

## Eric A. Kort

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### *Education*

Ph.D., Applied Physics, Harvard University, Cambridge, MA, 2011  
S.M., Applied Physics, Harvard University, Cambridge, MA, 2005  
B.A., Physics (with Honors), minor Mathematics, Pomona College, Claremont, CA, 2004

### *Research Experience*

*W. M. Keck Institute for Space Studies Postdoctoral Fellow*, JPL, Caltech, 2011-present  
Research Topic: Urban greenhouse gas emissions.

*Postdoctoral Fellow*, Prof. Steven C. Wofsy, Harvard University, 2011

*Graduate Research*, Prof. Steven C. Wofsy, Harvard University, 2006-2011

Research Topics: Laser spectroscopy instrument development and deployment for aircraft based measurements of carbon cycle gases. Regional to global scale observations, modeling, and inverse analysis of non-CO<sub>2</sub> greenhouse gases.

*Graduate Research*, Profs. Kenneth B. Crozier & Federico Capasso, Harvard University, 2005-2006  
Research Topic: Development of plasmonic laser antenna.

*Research Assistant*, Dr. Riccardo DeSalvo & Prof. William Johnson, Caltech, 2002-2003

Research Topic: Amorphous metal development for low-noise mirror supports, part of Laser Interferometer Gravitational-Wave Observatory (LIGO) project.

### *Honors and Awards*

W.M. Keck Institute for Space Studies Postdoctoral Fellowship, 2011  
National Center for Atmospheric Research Advanced Study Program Postdoctoral Fellowship (Declined), 2011  
Outstanding Student Paper Award, Fall Meeting, AGU, 2010  
National Defense Science and Engineering Graduate (NDSEG) Fellowship, 2007-2010  
Edmunds Physics Prize, Pomona College, 2004  
Tileston Physics Prize, Pomona College, 2003

### *Service & Synergistic Activities*

Aircraft Campaigns: START08, Broomfield, CO, Spring 2008  
HIPPO-1, Pole to Pole, Winter 2009  
HIPPO-2, Pole to Pole, Fall 2009  
HIPPO-3, Pole to Pole, Spring 2010  
CALNEX, Ontario, CA, Spring 2010  
HIPPO-4, Pole to Pole, Spring-Summer 2011  
HIPPO-5, Pole to Pole, Summer-Fall 2011  
Responsibilities included: participation in flight planning and operation of Li-Cor based CO<sub>2</sub> instrument (HIPPO); operation of QCLS (all, primary HIPPO-2,3 & CALNEX); ground calibrations (all); logistics, data processing, and training of new personnel (HIPPO, CALNEX)

Peer reviewer for *Atmospheric Chemistry and Physics*, *Journal of Geophysical Research*, and *Environmental Science and Technology*

American Geophysical Union member

*NACP Non-CO<sub>2</sub> Greenhouse Gas Synthesis Workshop*, Boulder, CO, Fall 2008

*Wetland Workshop*, Wageningen, The Netherlands, Summer 2009

*Geostatistical Inverse Modeling Workshop*, Ann Arbor, MI, Summer 2009

*HIPPO Science Team Meeting*, Boulder, CO, Spring 2011, 2012

*Megacity CO<sub>2</sub>*, Los Angeles & Paris, Spring 2011

*CARVE Science Team Meeting*, JPL, Pasadena, CA Winter 2012

*Megacity Carbon workshop*, Caltech, Pasadena, CA Spring 2012

### *Teaching Experience*

*Teaching Fellow*, Science A-30 (The Atmosphere), Prof. Steven Wofsy, Harvard University, 2008

*Teaching Fellow*, Physics 11b (Electricity & Magnetism), Prof. Eric Mazur, Harvard University, 2006

