

Lu Hu

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University of Montana
Department of Chemistry and Biochemistry
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RESEARCH INTERESTS

Air quality and atmospheric chemistry; wildfire smoke; volatile organic compounds (VOCs); tropospheric ozone; Source attribution of air toxics; GEOS-Chem chemical transport modeling; ground and airborne observations; proton-transfer-reaction mass spectrometry (PTR-MS)

EDUCATION

- Ph.D. **Land & Atmospheric Science**, University of Minnesota – Twin Cities 2014
Dissertation: “Constraints on the sources and impacts of volatile organic compounds (VOCs) over North America from tall tower measurements”
- M.S. **Geochemistry**, Chinese Academy of Sciences, Beijing/Guiyang 2008
- B.S. **Materials Chemistry**, China University of Geosciences, Beijing 2005

RESEARCH EXPERIENCE**University of Montana, Department of Chemistry and Biochemistry, Missoula, MT**

Associate Professor: 2022 - present

Assistant Professor: 2017 – 2022

- Emission and chemistry of VOCs from western US wildfires and from Arctic tundra via aircraft and ground-based observations
- Improving the characterization of Proton-Transfer-Reaction Mass Spectrometry for better identifying and quantifying VOCs
- Investigating factors controlling the variability and trend of tropospheric ozone and OH radical in recent decades
- Indoor air quality influenced by residential wood burning and wildfire smoke
- Constraining and modeling urban photochemistry

Harvard University, School of Engineering and Applied Science, Cambridge, MA

Postdoctoral Fellow with Daniel Jacob: 2014 – 2016

- Improving understanding of global tropospheric ozone by integrating recent model developments in isoprene chemistry, tropospheric halogen chemistry, lightning, and convection; Evaluating the model using an ensemble of sonde, aircraft, and satellite data.
- Modeling global ozone at an unprecedented $\sim 12 \times 12$ km² resolution for applications of ozone climate forcing and intercontinental transport of pollution.

University of Minnesota, Department of Soil, Water, and Climate, St. Paul, MN

Graduate Research Assistant with Dylan Millet: 2008 – 2014

- Designed, developed, and validated online in situ instrumentation to measure organic compounds in the atmosphere.
- Developed and implemented forward and inverse numerical 3D modeling to apportion biogenic and anthropogenic sources of organic carbon, estimate emission budgets, and assess atmospheric implications over North America.

Chinese Academy of Sciences, Institute of Geochemistry, Guiyang/Beijing, China

Graduate Research Assistant with Xinqing Lee: 2005 – 2008

- Designed chamber experiments for measuring the land-atmosphere exchange of greenhouse gases.
- Investigated geochemical records in lake sediments for reconstructing paleoclimate in Mongolia.

GRANTS

All funding amounts awarded since joining UM in 2017: > \$26 million. Among them, \$4,895,735 was awarded to my group (research funding only), and totaling > \$15 million to UM

Current research support

- Co-Principal Investigator: *Salt Lake City Summer Ozone Study (SLC-SOS)*, with E. Fischer (PI), G. Hallar, I. Pollack, R. Hannun, NSF AGS, # 2315083, 2023-2026, **\$1,709,603 (\$549,952 to UM)**
- Co-PI: *Research Infrastructure: RII Track 1: Integrating Montana's Environmental Research with Smart Sensors (IMERSS)*, with R. Walker (PI), J. Shaw, E. Metcalf, NSF, # 2242802, 2023– 2028, **\$20,000,000 (~\$10 million to UM; \$1,081,104 to my group directly)**
- Principal Investigator: *CAREER: Emissions and Chemical Impacts of Atmospheric Volatile Organic Compounds (VOCs) from Western United States Wildfires*, NSF AGS, #2144896, 2022-2027, **\$799,154**
- PI: *Comprehensive atmospheric chemistry of volatile organic compounds in high and mid-latitude urban areas impacted by wood smoke*, NOAA Climate Office, #NA20OAR4310296, 2021-2024, **\$600,000**
- Co-PI: *A new satellite data product for studying fire combustion efficiency, fire emission speciation, fire fronts, and fire weather at night and beyond*, NASA 80NSSC21K1976, 2021-2024, with J. Wang (PI), **\$109,320 to UM**
- Co-PI: *Collaborative Research: Atmospheric Formation and Implications of Secondary Organic Aerosol from Glycols and Glycol Ethers*, NSF # 2041980, 2021-2024, with S. Jathar (PI), **\$89,853 to UM**
- PI: *Atmospheric Chemistry Modeling at U of Montana*, NCAR Computational & Information Systems Lab, 2017-2027, computational resources

