Lea Hildebrandt Ruiz

Assistant Professor

The University of Texas at Austin, McKetta Department of Chemical Engineering
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ACADEMIC APPOINTMENTS

THE UNIVERSITY OF TEXAS AT AUSTIN
- Assistant Professor, Department of Chemical Engineering 2012 – present
- Assistant Professor, Center for Energy and Environmental Resources 2012 – present

OTHER APPOINTMENTS

NATIONAL CENTER FOR ATMOSPHERIC RESEARCH
- Postdoctoral Research Fellow, Atmospheric Chemistry Division 2011 – 2012

EDUCATION

CARNEGIE MELLON UNIVERSITY
Ph.D. in Chemical Engineering and in Engineering and Public Policy 2011
- Advisors: Spyros N. Pandis and Neil M. Donahue
- Dissertation title:
  "Atmospheric Organic Particulate Matter: Measurements, Models and Mitigation."

CALIFORNIA INSITUTE OF TECHNOLOGY
Bachelor of Science in Chemical Engineering (Environmental) 2006

SELECTED HONORS AND AWARDS

- CAREER Award, U.S. National Science Foundation 2017 – 2022
- Participation in Atmospheric Chemistry Colloquium for Emerging Senior Scientists 2011
- Atmospheric and Geospace Sciences Postdoctoral Research Fellowship 2011 – 2012
  U.S. National Science Foundation
- STAR ("Science to Achieve Results") Graduate Research Fellowship, 2010 – 2011
  U.S. Environmental Protection Agency
- Heinz Scholars for Environmental Research Doctoral Dissertation Support, 2010 – 2011
  The Teresa and H. John Heinz III Foundation
- Graduate Research Fellowship, U.S. National Science Foundation 2006 – 2009

ADVISING AND COMMITTEE SERVICE

Ph.D. advisor of (current):

- Dongyu Wang, Chemical Engineering *(sole advisor)* Fall 2013 – current
  - candidacy 12/2015
- Surya Dhulipala, Chemical Engineering *(sole advisor)* Spring 2014 – current
  - candidacy 04/2016
- Sahil Bhandari, Chemical Engineering *(sole advisor)* Fall 2015 – current

Ph.D. advisor of (past):

- Jeffrey Bean, Chemical Engineering *(sole advisor)* 2012 – 2016
  currently at Phillips 66 (Associate Engineer in the Air Research group)
- Cameron Faxon, Chemical Engineering *(co-advisor)* 2012 – 2014
  currently a postdoctoral fellow at University of Gothenburg, Sweden

Postdoctoral advisor of (past):

- Puneet Chhabra, Chemical Engineering *(sole advisor)* 2014 – 2015
  currently Senior Engineer at PerkinElmer

Ph.D. committee member (but not advisor) of (current):

- Matthew Beaudry, Chemical Engineering (advisor: Gary Rochelle)
- Yue Zhang, Chemical Engineering (advisor: Gary Rochelle)
- Juan Camilo Gonzales (advisor: Lydia Contreras)
- Sarah Seraj (advisor: Joshua Apte)
- Shahzad Gani (advisor: Joshua Apte)
- Felipe Cardoso Saldana (advisor: David Allen)

Ph.D. committee member (but not advisor) of (past):

- Adam Pacsi, Chemical Engineering (advisor: David Allen)
- Daniel Zavala, Chemical Engineering (advisor: David Allen)
- Brandon Boor, Civil, Architectural and Environmental Engineering (advisor: Atila Novoselac)
- Ling Huang, Chemical Engineering (advisor: David Allen)
- Wen Liao, Chemical Engineering (advisor: John Ekerdt)
- Steven Fulk, Chemical Engineering (advisor: Gary Rochelle)

UNDERGRADUATE ADVISING

Undergraduate Research advisor of:

- Prapul Pingali, Chemical Engineering 2017 – current
- Jorge Barrera, Chemical Engineering 2016 – current
- Do Young Maeng, Chemical Engineering 2015 – current
- Janani Ramachandran, Chemical Engineering 2015 – current
- Erin Formby, Chemical Engineering 2013
- Michelle Garnadi, Chemical Engineering 2013

- Marco Heredia, Chemical Engineering 2013
- Mark Goldman, Chemical Engineering (second reader on Thesis) 2012 – 2013

TEACHING EXPERIENCE

THE UNIVERSITY OF TEXAS AT AUSTIN 2012 – current

Numerical Methods in Chemical Engineering and Problem Solving (ChE 348)

