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DEGREES:

June, 1994 Ph.D. in Physical Chemistry, Harvard University, Cambridge, MA

June, 1985 B.A. in Chemistry, Oberlin College, Oberlin, OH.

PROFESSIONAL APPOINTMENTS:

2016 – 2017 Visiting Prof., Dept. of Chem., Copenhagen University, Denmark

2014 – Director, Linde Center for Global Environmental Science, Caltech.

2008 – 2011 Director, Linde Center for Global Environmental Science, Caltech.

2005 Visiting Prof., Dept. of Chem., University of Otago, New Zealand

2005 – 2006 Secretary of the Atmospheric Sciences Section, American Geophysical Union.

2004 – R. Stanton Avery Professor of Atmospheric Chemistry and Environmental Science and Engineering, California Institute of Technology.

2001 – 2004 Professor of Atmospheric Chemistry and Environmental Science and Engineering, California Institute of Technology.

1998 – 2001 Associate Professor of Atmospheric Chemistry and Environmental Engineering Science, California Institute of Technology.

1994 – 1997 Postdoctoral Research Fellow, Department of Chemistry, Harvard University.

HONORS AND AWARDS:

2017 Member, U.S National Academy of Sciences

2013 Fellow, American Geophysical Union

2002 MacArthur Fellow

1999 – 2003 Presidential Early Career Award for Scientists and Engineers (PECASE)

1992 – 1993 Hughes Corp., Graduate Fellowship.

1986 – 1988 National Science Foundation Graduate Fellowship.

LARGE PROJECTS:

2000 – Founding science team member Orbiting Carbon Observatory (OCO, OCO-2)

2002 – Chair and founder, Total Carbon Column Observing Network (TCCON)

2010 – 2012 PI, Mars Atmospheric Trace Molecule Occultation Spectrometer (MATMOS)

PUBLICATIONS:

