

Genevieve Plant

Climate and Space Research Bldg.
Ann Arbor, MI

Curriculum Vitae
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Education

- 2016 Ph.D. Electrical Engineering, Princeton University
- 2013 M.A. Electrical Engineering, Princeton University
- 2011 B.S. Electrical Engineering, Boston University

Professional Experience

- 2021-Present Assistant Research Scientist, Climate and Space Sciences and Engineering, University of Michigan
- 2017-2021 Postdoctoral Research Fellow, Climate and Space Sciences and Engineering, University of Michigan
- 2016-2017 Postdoctoral Research Fellow, Electrical Engineering, University of Michigan
- 2014 Research Assistant, NEC Laboratories America Inc., Princeton, NJ, USA
- 2011-2016 Graduate Research Assistant, Electrical Engineering, Princeton University

Journal Publications

16. A. M Gorchov Negrón, E.A. Kort, Y. Chen, A.R. Brandt, M.L. Smith, **G. Plant**, A.K. Ayasse, S. Schwietzke, D. Zavala-Araiza, C. Hausman, Á. F. Adames-Corraliza, “Excess methane emissions from shallow water platforms elevate the carbon intensity of US Gulf of Mexico oil and gas production,” *Proceedings of the National Academy of Sciences*, 120(15), e2215275120 (2023).
15. **G. Plant**, E.A. Kort, A.R. Brandt, Y. Chen, G. Fordice, A.M. Gorchov Negrón, S. Schwietzke, M. Smith, D. Zavala-Araiza, “Inefficient and unlit natural gas flares both emit large quantities of methane,” *Science* 337 (6614), 1566-1571 (2022).
14. **G. Plant**, E.A. Kort, L.T. Murray, J.D. Maasackers, I. Aben, “Evaluating urban methane emissions from space using TROPOMI methane and carbon monoxide observations,” *Remote Sensing of Environment* 268, 112756 (2022).
13. C. Gerlein-Safdi, A.A. Bloom, **G. Plant**, E.A. Kort, C.S. Ruf, “Improving Representation of Tropical Wetland Methane Emissions With CYGNSS Inundation Maps,” *Global Biogeochemical Cycles*, 35, e2020GB006890 (2021).
12. A. Gonzalez, D.B. Millet X. Yu, K.C. Wells, T.J. Griffis, B.C. Baier, P.C. Campbell, Y. Choi, J.P. DiGangi, A. Gvakharia, H.S. Halliday, E.A. Kort, K. McKain, J.B. Nowak, **G. Plant**, “Fossil versus nonfossil CO sources in the US: New airborne constraints from ACT-America and GEM,” *Geophysical Research Letters*, 48, e2021GL093361 (2021).