- Fall 2012 enrollment: 35; overall instructor rating: 4.1; overall course rating: 3.6
  (A peer teaching evaluation was completed by Dr. Venkat Ganesan and is on file)
- Spring 2013 enrollment: 37; overall instructor rating: 4.0; overall course rating: 3.7
- Spring 2015 enrollment: 80; overall instructor rating: 3.8; overall course rating: 3.6
- Spring 2016 enrollment: 46; overall instructor rating: 3.8; overall course rating: 3.6
  (A peer teaching evaluation was completed by Dr. Venkat Ganesan and is on file)
- Spring 2017 enrollment: 126; overall instructor rating: 3.4; overall course rating: 3.2
  (A peer teaching evaluation was completed by Dr. Roger Bonnecaze)

Atmospheric Physicochemical Processes (ChE 379/384)

- Fall 2014 enrollment: 11 (graduate, ChE 384), 2 (undergraduate, ChE 379)
  overall instructor rating: 4.1 ; overall course rating: 4.0
  (A peer teaching evaluation was completed by Dr. David Allen and is on file.)
- Fall 2015 enrollment: 4 (graduate, ChE 384), 1 (undergraduate, ChE 379)
  overall instructor rating: 4.7 ; overall course rating: 4.3
  (A peer teaching evaluation was completed by Dr. Kerry McKinney.)

SERVICE TO THE UNIVERSITY OF TEXAS AT AUSTIN

CENTER FOR ENERGY AND ENVIRONMENTAL RESOURCES

- Organizer of weekly air quality group seminar 2013 – current
- Organizer of workshop for Texas air quality researchers 2015 – current
  (attended by 80 researchers in 2015)

COCKRELL SCHOOL OF ENGINEERING

- Women in Engineering Program Committee member 2013 – 2016
- Research Symposium and Honors Colloquium Presenter 2013

MC KETTA DEPARTMENT OF CHEMICAL ENGINEERING

- ABET Outcomes Evaluation Committee (OEC) Chair 2013 – current
  (OEC 1 – criteria a, b and c)
- Computing Committee Chair 2015 – 2016
- Curriculum Committee 2014 – 2015
- Ph.D. Qualifying Exam Committee Member (Kinetics) 2013 – 2016
- Seminar Speaker Selection Committee 2013 – 2017

SELECTED PROFESSIONAL SERVICE

AMERICAN ASSOCIATION FOR AEROSOL RESEARCH

- Atmospheric Chemistry Working Group Chair 2012 – 2014
- Education Committee 2014 – present
- Tutorial Chair 2016 – present

Reviewer of the following international journals: American Institute of Chemical Engineers Journal, Atmospheric Chemistry and Physics, Atmospheric Environment, Atmospheric Measurement Techniques, Environmental Science and Technology, Geophysical Research Letters, Journal of Geophysical Research – Atmospheres, Scientific Reports

Reviewer of proposals submitted to the United States Environmental Protection Agency and the National Oceanographic and Atmospheric Administration

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
Member of working groups to develop a science synthesis report: Atmospheric impacts of oil and gas developments in Texas. Available at: https://www.tceq.texas.gov/assets/public/implementation/air/am/contracts/reports/oth/582166321516-20170629-environ-oilgas_impact_aq_synthesis.pdf

2016 - 2017

INVITED LECTURES

TEXAS A&M UNIVERSITY
Department of Atmospheric Sciences March 6, 2012
"Formation and Transformation of Atmospheric Particulate Matter: Measurements and Models"

UNIVERSITY OF COLORADO, BOULDER
Cooperative Institute for Research in Environmental Sciences March 16, 2015
"Tropospheric Reactive Chlorine: Observations, Sources and Effects"

PROFICIENCIES

COMPUTER SKILLS

- Applications: Igor Pro, Matlab and Microsoft Office

LANGUAGES

- Native proficiency in reading, writing and speaking German
- Bilingual proficiency in reading, writing and speaking English
- Professional working proficiency in reading, writing and speaking Spanish

PUBLICATIONS

Publications in peer-reviewed scientific journals

Summary: Researcher ID A-4236-2010, h-index = 16, g-index = 27
http://www.researcherid.com/rid/A-4236-2010

27. Y. J. Leong, N. P. Sanchez, H. W. Wallace, B. Karakurt Cevik, C. S. Hernandez, Y. Han, J. H. Flynn, P. Massoli, C. Floerchinger, E. C. Fortner, S. Herndon, J. K. Bean**, L. Hildebrandt Ruiz**, W. Jeon, Y. Choi, B. Lefer, R. J. Griffin: Overview of Surface Measurements and Spatial Characterization of Submicron Particulate Matter during the DISCOVER-AQ 2013 Campaign in Houston, *The Journal of the Air & Waste Management Association* 67, 8, 854-872, 2017.