Funds for teaching and equipment

- Co-PI: *Hardware to Enable High-Performance Computing for Theoretical Chemistry Education at UM*, with O. Berryman (PI), D. Decato, **\$54,502**
- Co-I: *ICARE: Growing Research Infrastructure Through Montana INBRE (GRITI), Montana INBRE*, with Z. Rossmiller (PI), E. Landguth, 2021, **\$50,000** to continue building infrastructure of the UM's first shared research computing cluster
- PI: *Bringing a flying laboratory into a classroom at UM: a creative curriculum for analytical/environmental chemistry*, UM Toelle-Bekken Family Memorial Fund Award, 2018-2019, **\$2,500**

Previously funded projects

- PI: *Long-term trends of tropospheric ozone constrained by global observation networks and GEOS-Chem*, NOAA Climate Program Office, # NA19OAR4310174, 2019-2023, **\$544,078 (\$439,078 to UM)**

- Co-PI: *The Salt Lake regional Smoke, Ozone, and Aerosol Study (SAMOZA)*, with D. Jaffe (PI) and S. Lyman, UT DEQ, 2022-2023, **\$295,580 plus \$65,000 matching fund (\$100,215 to UM)**
- PI: *Constraining wildfire emissions of volatile organic compounds (VOCs) with NASA airborne observations*, NASA EPSCoR Rapid Response Research, # 80NSSC20M0166, 2020-2022, **\$100,000 (\$83,614 to UM)**
- PI: *RII Track-4: Assessing the capability of TEMPO geostationary satellite observations of formaldehyde to constrain volatile organic compound emissions from western U.S. wildfire smoke*, NSF EPSCoR, #1929210, 2020-2022, **\$263,334**
- Co-I: *Biogenic volatile organic compounds and the fate of ozone in the changing Arctic*, NSF Office of Polar Programs, #1707569, with D. Helmig (PI) and D. Millet (co-I), 2017 – 2022, **\$599,680 (\$40,728 to UM)**
- PI: Collaborative Research: *Western wildfire Experiment for Cloud chemistry, Aerosol absorption and Nitrogen (WE-CAN)*, NSF Atmospheric Chemistry, # 1650275, with E. Fischer (overall PI) and 7 other Co-PIs, 2017 – 2022, **\$466,611**
- PI: *Missoula Air Toxic Study (MATS III): data analysis*, Montana INBRE, 2021-2022, **\$52,251**
- PI: *Missoula Air Toxic Study (MATS II): characterization of D5-siloxane measurements*, Montana INBRE, 2020-2021, **\$63,213**
- PI: *Missoula Air Toxic Study (MATS) I: a pilot research project*, Montana INBRE, 2019-2020, **\$63,474**
- PI: *Development of synthetic TEMPO satellite retrievals for future wildfire studies*, Montana NASA EPSCoR, 2019-2020, **\$50,000 with \$50,000 UM cost share**
- PI: *'Missing volatile organic compounds' and their atmospheric impacts in the changing Arctic*, U of Montana UGP Seed Grant, 2018-2019, **\$15,000**
- PI: *The Influence of Ozone from Outside States: Towards Cleaner Air in Minnesota*, Consortium on Law and Values in Health, Environment & the Life Sciences, UofMN, 2013–2014, **\$9,934**

Pending support:

N/A

AWARDS AND RECOGNITIONS

- Top cited article 2021-2022 in J. Geophys. Res., 2023
- NSF CAREER Award, 2022
- NSF EPSCoR Research Infrastructure Improvement Track-4 fellowship award, 2019
- Scientific Teaching Fellow, 2020-2021: *in recognition of demonstrated commitment to undergraduate education by participating in the 2021 Mobile Institute on Scientific Teaching*
- Recognized by UM Davison Honors College, 2021: *for their important contributions to the educational experiences of Honors Students*
- U Montana Merit Award, 2018, 2020, 2022
- Featured article on NASA website for Aura Science, 2017
- Journal cover article, J. Geophys. Res., Jan. 2015
- Best Student Poster Award, Air and Waste Management Association (A&WMA) 107th Annual Conference & Exhibition, 2014
- Outstanding Student Paper Award, American Geophysical Union (AGU) Fall Meeting, 2013: *Awarded to the top 3-5% of presenters in each section/focus group*