11. X. Yu, D.B. Millet, K.C. Wells, D.K. Henze, H. Cao, T.J. Griffis, E.A. Kort, **G. Plant**, M.J. Deventer, R.K. Kolka, D.T. Roman, K.J. Davis, A.R. Desai, B.C. Baier, K. McKain, A.C. Czarnetzki, A.A. Bloom, "Aircraft-based inversions quantify the importance of wetlands and livestock for Upper Midwest methane emissions," *Atmospheric Chemistry and Physics*, 21, 951–971 (2021).
10. X. Yu, D.B. Millet, K.C. Wells, T. J. Griffis, X. Chen, J.M. Baker, S.A. Conley, M.L. Smith, A. Gvakharia, E.A. Kort, **G. Plant**, J.D. Wood, "Top-down constraints on methane point source emissions from animal agriculture and waste based on new airborne measurements in the U.S. upper Midwest," *Journal of Geophysical Research: Biogeosciences*, 125 (2020).
9. **G. Plant**, E. A. Kort, C. Floerchinger, A. Gvakharia, I. Vimont, C. Sweeney, "Large fugitive methane emissions from urban centers along the US East Coast," *Geophysical Research Letters*, 46, 8500–8507 (2019).
8. K. Guo, R. Martinez, **G. Plant**, L. Maksymiuk, B. Janiszewski, M.J. Freeman, B. Maynard, M.N. Islam, F.L. Terry, R. Bedford, R. Gibson, F. Chenard, S. Chatigny, A.I. Ifarraguerri, "Generation of single mode, high power supercontinuum from 1.6 to 12 μ m with cascaded fluoride and chalcogenide fibers," *Applied Optics*, 57, 2519-2532 (2018).
7. R. Martinez, **G. Plant**, K. Guo, B. Janiszewski, B. Maynard, M.J. Freeman, M.N. Islam, F.L. Terry, O. Alvarez, F. Chenard, A.I. Ifarraguerri, "Mid-infrared supercontinuum generation from 1.6 to >11 μ m using concatenated step-index fluoride and chalcogenide fibers," *Optics Letters*, 43, 296-299 (2018).
6. **G. Plant**, Y. Chen, and G. Wysocki, "Optical heterodyne-enhanced chirped laser dispersion spectroscopy," *Optics Letters*. 42, 2770-2773 (2017)
5. **G. Plant**, A. Hangauer and G. Wysocki, "Fundamental Noise Characteristics of Chirped Laser Dispersion Spectroscopy," *IEEE Journal of Selected Topics in Quantum Electronics*, vol. 23, no. 2, pp. 1-10, (2017).
4. **G. Plant**, A. Hangauer, T. Wang, and G. Wysocki, "Fiber dispersion measurement using chirped laser dispersion spectroscopy technique," *Applied Optics*, 54, 9844-9847 (2015).
3. **G. Plant**, M. Nikodem, P. Mulhall, R.K. Varner, D. Sonnenfroh, G. Wysocki, "Field Test of a Remote Multi-Path CLaDS Methane Sensor," *Sensors*, 15, 21315-21326 (2015).
2. M. Nikodem, **G. Plant**, D. Sonnenfroh, and G. Wysocki, "Open-path sensor for atmospheric methane based on chirped laser dispersion spectroscopy," *Applied Physics B*, 119, 3-9 (2014).
1. M. Nikodem, **G. Plant**, Z. Wang, P. Prucnal, and G. Wysocki, "Chirped laser dispersion spectroscopy implemented with single- and dual-sideband electro-optical modulators," *Opt. Express*, 21, 14649-14655 (2013).

Patents

US Patent No. 10,656,083, “Chirped laser dispersion spectroscopy sensitivity booster”

Observational Datasets

Kort, E. A., Plant, G., Brandt, A. R., Chen, Y., Fordice, G., Gorchov Negron, A. M., Schwietzke, S., Smith, M., Zavala-Araiza, D. (2023). *F3UEL: flare methane destruction removal efficiencies* [Data set], University of Michigan - Deep Blue Data. <https://doi.org/10.7302/xsax-ec07>

Kort, E. A., Plant, G., Dacic, N. (2022). *Aircraft Data (2021) for Measurement of Agriculture Illuminating farm-Zone Emissions of N₂O (MAIZE)*, University of Michigan - Deep Blue Data. <https://doi.org/10.7302/0jvh-0c91>

Kort, E. A., Plant, G., Smith, M. L., Brandt, A. R., Chen, Y., Gorchov Negron, A. M., Schwietzke, S., Zavala-Araiza, D. (2022). *Aircraft Data (2020) for Flaring & Fossil Fuels: Uncovering Emissions & Losses (F³UEL)*, University of Michigan - Deep Blue Data. <https://doi.org/10.7302/1xjm-3v49>

Kort, E. A., Plant, G., Brandt, A. R., Chen, Y., Gorchov Negron, A. M., Schwietzke, S., Smith, M. L., Zavala-Araiza, D. (2022). *Aircraft Data (2021) for Flaring & Fossil Fuels: Uncovering Emissions & Losses (F³UEL)*, University of Michigan - Deep Blue Data. <https://doi.org/10.7302/6tgq-e116>

Millet, Dylan B.; Conley, Stephan A.; Gvakharia, Alexander; Kort, Eric A.; Plant, Genevieve; Smith, Mackenzie L.; Yu, Xueying. (2019). *Airborne measurements from the GEM study*. Retrieved from the Data Repository for the University of Minnesota, <https://doi.org/10.13020/f50r-zh70>

Aircraft Observations for East Coast Outflow Experiment (2019), ftp://aftp.cmdl.noaa.gov/data/campaign/ECO_2018/ECO_2018_insitu_10sec.nc

