

# YUZHEN YAN

yanyuzhen.pku@gmail.com

<https://yuzheny.com>

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## RESEARCH INTEREST

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- Reconstruction of atmospheric composition and chemistry, past climate, and ice sheets in key intervals in the Quaternary Period using innovative “blue ice” archives.
- Examination of the glaciological nature of blue ice areas with observations and models.
- Application of novel and/or previously under-appreciated geochemical proxies in ice cores.

## EDUCATION BACKGROUND

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- 09/2013-11/2019     **PhD**, Department of Geosciences, Princeton University  
Thesis: Climate Snapshots and Gas Records from Antarctic Blue Ice Records: Implications for the Mid-Pleistocene Transition and the Last Interglacial (Advisers: Dr. Michael L. Bender and Dr. John A. Higgins)
- 09/2009-07/2013     **Bachelor of Science** (with honor), College of Environmental Sciences and Engineering, Peking University, Beijing, China  
Thesis: Holocene Centennial Temperature Reconstruction for China (Adviser: Dr. Hongyan Liu)
- 09/2011-12/2011     **Exchange Student**, University of California, Los Angeles

## EMPLOYMENT HISTORY

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- 12/2019-01/2022     **Postdoctoral Research Associate**, Department of Earth, Environmental and Planetary Sciences, Rice University (Faculty hosts: Dr. Laurence Y. Yeung and Dr. Sylvia G. Dee).  
Research projects: doubly substituted oxygen ( $^{18}\text{O}^{18}\text{O}$ ) in ice core archives (w/ LYY) and evaluating negative deuterium excess in snow and ice observed in Dry Valleys and Allan Hills, Antarctica (w/ SGD).

## FIELD EXPERIENCE

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- 11/2022-01/2023     Five (5)-week field deployment in Allan Hills Blue Ice Area, East Antarctica drilling ice cores.
- 11/2015-01/2016     Seven (7)-week field deployment in Allan Hills Blue Ice Area, East Antarctica drilling ice cores.

## PEER-REVIEWED PUBLICATIONS [\*corresponding author(s)]

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1. **Yan, Y.\***, Kurbatov, A.V., Mayewski, P.A., Shackleton, S., and Higgins, J.A.: Early-Pleistocene East Antarctic temperature in phase with local insolation, *Nat. Geosci.*, 16(1), 50–55, <https://doi.org/10.1038/s41561-022-01095-x>, 2023.
2. **Yan, Y.\***, Banerjee, A., Murray, L.T., Tie, X., and Yeung, L.Y.\*: Tropospheric ozone during the Last Interglacial, *Geophys. Res. Lett.*, 49(23), e2022GL101113. <https://doi.org/10.1029/2022GL101113>, 2022.
3. **Hu, J.\***, **Yan, Y.\***, Yeung, L.Y., and Dee, S.G.: Sublimation origin of negative deuterium excess observed in snow and ice samples from McMurdo Dry Valleys and Allan Hills Blue Ice Areas, East Antarctica, *J. Geophys. Res. Atmos.*, 127(11), e2021JD035950, <https://doi.org/10.1029/2021JD035950>, 2022.
4. **Yan, Y.\***, Brook, E.J., Kurbatov, A.V., Severinghaus, J.P., and Higgins, J.A.: Ice Core Evidence for Atmospheric Oxygen Decline Since the Mid-Pleistocene Transition, *Sci. Adv.*, 7(51), eabj9341, <https://doi.org/10.1126/sciadv.abj9341>, 2021.
5. **Yan, Y.\***, Spaulding, N.E., Bender, M.L., Brook, E.J., Higgins, J.A., Kurbatov, A.V., and Mayewski, P.A.: Enhanced Moisture Delivery into Victoria Land, East Antarctica During the Early Last Interglacial: Implications for West Antarctic Ice Sheet Stability, *Clim. Past*, 17(5), 1841–1855, <https://doi.org/10.5194/cp-17-1841-2021>, 2021.
6. Yeung, L.Y.\*, Murray, L.T., Banerjee, A., Tie, X., **Yan, Y.**, Atlas, E.L., Schauffler, S.M. and Boering, K.A.: Effects of Ozone Isotopologue Formation on the Clumped-Isotope Composition of Atmospheric O<sub>2</sub>. *J. Geophys. Res. Atmos.*, 126(14), p.e2021JD034770, <https://doi.org/10.1029/2021JD034770>, 2021.
7. **Yan, Y.\***: Recent Advances in Quaternary Paleoclimate Research Using Antarctic Blue Ice, *Chin. Sci. Bull.*, 66(21), 2663–2670, <https://doi.org/10.1360/TB-2020-1151>, 2021 (in Chinese).
8. **Yan, Y.\***, Bender, M.L., Brook, E.J., Clifford, H., Kemeny, P., Kurbatov, A.V., Mackay, S., Mayewski, P.A., Ng, J., Severinghaus, J.P., and Higgins, J.A.: Two-million-year-old snapshots of atmospheric gases from Antarctic ice, *Nature*, 574(7780), 663–666, <https://doi.org/10.1038/s41586-019-1692-3>, 2019.
9. Stolper, D.A.\*, Bender, M.L., Dreyfus, G.B., **Yan, Y.** and Higgins, J.A.: A Pleistocene ice-core record of atmospheric O<sub>2</sub> concentrations, *Science*, 353(6306), 1427–1430, <https://doi.org/10.1126/science.aaf5445>, 2016.
10. Higgins, J.A.\*, Kurbatov, A.V., Spaulding, N.E., Brook, E.J., Introne, D.S., Chimiak, L., **Y. Yan**, Mayewski, P.A., and Bender, M. L.: Atmospheric composition 1 million years ago from blue ice in the Allan Hills, Antarctica, *Proc. Natl. Acad. Sci. U.S.A.*, 112(22), 6887–6891, <https://doi.org/10.1073/pnas.1420232112>, 2015.