1. Kurten, T, Moller, KH, Nguyen, TB, *et al.*, “Alkoxy Radical Bond Scissions Explain the Anomalously Low Secondary Organic Aerosol and Organonitrate Yields From alpha-Pinene + NO₃”, *J. Phys. Chem. Lett.*, 8, 2826-2834, 2017.
2. Liu, XX, Huey, LG, Yokelson, RJ, *et al.*, “Airborne measurements of western US wildfire emissions: Comparison with prescribed burning and air quality implications”, *J. Geophys. Res. – Atmos.*, 122, 6108-6129, 2017.
3. Wunch, D, Wennberg, PO, Osterman, G, *et al.*, “Comparisons of the Orbiting Carbon Observatory-2 (OCO-2) X-CO₂ measurements with TCCON”, *Atmos. Meas. Tech.*, 10, 2209-2238, 2017.
4. Turner, AJ, Frankenberg, C, Wennberg, PO, Jacob, DJ, “Ambiguity in the causes for decadal trends in atmospheric methane and hydroxyl”, *Proc. Nat. Acad. Sci.*, 114, 5367-5372, 2017.
5. Hedelius, JK, Parker, H, Wunch, DA, *et al.*, “Intercomparability of X-CO₂ and X-CH₄ from the United States TCCON sites”, *Atmos. Meas. Tech.*, 10, 2017.
6. Teng, AP, Crouse, JD, Wennberg, PO, “Isoprene Peroxy Radical Dynamics”, *J. Am. Chem. Soc.*, 139, 5367-5377, 2017.
7. Schwantes, RH, Schilling, KA, McVay, RC, *et al.*, “Formation of highly oxygenated low-volatility products from cresol oxidation”, *Atmos. Chem. Phys.*, 17, 3453-3474, 2017.
8. Zeng, ZC, Zhang, Q, Natraj, V *et al.*, “Aerosol scattering effects on water vapor retrievals over the Los Angeles Basin”, *Atmos. Chem. Phys.*, 17, 2495-2508, 2017.
9. Eldering, A, O'Dell, CW, Wennberg, PO, *et al.*, “The Orbiting Carbon Observatory-2: first 18 months of science data products”, *Atmos. Meas. Tech.*, 10, 549-563, 2017.
10. Crisp, D, Pollock, HR, Rosenberg, R, *et al.*, “The on-orbit performance of the Orbiting Carbon Observatory-2 (OCO-2) instrument and its radiometrically calibrated products”, *Atmos. Meas. Tech.*, 10, 59-81, 2017.
11. Zeng, ZC, Lei, LP, Strong, K, Jones, DBA, *et al.*, “Global land mapping of satellite-observed CO₂ total columns using spatio-temporal geostatistics”, *Int. J. Dig. Earth*, 10, 426-456, 2017.
12. Dupuy, E, Morino, I, Deutscher, NM, *et al.*, “Comparison of XH₂O retrieved from GOSAT short-wavelength infrared spectra with observations from the TCCON Network”, *Remote Sens.*, 8, 10.3390/rs8120982, 2016.
13. Feiner, PA, Brune, WH, Miller, DO, *et al.*, “Testing atmospheric oxidation in an Alabama forest”, *J. Atmos. Sci.*, 73, 4699-4710, 2016.
14. Wunch, D, Toon, GC, Hedelius, JK, *et al.*, “Quantifying the loss of processed natural gas within California's South Coast Air Basin using long-term measurements of ethane and methane”, *Atmos. Chem. Phys.*, 16, 14091-14105, 2016.
15. Saad, KM, Wunch, D, Deutscher, NM, *et al.*, “Seasonal variability of stratospheric methane: implications for constraining tropospheric methane budgets using total column observations”, *Atmos. Chem. Phys.*, 16, 14003-14024, 2016.
16. Frandsen, BN, Wennberg, PO, Kjaergaard, HG, “Identification of OSSO as a near-UV absorber in the Venusian atmosphere”, *Geophys. Res. Lett.*, 43, 11146-11155, 2016.
17. Travis, KR, Jacob, DJ, Fisher, JA, *et al.*, “Why do models overestimate surface ozone in the Southeast United States?”, *Atmos. Chem. Phys.*, 13561-13577, 2016.
18. St Clair, JM, Rivera-Rios, JC, Crouse, JD, *et al.*, “Investigation of a potential HCHO measurement artifact from ISOPOOH”, *Atmos. Meas. Tech.*, 9, 4561-4568, 2016.
19. Hedelius, JK, Viatte, C, Wunch, D, *et al.*, “Assessment of errors and biases in retrievals of XCO₂, XCH₄, XCO, and XN₂O from a 0.5 cm⁻¹ resolution solar-viewing spectrometer”, *Atmos. Meas. Tech.*, 9, 3527-3546, 2016.
20. Connor, BJ, Sherlock, V, Toon, G, Wunch, D, Wennberg, PO, “GFIT2: an experimental algorithm for vertical profile retrieval from near-IR spectra”, *Atmos. Meas. Tech.*, 9, 3513-3525, 2016.
21. Liu, X, Zhang, Y, Huey, LG, *et al.*, “Agricultural fires in the southeastern US during SEAC4RS: Emissions of trace gases and particles and evolution of ozone, reactive nitrogen,