- Doctoral Dissertation Fellowship, UofMN, 2013: *For the most accomplished Ph.D candidates*
- Consortium Student Scholar, UofMN, 2013: *One in nine research awards to projects related to the societal implications of environmental problems*
- Baker Travel Scholarship, UofMN, 2009, 2011, 2012
- Excellent Student Scholarship, Chinese Academy of Sciences, 2007
- Best Academic Report Award of Geosciences, Chinese Academy of Sciences, 2006
- Geochemistry Scholarship, Chinese Academy of Sciences, 2006
- Outstanding Graduate Award in Beijing, Beijing Municipal Education Commission, 2005: *Awarded to the top 5% of graduates in more than 100 universities in Beijing*

TEACHING AND MENTORING EXPERIENCE

Lectures at UofMT

- Fall 2020/2021/2022: CHMY104 Preparation for Chemistry, about 40-70 students, 4 Cr.
- Fall 2018/Spring 2021/Spring 2023: CHMY495/595 Atmospheric composition, 5-8 students, 3Cr.
- Spring 2019/2020: CHMY291/595 Chemistry in the Environment, 11 students, 3 Cr.
- Spring 2018: CHEM 421 Advanced Instrumental Analysis, 19 students, 4 Cr.
- Spring 2017/Fall 2019/Spring 2022: CHEM 541 Environmental Chemistry, 4-13 students, 3 Cr.

Guest Lectures

- Fall 2023: CHMY 311 Analytical Chemistry – Quantitative Analysis
- Fall 2017/Spring 2019: CHMY 595 Mass Spectrometry, UofMT

Mentor for Postdocs/Graduate/Undergraduate Students

- Advisor for 4 postdoc researchers (UofMT, 2017-present)
- Advisor for 5 PhD and 1 Master students (UofMT, 2017-present)
- Advisor for 5 undergrad researchers (UofMT, 2017-present)

Formal Training in Teaching

- Week-long workshop of Mobile Institute on Scientific Teaching, 2021
- GRAD 8101 Teaching in Higher Education, Preparing Future Faculty, UofMN, 2012

SKILLS

- MODELING: 3D chemical transport modeling (GEOS-Chem; Lagrangian particle dispersion model STILT); inverse modeling
- ANALYTICAL: Atmospheric composition monitoring; data acquisition; datalogger programming; proton transfer reaction-mass spectrometry (PTR-MS)
- COMPUTER: R/FORTRAN/IDL programming; UNIX system
- BUSINESS: Leadership and Teambuilding; Project Management; Grant Writing; Event Planning

PROFESSIONAL SERVICE

- Reviewer of The National Academies report on wildland fires, 2022
- Co-guest editor, Wildfires – influence on air, soil, and water, RSC Environmental Science: Progress and Impacts
- Primary Convener, AGU Fall Meeting 2019 in San Francisco, CA, “Biomass burning and its impacts: emission, chemical evolution, and beyond”, ~80 abstracts received

- Session co-chair, 2019 American Meteorological Society Annual Meeting in Phoenix, AZ, “From Combustion to Composition: New Insights into Smoke Chemistry from WE-CAN, FIREX and other recent efforts”, ~40 abstracts received
- U of Montana Department of Chemistry and Biochemistry, Webmaster, 2019-present
- U of Montana International Committee and Awards subcommittee, 2018-present
- U of Montana Department of Chemistry and Biochemistry seminar organizer, 2018 Spring
- U of Montana Department of Chemistry and Biochemistry graduate admission committee, 2017-present
- GEOS-Chem Steering Committee Member; co-chair of Oxidants and Chemistry, 2017-present
- Graduate committee member for 13 PhD/Master students in Chemistry, UofMT, 2017-present (Wade Permar, Catherine Wielgasz, Damien Ketcherside, Lixu Jin, Vanessa Selimovic, Bethany Shetler, Hannah Wright, Fischer Young, Alec Johnson, Qipei Shangguan, Chris King, Lu Tan, Emily Cope, Brahm Dean (MSU))
- Contributing author: International Global Atmospheric Chemistry Project (IGAC), Tropospheric Ozone Assessment Report (TOAR): Global metrics for climate change, human health and crop/ecosystem research, 2015-2017
- Session Chair, “Ozone Monitoring and Modeling”, A&WMA 107th Annual Conference & Exhibition, Long Beach, CA, June 2014
- Technical Coordinating Committee Member for the Measurement, Monitoring, Emission Inventory and Application (AA-2), A&WMA, 2013 – 2014
- Grant Reviewer: NASA (EPSCoR, Atmospheric Composition), NSF (NSF Atmospheric Chemistry Program;) NOAA AC4 (Atmospheric Chemistry, Carbon Cycle, and Climate), Montana INBRE, Montana NASA EPSCoR
- Journal Reviewer: *J. Geophys. Res.*; *Atmos. Chem. Phys.*; *Bull. Amer. Meteor. Soc.*;
Atmos. Environ.; *Atmos. Res.*; *J. Atmos. Ocean Tech.*;
J. Atmos. Sci.; *Sci. of the Total Environ.*; *J. Appl. Meteorol. Clim.*;
Agric. For. Meteorol., *Atmos. Pollu. Res.*; *Earth and Space Sci.*;
Geosci. Model Dev.

