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| Envelope with solid fillDa.Pan@ColoState.edu | **Da Pan** | A person in a suit  Description automatically generated with low confidence |
| Marker with solid fillColorado State University,  Fort Collins, CO, 80521 | **Research Scientist** |
| Internet with solid fill<https://atmospanda.com>  [Da Pan - Collett Research Group](https://collett.atmos.colostate.edu/people/da-pan/)  [Da Pan‬ -](https://scholar.google.com/citations?user=QhoK7lEAAAAJ&hl=en) | Atmospheric scientist that builds sensors, conducts observations, develops models, and analyzes policies for the C and N cycles. |

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| **Education**  **2009 – 2013:** **B.S. Atmospheric Sciences**, Peking University  **2013 – 2021: Ph.D. Environmental Engineering,**  Princeton University  **Research Areas** (Google Scholar: 2240 citations, H-index=17)  **Sensor development:** Low-power, fast response, and high sensitivity open-path sensors for greenhouse gases and reactive nitrogen  **Observations and modeling:** Air-surface exchanges of greenhouse gases and reactive nitrogen  Inorganic aerosol formation  Environmental impacts of O&G production and consumption  **Policy analyses:** Redistribution of air pollutants by trade  **Awards**  Cozzarelli Prize, (Paper of the Year Prize), Proceedings of the National Academy of Sciences  Princeton Environmental Institute–Science, Technology, and Environmental Policy Fellowship  **Professional Activities**  **Members** ofAmerican Geoscience Union and American Meteorological Society  **Convenor and Chair** of the Bioatmospheric N Cycle session (2023 AGU Fall Meeting)  **Journal reviewer** for *Atmosphere, Atmospheric Environment, Environmental Science & Technology, Journal of the Air & Waste Management Association, Chemosensors, Sensors* | **Research Experience**  **2023 – Present: Research Scientist I** Dr. Jeffrey L. Collett, Jr. group | Colorado State University  **2021 – 2023: Postdoctoral Fellow** Dr. Jeffrey L. Collett, Jr. group | Colorado State University  **2013 – 2021: Research Assistant** Dr. Mark A. Zondlo’s group | Princeton University  **2017 – 2020: Research Fellow** Dr. Denise L. Mauzerall’s group | Princeton University  **2018 – 2019: Research Intern** Optical Network and Sensing Laboratory | NEC Labs America  **2011 – 2013: Research Assistant** Dr. Jintai Lin’s group | Peking University  **Teaching and Mentoring Experience**  **Co-advisor |** Princeton University |Victor Fu,REU Student, 2014  **Invited Lecturer** | Colorado State University | Air Quality Characterization (ATS 716), Spring 2022  **Co-advisor** |Colorado State University | Jennifer B. Seth, REU Student, 2022  **Committee Member** | Colorado State University | Weixin Zhang, Master’s Student, 2022 – present  **Field Experience** (\*indicates field campaign lead):  **2022 – Present: HEI-Energy Community Exposures of Unconventional Oil and Gas Development\*** |Colorado  **2021 – 2022:** **Gradient NH3 flux measurements\*** | Rocky Mountain National Park | Colorado  **2021: CarCavAQS 2021** | Carlsbad Cavern National Park | Carlsbad, New Mexico  **2019 – 2020 Eddy Covariance flux measurements\*** | Hackensack Meadowlands | New Jersey  **2017:** **Eddy Covariance NH3 flux measurements** | Duke Forest | North Carolina  **2015 - 2016** **Eddy Covariance NH3 flux measurements\*** | Rocky Mountain National Park | Colorado  **2015 – 2017** **Eddy Covariance N2O flux measurements\*** | W.K. Kellogg Biological Station | Michigan  **2014 – 2014** **NASA DISCOVER-AQ** | Front Range, Colorado  **2014 – 2014** **CAREBeijing/NCP 2014** | North China Plain, China |