- and organic aerosol”, *J. Geophys. Res.*, 121, 7383, 2016.
22. Bela, MM, Barth, MC, Toon, O, *et al.*, “Wet scavenging of soluble gases in DC₃ deep convective storms using WRF-chem simulations and aircraft observations”, *J. Geophys. Res.*, 121, 4233, 2016.
 23. Barth, MC, Bela, MM, Fried, A, *et al.*, “Convective transport and scavenging of peroxides by thunderstorms observed over the central US during DC3”, *J. Geophys. Res.*, 121, 4272, 2016.
 24. Nguyen, TB, Tyndall, GS, Crouse, JD, *et al.*, “Atmospheric fate of Criegee intermediates in the ozonolysis of isoprene”, *Phys. Chem. Chem. Phys.*, 18, 10241, 2016.
 25. St. Clair, JM, Rivera-Rios, JC, Crouse, JD, *et al.*, “Kinetics and products of the reaction of first-generation isoprene hydroxy hydroperoxides with OH”, *J. Phys. Chem. A*, 120, 1441, 2016.
 26. Nault, BA, Garland, C, Wooldridge, PJ *et al.*, “Observational constraints on the oxidation of NO_x in the upper troposphere”, *J. Phys. Chem. A*, 120, 1468, 2016.
 27. Cai, C, Kulkarni, S, Zhao, Z, *et al.*, “Simulating reactive nitrogen, carbon monoxide, and ozone in California during ARCTAS-CARB 2008 with high wildfire activity”, *Atmos. Environ.*, 128, 28, 2016.
 28. Jorgensen, S, Knap, HC, Otkjaer, RV, *et al.*, “Rapid hydrogen shift scrambling in hydroperoxy-substituted organic peroxy radicals”, *J. Phys. Chem. A*, 120, 266, 2016.
 29. Bates, KH, Nguyen, TB, Teng, AP, *et al.*, “Production and fate of C₄ dihydroxycarbonyl compounds from isoprene oxidation”, *J. Phys. Chem. A*, 120, 106, 2016.
 30. Brune, WH, Baier, BC, Thomas, J, *et al.* “Ozone production chemistry in the presence of urban plumes”, *Faraday Discuss.*, 189, 169, 2016.
 31. Romer, PS, Duffey, KC, Wooldridge, PJ, *et al.*, “The lifetime of nitrogen oxides in an isoprene-dominated forest”, *Atmos. Chem. Phys.*, 16, 7623, 2016.
 32. Fisher, JA, Jacob, DJ, Travis, KR, *et al.*, “Organic nitrate chemistry and its implications for nitrogen budgets in an isoprene- and monoterpene-rich atmosphere: constraints from aircraft (SEAC4RS) and ground-based (SOAS) observations in the Southeast US”, *Atmos. Chem. Phys.*, 16, 5969, 2016.
 33. McVay, RC, Zhang, X, Aumont, B, *et al.*, “SOA formation from the photooxidation of alpha-pinene: systematic exploration of the simulation of chamber data”, *Atmos. Chem. Phys.*, 16, 2785, 2016.
 34. Kiel, M, Wunch, D, Wennberg, PO, *et al.*, “Improved retrieval of gas abundances from near-infrared spectra measured at the Karlsruhe TCCON station”, *Atmos. Meas. Tech.*, 9, 669, 2016.
 35. Kulawik, S, Wunch, D, O’Dell, C, *et al.*, “Consistent evaluation of ACOS-GOSAT, BESD-SCIAMACHY, CarbonTracker, and MACC through comparisons to TCCON”, *Atmos. Meas. Tech.*, 9, 683, 2016.
 36. Yu, K, Jacob, DJ, Fisher, JA, *et al.*, “Sensitivity to grid resolution in the ability of a chemical transport model to simulate observed oxidant chemistry under high-isoprene conditions”, *Atmos. Chem. Phys.*, 16, 4369, 2015.
 37. Schwantes, RH, Teng, AP, Nguyen, TB, *et al.*, “Isoprene NO₃ oxidation products from the RO₂ + HO₂ pathway”, *J. Phys. Chem. A.*, 119, 10158, 2015.
 38. Krechmer, JE, Coggon, MM, Massoli, P, *et al.*, “Formation of low volatility organic compounds and secondary organic aerosol from isoprene hydroxyhydroperoxide low-NO oxidation”, *Envir. Sci. Tech.*, 49, 10330, 2015.
 39. Barth, MC, Cantrell, CA, Brune, WH, *et al.*, “The deep convective clouds and chemistry (DC3) field campaign”, *Bull. Amer. Meteorol. Soc.*, 96, 1281, 2015.
 40. Buchwitz, M, Reuter, M, Schneising, O, *et al.*, “The greenhouse gas climate change initiative (GHG-CCI): Comparison and quality assessment of near-surface-sensitive satellite-derived CO₂ and CH₄ global data sets”, *Remote Sens. Environ.*, 162, 344, 2015.
 41. Liao, J, Froyd, KD, Murphy, DM, *et al.*, “Airborne measurements of organosulfates over the continental US”, *J. Geophys. Res.*, 120, 2990, 2015.
 42. Apel, EC, Hornbrook, RS, Hills, AJ, *et al.*, “Upper tropospheric ozone production from lightning NO_x-impacted convection: smoke ingestion case study from DC3 campaign”, *J.*

