

# Alexander B. Thames

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Department of Geosciences  
University Park, PA, 16802

Deike Building  
Room 434

## CURRENT POSITION

### **Pennsylvania State University**

PhD Candidate, Dual-Title: Geoscience and Climate Science

Advisors: Dr. Antonia Hadjimichael, Dr. Bradford J. Foley

State College, PA

2019 – Present

- Developing and implementing a multisite and multivariate synthetic weather generator to be used in conjunction with Colorado's StateCU in order to provide decision-makers and shareholders with information on agricultural consumptive use driven by climate risks in the Colorado River Basin
- Constructing exploratory models investigating how Earth's internal and external water reservoirs affect its thermal history and confines the present-day volatile flux into the mantle with non-standard feedbacks like variable regassing efficiency

## EDUCATION

### **Pennsylvania State University, Eberly College of Science**

BS: Physics, *with high distinction*; Minor: Mathematics

State College, PA

2015

## RESEARCH EXPERIENCE

### **Pennsylvania State University, Department of Meteorology and Atmospheric Science**

Faculty Researcher

Field and laboratory operation of the Airborne Tropospheric Hydrogen Oxides Sensor (ATHOS) and the OH Reactivity (OHR) instruments

State College, PA

2015 – 2019

#### **Atmospheric Tomography (ATom) Mission**

2016 – 2018

- Participated in a four-season NASA airborne campaign as the sole operator of the ATHOS and OHR instrument suite for 40+ research flights aboard the NASA DC-8 research aircraft as it flew between northern and southern polar regions, constantly ascending or descending between approximately 500ft and 39,000ft, to collect remote atmosphere HO<sub>x</sub> data
- Collected, processed, and analyzed measurements using LabVIEW and MATLAB software that I extensively modified

#### **Korean-United States Air Quality (KORUS-AQ) Mission**

2016

- Participated in an international NASA field campaign over South Korea operating the ATHOS and OHR instrument suite for over 120 flight-research hours aboard the NASA DC-8 research aircraft, to collect urban-influenced HO<sub>x</sub> data

#### **OH Reactivity Inter-Comparison**

2015

- Participated in an OH reactivity instrument comparison study in Jülich, Germany as the sole United States representative amongst eleven different participating research organizations
- Helped integrate three distinct laboratory pieces from three separate research institutions into an operational field experiment and operated the instrument during the comparison study

### **GRANTS, AWARDS, and CERTIFICATES**

<b>Alley Family Graduate Scholarship</b> Pennsylvania State University	2024
<b>NASA ARSET: Drought Monitoring, Prediction, and Projection</b> National Aeronautics and Space Administration	2024
<b>Paul D. Krynine Scholarship</b> Pennsylvania State University	2020 – 2022, 2024
<b>Pottorf Endowment for Graduate Excellence</b> Pennsylvania State University	2024
<b>Michael Loudin Family Graduate Scholarship</b> Pennsylvania State University	2023
<b>Earle S. Lenker Award</b> Pennsylvania State University	2022 - 2023
<b>NASA Group Achievement Award, ATom</b> National Aeronautics and Space Administration	2019
<b>NASA Group Achievement Award, KORUS-AQ</b> National Aeronautics and Space Administration	2016
<b>John and Elizabeth Holmes Teas Scholarship Fund</b> Pennsylvania State University	2014

### **RELATED PROFESSIONAL EXPERIENCE/SKILLS**

#### **Fieldwork**

- YAG and dye laser maintenance and realignment
- Diagnostic in-flight physical and electronic instrument repair
- Custom software creation/data processing on atmospheric physics/chemistry, hydroclimatic, and geophysical data

#### **Languages**

- Electronic: python, MATLAB, shell, C#, LaTeX, markdown, GDScript, GLSL
- Spoken: English, with some Spanish

#### **Leadership**

- College of Earth and Mineral Science Graduate Student Council 2019 - 2022

**PEER-REVIEWED PUBLICATIONS**

## First Author

1. **Alexander B Thames**, William H Brune, David O Miller, Hannah M Allen, Eric C Apel, Donald R Blake, T Paul Bui, Roisin Commane, John D Crounse, Bruce C Daube, Glenn S Diskin, Joshua P DiGangi, James W Elkins, Samuel R Hall, Thomas F Hanisco, Reem A Hannun, Eric Hints, Rebecca S Hornbrook, Michelle J Kim, Kathryn McKain, Fred L Moore, Julie M Nicely, Jeffrey Peischl, Thomas B Ryerson, Jason M St Clair, Colm Sweeney, Alex Teng, Chelsea R Thompson, Kirk Ullmann, Paul O Wennberg, Glenn M Wolfe, (2020). Missing OH reactivity in the global marine boundary layer. *Atmospheric Chemistry and Physics*, 20(6), 4013-4029.