26. A. Kiendler-Scharr, A. A. Mensah, E. Friese, D. Topping, E. Nemitz, A. S. H. Prevot, M. Äijälä, J. Allan, F. Canonaco, M. Canagaratna, S. Carbone, M. Crippa, M. Dall Osto, D. A. Day, P. De Carlo, C.F. Di Marco, H. Elbern, A. Eriksson, E.Freney, L. Hao, H. Herrmann, **L. Hildebrandt**, R. Hillamo, J. L. Jimenez, A. Laaksonen, G. McFiggans, C. Mohr, C. O'Dowd, R. Otjes, J. Ovadnevaite, S. N. Pandis, L. Poulain, P. Schlag, K. Sellegri, E. Swietlicki, P. Tiitta, A. Vermeulen, A. Wahner, D. Worsnop, and H.-C. Wu: Organic nitrates from night-time chemistry are ubiquitous in the European submicron aerosol, *Geophysical Research Letters*, **43**, 14, 7735-7744, 2016.

25. J.K. Bean, C.B. Faxon, Y.J. Leong, H.W. Wallace, B.K. Cevik, S. Ortiz, M.R. Canagaratna, S. Usenko, R. Sheesley, R.J. Griffin, and **L. Hildebrandt Ruiz**: Composition and Sources of Particulate Matter Measured near Houston, TX: Anthropogenic-Biogenic Interactions, *Atmosphere*, **7**, 73, 2016

24. J.K. Bean and **L. Hildebrandt Ruiz**. Hydrolysis and Gas-particle Partitioning of Organic Nitrates Formed from the Oxidation of α-Pinene in Environmental Chamber Experiments. *Atmospheric Chemistry and Physics*, 2175–2184, **16**, 2016.

23. A. Paciga, E. Karnezi, E. Kostenidou, **L. Hildebrandt**, M. Psichoudaki, G. J. Engelhart, B. H. Lee, M. Crippa, A. S. H. Prevot, U. Baltensperger, and S. N. Pandis. Volatility of organic aerosol and its components in the Megacity of Paris. *Atmospheric Chemistry and Physics*, 2013-2023, **16**, 2016.

22. C. B. Faxon, J. K. Bean and **L. Hildebrandt Ruiz**. Inland Concentrations of Cl_2 and $ClNO_2$ in Southeast Texas Suggest Chlorine Chemistry Significantly Contributes to Atmospheric Reactivity, *Atmosphere,* **6**, 1487-1506, 2015.

21. M. Pikridas, J. Sciare, F. Freutel, S. Crumeyrolle, S.-L. von der Weiden-Reinmüller, A. Borbon, A. Schwarzenboeck, M. Merkel, M. Crippa, E. Kostenidou, M. Psichoudaki, **L. Hildebrandt**, G. J. Engelhart, T. Petäjä, A. S. H. Prévôt, F. Drewnick, U. Baltensperger, A. Wiedensohler, M. Kulmala, M. Beekmann, and S. N. Pandis. In situ formation and spatial variability of particle number concentration in a European megacity. *Atmospheric Chemistry and Physics*, **15**, 10219 - 10237, 2015.

20. **L. Hildebrandt Ruiz**, A.L. Paciga, K. Cerully, A. Nenes, N.M. Donahue and S.N. Pandis. Formation and Aging of Secondary Organic Aerosol from Toluene: Changes in Chemical Composition, Volatility and Hygroscopicity, *Atmospheric Chemistry and Physics*, **15**, 8301-8313, 2015.

19. B. Zhao, S. Wang, N. M. Donahue, W. Chuang, **L. Hildebrandt Ruiz**, N. L. Ng, Y. Wang, J. Hao. Evaluation of one-dimensional and two-dimensional volatility basis sets in simulating the aging of secondary organic aerosol with smog chamber experiments, *Environmental Science and Technology*, **49** (4), 2245-2254, 2015.