## CONFERENCE PRESENTATIONS

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- 04/2022 Oxygen in the trapped air: identifying primary atmospheric signals and secondary bubble close-off fractionation (oral), EGU General Assembly
- 12/2021 On the origin of negative deuterium excess observed in snow and ice samples from McMurdo Dry Valleys and Allan Hills Blue Ice Areas, East Antarctica (poster), *AGU Fall Meeting*
- 05/2020 Oxygen-to-nitrogen ratios in 1.5-million-year-old ice cores from Allan Hills Blue Ice Areas: implications for the long-term atmospheric oxygen concentrations (online), *EGU General Assembly*
- 11/2018 Climate Snapshots from 2-Million-Year-Old Shallow Ice Cores in the Allan Hills Blue Ice Area, East Antarctica (oral), *Graduate Climate Conference*, Pack Forest, WA, USA
- 06/2018 Basal Ice Properties in Two-million-Year-old Allan Hills Cores (oral), *SCAR/IASC Open Science Conference*, Davos, Switzerland
- 12/2017 A method to precisely measure Ar isotopes and Xe/Kr ratios in air trapped in ice cores for simultaneous ice core dating and mean ocean temperature reconstruction (poster), *AGU Fall Meeting*, New Orleans, LA, USA
- 08/2017 2.7-Million-Year-Old Ice from Allan Hills Blue Ice Areas, East Antarctica Reveals Climate Snapshots Since Early Pleistocene (oral), *Goldschmidt Conference*, Paris, France

## INVITED TALKS (SELECTED)

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- 08/2022 Polar Research Institute of China
- 07/2022 Department of Ocean Science and Engineering, Southern University of Science and Technology
- 03/2022 School of Earth and Space Sciences, Peking University
- 03/2022 International Center for Isotope Effects Research, Nanjing University
- 01/2022 Shaanxi Key Laboratory of Earth Surface System and Environmental Carrying Capacity, Northwestern University
- 01/2021 State Key Laboratory of Marine Environmental Science, Xiamen University
- 11/2019 School of Earth and Space Sciences, University of Science and Technology of China
- 11/2019 School of Oceanography, Shanghai Jiao Tong University

05/2019	College of Environmental Science and Engineering, Peking University
01/2019	Department of Earth, Environmental and Planetary Sciences, Rice University
11/2018	Department of Geosciences, Princeton University
03/2017	College of Earth, Ocean, and Atmospheric Sciences, Oregon State University
02/2017	Scripps Institution of Oceanography, University of California, San Diego
10/2016	Department of Geosciences, Princeton University
06/2016	School of Geographic and Oceanographic Sciences, Nanjing University

## AWARDS AND FELLOWSHIP

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12/2019	<b>Poh-Hsi Pan Family Postdoctoral Fellowship</b> , Rice University
09/2017	<b>Harold W. Dodds Honorific Fellowship</b> , Princeton University
07/2016	<b>Antarctica Service Medal</b> , National Science Foundation
06/2016	<b>Walbridge Fund Graduate Award</b> (\$3,000), High Meadows Environmental Institute, Princeton University
05/2015-05/2017	<b>Princeton Energy and Climate Scholarship</b> , High Meadows Environmental Institute, Princeton University
10/2012	<b>Chun-Tsung Scholarship</b> , Peking University
01/2009	<b>Silver Medalist</b> , 22 <sup>nd</sup> National Chemistry Olympiad, Xi'an, China

## PROFESSIONAL SERVICE

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- Manuscript reviewer for *Science Advances*, *The Cryosphere*, *Atmospheric Chemistry and Physics*, *Science Bulletin*, and *Journal of Glaciology and Geocryology* (Chinese).
- Session co-convener and co-chair for “Ice Core Records of Environmental Change”, *AGU Fall Meeting (2018)*, Washington DC, USA.

## TEACHING EXPERIENCE

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02/2016-06/2016	<b>Teaching Assistant</b> , <i>GEO362 Paleoclimate</i> , Princeton University
02/2015-06/2015	<b>Teaching Assistant/Guest Lecturer</b> , <i>GEO362 Paleoclimate</i> , Princeton University
02/2013-07/2013	<b>Teaching Assistant/Guest Lecturer</b> , <i>12730020 Our Changing Planet</i> , Peking University