### *Publications*

19. Worden J, Wecht K, Frankenberg C, Alvarado M, Bowman K, Kort E, Kulawik S, Lee M, Payne V, Worden H, *CH<sub>4</sub> and CO distributions over tropical fires as observed by the Aura TES satellite instrument and modeled by GOES-Chem*, *Atmos. Chem. Phys. Disc.*, 12, 26207-26243, 2012.
18. Kort EA, Angevine W, Duren R, Miller CE, *Surface observations for monitoring megacity greenhouse gas emissions: minimum requirements for the Los Angeles megacity*, under review
17. Xiang B, Miller SM, Kort EA, Santoni GW, Daube BC, Commane R, Pittman JV, Angevine W, Ryerson T, Trainer M, Andrews AE, Nehrkorn T, and Wofsy SC, *Nitrous Oxide (N<sub>2</sub>O) Emissions from California based on 2010 CalNex Airborne Measurements*, under review
16. Tian H, Lu C, Guangsheng C, Tao B, Pan S, Del Gross SJ, Xu X, Bruhwiler L, Wofsy SC, Kort EA, and Prior SA, *Contemporary and projected terrestrial methane and nitrous oxide budgets in North America*, National Climate Assessment Biogeochemistry Special Issue, *Frontiers in Ecology and the Environment*, accepted.
15. Kort EA, Frankenberg C, Miller CE, and Oda T, *Space-based Observations of Megacity Carbon Dioxide*, *Geophysical Research Letters*, Vol. 39, L17806, doi: 10.1029/2012GL052738, 2012.
14. Wennberg PO, Mui W, Wunch D, Kort EA, Blake DR, Atlas EL, Santoni GW, Wofsy SC, Diskin GS, Jeong S, and Fischer ML, *On the Sources of Methane to the Los Angeles Atmosphere*, *Environmental Science and Technology*, 46 (17), pp 9282-9289, doi: 10.1021/es301138y, 2012.
13. Kort EA, Wofsy SC, Daube BC, Diao M, Elkins JW, Gao RS, Hintsa EJ, Hurst DF, Jimenez R, Moore FL, Spackman JR, and Zondlo MA, *Atmospheric observations of high latitude Arctic Ocean methane emissions up to 82°north*, *Nature Geoscience*, 5, 318-321, doi:10.1038/ngeo1452, 2012.
12. Miller SM, Kort EA, Hirsch AI, Dlugokencky EJ, Andrews AE, Xu X, Tian H, Nehrkorn T, Eluszkiewicz J, Michalak AM, and Wofsy SC, *Regional sources of nitrous oxide over the United*

*States: seasonal variation and spatial distribution*, J. Geophys. Res., 117, D06310, doi:10.1029/2011JD016951, 2012.

11. Newman S, Jeong S, Fischer ML, Xu X, Haman CL, Lefer B, Alvarez S, Rappenglueck B, Kort EA, Andrews AE, Peischl J, Gurney KR, Miller CE, and Yung YL, *Diurnal tracking of anthropogenic CO<sub>2</sub> emissions in the Los Angeles basin mega-city during spring, 2010*, Atmos. Chem. Phys. Disc., 12, 5771-5801, 2012.
10. Pollack IB, Ryerson TB, Trainer M, Parrish DD, Andrews AE, Atlas EL, Blake DR, Brown SS, Commane R, Daube BC, de Gouw JA, Dube WP, Flynn J, Frost GJ, Gilman JB, Grossberg N, Holloway JS, Kofler J, Kort EA, Kuster WC, Lang PM, Lefer B, Lueb RA, Neuman JA, Nowak JB, Novelli PC, Peischl J, Perring AE, Roberts JM, Santoni G, Schwarz JP, Spackman JR, Wagner NL, Warneke C, Wofsy SC, and Xiang B, *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., 117, D00V05, doi:10.1029/2011JD016772, 2012.
9. Wecht KJ, Jacob DJ, Wofsy SC, Kort EA, Worden JR, Kulawik SS, Henze DK, Kopacz M, and Payne VH, *Validation of TES methane with HIPPO aircraft observations: implications for inverse modeling of methane sources*, Atmos. Chem. Phys., 12, 182301832, 2012.
8. Kort EA, Patra PK, Ishijima K, Daube BC, Jiménez R, Elkins J, Hurst D, Moore FL, Sweeney C, and Wofsy SC, *Tropospheric distribution and variability of N<sub>2</sub>O: Evidence for strong tropical emissions*, Geophysical Research Letters, Vol. 38, L15806, doi:10.1029/2011GL047612, 2011.
7. Wofsy SC, & HIPPO team, *HIAPER Pole-to-Pole Observations (HIPPO): Fine grained, global scale measurements for determining rates for transport, surface emissions, and removal of climatically important atmospheric gases and aerosols*, Phil. Trans. of the Royal Society A, 369(1943), 2073-2086, 2011.
6. Pickett-Heaps CA, Jacob DJ, Wecht KJ, Kort EA, Wofsy SC, Diskin GS, Worthy DEJ, Kaplan JO, Bey I, and Drevet J: *Magnitude and seasonality of wetland methane emissions from the Hudson Bay Lowlands (Canada)*, Atmos. Chem. Phys., 11, 3773-3779, doi:10.5194/acp-11-3773-2011, 2011.
5. Wunch D, Toon GC, Wennberg PO, Wofsy SC, Stephens BB, Fischer ML, Uchino O, Abshire JB, Bernath P, Biraud SC, Blavier JFL, Boone C, Bowman KP, Browell EV, Campos T, Connor BJ, Daube BC, Deutscher NM, Diao M, Elkins JW, Gerbig C, Gottlieb E, Griffith DWT, Hurst DF, Jimenez R, Keppel-Aleks, Kort EA, Macatangay R, Machida T, Matsueda H, Moore F, Morino I, Park S, Robinson J, Roehl CM, Sawa Y, Sherlock V, Sweeney C, Tanaka T, Zondlo MA, *Calibration of the Total Carbon Column Observing Network using aircraft profile data*, Atmos. Meas. Tech., 3, 1351-1362 doi: 10.5194/amt-3-1351-2010, 2010.
4. Kort EA, Andrews AE, Dlugokencky EJ, Sweeney C, Hirsch, A, Eluszkiewicz J, Nehrkorn T, Michalak AM, Stephens BB, Gerbig C, Miller JB, Kaplan J, Houweling S, Daube BC, Tans PP, Wofsy SC, *Atmospheric constraints on 2004 emissions of methane and nitrous oxide in North America from atmospheric measurements and a receptor-oriented modeling framework*, Journal of Integrative Environmental Sciences, 7: 2, 125-133, doi:10.1080/19438151003767483, 2010.