18. M. R. Canagaratna, J. L. Jimenez, J. H. Kroll, Q. Chen, S. H. Kessler, P. Massoli, **L. Hildebrandt Ruiz**, E. Fortner, L. R. Williams, K. R. Wilson, J. D. Surratt, N. M. Donahue, J. T. Jayne, and D. R. Worsnop. Elemental Ratio Measurements of Organic Compounds using Aerosol Mass Spectrometry: Characterization, Improved Calibration, and Implications. *Atmospheric Chemistry and Physics* **15**, 253-272, 2015.

17. M. Crippa, F. Canonaco, V. A. Lanz, M. Äijälä, J. D. Allan, S. Carbone, G, Capes, M. Dall'Osto, D. A. Day, P. F. DeCarlo, M. Ehn, A. Eriksson, E. Freney, **L. Hildebrandt Ruiz**, R. Hillamo, J.-L. Jimenez, H. Junninen, A. Kiendler-Scharr, A.-M. Kortelainen, M. Kulmala, A. A. Mensah, C. Mohr, E. Nemitz, C. O'Dowd, J. Ovadnevaite, S. N. Pandis, T. Petäjä, L. Poulain, S. Saarikoski, K. Sellegri, E. Swietlicki, P. Tiitta, D. R. Worsnop, U. Baltensperger, A. S. H. Prévôt. Compilation of organic aerosol components for 25 AMS datasets across Europe using a newly developed ME-2 based source apportionment strategy. *Atmospheric Chemistry and Physics*, **14**, 6159–6176, 2014.

16. T. Yli-Juuti, K. Barsanti, **L. Hildebrandt Ruiz**, A.-J. Kieloaho, U. Makkonen, T. Petäjä, M. Kulmala and I. Riipinen. Model for acid-base chemistry in nanoparticle growth. *Atmospheric Chemistry and Physics*, **13**, 12507 - 12524, 2013

15. M. R. Pennington, B. R. Bzdek, J. W. DePalma, J. N. Smith, A.-M. Kortelainen, **L. Hildebrandt Ruiz**, T. Petäjä, M. Kulmala, D. R. Worsnop, M. V. Johnston. Identification and quantification of particle growth channels during new particle formation. *Atmospheric Chemistry and Physics*, **13**, 10215-10225, 2013.

14. M. Pikridas, I. Riipinen, **L. Hildebrandt**, E. Kostenidou, H. Manninen, N. Mihalopoulos, N. Kalivitis, J. Burkhart, A. Stohl, M. Kulmala, S. N. Pandis. New particle formation at a remote marine site in the Eastern Mediterranean. *Journal of Geophysical Research – Atmospheres*, **117**, D12205, doi:10.1029/2012JD017570, 2012.

13. **L. Hildebrandt**, E. Kostenidou, V. A. Lanz, G. Kouvarakis, A. S. H. Prevot, U. Baltensperger, N. Mihalopoulos, N.M. Donahue and S.N. Pandis. Sources and Atmospheric Processing of Organic Aerosol in the Mediterranean: Insights from Aerosol Mass Spectrometer Factor Analysis. *Atmospheric Chemistry and Physics*, **11**, 12499–12515, 2011.

12. **L. Hildebrandt**, K. Henry, J.H. Kroll, D. R. Worsnop, S.N. Pandis and N.M. Donahue. Evaluating the Mixing of Organic Aerosol Components Using High-Resolution Aerosol Mass Spectrometry. *Environmental Science and Technology* **45**, 6329-6335, 2011.

11. G.J. Engelhart, **L. Hildebrandt**, E. Kostenidou, N. Mihalopoulos, N.M. Donahue, S.N. Pandis. Water content of aged aerosol. *Atmospheric Chemistry and Physics* **11**, 911-920, 2011.

10. B.-H. Lee, E. Kostenidou, **L. Hildebrandt**, I. Riipinen, G.J. Engelhart, C. Mohr, P.F. DeCarlo, N. Mihalopoulos, A.S.H. Prevot, U. Baltensperger, S.N. Pandis. Measurement of the Ambient Organic Aerosol Volatility Distributions: Application during the Finokalia Aerosol Measurement Experiment (FAME-2008). *Atmospheric Chemistry and Physics* **10**, 12149-12160, 2010.

9. **L. Hildebrandt**, E. Kostenidou, D. R. Worsnop, N. Mihalopoulos, N.M. Donahue and S.N. Pandis. Formation of Highly Oxygenated Organic Aerosol in the Atmosphere: Insights from the Finokalia Aerosol Measurement Experiments. *Geophysical Research Letters* 37, L23801, doi:10.1029/2010GL045193, 2010.