COMMUNITY SERVICE AND LEADERSHIP

- Co-director/judge, Montana Science Fair, 2020 - present
- Judge, Air quality test outreach symposium, 2022/2023
- Co-presenter, Using the State Department Exchange Visitor program to host international scholars in your department, UMT Professional Development Series, 2020
- Chair, Harvard Atmospheric Science Seminar Committee, 2015 – 2016
- Co-founder and Board Member, Joint UMN-China Coalition for Clean Energy, 2013
- Coordinator: Departmental Centennial Seminar Series Committee, UofMN, 2012 – 2013
- Organizer, Career Symposium Series for Young Scientists, UofMN, 2012
- Judge, Twin Cities Regional State Science Fairs, 2012, 2013
- Vice President, Departmental Graduate Student Association, UofMN, 2010

INVITED WORKSHOPS

- The ALaskan Pollution and Chemical Analysis (ALPACA) workshop, Fairbanks, AK, May 2018
- NSF Atmospheric Chemistry PI meeting, June 2018

- IGAC IBBI (Interdisciplinary Biomass Burning Initiative) workshop, July 2017

PUBLICATIONS (available at www.umt.edu/atmoschem)

h-index: 25 ([Google Scholar](https://scholar.google.com/))

In Review

- **Christiansen, A.**, Mickley, L. J., and **Hu, L.**, Constraining Long-Term NO_x Emissions over the United States and Europe using Nitrate Wet Deposition Monitoring Networks, *Atmos. Chem. Phys.*, in review
- Sun, S., Zhu, L., Liu, S., Shu, L., González Abad, G., Nowlan, C., Ayazpour, Z., De Smedt, I., Chen, Y., Pu, D., Sun, W., Bai, B., Wang, D., Li, X., Zuo, X., Fu, W., Li, Y., Zhang, P., **Hu, L.**, **Permar, W.**, Richter, D., Fried, A., Hanisco, T. F., Wolfe, G. M., Liao, J., St. Clair, J. M., Yang, X., and Fu, T.-M.: Validating formaldehyde products from four satellites (OMI, OMPS-NPP, OMPS-N20, and TROPOMI) with FIREX-AQ and WE-CAN aircraft observations over the United States during fire seasons, in review.
- Ninneman, M., Lyman, S., **Hu, L.**, **Cope, E.**, **Ketcherside, D.**, Jaffe, D., Investigation of Ozone Formation Chemistry During the Salt Lake Regional Smoke, Ozone, and Aerosol Study (SAMOZA), in review.
- Jaffe, D., M. Ninneman, L. Nguyen, H. Lee, **L. Hu**, **D. Ketcherside**, **L. Jin**, **E. Cope**, S. Lyman, C. Jones, T. O’Neil, and M. Mansfield, Key Results from the Salt Lake regional Smoke, Ozone and Aerosol Study (SAMOZA), in review.