**Publications**

**Manuscripts under review:**

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| 26. | **Pan, D.**, Mauzerall, D. L., Wang, R., Guo, X., Puchalski, M., Guo, Y., Song, S., Sun, K., Sullivan, A. P., Collett Jr, J. L., Schichtel, B. A., & Zondlo, M. A. Regime Shift in Atmospheric Secondary Inorganic Aerosol Formation in the Rural United States. *Nature Geocience*. |
| 25. | Guo, Y., Winiwarter, W., Wang, X., **Pan, D.**, Gu, B., & Zhang, L. Nitrogen abatement to adress PM2.5 challenge persisting under climate mitigation policies. *Nature communications*. |

**Peer-reviewed: 24, 2241 citations, H-index of 17 according to Google Scholar, as of 10/25/2023.**

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| 24. | **Pan, D.**, Pollack, I. B., Sive, B., Marsavin, A., Naimie, L. E., Benedict, K. B., Zhou, Y., Sullivan, A. P., Prenni, A. J., Cope, E., Calahorrano, J. J., Fischer, E. V., Schichtel, B. A., & Collett Jr, J. L. (2023). Source characterization of volatile organic compounds at Carlsbad Caverns National Park. Journal of the Air & Waste Management Association. |
| 23. | Pollack, I.B., **Pan, D.**, Marsavin, A., Cope, E.J., Juncosa Calahorrano, J., Naimie, L., Benedict, K.B., Sullivan, A.P., Zhou, Y., Sive, B.C. and Prenni, A.J., 2023. Observations of ozone, acyl peroxy nitrates, and their precursors during summer 2019 at Carlsbad Caverns National Park, New Mexico. (2023). Journal of the Air & Waste Management Association. |
| 22. | Wang, R., **Pan, D.**, Guo, X., Sun, K., Clarisse, L., Van Damme, M., Coheur, P.-F., ClerBaux, C., Puchalski, M., & Zondlo, M. A. (2023). Bridging the spatial gaps of the Ammonia Monitoring Network using satellite ammonia measurements. *Atmospheric Chemistry and Physics*. |
| 21. | Guo, X., **Pan, D.**, Daly, R. W., Chen, X., Walker, J. T., Tao, L., McSpiritt, J., & Zondlo, M. A. (2022). Spatial heterogeneity of ammonia fluxes in a deciduous forest and adjacent grassland. *Agricultural and Forest Meteorology*, *326*, 109128. |
| 20. | **Pan, D.**, Gelfand, I., Tao, L., Abraha, M., Sun, K., Guo, X., Chen, J., Robertson, G. P., & Zondlo, M. A. (2022). A new open‐path eddy covariance method for nitrous oxide and other trace gases that minimizes temperature corrections. *Global Change Biology*, *28*(4), 1446-1457. |
| 19. | **Pan, D.**, Benedict, K. B., Golston, L. M., Wang, R., Collett Jr, J. L., Tao, L., Sun, K., Guo, X., Ham, J., & Prenni, A. J. (2021). Ammonia dry deposition in an alpine ecosystem traced to agricultural emission hotpots. *Environmental Science & Technology*, *55*(12), 7776-7785. |
| 18. | Qin, Y., Zhou, M., **Pan, D.**, Klimont, Z., Gingerich, D. B., Mauzerall, D. L., Zhao, L., He, G., & Bielicki, J. M. (2021). Environmental consequences of potential strategies for China to prepare for natural gas import disruptions. *Environmental Science & Technology*, *56*(2), 1183-1193. |
| 17. | Wang, R., Guo, X., **Pan, D.**, Kelly, J. T., Bash, J. O., Sun, K., Paulot, F., Clarisse, L., Van Damme, M., & Whitburn, S. (2021). Monthly patterns of ammonia over the contiguous United States at 2‐km resolution. *Geophysical research letters*, *48*(5), e2020GL090579. |
| 16. | Golston, L. M., **Pan, D.**, Sun, K., Tao, L., Zondlo, M. A., Eilerman, S. J., Peischl, J., Neuman, J. A., & Floerchinger, C. (2020). Variability of ammonia and methane emissions from animal feeding operations in northeastern Colorado. *Environmental Science & Technology*, *54*(18), 11015-11024. |
| 15. | Guo, Y., Chen, Y., Searchinger, T. D., Zhou, M., **Pan, D.**, Yang, J., Wu, L., Cui, Z., Zhang, W., & Zhang, F. (2020). Air quality, nitrogen use efficiency and food security in China are improved by cost-effective agricultural nitrogen management. *Nature Food*, *1*(10), 648-658. |
| 14. | **Pan, D.**, Tao, L., Sun, K., Golston, L. M., Miller, D. J., Zhu, T., Qin, Y., Zhang, Y., Mauzerall, D. L., & Zondlo, M. A. (2020). Methane emissions from natural gas vehicles in China. *Nature communications*, *11*(1), 4588. |