Internal Service Experience

Graduate Admissions Committee (2021-Present), Climate and Space Sciences and Engineering, University of Michigan

Executive Committee (2019-2022), Michigan Postdoctoral Association of the College of Engineering (MPACE), University of Michigan

Judge (2021), Engineering Research Symposium: Undergraduate Poster Session & Scientific Visualization Competition, University of Michigan

Co-organizer (2018-2020), Climate Seminar, Department of Climate and Space Sciences and Engineering, University of Michigan

Abstract Judge (2018), University of Michigan Engineering Graduate Symposium

External Service Experience

Program Chair (2021-Present), Optics and Photonics for Sensing the Environment (ES), Optica (formerly Optical Society, OSA) Sensing Congress.

Proposal Reviewer (2019-Present), NOAA AC4 Program, Atmospheric Measurement Technology topic of the DOE SBIR program.

Judge (2019, 2021), Outstanding Student Presentation Awards, AGU Fall Meeting

Committee Member, Presider (2021), OSA Optical Sensors and Sensing Congress.

Technical Advisory Group Member (2020), NY State GHG Inventory Development, organized by Eastern Research Group (ERG)

Reviewer (2018), OSA – Special Program Grant for Outreach and Professional Development

Leadership Council (2014-2016), Women in STEM Leadership Council, Princeton University

Vice President (2013-2016), Graduate Women in Science and Engineering (GWISE), Princeton University

Conference Proceedings

Y. Chen, J. Englander, A.M. Gorchov Negrón, **G. Plant**, G. Fordice, S. Schwietzke, D. Zavala-Araiza, E.A. Kort, A.R. Brandt, “Seven years of repeated mobile OGI surveys for tracking long-term trends in methane emissions from oil and gas facilities,” 2022 Fall Meeting, AGU, Chicago, IL.

M. Li, E.A. Kort, A.A. Bloom, D. Wu, **G. Plant**, C. Gerlein-Safdi, T. Pu, “Using Atmospheric Observations to Improve the Representation of Wetland Methane Emissions in the Pantanal,” 2022 Fall Meeting, AGU, Chicago, IL.

E. Whiting, **G. Plant**, E.A. Kort, “Estimating Urban Methane Emissions from Space using TROPOMI CH₄:CO Enhancement Ratios,” 2022 Fall Meeting, AGU, Chicago, IL.

A.M. Gorchov Negrón, E.A. Kort, Y. Chen, A.R. Brandt, M. Smith, **G. Plant**, A. Ayasse, S. Schwietzke, D. Zavala-Araiza, C. Hausman, A. Adames-Corraliza, “Observations show that methane emissions elevate the carbon intensity of oil and gas production in the U.S. Gulf of Mexico,” 2022 Fall Meeting, AGU, Chicago, IL.

G. Plant, E.A. Kort, G. Fordice, A.R. Brandt, Y. Chen, A.M. Gorchov Negrón, S. Schwietzke, M. Smith, T. Sullivan, P. Wilczak, “Field Measurements of Flare Combustion Efficiencies and NO_x Production Rates in Major US Oil and Gas Basins,” 2021 Fall Meeting, AGU, New Orleans, LA.

A.M. Gorchov Negron, E.A. Kort, M. Smith, **G. Plant**, A. Adames-Corraliza, Y. Chen, A.R. Brandt, S. Schwietzke, D. Zavala-Araiza, T. Sullivan, P. Wilczak, “Emissions of CH₄, CO₂, and NO_x from Offshore Alaska Oil and Gas Activities,” 2021 Fall Meeting, AGU, New Orleans, LA.

N. Dacic, **G. Plant**, T. Sullivan, E.A. Kort, “Using airborne observations over the US Corn Belt to quantify N₂O emissions and evaluate underlying controlling processes,” 2021 Fall Meeting, AGU, New Orleans, LA.

I. Lopez-Coto, C. Sweeney, **G. Plant**, K. McKain, X. Ren, A. Karion, E. A. Kort, B. McDonald, S. Gourdj, J. Miller, R. Dickerson, P. Shepson, G. Roest, K. Gurney, A. Stein, J. Whetstone, “Reduction in GHG emissions in the US North East Corridor due to COVID-19 lockdowns as measured by the East Coast Outflow Experiment,” EGU21-16040.