Refereed

1. **Permar, P.**, **C. Wielgasz**, **L. Jin**, X. Chen, M. M. Coggon, L. A. Garofalo, G. I. Gkatzelis, **D. Ketcherside**, D. B. Millet, B. B. Palm, Q. Peng, M. A. Robinson, J. A. Thornton, R. J. Yokelson, P. Veres, C. Warneke, E. V. Fischer, **L. Hu**, Assessing formic and acetic acid emissions and chemistry in western U.S. wildfire smoke: implications for atmospheric modeling, *Environ. sci.: Atmos.*, <https://doi.org/10.1039/D3EA00098B>, 2023
2. **Jin, L.**, **Permar, W.**, **Selimovic, V.**, **Ketcherside, D.**, Yokelson, R. J., Hornbrook, R. S., Apel, E. C., Ku, I.-T., Collett Jr., J. L., Sullivan, A. P., Jaffe, D. A., Pierce, J. R., Fried, A., Coggon, M. M., Gkatzelis, G. I., Warneke, C., Fischer, E. V., and **Hu, L.**: Constraining emissions of volatile organic compounds from western US wildfires with WE-CAN and FIREX-AQ airborne observations, *Atmos. Chem. Phys.*, 23, 5969–5991, <https://doi.org/10.5194/acp-23-5969-2023>, 2023.
3. **Permar W.**, **L. Jin**, Q. Peng, K. O’Dell, E. Lill, **V. Selimovic**, R. J. Yokelson, R. S. Hornbrook, A. J. Hills, E. C. Apel, I-T. Ku, Y. Zhou, B. C. Sive, A. P. Sullivan, J. L. Collett Jr., B. B. Palm, J. A. Thornton, F. Flocke, E. V. Fischer, **L. Hu**, Atmospheric OH reactivity in the western United States determined from comprehensive gas-phase measurements during WE-CAN, *Environ. sci.: Atmos.*, <https://doi.org/10.1039/D2EA00063F>, 2023.
4. **Selimovic, V.**, **D. Ketcherside**, **S. Chaliyakunnel**, **C. Wielgasz**, **W. Permar**, H. Angot, D. B. Millet, A. Fried, D. Helmig, and **L. Hu**, Atmospheric biogenic volatile organic compounds in the Alaskan Arctic tundra: constraints from measurements at Toolik Field Station, *Atmos. Chem. Phys.*, 22, 14037–14058, <https://doi.org/10.5194/acp-22-14037-2022>, 2022.
5. **Christiansen, A.**, L. J. Mickley, J. Liu, L. D. Oman, **L. Hu**, Multidecadal increases in global tropospheric ozone derived from ozonesonde and surface site observations: Can models reproduce ozone trends? *Atmos. Chem. Phys.* 22, 14751–14782, <https://doi.org/10.5194/acp-22-14751-2022>, 2022.
6. Akherati, A., He, Y., Garofalo, L. A., Hodshire, A. L., Farmer, D. K., Kreidenweis, S. M., **Permar, W.**, **Hu, L.**, Fischer, E. V., Jen, C. N., Goldstein, A. H., Levin, E. J. T., DeMott, P.