| 13. | Caulton, D. R., Lu, J. M., Lane, H. M., Buchholz, B., Fitts, J. P., Golston, L. M., Guo, X., Li, Q., McSpiritt, J., & **Pan, D.** (2019). Importance of superemitter natural gas well pads in the Marcellus shale. *Environmental Science & Technology*, *53*(9), 4747-4754. |
| 12. | Wang, J., Ni, R., Lin, J., Tan, X., Tong, D., Zhao, H., Zhang, Q., Lu, Z., Streets, D., & **Pan, D.** (2019). Socioeconomic and atmospheric factors affecting aerosol radiative forcing: production-based versus consumption-based perspective. *Atmospheric Environment*, *200*, 197-207. |
| 11. | Caulton, D. R., Li, Q., Bou-Zeid, E., Fitts, J. P., Golston, L. M., **Pan, D.**, Lu, J., Lane, H. M., Buchholz, B., & Guo, X. (2018). Quantifying uncertainties from mobile-laboratory-derived emissions of well pads using inverse Gaussian methods. *Atmospheric Chemistry and Physics*, *18*(20), 15145-15168. |
| 10. | Clark, S. C., Ryals, R., Miller, D. J., Mullen, C. A., **Pan, D.**, Zondlo, M. A., Boateng, A. A., & Hastings, M. G. (2017). Effluent gas flux characterization during pyrolysis of chicken manure. *ACS Sustainable Chemistry & Engineering*, *5*(9), 7568-7575. |
| 9. | Golston, L. M., Tao, L., Brosy, C., Schäfer, K., Wolf, B., McSpiritt, J., Buchholz, B., Caulton, D. R., **Pan, D.**, & Zondlo, M. A. (2017). Lightweight mid-infrared methane sensor for unmanned aerial systems. *Applied Physics B*, *123*, 1-9. |
| 8. | Sun, K., Tao, L., Miller, D. J., **Pan, D.**, Golston, L. M., Zondlo, M. A., Griffin, R. J., Wallace, H. W., Leong, Y. J., & Yang, M. M. (2017). Vehicle emissions as an important urban ammonia source in the United States and China. *Environmental Science & Technology*, *51*(4), 2472-2481. |
| 7. | Zhang, Q., Jiang, X., Tong, D., Davis, S. J., Zhao, H., Geng, G., Feng, T., Zheng, B., Lu, Z., Streets, D. G., Ni, R., Brauer, M., van Donkelaar, A., Martin, R. V., Huo, H., Liu, Z., **Pan, D.**, Kan, H., Yan, Y., . . . Guan, D. (2017). Transboundary health impacts of transported global air pollution and international trade. Nature, 543(7647), 705-709. |
| 6. | Eilerman, S. J., Peischl, J., Neuman, J. A., Ryerson, T. B., Aikin, K. C., Holloway, M. W., Zondlo, M. A., Golston, L. M., **Pan, D.**, & Floerchinger, C. (2016). Characterization of ammonia, methane, and nitrous oxide emissions from concentrated animal feeding operations in northeastern Colorado. *Environmental Science & Technology*, *50*(20), 10885-10893. |
| 5. | Lin, J., Tong, D., Davis, S., Ni, R., Tan, X., **Pan, D.**, Zhao, H., Lu, Z., Streets, D., & Feng, T. (2016). Global climate forcing of aerosols embodied in international trade. *Nature Geoscience*, *9*(10), 790-794. |
| 4. | Miller, D. J., Sun, K., Tao, L., **Pan, D.**, Zondlo, M. A., Nowak, J. B., Liu, Z., Diskin, G., Sachse, G., & Beyersdorf, A. (2015). Ammonia and methane dairy emission plumes in the San Joaquin Valley of California from individual feedlot to regional scales. *Journal of Geophysical Research: Atmospheres*, *120*(18), 9718-9738. |
| 3. | Tao, L., Sun, K., Miller, D. J., **Pan, D.**, Golston, L. M., & Zondlo, M. A. (2015). Low-power, open-path mobile sensing platform for high-resolution measurements of greenhouse gases and air pollutants. *Applied Physics B*, *119*, 153-164. |
| 2. | Lin, J., **Pan, D.**, Davis, S. J., Zhang, Q., He, K., Wang, C., Streets, D. G., Wuebbles, D. J., & Guan, D. (2014). China’s international trade and air pollution in the United States. *Proceedings of the National Academy of Sciences*, *111*(5), 1736-1741. |
| 1. | Lin, J., **Pan, D. (co-first author)**, & Zhang, R. (2013). Trend and interannual variability of Chinese air pollution since 2000 in association with socioeconomic development: A brief overview. *Atmospheric and Oceanic Science Letters*, *6*(2), 84-89. |