- Geophys. Res.*, 120, 2505, 2015.
43. Ayres, BR, Allen, HM, Draper, DC, *et al.*, “Organic nitrate aerosol formation via NO₃ + biogenic volatile organic compounds in the southeastern United States”, *Atmos. Chem. Phys.*, 15, 13377, 2015.
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 45. Kim, PS, Jacob, DJ, Fisher, JA, *et al.*, “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, 10411, 2015.
 46. Turner, AJ, Jacob, DJ, Wecht, KJ, *et al.*, “Estimating global and North American methane emissions with high spatial resolution using GOSAT satellite data”, *Atmos. Chem. Phys.*, 15, 7049, 2015.
 47. Nguyen, TB, Bates, KH, Crouse, JD, *et al.*, “Mechanism of the hydroxyl radical oxidation of methacryloyl peroxyxynitrate (MPAN) and its pathway towards secondary organic aerosol formation in the atmosphere”, *Phys. Chem. Chem. Phys.*, 17, 17914, 2015.
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 49. Praske, E, Crouse, JD, Bates, KH, Kurten, T, Kjaergaard, HG, Wennberg, PO, “Atmospheric Fate of Methyl Vinyl Ketone: Peroxy Radical Reactions with NO and HO₂”, *J. Phys. Chem. A*, 119, 4562, 2015.
 50. Nguyen, TB, Crouse, JD, Teng, AP, St. Clair, JM, Paulot, F, Wolfe, GM, Wennberg, PO, “Rapid Deposition of Oxidized Biogenic Compounds to a Temperate Forest”, *Proc. Nat. Acad.*, 112, E392, 2015.
 51. Frankenberg, C, Pollock, R, Lee, RAM, Rosenberg, R, Blavier, JF, Crisp, D, O'Dell, CW, Osterman, GB, Roehl, C, Wennberg, PO, Wunch, D, “The Orbiting Carbon Observatory (OCO-2): Spectrometer Performance Evaluation using Pre-launch Direct Sun Measurements”, *Atmos. Meas. Tech.*, 8, 301, 2015.
 52. Rivera-Rios, JC, Nguyen, TB, Crouse, JD, Jud, W, St Clair, JM, Mikoviny, T, Gilman, JB, Lerner, BM, Kaiser, JB, de Gouw, J, Wisthaler, A, Hansel, A, Wennberg, PO, Seinfeld, JH, Keutsch, FN, “Conversion of Hydroperoxides to Carbonyls in Field and Laboratory Instrumentation: Observational Bias in Diagnosing Pristine Versus Anthropogenically Controlled Atmospheric Chemistry”, *Geophys. Res. Lett.*, 41, 8645, 2014.
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 54. Nguyen, TB, Crouse, JD, Schwantes, RH, Teng, AP, Bates, KH, Zhang, X, St Clair, JM, Brune, WH, Tyndall, GS, Keutsch, FN, Seinfeld, JH, Wennberg, PO, “Overview of the Focused Isoprene eXperiment at the California Institute of Technology (FIXCIT): Mechanistic Chamber Studies on the Oxidation of Biogenic Compounds”, *Atmos. Chem. Phys.*, 14, 13531, 2014.
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 56. Lee, L, Teng, AP, Wennberg, PO, Crouse, JD, Cohen, RC, “On Rates and Mechanisms of OH and O₃ Reactions with Isoprene-Derived Hydroxy Nitrates”, *J. Phys. Chem. A*, 118, 1622, 2014.