- J., Campos, T. L., Flocke, F., Reeves, J. M., Toohey, D. W., Pierce, J. R., and Jathar, S. H.: Dilution and Photooxidation Driven Processes Explain the Evolution of Organic Aerosol in Wildfire Plumes. *Environ. Sci.: Atmos.*, <https://doi.org/10.1039/D1EA00082A>, accepted.
7. Kille, N., K. Zarzana, J. Romero Alvarez, C. Lee, J. Rowe, B. Howard, T. Campos, A. Hills, R. Hornbrook, I. Ortega, **W. Permar**, I. -T. Ku, J. Lindaas, I. Pollack, A. P. Sullivan, Y. Zhou, C. Fredrickson, B. Palm, Q. Peng, E. Apel, **L. Hu**, J. Collett, E. V. Fischer, F. Flocke, J. Hannigan, J. Thornton, and R. Volkamer, The CU airborne solar occultation flux instrument: performance evaluation during BB-FLUX, *ACS Earth and Space Chemistry*, doi:10.1021/acsearthspacechem.1c0028, 2022, 6, 3, 582–596.
 8. Farley, R. N. Bernays, D. Jaffe, **D. Ketcherside**, **L. Hu**, S. Zhou, S. Collier, Q. Zhang, Persistent Influence of Biomass Burning Aerosols during Clean Air Conditions in the Western United States, *Environmental Science & Technology*, doi:/10.1021/acs.est.1c07301, 2022, 56, 6, 3645–3657.
 9. Lill, E.; Lindaas, J.; Juncosa Calahorrano, J. F.; Campos, T.; Flocke, F.; Apel, E. C.; Hornbrook, R. S.; Hills, A.; Jarnot, A.; Blake, N.; **Permar, W.**; **Hu, L.**; Weinheimer, A.; Tyndall, G.; Montzka, D. D. e; Hall, S. R.; Ullmann, K.; Thornton, J.; Palm, B. B.; Peng, Q.; Pollack, I.; Fischer, E. V. Wildfire-Driven Changes in the Abundance of Gas-Phase Pollutants in the City of Boise, ID during Summer 2018. *Atmospheric Pollution Research* 2022, 13 (1), 101269. <https://doi.org/10.1016/j.apr.2021.101269>
 10. Palm, B., Q. Peng, S. R. Hall, K. Ullmann, T. L. Campos, A. Weinheimer, D. Montzka, G. Tyndall, **W. Permar**, **L. Hu**, F. Flocke, E. V. Fischer and J. A. Thornton, Spatially resolved photochemistry impacts emissions estimates in fresh wildfire plumes, *Geophysical Research Letters*, 2021, 48, e2021GL095443. <https://doi.org/10.1029/2021GL095443>
 11. Peng, Q., B. Palm, C. Fredrickson, B. Lee, S. Hall, K. Ullmann, T. Campos, A. Weinheimer, E. Apel, F. Flocke, **W. Permar**, **L. Hu**, L. Garofalo, M. Pothier, D. Farmer, I-T. Ku, A. Sullivan, J. Collett, E. V. Fischer, and J. Thornton, Observations and modeling of NOx Photochemistry and Fate in Fresh Wildfire Plumes, *ACS Earth and Space Chemistry*, 2021, <https://doi.org/10.1021/acsearthspacechem.1c00086>.
 12. L. Liu, **L. Hu**, Y. Liu, H. Wang, Health Impacts of Ambient Ozone Pollution in China and India, *Atmos. Environ.*, 267 (2021) 118753, <https://doi.org/10.1016/j.atmosenv.2021.118753>
 13. Carter, T. S., C. L. Heald, C. D. Cappa, J. H. Kroll, T. L. Campos, H. Coe, M. I. Cotterell, N. W. Davies, D. K. Farmer, C. Fox, L. A. Garofalo, **L. Hu**, J. M. Langridge, E. J. T. Levin, S. M. Murphy, R. P. Pokhrel, Y. Shen, K. Szpek, J. W. Taylor, and H. Wu (2021), Investigating Carbonaceous Aerosol and its Absorption Properties from Fires in the western US (WE-CAN) and southern Africa (ORACLES and CLARIFY), *Journal of Geophysical Research: Atmospheres*, 126, e2021JD034984, doi:<https://doi.org/10.1029/2021JD034984>.
 14. Lindaas, J., I. B. Pollack, J. J. Calahorrano, K. O'Dell, L. A. Garofalo, M. A. Pothier, D. K. Farmer, S. M. Kreidenweis, T. Campos, F. Flocke, A. J. Weinheimer, D. D. Montzka, G. S. Tyndall, E. C. Apel, A. J. Hills, R. S. Hornbrook, B. B. Palm, Q. Peng, J. A. Thornton, **W. Permar**, **C. Wielgasz**, **L. Hu**, J. R. Pierce, J. L. Collett Jr., A. P. Sullivan, and E. V. Fischer (2021), Empirical Insights Into the Fate of Ammonia in Western U.S. Wildfire Smoke Plumes, *Journal of Geophysical Research: Atmospheres*, 126(11), e2020JD033730, doi:<https://doi.org/10.1029/2020JD033730>.
 15. **Permar, W.**, **Q. Wang**, **V. Selimovic**, **C. Wielgasz**, R. J. Yokelson, R. S. Hornbrook, A. J. Hills, E. C. Apel, I-T. Ku , Y. Zhou, B. C. Sive, A. P. Sullivan, J. L. Collett Jr, T. L. Campos, B. B. Palm, Q. Peng, J. A. Thornton, L. A. Garofalo, D. K. Farmer, S. M. Kreidenweis, E. J.