**Intellectural Properites**

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| 2. | Tian, Y, **Pan, D.**, “Rapid temperature measurements by wavelength modulation spectroscopy”, Provisional patent application 23/068,181 filed April 01, 2020. |
| 1. | Zondlo, M. A., Tao, L., **Pan, D.**, Collins, J., Guiguizian, P., Bell, H., Elliott, H., Killough, P., Geerthuis, B., and Soto, H., “Spectroscopic devices, systems, and methods for optical sensing of molecular species”, Provisional patent application 62/809,249 filed February 22, 2019. |

**Presentations**

**Invited Seminars**

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| 2. | **Pan, D.**, Observations and Modeling of Atmospheric Reactive Nitrogen and Volatile Organic Compounds. Departmental Seminar at Department of Atmospheric Science, University of Wyoming (2023). |
| 1. | **Pan, D.**, Methane emissions from natural gas vehicles in China. Research Seminar at Institute of Urban Environment, Chinese Academy of Sciences (2015)**.** |

**First-Author Conference Oral Presentations**

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| 6. | **Pan, D.**, Naimie, L., Sullivan, A.P., Walker, J.T., Djurkovic, A., Schichtel, B.A., Collett, Jr, J.L. (2022), Ammonia surface-atmosphere exchange processes in Rocky Mountain National Park, 2022 AGU fall Meeting. |
| 5. | **Pan, D.**, Mauzerall, L.D., Benedict, K. B., Wang, R., Golston, L. M., Collett Jr, J. L., Tao, L., Sun, K., Guo, X., Ham, J., Prenni, A. J., Schichtel, B. A., Puchalski, M., Zondlo, M. A. (2021). A paradigm shift in sulfate-nitrate-ammonium aerosol formation in the US and its implications for air quality, 2021 Air & Waste Management Association Visibility Conference. |
| 4. | **Pan, D.**, Naimie, L., Sullivan, A.P., Walker, J.T., Djurkovic, A., Schichtel, B.A., Collett, Jr, J.L. (2021), Ammonia surface-atmosphere exchange processes over alpine foresets in Rocky Mountain National Park, 2021 AMS Annual Meeting. |
| 3. | **Pan, D.**, Ham, J., Benedict, K. B., Prenni, A. J., Schichtel, B. A., Collett Jr, J. L., Zondlo, M. A. (2016). Eddy covariance measurements of NH3 fluxes in Rocky Mountain National Park with an open-path quantum cascade laser-based sensor, 2016 NADP Conference. |
| 2. | **Pan, D.**, L. Tao, Sun, K., Miller, D. J., Golston, L. M., and Zondlo M. A. (2015). Quantification of ammonia losses near animal feedlots using mobile measurements during DISCOVER-AQ, DISCOVER-AQ Science Team Meeting. |
| 1. | **Pan, D.**, L. Tao, K. Sun, D. Miller, L. Golston, T. Zhu, Y. Tian, T. Wang, and M. Zondlo (2014): Methane emissions from natural gas vehicles in China during CAREBeijing, 2014 AGU fall meeting. |