C. Gerlein-Safdi, A.A. Bloom, **G. Plant**, E.A. Kort, C.S. Ruf (2020), “Improving representation of tropical wetland methane emissions with CYGNSS inundation maps,” 2020 Fall Meeting, AGU, virtual.

(invited) **G. Plant**, E.A. Kort, J.D. Maasakkers, I. Aben (2020), “Exploring Urban Methane Emissions from TROPOMI CH₄ and CO Observations,” Local and Regional Sources of Pollution and their Impacts session, 2020 Virtual Global Monitoring Annual Conference (eGMAC).

(invited) **G. Plant**, E.A. Kort, C. Sweeney (2020), “Data-driven Urban Methane Emission Estimates Based on Aircraft Observations: Sensing Considerations and Results,” OSA Optical Sensors and Sensing Congress, virtual.

(invited) **G. Plant**, E.A. Kort, C. Sweeney (2020), “Data-driven Urban Methane Emission Estimates Based on Aircraft Observations: Sensing Considerations and Results,” Conference on Laser and Electro Optics (CLEO), virtual.

G.Plant, E.A. Kort, J.D. Maasakkers, I. Aben (2019), “Urban Methane Emissions Estimates from TROPOMI CH₄ and CO Observations,” Abstract A44E-10, 2019 Fall Meeting, AGU, San Francisco, CA.

G. Plant, E. A. Kort, C. Floerchinger, A. Gvakharia, I. Vimont, C. Sweeney (2019), “Large fugitive methane emissions from urban centers along the US East Coast,” NOAA ESRL Global Monitoring Annual Conference, Boulder, CO.

C. Sweeney, E.A. Kort, C.R. Floerchinger, **G.Plant**, P.B. Shepson (2018), “The urban methane paradox: Results from the 2018 East Coast Outflow experiment,” Abstract A32B-04 presented at 2018 Fall Meeting, AGU, Washington, D.C.

C.R. Floerchinger, S.C. Wofsy, K.D. Hajny, C. Sweeney, T. Newberger, E.A. Kort, **G.Plant**, A. Gvakharia, P.B. Shepson (2018), “Fractional methane emissions from natural gas infrastructure in urban domains in the Eastern United States using airborne measurements and Lagrangian Particle Dispersion Modeling,” Abstract A33C-06 presented at 2018 Fall Meeting, AGU, Washington, D.C.

Y. Huang, E.A. Kort, A. Karion, J. Ware, **G. Plant**, C. Sweeney, C.R. Floerchinger, K.L. Mueller (2018), "Excess Urban Methane Emissions from Northeast Corridor Washington, DC/Baltimore Metropolitan Region," Abstract A43R-3470 presented at 2018 Fall Meeting, AGU, Washington, D.C.

X. Yu, D.B. Millet, K.C. Wells, T.J. Griffis, J.M. Baker, S. Conley, M.L. Smith, A. Gvakharia, E.A. Kort, **G. Plant**, J.D. Wood (2018), "New top-down constraints on methane emissions from animal agriculture based on GEM airborne measurements in the US Upper Midwest," Abstract B44D-06 presented at 2018 Fall Meeting, AGU, Washington, D.C.

Y. Chen, **G. Plant**, and G. Wysocki (2017), "Heterodyne Efficiency in Chirped Laser Dispersion Spectroscopy," in Conference on Lasers and Electro-Optics, paper SW4L.5, San Jose, CA.

G. Plant, Y. Chen, and G. Wysocki (2016), "Optical Heterodyne-Enhanced Chirped Laser Dispersion Spectroscopy," in Conference on Lasers and Electro-Optics, paper SF1H.6, San Jose, CA.

Y. Chen, **G. Plant**, A. Hangauer, and G. Wysocki (2016), "FPGA-based chirped laser dispersion spectrometer," in Conference on Lasers and Electro-Optics, paper SF1H.7, San Jose, CA.

G. Plant, A. Hangauer, and G. Wysocki (2015), "Remote Sensing of Atmospheric Methane with Simultaneous Ranging using Chirped Laser Dispersion Spectroscopy," ILRC 27 (International Laser Radar Conference), New York, NY.