- T. Levin, P. J. DeMott, F. Flocke, E. V. Fischer, and **L. Hu** (2021), Emissions of trace organic gases from western U.S. wildfires based on WE- CAN aircraft measurements, *J. Geophys. Res. – Atmos.*, 126, e2020JD033838. <https://doi.org/10.1029/2020JD033838>. [**Top Cited Article 2021-2022**]
16. Lindaas, J., Pollack, I. B. Garofalo, L. A., Pothier, M. A., Farmer, D. K., Kreidenweis, S. M., Campos, T., Flocke, F., Weinheimer, A. J., Montzka, D. D., Tyndall, G. S., Palm, B. P., Peng, Q., Thornton, J. A., **Permar, W., Wielgasz, C., Hu, L.**, Ottmar, R. D., Restaino, J. C., Hudak, A. T., Ku, I.-T., Sullivan, A., Collett Jr., J. L., and Fischer, E. V. (2021), Emissions of reactive nitrogen from western wildfires during summer 2018, *J. Geophys. Res. – Atmos.*, 126, e2020JD032657. <https://doi.org/10.1029/2020JD032657>
 17. Angot, H., McErlean, K., **Hu, L.**, Millet, D. B., Hueber, J., Cui, K., Moss, J., **Wielgasz, C.**, Milligan, T., **Ketcherside, D.**, Bret-Harte, M. S., and Helmig, D.: Biogenic volatile organic compound ambient mixing ratios and emission rates in the Alaskan Arctic tundra, *Biogeosciences*, 17, 6219–6236, <https://doi.org/10.5194/bg-17-6219-2020>, 2020.
 18. Juncosa Calahorrano, J. F., J. Lindaas, K. O'Dell, B. B. Palm, Q. Peng, F. Flocke, I. B. Pollack, L. A. Garofalo, D. K. Farmer, J. R. Pierce, J. L. Collett Jr., A. Weinheimer, T. Campos, R. S. Hornbrook, S. R. Hall, K. Ullmann, M. A. Pothier, E. C. Apel, **W. Permar, L. Hu**, A. J. Hills, D. Montzka, G. Tyndall, J. A. Thornton, E. V. Fischer (2020). Daytime oxidized reactive nitrogen partitioning in Western U.S. Wildfire Smoke Plumes. *J. Geophys. Res. – Atmos.*, 125, e2020JD033484. <https://doi.org/10.1029/2020JD033484>
 19. A. Archibald, J. L. Neu, Y. Elshorbany, O. R. Cooper, P. J. Young, H. Akiyoshi, R. T. Cox, M. Coyle, Richard Derwent, M. Deushi, A. Finco, G. J. Frost, I. E. Galbally, G. Gerosa, C. Granier, P. T. Griffiths, R. Hossaini, **L. Hu**, P. Jöckel, B. Josse, M. Y. Lin, M. Mertens, O. Morgenstern, M. Naja, V. Naik, S. J. Oltmans, D. A. Plummer, L. E. Revell, A. Saiz-Lopez, P. Saxena, Y. M. Shin, I. Shaahid, D. E. Shallcross, S. Tilmes, T. J. Wallington, T. Trickel, T. Wang, H. M. Worden, G. Zeng. (2020): Tropospheric Ozone Assessment Report: Critical review of changes in the tropospheric ozone burden and budget from 1960-2100, *Elem Sci Anth.*, 8: 1. DOI: <https://doi.org/10.1525/elementa.2020.034>
 20. Palm, B. B., Q. Peng, C. D. Fredrickson, B. H. Lee, L. A. Garofalo, M. A. Pothier, S. M. Kreidenweis, D. K. Farmer, R. P. Pokhrel, Y. Shen, S. M. Murphy, **W. Permar, L. Hu**, T. L. Campos, S. R. Hall, K. Ullmann, X. Zhang, F. Flocke, E. V. Fischer, and J. A. Thornton (2020), Quantification of organic aerosol and brown carbon evolution in fresh wildfire plumes, *Proc. Natl. Acad. Sci. U.S.A.*, 117(47), 29469, doi:10.1073/pnas.2012218117.
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Other Publications

- Hu, L.**, and **Permar, W.** 2020. PTR-ToF-MS Measurements of Complete NMVOCs Data. Version 0.1 [PRELIMINARY]. UCAR/NCAR - Earth Observing Laboratory. <https://data.eol.ucar.edu/dataset/548.053>. Accessed 01 Jul 2022.
- Hu, L.**, and **Permar, W.** , 2020. PTR-ToF-MS Measurements of Selected NMVOCs Data. Version 3.0. UCAR/NCAR - Earth Observing Laboratory. <https://doi.org/10.26023/K9F4-2CNH-EQ0W>. Accessed 01 Jul 2022.
- Hu, L.**, Constraints on the sources and impacts of volatile organic compounds (VOCs) over North America from tall tower measurements, *University of Minnesota Ph.D. dissertation: Twin Cities, MN, USA*, 2014.
- Luan, Y., **L. Hu**, K.C. Wells, The influence of ozone from outside state: Towards cleaner air in Minnesota, Extended Abstract # 33368 for the *Air & Waste Management Association (A&WMA)'s 107th Annual Conference and Exhibition*, Long Beach, CA, June, 2014

SELECTED PRESENTATIONS

Public Outreach

- spectrUM Science Museum new exhibit: High quality Atmospheric Readings and Telemetry (HART) Weather and Air Quality Station for outreach, Missoula, MT, Sept. 2023
- Missoula Public Library's "Air, Fire, and Smoke event", Missoula, MT, Apr. 2023
- U Montana Staff Ambassador's Day, "Air quality research at U Montana", Missoula, MT, Mar. 2023
- Research Education on Air and Cardiovascular Health (REACH), "Quantifying the emissions of trace organic gases from western US wildfires", Missoula, MT, Aug. 2022
- Hosted visits from local high school students (Sentinel HS) in our lab for outreach, Jun. 2022
- U Montana Freshman Seminar, "Atmospheric Chemistry Program at UM", Missoula, MT, 2019/2020/2021
- U Montana New Student Orientation, "Environmental Chemistry Program at UM", Missoula, MT, Aug. 2019

