’Leary, A. K. Chatterjee, **R. A. Washenfelder**, D. A. Bussman, and R. H. Grubbs. New approaches to olefin cross-metathesis. *Journal of the American Chemical Society*, 122, 58-71, 2000.
2. O’Leary, D. J., H. E. Blackwell, **R. A. Washenfelder**, K. Miura, and R. H. Grubbs. Terminal olefin cross-metathesis with acrolein acetals. *Tetrahedron Letters*, 40, 1091-1094, 1999.
1. O’Leary, D. J., H. E. Blackwell, **R. A. Washenfelder**, and R. H. Grubbs. A new method for cross-metathesis of terminal olefins. *Tetrahedron Letters*, 39, 7427-7430, 1998.

BOOK CHAPTERS

Young, C. J., **R. A. Washenfelder**, and S. S. Brown, “Cavity Enhanced Spectroscopy: Applications, Theory and Instrumentation” in *Encyclopedia of Analytical Chemistry: Applications, Theory, and Instrumentation*, ed. Markus W. Sigrist, John Wiley and Sons, doi: 10.1002/9780470027318.a9195, 2011.

INVITED SEMINARS AND TALKS (2006 – Present)

Optical properties of brown carbon aerosol. Invited speaker, Innovations in Aerosol Physics and Chemistry Workshop, Washington University, St. Louis, MO, 2015.

Atmospheric field measurements using cavity enhanced spectroscopy. Invited speaker, International Summer School on Cavity Enhanced Spectroscopy, Boulder, CO, 2015.

Optical properties of brown carbon aerosol in the near-ultraviolet spectral region. Invited speaker, Analytical Chemistry Seminar, University of Colorado, Boulder, CO, 2015.

Absorption and scattering by atmospheric aerosol. Kavli Frontiers of Science, Irvine, CA, 2014.

Absorbing trace gases and aerosols: Recent laboratory and field work on glyoxal and brown carbon. Invited speaker, NOAA Chemical Sciences Division Seminar, Boulder, CO, 2013.

Optical properties of organic aerosol. Invited speaker, University of Colorado Sigma Xi honor society, 2013.

Broadband cavity enhanced spectroscopy (BBCES). Invited speaker, Israel Institute of Technology, Department of Civil and Environmental Engineering, Haifa, Israel, 2013.

Applications of broadband cavity enhanced spectroscopy (BBCES) to studies of aerosol optical extinction and glyoxal’s contribution to organic aerosol. Invited speaker, Weizmann Institute of Science Department of Environmental Sciences and Energy Research, Rehovot, Israel, 2012.

Spectroscopy and remote sensing. Invited speaker, American Chemical Society Meeting, Philadelphia, PA, 2012.

Column abundances of carbon dioxide and methane retrieved from ground-based near-infrared solar spectra. Invited speaker, University of Colorado Department of Chemistry, Boulder, CO, 2008.

SELECTED CONFERENCE AND MEETING PRESENTATIONS (2006 – Present)

Washenfelder, R. A., A. R. Attwood, M. F. Flores, C. A. Brock, G. Adler, L. Segev, Y. Rudich, J. Lee, S. Nizkorodov, J. Laskin, A. Laskin, H. Guo, L. Xu, R. J. Weber, N. L. Ng, H. M. Allen, B. R. Ayres, K. Baumann, R. C. Cohen, D. C. Draper, K. C. Duffey, E. Edgerton, J. L. Fry, W. W. Hu, J. L. Jimenez, B. B. Palm, P. Romer, E. A. Stone, P. J. Wooldridge, and S. S. Brown, Laboratory and field studies of brown carbon absorption in the near-ultraviolet spectral region. Oral presentation at the ACS Spring Meeting, Denver, CO, 2015.

Washenfelder, R. A., A. R. Attwood, C. A. Brock, H. Guo, L. Xu, R. J. Weber, N. L. Ng, H. M. Allen, B. R. Ayres, K. Baumann, R. C. Cohen, D. C. Draper, K. C. Duffey, E. Edgerton, J. L. Fry, W. W. Hu, J. L. Jimenez, B. B. Palm, P. Romer, E. A. Stone, P. J. Wooldridge, and S. S. Brown, Biomass burning dominates brown carbon absorption in the rural southeastern U. S. Poster presentation at the Gordon Research Conference, Waterville Valley, NH, 2015.

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Washenfelder, R. A., C. J. Young, S. S. Brown, W. Angevine, E. L. Atlas, D. R. Blake, D. M. Bon, M. J. Cubison, J. A. de Gouw, S. Dusanter, J. Flynn, J. B. Gilman, M. Graus, S. Griffith, N. Grossberg, P. L. Hayes, J. L. Jimenez, W. C. Kuster, B. L. Lefer, I. B. Pollack, T. B. Ryerson, H. Stark, P. S. Stevens, and M. K. Trainer, The glyoxal budget and its contribution to secondary organic aerosol for Los Angeles during CalNex 2010. Poster presentation at the AGU Fall Meeting, San Francisco, CA, 2011.