G. Plant, A. Hangauer, and G. Wysocki (2015), "Fundamental Limits in Chirped Laser Dispersion Spectroscopy," in Conference on Lasers and Electro-Optics, paper SM1O.2, San Jose, CA

G. Plant, A. Hangauer, M. Huang, T. Wang, and G. Wysocki (2015), "Gas Sensing Fiber Network with Simultaneous Multi-node Detection using Range-resolved Chirped Laser Dispersion Spectroscopy," in Conference on Lasers and Electro-Optics, paper SM2O.1, San Jose, CA.

G. Plant, A. Hangauer, Y. Tian, T. Wang, and G. Wysocki (2014), "Methane Leak Detection Sensor Network based on Fiber-coupled Chirped Laser Dispersion Spectroscopy," in Light, Energy and the Environment, paper ETu4A.2, Canberra, Australia

G. Plant, Y. Tian, T. Wang, and G. Wysocki (2014), "Improved Signal Processing for Distributed Sensing Network based on Chirped Laser Dispersion Spectroscopy," in Conference on Lasers and Electro-Optics, paper SM3E.2, San Jose, CA.

G. Plant, M. Nikodem, P. Mulhall, R. Varner, D. Sonnenfroh, and G. Wysocki (2014), "Remote Methane Sensing at Sallie's Fen using Chirped Laser Dispersion Spectroscopy," Field Laser Applications in Industry and Research (FLAIR), Florence, Italy.

G. Plant, M. Nikodem, P. Mulhall, R. Varner, D. Sonnenfroh, and G. Wysocki (2013), "Field Deployment of a Remote Multi-Path Methane Sensor," in Renewable Energy and the Environment, paper EM4A.3

G. Plant, M. Nikodem, D. M. Sonnenfroh, and G. Wysocki (2013), "Chirped Laser Dispersion Spectroscopy for Remote Sensing of Methane at 1.65 μ m - Analysis of System Performance," Conference on Lasers and Electro-Optics, paper JW2A.79, San Jose, CA.

G. Plant, R. Marshall, H. Dahlgren, C. Goenka, J.L. Semeter (2011), "A High-Speed Tomographic Imaging System for Studying Dynamic Aurora," Coupling, Energetics and Dynamics of Atmospheric Regions (CEDAR) Workshop, Santa Fe, NM.

Selected Media Coverage

Extensive news coverage for flaring study, including [NYT](#), [NPR](#), [WSJ](#), among [others](#), and the [AAAS Science Podcast](#).

["Flying sensors snare vast amounts of a 'fugitive' greenhouse gas," Nature, Environmental Sciences, July 2019](#)

["Major U.S. cities are leaking methane at twice the rate previously believed," Science, July 2019](#)

["Light Matters – EDU Spotlight," Photonics Media, October 2014](#)

Teaching and Mentoring Experience

University of Michigan

Earth Systems Evolution, Guest Lecturer, (Fa '18)

REU Program In Climate and Space Science Observation (PICASSO), Mentor (Summer '18)

Princeton University

Senior Thesis Research Project, Mentor (Fa '15)

Electromagnetic Field Theory and Optics, Assistant in Instruction (Fa'14)

REU Mid Infrared Technologies for Health and the Environment (MIRTHE), Mentor (Summer '13)

Independent Undergraduate Research Project, Mentor (Sp '13)

Boston University

Introduction to Instruction, Teaching Assistant (Sp '10, Fa '11)

Recent Community Engagement

Electronics Mentor (2019), FIRST robotics team, New School High, Plymouth, MI

Design Challenge Mentor (2018), Summer Engineering Exploration (SEE) Camp, University of Michigan

Camp Counselor (2018), Women in Science and Engineering (WISE) Girls in Science Camp, University of Michigan

Design Challenge Collaborator (2018, 2019), Iridescent Learning (iridescentlearning.org)

Awards

Francis Robbins Upton Fellowship (2011-2016), Princeton University

Center for Space Physics Undergraduate Research Award (2011), Boston University

Undergraduate Poster Award (2011), CEDAR Workshop

Kenneth R. Lutchen Fellowship (2010), Boston University

Affiliations

Optica (formerly Optical Society of America, OSA)

American Geophysical Union (AGU)