- Montana's Research Road Show, "Clarifying the Chemistry of Wildfire Smoke", Missoula, MT, Oct. 2018
- Idaho Botanical Garden, and Boise Public Library at Main Downtown Branch, "Clarifying the Chemistry of Wildfire Smoke", Boise, ID, Aug. 2018

Invited Conference/Seminar Talks

- AGU Fall Meeting 2023, Session of Atmospheric Composition and Chemistry in the New Arctic, "Known and unexplored reactive organic carbon in the Arctic atmosphere", Dec. 2023
- Montana State University Chemistry and Biochemistry Departmental Seminar, "Tracking atmospheric organic pollutants in the western US", March. 2023
- AGU Fall Meeting 2022, Session of Atmospheric chemistry in the wildfire plume, "Volatile organic compounds (VOCs) from fires: how many should we care about?", Dec. 2022
- AGU Fall Meeting 2022, Session of Polar and Wintertime Atmospheric Chemistry, "Atmospheric chemistry of volatile organic compounds in high and mid-latitude urban areas impacted by residential wood burning", Dec. 2022
- TEMPO Science Team Meeting, "Potential applications of TEMPO formaldehyde data in the western US", Jun. 2022 (virtual)
- University of Iowa, Analytical Chemistry Divisional Seminar, "Quantifying the emissions and chemistry of trace organic gases from US wildfires", Oct. 2021 (virtual)
- University of New Mexico Pharmaceutical Sciences and Toxicology Seminar, Emissions of hazardous air pollutants from wildfire smoke, Oct. 2021 (virtual)
- Frontiers in Atmospheric Chemistry Seminar Series, MIT/UC Davis/CSU/Reed/U Toronto/U Michigan, "Atmospheric volatile organic compounds in western US wildfire smoke", Apr. 2021 (virtual)
- UM Geology Club seminar, "Atmospheric biogeochemistry", Mar. 2020
- Flathead Valley Community College STEM Colloquium, "Organic compounds from wildfire smoke", Nov. 2019
- Eastern Washington University Chemistry Seminar, "Organic compounds from wildfire smoke", Nov. 2019
- U of Minnesota Soil, Water, and Climate Seminar, "Wildfire smoke in the west", May 2019
- Chinese Atmospheric Chemists Forum: "Overview and preliminary findings of the WE-CAN project", Nov. 2018 (virtual)
- University of Montana, Geosciences Seminar: "Global budget of tropospheric ozone", Mar. 2017
- MIT Atmospheric Science Seminar, Cambridge, MA: "Factors controlling global tropospheric ozone", Apr. 2016
- University of Montana, Chemistry Seminar: "Tropospheric ozone and related organic trace gases: sources and chemistry", Feb. 2016
- City University of Hong Kong, Energy and Environment Seminar: "Tropospheric ozone and related organic trace gases: sources and chemistry", Feb. 2016
- Harvard Environmental Chemistry Seminar, Cambridge, MA: "Isoprene emissions and chemical impacts over an ecological transition region", Nov. 2015

- UofMN Doctoral Research Showcase, Minneapolis, MN: “Reconciling the differences between top-down and bottom-up estimates of VOC emissions using tall tower measurements”, Apr. 2014
- Pacific Northwest National Laboratory (PNNL) Atmospheric Science Seminar, Richland, WA: “Constraints on North American VOC sources from tall tower measurements”, Feb. 2014
- Harvard University Environmental Science and Engineering Seminar, Cambridge, MA: “Constraints on the sources and chemical impacts of volatile organic compounds (VOCs) over North America using tall tower measurements”, Feb. 2014
- UofMN Doctoral Dissertation Fellows Seminar, Minneapolis, MN: “Tall tower-based constraints on the sources of organic compounds in the atmosphere”, Jan. 2014
- The Flint Hills Resources Pine Bend Refinery, Rosemount, MN: “Constraints on regional VOC sources from tall tower measurements”, Jun. 2013
- Institute of Geochemistry, Chinese Academy of Sciences, Guiyang, Guizhou, China: “Tall Tower-based constraints on natural and anthropogenic acetone sources in North America”, Sept. 2012