3. Zahniser MS, Nelson DD, McManus JB, Herndon S, Wood E, Shorter JH, Lee BW, Santoni GH, Jimenez R, Daube BC, Park S, Kort EA, Wofsy SC, *Infrared QC laser applications to field measurements of atmospheric trace gas sources and sinks in environmental research: enhanced capabilities using continuous wave QCLs*, SPIE, Vol. 7222, doi:10.1117/12.815172, 2009.
2. Kort EA, Eluszkiewicz J, Stephens BB, Miller JB, Gerbig C, Nehrkorn T, Daube BC, Kaplan JO, Houweling S, Wofsy SC, *Emissions of CH<sub>4</sub> and N<sub>2</sub>O over the United States and Canada based on a receptor-oriented modeling framework and COBRA-NA atmospheric observations*, Geophysical Research Letters, Vol. 35, L18808, doi:10.1029/2008GL034031, 2008.
1. Cubukcu E, Kort EA, Crozier KB, Capasso F, *Plasmonic laser antenna*, Applied Physics Letters, 89, 093120, 2006.

*Presentations & Posters (\*invited)*

\*Kort EA, *From Pole-to-Pole Flights to Megacity Observatories: Observing & quantifying greenhouse gas emissions*, Pomona College Physics Colloquia, 2012

Kort EA, Frankenberg C, Miller CE, *Space-based Observations of Megacity Carbon Dioxide*, IWGGMS8, Caltech, 2012

\*Kort EA, *Arctic methane, tropical nitrous oxide, and megacity carbon dioxide: linking atmospheric observations to emissions*, UC Irvine, 2012

\*Kort EA, *Arctic methane and Megacity carbon dioxide: surprises, suggestions, and consilience?*, UCLA, 2012

Kort EA, *Urban CO<sub>2</sub> and CH<sub>4</sub> source attribution and network sensitivity*, Megacities Carbon Project workshop, Caltech, Pasadena, CA 2012

Kort EA, *Estimating emissions trends from Atmospheric Concentrations*, Megacities Carbon Project workshop, Caltech, Pasadena, CA 2012

Kort EA, Miller CE, Duren R, Eldering A, Sander S, Newman S, *Megacity Carbon: Observing system study for tracking Los Angeles greenhouse gas emission trends*, EGU Meeting, Vienna, Austria, 2012