## Co-Author

1. Hendrik Fuchs, Anna Novelli, Michael Rolletter, Andreas Hofzumahaus, Eva Y Pfannerstill, Stephan Kessel, Achim Edtbauer, Jonathan Williams, Vincent Michoud, Sebastien Dusanter, Nadine Locoge, Nora Zannoni, Valerie Gros, Francois Truong, Roland Sarda-Esteve, Danny R Cryer, Charlotte A Brumby, Lisa K Whalley, Daniel Stone, Paul W Seakins, Dwayne E Heard, Coralie Schoemaeker, Marion Blocquet, Sebastien Coudert, Sebastien Batut, Christa Fittschen, **Alexander B Thames**, William H Brune, Cheryl Ernest, Hartwig Harder, Jennifer BA Muller, Thomas Elste, Dagmar Kubistin, Stefanie Andres, Birger Bohn, Thorsten Hohaus, Frank Holland, Xin Li, Franz Rohrer, Astrid Kiendler-Scharr, Ralf Tillmann, Robert Wegener, Zhujun Yu, Qi Zou, Andreas Wahner (2017). Comparison of OH reactivity measurements in the atmospheric simulation chamber SAPHIR. *Atmospheric Measurement Techniques*, 10(10), 4023-4053.
2. Paul S Romer, Paul J Wooldridge, John D Crounse, Michelle J Kim, Paul O Wennberg, Jack E Dibb, Eric Scheuer, Donald R Blake, Simone Meinardi, Alexandra L Brosius, **Alexander B Thames**, David O Miller, William H Brune, Samuel R Hall, Thomas B Ryerson, Ronald C Cohen (2018). Constraints on Aerosol Nitrate Photolysis as a Potential Source of HONO and NO<sub>x</sub>. *Environmental Science and Technology*, 52(23), 13738-13746.
3. GM Wolfe, JM Nicely, JM St Clair, TF Hanisco, J Liao, L Oman, WH Brune, DO Miller, **AB Thames**, GG Abad, TB Ryerson, J Peischl, K McCain, C Sweeney, PO Wennberg, MI Kim, JD Crounse, SR Hall, K Ullmann, GS Diskin, TP Bui, CS Chang, JM Dean-Day, (2019). ATom: Column-Integrated Densities of Hydroxyl and Formaldehyde in Remote Troposphere. *ORNL DAAC*.
4. Glenn M Wolfe, Julie M Nicely, Jason M St Clair, Thomas F Hanisco, Jin Liao, Luke D Oman, William B Brune, David Miller, **Alexander Thames**, Gonzalo González Abad, Thomas B Ryerson, Chelsea R Thompson, Jeff Peischl, Kathryn McKain, Colm Sweeney, Paul O Wennberg, Michelle Kim, John D Crounse, Samuel R Hall, Kirk Ullmann, Glenn Diskin, Paul Bui, Cecilia Chang, Jonathan Dean-Day, (2019). Mapping hydroxyl variability throughout the global remote troposphere via synthesis of airborne and satellite formaldehyde observations. *Proceedings of the National Academy of Sciences*, 116(23), 11171-11180.
5. Saewung Kim, Roger Seco, Dasa Gu, Dianne Sanchez, Daun Jeong, Alex B Guenther, Young-Ro Lee, John E Mak, Luping Su, Dan Bi Kim, Joonyoung Ahn, John Sullivan, Thomas Mcgee, Russell Long, William H Brune, **Alexander Thames**, Armin