8. M. Pikridas, K. Bougiatioti, **L. Hildebrandt**, G.J. Engelhart, E. Kostenidou, C. Mohr, A. S. H. Prevot, G. Kouvarakis, P. Zarmpas, J. F. Burkhart, B.-H. Lee, M. Psichoudaki, N. Mihalopoulos, C. Pilinis, A. Stohl, U. Baltensperger, M. Kulmala, and S. N. Pandis: The Finokalia Aerosol Measurement Experiments - 2008 (FAME-08): An Overview, *Atmospheric Chemistry and Physics* **10**, 6793–6806, 2010.

7. N. L. Ng, M. R. Canagaratna, Q. Zhang, J. L. Jimenez, J. Tian, I. M. Ulbrich, J. H. Kroll, K. S. Docherty, P. S. Chhabra, R. Bahreini, S. M. Murphy, J. H. Seinfeld, **L. Hildebrandt**, N. M. Donahue, P. F. DeCarlo, V. A. Lanz, A. S. H. Prevot, E. Dinar, Y. Rudich, and D. R. Worsnop: Organic aerosol components observed in northern hemispheric datasets from aerosol mass spectrometry, *Atmospheric Chemistry and Physics* **10**, 4625-4641, 2010.

6. **L. Hildebrandt**, G.J. Engelhart, , C. Mohr, E. Kostenidou, V. A. Lanz, A. Bougiatioti, P. F. DeCarlo, A. S. H. Prevot, U. Baltensperger, , N. Mihalopoulos, N.M. Donahue and S.N. Pandis. Aged organic aerosol in the Eastern Mediterranean: The Finokalia Aerosol Measurement Experiment – 2008, *Atmospheric Chemistry and Physics* **10**, 4167-4186, 2010.

5. **L. Hildebrandt**, N.M. Donahue and S.N. Pandis. High formation of secondary organic aerosol from the photo-oxidation of toluene. *Atmospheric Chemistry and Physics* **9**, 2973–2986, 2009.

4. J.R. Pierce, G.J. Engelhart, **L. Hildebrandt**, E.A. Weitkamp, R.K. Pathak, N.M. Donahue, A.L. Robinson, P.J. Adams and S.N. Pandis. Constraining particle evolution from wall losses, coagulation, and condensation-evaporation in smog-chamber experiments: Optimal estimation based on size distribution measurements. *Aerosol Science and Technology* **42**, 1001-1015, 2008.

3. U. Dusek, G.P. Frank, **L. Hildebrandt**, J. Curtius, J. Schneider, S. Walter, D. Chand, F. Drewnick, S. Hings, D. Jung, S. Borrmann, M.O. Andreae. Size matters more than chemistry for cloud-nucleating ability of aerosol particles. *Science* **312**, 1375-1378, 2006.

2. M.I. Guzman, **L. Hildebrandt**, A.J. Colussi, M.R. Hoffmann. Cooperative hydration of pyruvic acid in ice. *Journal of the American Chemical Society* **128**, 10621-10624, 2006.

1. J.D. Surratt, S.M. Murphy, J.H. Kroll, N.L. Ng, **L. Hildebrandt**, A. Sorooshian, R. Szmigielski, R. Vermeylen. W. Maenhaut, M. Claeys, R.C. Flagan, J.H. Seinfeld. Chemical composition of secondary organic aerosol formed from the photooxidation of isoprene. *Journal of Physical Chemistry A* **110**, 9665-9690, 2006.

Technical Reports

1. **L. Hildebrandt Ruiz**, G. Yarwood, B. Koo, and G. Heo. "Sources of Organic Particulate Matter in Houston: Evidence from DISCOVER-AQ Data, Modeling, and Experiments" Final report prepared for the Texas Air Quality Research Program (Project 14-024) by the University of Texas at Austin and ENVIRON International Corporation, available at:

http://aqrp.ceer.utexas.edu/projectinfoFY14_15/14-024/14-024%20Final%20Report.pdf , 2015

2. **L. Hildebrandt Ruiz** and G. Yarwood. “Interactions between Organic Aerosol and NOy: Influence on Oxidant Production.” . Final report prepared for the Texas Air Quality Research Program (Project 12-012) by the University of Texas at Austin and ENVIRON International Corporation, available at http://aqrp.ceer.utexas.edu/projectinfoFY12_13/12-012/12-012%20Final%20Report.pdf , 2013.