Kort EA, *Arctic methane: that which comes from the sea*, HIPPO Science Team Meeting, Boulder, CO, 2012

\*Kort EA, *Tracking anthropogenic emissions in megacities: ground-based network design and space-based observations*, ESE & Society discussion group, Caltech, Pasadena, CA, 2012

Kort EA, Miller CE, Duren R, Eldering A, Sander S, Newman S, *Megacity Carbon: Initial network design for Los Angeles*, AGU Fall Meeting, San Francisco, CA, 2011

\*Kort EA, *Pole to pole observations of greenhouse gases: surprises in methane and nitrous oxide*, Yuk's Lunch Seminar, Caltech, Pasadena, CA, 2011

Kort EA, *High-resolution Inverse Modeling for LA, Monitoring CO<sub>2</sub> in Megacities: Paris – Los Angeles workshop*, Paris, France, 2011

Kort EA, *Atmospheric observations and emissions estimates of methane and nitrous oxide from regional to global scale*, Harvard University, Cambridge, MA, 2011

Kort EA, *Non-CO<sub>2</sub> inter-instrument comparisons*, HIPPO science team meeting, Boulder, CO 2011

Kort EA, *Tropical N<sub>2</sub>O, Arctic CH<sub>4</sub>, and future TRANSCOM comparisons*, HIPPO science team meeting, Boulder, CO 2011

Kort EA, *Harvard QCLS instrument*, HIPPO science team meeting, Boulder, CO 2011

\*Kort EA, *Non-CO<sub>2</sub> Greenhouse Gases: atmospheric observations and emissions estimates from regional to global scale*, Jet Propulsion Laboratory, Pasadena, CA, 2011

Kort EA, Daube BC, Ishijima K, Patra P, Jimenez R, Wofsy SC, *Global distributions of nitrous oxide and implications for emissions: Measurements from the HIPPO (HIAPER Pole to Pole Observations) campaign and comparisons to a global model*, AGU Fall Meeting, San Francisco, CA, 2010 (poster)

Kort EA, *Regional to global scale inversions on non-CO<sub>2</sub> greenhouse gases*, TRANSCOM, LBNL, Berkeley, CA, 2010

\*Kort EA, *Non-CO<sub>2</sub> greenhouse gases from regional to global scale: Atmospheric observations and implications for emissions*, JAMSTEC, Yokohama, Japan, 2010

Kort EA, Miller S, Havice T, Sweeney C, Andrews AE, Dlugokencky EJ, Tans PP, Hirsch A, Worth D, Eluszkiewicz J, Nehrkorn T, Michalak AM, Tian H, Wofsy SC, *Spatial and Temporal Distributions of Methane and Nitrous Oxide Emissions in North America*, NASA Terrestrial Ecology Science Team Meeting, La Jolla, CA, 2010 (poster)

Kort EA, Sweeney C, Andrews AE, Dlugokencky EJ, Tans PP, Hirsch A, Eluszkiewicz J, Nehrkorn T, Michalak AM, Wofsy SC, *Do aircraft-based atmospheric observations indicate that anthropogenic methane emissions in the United States are larger than reported?*, AGU Fall Meeting, San Francisco, CA, 2009 (poster)

Kort EA, Daube BC, Wofsy SC, Andrews A, Hirsch A, Sweeney C, Dlugokencky E, Miller J, Tans P, Eluszkiewicz J, Nehrkorn T, Michalak A, Stephens B, Gerbig C, Kaplan J, Houweling S, *Atmospheric constraints on emissions of methane and nitrous oxide in North America from atmospheric measurements and a receptor-oriented modeling framework*, NCGG5, Wageningen, The Netherlands, 2009

Kort EA, *Methane and Nitrous Oxide in North America: Using an LPDM to Constrain Emissions*, Non-CO<sub>2</sub> Greenhouse Gas Synthesis Workshop, Boulder, CO, 2008

\*Kort EA, Eluszkiewicz J, Stephens BB, Miller JB, Gerbig C, Nehrkorn T, Daube BC, Kaplan JO, Houweling S, Wofsy SC, *Atmospheric constraints on emissions of Methane and Nitrous Oxide in North America*, Ameriflux, Boulder, CO, 2008