- Wisthaler, Markus Müller, Andrew Weinheimer, Tomas Mikoviny, Melissa Yang, Jung-Hun Woo, Soyoung Kim, Hyunju Park, (2020). The roles of suburban forest in controlling vertical trace gas and OH reactivity distributions—a case study for Seoul Metropolitan Area. *Faraday Discussions*.
6. WH Brune, DO Miller, **AB Thames**, HM Allen, EC Apel, DR Blake, TP Bui, R Commane, JD Crouse, BC Daube, GS Diskin, JP DiGangi, JW Elkins, SR Hall, TF Hanisco, RA Hannun, EJ Hintsa, RS Hornbrook, MJ Kim, K McKain, FL Moore, JA Neuman, JM Nicely, J Peischl, TB Ryerson, JM St. Clair, C Sweeney, AP Teng, C Thompson, K Ullmann, PR Veres, PO Wennberg, GM Wolfe, (2020). Exploring oxidation in the remote free troposphere: Insights from Atmospheric Tomography (ATom). *Journal of Geophysical Research: Atmospheres*, 125(1), e2019JD031685.
  7. Patrick R Veres, J Andrew Neuman, Timothy H Bertram, Emmanuel Assaf, Glenn M Wolfe, Christina J Williamson, Bernadett Weinzierl, Simone Tilmes, Chelsea R Thompson, **Alexander B Thames**, Jason C Schroder, Alfonso Saiz-Lopez, Andrew W Rollins, James M Roberts, Derek Price, Jeff Peischl, Benjamin A Nault, Kristian H Møller, David O Miller, Simone Meinardi, Qinyi Li, Jean-François Lamarque, Agnieszka Kupc, Henrik G Kjaergaard, Douglas Kinnison, Jose L Jimenez, Christopher M Jernigan, Rebecca S Hornbrook, Alan Hills, Maximilian Dollner, Douglas A Day, Carlos A Cuevas, Pedro Campuzano-Jost, James Burkholder, T Paul Bui, William H Brune, Steven S Brown, Charles A Brock, Ilann Bourgeois, Donald R Blake, Eric C Apel, Thomas B Ryerson, (2020). Global airborne sampling reveals a previously unobserved dimethyl sulfide oxidation mechanism in the marine atmosphere. *Proceedings of the National Academy of Sciences*, 117(9), 4505-4510.
  8. Katherine R Travis, Colette L Heald, Hannah M Allen, Eric C Apel, Stephen R Arnold, Donald R Blake, William H Brune, Xin Chen, Róisín Commane, John D Crouse, Bruce C Daube, Glenn S Diskin, James W Elkins, Mathew J Evans, Samuel R Hall, Eric J Hintsa, Rebecca S Hornbrook, Prasad S Kasibhatla, Michelle J Kim, Gan Luo, Kathryn McKain, Dylan B Millet, Fred L Moore, Jeffrey Peischl, Thomas B Ryerson, Tomás Sherwen, **Alexander B Thames**, Kirk Ullmann, Xuan Wang, Paul O Wennberg, Glenn M Wolfe, Fangqun Yu, (2020). Constraining remote oxidation capacity with ATom observations. *Atmospheric Chemistry and Physics*, 20(13), 7753-7781.
  9. Agnieszka Kupc, Christina J Williamson, Anna L Hodshire, Jan Kazil, Eric Ray, T Paul Bui, Maximilian Dollner, Karl D Froyd, Kathryn McKain, Andrew Rollins, Gregory P Schill, **Alexander Thames**, Bernadett B Weinzierl, Jeffrey R Pierce, Charles A Brock, (2020). The potential role of organics in new particle formation and initial growth in the remote tropical upper troposphere. *Atmospheric Chemistry and Physics Discussions*, 1-38.
  10. Siyuan Wang, Eric C Apel, Rebecca H Schwantes, Kelvin H Bates, Daniel J Jacob, Emily V Fischer, Rebecca S Hornbrook, Alan J Hills, Louisa K Emmons, Laura L Pan, Shawn Honomichl, Simone Tilmes, Jean-François Lamarque, Mingxi Yang, Christa A Marandino, Eric S Saltzman, Warren de Bruyn, Sohiko Kameyama, Hiroshi Tanimoto, Yuko Omori, Samuel R Hall, Kirk Ullmann, Thomas B Ryerson, Chelsea R Thompson, Jeff Peischl, Bruce C Daube, Róisín Commane, Kathryn McKain, Colm Sweeney, **Alexander B Thames**, David O Miller, William H Brune, Glenn S Diskin, Joshua P DiGangi, Steven C Wofsy, (2020). Global Atmospheric Budget of Acetone: Air-Sea Exchange and the Contribution to Hydroxyl Radicals. *Journal of Geophysical Research: Atmospheres*, 125(15), e2020JD032553.
  11. Katherine R Travis, Colette L Heald, Hannah M Allen, Eric C Apel, Stephen R Arnold, Donald R Blake, William H Brune, Xin Chen, Róisín Commane, John D Crouse, Bruce C Daube, Glenn S Diskin, James W Elkins, Mathew J Evans, Samuel R Hall, Eric J