**First-Author Conference Poster Presentations**

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| 11. | **Pan, D.,** Naimie, L.E., Walker, J.T., Sullivan, A.P., Benedict, K.B., Djurkovic, A., Schichtel, B.A., Perrin, R., Singh, A., Ham, J., Prenni, A.J., Zondlo, M.A., Collett J.L. (2021). Ammonia Surface-Atmosphere Exchange Processes in Rocky Mountain National Park, 2021 NADP Conference. |
| 10. | **Pan, D.**, Mauzerall, D. L., Benedict, K. B., Wang, R., Golston, L. M., Collett Jr, J. L., Tao, L., Sun, K., Guo, X., Ham, J., Prenni, A. J., Schichtel, B. A., Puchalski, M., Mikoviny, T., Muller, M., Wisthaler, A., Zondlo, M. A. (2020). A paradigm shift in sulfate-nitrate-ammonium aerosol formation in the US and its implications for air quality, 2020 AGU Fall Meeting. |
| 9. | **Pan, D.,** Benedict, K.B., Golston, L.M., Tao, L., Sun, K., Guo, X., Wang, R., Ham, J., Prenni, A.J., Schichtel, B.A., Collett, J.L., Zondlo, M.A. (2019). Impacts of Ammonia Emission Hotspots on Reactive Nitrogen Deposition: A Case Study of the Rocky Mountain National Park. 2019 Atmospheric Chemistry Gordon Research Conference. |
| 8. | **Pan, D.**, Guo, X., Wang, R., Golston, L., Caulton, D., Tao, L., Guo, Y., Mauzerall, D. M., Zondlo, M. A. (2018). Integrating NH3 observations to investigate effectiveness of NH3 control in reducing PM2.5 and improving visibility in the US, 2018 AGU Fall Meeting. |
| 7. | **Pan, D.**, Guo, X., Wang, R., Sun, K., Golston, L.M., Mauzerall, D.L., and Zondlo, M.A. (2017) Intercomparison of Ammonia Observations from Policy Making Perspective, NASA Health and Air Quality Applied Sciences Team (HAQAST) 3. |
| 6. | **Pan, D.**, Ham, J., Tao, L., Benedict, K. B., Prenni, A. J., Schichtel, B. A., Sun, K., Collett Jr, J. L., Zondlo, M. A. (2016). What can we learn about ammonia fluxes from eddy covariance measurements, 2016 AGU Fall Meeting. |
| 5. | **Pan, D.**, Ham, J., Benedict, K. B., Prenni, A. J., Schichtel, B. A., Collett Jr, J. L., Zondlo, M. A. (2016). Eddy covariance measurements of NH3 fluxes over a natural grass land with an open-path quantum cascade laser-based sensor, 2015 Acid Rain Conference. |
| 4. | **Pan, D.**, Tao, L., Gelfand, I., Moyer, R., Poe, A., Sun, K., Abraha, M., Robertson, P., Zondlo, M. A., Open-path, quantum cascade-laser-based sensor for eddy covariance measurements of nitrous oxide fluxes, 2015 AGU Fall Meeting |
| 3. | **Pan, D.**, Ham, J., Benedict, K. B., Prenni, A. J., Schichtel, B. A., Collett Jr, J. L., Zondlo, M. A. (2015). Eddy covariance measurements of NH3 fluxes over a natural grass land with an open-path quantum cascade laser-based sensor, 2015 AGU Fall Meeting. |
| 2. | **Pan, D.**, L. Tao, K. Sun, D. Miller, L. Golston, T. Zhu, Y. Tian, T. Wang, and M. Zondlo (2014): Methane emissions from natural gas vehicles in China, 2014 GEIA Conference. |
| 1. | **Pan, D.**, Kuang, Y., Lin J. (2012). Multi-decadal variability of aerosol optical depth over China estimated from visibility measurements at ground meteorological stations, 12th International Global Atmospheric Chemistry (IGAC) Science Conference. |