 57. Bates, KH, Crouse, JD, St Clair, JM, Bennett, NB, Nguyen, TB, Seinfeld, JH, Stoltz, BM, Wennberg, PO, “Gas Phase Production and Loss of Isoprene Epoxydiols”, *J. Phys. Chem. A*, 118, 1237, 2014.
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59. Gentner, DR, Ford, TB, Guha, A, Boulanger, K, Brioude, J, Angevine, WM, de Gouw, JA, Warneke, C, Gilman, JB, Ryerson, TB, Peischl, J, Meinardi, S, Blake, DR, Atlas, E, Lonneman, WA, Kleindienst, TE, Beaver, MR, St Clair, JM, Wennberg, PO, VandenBoer, TC, Markovic, MZ, Murphy, JG, Harley, RA, Goldstein, AH, "Emissions of organic carbon and methane from petroleum and dairy operations in California's San Joaquin Valley", *Atmos. Chem. Phys.*, 14, 4955-4978, 2014.
60. St Clair, JM, Spencer, KM, Beaver, MR, Crouse, JD, Paulot, F, Wennberg, PO, "Quantification of hydroxyacetone and glycolaldehyde using chemical ionization mass spectrometry", *Atmos. Chem. Phys.*, 14, 4251-4262, 2014.
61. Galli, A, Guerlet, S, Butz, A, Aben, I, Suto, H, Kuze, A, Deutscher, NM, Notholt, J, Wunch, D, Wennberg, PO, Griffith, DWT, Hasekamp, O, Landgraf, J, "The impact of spectral resolution on satellite retrieval accuracy of CO₂ and CH₄", *Atmos. Meas. Tech.*, 7, 1105-1119, 2014.
62. Pusede, SE, Gentner, DR, Wooldridge, PJ, Browne, EC, Rollins, AW, Min, KE, Russell, AR, Thomas, J, Zhang, L, Brune, WH, Henry, SB, DiGangi, JP, Keutsch, FN, Harrold, SA, Thornton, JA, Beaver, MR, St Clair, JM, Wennberg, PO, Sanders, J, Ren, X, VandenBoer, TC, Markovic, MZ, Guha, A, Weber, R, Goldstein, AH, Cohen, RC, "On the temperature dependence of organic reactivity, nitrogen oxides, ozone production, and the impact of emission controls in San Joaquin Valley, California", *Atmos. Meas. Tech.*, 14, 3373-3395, 2014.
63. Nguyen, TB, Coggon, MM, Bates, KH, Zhang, X, Schwantes, RH, Schilling, KA, Loza, CL, Flagan, RC, Wennberg, PO, Seinfeld, JH, "Organic aerosol formation from the reactive uptake of isoprene epoxydiols (IEPOX) onto non-acidified inorganic seeds", *Atmos. Chem. Phys.*, 14, 3497-3510, 2014.
64. Deng, F, Jones, DBA, Henze, DK, Bousserez, N, Bowman, KW, Fisher, JB, Nassar, R, O'Dell, C, Wunch, D, Wennberg, PO, Kort, EA, Wofsy, SC, Blumenstock, T, Deutscher, NM, Griffith, DWT, Hase, F, Heikkinen, P, Sherlock, V, Strong, K, Sussmann, R, Warneke, T, "Inferring regional sources and sinks of atmospheric CO₂ from GOSAT XCO₂ data", *Atmos. Chem. Phys.*, 14, 3703-3727, 2014.
65. Crouse, JD, Nielsen, LB, Jorgensen, S, Kjaergaard, HG, Wennberg, PO, "Autoxidation of Organic Compounds in the Atmosphere", *J. Phys. Chem. Lett.*, 7, 3513-3520, 2013.
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