- Hints, Rebecca S Hornbrook, Prasad S Kasibhatla, Michelle J Kim, Gan Luo, Kathryn McKain, Dylan B Millet, Fred L Moore, Jeffrey Peischl, Thomas B Ryerson, Tomás Sherwen, **Alexander B Thames**, Kirk Ullmann, Xuan Wang, Paul O Wennberg, Glenn M Wolfe, Fangqun Yu, (2020). Constraining remote oxidation capacity with ATom observations. *Atmospheric chemistry and physics*, 20(13), 7753-7781.
12. Saewung Kim, Roger Seco, Dasa Gu, Dianne Sanchez, Daun Jeong, Alex B Guenther, Youngro Lee, John E Mak, Luping Su, Dan Bi Kim, Youngjae Lee, Joon-Young Ahn, Tom Mcgee, John Sullivan, Russell Long, William H Brune, **Alexander B Thames**, Armin Wisthaler, Markus Müller, Thomas Mikoviny, Andy Weinheimer, Melissa Yang, Jung-Hun Woo, Soyoung Kim, Hyunjoo Park, (2020). The role of a suburban forest in controlling vertical trace gas and OH reactivity distributions—a case study for the Seoul metropolitan area. *Faraday Discussions*, 226, 537-550.

## CONFERENCES

- |   |                   |
|---|-------------------|
| <b>American Geophysical Union</b>   | Washington, D.C   |
| Poster Presentation   | 2024              |
| <i>Thames, A.B., Hadjimichael, A., Quinn, J.D.: Understanding Compound Climate Impacts to Agriculture Using a Multisite Weather Generator in the Upper Colorado River Basin</i>               |                   |
| <b>Climate Intelligence Summer School</b>   | Lake Como, Italy  |
| Attendee  | 2024              |
| <b>American Geophysical Union</b>   | San Francisco, CA |
| Poster Presentation   | 2023              |
| <i>Thames, A.B., Hadjimichael, A., Kukal, M.S., Raj, C.: Assessing the Compound Impacts of Precipitation and Temperature on Agriculture in the Upper Colorado River Basin</i>                 |                   |
| <b>American Geophysical Union</b>   | Online            |
| Poster Presentation   | 2021              |
| <i>Thames, A.B., Foley, B.J.: Producing Feasible Water and Thermal Evolutions for Earth's Mantle Using Monte Carlo Analysis</i>   |                   |
| <b>American Geophysical Union</b>   | Online            |
| Poster Presentation   | 2020              |
| <i>Thames, A.B., Foley, B.J.: Using Monte Carlo Analysis and Present-Day Constraints on Earth's Water Budget to Produce Feasible Water and Thermal Histories via Reverse-Time Integration</i> |                   |
| <b>American Geophysical Union</b>   | Washington, D.C   |
| Poster Presentation   | 2018              |
| <i>Thames, A.B., Brune, W.B., Miller, D.O.; NASA ATom Science Team: Global OH Reactivity in the Remote Marine Boundary Layer and the Potential of Missing Reactivity</i>                      |                   |
| <b>Atmospheric Tomography Mission Science Team Meeting II</b>   | Boulder, CO       |
| Oral Presentation of Research   | 2018              |

- Thames, A.B.**, Brune, W.B., Miller, D.O.; NASA ATom Science: *Research Update #2*
- Korea-US Air Quality Mission, Science Team Meeting II** Irvine, CA  
Oral Presentation of Research 2018
- Thames, A.B.**, Brune, W.B., Miller, D.O.; NASA KORUS-AQ Science: *Research Update #2*
- American Meteorological Society** Austin, TX  
Poster Presentation 2018
- Thames, A.B.**, Brune, W.B., Miller, D.O.; NASA ATom Science: *Measured OH Reactivity in ATom1 and ATom2*
- Atmospheric Tomography Mission Science Team Meeting I** Boulder, CO  
Poster Presentation 2017
- Thames, A.B.**, Brune, W.B., Miller, D.O.; NASA ATom Science: *Research Update #1*
- Korea-US Air Quality Mission, Science Team Meeting I** Jeju Island, South Korea  
Oral Presentation of Research 2017
- Thames, A.B.**, Brune, W.B., Miller, D.O., Brosius, A.L.; NASA KORUS-AQ Science: *Research Update #1*
- OH Reactivity Intercomparison Science Team Meeting** Jülich, Germany  
Oral Presentation of Research 2016
- Thames, A.B.**, Brune, W.B., Miller, D.O.; *Research Update #1*