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Washenfelder, R. A., M. Trainer, G. J. Frost, T. B. Ryerson, E. L. Atlas, J. A. deGouw, F. M. Flocke, A. Fried, J. S. Holloway, D. D. Parrish, J. Peischl, D. Richter, S. M. Schauffler, J. G. Walega, C. Warneke, P. Weibring, and W. Zheng, Analysis of emissions from industrial sources in Houston, Texas. Oral presentation at the TCEQ Air Quality Meeting, Austin, TX, 2009.

Washenfelder, R. A., M. Trainer, G. J. Frost, T. B. Ryerson, E. L. Atlas, J. A. deGouw, F. M. Flocke, A. Fried, J. S. Holloway, D. D. Parrish, J. Peischl, D. Richter, S. M. Schauffler, J. G. Walega, C. Warneke, P. Weibring, and W. Zheng, Characterization of industrial emission sources and photochemistry in Houston, Texas. Poster presentation at the AGU Fall Meeting, San Francisco, CA, 2009.

Washenfelder, R. A., A. O. Langford, H. Fuchs, and S. S. Brown, Measurement of glyoxal using an incoherent broadband cavity enhanced absorption spectrometer. Poster presentation at the AGU Fall Meeting, San Francisco, CA, 2008.

Washenfelder, R. A., T. B. Ryerson, E. L. Atlas, C. A. Brock, G. J. Frost, J. S. Holloway, J. W. Peischl, S. M. Schauffler, M. Trainer, and F. C. Fehsenfeld, Emissions of SO₂, NO_x, CO₂, and hydrocarbons from industrial sources in Houston measured by the NOAA WP-3. Oral presentation at the EPA 17th International Emission Inventory Conference, Portland, OR, 2008.

Washenfelder, R. A., C. A. Brock, G. J. Frost, J. S. Holloway, J. W. Peischl, T. B. Ryerson, M. Trainer, and F. C. Fehsenfeld, Emissions of SO₂, NO_x, and CO₂ from the Houston Ship Channel measured by the NOAA WP-3. Oral presentation at the AGU Fall Meeting, San Francisco, CA, 2007.

Washenfelder, R. A., Instrumental techniques for detecting atmospheric mercury. Oral presentation for the National Research Council Postdoctoral Fellows, Boulder, CO, 2007.

Washenfelder, R. A., C. A. Brock, G. J. Frost, J. S. Holloway, J. W. Peischl, T. B. Ryerson, M. Trainer, and F. C. Fehsenfeld, Emissions of SO₂, NO_x, and CO₂ from the Houston Ship Channel measured onboard the NOAA WP-3D. Poster at the Principal Findings Data Analysis Workshop – TexAQS II / GoMACCS 2006, Austin, TX, 2007.

Washenfelder, R. A., P. O. Wennberg, A. R. Desai, K. Davis, G. C. Toon, and G. K. Aleks, Regional CO₂ uptake observed by column and eddy-covariance measurements. Oral presentation at the Orbiting Carbon Observatory Science Team Meeting, Pasadena, CA, 2006.

Washenfelder, R. A., G. C. Toon, Z. Yang, G. K. Aleks, P. O. Wennberg, A. R. Desai, D. M. Riccuito, and A. E. Andrews, 2006, Surface exchange of CO₂ observed by column measurements. Poster presentation at the AGU Fall Meeting, San Francisco, CA, 2006.

PROFESSIONAL SERVICE (2006 – Present)

- 2006–2015 Journal reviewer for *Applied Optics*; *Atmospheric Chemistry and Physics*; *Atmospheric Measurement Techniques*; *Chemosphere*; *Environmental Science and Technology*; *Journal of Geophysical Research – Atmospheres*; *Journal of Quantitative Spectroscopy and Radiative Transfer*
- 2006–2014 Proposal reviewer for DOE Small Business Innovation Research; NSF Atmospheric Chemistry; NOAA Climate Program's Global Climate Change Program; NASA ROSES Airborne Instrument Technology Transition
- 2015 Co-chair for 11th International User Meeting and Summer School on Cavity Enhanced Spectroscopy
- 2015 Session chair for American Chemical Society Meeting
- 2012–2015 Review panel member for the Barry M. Goldwater Scholarship Program
- 2014 Review panel member for NASA Carbon Monitoring System.
- 2009 Review panel member for NOAA Climate Program's Global Climate Change Program
- 2009, 2013 Evaluated applications for the Ernest F. Hollings Undergraduate Scholarship Program
- 2008 Evaluated CIRES Graduate Research Fellowship applications for the NOAA Chemical Sciences Division
- 2008 Guest lecturer on Incoherent Broadband Cavity Enhanced Absorption Spectroscopy, University of Colorado, CHEM 5161
- 2007 Session chair for American Geophysical Union Meeting

OUTREACH SERVICE (2006 – Present)

2007–2014 Science judge at Roche Colorado Regional Science Fair

2010 Speaker for Women in the Environmental Industry group

2010 Worked with CIRES to publicize the TexAQS2006 science results with a press release and podcast

2007–2008 Moderator at National Ocean Sciences Bowl